UNPROTECTED/NON PROTÉGÉ

ORIGINAL/ORIGINAL

CMD: 19-M29

Date signed/Signé le : 04 SEPTEMBER 2019

Industry Report

Rapport sur le secteur nucléaire

Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018

Rapport de surveillance réglementaire sur l'utilisation des substances nucléaires au Canada : 2018

Public Meeting

Réunion publique

Scheduled for:

November 7, 2019

Prévue pour :

le 7 novembre 2019

Submitted by:

CNSC Staff

Soumise par :

Le personnel de la CCSN

e-Doc 5929337 (WORD)
e-Doc 5985236 (PDF)

Canada

Summary

This Commission member document (CMD) presents the *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018.*

Through inspections, reviews and assessments, Canadian Nuclear Safety Commission staff concluded that licensees in the medical, industrial, academic and research, and commercial sectors have made adequate provisions to protect the health, safety and security of persons and the environment.

There are no actions requested of the Commission. This CMD is for information only.

Résumé

Ce document à l'intention des commissaires contient le *Rapport de surveillance réglementaire sur l'utilisation des substances nucléaires au Canada : 2018*.

Au moyen d'inspections, d'examens et d'évaluations, le personnel de la Commission canadienne de sûreté nucléaire a conclu que les titulaires de permis du secteur médical, du secteur industriel, du secteur universitaire et de la recherche et du secteur commercial ont pris des mesures adéquates pour préserver la santé, la sûreté et la sécurité des personnes et protéger l'environnement

Aucune mesure n'est requise de la Commission. Ce CMD est présenté à titre d'information seulement.

Signed/signé le

04 September 2019

Colin Moses

Director General / Director General

Directorate of Nuclear Substance Regulation

Directeur général de la

Direction de la réglementation des substances nucléaires

This page was intentionally left blank.

L'organisme de réglementation nucléaire du Canada

Regulatory Oversight Report on the Use of Nuclear Substances: 2018





Commission canadienne de sûreté nucléaire
Canadian Nuclear Safety Commission

Canada

Regulatory Oversight Report on the Use of Nuclear Substance in Canada: 2018

Également publié en français sous le titre : Rapport de surveillance réglementaire sur l'utilisation des substances nucléaires au Canada : 2018 (ébauche)

Document availability

This document can be viewed on the CNSC website. To request a copy of the document in English or French, please contact:

Canadian Nuclear Safety Commission
280 Slater Street
P.O. Box 1046, Station B
Ottawa, Ontario K1P 5S9
CANADA

Tel.: 613-995-5894 or 1-800-668-5284 (in Canada only)
Fax: 613-995-5086
Email: cnsc.info.ccsn@canada.ca
Website: nuclearsafety.gc.ca
Facebook: facebook.com/CanadianNuclearSafetyCommission
YouTube: youtube.com/cnscccsn
Twitter: @CNSC_CCSN
LinkedIn: linkedin.com/company/cnsc-ccsn

Publishing history

September 2019 Version 1.0

Cover images

From left to right:
Inspection of a mobile linear accelerator unit
Working with nuclear substances
Inspection of a portable gauge
Well logging source storage
Storage location at a waste nuclear substance licensee

Table of contents

Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018

Executive summary

The *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018* summarizes the safety performance of 1,520 licensees, which hold a total of 2,135 licences. The Canadian Nuclear Safety Commission (CNSC) authorizes these licensees to use of nuclear substances and prescribed equipment in the medical, industrial, academic and research, and commercial sectors. The waste nuclear substance licensees that were presented as their own sector in the 2017 version of this report are presented in this 2018 report as a subsector within the commercial sector.

The CNSC regulates the nuclear industry in Canada through a comprehensive program of licensing, certification, compliance verification, enforcement and reporting. For each sector described in this report, CNSC staff evaluate safety performance through inspections, assessments, and reviews of licensee programs and processes.

CNSC staff use a well-established Safety and Control Area Framework in evaluating each licensee's safety performance. The framework includes 14 safety and control areas (SCAs) covering all technical areas of regulatory oversight. For the purpose of this report, CNSC staff evaluate safety performance by presenting licensees' regulatory compliance in select SCAs (that is, management system, operating performance, radiation protection and security), as well as effective doses to workers and reported events.

In 2018, as part of the ongoing regulatory oversight of licensees, CNSC staff conducted compliance verification activities consisting of field inspections, desktop reviews and technical assessments of licensee activities. The evaluations of findings for the SCAs covered in this report show that, overall, licensees made acceptable provision to protect health, safety, security, and the environment from the use of nuclear substances and prescribed equipment, and took the measures required to implement Canada's international obligations. Based on these evaluations, CNSC staff conclude that the use of nuclear substances and prescribed equipment in Canada remains safe.

Compliance verification

In 2018, CNSC staff conducted 949 inspections across the four sectors. Overall, licensees showed satisfactory compliance ratings in all of the SCAs examined in this report. Where items of non-compliance were identified, CNSC staff ensured that licensees took appropriate corrective actions. Licensees immediately addressed any items of non-compliance that had immediate risks to health, safety or security. CNSC staff found that the majority of inspected licensees in 2018 were in compliance with the requirements in the SCAs covered in this report:

- In the management system SCA, 94% of the licensees inspected ensured that adequate processes and programs were in place to achieve their safety objectives.
- In the operating performance SCA, 84% of the licensees inspected made adequate provisions for health, safety, security, and the protection of the environment.
- In the radiation protection SCA, 84% of the licensees inspected had adequate measures and programs in place to ensure that exposure to workers and the public to ionizing radiation was monitored, and controlled, and remained ALARA (as low as reasonably achievable).

- In the security SCA, 92% of the licensees inspected demonstrated that they have adequate provisions in place to prevent the loss, sabotage, illegal use, illegal possession or illegal removal of nuclear substances and prescribed equipment in their care and control.

Enforcement

The CNSC uses a graduated approach to enforcement to encourage compliance and deter future non-compliance. When non-compliance (or continued non-compliance) has been identified, CNSC staff assess the significance of the non-compliance and determine the appropriate enforcement action.

In 2018, the CNSC took 16 escalated enforcement actions against licensees in the four sectors, including 13 orders and three administrative monetary penalties (AMPs). Most of the enforcement actions were taken against licensees in the industrial sector, consistent with trends from previous years. In two cases, licensees that received orders have yet to comply with the terms and conditions of the order, so the order remains in place. All AMPs issued in 2018 have been paid. Refer to section 6.3 for details.

Effective doses to workers

Licensees are required to keep radiation doses to persons below regulatory limits and ALARA in accordance with the radiation protection programs established under the CNSC licences.

In 2018, doses were monitored for 58,689 workers in the four sectors covered in this report. Of those workers, 22,799 were identified as nuclear energy workers (NEWs). The remaining 35,890 were not identified as NEWs and are referred to as non-NEWs in the report. Exposures to radiation continued to be very low for workers in 2018, consistent with previous reporting years.

On two occasions, NEWs received extremity doses that exceeded the regulatory limit of 500 mSv. These incidents were reported to the Commission in March 2018 and December 2018, respectively. Refer to section 6.1 for details about these events.

In 2018, one non-NEW received a whole body dose above the regulatory limit of 1 mSv. This event was presented to the Commission in August 2018. The details of this event are reported in section 6.1.

Reported events

CNSC staff assessed the 195 events reported by licensees covered in this report. Reported events have been ranked using the International Nuclear and Radiological Event Scale. Of these, 190 were ranked as level 0 (no safety significance), three were ranked as level 1 (anomaly) and two were ranked as level 2 (incident). Reported events are discussed in more detail in section 6.4.

For all of the events reported, licensees implemented appropriate response measures to mitigate the impacts of the events and to limit radiation exposure to workers and the public. CNSC staff reviewed the measures and found them to be satisfactory.

Conclusion

Based on the CNSC's comprehensive regulatory oversight of the industry, CNSC staff conclude that the use of nuclear substances and prescribed equipment in Canada is safe. Licensees corrected identified items of non-compliance to the satisfaction of CNSC staff; adequate

provisions are in place for to protect of the health, safety and security of persons and the environment from the use of nuclear substances and prescribed equipment.

1. Background

1.1 Background

For a comprehensive overview of the CNSC and its activities, consult the CNSC's 2017–18 annual report, *Nuclear Safety: Our Commitment*.

The Canadian Nuclear Safety Commission (CNSC) regulates the development, production, possession and use of nuclear substances, prescribed equipment and prescribed information in order to prevent unreasonable risk to the environment, to the health and safety of persons, and to security. The CNSC also disseminates objective scientific, technical and regulatory information to the public.

Persons licensed by the CNSC are responsible for operating their facilities and managing their activities safely, and are required to implement programs that make adequate provisions for protecting health, safety, security and the environment. The CNSC is responsible for setting the requirements and verifying compliance against those requirements.

Each year, CNSC staff assess the overall safety performance of the use of nuclear substances and prescribed equipment in Canada. Staff consider industry performance as a whole, as well as the performance of each sector (that is, medical, industrial, academic and research, and commercial) separately. This assessment is summarized in this document. Descriptions of each sector can be found in section 4.

The CNSC regulates the nuclear industry in Canada through a comprehensive program of licensing, certification, compliance verification and enforcement. For each of the nuclear sectors described in this report, CNSC staff evaluate safety performance through assessments, inspections, reviews, and evaluations of licensee programs and processes.

The safe use of nuclear substances and prescribed equipment in Canada is demonstrated through licensees' compliance with the *Nuclear Safety and Control Act* (NSCA) and its associated regulations, as well as specific conditions set out in CNSC licences.

2. Report overview

This regulatory oversight report focuses on the results of compliance verification and enforcement activities in 2018 for licensees authorized to conduct activities involving nuclear substances or prescribed equipment. For the purposes of reporting, licensees are grouped into four sectors:

- medical
- industrial
- academic and research
- commercial[1]

2.1 Data collection

Compliance ratings, non-compliance data, and CNSC enforcement actions were obtained from the CNSC's compliance verification and enforcement program in 2018.

Annual compliance reports submitted by licensees in calendar year 2018 provided the data on doses incurred by persons engaged in licensed activities in the four sectors covered in this report.

Events are reported to the CNSC through the CNSC duty officer. An event is any unintended occurrence, including operating error, equipment failure or another mishap, or deliberate action on the part of others, the consequences or potential consequences of which may be significant from the point of view of protection or safety. Reported events are tracked by CNSC staff.

2.2 Safety performance measures

CNSC staff use many metrics to evaluate licensees' performance. This report uses a subset of these which – when taken together – have been determined to provide a well-rounded picture of performance across the four sectors covered by this report. The metrics used in this report are:

- doses to workers
- inspection performance
- enforcement actions
- reported events

2.2.1 Doses to workers

Each licensee is required to implement a radiation protection program that ensures radiation doses to workers are well below regulatory limits and kept as low as reasonably achievable (ALARA), with social and economic factors taken into account. Thus, ascertainment of the magnitude of doses received by workers is an integral part of a licensee's radiation protection program.

This report references two groups of workers who perform the types of activities referenced in a CNSC licence: those identified as nuclear energy workers (NEWs) and those not identified as NEWs (non-NEWs). The term "NEW" means a person who is required, in the course of his or her business or occupation in connection with a nuclear substance or nuclear facility, to perform

[1] The waste nuclear substance licensees, previously reported as their own sector, have been included as a subsector in the commercial sector for the 2018 report.

duties in circumstances that may result in the person receiving a dose of radiation greater than 1 millisievert (mSv) per year (*NSCA*, section 2). A worker not identified as a NEW is person who is unlikely to receive a dose greater than 1 mSv per year while performing duties in connection with a nuclear substance or nuclear facility. This report provides dose information for all workers, while primarily focusing on those identified as NEWs.

The CNSC's regulatory effective dose limits for NEWs are set at 50 mSv in any one-year dosimetry period and a total of 100 mSv over a five-year dosimetry period. The one-year dosimetry period covers January 1 to December 31 of every year. The current five-year dosimetry period started on January 1, 2016 and will end on December 31, 2020. For all persons not identified as NEWs (non-NEWs), the effective dose limit is 1 mSv per calendar year.

Additionally, section 14 of the *Radiation Protection Regulations* sets out equivalent dose limits for the lens of the eye, the skin, and the hands and feet, for NEWs and persons not identified as NEWs

Health Canada administers the National Dose Registry, which is Canada's national repository of dose records for workers who are monitored for occupational exposure to ionizing radiation, whether under the CNSC's mandate or not. Health Canada has published the *Report on Occupational Radiation Exposures in Canada 2017*, covering the years 2007 to 2016. Doses monitored by the National Dose Registry were consistent with the doses reported by licensees to the CNSC, where comparable job categories and subsectors were examined.

Licensees' performance as it relates to doses to workers is presented in section 6.1.

2.2.2 Inspection performance

To ensure comprehensive regulatory oversight and reporting of licensed activities, CNSC staff have developed a set of safety and control areas (SCAs). SCAs have been in use for a number of years, and represent a well-established set of technical areas that have proven effective in evaluating licensee safety performance of regulated facilities and activities under the CNSC's purview. The CNSC has defined 14 SCAs:

- management system
- human performance management
- operating performance
- safety analysis
- physical design
- fitness for service
- radiation protection
- conventional health and safety
- environmental protection
- emergency management and fire protection
- waste management
- security
- safeguards and non-proliferation
- packaging and transport

During licensing and compliance activities, CNSC staff review the licensee's (or applicant's) performance within each relevant SCA by reviewing licensee documents and conducting inspections. Owing to the broad nature of the different activities conducted by the licensees covered in this report, not all SCAs apply to all activities or all licensees. Although not

incorporated into this report, all relevant SCAs are assessed during compliance inspections and reviews of licensees' documents, and a compliance rating similar to those found in this report is assigned for each SCA. All required corrective actions arising from below-satisfactory performance are tracked and followed up by CNSC staff to ensure that all items of non-compliance are addressed to the satisfaction of the CNSC.

For the purpose of this report, the performance in a subset of the SCAs evaluated during inspections is reviewed and reported. The following four SCAs are the most relevant indicators of safety performance for licensees in the sectors covered in this report: management system, operating performance, radiation protection and security. These SCAs are applicable to most of the licensees covered by this report and, together, provide an indication of licensees' overall safety performance. Descriptions of the four SCAs highlighted in this report, alongside inspection performance for each, is presented in section 6.2.

While events related to packaging and transport are included in the report, and provide an indication of their impact on the health and safety of persons and on the environment, the report does not explicitly cover performance in the packaging and transport. The decision to exclude performance ratings for this SCA was made because many of the licensees in this report do not transport nuclear substances or prescribed equipment and, therefore, inspection ratings are not available for all licensees. Furthermore, the transport of nuclear substances and prescribed equipment can be carried out by companies that are not licensees (carriers). Anyone transporting nuclear substances must do so in accordance with the *Packaging and Transport of Nuclear Substances Regulations, 2015*. CNSC staff assess licensee programs and verify compliance in the packaging and transport SCA whenever applicable.

In addition, ratings for the environmental protection SCA are included for the waste nuclear substance subsector (appendix C.4). Environmental protection SCA ratings are not reported for the other sectors because the majority of nuclear substance and radiation device licensees are authorized to possess and use sealed sources and radiation devices, which have an extremely low risk of impact on the environment (as per REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures*, Version 1.1). Sealed sources are designed to international standards and must meet stringent design requirements. The CNSC certifies all radiation devices to ensure that they are safe for use and meet CNSC requirements, which includes an assessment of their design (*Nuclear Substances and Radiation Devices Regulations*, s. 11, s. 12). In addition, the CNSC regulations require regular leak testing of sealed sources, thereby ensuring that the environment is protected.

The unsealed nuclear substances, used by a small group of CNSC licensees, are generally short-lived radionuclides. Their use is typically confined to controlled rooms or laboratories designed in accordance with regulatory requirements, including associated work practices, that prevent the release or uncontrolled release of nuclear substances to the environment. These measures form a part of the licensing basis for the CNSC licence issued. CNSC staff verify compliance with these measures through compliance activities.

For waste nuclear substance licensees that may have interactions with the environment, releases to the environment are monitored and reported to the CNSC annually. Environmental releases are minimized through the use of emissions control technologies such as high-efficiency particulate air (HEPA) filters and waste water collection tanks, which is consistent with the principles outlined in REGDOC-2.9.1. Emissions from waste nuclear substance licensees have historically been below levels that would pose a risk to the public or the environment. CNSC staff are satisfied that there are adequate measures in place to protect the public and the environment.

The conventional health and safety SCA is defined as the implementation of a program to manage workplace safety hazards and to protect workers, and is verified as a part of every CNSC inspection across all sectors. Although not specifically detailed or rated for each sector in this report, any practice or situation that would indicate to CNSC staff that the conventional health and safety program is below CNSC expectations is immediately identified to the licensee to ensure the issue is rectified to the satisfaction of CNSC staff. Results for this SCA under the waste nuclear substances subsector have been included in appendix C.4. Licensees in this subsector are required to implement and maintain a conventional health and safety program that meets the requirements of the applicable safety legislation for their sites. This program is referenced in the licence conditions handbook for each waste nuclear substance licence and becomes part of the licensing basis.

2.2.3 Enforcement actions

Under the *Nuclear Safety and Control Act* and associated regulations, the CNSC can take various levels of regulatory action to protect the health, safety and security of Canadians and the environment.

The CNSC uses a graduated approach to enforcement commensurate with risk to encourage compliance, and deter future non-compliance. When non-compliance (or continued non-compliance) has been identified, CNSC staff assess the significance of the non-compliance, and determine the appropriate enforcement action, based on the CNSC's graduated approach to enforcement. Each enforcement action is an independent response to non-compliance. Significant regulatory actions taken by the CNSC are posted on the CNSC website.

Measures used to encourage compliance, and deter further non-compliances, include:

- informing licensee/discussion with licensee
- written notices
- formal requests under *General Nuclear Safety and Control Regulations* section 12(2)
- orders
- increased regulatory scrutiny
- licensing actions
- administrative monetary penalties (AMP)
- decertification
- prosecution
- revocation of licence

Section 6.3 presents trends and analysis of enforcement actions issued to licensees covered by this report. Detailed descriptions of each order or AMP issued to licensees covered by this report are available in appendix D.

2.2.4 Reported events

Licensees, as well as those who transport nuclear substances, are required to report to the CNSC regarding situations, events, and dangerous occurrences. The reporting requirements are found in the NSCA and regulations made under the NSCA Within a defined time period, licensees are required to submit a written report to the CNSC on the event. The written report must include an analysis of the cause and circumstances of the event, as well as any measures taken, or proposed to be taken, by the licensee to prevent recurrence. Together, the initial and final reports allow the CNSC to verify whether the licensee has taken appropriate measures to mitigate the event and implemented adequate corrective actions to prevent recurrence.

The CNSC uses the International Nuclear and Radiological Event Scale (INES) tool to categorize events in the sectors covered by this report. Additional information on the INES classification can be found on the CNSC website.

Trending and analysis of events reported to the CNSC in 2018 are presented in section 6.4. Descriptions of each reported event are available in appendix E.

2.2.5 Glossary

For definitions of terms used in this document, see REGDOC-3.6, *Glossary of CNSC Terminology*, which includes terms and definitions used in the *NSCA* and the regulations made under it, and in CNSC regulatory documents and other publications.

3. Regulatory program for the use of nuclear substances

The possession, use, transfer, import, export, abandonment and storage of nuclear substances and prescribed equipment must be licensed by the Canadian Nuclear Safety Commission (CNSC) when the amount of nuclear substance involved is greater than its exemption quantity (see Schedule 1 of the *Nuclear Substances and Radiation Devices Regulations*). Facilities where certain types of Class II prescribed equipment are to be installed must also be licensed by the CNSC prior to their construction, operation or decommissioning. A licence is also required to service radiation devices or Class II prescribed equipment.

All licensees that operate Class II nuclear facilities or that service Class II prescribed equipment must have a certified radiation safety officer (RSO) and a qualified temporary replacement. The RSO is responsible for implementing the radiation safety program, and ensuring that licensed activities are conducted safely and all regulatory requirements are met.

All radiation devices and most Class II prescribed equipment, as well as certain types of transport packages, must be certified by the CNSC before they can be used in Canada.

The CNSC's compliance and verification program measures licensee compliance with CNSC regulatory requirements. Regular inspections and desktop evaluations verify that licensees comply with the *Nuclear Safety and Control Act* (NSCA) and its associated regulations, as well as any conditions included in their licences.

To determine appropriate levels of regulatory monitoring and control, CNSC staff establish compliance verification plans for each nuclear sector that are based on risk-informed regulatory oversight of each sector's activities. Modifications to the compliance plans are made on an ongoing basis in response to events and changes in licensees' performance.

In the fiscal year 2019–20, CNSC staff are reviewing the regulatory oversight strategies for larger or more complex nuclear substance and radiation device licensees to assess if the regulatory oversight tools used in its current regulatory approach are effective for these types of licensees.

3.1 CNSC regulatory effort

The Commission has authorized designated officers to make decisions on licensing and certification as they pertain to nuclear substances and prescribed equipment. In 2018, CNSC designated officers made a total of 2,424 decisions related to the activities covered in the report (Table 1). This is 6% lower than 2017. The decrease is attributable to a drop in the number of certification decisions for prescribed equipment.

Table 1: Licensing and certification in 2018, all sectors combined

Type of decision	Number of decisions
Licensing (issuance of new licences, licence renewals, licence amendments, licence revocations and licence transfers)	1,824
Certification of prescribed equipment (radiation devices, Class II prescribed equipment and transport packages)	93
Certification of exposure device operators (EDOs) (issuance of new certification and renewal of certification)	488
Certification of Class II RSOs	19
Total	**2,424**

In 2018, CNSC staff spent 11,827 person-days – roughly the annual equivalent of 53 full-time staff – on efforts directly related to licensing, compliance and certification of the use of nuclear substances and prescribed equipment (Table 2). This is down approximately 9% from 2017 and 5% from 2016.

Table 2: CNSC staff direct effort for regulating the use of nuclear substances and prescribed equipment in 2018, all sectors combined

Activity	Person-days
Licensing	4,705
Certification	1,215
Compliance verification	5,907

From 2017 to 2018 there was a 25% drop in direct effort spent on certification activities. Time reported on certification includes time allocated to certification of exposure device operators (EDOs) and time allocated to certification of packages, radiation devices and Class II prescribed equipment. While there was an increase in the decisions related to certification of exposure device operators; the increase in decisions related to certification of EDOs did not translate into an increase in effort as CNSC staff optimized their processes. In 2018 there was a drop in the number of decisions related to certification of prescribed equipment that drove down the time spent in this area.

There was also a drop the time allotted to compliance verification (18% decrease), compared to 2017. The decrease in the overall number of inspections performed in 2018 was due primarily to the increase in the time spent on training and mentoring new inspectors as well as the focus on conducting performance-based inspections as opposed to records-based inspections. In addition, there was an increase in the effort spent by inspectors collaborating with licensing staff in event reviews and subsequent follow-ups. In addition, resources were focused on strengthening guidance for licensee programs and sharing operating experience with licensees in order to help licensees further improve their programs and promote compliance. These efforts are expected to improve performance trends. See section 5 for two examples of CNSC staff efforts to address performance trends in certain subsectors.

The reductions in compliance verification time did not have an impact on the number of inspections completed (949 in 2018 versus 944 in 2017). Inspections are planned and prioritized

in a risk-informed manner and the rationale for not conducting inspections according to the plan are documented. CNSC staff prioritized inspections of high risk licensees as well as those that had demonstrated poor performance to ensure that all essential inspections were completed. See section 3.7 for details on the compliance verification process.

3.2 Licensing

Activities involving nuclear substances and prescribed equipment generally require a licence unless the quantity being used is low enough to be exempt from the requirement to have a licence (*Nuclear Substances and Radiation Devices Regulations*). To obtain a licence, an applicant must submit an application to the CNSC. The CNSC will issue a licence only when the applicant:

- is deemed qualified to carry on the activity that the licence will authorize
- has demonstrated that they will protect the health and safety of persons and the environment
- has demonstrated that they will maintain security of the nuclear substances or prescribed equipment
- has confirmed that they will adhere to the international obligations to which Canada has agreed

The CNSC has produced a series of licence application guides to ensure that its expectations for applicants are clear and to facilitate applicants' interactions with the regulator. Licence application forms and guides for nuclear substances and radiation devices as well as for Class II facilities and prescribed equipment can be found on the CNSC website.

CNSC staff perform a risk-informed technical assessment of applications submitted to the CNSC. When a licensee applies for a licence renewal, the existing licensee is subject to the same scrutiny as a first-time applicant. In addition to the application information submitted, CNSC staff ensure there are no outstanding cost recovery fees or financial guarantees, and that there is a satisfactory compliance history. A peer review by another CNSC staff member is conducted following the initial review of all licence applications.

For all new applications associated with industrial radiography or well logging sealed sources, considered high-risk activities, CNSC staff will conduct a pre-licensing visit for the purpose of assessing the primary facility and the applicant's readiness to commence licensed activities. CNSC staff may also conduct a pre-licensing visit for other uses of nuclear substances and prescribed equipment at the CNSC's discretion. During these visits, CNSC staff interview the applicant and proposed radiation safety officer to assess their knowledge of the regulatory requirements, their own radiation safety program and their responsibilities. CNSC staff conducted nine pre-licensing visits in 2018. In seven cases, CNSC staff made the recommendation to issue a licence. In two cases, a second pre-licensing visit was required prior to the recommendation to issue a licence. In one of those cases, CNSC staff identified security concerns that needed to be addressed and in the other case, the applicant did not demonstrate a comprehensive knowledge of the radiation safety program nor of his responsibilities. Recommendations were made to issue a licence based on the improvements noted in the second pre-licensing visits.

If the application satisfies the above requirements, the Commission, or a designated officer authorized by the Commission, may issue a licence authorizing the licensee to conduct the activities requested in the licence. The licence includes provisions that define and limit the scope of the authorized activities, as well as specific conditions that must be fulfilled by the licensee when conducting those activities.

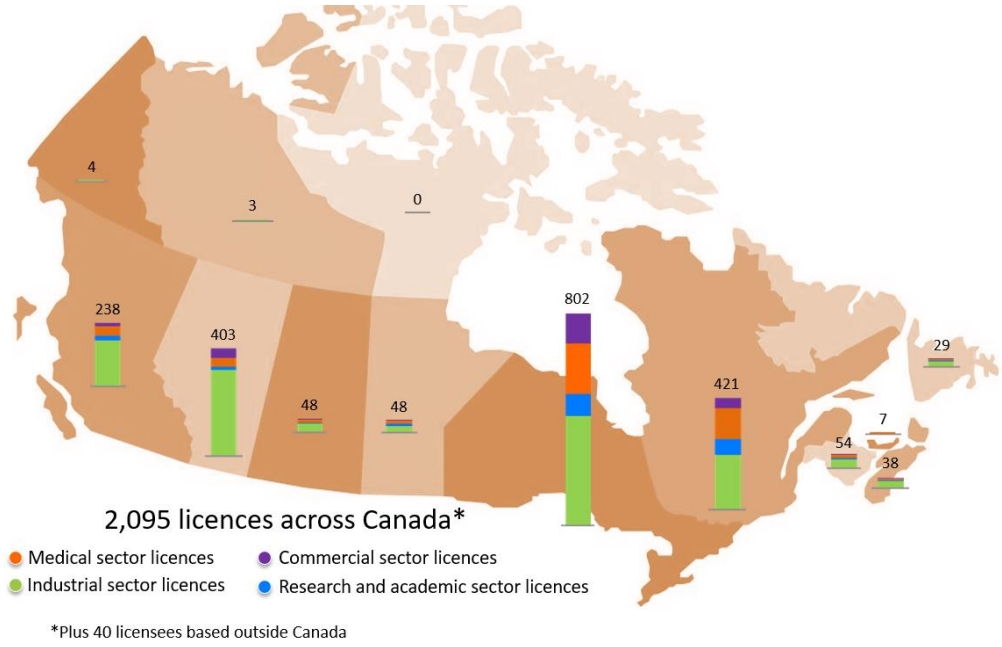
In 2018, there were 2,135 licences held for the use of nuclear substances and prescribed equipment (Table 3). The licensees are located throughout Canada, as indicated in figure 1. Descriptions of the four sectors can be found in section 4.

The CNSC will continue to explore additional opportunities to consolidate multiple licensed activities under a single licence. Consolidation of use types could yield efficiencies for both licensees and CNSC staff without diminishing CNSC's oversight of the activities. It is expected that if the CNSC were to implement such consolidation, the number of licences would decrease.

Table 3: Number of licences by sector, 2014 – 2018

Sector	2014	2015	2016	2017	2018
Medical	536	494	470	457	436
Industrial	1,398	1,349	1,308	1,287	1,259
Academic and research	229	207	208	195	192
Commercial	256	251	254	252	248
Total	**2,419**	**2,301**	**2,240**	**2,191**	**2,135**

Figure 1: Licensees that use nuclear substances and prescribed equipment are located across Canada



3.3 Certification of prescribed equipment and transport packages

An application for certification must be submitted to the CNSC before the prescribed equipment can be used in Canada. Prescribed equipment includes radiation devices and Class II prescribed equipment. An application for certification is also needed for certain types of transport packages.

Regulatory documents REGDOC-1.5.1, *Application Guide: Certification of Radiation Devices or Class II Prescribed Equipment* *and* RD/GD-352, *Design, Testing and Performance of Exposure Devices* outline CNSC expectations for the certification of radiation devices and Class II prescribed equipment, while RD/GD- 364, *Joint Canada - United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages* , outlines CNSC expectations for the certification of transport packages.

Upon receipt of an application, CNSC staff conduct a thorough technical review of the information contained in the submission to determine if:

- the prescribed equipment or transport package meets all CNSC regulatory requirements and is safe to use
- adequate measures are in place in respect of its use to protect the environment, national security, and the health and safety of persons

A CNSC quality assurance program in the form of a peer review by another qualified CNSC staff member is in place for the review of applications for certification of prescribed equipment and transport packages.

If satisfied that the design meets the above requirements, the Commission, or a designated officer authorized by the Commission, may issue a certificate for the prescribed equipment or transport package based on the recommendation of the CNSC staff members who conducted the technical evaluations.

If the design does not comply with the above requirements or if a certified model is found to be unsafe, the designated officer will contact the applicant and all affected parties, such as users in the case of a certified model, to inform them of the decision to either not certify the new model or to decertify a currently certified model. In these cases, the CNSC will provide the applicant and affected parties an opportunity to be heard in accordance with the process specified in the regulations.

As seen in Table 1, designated officers made 93 decisions related to the certification of prescribed equipment (66) or transport packages (27). This is a decrease from past years, and was expected as 2016 to 2017 marked a peak in certification activity due to the expiry of a high number of certificates. To that end, the number of certification decisions in 2018 is reflective of a typical year.

No prescribed equipment or transport packages were decertified in 2018.

3.4 Certification of exposure device operators

Licensees are required under the *Nuclear Substances and Radiation Devices Regulations* to permit only CNSC-certified personnel and supervised trainees to use exposure devices containing nuclear substances. In 2018, the CNSC certified 98 new exposure device operators (EDOs) and renewed the certifications of 390 others.

Prior to 2013, the CNSC issued EDO certifications without an expiry date. The implementation of EDO certification renewal and expiry dates, in early 2013, resulted in two groups of EDOs:

- EDOs certified before 2013 received replacement certifications with expiry dates generated by an algorithm to avoid a disproportionate number of renewals in any one year; these expiry dates span 2015 to 2019

- EDOs initially certified in and after 2013 received certifications with five-year validity periods

In 2018 for the first time, EDOs from both groups applied for renewal. Additionally, in 2013 the CNSC issued the highest number of initial EDO certifications to date, which corresponds to the increase in EDO-related certification decisions in 2018. CNSC staff expect that by 2020 the volume of EDO certification decisions will stabilize at a slightly lower rate, as all EDOs will be in five-year renewal cycles.

The CNSC EDO certification program is designed to ensure the continued competency of the operator, and maintain the safety and security of persons and devices when working with exposure devices. Certified individuals must demonstrate the ability to:

- safely and securely handle, transport, store and operate exposure devices and any accessories to the devices
- properly use radiation detection and monitoring equipment
- understand the obligation to comply with all relevant regulatory requirements

Regulatory document REGDOC-2.2.3, *Personnel Certification: Exposure Device Operators*, and CSA Group document CSA PCP-09, *Certified Exposure Device Operator Personnel Certification Guide*, outline the CNSC's requirements and guidance for certification as an EDO and for renewal of an EDO certification.

The CNSC may take regulatory action if an EDO is found to be operating contrary to safety protocols and conditions, or if an EDO is causing undue risk to the public or the environment. No EDOs were decertified in 2018. The CNSC designated officer refused to renew one EDO certification based on evidence that the applicant knowingly made a false or misleading written or oral statement to the Commission.

Figure 2: CNSC inspector observing an EDO set up for industrial radiography (source: CNSC)

3.5 Certification of Class II radiation safety officers

All licensees that operate Class II nuclear facilities or that service Class II prescribed equipment must have a certified radiation safety officer (RSO) and a qualified temporary replacement. The RSO ensures that licensed activities are conducted safely and all regulatory expectations are met.

There are two components to the RSO certification process:

- an assessment of the candidate's capability to perform the duties of the position, based on the submitted application
- an assessment of the candidate's knowledge of the licensed activities, based on an examination

RSO candidates must possess certain qualifications before they can be considered for certification. For most Class II licensed activities, candidates must have at least a bachelor's degree in engineering or science from a recognized university.[2] Alternative education qualifications may be reviewed on a case-by-case basis.

Candidates who are clearly able to demonstrate their knowledge as it relates to the RSO position within their organization will be certified in the position of RSO by the Commission or a designated officer authorized by the Commission.

The process for certification of Class II RSOs, along with guidance for applicants, is outlined in REGDOC-2.2.3, *Personnel Certification: Radiation Safety Officers*.

In 2018, the CNSC certified 19 Class II RSOs. No Class II RSOs were decertified in 2018. The CNSC has certified some 260 Class II RSOs since 2010.

3.6 Appointed radiation safety officers

There are approximately 1,700 Radiation Safety Officers (RSOs) appointed for nuclear substances and radiation device licences (these individuals are known as the radiation protection program authority for waste nuclear substance licensees). The designation of an RSO for nuclear substances and radiation devices licences is the responsibility of the applicant authority, the person accountable for the management and control of the licensed activity. The RSO is the person the CNSC will contact about radiation safety and compliance matters. The appointment of these RSOs does not involve a certification process.

The CNSC requires that the RSO's qualifications be included in a licence application, and will determine if the RSO has sufficient knowledge and expertise with regard to the applicant's proposed activities. The RSO may be a consultant hired by the applicant to carry out this role, provided that the consultant is clearly designated by the applicant authority to do so. Such information must be communicated to the CNSC as part of the licence application process. Site RSOs may be used where a licensee has multiple locations of licensed activity.

Unless otherwise noted by the applicant authority, the RSO will be considered to have the authority to act for the applicant and will have signing authority for all matters encompassed by

[2] Exceptions may be made for certain lower-risk activities such as the operation of mobile industrial accelerators and oil well logging accelerators.

the CNSC licence. The CNSC conducted an evaluation of the role of the RSO; information on the evaluation is available in section 5.2.

3.7 Compliance verification

The CNSC verifies compliance by conducting inspections and reviewing licensee documentation and operational activities. Licensees are required to report routine performance data, through annual compliance reports. They must also report the occurrence of specific types of events to the CNSC within timeline set out in regulation. In addition, the CNSC conducts investigations of unplanned events and public complaints.

Figure 3: CNSC inspector conducting inspection of a calibration licensee (source: CNSC)

In 2018, CNSC staff conducted 949 inspections to verify compliance with CNSC regulatory requirements. The performance of licensees evaluated through these inspections can be found in section 6.2. Eight licensees received an unacceptable rating in one or more SCAs.

CNSC staff have a range of tools at their disposal to use when an item non-compliance has been identified. The chosen enforcement action is commensurate with the risk that the item non-compliance presents to the environment, the health and safety of workers and members of the public, and to security. Enforcement actions vary with non-compliance severity, and can include orders and administrative monetary penalties (AMPs). Each is an independent response to an item of non-compliance. Information on the 16 enforcement actions taken in 2018 can be found in section 6.3.

CNSC staff plan inspections based on the risk-informed regulatory program which describes the inspection frequencies based on the relative risk of the activity being licensed. Inspections that are due in a given year but not completed are tracked.

All inspections of waste nuclear substance licences have been completed as per the schedule.

The inspection frequencies for Class II licences are two inspections every five years. Ninety-three percent of Class II licences were inspected within this frequency. Any inspections that did not occur as per the schedule were tracked and managed in the schedule.

For nuclear substance and radiation device licences, which account for the majority of licences covered by this report, the inspection frequencies range from annually, to one inspection every

three years or one inspection every five years for medium risk licences, to as-needed for low risk licences. CNSC staff develop annual inspection plans to focus on high risk licences and prioritize inspections based on a number of factors including past performance, increased event trends, significant program changes (e.g. a new RSO) and other factors. This ensures that CNSC staff focus compliance effort on risk significant activities.

However, over the last five years (as of November 2018), while 92% of the high risk licences were inspected within the specified frequency, sixty (60%) of the medium risk licences were inspected within the specified frequency. As a result CNSC staff undertook a review of the CNSC compliance strategy for these licensees. CNSC staff have modified their approach to planning and prioritizing inspections for the fiscal year 2019 –20. In parallel the CNSC is conducting a review of the risk-informed regulatory program and the associated inspection frequency guidelines for nuclear substance and radiation device licences to ensure that they provide effective and risk-informed oversight of regulated activities.

4. Sectors

For the purpose of reporting, licensees that use or possess nuclear substances or prescribed equipment are grouped into sectors, which are described below. The technical briefing CMD 18-M49 presented at the October 2018 Commission meeting provides additional details on the activities included in this oversight report.

4.1 Medical sector

Licensees in the medical sector use radiation to diagnose and treat diseases.

Figure 4: CNSC inspectors conducting an inspection of a licensee with Class II prescribed equipment (source: CNSC)

In nuclear medicine, radioactive isotopes are attached to a drug compound to form radiopharmaceuticals. These radiopharmaceuticals are administered by injection, inhalation, or ingestion, delivering the radiopharmaceutical to the target location for diagnostic imaging, therapy or palliative care.

Therapeutic treatments are also delivered using prescribed equipment such as linear accelerators and brachytherapy machines. A medical linear accelerator targets and irradiates tumour cells in patients. Cancer treatment using brachytherapy involves placing brachytherapy seeds (sealed sources) in a patient to deliver a localized dose to the diseased or affected tissue.

Medical uses of nuclear substances and prescribed equipment are classed as medium risk.

4.2 Industrial sector

Licensees grouped in the industrial sector use nuclear substances and prescribed equipment in diverse applications.

Nuclear substances can be used for the measurement of physical parameters such as density, moisture content and geological composition in civil engineering. For example, portable nuclear gauges are often used to measure moisture and density in soil, and the compaction of asphalt in road construction. The CNSC website has additional information and tools related to portable gauge use.

Figure 5: Worker operating a portable gauge to measure soil characteristics (source: CNSC)

Nuclear substances in radiation devices such as fixed gauges are used for measuring the fill level and flow rate in industrial facilities (such as those that support oil and gas exploration, mining and manufacturing).

In oil well logging applications, nuclear substances are lowered down an exploratory oil well to produce a chart of various soil parameters through the depth of the hole.

Nuclear substances and prescribed equipment are used by some licensees for non-destructive testing. One example is industrial radiography, in which certified exposure device operators use exposure devices containing nuclear substances surrounded by dense shielding to verify the internal structure and integrity of various materials including pipe welds and concrete. More recently, a small number of licensees are turning to linear accelerators for radiography imaging. This equipment facilitates the analysis of materials that are too thick to analyze using more traditional methods. Moreover, high-energy computed tomography (CT) machines are being used to create three-dimensional images of the interior of materials such as logs and engineered wood products.

High risk uses of nuclear substances in the industrial sector include: industrial radiography, oil well logging and subsurface zone location. The other applications in the industrial sector are medium risk or low risk.

4.3 Academic and research sector

This sector uses nuclear substances and prescribed equipment as a tool for laboratory studies, research, teaching and calibration. For example, unsealed sources are used in research laboratories for labeling DNA, and sealed sources are used in self-shielded irradiators. Accelerators and Class II prescribed equipment are used for research in medicine and physics.

Uses of nuclear substances and prescribed equipment in the academic and research sector are classified as medium or low risk.

CNSC laboratory

As part of its regulatory functions, the Canadian Nuclear Safety Commission (CNSC) conducts certain activities regulated under the *Nuclear Safety and Control Act* (NSCA). To ensure oversight transparency, CNSC management has separated the organization's work as a licensee from its work as a regulator.

The CNSC laboratory provides calibration services and analytical services for CNSC staff, including CNSC inspectors. To provide these services, the CNSC holds two licences: one for its gamma calibration irradiator located at its laboratory in Ottawa, and a second for consolidated uses of nuclear substances that covers all other activities conducted by the CNSC at its laboratory or elsewhere in Canada. Both licences were issued in accordance with the NSCA and are regulated using the same licensing and compliance verification processes that would apply to other, similar licensees.

In this report, the CNSC laboratory is included in the laboratory studies and consolidated use of nuclear substances subsector.

4.4 Commercial sector

The commercial sector encompasses a number of licensed activities related to the production, processing, storage and distribution of nuclear substances, and the calibration and servicing of prescribed equipment for commercial gain.

Isotope-production cyclotrons can produce a range of different radioisotopes widely used in the diagnosis and treatment of disease. The majority of licensees in the processing of nuclear substances subsector process isotopes to provide products and services used for the diagnosis and treatment of disease.

Distributors of radiation devices and nuclear substances are the link between the manufacturer and the end user. In some cases (for example, smoke detectors), end users are not required to hold licences for devices; however, companies that distribute such products in Canada are.

A licence is required to possess equipment for calibrating radiation detection instruments such as radiation survey meters. These licensees use nuclear substances and prescribed equipment to determine the response of radiation detection instruments.

Figure 6: CNSC inspector conducting an inspection of a waste nuclear substance licensee (source: CNSC)

The installation, repair and non-routine maintenance of radiation devices and prescribed equipment located in Canada requires a servicing licence issued by the CNSC, even if the licensee's headquarters are located outside Canada.

Waste nuclear substance licensees are included in the commercial sector. Similar to other groups of licensees in this sector, the waste nuclear substance licensees, support other users of nuclear substances by handling low-level waste from research laboratories, as well as slightly contaminated metals, laundry and equipment from other types of nuclear facilities.

Uses of nuclear substances and prescribed equipment in the commercial sector are classified as medium or low risk.

5. Case studies in regulatory intervention

CNSC staff monitor the performance of licensees across all sectors, using various metrics. When these metrics indicate that the performance of a group of licensees is not meeting expectations, or is declining, CNSC staff develop regulatory strategies to address the situation. Once the strategies have been implemented, CNSC staff monitor their effects adjust them if necessary.

Two case studies are presented in this section. The first is the regulatory strategy for the portable gauge subsector that began in 2010 and continues today, and the second is the regulatory strategy for the nuclear medicine subsector that is in the early stages of implementation. Both these uses of nuclear substances are considered medium risk.

5.1 Reflection on regulatory strategy for portable gauges

Over the last decade, the portable gauge subsector has been closely monitored by CNSC staff with regard to its performance, and has been the focus of a targeted regulatory strategy to improve performance with two major components: an outreach campaign and a compliance verification strategy.

In 2008 and 2009, CNSC staff observed a high-level of non-compliance amongst this group of licensees (figure 8). CNSC staff formalized a working group in 2010 to develop a unified strategy for outreach to portable gauge licensees to promote a positive safety culture, to improve communication between the CNSC and portable gauge licensees, to improve licensee's compliance with regulatory requirements, and to encourage the safe use of portable gauges in the field.

In the summer of 2014, CNSC staff launched a workshop with portable gauge licensees in Mississauga with the focus on providing RSOs with information on licensing and compliance expectations. Based on the feedback received at this initial session, CNSC staff developed a suite of six presentations:

- Portable Gauge Logistics / Introduction
- Radiation Protection and Ascertaining Doses
- Compliance Program
- Training Requirements
- Transport of Radioactive Materials – Overview of Regulatory Requirements
- Event Reporting and Emergency Response

These presentations were delivered in 28 workshops across Canada between 2015 and 2018.

In concert with the workshops, CNSC staff developed easily accessible resource material intended for portable gauge users, including a quick reference guide (2015), the *"Working Safely with Portable Gauges"* booklet (updated 2018) and a safety video for portable gauge users (2018). These references are available on the CNSC's portable gauge Web page.

To inform portable gauge licensees of these tools, the CNSC staff have published articles in the DNSR newsletter, sent direct emails to portable gauge licensees and promoted the tools during face-to-face interactions with licensees.

Alongside this information campaign, CNSC staff changed their inspection approach for the portable gauge subsector. In 2015, the approach changed from primarily verifying records and programs at head offices to conducting inspections in the field and observing workers operating portable gauges. In addition, CNSC staff increased their enforcement response to non-compliance

observed in the field. The change in approach led to improved detection of non-compliance in this subsector, shown by a decline in the performance in the radiation protection and operating performance SCAs (figure 8).

The CNSC's transition to performance-based inspection has proved particularly effective at identifying and correcting common non-compliances. For example, in 2018, the five most common items of non-compliance across all SCAs for portable gauge licensees were incorrectly filled out or incomplete transport records, failure to meet worker obligations, incorrect or incomplete labelling on Type A packages, incorrect or incomplete labelling on portable gauges in the field, and failure to notify NEWs of their obligation in writing. Many of these items of non-compliances would not be detected in a records-based inspection.

CNSC staff have continued to monitor the performance of this subsector. In 2018, CNSC staff noted an increase in licensees' performance in the operating performance and radiation protection SCAs. Furthermore, in 2017 and 2018, the percentage of portable gauges workers receiving doses between 1 and 5 mSv has dropped compared to previous years (figure 7). Taken together, these observations could be an indication that the interventions and outreach put in place by CNSC staff are having the desired effect – workers in the portable gauge sector performing their duties in a safe manner.

CNSC staff will continue to monitor the performance of licensees in this subsector. Furthermore, CNSC staff will continue to engage with portable gauge licensees with a particular focus on promoting the use of the various training and information tools that the CNSC has made available. For instance, at the start of the 2018 construction season CNSC staff sent out a reminder about safe work practices and links to resources on portable gauge safety. Similar reminders will be sent out annually.

Figure 7: Doses received by portable gauge workers, 2013 -2018

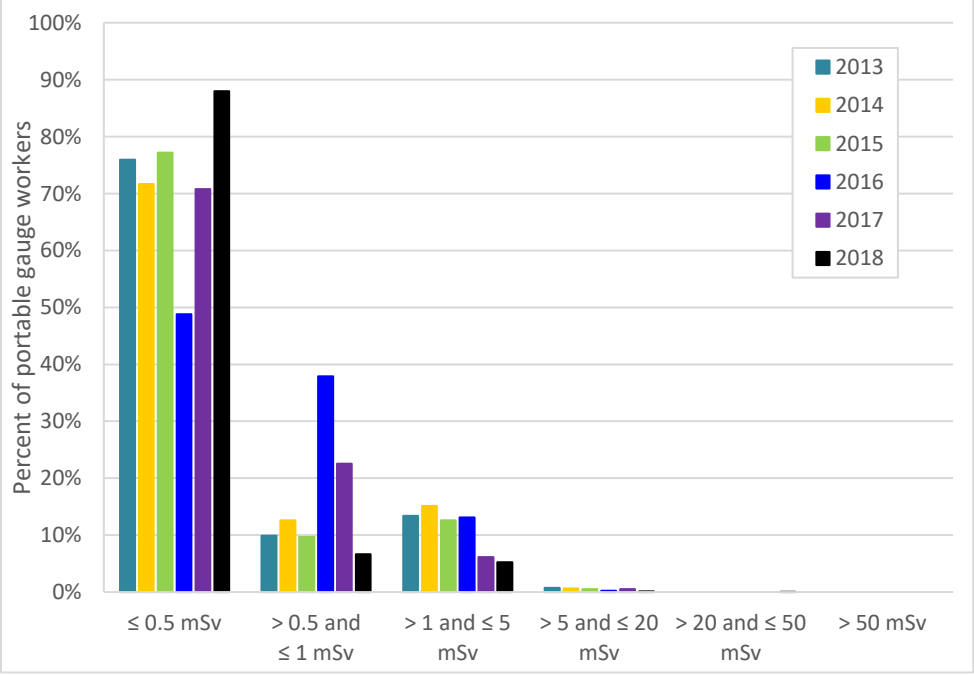
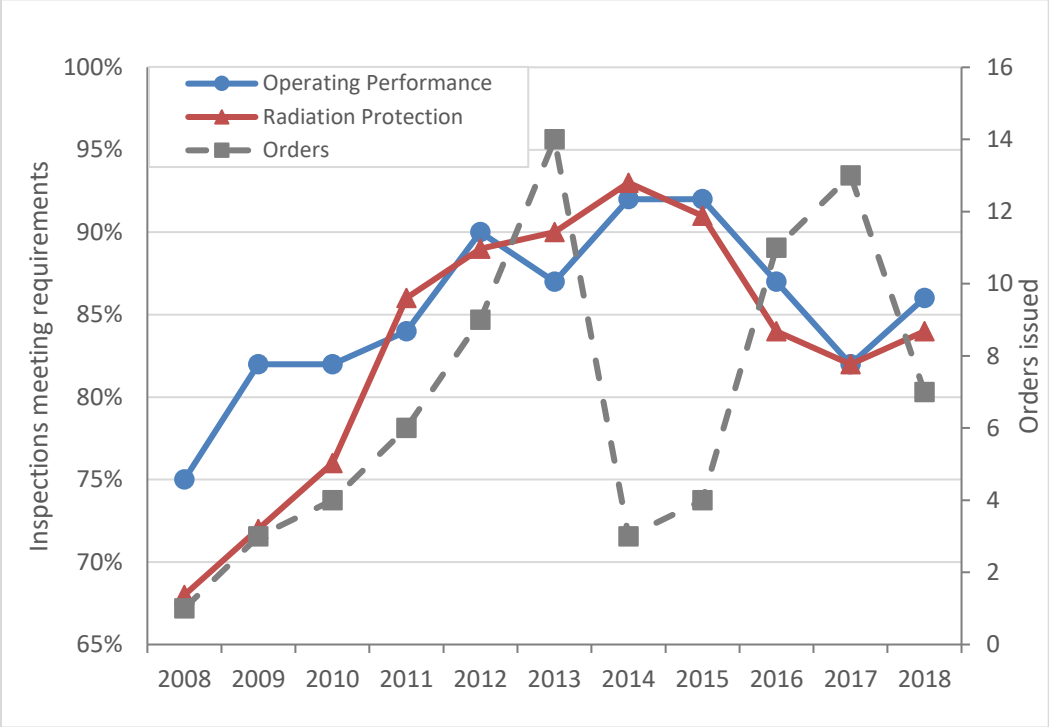


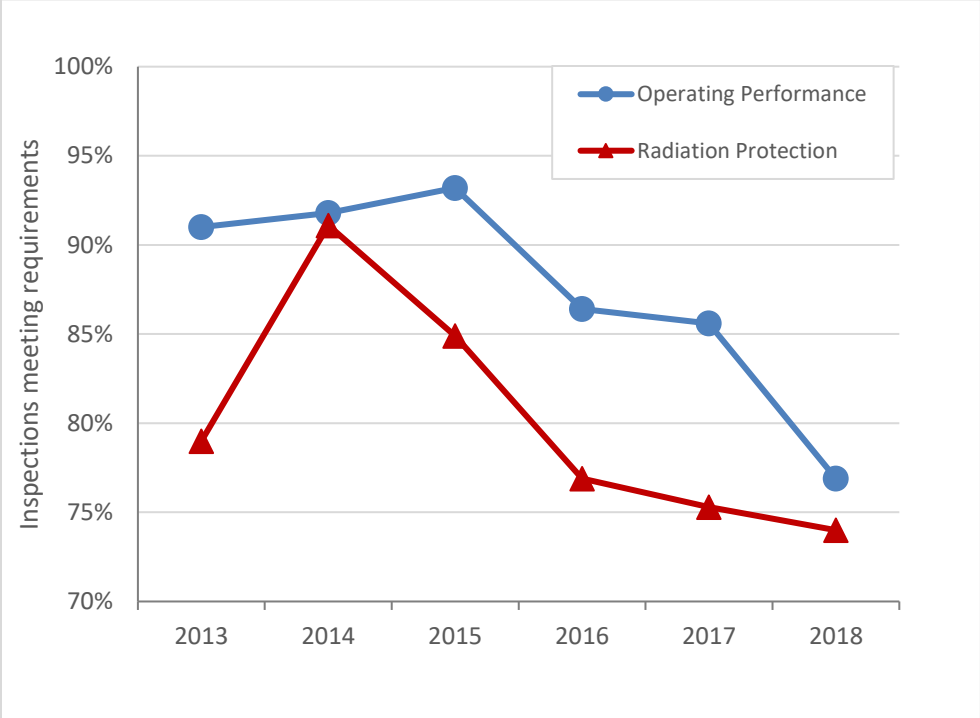
Figure 8: Performance of portable gauge licensees, 2008–2018



5.2 A strategy to improve performance in nuclear medicine

Over the past five years, CNSC staff have observed a gradual but steady decline in the performance of nuclear medicine licensees in the operating performance and radiation protection SCAs (figure 9). The declining performance has made this subsector a focus of increased regulatory oversight.

Figure 9: Performance of nuclear medicine licensees, 2013–2018



Beginning in 2016, CNSC staff shifted the focus of their inspections of nuclear medicine licensees from conducting primarily record-based inspections to observing workers performing their duties. The approach to use performance-based inspection in nuclear medicine follows the same approach used for industrial radiography and portable gauge licences. As was seen with those two subsectors, and now with the nuclear medicine subsector, the performance-based inspection approach has improved detection of common areas of non-compliance.

This focus on performance-based inspections improved CNSC staff's detection of non-compliance in operating performance. In 2018, the most common items of non-compliances across all SCAs for nuclear medicine licences included: failure of workers to meet their obligations, failure of workers to follow licensee procedures, failure to conduct thyroid monitoring as required, inadequate implementation and oversight of radiation protection programs, and failure to conduct leak tests as required. Licensees corrected all items of non-compliance to the satisfaction of CNSC. Many of these items of non-compliance would not have been detected with a records-based inspection.

The medical sector is classified as a medium risk activity, largely based on the programmatic protections and oversight afforded by the radiation protection programs in place in medical institutions. However, the deficiencies noted above, while all resolved to the satisfaction of CNSC staff, can be indicative of weakness in licensees' design and implementation of their

radiation protection programs. As a result, CNSC staff identified a need to intervene and adapt the CNSC's regulatory oversight of this sector.

At the October 2017 Commission Meeting, in CMD 17-M44, CNSC staff outlined their strategy to the Commission to respond to the declining performance in the medical sector and the challenges faced by RSOs in the medical and academic sector. Committed to evidence-based regulation, the CNSC decided to use a structured evaluation to define the problems facing RSOs in the medical and academic and research sectors. The intent was to clearly understand the issues contributing to the decline in performance, thus allowing CNSC staff to implement an oversight strategy targeting those specific areas. The evaluation report was posted on the CNSC website.

The evaluation was conducted between July 2017 and July 2018. Using methods including interviews, online surveys, literature reviews, data analysis and case studies, the evaluation team looked at how RSO behaviour influences radiation protection programs and identified key challenges faced by RSOs. Four core areas that influence radiation protection program results – training; communication and advice; monitoring, controlling, reporting; and continuous improvement – were examined, along with other influencing factors. Successes and obstacles were identified in each area.

The evaluation found that RSOs have the capability, opportunity, and motivation to deliver effective radiation protection training, disseminate essential information and conduct monitoring and oversight activities. However, it also identified challenges. For instance, the evaluation noted that RSOs in the medical sector face more obstacles than those in the academic and research sector, due to factors such as budget constraints, complexity of operations and the additional need to balance patient care. The evaluation also noted that RSOs in large institutions and part-time RSOs often lack time for continuous improvement activities.

The evaluation report made two recommendations for CNSC staff.

1. CNSC staff should provide regulatory guidance to RSOs with respect to:

    - the characteristics of a successful internal audit/inspection program (frequency, format, timing, templates)
    - adequate RSO resourcing levels based on the nature and magnitude of licensed activity
    - the content of RSO work descriptions based on nature and magnitude of licensed activity

2. CNSC should enhance its existing compliance promotion strategy to support RSOs with their continuous improvement activities.

The CNSC is developing a regulatory guidance document, REGDOC-1.6.2- *Developing and Implementing an Effective Radiation Protection Program for Users of Nuclear Substances and Radiation Devices*. The REGDOC will address the specific recommendations of the evaluation, providing guidance on the design and implementation of a radiation protection program, and will describe the key program elements and outline the roles and responsibilities of those positions necessary to the success of the program, including the RSO.

To address the evaluation's recommendation to enhance its compliance promotion strategy, CNSC staff are reviewing the current outreach and communication tools with an eye to modernizing the tools where appropriate. In particular, CNSC staff are exploring tools that expressly target licensees that are struggling to meet regulatory expectations or are faced with declining performance.

In order to support and monitor the impacts of these improvements, CNSC staff will maintain the enhanced oversight provided through the performance-based inspections of nuclear medicine workers, observing them in the conduct of their tasks. In addition, CNSC staff are increasingly leveraging the insights provided by in depth Type I inspections of complex programs, which provide a vehicle through which staff can measure the effectiveness of licensee programs. Further, as mentioned in section 3.7, changes to the annual inspection planning process will ensure that CNSC staff leverage performance indicators to focus on at-risk licensees.

The CNSC maintains a responsive and agile regulatory program. While items of non-compliances observed in the medical sector have been corrected and do not represent a significant concern, increased regulatory attention in this area will be needed to ensure that licensees continue to design and implement effective controls over work practices. While it will take time for the regulatory interventions described above to take effect across the industry, CNSC staff expect to see performance trends stabilize in coming years. The enhanced scrutiny provided through the performance-based inspections will allow staff to monitor the effectiveness of their strategy, and adjust course as necessary.

6. Safety performance

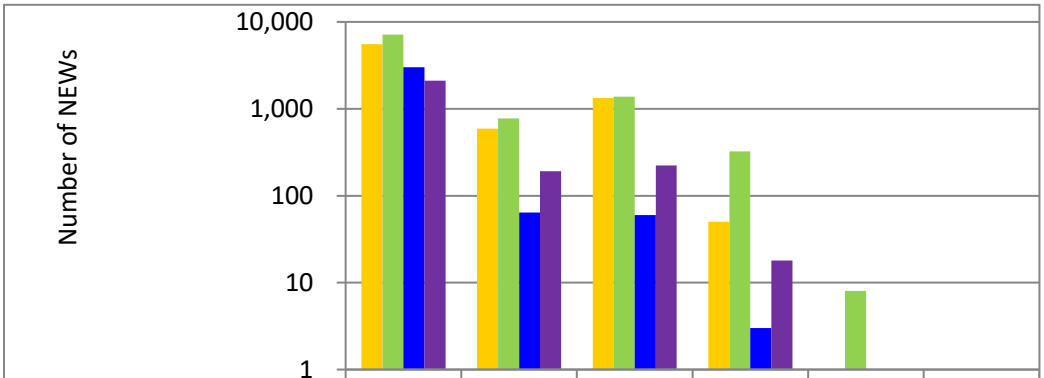
6.1 Doses to workers

A total of 58,689 workers in the four sectors covered in this report were monitored for occupational doses in 2018, 22,799 of whom were identified as NEWs.

The differences in doses to workers among sectors reflect the nature of the various activities within those sectors

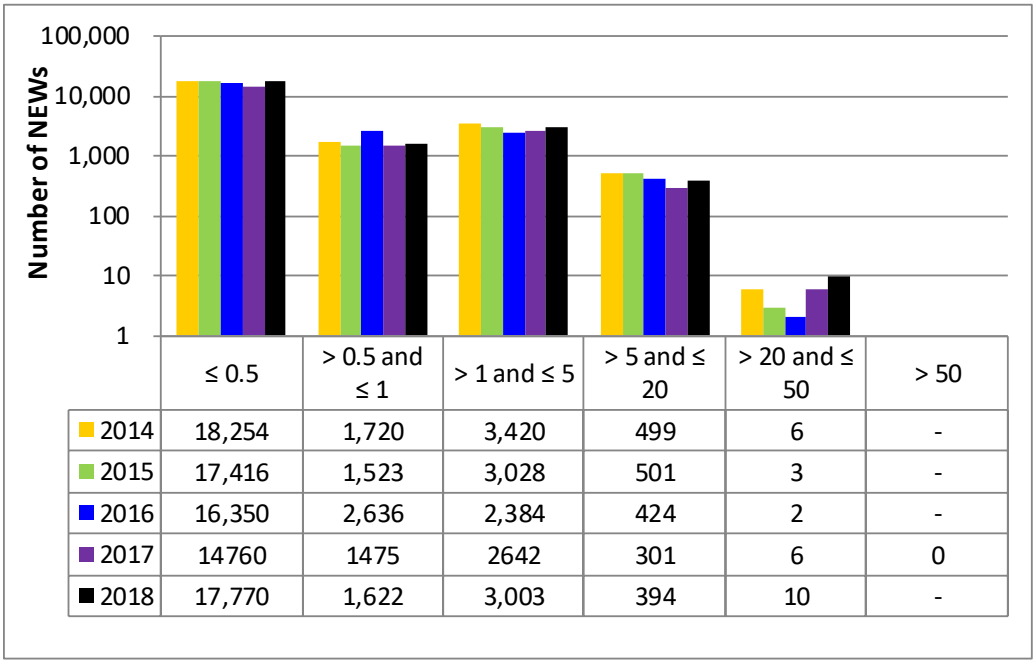
Figure 10 shows the doses received by the 22,799 NEWs monitored in 2018, while figure 11 shows the doses of NEWs from 2014 to 2018.

Figure 10: Sector-by-sector comparison of annual effective doses to all NEWs reported by licensees in 2018



	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv	
Medical	5,530	589	1,339	50	1	-
Industrial	7,123	778	1,382	323	8	
Academic and research	3,006	64	60	3	-	-
Commercial	2,111	191	222	18	1	-

Figure 11: Annual effective doses to NEWs, 2014 – 2018, all sectors combined



	≤ 0.5	> 0.5 and ≤ 1	> 1 and ≤ 5	> 5 and ≤ 20	> 20 and ≤ 50	> 50
2014	18,254	1,720	3,420	499	6	-
2015	17,416	1,523	3,028	501	3	-
2016	16,350	2,636	2,384	424	2	-
2017	14760	1475	2642	301	6	0
2018	17,770	1,622	3,003	394	10	-

In 2018, there were two occasions on which workers received extremity doses that exceeded regulatory limits. Both were reported to the Commission through event initial reports.

The first extremity dose exceedance incident occurred in the medical sector. A NEW, a nuclear medicine technologist, was preparing a technetium-99m product used for lung scans when the syringe shield slipped causing the technetium-99m to be ejected onto the worker's bare wrist. The worker noticed the contamination immediately and followed the decontamination protocols. The estimated dose to the skin was 3,650 mSv, in excess of the regulatory limit of 500 mSv. As a result, this event ranked as International Nuclear and Radiological Event Scale (INES) level 2. The worker has not reported any health effects as a result of the contamination exposure. This event was reported to the Commission in March 2018, and was highlighted as an opportunity to share lessons learned in the spring 2018 edition of the DNSR newsletter.

In the second extremity dose incident, one NEW in the commercial sector received a dose to the skin of the hand above regulatory limits in an event ranked level 2 on the INES. The skin contamination incident occurred while the worker was dispensing iodine-131 therapy doses during a routine production run. After conducting troubleshooting activities with the dispensing equipment, the worker did not follow the licensee's contamination monitoring procedures, which resulted in the contamination being detected the following morning. The estimated skin dose to the worker was 1,681 mSv to the left thumb. The regulatory limit for extremities is 500 mSv. CNSC staff confirmed the skin dose calculation for the worker. A return-to-work authorization letter was issued by a CNSC designated officer in March 2019. The worker was closely monitored following the incident and has not experienced adverse effects to the skin as a result of the radiation exposure. The event was presented to the Commission in December 2018. Shortly after CNSC staff were notified of the incident, a focused inspection identified some program deficiencies. CNSC staff took further enforcement actions and an order was issued to the licensee on December 19, 2018. At the time of writing, the licensee continues to work on implementing the corrective action plan resulting from the inspection and addressing the requirements of the order.

In 2018, the CNSC received a report that a non-NEW had received a whole body dose in excess of regulatory limits. The worker is an employee of a carrier company. The company's radiation protection program requires all workers who handle packages containing radioactive material to wear personal dosimeters. When the company received its year-end report from the National Dosimetry Service, one employee was found to have a dosimetry reading of 1.06 mSv. The regulatory limit for non-NEWs is 1 mSv. As a result, this event ranked as INES level 1. The worker was removed from work that involved packages containing radioactive material. Furthermore, the company made changes to its dosimetry program to allow for more frequent monitoring. This event was presented to the Commission in August 2018.

6.2 Inspection performance

6.2.1 Management system

The management system SCA covers the framework that establishes the processes, programs and resources required to ensure that a licensee achieves its safety objectives, continuously monitors its performance against those objectives, and fosters a healthy safety culture.

In 2018, licensees continued to maintain strong performance in the management system SCA. Overall, 94% of the licensees inspected received ratings of fully satisfactory or satisfactory for this SCA (figure 12). Most of the items of non-compliance were administrative in nature. The medical sector showed a slight decline in performance in 2018 versus previous years (figure 13). This can be attributed to the drop in performance by radiation therapy licensees, where half of those inspected (3 of 6) received ratings of below expectations (Table 4).

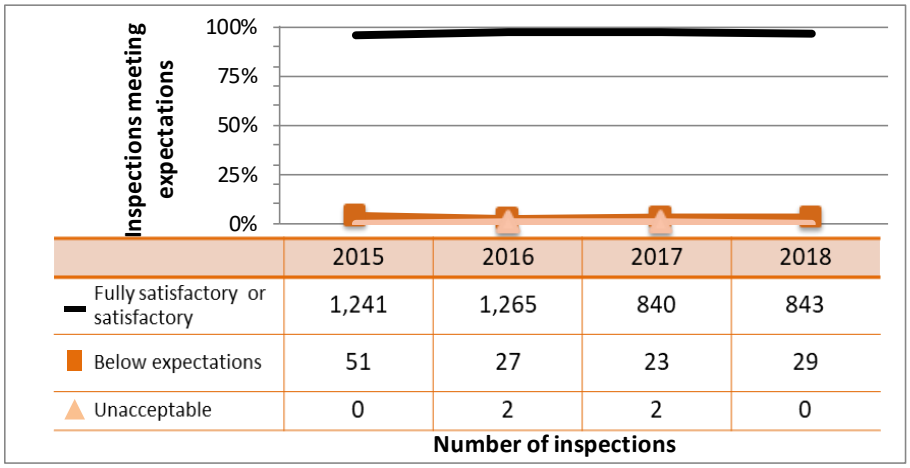
Generally speaking, a below expectations rating for the management system SCA is provided when the non-compliances point to broader systemic program weaknesses. For radiation therapy licences these may include:

- poor document management control
- unclear roles and responsibilities or RSO authorities, or
- ineffective radiation safety committees.

These items are generally indicative of poor program design or implementation and as a result may lead to future program failures. In such cases, CNSC staff will increase regulatory scrutiny to ensure resolution of the specific non-compliances identified during the inspection, and to ensure that any systemic issues are adequately identified and addressed. With respect to the three licensees receiving below expectations in 2018, one radiation therapy licensee resolved CNSC staff's concern promptly. The other two remained under enhanced scrutiny into 2019 until such time as staff were satisfied that the two licensees have successfully implemented adequate radiation protection programs.

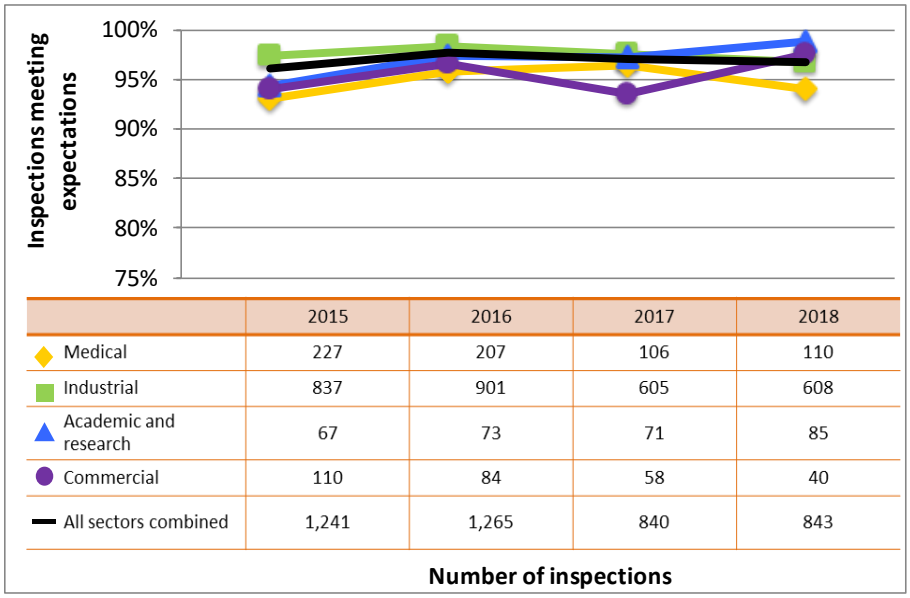
No licensees received unacceptable ratings for the management system SCA.

Figure 12 : Inspection ratings for management systems, 2014 – 2018



	2015	2016	2017	2018
Fully satisfactory or satisfactory	1,241	1,265	840	843
Below expectations	51	27	23	29
Unacceptable	0	2	2	0

Figure 13: Sector-to-sector comparison of inspection ratings meeting or exceeding expectations for management systems, 2014- 2018



	2015	2016	2017	2018
Medical	227	207	106	110
Industrial	837	901	605	608
Academic and research	67	73	71	85
Commercial	110	84	58	40
All sectors combined	1,241	1,265	840	843

6.2.2 Operating performance

Operating performance refers to the licensee's ability to perform licensed activities in accordance with pertinent operational and safety requirements defined in the NSCA, its associated regulations and licence conditions. Licensees are expected to demonstrate that they comply with operational and safety requirements by providing workers with appropriate procedures for the safe use of nuclear substances and prescribed equipment, by ensuring that workers follow procedures and by maintaining records that demonstrate compliance.

In 2018, licensees' performance in the operating performance SCA declined from previous years (figure 15). Performance by licensees in this SCA has been declining slowly from 2015, when 91% of licensees received ratings of fully satisfactory or satisfactory, to 2018, when 84% of licensees received the same performance ratings. Four licensees received unacceptable ratings for operating performance, one in each of the industrial subsectors covered in the report: industrial

radiography, oil well logging, portable gauge, and fixed gauge. Three of the four – the industrial radiography, portable gauge and fixed gauge licensees – also received unacceptable ratings in the radiation protection SCA (section 6.2.3). These three licensees were issued orders as a result of the inspection (section 6.3).

Performance of licensees in the medical sector continued to fall in 2018, as evidenced by a smaller proportion of inspections (77%) with fully satisfactory or satisfactory operating performance ratings (figure 16). Both the nuclear medicine (77%) and radiation therapy (67%) subsectors experienced a drop in performance in 2018, contributing to the overall performance of the medical sector (see appendix C.1). CNSC staff's proposed plan of action is discussed in section 5.2. In recent years, CNSC staff have shifted the focus of nuclear medicine inspections away from records-based inspections to focus more on observing workers performing their duties, where possible. The increase in findings of non-compliance both in operating performance and radiation protection (section 6.2.3) may be attributable, in part, to this strategy.

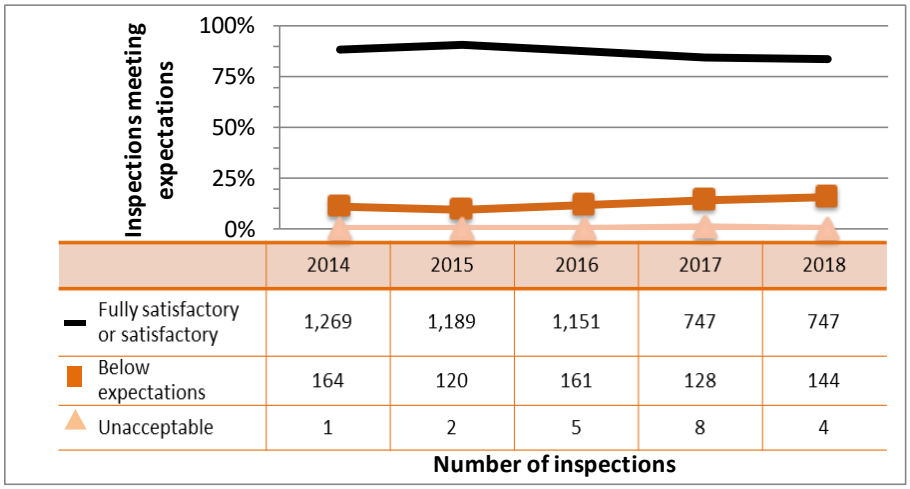
While performance of industrial sector licensees as a whole was up slightly in 2018, the performance of licensees in the fixed gauge subsector continued to fall (see appendix C.2). In 2018, only 68% of fixed gauge licensees received ratings of fully satisfactory or satisfactory for operating performance. The most common items of non-compliance for fixed gauge licensees in this SCA were failure of workers to meet their obligations, failure of workers to follow licensee procedures, and failure to meet the requirement for vessel or hopper entry. These items of non-compliance are largely linked to an inspection campaign that focused on ensuring that licensees have effective control of vessel entries. This campaign followed changes to the licence condition that specifies necessary controls for entry of vessels mounted with fixed gauges. Licensees addressed all items of non-compliance to the satisfaction of CNSC staff.

Within the industrial sector, the high risk subsectors – industrial radiography and oil-well logging – continue to have over 85% of inspections receiving fully satisfactory or satisfactory ratings. Historically, these licensees have been inspected every year. The frequent inspections and high level of scrutiny may be contributing to the sustained good performance by licensees in these subsectors.

Figure 14: Fixed gauge attached to a pipe (source: CNSC)

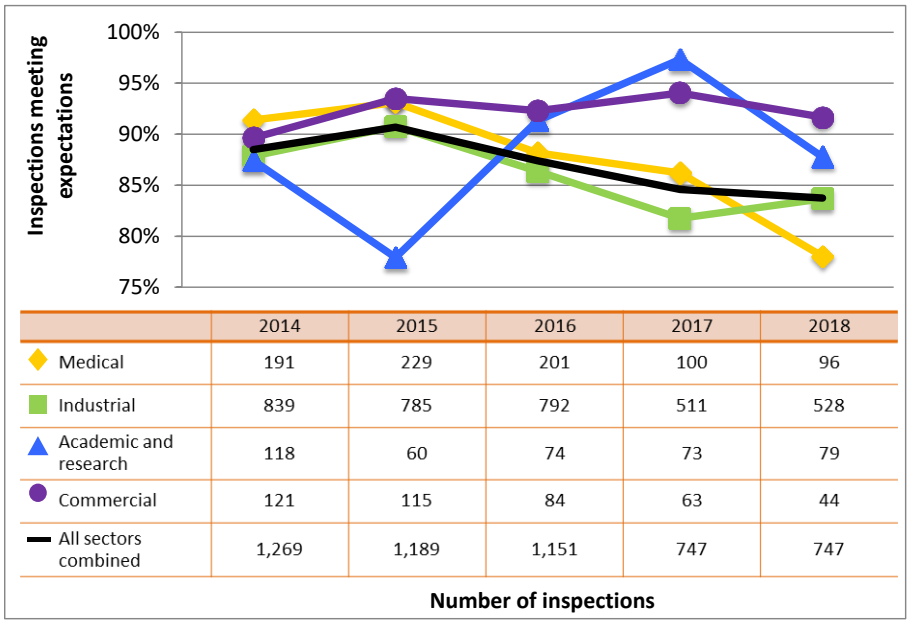
Fixed gauge licences are considered medium risk. As stated in section 3.7, the inspection focus over the last several years has been on yearly inspections of high risk licensees. As a result, some medium risk licensees, including many fixed gauge licensees, were not inspected within their respective inspection frequencies. These licensees have gone a number of years without an inspection during which time they may have become more complacent, which leads to more findings of non-compliance when an inspection does occur. This is one of the reasons why, in 2019, the inspection focus is turning to medium risk licensees that have not been inspected within the desired frequency. Moreover, in the fixed gauge subsector, previous incidents of exposure to workers during vessel entries have led the CNSC to place a particular focus on this aspect in recent years. This increased focus has in turn led to an increase in findings of non-compliance.

Figure 15: Inspection performance for operating performance, 2014 – 2018



	2014	2015	2016	2017	2018
Fully satisfactory or satisfactory	1,269	1,189	1,151	747	747
Below expectations	164	120	161	128	144
Unacceptable	1	2	5	8	4

Figure 16: Sector-by-sector comparison of inspections meeting or exceeding expectations for operating performance, 2014 – 2018



	2014	2015	2016	2017	2018
Medical	191	229	201	100	96
Industrial	839	785	792	511	528
Academic and research	118	60	74	73	79
Commercial	121	115	84	63	44
All sectors combined	1,269	1,189	1,151	747	747

6.2.3 Radiation protection

Radiation protection programs are required for every licensee to ensure that contamination levels and radiation doses received by workers are monitored, controlled and maintained below regulatory dose limits and kept ALARA, with social and economic factors taken into account. Licensees can meet these objectives by monitoring worker doses; posting radiation warning signs; planning appropriately for radiological emergencies; managing oversight of operational activities; and instituting effective workplace practices that emphasize the use of time, distance and shielding to minimize exposure to radiation and emphasize the use of appropriate protective equipment.

Figure 17: CNSC inspector measuring dose rates during an inspection (source: CNSC)

Licensees' performance in the radiation protection SCA remained steady in 2018 compared to previous years with 84% of inspected licensees (747 of 888) receiving ratings of fully satisfactory or satisfactory (figure 18). Licensees corrected items of non-compliance to the satisfaction of CNSC staff. Performance was lowest among medical sector and academic and research sector licensees (figure 19). The year-over-year drop in inspection performance in radiation protection for the academic and research sector is an artifact of the way inspections are conducted and counted for consolidated use licences; items of non-compliance found at one location under a licence will often occur at the other locations under that same licence.

Six licensees received unacceptable ratings for the radiation protection SCA during inspections conducted in 2018. Five of these were in the industrial sector, and one was in the medical sector. Orders were issued to all six of the licensees (see section 6.3).

The performance of licensees in the nuclear medicine subsector continued to decline, driving the overall drop in the medical sector's performance (see appendix C.1). In 2018, 74% of nuclear medicine licensees received ratings of fully satisfactory or satisfactory. Many of the factors that contributed to lower operating performance ratings (section 6.2.2) translate to lower ratings for the radiation protection SCA as well. The performance of the medical sector, and nuclear medicine in particular, is described in additional detail in section 5.2.

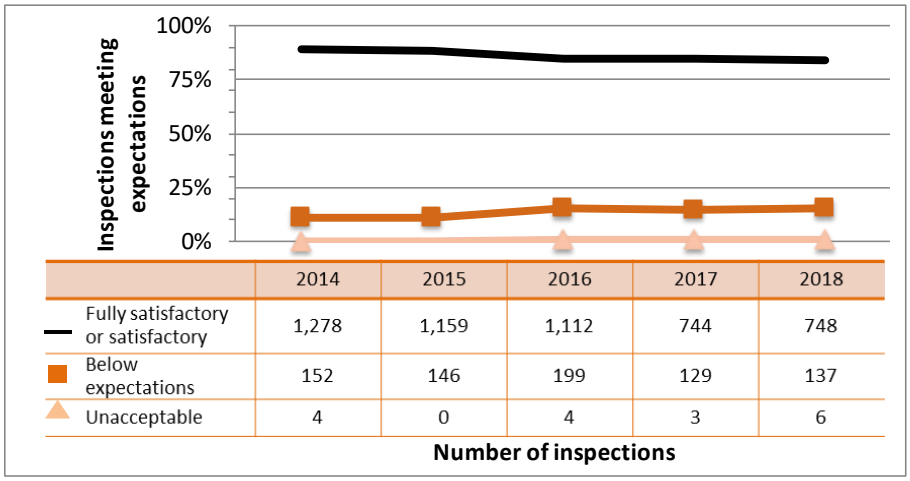
In 2018, the overall performance for licensees in the industrial sector remained steady; however, there were some noteworthy trends for different subsectors (see appendix C.2). The performance of fixed gauge and portable gauge licensees remained low in 2018, with only 77% and 84% of inspected licensees, receiving ratings of fully satisfactory or satisfactory.

For the fixed gauge licensees, the factors contributing to low operating performance ratings in the operating performance SCA (section 6.2.2) also apply as reasons for relatively lower performance in the radiation protection SCA. The most common items of non-compliance in the radiation protection SCA for fixed gauge licensees was failure to have a calibrated survey meter.

CNSC staff recognize that the performance level of portable gauge licensees is lower than desired across many SCAs. To address the concerns about performance among this group of licensees, the CNSC implemented a regulatory intervention targeting portable gauge licensees. The details of this program and the most common items of non-compliance are described in section 5.1.

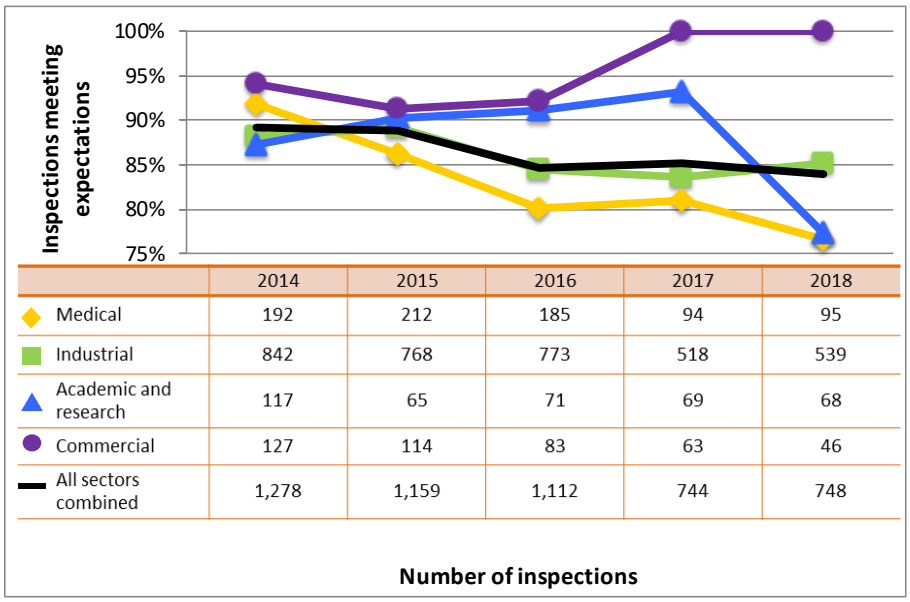
Licensees in the oil well logging subsector continued to improve their performance in the radiation protection SCA. In 2018, 91% of inspected licensees met expectations, returning to levels seen prior to 2016.

Figure 18: Inspection performance for radiation protection, 2014 – 2018



	2014	2015	2016	2017	2018
Fully satisfactory or satisfactory	1,278	1,159	1,112	744	748
Below expectations	152	146	199	129	137
Unacceptable	4	0	4	3	6

Figure 19: Sector-to-sector comparison of inspections meeting or exceeding expectations for radiation protection, 2014 – 2018



	2014	2015	2016	2017	2018
Medical	192	212	185	94	95
Industrial	842	768	773	518	539
Academic and research	117	65	71	69	68
Commercial	127	114	83	63	46
All sectors combined	1,278	1,159	1,112	744	748

6.2.4 Security

The security SCA covers the physical security measures, practices and programs that licensees are required to have in place to prevent the loss, illegal use, illegal possession or illegal removal of nuclear substances or prescribed equipment during their entire lifecycle, including while they are in storage or during transport. The extent of the security measures required depends upon the types of nuclear substances or prescribed equipment used and activities performed by each licensee.

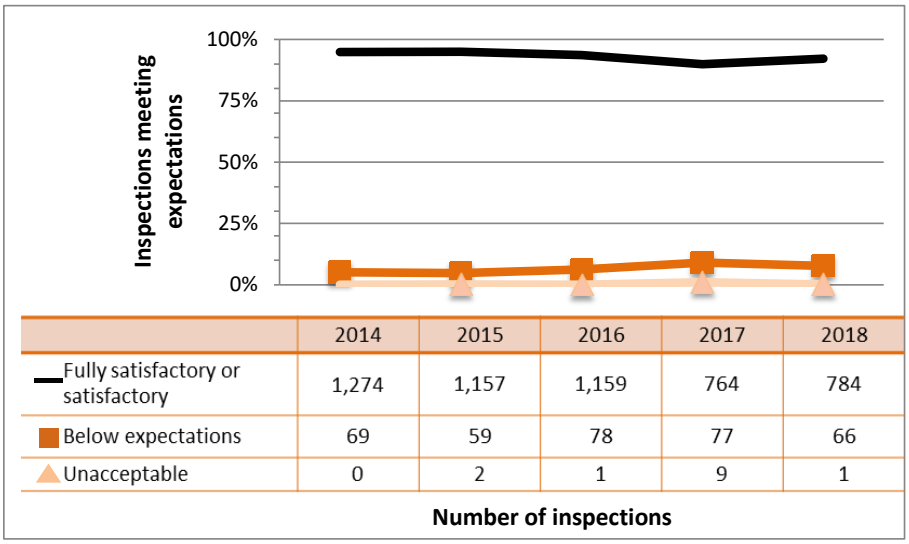
The safety and security of sealed sources is increased through effective control and tracking. CNSC compliance inspections include requirements to verify sealed source tracking information.

Overall, in 2018, licensees' performance in the security SCA remained consistent with previous years; 92% of inspected licensees (748 of 815) received fully satisfactory or satisfactory ratings (figure 20). One licensee, a portable gauge licensee, received an unacceptable rating in the security SCA. This licensee was issued an order as a result of the inspection findings (section 6.3).

Notably, performance in the medical sector improved in 2018. Conversely, performance in the academic and research sector dropped substantially. CNSC staff will continue to monitor performance in this sector to determine if it is the start of a trend, or an anomaly. Many of the items of non-compliance observed in the academic and research sector were tied to the implementation of REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources* for licensees with Category 3 sealed sources.

In May 2018, REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources* came into force for all licensees. In preparation for this, over the past years, focused inspections of radiation therapy licensees with Category 3 sealed sources were performed. Licensees have corrected items of non-compliance. Based on the work done in advance of the implementation of REGDOC-2.12.3, CNSC staff expect performance ratings for the radiation therapy subsector to improve in the coming years.

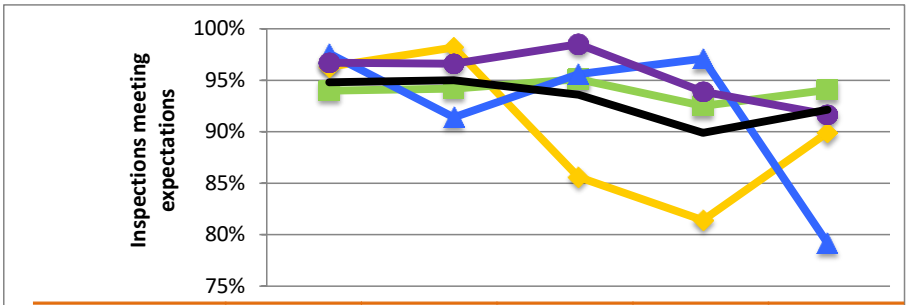
Figure 20: Inspection performance for security, 2014 – 2018



	2014	2015	2016	2017	2018
Fully satisfactory or satisfactory	1,274	1,157	1,159	764	784
Below expectations	69	59	78	77	66
Unacceptable	0	2	1	9	1

Number of inspections

Figure 21: Sector-to-sector comparison of inspections meeting or exceeding expectations, 2014 – 2018



	2014	2015	2016	2017	2018
Medical	181	219	190	96	107
Industrial	875	780	830	552	587
Academic and research	120	64	70	66	57
Commercial	98	94	69	46	33
All sectors combined	1,274	1,157	1,159	764	784

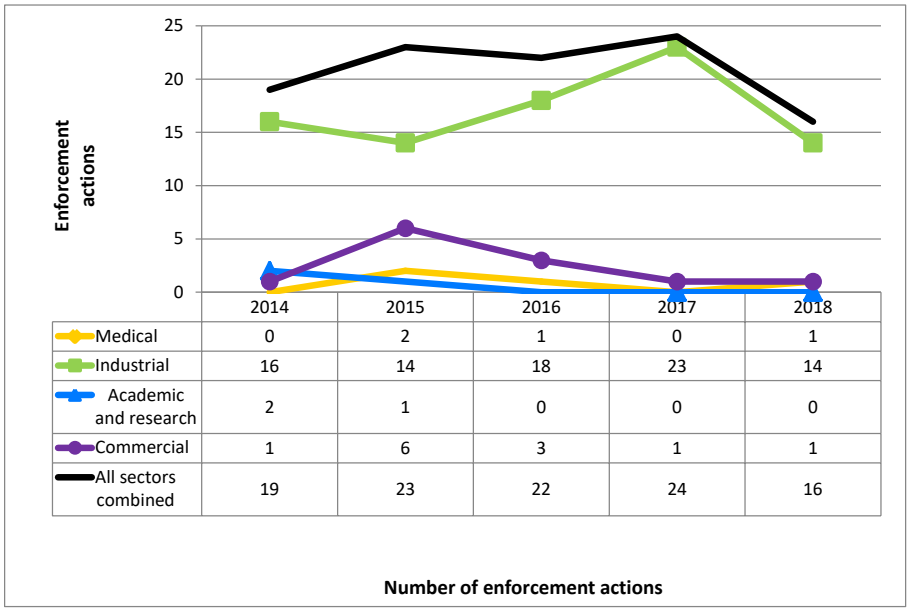
Number of inspections

Under the recently implemented REGDOC-2.12.3, CNSC staff are now required to conduct technical assessments of all new licensee facilities where Category 3 sources could be stored or used, in addition to the assessments conducted for new licensee locations for Category 1 and 2 sealed sources. As a result, CNSC staff conducted 244 assessments of site security plans in 2018, nearly double the 130 conducted in 2017. If CNSC staff determined that the site security plan was incomplete or inadequate, the licensee was required to revise it to meet the requirements.

6.3 Enforcement actions

In 2018, CNSC staff issued 13 orders and three AMPs to licensees covered by this report. The majority of the enforcement actions were issued to licensees in the industrial sector, consistent with previous years.

Figure 22 : Sector-to-sector comparison of enforcement actions[3] issued, 2014 – 2018



	2014	2015	2016	2017	2018
Medical	0	2	1	0	1
Industrial	16	14	18	23	14
Academic and research	2	1	0	0	0
Commercial	1	6	3	1	1
All sectors combined	19	23	22	24	16

Additional details about the enforcement actions taken by CNSC staff in 2018 are available in appendix D.

6.4 Reported events

Licensees are required to have programs in place for the management of unplanned events and accidents. The events that warrant mandatory reporting and the content of the reports are set out in the NSCA, its regulations and the licence conditions. CNSC staff review, assess and track all events reported by licensees.

Since 2014, reported events have been ranked using the (International Nuclear and Radiological Event Scale (INES)), a tool for communicating the safety significance of nuclear and radiological events to the public. Note that the scale is not a tool for comparing safety performances among facilities or organizations, but rather for effectively communicating the safety significance of events.

In 2018, 195 events related to nuclear substances and prescribed equipment were reported to the CNSC (figure 23). This is an increase compared to past years. Of these events, 190 ranked as INES level 0 (no safety significance), three were ranked as INES level 1 (anomaly) based on the quantity of nuclear substances involved and the type of event reported, and two were ranked as INES level 2 (incident). A description of each event can be found in appendix E.

The increase in events reported to the CNSC was at INES level 0. Overall, DNSR is seeing an improved reporting culture by licensees which is a positive outcome of outreach activities. Many licensees were unaware of reporting requirements or were reluctant to report to the regulator potentially due to the possibility of increased oversight. In 2017 and 2018, CNSC staff took on several initiatives to increase licensees' understanding of the reporting requirements. These

[3] Orders and AMPs

included articles in the DNSR newsletter, preparing and posting a draft of REGDOC-3.1.3, *Reporting Requirements for Waste Nuclear Substance Licensees, Class II Nuclear Facilities and Users of Prescribed Equipment, Nuclear Substances and Radiation Devices*, for public comment. In addition, CNSC staff engaged in targeted communication with the Canadian Association of Recycling Industries to inform this non-licensee community of their responsibility to report radioactive material detected at their facilities and, more generally, to inform them of the steps to follow when this occurs, so they can keep their staff safe. This combined effort may be one factor responsible for the increase in the number of events that were reported.

The three INES level 1 events were each different. One event involved a portable gauge reported stolen that was not recovered, another event involved the discovery of a fixed gauge outside regulatory control at a scrapyard, and another event involved a non-NEW receiving an annual whole body dose above the regulatory limits (see section 6.1).

Both INES level 2 events reported in 2018 involved NEWs with skin contamination in excess of the regulatory limits (see section 6.1).

Compared to previous years, there was a notable increase in the number of events involving malfunctioning or damaged devices (32% increase compared to 2017), and the number of events related to packaging and transport (75% increase compared to 2017).

The majority of malfunctioning device reports were related to shutters being stuck on portable or fixed gauges. The sometimes harsh, dirty, industrial settings where these devices are used explain how these events can occur. In addition, inadequate maintenance of the devices and operator error can lead to a malfunctioning gauge. Damaged devices are generally a result of a fall or impact or as a result of a portable gauge being damaged at construction sites. CNSC staff track and review events related to damaged or malfunctioning devices with a lens on the integrity of the device. If appropriate, CNSC staff may review the design to determine whether there is a design deficiency that may be contributing to the failure. If an issue is identified in the design, CNSC staff would engage with the manufacturer of the device, and if necessary, the device would be decertified and all users informed.

With respect to packaging and transport events, during outreach events, CNSC staff have highlighted the requirement to report all motor vehicle collisions even when there are no injuries and the packages being transported are not damaged. Most of these reported events involved no or minimal damage to the package. CNSC staff view the year-over-year increase in the number of reported motor vehicle collisions as a reflection of an improved reporting culture amongst licensees and carriers.

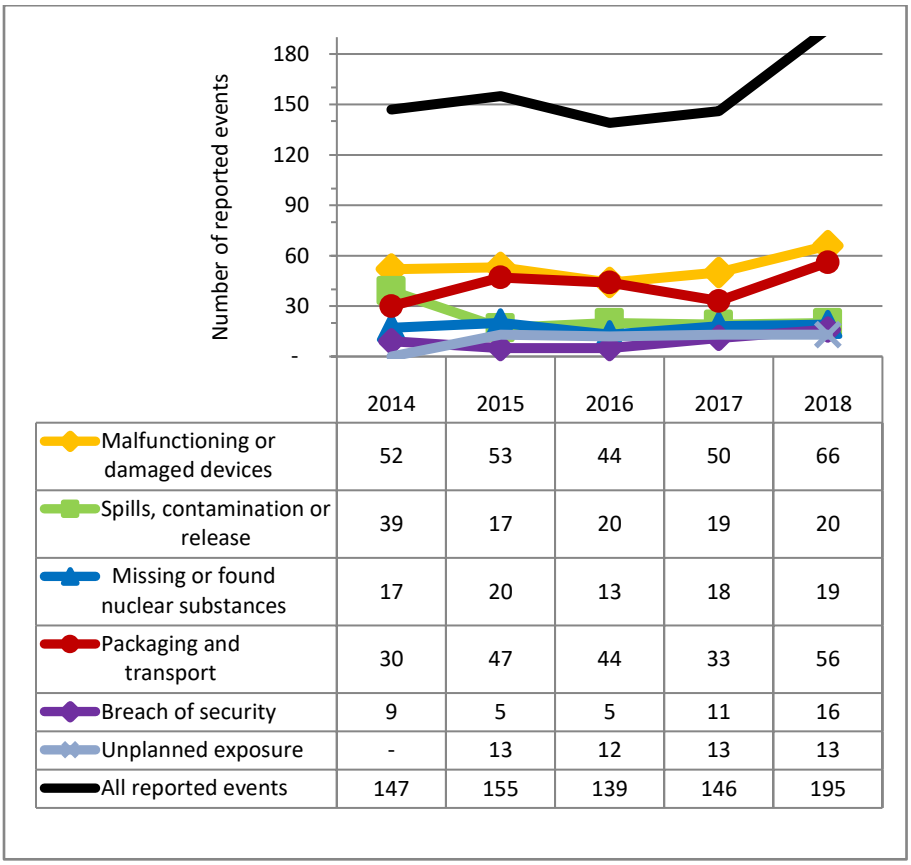
There was one report of a release of twice the annual limit of germanium-68 down the sewer. The licensee has altered their internal procedures to prevent recurrence.

There were five events that could not be placed into one of the categories shown in figure 23. A short description is given here, and more details can be found in appendix E.

- A vehicle used as an industrial radiography dark room caught fire – the radiation device was located in a separate locked compartment, and there was no damage to the exposure device.
- A fire occurred in a location where fixed gauges were mounted – the gauges were not damaged.
- A fire broke out on the roof of a building with rooms that house low risk sealed sources and radiation devices – there was no damage to the sealed sources or devices.

- An area inside a building housing waste nuclear substances was eroded due to a leak from a pressurized fire water main.
- A worker at a waste nuclear substance licensee's facility sustained a lost time injury after being struck in the head by a piece of equipment.

Figure 23: Reported events from 2014 – 2018, all sectors combined



	2014	2015	2016	2017	2018
Malfunctioning or damaged devices	52	53	44	50	66
Spills, contamination or release	39	17	20	19	20
Missing or found nuclear substances	17	20	13	18	19
Packaging and transport	30	47	44	33	56
Breach of security	9	5	5	11	16
Unplanned exposure	-	13	12	13	13
All reported events	147	155	139	146	195

Note: Unplanned exposures include individuals crossing safety barriers while industrial radiography was occurring, skin contamination events below regulatory limits, any events where procedures were not followed and workers received dose below regulatory limits, and any events where regulatory limits were exceeded.

7. Stakeholder engagement

Stakeholder engagement and outreach are critical elements of the CNSC's regulatory approach. Given the breadth of licensees regulated in the area of nuclear substances, a particular focus is on reaching and engaging with licensee communities, which leads to increased awareness and better understanding of the regulatory process and requirements. This, in turn, can lead to improved workplace safety. CNSC staff leverage a variety of fora to engage with licensees and promote the use of the tools that are developed to support their compliance with regulatory expectations.

Inspections are a particularly valuable opportunity to engage directly with licensees.

Figure 24: CNSC staff participating in outreach activity (source: CNSC)

CNSC outreach sessions held throughout Canada in 2018 gave licensees and others the opportunity to interact with the regulator outside the scope of an inspection or licensing activities. Digital technologies such as WebEx continue to be used to host virtual outreach sessions and working group meetings. Some of the key sessions are described below. In addition to outreach sessions, CNSC staff delivered presentations at various conferences to share information on developing regulatory topics.

Furthermore, to improve the public's level of understanding of proposed or licensed nuclear facilities and activities, some Class II licensees are required to develop and implement a public information program that includes a disclosure protocol. There were no incidents that triggered the public information and disclosure programs in 2018.

7.1 Outreach

7.1.1 Outreach to licensees

Outreach sessions

CNSC staff continued to provide 'Meet the Nuclear Regulator' outreach sessions at which CNSC experts introduced the CNSC and its work to ensure the safety of Canadian nuclear facilities and activities. The 2018 sessions were held in Ottawa/Gatineau and Winnipeg.

Newsletters

The CNSC has been issuing the DNSR newsletter since 2009 as an outreach vehicle for disseminating regulatory and safety information. The newsletter articles address various topics of regulatory interest and support the regulator's commitment to keeping both licensees and the public informed. Regular editions of the newsletter provide valuable information to licensees in all sectors; special editions focus on either a specific subsector or an area of regulatory interest.

All newsletters are posted on the CNSC website and sent to recipients on the CNSC subscription list.

In 2018, three editions of the DNSR newsletter were published: a spring edition in June, a special edition in September and a fall edition in December. Some of the topics included were new

resources for portable gauge users; an evaluation of the role of radiation safety officers; new security requirements for Category 3, 4 and 5 sealed sources; invitations to consult on draft regulatory documents; CNSC expectations for practical examinations for exposure device operators; and the importance of shipping documents from the perspective of a first responder.

7.1.2 Outreach to the medical sector

Canadian Radiation Protection Association working group

A working group was established between the CNSC and the Canadian Radiation Protection Association (CRPA) in 2014. The working group met three times in 2018. The group enables engagement to ensure continued positive communication exists between the CNSC and members of the CRPA (which represents many licensees in the medical and academic sectors) on topics including upcoming REGDOCs, projects and sharing information on reported events.

Canadian Radiation Protection Association Conference

For almost three decades, CNSC staff have delivered regulatory-focused presentations and participated in regulatory workshops at the CRPA's annual conferences. At the 2018 annual conference held in Québec City, CNSC staff delivered presentations on:

- issues associated with isotope handling
- information on why Class II RSO candidates fail certification
- the regulatory oversight of new accelerator technologies
- identification of success factors of the RSO by enhancing the oversight through program evaluation

CNSC-Class II/CRPA/COMP working group

The CNSC-Class II/CRPA/COMP (Canadian Organization of Medical Physicists) (C3) working group was established in late 2015 with the mission of providing a forum for communication and information sharing among stakeholders in the regulated Class II community. The group met once in 2018.

Other outreach activities

CNSC staff presented at the IAEA Security Working Group Meeting on how CNSC inspectors are transferring knowledge and completing security inspections at medical facilities.

CNSC staff participated in a joint scientific meeting of the Canadian Association of Radiation Oncology (CARO), COMP, and the Canadian Association of Medical Radiation Technologists (CAMRT). CNSC staff delivered poster presentations on verifying nuclear facility workload factors and physical barrier expectations for Class II prescribed equipment.

CNSC staff participated in the annual CANM (Canadian Association of Nuclear Medicine)-CAMRT conference. They presented on the RSO evaluation project and also on REGDOC-2.7.3, *Radiation Protection Guidelines for the Safe Handling of Decedents.*

7.1.3 Outreach to the industrial sector

Industrial radiography working group

In 2009, a CNSC/industrial radiography working group was established to foster improved communications between the CNSC and the industry. The working group meets twice a year to discuss best practices and safety performance, and provides a forum in which stakeholders can stay informed of new developments from both technical and regulatory perspectives. At the 2018 meetings, the group discussed items of interest to the industrial radiography subsector, such as new and existing equipment, the process for the certification of EDOs and CSA PCP-09, *Certified Exposure Device Operator Personnel Certification Guide.*

Industrial radiography annual meeting

The CNSC holds two separate annual meetings with the radiography industry. In 2018, the meetings were held in Nisku, Alberta, and Ottawa, Ontario. CNSC staff use these meetings to address recent and upcoming regulatory developments and discuss other areas of regulatory focus. During the 2018 meetings, the CNSC gave presentations on REGDOC-2.5.5, *Design of Industrial Radiography Installations*, the RSO's responsibilities and obligations with an overview of CNSC Type I inspections, an update on the process for the certification of EDOs and an overview of compliance for the previous year. Representatives of industry delivered a case study presentation to their peers.

Other outreach activities

CNSC staff provided outreach sessions to the County of Simcoe, Solid Waste Management staff (Barrie, Ontario) and to the Canadian Association of Recycling Industries (Richmond, British Columbia) to:

- provide information on how to respond to alarms when dealing with unidentified radioactive material that may be found in metal recycling facilities
- explain the reporting requirements associated with such findings, as per the *Packaging and Transport of Nuclear Substances Regulations, 2015*

8. Regulatory developments

This section provides details of the regulatory developments of 2018 relating to regulatory programs for licensees covered in this report.

8.1 Radiation Protection Regulations

Amendments to the *Radiation Protection Regulations* (RPR) are currently ongoing to align with ICRP Publication 103 and IAEA's *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards* GSR Part 3 (2014). The CNSC solicited feedback from stakeholders and members of the public regarding proposals to amend the RPR in 2013 through a discussion paper (that is, DIS-13-01, *Proposals to Amend the Radiation Protection Regulations*). The CNSC has moved forward with most of the proposed amendments to harmonize the RPR as outlined in the *What We Heard Report* for DIS-13-01. DIS-13-01 was the first step in the public consultation process for the CNSC's revisions to the RPR. Stakeholders will have a further opportunity to comment on any proposed amendments when they are published in the *Canada Gazette*, Part I. The CNSC is working on developing regulatory documents that will support the implementation of the regulatory requirements by licensees.

8.2 Application guide

In April 2018, REGDOC-1.5.1, *Licence Application Guide: Certification of Radiation Devices or Class II Prescribed Equipment* was published. This guide is intended to help applicants to prepare and submit applications to the CNSC for certification of radiation devices and Class II prescribed equipment. Guidance contained in this document aims to inform the applicant, to elaborate further on requirements or to provide direction to licensees and applicants on how to meet requirements. It also provides more information about how CNSC staff evaluate specific problems or data during their review of licence applications.

REGDOC-1.4.1, *Licence Application Guide: Class II Nuclear Facilities and Prescribed Equipment* is currently in development. When finalized it will set out guidance for applicants wanting to apply for any Class II facilities and prescribed equipment licence, including licences for neutron generators, geophysical logging accelerators, portable and mobile industrial accelerators, Class II irradiators and manual brachytherapy

8.3 Safety culture in the nuclear industry

REGDOC-2.1.2, *Safety Culture*, was published in April 2018. This document sets out requirements and guidance for fostering a healthy safety culture and for conducting safety culture assessments. It does the same for security culture. It is important to recognize that both nuclear safety and security and their cultures share the same overall objective, which is to limit the risk resulting from nuclear substances, prescribed equipment and associated facilities.

While the requirements in the REGDOC are not mandatory for the licensees covered in this report, CNSC staff encourage licensees to use it assess their own safety cultures. For example, when inspectors conduct inspections of cyclotron facilities, they present the contents of REGDOC-2.1.2 at the opening meeting, and then, in the final report, include a matrix for assessing the maturity of safety culture with findings made during the inspection. The licensee is encouraged to place the findings into the appropriate stage of the matrix to assess their own safety culture maturity.

8.4 Industrial radiography

In March 2018, REGDOC-2.5.5, *Design of Industrial Radiography Installations*, was published. This document provides guidance for the design of radiography installations. This information will assist individuals in the design and construction of installations that are safe to use, and that ensure that doses to certified exposure device operators, workers and all persons in the vicinity of the work being performed are within regulatory limits and are kept as low as reasonably achievable.

8.5 Radiation protection in the medical sector

In June 2018, REGDOC-2.7.3, *Radiation Protection Guidelines for Safe Handling of Decedents* was published. Many medical procedures using nuclear substances are carried out to diagnose and treat diseases. Procedures involving the use of nuclear substances for therapeutic purposes are usually conducted on an outpatient basis, and a patient poses a minimal radiation risk to the public upon release from a treatment centre. In the unlikely event that a patient dies within a short period following a medical procedure that used a nuclear substance, the substance may still be present in the body and certain precautions may be recommended when handling the body.

This document provides guidance and recommended practices for minimizing radiation dose to death-care professionals and other members of the public who may encounter a decedent with residual nuclear substances from therapeutic medical procedures.

8.6 Safeguards and non-proliferation

In 2018, there were two regulatory documents published in the area of safeguards and non-proliferation. REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*, was published in February 2018. The document sets out requirements and guidance for safeguards programs for applicants and licensees that possess nuclear material, carry out specified types of nuclear-fuel-cycle-related research and development work, or carry out specified types of nuclear-related manufacturing activities. The requirements and guidance in this document are essential to Canadian compliance with the safeguards agreements entered into with the IAEA, and are consistent with modern national and international practices.

REGDOC-2.13.2, *Import and Export*, Version 2, was published in April 2018. This document has been revised as a two-part document:

- Part I sets out CNSC guidance for current and prospective licensees that intend to import or export nuclear and nuclear-related dual-use items, also known as controlled nuclear substances, equipment and information.
- Part II sets out CNSC for current and prospective licensees that intend to import or export risk-significant radioactive sources (Category 1 and 2 radioactive sources)

8.7 Security of Category 3 sources

By May 31, 2018, all licensees possessing Category 3, 4 and 5 sealed sources were required to come into compliance with REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources*. CNSC staff verified the implementation of the requirements in REGDOC-2.12.3 by proactively engaging with licensees.

CNSC staff conducted several initiatives to support the full implementation of REGDOC-2.12.3, with particular attention to licensees with Category 3 sealed sources. These included:

- developing and distributing a tool to help licensees establish their inventory security categorization level (the Categorization and Assessment Tool or CAT)
- developing a YouTube video to help identify licensee site security plan best practices
- publishing in the DNSR newsletter several security articles to increase awareness on security and REGDOC 2.12.3 expectations
- developing guidance to help licensees determine if they are required to aggregate their inventory activity in order to ascertain their security categorization level

8.8 Radiation safety officers

In 2018, CNSC staff continued to review the oversight process of appointed RSOs in order to identify factors that may lead to greater success in that position. (See section 0 for details of the evaluation).The final report and associated action plan on the evaluation of the role of appointed RSOs will be available on the CNSC website in late 2019. The action plan provides additional guidance for RSOs and licensees on the development and implementation of a successful audit, RSO resourcing levels, RSO work description and the composition of a radiation safety committee if applicable.

8.9 Regulatory focus in 2019

The CNSC's focus in 2019 with regards to the use of nuclear substances and prescribed equipment continues to be on effective regulatory oversight and continuous improvement. Activities that will be undertaken in 2019 include:

- conducting a review of the regulatory program for larger and more complex licensees (e.g., licensees that perform a high volume of work or several different activities under a single program) to determine an appropriate regulatory oversight strategy – including resource reallocation - to effectively regulate these facilities
- adjusting the inspection focus and planning process for licensees with nuclear substance and radiation device licences so as to optimize CNSC staff's ability to detect and address non-compliance, and leverage their efforts to improve safety in the industry including
    - enhancing the risk-informed inspection planning process to better consider the risks associated with the activity, a licensee's compliance history, and other contributing factors
    - refocusing fiscal year 2019–2020 inspection plans to enhance scrutiny of medium risk licensees on the inspection plan for the year
- implementing the regulatory strategy to improve radiation protection program design and its implementation in the medical sector, including
    - increasing the number of inspections of nuclear medicine licensees
    - launching public consultation on REGDOC-1.6.2, *Developing and Implementing an Effective Radiation Protection Program for the use of Nuclear Substances and Radiation Devices* intended to assist applicants and RSOs in implementing effective radiation protection programs
    - developing innovative tools to engage with licensees
- studying opportunities to better reflect licensees' programs through a single licence with the added benefit of reducing the administrative burden on licensees
- continuing to monitor the regulatory framework and regulatory practices to ensure that they are appropriate, agile and sufficient to effectively regulate new technologies, new applications of existing technologies and new types of prescribed equipment
- providing clarity on expectations by finalizing the following regulatory documents which were posted for public comment in 2018 and are expected to be published in 2019:

- REGDOC-1.4.1, *Licence Application Guide: Class II Nuclear Facilities and Prescribed Equipment*
- REGDOC-2.5.6, *Design of Nuclear Substance Laboratories and Nuclear Medicine Rooms*
- REGDOC-2.7.1, *Radiation Protection*
- REGDOC-2.7.2, *Dosimetry, Volume I: Ascertaining Occupational Dose*
- REGDOC-2.8.1, *Conventional Health and Safety*
- REGDOC-2.9.2, *Environmental Protection: Controlling Releases to the Environment*
- REGDOC-3.1.3, *Reporting Requirements for Waste Nuclear Substance Licensees, Class II Nuclear Facilities and Users of Prescribed Equipment, Nuclear Substances and Radiation Devices*

9. Overall conclusions

CNSC staff continued their ongoing regulatory oversight of licensees in the medical, industrial, academic and research, and commercial sectors. Staff conducted compliance verification activities consisting of field inspections, desktop reviews and technical assessments of licensee activities, and concluded that the use of nuclear substances and prescribed equipment in Canada is safe. The evaluations of findings for the safety and control areas (SCAs) covered in this report show that, overall, licensees made adequate provisions to protect the health, safety and security of persons and the environment from the use of nuclear substances and prescribed equipment, and took the measures required to implement Canada's international obligations.

Compliance verification

In 2018, CNSC staff conducted 949 inspections to verify compliance with CNSC regulatory requirements across all sectors. Of inspected licensees, the majority were found to be compliant in the SCAs covered in this report:

- 94% were compliant in management system
- 84% were compliant in operating performance
- 84% were compliant in radiation protection
- 92% were compliant in security

Licensees that failed to meet requirements took appropriate corrective measures to address items of non-compliance found during inspections. CNSC staff systematically tracked all items of non-compliance until licensees took the appropriate corrective measures to address them. All corrective measures put in place by licensees were reviewed by CNSC staff and found to be satisfactory.

Doses to workers

Doses to workers remained very low in 2018, consistent with previous years. One non-NEW received an annual whole body exposure in excess of the regulatory limit of 1 mSv. Two NEWs received extremity doses in excess of CNSC's regulatory limit of 500 mSv. None of the individuals have reported adverse reactions as a result of the dose received.

Enforcement actions

In 2018, the CNSC took escalated enforcement actions in 16 instances. It issued 13 orders and three administrative monetary penalties (AMPs) to ensure that the health and safety of workers, the Canadian public and the environment were being adequately protected. Most of the enforcement actions were taken against licensees in the industrial sector, consistent with trends from previous years. In two instances, licensees subject to an order have yet to implement corrective measures that meet the satisfaction of CNSC staff; the orders to these licensees remain in place. All AMPs issued in 2018 have been paid.

Reported events

Licensees reported 195 events to the CNSC that are covered in this report, all of which were assessed by CNSC staff. Of the total number of events reported, 190 were categorized as level 0 (no safety significance) on the International Nuclear and Radiological Event Scale. Three events ranked as level 1 (anomaly) due to the quantity of nuclear substances involved and the type of event reported. Two events ranked at level 2 (incident) resulted in a NEW receiving a dose to the skin of the hands above the regulatory limits.

There were no releases of nuclear substances to the environment that had an adverse radiological impact or that resulted in a person receiving a dose in excess of the regulatory limit for members of the public.

Conclusion

The use of nuclear substances and prescribed equipment in Canada is safe. Adequate provisions for the protection of health, safety, security, and the environment from the use of nuclear substances and prescribed equipment are in place.

Appendix A: Relevant regulatory references

The following is a list of regulatory references that apply to the use of nuclear substances and prescribed equipment. The list is not exhaustive.

Act and regulations

Nuclear Safety and Control Act

Administrative Monetary Penalties Regulations (Canadian Nuclear Safety Commission)

Class II Nuclear Facilities and Prescribed Equipment Regulations

General Nuclear Safety and Control Regulations

Nuclear Substances and Radiation Devices Regulations

Packaging and Transport of Nuclear Substances Regulations, 2015

Radiation Protection Regulations

Transportation of Dangerous Goods Regulations

Regulatory documents

REGDOC-1.4.1, *Licence Application Guide: Class II Nuclear Facilities and Prescribed Equipment* (draft)

REGDOC-1.5.1, *Application Guide: Certification of Radiation Devices or Class II Prescribed Equipment*

REGDOC-1.6.1, *Licence Application Guide: Nuclear Substances and Radiation Devices, Version 2*

REGDOC-2.2.3, *Personnel Certification: Radiation Safety Officers*

REGDOC-2.2.3, *Personnel Certification: Exposure Device Operators*

G-129, rev. 1, *Keeping Radiation Exposures and Doses "As Low as Reasonably Achievable (ALARA)"*

REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures*, Version 1.1

REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources*

REGDOC-2.14.1, *Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015*

REGDOC-3.6, *Glossary of CNSC Terminology*

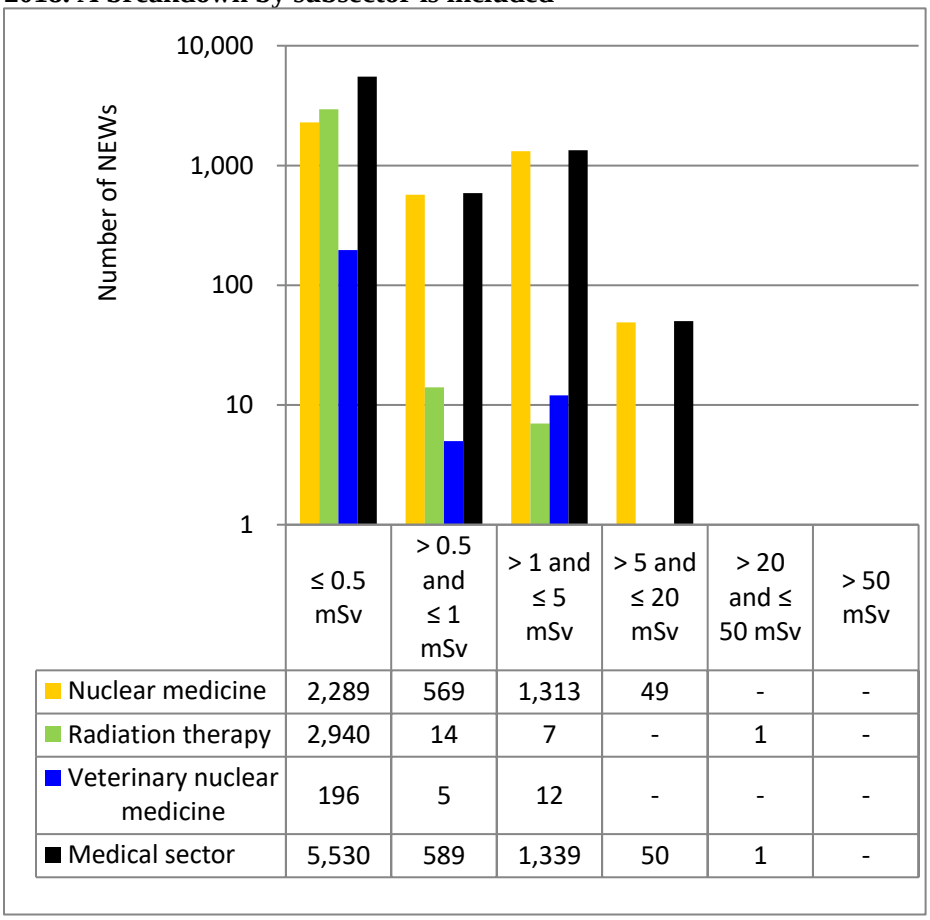
Regulatory Policy P-290, *Managing Radioactive Waste*

Appendix B: Doses to nuclear energy workers, by sector

B.1 Medical sector

This appendix shows the doses received by NEWs in the medical sector, as reported to the CNSC in 2018. Note that the total number of NEWs shown in the medical sector row is the aggregate for the entire sector, including subsectors not highlighted in this report. Results are similar to past years.

Figure 25: Doses to nuclear energy workers in the medical sector, by subsector reported in 2018. A breakdown by subsector is included

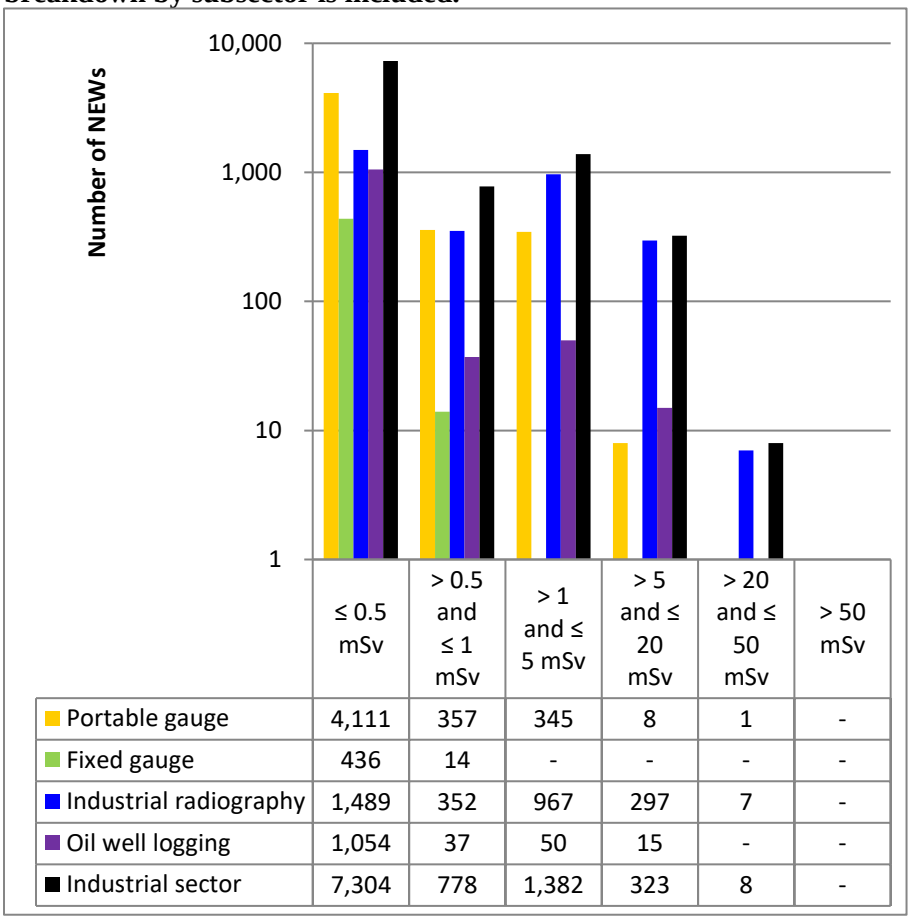


	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Nuclear medicine	2,289	569	1,313	49	-	-
Radiation therapy	2,940	14	7	-	1	-
Veterinary nuclear medicine	196	5	12	-	-	-
Medical sector	5,530	589	1,339	50	1	-

B.2 Industrial sector

This appendix shows the doses received by NEWs in the industrial sector, as reported to the CNSC in 2018. Note that the total number of NEWs shown in the industrial sector row is the aggregate for the entire sector, including subsectors not highlighted in this report. Results are similar to past years.

Figure 26: Doses to nuclear energy workers in the industrial sector reported in 2018. A breakdown by subsector is included.



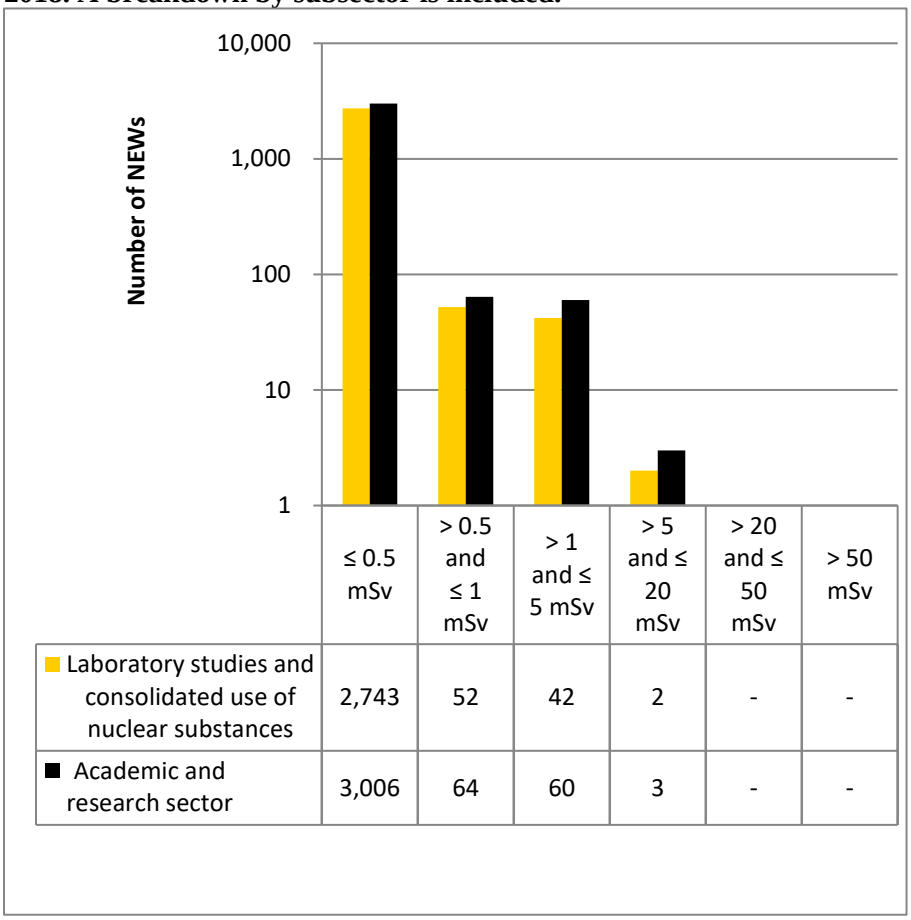
	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Portable gauge	4,111	357	345	8	1	-
Fixed gauge	436	14	-	-	-	-
Industrial radiography	1,489	352	967	297	7	-
Oil well logging	1,054	37	50	15	-	-
Industrial sector	7,304	778	1,382	323	8	-

B.3 Academic and research sector

This appendix shows the doses received by NEWs in the academic and research sector, as reported to the CNSC in 2018. Note that the total number of NEWs shown in the academic and research sector row is the aggregate for the entire sector, including subsectors not highlighted in this report. Results are similar to past years.

Doses received by NEWs working at the CNSC laboratory remained very low, with all workers receiving doses below 0.5 mSv.

Figure 27: Doses to nuclear energy workers in the academic and research sector reported in 2018. A breakdown by subsector is included.

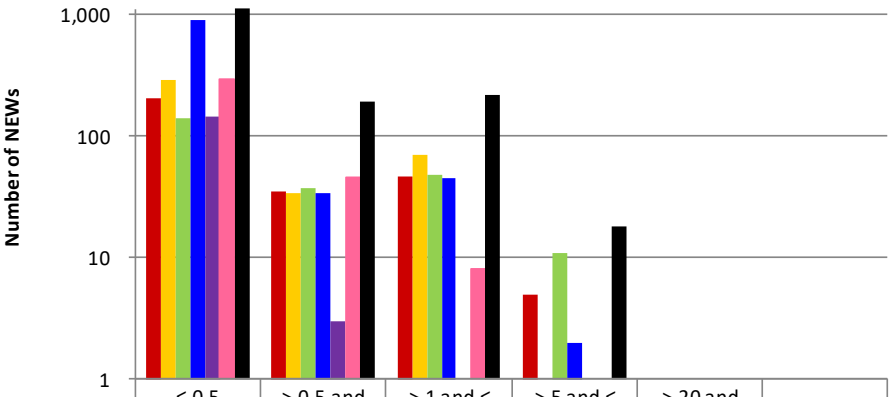


	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Laboratory studies and consolidated use of nuclear substances	2,743	52	42	2	-	-
Academic and research sector	3,006	64	60	3	-	-

B.4 Commercial sector

This appendix shows the doses received by NEWs in the commercial sector, as reported to the CNSC in 2018. Note that the total number of NEWs shown in the commercial sector row is the aggregate for the entire sector, including subsectors not highlighted in this report. Results are similar to past years.

Figure 28: Doses to nuclear energy workers in the commercial sector reported in 2018. A breakdown by subsector is included.



	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Isotope production	208	35	47	5	-	-
Processing of nuclear substances	288	34	71	-	-	-
Distribution	142	37	49	11	1	-
Servicing	903	34	46	2	-	-
Calibration	144	3	1	-	-	-
Waste Nuclear Substances	293	46	8	-	-	-
Commercial sector	2,111	191	222	18	1	-

Appendix C: Inspections ratings, by sector

C.1 Medical sector

Table 4 in this appendix shows the inspection performance of licensees in the medical sector. The performance of the subsectors is shown for the years 2014 – 2018 as a percentage of the inspections that received fully satisfactory or satisfactory grades for the SCA and the total number of inspections where performance in that SCA was assessed. The number of inspections for the medical sector is the aggregate for the entire sector, including subsectors not highlighted in this report.

A breakdown by subsector is not provided for the security SCA given the potentially sensitive information associated with that SCA.

Table 4: Inspection performance for subsector of the medical sector, 2014 – 2018

SCA	Subsector or sector	Percent of inspections meeting expectations (total number inspections conducted)				
		2014	2015	2016	2017	2018
Management system	Nuclear medicine	--	93% (203)	96% (174)	98% (91)	96% (103)
	Radiation therapy	--	93% (14)	67% (10)	82% (11)	50% (6)
	Veterinary nuclear medicine	--	100% (6)	100% (9)	100% (4)	100% (4)
	Medical sector	--	94% (242)	96% (216)	97% (110)	94% (117)
Operating performance	Nuclear medicine	92% (159)	93% (205)	86% (184)	86% (90)	77% (104)
	Radiation therapy	86% (21)	93% (14)	92% (24)	89% (18)	67% (12)
	Veterinary nuclear medicine	80% (10)	100% (6)	100% (9)	100% (4)	100% (4)
	Medical sector	91% (209)	93% (246)	88% (228)	87% (116)	77% (124)
Radiation protection	Nuclear medicine	91% (158)	85% (205)	77% (186)	75% (89)	74% (104)
	Radiation therapy	96% (22)	100% (15)	100% (24)	100% (19)	100% (12)
	Veterinary nuclear medicine	80% (10)	83% (6)	67% (9)	100% (4)	50% (4)
	Medical sector	92% (209)	86% (246)	80% (231)	81% (116)	77% (124)
Security	Medical Sector	96% (188)	98% (223)	86% (222)	81% (118)	91% (119)

Note : Green indicates >85% of inspections in a year met or exceeded expectations for an SCA.
Yellow indicates 80% - 85% of inspections in a year met or exceeded expectations for an SCA.
Red indicates < 80% of inspections in a year met or exceeded expectations for an SCA.

C.2 Industrial sector

A breakdown by subsector is not provided for the security SCA given the potentially sensitive information associated with that SCA.

Table 5 in this appendix shows the inspection performance of licensees in the industrial sector. The performance of the subsectors is shown for the years 2014 – 2018 as a percentage of the inspections that received fully satisfactory or satisfactory grades for the SCA and the total number of inspections where performance in that SCA was assessed. The number of inspections for the industrial sector is the aggregate for the entire sector, including subsectors not highlighted in this report.

A breakdown by subsector is not provided for the security SCA given the potentially sensitive information associated with that SCA.

Table 5: Inspection performance for subsector of the industrial sector, 2014 – 2018

SCA	Subsector or sector	Percent of inspections meeting expectations (total number inspections conducted)				
		2014	2015	2016	2017	2018
Management system	Portable gauge	--	99% (338)	98% (443)	99% (303)	98% (321)
	Fixed gauge	--	96% (170)	100% (205)	94% (130)	94% (112)
	Industrial radiography	--	96% (163)	97% (201)	96% (136)	96% (138)
	Oil well logging	--	98% (50)	100% (48)	100% (42)	98% (43)
	Industrial sector	--	97% (860)	98% (916)	98% (620)	97% (608)
Operating performance	Portable gauge	92% (433)	92% (389)	87% (439)	82% (82%)	86% (326)
	Fixed gauge	76% (219)	90% (170)	77% (205)	70% (136)	68% (111)
	Industrial radiography	91% (224)	92% (190)	94% (199)	89% (116)	88% (138)
	Oil well logging	87% (61)	77% (49)	90% (48)	93% (42)	86% (44)
	Industrial sector	88% (955)	91% (865)	86% (917)	82% (625)	83% (633)

SCA	Subsector or sector	Percent of inspections meeting expectations (total number inspections conducted)				
		2014	2015	2016	2017	2018
Radiation protection	Portable gauge	92% (431)	91% (389)	84% (442)	82% (306)	84% (326)
	Fixed gauge	81% (222)	80% (170)	78% (205)	80% (132)	77% (111)
	Industrial radiography	86% (224)	92% (189)	92% (198)	90% (130)	91% (138)
	Oil well logging	90% (61)	90% (48)	79% (48)	86% (42)	91% (44)
	Industrial sector	88% (956)	89% (862)	84% (916)	84% (620)	85% (633)
Security	Industrial sector	94% (931)	94% (828)	95% (873)	91% (610)	94% (624)

Note : Green indicates >85% of inspections in a year met or exceeded expectations for an SCA. Yellow indicates 80% - 85% of inspections in a year met or exceeded expectations for an SCA. Red indicates < 80% of inspections in a year met or exceeded expectations for an SCA.

C.3 Academic and research sector

Table 6 in this appendix shows the inspection performance of licensees in the industrial sector. The performance of the subsectors is shown for the years 2014 – 2018 as a percentage of the inspections that received fully satisfactory or satisfactory grades for the SCA and the total number of inspections for which performance in that SCA was assessed. The number of inspections for the industrial sector is the aggregate for the entire sector, including subsectors not highlighted in this report.

A breakdown by subsector is not provided for the security SCA given the potentially sensitive information associated with that SCA.

In March 2018, CNSC staff conducted an inspection at the CNSC laboratory on the CNSC's consolidated use licence. No items of non-compliance were identified during the inspection.

Table 6: Inspection performance for subsector of the academic and research sector, 2014 – 2018

SCA	Subsector or sector	Percent of inspections meeting expectations (total number inspections conducted)				
		2014	2015	2016	2017	2018
Management system	Laboratory studies and consolidated use	--	95% (61)	97% (71)	97% (73)	99% (84)
	Academic and research sector	--	94% (71)	97% (75)	97% (73)	99% (86)
Operating performance	Laboratory studies and consolidated use	87% (124)	75% (63)	92% (75)	97% (74)	88% (86)
	Academic and research sector	87% (135)	78% (77)	91% (81)	97% (75)	88% (90)
Radiation protection	Laboratory studies and consolidated use	86% (123)	88% (60)	90% (73)	93% (73)	76% (84)
	Academic and research sector	87% (134)	90% (72)	91% (78)	93% (74)	77% (88)
Security	Academic and Research Sector	98% (123)	91% (70)	96% (73)	96% (69)	79% (72)

Note : Green indicates >85% of inspections in a year met or exceeded expectations for an SCA. Yellow indicates 80% - 85% of inspections in a year met or exceeded expectations for an SCA. Red indicates < 80% of inspections in a year met or exceeded expectations for an SCA.

C.4 Commercial sector

Table 7 shows the inspection performance of licensees in the commercial sector. The performance of the subsectors is shown for the years 2014 – 2018 as a percentage of the inspections that received fully satisfactory or satisfactory grades for the SCA and the total number of inspections for which performance in that SCA was assessed. The number of inspections for the commercial sector is the aggregate for the entire sector, including subsectors not highlighted in this report. Due to the small number of inspections in each subsector, identifying trends is difficult.

A breakdown by subsector is not provided for the security SCA given the potentially sensitive information associated with that SCA.

Table 7: Inspection performance for subsectors of the commercial sector, 2014 – 2018

SCA	Subsector and sector	Percent of inspections meeting expectations (total number inspections conducted)				
		2014	2015	2016	2017	2018
Management system	Isotope production	--	100% (5)	100% (1)	100% (3)	100% (1)
	Processing of nuclear substances	--	90% (10)	100% (8)	100% (11)	100% (5)
	Distribution	--	94% (16)	94% (18)	100% (11)	100% (8)
	Servicing	--	97% (35)	100% (42)	84% (19)	95% (19)
	Calibration	--	100% (10)	78% (9)	100% (3)	100% (4)
	Waste nuclear substances	--	100% (8)	100% (4)	100% (4)	100% (5)
	Commercial sector	--	94% (117)	97% (87)	93% (62)	97% (41)
Operating performance	Isotope production	--	100% (8)	100% (2)	100% (4)	100% (4)
	Processing of nuclear substances	87% (15)	82% (11)	78% (9)	92% (13)	100% (5)
	Distribution	95%	94%	100%	82%	88%

SCA	Subsector and sector	Percent of inspections meeting expectations (total number inspections conducted)				
		2014	2015	2016	2017	2018
		(19)	(16)	(17)	(11)	(8)
Operating performance	Servicing	88% (51)	97% (39)	92% (47)	95% (21)	100% (24)
	Calibration	100% (15)	100% (10)	89% (9)	100% (3)	100% (4)
	Waste nuclear substances	100% (9)	100% (8)	100% (4)	100% (4)	100% (5)
	Commercial sector	90% (135)	94% (123)	92% (91)	94% (67)	92% (48)
Radiation protection	Isotope production	--	100% (9)	100% (2)	75% (4)	100% (4)
	Processing of nuclear substances	87% (15)	75% (12)	100% (9)	83% (9)	100% (5)
	Distribution	94% (18)	94% (16)	100% (17)	100% (11)	100% (7)
	Servicing	98% (52)	95% (39)	93% (42)	100% (21)	100% (23)
	Calibration	93% (15)	100% (10)	78% (9)	100% (3)	100% (4)
	Waste nuclear substances	100% (9)	100% (8)	100% (4)	100% (4)	100% (5)
	Commercial sector	94% (135)	92% (125)	92% (90)	95% (63)	100% (46)
Security	Commercial sector	97% (101)	97% (97)	99% (70)	94% (53)	93% (41)

Note : Green indicates >85% of inspections in a year met or exceeded expectations for an SCA. Yellow indicates 80% - 85% of inspections in a year met or exceeded expectations for an SCA. Red indicates < 80% of inspections in a year met or exceeded expectations for an SCA.

Performance in the environmental protection SCA and conventional health and safety SCA are reported on only for the waste nuclear substance subsector. The waste nuclear substance licensees continue to manage and monitor environmental releases as a result of licensed activities. These

releases are kept well below regulatory limits. There were no unplanned releases to the environment as a result of licensed activities in 2018.

No waste nuclear substance licensees received below expectations or unacceptable ratings in the conventional health and safety SCA. The licensees continue to implement a health and safety program in accordance with the applicable occupational health and safety legislation to protect the health and safety of their workers. One lost-time injury was reported to the CNSC for the reporting period (see event WNS5 in appendix E).

Appendix D: Enforcement actions issued in 2018

Table 8: Orders issued in 2018

Issue date (2018)	Order #	Location	Licensee	Sector, subsector	Licensee response	Closure date (2018)
Jan. 16	0574	Grand Prairie, AB	International Paper Canada Pulp Holdings Inc.	Industrial sector, Fixed gauge	Ceased all entries into vessels with radiation devices until training was provided to all workers in relation to vessel entry. A complete training record was provided. Corrected all items of non-compliance to the satisfaction of the CNSC.	Apr. 25
Jan. 23	0843	Mississauga, ON	The Graff Company ULC	Industrial sector, Industrial radiography	Ceased operation and transport of radiation devices until changes were made to the implementation and oversight of the radiation protection program, and corrected all items of non-compliance to the satisfaction of the CNSC.	Feb. 5
Mar. 1	0668	Nisku, AB	Qualitest Canada Ltd.	Industrial sector, Portable gauge	Ceased using portable gauges until improvements were made to the implementation and oversight of the radiation protection program and all items of non-compliance were corrected to the satisfaction of the CNSC.	Mar. 26
Mar. 6	0860	Sarnia, ON	ARLANXEO Canada Inc.	Industrial sector, Fixed gauge	Ceased all entries into vessels with radiation devices until the licensee changed their procedures for conducting vessel entries to ensure compliance with the CNSC's requirements and until staff were trained on the new procedures.	Mar. 29

Issue date (2018)	Order #	Location	Licensee	Sector, subsector	Licensee response	Closure date (2018)
Apr. 25	0837	Hamilton, ON	Soil-Mat Engineers & Consultants Ltd.	Industrial sector, Portable gauge	Ceased all use of portable gauges until immediate provisions for the safe and secure storage of all portable gauges and all items of non-compliance were corrected to the satisfaction of the CNSC. Corrected all items of non-compliance to the satisfaction of the CNSC.	May 16
May 11	1206	Waterloo, ON	Waterloo Nuclear & Radiography Inc.	Medical sector, Nuclear medicine	Order remains open as of July 15, 2019.	
May 14	0770	Edmonton, AB	Kamit Group Ltd.	Industrial sector, Portable gauge	Ceased using portable gauges until improvements were made to the implementation and oversight of the radiation protection program and all items of non-compliance were corrected to the satisfaction of the CNSC.	May 22
May 25	0594	Laval, QC	Stantec Consulting Ltd.	Industrial sector, Portable gauge	Removed one individual from work involving a portable gauge until the individual completed training on the licensee's radiation protection program and matters related to the security of portable gauges, and demonstrated that they are working in accordance with CNSC regulations.	Jun. 15
Jul. 25	0608	Williams Lake, BC	Peterson Contracting Ltd.	Industrial sector, Portable gauge	Ceased all use of portable gauges until immediate provisions for the safe and secure storage of all portable gauges and all items of non-compliance were corrected to the satisfaction of the CNSC.	Aug. 24

Issue date (2018)	Order #	Location	Licensee	Sector, subsector	Licensee response	Closure date (2018)
Aug. 30	0609	Crowsnest Pass, AB	Parkland Geotechnical Consulting Ltd.	Industrial sector, Portable gauge	Removed one individual from work involving portable gauges at this specific location until the licensee demonstrated that they are working in accordance with CNSC regulations. Item of non-compliance corrected to the satisfaction of the CNSC.	Sep. 7
Sep. 13	0774	Cypress County, AB	GEM Testing Ltd.	Industrial sector, Portable gauge	Removed one individual from work involving a portable gauge until the individual completed training on the licensee's radiation protection program and matters related to the security of portable gauges, and demonstrated that they are working in accordance with CNSC regulations. Corrected all items of non-compliance to the satisfaction of the CNSC.	Sep. 25
Oct. 24	0596	Whitecourt, AB	BAKOSNDT Ltd.	Industrial sector, Industrial radiography	Removed one individual from work involving exposure devices. Retrained worker in their obligations regarding the use the safety of devices, and exposure device operator was recertified.	Dec. 19
Dec. 19	n/a	Burlington, ON	Isologic Innovative Radiopharmaceuticals Ltd.	Commercial sector, Processing of nuclear substances	Order remains open as of July 15, 2019.	

Table 9: Administrative penalties issued in 2018

Issue date (2018)	AMP #	Licensee or individual	Sector, Subsector	Reason for issuing AMP	Penalty amount	Closure date (2018)
Apr. 23	2018-AMP-01	ARLANXEO Canada Inc.	Industrial sector, Fixed gauge	Failure to comply with a condition of a licence in violation of subsection 48(c) of the *Nuclear Safety and Control Act*. Specifically: Failure to comply with CNSC licence condition 2052-3 related to vessel entry.	$7,930	Apr. 23
Apr. 30	2018-AMP-02	20/20 ND Technology Inc.	Industrial sector, Industrial radiography	Failure to immediately make a preliminary report to the Commission of a specific situation and of actions taken by the licensee in violation of subsection 29(1) of the *General Nuclear Safety and Control Regulations*.	$9,190	Jun. 1
Jun. 27	2018-AMP-03	Quantum Petrophysics Inc.	Industrial sector, Oil well logging	Violation of paragraph 26(1)(a) of the *Packaging and Transport of Nuclear Substances Regulations, 2015*. Presentation for transport or transport of radioactive material in package not meeting requirements.	$11,920	Jan. 14, 2019

Appendix E: List of events reported in 2018

Table 10: Events reported to CNSC in 2018

#	Date reported	INES rating	Event type	Sector	Event summary
3312	Jan. 8	0	Device malfunction	Industrial	A licensed service provider received three portable gauges from another licensee for servicing. One gauge had a fully open shutter. Dose rates were at normal levels. Licensee took preventive measures by re-training the technician involved in the preparation of shipments.
3233	Jan. 11	0	Packaging and transport	Commercial	Twenty-four Type A packages containing 30 GBq of iodine-131 were accidentally left at an unauthorized facility. The packages were not in close proximity to personnel. The packages were picked up by the commercial carrier the following morning and returned to their depot.
3235	Jan. 15	0	Lost	Medical	A 3.7 MBq cobalt-57 spot marker used in the imaging of a patient went missing. The sealed source was later recovered and has been returned to the licensee's possession.
3236	Jan. 17	0	Device malfunction	Medical	An iridium-192 (260.9 GBq) sealed source was stuck between a transport container and a treatment unit during a high dose rate brachytherapy source change. The source was returned to the transport container; however, the source cable tail remained locked in the drive. A survey of the unit showed no measurable contamination. With the source in the transport container, there was no radiation in the room.
3237	Jan. 17	0	Device damaged	Industrial	An exposure device fell from a platform while the source was in the shielded position and the crank was damaged. There was no damage to the device itself and no risk of exposure. No injuries resulted from this event. Leak tests were conducted. No leaks

#	Date reported	INES rating	Event type	Sector	Event summary
					were detected. The licensee has implemented corrective actions in order to prevent recurrence.
3243	Jan. 18	0	Breach of security	Industrial	Access control to a storage area for Category 3 sealed sources was compromised when the key was left in the lock. The storage room is inside a protected area. An inventory check was performed and all sources were accounted for. Training has been delivered to relevant personnel to future recurrence.
3241	Jan. 22	0	Spill	Commercial	A spill of 20 GBq of technetium-99m occurred at a licensee's facility when a vial was dropped. The spill was contained to the fume hood and was immediately cleaned. There was no overexposure or releases to the environment as a result of this incident. The licensee has considered corrective actions in order to prevent recurrence.
3321	Jan. 23	0	Breach of security	Industrial	A break-in occurred at a vehicle storing exposure devices. The compartment containing the radiography cameras was not tampered with.
3242	Jan. 25	0	Device damaged	Industrial	A portable gauge was damaged by a vehicle at a construction site when an employee left it unattended. There was no damage to the shielding and source rod. Leak tests indicated there were no leaks. The licensee implemented corrective actions to prevent recurrence. No injuries or overexposures occurred as a result of this incident.
3311	Jan. 26	0	Device malfunction	Industrial	A detector component for a fixed gauge malfunctioned. The incident did not pose a risk to the health and safety of persons. A licensed service provider was called to service the device.

#	Date reported	INES rating	Event type	Sector	Event summary
3246	Jan. 26	0	Unplanned exposure	Industrial	Workers were found inside posted safety barriers during industrial radiography work. The workers were removed. A survey of the area indicated no overexposure. The licensee implemented corrective actions to prevent recurrence.
3247	Jan. 29	0	Spill	Commercial	A worker dropped a vial on a laboratory floor resulting in a spill of 8 GBq of technetium-99m. No skin contamination occurred and shielding was applied to the spill for three days to allow for decay. Results from survey and wipe tests were close to background level. The licensee provided refresher training to all staff on how to prevent handling and human errors.
3248	Feb. 1	0	Device malfunction	Industrial	An iridium-192 sealed source (2.56 TBq) radiography source did not fully retract into the shielded position in an exposure device due to ice build-up. Additional shielding was not used when workers recovered the source, but no overexposures resulted from this event. The device was sent for servicing and was determined to be in good condition. The licensee has implemented corrective actions to prevent recurrence.
3253	Feb. 5	0	Breach of security	Industrial	An intruder attempted to hot-wire and steal a vehicle in a licensee's compound but was unsuccessful in their attempt. A perimeter alarm was tripped when the individual attempted to break into the shop to locate the keys. The intruder made no attempt to access the vault where the radiation devices were stored. The licensee has implemented additional security measures to prevent future recurrences.
3251	Feb. 5	0	Device malfunction	Industrial	A licensee transferred a portable gauge to a licensed service provider for maintenance and calibration while

#	Date reported	INES rating	Event type	Sector	Event summary
					the shutter was in the open position. The portable gauge operator did check the shutter prior to shipping the gauge. The service provider placed the gauge in secure storage until they removed the soil debris that was preventing the spring from allowing shutter to close. Leak tests indicated there were no leaks. No overexposures occurred as a result of this incident and the licensee has implemented measures to prevent recurrence.
3265	Feb. 13	2	Unplanned exposure	Medical	A technologist handling a syringe with technetium-99m received skin contamination when the syringe slipped from their hand. The calculated dose to the skin (3,652 mSv) exceeded the regulatory limit. The licensee has implemented corrective actions to prevent recurrence. The technologist was off duty until a return to work letter was issued by the CNSC.
3267	Feb. 22	0	Packaging and transport	Commercial	A source vial containing a mixture of isotopes (74.4 kBq) was shattered. The package was undamaged. No contamination was found on the external surface of the package or vial. It was concluded that the vial had a defect prior to delivery. To prevent recurrence, plastic vials are now used instead of glass vials.
3269	Feb. 27	0	Spill	Commercial	A vial containing 460 MBq of fuorine-18 was dropped on the floor in a hot cell. Absorbent pads and lead shielding was used to allow the technician to continue work. No skin contamination or overexposures resulted from this incident and corrective actions were implemented to prevent recurrence.
3268	Feb. 28	0	Contamination	Commercial	While a NEW was travelling through airport security, contamination was detected on a pair of pants inside the suitcase of the NEW, who had

#	Date reported	INES rating	Event type	Sector	Event summary
					conducted a servicing inspection the previous day. It is suspected that the contamination occurred during the de-gowning process. The NEW was wearing a dosimeter; the dose received during the servicing work was below the regulatory limits (although it was above the licensee's internal limit). Corrective actions were implemented to prevent recurrence.
3270	Feb. 28	0	Spill	Medical	A spill occurred when 3.5 GBq of technetium-99m was heated in the microwave and the vial broke in the microwave due to pressure. No contamination or overexposures resulted from this incident. The licensee terminated the practice of using microwaves to heat radiopharmaceutical kits when the hot plate is unavailable.
3271	Mar. 1	0	Other (fire)	Industrial	An electrical fire began in the darkroom of a vehicle used for industrial radiography. The exposure device was in the vehicle at the time however, it was not damaged by the fire. A leak test was performed and no leaks were detected. No overexposures or injuries resulted from this event. To prevent recurrence the licensee reminded employees that exposure devices must be stored at the main vault rather than onboard darkroom trucks.
3229	Mar. 2	0	Packaging and transport	Industrial	A vehicle transporting a neutron generator was involved in an accident. The driver was transported to the hospital and released the next day. The licensee retrieved the device the following day. There was no damage to the device.
3327	Mar. 4	0	Device damaged	Industrial	A fixed gauge incurred damage to the shutter when the gauge fell about 0.3 m. Leak tests were performed. No leaks were detected. No overexposures or contamination

#	Date reported	INES rating	Event type	Sector	Event summary
					occurred as a result of this event. The gauge was isolated and removed from service.
3274	Mar. 5	0	Device damaged	Industrial	The shutter on a fixed gauge was not functioning. It was locked in the closed position at the time of the event. The licensee has taken the gauge out of service for repair or possible disposal.
3276	Mar. 5	0	Device damaged	Industrial	An exposure device was dropped about2.1 m resulting in minor damage. The device was locked/shielded at the time of the incident. No injuries occurred and leak tests were performed. No leaks were detected. Corrective actions were implemented to prevent future recurrences.
3278	Mar. 5	1	Found	Industrial	A fixed gauge was discovered at a scrapyard. The device originated from a company that is now bankrupt and whose assets were sold to other companies. Arrangements were made with a licensed service provider to retrieve the gauge from the scrapyard for proper disposal.
3328	Mar. 7	0	Packaging and transport	Academic	A package containing 48.1 kBq of actinium-225 appeared damaged. After inspection, it was confirmed that while the container was not positioned correctly and the inner packing material was damaged, there was no damage to the container and no contamination was found.
3282	Mar. 8	0	Device malfunction	Industrial	A shutter of a fixed gauge could not be closed. Access to the gauge was restricted until repairs were completed.
3280	Mar. 10	0	Device damaged	Industrial	A sealed source was stuck in a guide tube of an exposure device. The source was successfully retrieved. Estimated doses were below action levels and below regulatory limits.

#	Date reported	INES rating	Event type	Sector	Event summary
					Corrective actions were implemented to prevent recurrence.
3281	Mar. 14	0	Device damaged	Industrial	A sealed source from a fixed gauge was stuck in the unshielded position. The gauge was isolated and removed from the area. The licensee has taken the gauge out of service for repair or possible disposal.
3283	Mar. 16	0	Device damaged	Industrial	A sealed source was stuck in a guide tube of an exposure device after it had fallen from a stand. The source was successfully retrieved the same day, and estimated doses were below regulatory limits.
3287	Mar. 19	0	Device damaged	Industrial	A locking ring on the shutter handle of a fixed gauge was broken. The shutter was opening and closing normally and a chain and lock was used to secure the shutter arm in the closed position until the device was repaired. No overexposures occurred as a result of this event.
3290	Mar. 19	0	Packaging and transport	Medical	A Type A package containing 8.8 MBq of radium-225 was damaged by a forklift during unloading. The package only sustained damage to the outer portions. The inner lead pot was not damaged and readings were at normal levels. No overexposures or contamination resulted from this event.
3289	Mar. 21	0	Device damaged	Industrial	A shutter on a fixed gauge was damaged. The gauge was in the closed position. The gauge was isolated until it was repaired.
3293	Mar. 29	0	Breach of security	Commercial	A break-in occurred in the mechanical space above a cyclotron. There was no indication of forced entry and all contents were intact and accounted for. Corrective actions were implemented to prevent recurrence.
3297	Apr. 2	0	Device damaged	Industrial	A magnet stand fell on the source guide tube of an exposure device, preventing the source from being

#	Date reported	INES rating	Event type	Sector	Event summary
					retracted into the shielded position. The source was retrieved successfully. No overexposures occurred as a result of this event. The device was sent for inspection to replace any damaged equipment. Corrective actions were implemented to prevent recurrence.
3299	Apr. 2	0	Device malfunction	Industrial	A sealed source failed to retract to the shielded position in an exposure device. The EDO was not immediately aware and continued to work in the vicinity of the source. The dose estimate indicated there was no overexposure as a result of the event. The licensee has implemented corrective actions to prevent recurrence.
3310	Apr. 10	0	Packaging and transport	Industrial	A mobile darkroom truck with an exposure device onboard was involved in a motor vehicle accident. No visible damage was noted and dose rates were normal. No overexposures or injuries resulted from this event.
3335	Apr. 11	0	Packaging and transport	Commercial	A licensee received a shipment of fluorine-18 in which one red cable tie was missing from a vial. The consignor confirmed that all packages were shipped with a red cable tie, and no irregularities were reported by the consignor. Inspection of the vial indicated that the integrity of the vial of fluorine-18 was not compromised.
3302	Apr. 12	0	Lost	Academic	A Category 5 strontium-90 sealed source went missing from a licensee’s inventory; it is believed that the sealed source is still within the facility's controlled zone. The licensee has implemented measures to prevent recurrence. There were no effects to health and safety as a result of the event. The sealed source has not been recovered.

#	Date reported	INES rating	Event type	Sector	Event summary
3339	Apr. 18	0	Packaging and transport	Commercial	A shipment of fluorine-18 was received with the red cable tie removed. It was confirmed that the cable tie was broken when the package was off-loaded from the aircraft. The integrity of the package was not compromised after inspection.
3318	Apr. 19	0	Lost	Industrial	A canister with radioactivity marking was discovered on the side of a highway. The cobalt-60 sealed source (1.85 GBq) was successfully located, recovered and repackaged properly to be transported back to the licensee's facility.
3340	Apr. 20	0	Device malfunction	Industrial	A shutter on a fixed gauge was stuck in the closed position. A perimeter was established until the device was repaired. There were no overexposures as a result of this event.
3313	Apr. 23	0	Device damaged	Industrial	A portable gauge was discovered with a high radiation dose rate during a routine inspection. There was no visible damage and the shutter was closed. The gauge had also been recently serviced and leak tested, with normal results. The portable gauge was transported to a servicing company for repair or disposal.
3317	Apr. 24	0	Unplanned exposure	Industrial	Two individuals were present inside a radiography warning barrier while the source was exposed. The source was immediately retracted and the individuals left the area. Corrective actions were implemented to prevent recurrence. No overexposures occurred as a result of this event.
3319	Apr. 28	0	Device damaged	Industrial	A portable gauge was damaged when it was hit by an unauthorized vehicle that entered a construction site. The gauge sustained only superficial damage. The source was retracted into the shielded position. Leak tests were conducted. No leaks were

#	Date reported	INES rating	Event type	Sector	Event summary
					detected. The gauge was repaired and put back into service. No injuries or overexposures occurred as a result of this event.
3333	Apr. 28	0	Packaging and transport	Commercial	A vehicle transporting two Type A packages containing unit doses of tectnitium-99m was involved in a motor vehicle accident. The vehicle sustained minor damage. The driver was not seriously injured, but a secondary driver was assigned to complete the delivery. The packages were not damaged.
3329	May 4	0	Unplanned exposure	Industrial	An individual was within the radiography warning barriers while industrial radiography work was taking place. The calculated dose was below regulatory limits and no overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3332	May 7	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle accident. The portable gauge was not damaged. No injuries or loss in containment occurred as a result of this event.
3336	May 9	0	Lost	Medical	A Category 5 cobalt-57 sealed source was lost following its use during calibration. The licensee implemented the following corrective measure: the sources are now attached to their shielding containers by a string to avoid loss. The source was not recovered.
3337	May 10	0	Packaging and transport	Commercial	An electron capture detector was lost in transport. The device was located in the commercial carrier's warehouse with no visual damage to the package or the device. The package was later delivered to the manufacturer. Corrective actions will be implemented to prevent recurrence.

#	Date reported	INES rating	Event type	Sector	Event summary
3341	May 14	0	Device damaged	Industrial	A fixed gauge's handle pin was damaged, resulting in the shutter being stuck in the open position. The device was repaired. No overexposures resulted from this event.
3344	May 14	0	Device malfunction	Industrial	The shutter on a portable gauge was stuck in a partially open position. Dose rates were measured and did not identify a significant elevation in dose rate. There were no overexposures as a result of this event. The shutter malfunction was resolved.
3347	May 15	0	Breach of security	Medical	A set of master keys was reported missing. The keys were found. The inventory of nuclear substances was verified and was intact. Corrective actions were implemented to prevent recurrence.
3349	May 15	0	Device damaged	Industrial	A shutter plate fell off a fixed gauge because the wire holding the shutter in place broke. The device remained in use with the shutter open until it was serviced. A new shutter assembly was ordered and installed. No overexposures resulted from this event.
3346	May 17	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a collision. There was no damage to the gauge or its transport container. No overexposures or injuries resulted from this event.
3358	May 22	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a collision. There was minor damage to the vehicle. There was no damage to the gauge or its transport container. A leak test was performed; no leaks were detected. No injuries or overexposures resulted from this event.
3348	May 23	0	Device damaged	Industrial	A portable gauge cover was damaged and cracked. It is believed that a hard

#	Date reported	INES rating	Event type	Sector	Event summary
					material struck the cover. The gauge was put into storage and a leak test was performed. No leaks were detected. The gauge was repaired. No overexposures occurred as a result of this event.
3351	May 23	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in an accident. There was no damage to the transport case or to the gauge. A leak test was performed. No leaks were detected. No overexposures or injuries occurred as a result of this event.
3353	May 25	0	Device damaged	Industrial	A fixed gauge was dropped about 1.3 m while being moved with a forklift. Inspection of the gauge revealed no visible damage. A leak test was performed. No leaks were detected. The gauge was returned to service and no overexposures or injuries occurred as a result of this event.
3379	May 25	0	Breach of security	Industrial	An intruder gained access to a storage area with portable density gauges by breaking the entry lock. Hand tools were stolen; however, all portable gauges were accounted for. The licensee repaired the locks. Local police were notified.
3355	May 25	0	Other (fire)	Industrial	A fire occurred in an area where fixed gauges were located. There was no visible damage to the gauges. A leak test was performed. No leaks were detected. No overexposures or injuries resulted from this event.
3362	May 28	0	Packaging and transport	Industrial	A vehicle carrying an exposure device was involved in collision. The vehicle sustained minor damage. There was no visible damage to the exposure device. A leak test was performed. No leaks were detected. No injuries or overexposures resulted from this event.
3356	May 29	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a collision. The vehicle sustained minor damage.

#	Date reported	INES rating	Event type	Sector	Event summary
					The portable gauge and its transport container were not damaged. A leak test was performed. No leaks were detected. No injuries or overexposures resulted from this event.
3357	May 30	0	Spill	Industrial	Technetium-99m leaked from an IV while a patient was on a treadmill. Contamination was found on the patient's clothing, and the clothing worn by two NEWs. The clothing was removed and put into storage for the technetium to decay. An NEW received skin contamination on the arm below the regulatory limits. Corrective actions were implemented to prevent recurrence.
3361	May 30	0	Device malfunction	Industrial	A portable gauge was transported with the shutter stuck in the open position. The gauge was isolated in its transport package away from workers until it could be repaired. The licensee implemented corrective actions to prevent recurrence. No overexposures resulted from this event.
3360	May 31	0	Device malfunction	Industrial	A shutter malfunction was discovered on a fixed gauge during a routine dose rate survey. The gauge remained in operation but access was removed until the gauge was repaired. Corrective actions were implemented to prevent recurrence. No overexposures resulted from this event.
3368	Jun. 6	0	Spill	Medical	A spill of about 1 GBq of technetium-99m occurred on a benchtop. The area was decontaminated and covered with lead until the technetium-99m decayed. There was no personal contamination.
3370	Jun. 7	0	Packaging and transport	Commercial	A package containing 111 MBq iodine-123 was delivered with a broken vial. The radioactive material was contained in the lead pot. No contamination was present on the

#	Date reported	INES rating	Event type	Sector	Event summary
					exterior of the lead pot or the package. Corrective actions were implemented to prevent recurrence.
3381	Jun. 7	0	Device damaged	Industrial	A portable gauge fell from a vehicle when it was being removed from its Type A case resulting in minor damage. The plastic case was cracked on one corner but the source rod was fully intact. Dose rate measurements were taken and readings were normal. No overexposures occurred as a result of this event.
3371	Jun. 8	1	Stolen	Industrial	A portable gauge was stolen from a job site when the technician walked away from it. The incident was reported to local police. The gauge has not been recovered.
3375	Jun. 8	0	Device malfunction	Industrial	A possible defect with a portable gauge was identified. The top cap of the index rod was coming off when the source rod was being retracted. The manufacturer confirmed a possible defect. The distributor has sent a safety notice to all licensees they sold the device to and has implemented additional testing as part of the gauge servicing protocol. No overexposures resulted from this event.
3417	Jun. 8	0	Packaging and transport	Commercial	A vehicle carrying two Type A packages of technetium-99m was involved in a motor vehicle collision. There was no damage to the packages and they were delivered to their destination. No injuries or overexposures resulted from this event.
3377	Jun. 10	0	Device malfunction	Industrial	A portable gauge was stored with the shutter in the open position. There were no exposures to workers or members of the public because the device was returned on the weekend when the office was closed. Corrective actions were implemented to prevent recurrence.

#	Date reported	INES rating	Event type	Sector	Event summary
WNS1	Jun. 10	0	Packaging and transport	Commercial	A package received at a waste nuclear substance licensee showed evidence of damage. The contents were inspected and no contamination was discovered outside of the packaging. There was no impact on the health and safety of workers, the public or the environment as a result of this event.
3372	Jun. 11	0	Unplanned exposure	Industrial	A portable gauge user disconnected the source rod from a portable gauge and accidently exposed non-NEWs. The fact the worker could remove the source rod is likely tied to the defect reported in event 3375. The gauge was secured and locked away in a storage room. Corrective actions were implemented to prevent recurrence. No overexposures resulted from this event.
3373	Jun. 11	0	Device malfunction	Industrial	A stuck shutter was identified on a mounted fixed gauge. Radiation survey indicated that it was stuck in the closed position. The gauge was left in its current position and was not placed in storage. A licensed service provider was contracted to repair the gauge or remove it for disposal.
3374	Jun. 11	0	Spill	Commercial	A spill of 300 MBq of iodine-131 occurred inside a shielded, vented enclosure. The vial and majority of the spill were transferred to waste. No iodine-131 was detected in the air near the site of the spill. There was no personnel contamination or overexposure as a result of this event. Corrective actions were implemented to prevent recurrence.
3376	Jun. 11	0	Device malfunction	Industrial	A licensee had two portable gauges in storage with partially open shutters. These were discovered during an inspection by the CNSC. The portable gauges were cleaned and where necessary, sent for servicing. Dose estimates indicate that there were

#	Date reported	INES rating	Event type	Sector	Event summary
					likely no overexposures as a result of this event. The licensee has implemented corrective actions to prevent recurrence.
3387	Jun. 12	0	Spill	Commercial	A spill of 25.9 GBq of technetium-99m occurred inside a fume hood. There was minor contamination on the floor. The affected areas were covered with lead until the technetium-99m decayed. Corrective actions were implemented to prevent recurrence. No releases or personnel contamination occurred as a result of this event.
3380	Jun. 14	0	Lost	Medical	A diagnostic seed (iodine-125, Category 5 sealed source) implanted in a patient was misplaced after removal and has not been recovered. Risk to the public and the environment is considered to be very low. Corrective actions were implemented to prevent recurrence.
3401	Jun. 14	1	Unplanned exposure	Non-licensee	A non-NEW working for an airline carrier received a dose that exceeded the annual limit for a member of the public. The carrier took immediate action to remove this worker from handling radioactive packages.
3418	Jun. 17	0	Device malfunction	Industrial	The source extension rod of a fixed gauge device became detached. The source was locked and shielded in the device until the gauge was repaired. No overexposures occurred from this event.
3390	Jun. 20	0	Packaging and transport	Commercial	A package of technetium-99m that was delivered to a customer did not have the security seal. The package was returned to the supplier, who verified that all contents were present. There were no leaks or contamination. The licensee is looking into more visible and resistant security seals.

#	Date reported	INES rating	Event type	Sector	Event summary
3398	Jun. 20	0	Device malfunction	Industrial	A portable gauge with an open shutter was found in storage. The gauge was tagged as out of service. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3384	Jun. 21	0	Other (fire)	Academic	Fire broke out on roof of a building with two rooms that house low activity sealed sources and radiation devices. There was no visible damage to any sources and readings from a contamination meter matched background levels. All sources were accounted for and secured.
3386	Jun. 22	0	Found	Commercial	A device containing a radioactive source (radium-226) was found during a clean-up at a warehouse. A CNSC-licensed company retrieved the device and disposed of it.
3399	Jun. 22	0	Device malfunction	Industrial	A portable gauge was discovered in storage with an open shutter. The licensee was able to clean the gauge so the shutter would close, and the gauge was returned to service. However, the shutter became more and more difficult to close, so the gauge was tagged as out of service. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
WNS2	Jun. 23	0	Other (fire protection)	Commercial	An underground pressurized fire water main that supplied fire water to the licensed building leaked and eroded the surrounding area inside the licensed building. The cause was determined to be corrosion. The licensee took corrective actions to fix the leak and prevent further erosion issues in that area.
3388	Jun. 26	0	Device damaged	Industrial	A vehicle hit a portable gauge at a work site. The device handle was stuck under the vehicle. There was no visible damage to the gauge, and dose

#	Date reported	INES rating	Event type	Sector	Event summary
					rates were normal. A leak test was performed. No leaks were detected. No injuries or overexposures resulted from this event.
3389	Jun. 28	0	Device damaged	Industrial	A portable gauge fell down a manhole. It sustained damage to the cover and electronics panel. A visual check indicated that the shutter remained closed. A leak test was performed. No leaks were detected. No overexposures occurred as a result of this event.
3438	Jul. 3	0	Device damaged	Industrial	An XRF analyzer was dropped about 0.3 m. There was no visible damage but the device produced error messages when the operator tried to take a reading. The operator was able to determine that the shutter remained closed. A leak test was performed. No leaks were detected. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3407	Jul. 4	0	Contamination	Medical	A licensee received a shipment of technetium-99m with contamination on the inside of the container. The worker detected contamination on their hands after opening the package but was able to successfully decontaminate them. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3392	Jul. 6	0	Contamination	Academic	A licensee received a survey meter for calibration contaminated with uranium oxide. The meter was segregated until it could be cleaned to prevent further spread of contamination. The technician observed powder on their hands and was able to follow decontamination protocols. There was no ingestion or inhalation of the material. No

#	Date reported	INES rating	Event type	Sector	Event summary
					overexposures resulted from this event.
3393	Jul. 6	0	Packaging and transport	Industrial	A vehicle carrying a portable gauge was involved in a motor vehicle collision. A leak test was performed. No leaks were detected. No injuries or overexposures occurred as a result of this event.
3394	Jul. 10	0	Device damaged	Industrial	The handle on a fixed gauge came off the device. The shutter was in the closed position at the time. The device was sent for disposal. No overexposures occurred as a result of this event.
3396	Jul. 11	0	Lost	Medical	A Category 5 cobalt-57 check source was accidentally left taped to a patient. The patient removed the source but did not recall where she placed it. The source was lost, and the use of check sources on patients has been discontinued. The source has not been recovered.
3406	Jul. 11	0	Device damaged	Industrial	A portable gauge was damaged when it was hit by construction equipment at a job site. The handle was damaged but the shutter remained intact. The gauge was disposed of. No overexposures or injuries occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3404	Jul. 17	0	Packaging and transport	Commercial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. The gauge was not damaged. A leak test was performed. No leaks were detected. No injuries or overexposures resulted from this event.
3410	Jul. 17	0	Device damaged	Industrial	A vehicle collided with a portable gauge. The source rod was in the closed position with the shutter closed. No overexposures occurred as a result of this event. Corrective

#	Date reported	INES rating	Event type	Sector	Event summary
					actions have been implemented to prevent recurrence.
3419	Jul. 19	0	Device malfunction	Industrial	The shutter on a portable gauge was found partially open and could not be closed. The gauge was repaired and put back into service. More shutter verification checks will be performed. No overexposures occurred as a result of this event.
3421	Jul. 19	0	Device damaged	Industrial	A source was stuck in the guide tube of an exposure device. The source was successfully retrieved and the guide tube was disposed of. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3409	Jul. 20	0	Breach of security	Medical	An iridium-192 (Category 3) sealed source was left unsecured for 24 hours after a source change. The source was locked away as soon as it was discovered. There was no indication of source tampering. Corrective actions were implemented to prevent recurrence. No overexposures resulted from this event.
3414	Jul. 20	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in an accident. There was no damage to the gauge. A leak test was performed. No leaks were detected. No injuries or overexposures resulted from this event.
3413	Jul. 21	0	Spill	Commercial	A vial of technetium-99m was dropped and the contents were spilled. Lead shielding was placed around the area. No personal contamination or overexposures occurred as a result of this event.
3408	Jul. 22	0	Device malfunction	Industrial	The sealed source in an exposure device could not be retracted to the shielded position. The locking mechanism on the device was damaged and replaced. Corrective

#	Date reported	INES rating	Event type	Sector	Event summary
					actions were implemented to prevent recurrence. No overexposures occurred as a result of this event.
3411	Jul. 23	0	Packaging and transport	Industrial	Twenty-five fixed gauges were improperly shipped to a licensed service provider. The procedures for transporting shutterless devices were inadequate and did not meet the requirements of a Type A certification. No overexposures occurred as a result of this event. Corrective actions were implemented to prevent recurrence.
3422	Jul. 24	0	Packaging and transport	Medical	A package containing an iridium-192 sealed source (390 GBq) was delivered and left unattended by the carrier. The package was not tampered with or damaged. No overexposures occurred as a result of this event. Corrective actions were implemented to prevent recurrence.
3436	Jul. 24	0	Packaging and transport	Commercial	A package containing a molybdium-99 was left outside and was damaged by water. There was no damage to the contents, and no contamination on the inside or outside of the package. Both the consignor and the carrier had informed the licensee of the damage.
3435	Jul. 31	0	Lost	Medical	An iodine-125 seed (Category 5) was misplaced. The seed was unaccounted for after tissue sampling. Corrective actions were implemented to prevent recurrence. The sealed source has not been recovered.
3425	Aug. 1	0	Spill	Medical	Fluorine-18 (555 MBq) leaked from an improperly connected IV line. The floor of the room was contaminated, as were the shoes of both technicians and the wheels of the auto-injector machine. Decontamination and containment procedures were executed. No overexposures or personal contamination resulted from this event. Corrective actions were implemented to prevent recurrence.

#	Date reported	INES rating	Event type	Sector	Event summary
3426	Aug. 2	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. There was no damage to the gauge. No injuries or overexposures resulted from this event. Corrective actions were implemented to prevent recurrence.
3453	Aug. 3	0	Packaging and transport	Commercial	A vehicle carrying UN 2910 packages was involved in a motor vehicle collision. There was no damage to the packages. No injuries or overexposures resulted from this event.
3429	Aug. 7	0	Packaging and transport	Industrial	The transport container for a portable gauge was damaged when the diver of the vehicle transporting the gauge braked hard. There was no damage to the gauge. The gauge was put back into service with a new Type A transport container. No overexposures occurred as a result of this event. Corrective actions were implemented to prevent recurrence.
3431	Aug. 8	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. The gauge was not damaged. A leak test was performed. No leaks were detected. No injuries or overexposures occurred as a result of this event.
3432	Aug. 8	0	Unplanned exposure	Industrial	An industrial radiography crew failed to erect all necessary safety barriers and another worker in the area walked directly over the area where the exposure was taking place. Dose estimates indicate that no overexposures occurred as a result of this event. Corrective actions were implemented to prevent recurrence.
WNS3	Aug. 8	0	Packaging and transport	Commercial	A package received by a waste nuclear substance licensee showed evidence of damage. The contents were inspected and no contamination was discovered outside of the packaging. There was no impact on

#	Date reported	INES rating	Event type	Sector	Event summary
					the health and safety of workers, the public or the environment as a result of this event.
3434	Aug. 8	0	Breach of security	Industrial	A licensee reported a break-in at their location. No devices were being stored during the break-in as the portable gauges were being used at other locations. Local police were notified. No theft of devices occurred as a result of this event.
3437	Aug. 9	0	Breach of security	Industrial	An employee's vehicle was stolen after a security gate was breached. There was no attempt to access the radiation storage area. All sources are accounted for. The licensee has implemented upgraded security features. Police were notified of the event.
3439	Aug. 16	0	Device malfunction	Industrial	A sealed source assembly was cut during retrieval, damaging the connector. No overexposures occurred as a result of this event. The device was transferred to the supplier for disposal once the sealed source had decayed to Type A quantities.
3441	Aug. 16	0	Device damaged	Industrial	A portable gauge was damaged by a steamroller at a job site. The shutter was closed and the sources were undamaged. A leak test was performed. No leaks were detected. No overexposures occurred as a result of this event.
3442	Aug. 17	0	Device damaged	Industrial	An index rod broke off a portable gauge. Damage was likely due to the age of the device. The source rod was in the shielded position but could no longer be locked in that position. The gauge was removed from service and remained in storage until it was transferred for disposal.
3443	Aug. 17	0	Unplanned exposure	Industrial	Two non-NEWs crossed barriers during radiography operations. No overexposures occurred as a result of

#	Date reported	INES rating	Event type	Sector	Event summary
					this event. Corrective actions were implemented to prevent recurrence.
3445	Aug. 20	0	Breach of security	Medical	In error, building security gave contractors access to the secured hot laboratory. This space is restricted to authorized users. The licensee confirmed that no sources were missing or tampered with. Corrective actions were implemented to prevent recurrence.
3446	Aug. 20	0	Packaging and transport	Industrial	An ATV transporting a portable gauge with a Type A package was involved in an accident. There was no damage to the device. A leak test was performed. No leaks were detected. No injuries or overexposures occurred as a result of this event.
3447	Aug. 20	0	Stolen	Industrial	A portable gauge was stolen after having been left unattended. The gauge was successfully recovered. The gauge was intact with the source in the shielded position. A leak test was performed. No leaks were detected. No overexposures occurred as a result of this event. Corrective actions were implemented to prevent recurrence.
3448	Aug. 20	0	Device damaged	Industrial	A portable gauge was left unattended and hit by a vehicle at a job site. There was no damage to the gauge. A leak test was performed. No leaks were detected. No injuries or overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3473	Aug. 20	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. The gauge was not damaged. No injuries or overexposures occurred as a result of this event.
3400	Aug. 21	0	Packaging and transport	Commercial	A vehicle transporting radiopharmaceuticals (UN 2910 cases) was involved in a motor

#	Date reported	INES rating	Event type	Sector	Event summary
					vehicle collision. There was no damage to the case. No injuries or overexposures occurred as a result of this event.
3450	Aug. 22	0	Lost	Medical	When conducting an inventory verification, the licensee identified a cobalt-57 sealed source spot marker as missing. It is unclear when the source was disposed of or went missing. The source has since decayed to below the exemption quantity, presenting no risk to public safety.
3449	Aug. 23	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. The gauge was not damaged. No injuries or overexposures occurred as a result of this event.
3452	Aug. 24	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. There was no damage to the gauge. A leak test was performed. No leaks were detected. No injuries or overexposures resulted from this event.
3444	Aug. 27	0	Packaging and transport	Commercial	A vehicle transporting empty excepted packages (UN 2910) was involved in a motor vehicle collision. There was no damage to the packages. No injuries or overexposures resulted from this event.
3454	Aug. 28	0	Device damaged	Industrial	A portable gauge was run over by a dump truck at a job site. The handle and casing were heavily damaged but the shielding was intact and the shutter was closed. A leak test was performed. No leaks were detected. No overexposures occurred as a result of this event. Corrective actions were implemented to prevent recurrence.
3457	Aug. 29	0	Device damaged	Industrial	A source was disconnected on an exposure device. It was returned to the locked positon. A leak test was

#	Date reported	INES rating	Event type	Sector	Event summary
					performed. No leaks were detected. No overexposures occurred as a result of this event. Corrective actions were implemented to prevent recurrence.
3463	Aug. 30	0	Spill	Medical	A spill of 1024 MBq of technetium-99m occurred prior to injection, resulting in contamination on the lab floor. One worker had skin contamination but was able to remove the contamination by washing hands. No overexposures occurred as a result of this event.
3456	Sep. 4	0	Stolen	Industrial	A vehicle transporting a portable gauge was stolen at knife point. The technician was not harmed during the incident. Police were notified of the event. The truck and the gauge were recovered on the same day. The gauge was still secured to the vehicle upon recovery was not damaged.
3459	Sep. 6	0	Spill	Medical	A spill of fluorine-18 occurred during patient injection. The technologist had skin contamination, but no overexposures occurred as a result of this event. Corrective actions were implemented to prevent recurrence.
WNS4	Sep. 11	0	Packaging and transport	Commercial	A package received at a waste nuclear substance licensee facility was misclassified as “unconditional release” and should have been classified as “excepted” with respect to IAEA Regulations. There was no impact on the health and safety of workers, the public or the environment as a result of this event.
3464	Sep. 15	0	Unplanned exposure	Industrial	A non-NEW crossed radiography warning barriers while the source was exposed. Dose estimates indicated that no overexposures occurred as a result of this event. Corrective actions were implemented to prevent recurrence.
3465	Sep. 20	0	Packaging and transport	Industrial	A vehicle used for industrial radiography and carrying an exposure device was involved in an accident.

#	Date reported	INES rating	Event type	Sector	Event summary
					There was no damage to the storage area or the exposure device. No injuries or overexposures occurred as a result of this event.
3466	Sep. 21	0	Device damaged	Industrial	An exposure device was dropped 1.2 m resulting in minor damage to the handle but no functional damage. A leak test was performed. No leaks were detected. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3467	Sep. 21	0	Device damaged	Industrial	A portable gauge was run over by a vehicle at a job site. The source rod was damaged and could not be retracted to the shielded position. The gauge was packaged and transported for disposal. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3468	Sep. 24	0	Packaging and transport	Commercial	Contamination was found inside a lead pot containing iodine-131 when it was opened upon receipt. The leaking vial was returned to the lead pot for decay. No overexposures or thyroid uptake occurred as a result of this event.
3470	Sep. 26	0	Breach of security	Academic	Staff performing facility maintenance entered a room without proper authorization. No radioactive material was present but all non-lab workers must receive training and authorization before entering this room. Corrective actions have been implemented to prevent recurrence.
3474	Sep. 26	0	Device malfunction	Industrial	A shutter on a fixed gauge could not be closed. The gauge remains in operation and is fixed to a pipeline. The licensee replaced the gauge and confirmed that no doses were received as a result of this event. Corrective actions are being implemented to prevent recurrence.

#	Date reported	INES rating	Event type	Sector	Event summary
3489	Sep. 26	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. There was no damage to the gauge. A leak test was performed. No leaks were detected. No injuries or overexposures resulted from this event.
3475	Sep. 28	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. There was no damage to the gauge. A leak test was performed. No leaks were detected. No injuries or overexposures resulted from this event.
3477	Oct. 2	0	Spill	Medical	A spill of 600 MBq of fluorine-18 occurred when a vial fell to the floor. The spill was cleaned and the room was decontaminated. One NEW had low level skin contamination, but no overexposure. Corrective actions have been implemented to prevent recurrence.
3480	Oct. 2	0	Contamination	Medical	Contamination was found on an external component of a remote afterloader during a source change. The component was removed and no other contamination was found. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3476	Oct. 3	0	Unplanned exposure	Industrial	A source retrieval was conducted when the EDO believed the source was disconnected from the cables. The EDO believed the source was shielded by a lead tunnel; movement of the device during the procedure dislodged the sealed source and resulted in a dose to the EDO. The dose was below regulatory limits. The source was fully retracted after it was dislodged. Corrective actions have been implemented to prevent recurrence.

#	Date reported	INES rating	Event type	Sector	Event summary
3481	Oct. 4	0	Device damaged	Medical	The plastic covering a cesium-137 sealed source was cracked causing the source to leak. The source was transferred for disposal. No overexposures or contamination occurred as a result of this event.
3483	Oct. 5	0	Found	Industrial	Radioactive material was discovered at a waste transfer station when the alarm was triggered by material from a private residence. Emergency services responded to the call at the waste transfer station and identified the radiation source as radium-226. The source was wrapped in a lead blanket and placed is secure storage until disposal. Dose estimates indicate no overexposures occurred as a result of this event.
3484	Oct. 9	0	Device damaged	Industrial	The guide rod of a portable gauge broke when it was being retracted into the safe position. The source was briefly exposed and the technician immediately put it back into its shielding. No overexposures occurred as a result of this event. Corrective actions have been implemented including retraining of personnel.
3485	Oct. 10	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. There was no damage to the gauge. A leak test was performed. No leaks were detected. No injuries or overexposures resulted from this event.
3486	Oct. 10	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in an accident. There was minor damage to the vehicle but no damage to the gauge. No injuries or overexposures resulted from this event.
3487	Oct. 11	0	Spill	Commercial	A spill of 1.85 GBq of iodine-131 occurred inside a shielded isolator. No employees were exposed to the spill as the process is automated. No overexposures or personal

#	Date reported	INES rating	Event type	Sector	Event summary
					contamination occurred from this event. Corrective actions have been implemented to prevent recurrence.
3488	Oct. 12	0	Stolen	Industrial	A portable gauge was stolen from an employee's vehicle. The gauge was discovered by a member of the public. It was not damaged. A leak test was performed and leaks were detected.
3490	Oct. 16	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. The driver was injured and taken to the hospital. There was no damage to the gauge. A leak test was performed. No leaks were detected. No overexposures occurred from this event.
3491	Oct. 17	0	Device damaged	Industrial	A radiography exposure device fell and damaged a guide tube. A source retrieval was conducted successfully. The guide tube was cut in order to retract the source into the device. Corrective actions have been implemented to prevent recurrence. Dose estimates indicate no overexposures occurred as a result of this event.
3492	Oct. 22	0	Packaging and transport	Commercial	A vehicle carrying various radiopharmaceutical and diagnostic products (Type A packages) was involved in a motor vehicle collision. There was no damage to the packages. No injuries or overexposures occurred from this event.
3501	Oct. 22	0	Packaging and transport	Industrial	A Type A package containing a portable gauge was damaged when it fell off the back of a truck and was dragged for 1 to 3 km. The package sustained abrasions but the gauge was not damaged. A leak test was performed. No leaks were detected. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.

#	Date reported	INES rating	Event type	Sector	Event summary
3493	Oct. 23	0	Missing	Industrial	An authorized worker left a portable gauge inside an unattended vehicle when the vehicle broke down. When the worker returned to the vehicle several days later, the gauge was missing. The investigation revealed that the owner of the vehicle emptied all of the contents from the car before having it towed. The licensee retrieved the portable gauge that same night.
3495	Oct. 24	0	Packaging and transport	Industrial	A vehicle struck a parked vehicle containing a portable gauge. There was no damage to the portable gauge. No injuries or overexposures resulted from this event.
3496	Oct. 24	0	Breach of security	Academic	A radiation device was accessed by an unauthorized worker who was performing maintenance work. The auto sampler of the unit was damaged. Damages were minor and did not affect the radiation component of the device. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3497	Oct. 25	0	Packaging and transport	Industrial	A vehicle transporting a portable gauge was involved in a motor vehicle collision. There was no damage to the gauge. No injuries or overexposures resulted from this event.
3498	Oct. 25	0	Lost	Medical	An iodine-125 seed with an activity of 9 MBq was lost following removal from a patient. The sealed source has not been recovered. Corrective actions have been implemented to prevent recurrence.
3502	Oct. 27	0	Packaging and transport	Industrial	A vehicle transporting radiation packages (UN 2195) was involved in a motor vehicle collision. There was no damage to the packages. No injuries or overexposures resulted from this event.

#	Date reported	INES rating	Event type	Sector	Event summary
3505	Oct. 30	0	Breach of security	Medical	A security system used for securing the licensee's prescribed equipment was found disarmed at which point the security office immediately re-armed the security system. The security system was chained with the cable (secondary barrier) and the door was closed (primary barrier).
3506	Nov. 2	0	Device damaged	Industrial	During routine leak test sampling, a missing shutter was discovered on a fixed gauge. The fixed gauge has been repaired. No overexposures occurred as a result of this event.
3507	Nov. 6	0	Device damaged	Industrial	A portable gauge was damaged at a jobsite. The guide rod was broken from the impact, but the shutter was closed and the source remained inside the shielding. The gauge was transported for repair. A leak test was performed. No leaks were detected. No overexposures occurred as a result of this event.
3508	Nov. 6	0	Device malfunction	Academic	Additional force was required to retract a cesium-137 source into the shielded position of a radiation device as a result of an internal set screw not being positioned correctly. No issues were found with other devices. No overexposures occurred as a result of this event.
3511	Nov. 6	0	Unplanned exposure	Medical	A worker dropped one of two capsules of iodine-131 onto a laboratory bench. It went unnoticed for about 20 hours. Three NEWs were exposed to the source during this time. Dose estimates indicated that no overexposures occurred as a result of the event. The NEWs performed bioassays, and all measurements were normal.
3509	Nov. 9	2	Unplanned exposure	Commercial	A NEW received a dose to the skin (1,681 mSv) in excess of regulatory limits. The skin contamination incident occurred while the worker was dispensing iodine-131 therapy

#	Date reported	INES rating	Event type	Sector	Event summary
					doses during a routine production run. CNSC staff continue to work with the licensee to identify adequate corrective measures.
3510	Nov. 9	0	Packaging and transport	Commercial	A licensee noted that a Type A package containing 102 Gbq of fluorine-18 could be opened without removing the security seal. No tampering was suspected. The licensee put the doses in storage for decay prior to sending them back to the consignor.
3526	Nov. 11	0	Packaging and transport	Industrial	A vehicle transporting oil well logging tools was involved in a motor vehicle collision. There was no damage to the Type A packages. No injuries or overexposures resulted from this event.
3513	Nov. 14	0	Device damaged	Industrial	A weld gap was identified between the source holder and mounting plate of a fixed gauge. The device was in the locked out position. The gauge was removed and packaged in a Type A container to be shipped for disposal. No overexposures occurred as a result of this event. Corrective actions are being implemented to prevent recurrence.
WNS5	Nov. 14	0	Other (conventional health and safety)	Commercial	A worker sustained minor head injuries after being struck on the head by a piece of equipment; the worker was wearing a hard hat at the time of the incident. The licensee only classified the incident as a lost time accident only after receiving reimbursement for the worker's time off. Corrective actions are currently being developed.
3514	Nov. 19	0	Device malfunction	Industrial	The shutter on a fixed gauge was stuck in the closed position. A leak test was performed. No leaks were detected. The gauge remained closed and locked out in its normal operating position until replaced. No

#	Date reported	INES rating	Event type	Sector	Event summary
					overexposures occurred as a result of this event.
3519	Nov. 19	0	Release	Academic	Twice the annual limit of germanium-68 was released down the sewer. Procedures have been altered to decay/store small amounts of germanium-68 prior to disposal.
3518	Nov. 20	0	Breach of security	Academic	A security system impairment was observed in a room housing a Category 1 sealed source. The security system was fixed and is now functioning normally
3520	Nov. 22	0	Packaging and transport	Industrial	A vehicle carrying a portable gauge was involved in a motor vehicle collision. There was no damage to the device. Dose rates were measured and were normal. No injuries or overexposures occurred as a result of this event.
3521	Nov. 23	0	Packaging and transport	Industrial	A vehicle carrying a portable gauge was involved in an accident. There was no damage to the device. A leak test was performed. No leaks were detected. No injuries or overexposures occurred as a result of this event.
3529	Nov. 27	0	Device damaged	Industrial	Shielding on a fixed gauge mounted in a vessel was damaged from exposure to high temperatures that reached the gauge through a hole in the vessel. The hole was temporarily plugged and a full repair was planned for March 2019.
3527	Nov. 29	0	Spill	Medical	A spill of 0.36 GBq of fluorine-18 occurred when a vial was dropped. A worker found a small amount of contamination on his shoe cover, which was quickly removed. No other personal or clothing contamination was found. No overexposures occurred. Corrective actions are being implemented to prevent recurrence.
3525	Dec. 3	0	Breach of security	Industrial	A break-in occurred at a licensee's facility. Nothing was stolen and no

#	Date reported	INES rating	Event type	Sector	Event summary
					other damage besides damage to the front doors was noted. A report was filed with the RCMP.
3528	Dec. 4	0	Missing	Academic	A notification was received regarding unaccounted for smoke detectors. The devices predate the CNSC's classification of smoke detectors as radiation devices, which may have led to confusion regarding proper requirements for tracking and disposal. Corrective actions have been implemented to prevent recurrence. Due to the low activity and location of the source in the device, no measurable dose is expected to be received by any person as a result of this event.
3530	Dec. 6	0	Device damaged	Industrial	The handle of a portable gauge was damaged when it was hit by an asphalt roller at a job site. The shutter was closed and the source was secured in the shielded position. The gauge has been transferred for disposal. No overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3531	Dec. 7	0	Unplanned exposure	Industrial	Five non-NEWs entered a confined space equipped with a fixed gauge that had not been isolated. They did not have the authorization to enter the vessel. Dose estimates indicate that no overexposures occurred as a result of this event. Corrective actions have been implemented to prevent recurrence.
3532	Dec. 9	0	Packaging and transport	Academic	A package was received containing vials of liquid hydrogen-3. There was contamination detected on the interior package. There was no contamination on the outside of the package, nor was there any visible damage to the package. The contaminated secondary containers were decontaminated until wipe tests were at background level. No personal contamination or

#	Date reported	INES rating	Event type	Sector	Event summary
					overexposures occurred as a result of this event.
3539	Dec. 9	0	Breach of security	Medical	A brachytherapy device was left improperly secured with no authorized users present. Corrective actions have been implemented to prevent recurrences.
3533	Dec. 10	0	Packaging and transport	Industrial	A vehicle carrying a portable gauge was involved in a motor vehicle collision. The driver received minor injuries. There was no damage to the gauge. A leak test was performed. No leaks were detected. No overexposures occurred as a result of this event.
3547	Dec. 19	0	Device damaged	Medical	A broken glass ampule containing cesium-137 was found in a licensee’s storage area. The ampule was sealed with epoxy and kept in storage. No overexposures or contamination occurred as a result of this event.
3542	Dec. 21	0	Lost	Medical	An iodine-125 seed (Category 5) went missing following removal from a patient. The seed was lost when it was sent to pathology for analysis. The sealed source was not recovered but is believed to be on the licensee's premises. The licensee will review this incident with all relevant personnel before starting this procedure at other sites.
3543	Dec. 21	0	Device damaged	Industrial	A licensee discovered that one of their portable gauges had a hole in in its base during a routine inspection. The shutter was completely closed; there was no damage to the shielding, and the sources remained intact. The gauge has been sent for repair. No overexposures occurred as a result of this event.

Appendix F: Categorization of Sealed Sources

The category of sealed sources is a risk-based ranking developed by the International Atomic Energy Agency and described in IAEA, *Categorization of Radioactive Sources, Safety Guide RS-G-1.9 (2005)*.

Sealed Source Category	Risk	Description	Examples of usage
1	Very high risk	These sealed sources, if not safely managed or securely protected, would be likely to cause permanent injury (in some cases fatal) to a person handling or coming in contact with them for a period of a few minutes. Exposure would be fatal if a person were close to it in an unshielded manner for a few minutes to an hour	• Self-shielded irradiator • Gamma knife radiosurgery • External beam radiotherapy
2	High risk	These sealed sources, if not safely managed or securely protected, could cause permanent injury to a person handling it, or coming in contact with them, for a short period of time (minutes to hours), or be fatal if close to it in an unshielded manner for a few days.	• Industrial radiography
3	Moderate risk	These sealed sources, if not safely managed or securely protected, could cause permanent injury to a person either handling them, or, otherwise coming in contact with them, for some hours. Although unlikely, it could be fatal to be close to this amount of unshielded radioactive nuclear substances for a period of days to weeks.	• Industrial gauges (usually fixed) • High dose rate brachytherapy
4	Low risk	It is very unlikely that anyone would be permanently injured by these sealed sources. However, if this unshielded radioactive nuclear substance is not safely managed or securely protected, although unlikely, it could temporarily injure someone handling it, in contact with it, or who is close to it for several weeks.	• Portable moisture-density gauges
5	Very low risk	No one could be permanently injured by this radioactive nuclear substance.	• Electron capture detectors • Radioactive seed for cancer treatment

Appendix G: Compliance rating levels

The following rating levels, as shown in table 11, reflect the transition in rating terminology used by the CNSC. While inspection reports may still use the previous rating levels, licensees that use nuclear substances and radiation devices can expect this transition to take place in time.

Table 11: Compliance rating terminology

Previous rating level	Description	New rating level	Description
A	Exceeds expectations	FS	Fully satisfactory
B	Meets expectations	SA	Satisfactory
C	Improvement is required	BE	Below expectations
D	This area is seriously compromised		
E	Breakdown	UA	Unacceptable

Fully satisfactory (FS)

Safety and control measures implemented by the licensee are highly effective. In addition, compliance with regulatory requirements is fully satisfactory, and compliance within the SCA exceeds requirements and CNSC expectations. Overall, compliance is stable or improving, and any problems or issues that arise are promptly addressed.

Satisfactory (SA)

Safety and control measures implemented by the licensee are sufficiently effective. In addition, compliance with regulatory requirements is satisfactory. Compliance within the SCA meets requirements and CNSC expectations. Any deviation is minor and any issues are considered to pose a low risk to the achievement of regulatory objectives and CNSC expectations. Appropriate improvements are planned.

Below expectations (BE)

Safety and control measures implemented by the licensee are marginally ineffective. In addition, compliance with regulatory requirements falls below expectations. Compliance within the SCA deviates from requirements or CNSC expectations to the extent that there is a moderate risk of ultimate failure to comply. Improvements are required to address identified weaknesses. The licensee is taking appropriate corrective action.

Unacceptable (UA)

Safety and control measures implemented by the licensee are significantly ineffective. In addition, compliance with regulatory requirements is unacceptable and is seriously compromised. Compliance within the SCA is significantly below requirements or CNSC expectations, or there is evidence of overall non-compliance. Without corrective action, there is a high probability that the deficiencies will lead to unreasonable risk. Issues are not being addressed effectively, no appropriate corrective measures have been taken and no alternative plan of action has been provided. Immediate action is required.

Appendix H: Inspections conducted in 2018

Table 12: Inspections conducted in 2018

Inspection date	Licensee name	City	Province	Inspection type	Sector
2018-01-05	2469015 Ontario Inc.	Pickering	ON	Type II	Medical
2018-01-08	WSP Canada Inc.	Edmonton	AB	Type II	Industrial
2018-01-08	SGS Canada Inc.	Québec	QC	Type II	Industrial
2018-01-08	React Radiography Ltd.	Edmonton	AB	Type II	Industrial
2018-01-08	IRISNDT Corp.	Barrhead	AB	Type II	Industrial
2018-01-08	Stornoway Diamonds (Canada) Inc.	Chibougamau	QC	Type II	Industrial
2018-01-09	Ultratest N.D.T. Services (2010) Inc.	Edmonton	AB	Type II	Industrial
2018-01-09	Institut universitaire de cardiologie et de pneumologie de Québec	Québec	QC	Type II	Academic and research
2018-01-09	Weatherford Canada Partnership	Edmonton	AB	Type II	Industrial
2018-01-09	Institut universitaire de cardiologie et de pneumologie de Québec	Ste-Foy	QC	Type II	Medical
2018-01-09	Medical Imaging Consultants	Edmonton	AB	Type II	Medical
2018-01-09	Institut universitaire de cardiologie et de pneumologie de Québec	Ste-Foy	QC	Type II	Medical
2018-01-09	Groupe vétérinaire Daubigny Inc.	Québec	QC	Type II	Medical
2018-01-10	Pavages Rolland Fortier Inc.	Ange-Gardien	QC	Type II	Industrial
2018-01-10	Mistras Services Inc.	Lévis	QC	Type II	Industrial
2018-01-10	Mistras Services Inc.	Lévis	QC	Type II	Industrial
2018-01-10	Metalogic Inspection Services Inc.	Edmonton	AB	Type II	Industrial
2018-01-10	St. Joseph's Hospital	Hamilton	ON	Type II	Academic and research
2018-01-10	St. Joseph's Hospital	Hamilton	ON	Type II	Academic and research

2018-01-10	Agnico-Eagle Mines Ltd.	Meadowbank	NU	Type II	Industrial
2018-01-10	University of Alberta	Edmonton	AB	Type II	Academic and research
2018-01-10	St. Joseph's Hospital	Hamilton	ON	Type II	Medical
2018-01-10	St. Joseph's Hospital	Hamilton	ON	Type II	Medical
2018-01-10	St. Joseph's Hospital	Hamilton	ON	Type II	Medical
2018-01-10	St. Joseph's Hospital	Hamilton	ON	Type II	Medical
2018-01-10	St. Joseph's Hospital	Hamilton	ON	Type II	Medical
2018-01-11	Alco Gas & Oil Production Equipment Ltd.	Edmonton	AB	Type II	Industrial
2018-01-11	Scanning Technologies Inc.	Edmonton	AB	Type II	Industrial
2018-01-11	Centre intégré de santé et de services sociaux de Chaudière-Appalaches	St-Georges	QC	Type II	Medical
2018-01-12	Ezeflow Inc.	Granby	QC	Type II	Industrial
2018-01-12	Ezeflow Inc.	Granby	QC	Type II	Industrial
2018-01-13	Centre Hospitalier de l'Université de Montréal	Montreal	QC	Type II	Medical
2018-01-13	Centre Hospitalier de l'Université de Montréal	Montreal	QC	Type II	Medical
2018-01-15	Elekta, Inc.	Toronto	ON	Type II	Commercial
2018-01-15	Halliburton Canada Ltd	Nisku	AB	Type II	Industrial
2018-01-15	Opus Stewart Weir Ltd.	Grande Prairie	AB	Type II	Industrial
2018-01-15	Intrepid NDE Testing Corp.	Grande Prairie	AB	Type II	Industrial
2018-01-16	Gamma Spec NDT Ltd.	Grande Prairie	AB	Type II	Industrial
2018-01-16	Anode NDT Ltd.	Grande Prairie	AB	Type II	Industrial
2018-01-16	CGC Acquisition Corporation	Red Deer	AB	Type II	Industrial
2018-01-16	International Paper Company	Grande Prairie	AB	Type II	Industrial
2018-01-16	University of Toronto	Toronto	ON	Type II	Academic and research
2018-01-16	University of Toronto	Toronto	ON	Type II	Academic and research

2018-01-16	Qualité N.D.E. Limitée	Mercier	QC	Type II	Commercial
2018-01-17	Ray-Tech Inspection Inc.	Beaverlodge	AB	Type II	Industrial
2018-01-17	Gamma Spec NDT Ltd.	Grande Prairie	AB	Type II	Industrial
2018-01-17	S.G.H. Inspection Ltd.	Grove Dale	AB	Type II	Industrial
2018-01-17	University of Toronto	Mississauga	ON	Type II	Academic and research
2018-01-17	Bonnett's Energy Services	Red Deer	AB	Type II	Industrial
2018-01-17	Reliance Oilfield Services	Red Deer	AB	Type II	Industrial
2018-01-17	Apex Diagnostic Services Inc.	Peterborough	ON	Type II	Medical
2018-01-18	Logco Wireline Services Ltd.	Calmar	AB	Type II	Industrial
2018-01-18	Inspectrum Testing Inc.	Grande Prairie	AB	Type II	Industrial
2018-01-18	Buffalo Inspection Services (2005) Inc.	Fort St. John	AB	Type II	Industrial
2018-01-18	Cal Frac Well Services Ltd.	Clairmont	AB	Type II	Industrial
2018-01-18	Weatherford Canada Ltd.	Edmonton	AB	Type II	Industrial
2018-01-19	Nortech Advanced N.D.T. Ltd.	Edmonton	AB	Type II	Industrial
2018-01-19	Nortech Advanced N.D.T. Ltd.	Various Cities	AB, BC	Type I	Industrial
2018-01-22	Winnipeg Regional Health Authority	Winnipeg	MB	Type II	Medical
2018-01-23	Winnipeg Regional Health Authority	Winnipeg	MB	Type II	Medical
2018-01-23	The Graff Company Ltd.	Mississauga	ON	Type II	Industrial
2018-01-23	Mevex Corporation	Stittsville	ON	Type II	Commercial
2018-01-23	Winnipeg Regional Health Authority	Winnipeg	MB	Type II	Medical
2018-01-24	CEGEP de Trois-Rivières	Trois-Rivières	QC	Type II	Industrial
2018-01-24	Labcan (1989) Ltée	Trois-Rivières	QC	Type II	Industrial
2018-01-24	PanPacific Wireline Services Inc.	Brampton	ON	Type II	Industrial
2018-01-24	MyHealth Partners Inc.	Toronto	ON	Type II	Medical
2018-01-25	Winnipeg Regional Health Authority	Winnipeg	MB	Type II	Medical
2018-01-25	Canadoil Forge Ltd.	Bécancour	QC	Type II	Industrial
2018-01-25	Berry Plastics Canada Inc.	Belleville	ON	Type II	Industrial
2018-01-25	Automation and Control Technology Inc.	Montreal	QC	Type II	Commercial
2018-01-25	Canadian Nuclear Laboratories Ltd.	Bécancour	QC	Type II	Commercial

2018-01-26	Lab Journeaux Inc.	Dorval	QC	Type II	Industrial
2018-01-26	C.B. Non-Destructive Testing Ltd	Oakville	ON	Type II	Industrial
2018-01-29	Carmeuse Lime (Canada) Limited	Ingersoll	ON	Type II	Industrial
2018-01-30	Bruce Power Inc.	Tiverton	ON	Type II	Industrial
2018-01-30	Bruce Power Inc.	Tiverton	ON	Type II	Industrial
2018-01-30	Bruce Power Inc.	Tiverton	ON	Type II	Academic and research
2018-01-30	Bruce Power Inc.	Tiverton	ON	Type II	Academic and research
2018-01-30	Bruce Power Inc.	Tiverton	ON	Type II	Academic and research
2018-01-30	Bruce Power Inc.	Tiverton	ON	Type II	Academic and research
2018-01-30	Bruce Power Inc.	Tiverton	ON	Type II	Academic and research
2018-02-01	Southern Alberta Institute of Technology	Calgary	AB	Type II	Industrial
2018-02-05	Noremtech Inc.	Stittsville	ON	Type II	Commercial
2018-02-06	GHD Consultants Ltd.	St-Laurent	QC	Type II	Industrial
2018-02-06	Protekna Services Techniques Inc.	Bécancour	QC	Type II	Industrial
2018-02-06	Atomic NDT Ltd.	Rocky Mountain House	AB	Type II	Industrial
2018-02-06	Canadian Cutting & Coring (Toronto) Ltd	Brampton	ON	Type II	Industrial
2018-02-06	Canadian Cutting and Coring (Toronto) Ltd.	Brampton	ON	Type II	Industrial
2018-02-07	Construction DJL Inc.	Shawinigan	QC	Type II	Industrial
2018-02-07	Canadian Institute for NDE	Hamilton	ON	Type II	Industrial
2018-02-07	Tier 1 Energy Solutions, Inc.	Leduc	AB	Type II	Industrial
2018-02-07	Centre Intégré Universitaire de santé et de services sociaux	Shawinigan-Sud	QC	Type II	Medical
2018-02-07	Centre Intégré Universitaire de santé et de services sociaux	Shawinigan-Sud	QC	Type II	Medical
2018-02-07	Sartrex Power Control Systems Inc.	Concord	ON	Type II	Commercial

2018-02-08	Focus NDTIS Inc.	Edmonton	AB	Type II	Industrial
2018-02-08	Stuart Hunt & Associates Ltd.	Edmonton	AB	Type II	Commercial
2018-02-08	Stuart Hunt & Associates Ltd.	Edmonton	AB	Type II	Commercial
2018-02-08	Stuart Hunt & Associates Ltd.	Edmonton	AB	Type II	Commercial
2018-02-09	Spectrum Wireline Services Ltd.	Red Deer	AB	Type II	Industrial
2018-02-14	Impexxus Medical Imaging Inc.	Whitby	ON	Type II	Medical
2018-02-14	Lakeridge Health	Oshawa	ON	Type II	Medical
2018-02-15	Dr. Houman Mahallati	Calgary	AB	Type II	Commercial
2018-02-15	EFW Radiology	Calgary	AB	Type II	Medical
2018-02-20	Canadian Natural Upgrading Limited	Fort McMurray	AB	Type II	Industrial
2018-02-20	Canadian Natural Upgrading Limited	Fort McMurray	AB	Type II	Industrial
2018-02-20	Acuren Inc.	Fort McMurray	AB	Type II	Industrial
2018-02-20	Acuren Inc.	Fort McMurray	AB	Type II	Industrial
2018-02-20	Canadian Engineering & Inspection Ltd.	Edmonton	AB	Type II	Industrial
2018-02-20	Canadian Natural Upgrading Limited	Fort McMurray	AB	Type II	Industrial
2018-02-20	Canadian Natural Upgrading Limited	Fort McMurray	AB	Type II	Industrial
2018-02-21	Higher Ground Consulting Inc.	Calgary	AB	Type II	Industrial
2018-02-21	IRISNDT Corp.	Calgary	AB	Type II	Industrial
2018-02-21	RTD Quality Services Inc.	Fort McMurray	AB	Type II	Industrial
2018-02-21	Horton CBI, Limited	Calgary	AB	Type II	Industrial
2018-02-21	Shaw Pipeline Services Ltd.	Sherwood Park	AB	Type II	Industrial
2018-02-21	Suncor Energy Inc./Suncor Énergie Inc.	Fort McMurray	AB	Type II	Industrial
2018-02-22	ENC Testing Inc.	Sherwood Park	AB	Type II	Industrial
2018-02-22	Mistras Canada, Inc.	Fort McMurray	AB	Type II	Industrial
2018-02-22	Gamma-Tech Inspection Ltd.	Calgary	AB	Type II	Industrial
2018-02-22	Mistras Canada, Inc.	Fort McMurray	AB	Type II	Industrial
2018-02-23	CHU de Québec - Université Laval	Québec, Sainte-Foy	QC	Type I	Medical
2018-02-23	Nighat Geo Services Inc.	Edmonton	AB	Type II	Industrial
2018-02-23	Nuclear Services Canada Inc.	Merlin	ON	Type II	Commercial

2018-02-23	Nuclear Services Canada Inc.	Merlin	ON	Type II	Commercial
2018-02-26	Baker Hughes Canada Company	Sarnia	ON	Type II	Industrial
2018-02-26	Englobe Corp.	Edmonton	AB	Type II	Industrial
2018-02-26	Geolog Solutions Inc.	Red Deer	AB	Type II	Industrial
2018-02-26	Baker Hughes Canada Company	Sarnia	ON	Type II	Industrial
2018-02-27	20/20 ND Technology Inc.	Grande Prairie	AB	Type II	Industrial
2018-02-27	Buffalo Inspection Services (2005) Inc.	Fort St. John	AB	Type II	Industrial
2018-02-27	Tomlinson Enterprises Ltd.	Sarnia	ON	Type II	Industrial
2018-02-27	Canadian Inspection Ltd.	Edmonton	AB	Type II	Industrial
2018-02-27	Interface Testing Services Inc.	Sarnia	ON	Type II	Industrial
2018-02-27	Innotech Alberta Inc.	Edmonton	AB	Type II	Academic and research
2018-02-27	Tomlinson Enterprises Ltd.	Sarnia	ON	Type II	Industrial
2018-02-27	Associate Veterinary Clinics (1981) Ltd.	Calgary	AB	Type II	Medical
2018-02-27	Moore EquineVeterinary Centre Ltd.	Rocky View	AB	Type II	Medical
2018-02-28	Intrepid NDE Testing Corp.	Grande Prairie	AB	Type II	Industrial
2018-02-28	20/20 ND Technology Inc.	Grande Prairie	AB	Type II	Industrial
2018-02-28	Gamma Spec NDT Ltd.	Grande Prairie	AB	Type II	Industrial
2018-02-28	React Radiography Ltd.	Edmonton	AB	Type II	Industrial
2018-02-28	Clear Image Inspection Ltd.	Bentley	AB	Type II	Industrial
2018-02-28	Streamline Inspection Limited	Red Deer	AB	Type II	Industrial
2018-02-28	Imperial Oil Limited	Sarnia	ON	Type II	Industrial
2018-02-28	Canadian Tower Scanning Inc.	Sarnia	ON	Type II	Industrial
2018-02-28	CGC Acquisition Corporation	Red Deer	AB	Type II	Industrial
2018-02-28	Big Guns Energy Services Inc.	Red Deer	AB	Type II	Industrial
2018-03-01	Qualitest Canada Ltd.	Nisku	AB	Type II	Industrial
2018-03-01	Wright Quality Services Inc.	Beaumont	AB	Type II	Industrial
2018-03-01	Oshanek Inspection Services (1972) Ltd.	Grande Prairie	AB	Type II	Industrial
2018-03-01	Galey Inspection Services Ltd.	Sexsmith	AB	Type II	Industrial
2018-03-01	TechSpec NDT Limited	Grande Prairie	AB	Type II	Industrial
2018-03-01	Buffalo Inspection Services (2005) Inc.	Edmonton	AB	Type II	Industrial
2018-03-01	ARLANXEO Canada Inc.	Sarnia	ON	Type II	Industrial

2018-03-01	Tracerco Radioactive Diagnostic Services Canada, Inc.	Sarnia	ON	Type II	Industrial
2018-03-01	Tracerco Radioactive Diagnostic Services Canada, Inc.	Sarnia	ON	Type II	Commercial
2018-03-01	Tracerco Radioactive Diagnostic	Sarnia	ON	Type II	Commercial
2018-03-01	Tracerco Radioactive Diagnostic Services Canada, Inc.	Sarnia	ON	Type II	Industrial
2018-03-01	ARLANXEO Canada Inc.	Sarnia	ON	Type II	Industrial
2018-03-02	Brant Community Healthcare System	Brantford	ON	Type II	Medical
2018-03-02	Brant Community Healthcare System	Brantford	ON	Type II	Medical
2018-03-05	Richmond Plastics Ltd.	Richmond	BC	Type II	Industrial
2018-03-06	EXL Engineering Inc.	Richmond	BC	Type II	Industrial
2018-03-06	Perfection Inspection Limited	Cambridge	ON	Type II	Industrial
2018-03-06	Unique Detection Services Limited	Cambridge	ON	Type II	Industrial
2018-03-06	Graymar Equipment (2008) Inc.	Delta	BC	Type II	Industrial
2018-03-07	Natural Resources Canada/ Ressources naturelles Canada	Hamilton	ON	Type II	Industrial
2018-03-07	RTD Canada Inc.	Delta	BC	Type II	Industrial
2018-03-07	Contro Valve Equipment Inc.	Burlington	ON	Type II	Commercial
2018-03-07	Canadian Blood Services/ Société canadienne du sang	Vancouver	BC	Type II	Medical
2018-03-08	Horizon Engineering Inc.	North Vancouver	BC	Type II	Industrial
2018-03-08	MyHealth Partners Inc.	Toronto	ON	Type II	Medical
2018-03-08	Provincial Health Services Authority (British Columbia)	Vancouver	BC	Type II	Medical
2018-03-08	Provincial Health Services Authority (British Columbia)	Vancouver	BC	Type II	Medical
2018-03-09	University of Toronto	Toronto	ON	Type II	Commercial
2018-03-11	Les Laboratoires d'Essais Mequaltech Inc.	Montreal	QC	Type II	Industrial
2018-03-12	Carrière Bernier Ltée	St-Jean-sur-Richelieu	QC	Type II	Industrial
2018-03-12	P. Baillargeon Ltée	St-Jean-sur-Richelieu	QC	Type II	Industrial
2018-03-12	Kubota Materials Canada Corporation	Orillia	ON	Type II	Industrial

2018-03-12	Layfield Canada Ltd.	Richmond	BC	Type II	Industrial
2018-03-12	DGI Geoscience Inc.	Barrie	ON	Type II	Industrial
2018-03-12	Centre intégré de santé et de services sociaux de la Montérégie-Centre	St-Jean-sur-Richelieu	QC	Type II	Medical
2018-03-12	Centre intégré de santé et de services sociaux de la Montérégie-Centre	St-Jean-sur-Richelieu	QC	Type II	Medical
2018-03-12	Kubota Materials Canada Corporation	Orillia	ON	Type II	Industrial
2018-03-13	Stasuk Testing & Inspection Ltd.	Burnaby	BC	Type II	Industrial
2018-03-13	Charles River Laboratories Montréal ULC	Senneville	QC	Type II	Academic and research
2018-03-13	Coanda Research and Development Corporation	Burnaby	BC	Type II	Industrial
2018-03-13	Centre intégré de santé et de services sociaux de la Montérégie-Ouest	Salaberry-de-Valleyfield	QC	Type II	Medical
2018-03-13	Centre intégré de santé et de services sociaux de la Montéré	Salaberry-de-Valleyfield	QC	Type II	Medical
2018-03-13	Charles River Laboratories Montréal ULC	Senneville	QC	Type II	Industrial
2018-03-14	Perfection Inspection Limited	Cambridge	ON	Type II	Industrial
2018-03-14	Trenergy Inc.	St. Catharines	ON	Type II	Industrial
2018-03-14	Lhoist North America of Canada Inc.	Langley	BC	Type II	Industrial
2018-03-14	University of British Columbia	Vancouver	BC	Type II	Academic and research
2018-03-14	Résoscan Inc.	Greenfield Park	QC	Type II	Medical
2018-03-16	CIUSSS de l'Est-de-l'Île-de-Montréal	Montreal	QC	Type II	Medical
2018-03-19	Kodiak Nondestructive Testing Services Ltd.	Nanaimo	BC	Type II	Industrial
2018-03-19	Canadian Nuclear Safety Commission	Ottawa	ON	Type II	Academic and research
2018-03-19	Centre intégré de santé et de services sociaux de l'Outaouais	Gatineau	QC	Type II	Medical
2018-03-19	Centre intégré universitaire de santé et de services sociaux	Montreal	QC	Type II	Medical

2018-03-19	Centre intégré universitaire de santé et de services sociaux	Montreal	QC	Type II	Medical
2018-03-19	Centre intégré de santé et de services sociaux de l'Outaouais	Gatineau	QC	Type II	Medical
2018-03-20	Cambium Inc.	Kingston	ON	Type II	Industrial
2018-03-20	Seymour Pacific Developments Ltd.	Campbell River	BC	Type II	Industrial
2018-03-20	Steel Inspection & Testing Ltd.	St. Catharines	ON	Type II	Industrial
2018-03-20	Shell Canada Limited	Brockville	ON	Type II	Industrial
2018-03-20	Cordax Evaluation Technologies Inc.	Calgary	AB	Type II	Industrial
2018-03-20	Vancouver Island Health Authority	Courtenay	BC	Type II	Medical
2018-03-20	Vancouver Island Health Authority	Courtenay	BC	Type II	Medical
2018-03-21	WSP Canada Inc.	Victoria	BC	Type II	Industrial
2018-03-21	WSP Canada Inc.	Victoria	BC	Type II	Industrial
2018-03-21	BWXT Canada LTD.	Cambridge	ON	Type II	Industrial
2018-03-21	Certified Testing Systems (2009) Inc.	Kitchener	ON	Type II	Industrial
2018-03-21	Hydro-Québec	Trois-Rivières	QC	Type II	Academic and research
2018-03-21	Hydro-Québec	Bécancour	QC	Type II	Academic and research
2018-03-21	WorleyParsons Canada Services Ltd.	Calgary	AB	Type II	Industrial
2018-03-21	Centre hospitalier universitaire Sainte-Justine	Montreal	QC	Type II	Medical
2018-03-21	Centre hospitalier universitaire Sainte-Justine	Montreal	QC	Type II	Medical
2018-03-22	Queen's University	Kingston	ON	Type I	Academic and research
2018-03-22	WSP Canada Inc.	Nanaimo	BC	Type II	Industrial
2018-03-22	Berthold Technologies U.S.A., LLC	Mississauga	TN	Type II	Commercial
2018-03-22	CMD Medical Imaging Centre Inc.	Thornhill	ON	Type II	Medical
2018-03-22	Vancouver Island Health Authority	Nanaimo	BC	Type II	Medical
2018-03-22	Healthwise Diagnostics Inc.	Thornhill	ON	Type II	Medical

2018-03-22	Vancouver Island Health Authority	Nanaimo	BC	Type II	Medical
2018-03-23	8418748 Canada Inc.	Montreal	QC	Type II	Industrial
2018-03-23	Alexman Contracting Inc.	Thornton	ON	Type II	Industrial
2018-03-23	Centre intégré universitaire de santé et de services sociaux	Montreal	QC	Type II	Medical
2018-03-26	CIMA + S.E.N.C	Montreal	QC	Type II	Industrial
2018-03-26	Les Inspections Thermetco Inc.	Montreal	QC	Type II	Industrial
2018-03-26	Uni-Tech Inspection Services Ltd.	Glengarry	ON	Type II	Industrial
2018-03-26	Agriculture and Agri-Food Canada	St-Hyacinthe	QC	Type II	Industrial
2018-03-26	Spectrum NDT Ltd.	Calgary	AB	Type II	Industrial
2018-03-26	Roke Technologies Ltd.	Calgary	AB	Type II	Industrial
2018-03-26	Hopewell Designs, Inc.	Chalk River	ON	Type II	Commercial
2018-03-27	Centre intégré de santé et de service sociaux de Montérégie-Centre	Greenfield Park	QC	Type I	Medical
2018-03-27	GHD Consultants Ltd.	Montreal	QC	Type II	Industrial
2018-03-27	Ontario Power Generation Inc.	Pickering	ON	Type II	Industrial
2018-03-28	Labo S.M. Inc.	Longueuil	QC	Type II	Industrial
2018-03-28	Centre intégré de santé et de service sociaux de Montérégie-Centre	Greenfield Park	QC	Type II	Medical
2018-03-29	Genfir Inc.	Lasalle	QC	Type II	Industrial
2018-03-29	Lantheus MI Canada, Inc.	Dorval	QC	Type II	Commercial
2018-04-04	Centre d'Imagerie nucléaire et TEP\Ct Ville-Marie Inc.	Montreal	QC	Type II	Medical
2018-04-04	Centre Hospitalier de l'Université de Montréal	Montreal	QC	Type II	Medical
2018-04-04	Centre hospitalier de l'Université de Montréal	Montreal	QC	Type II	Medical
2018-04-04	Centre d'imagerie nucléaire et TEP\CT Ville-Marie Inc.	Montreal	QC	Type II	Medical
2018-04-05	National Research Council of Canada	Ottawa	ON	Type I	Academic and research
2018-04-05	National Research Council of Canada	Ottawa	ON	Type II	Academic and research
2018-04-09	Médecine nucléaire DIX30 Inc.	Brossard	QC	Type II	Medical
2018-04-11	Centre universitaire de santé McGill	Montreal	QC	Type II	Medical

2018-04-13	TISI Canada Inc.	Red Deer	AB	Type II	Industrial
2018-04-13	Sunnybrook Health Sciences Centre	Toronto	ON	Type I	Medical
2018-04-17	Bare Contracting Services Ltd.	Mississauga	ON	Type II	Industrial
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-18	Université McGill/McGill University	Montreal	QC	Type II	Academic and research
2018-04-19	Quantum Petrophysics Inc.	Blackfalds	AB	Type II	Industrial
2018-04-19	Centre hospitalier de l'Université de Montréal	Montreal	QC	Type II	Commercial
2018-04-24	Soil-Mat Engineers & Consultants Ltd.	Hamilton	ON	Type II	Industrial

2018-04-24	Ruetgers Canada Inc.	Hamilton	ON	Type II	Industrial
2018-05-06	SGS Canada Inc.	Québec	QC	Type II	Industrial
2018-05-08	Stantec Consulting Ltd.	Calgary	AB	Type II	Industrial
2018-05-09	1051630 Alberta Ltd.	Calgary	AB	Type II	Industrial
2018-05-09	Wood Canada Limited	Burlington	ON	Type II	Industrial
2018-05-09	CRH Canada Inc.	Oakville	ON	Type II	Industrial
2018-05-09	MPE Engineering Ltd.	Calgary	AB	Type II	Industrial
2018-05-09	Bruce Power Inc.	Tiverton	ON	Type II	Academic and research
2018-05-10	Parkland Geotechnical Consulting Ltd.	Calgary	AB	Type II	Industrial
2018-05-10	Cott Corporation	Calgary	AB	Type II	Industrial
2018-05-10	Waterloo Nuclear & Radiography Inc.	Waterloo	ON	Type II	Medical
2018-05-10	2345171 Ontario Inc.	Guelph	ON	Type II	Medical
2018-05-14	J.R. Paine & Associates Ltd.	Edmonton	AB	Type II	Industrial
2018-05-14	Allnorth Consultants Limited	Edmonton	AB	Type II	Industrial
2018-05-14	Allnorth Consultants Limited	Edmonton	AB	Type II	Industrial
2018-05-14	Kamit Group Ltd.	Edmonton	AB	Type II	Industrial
2018-05-14	Molson Canada 2005	Etobicoke	ON	Type II	Industrial
2018-05-14	Keyera Corp.	Stettler	AB	Type II	Industrial
2018-05-14	First Choice Beverage Inc.	Mississauga	ON	Type II	Industrial
2018-05-14	Uni-Vert Tech Inc.	Ste-Marcelline de Kildare	QC	Type II	Commercial
2018-05-14	Institut national de recherche scientifique	Laval	QC	Type II	Medical
2015-05-15	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-05-15	ENC Testing Inc.	St. Albert	AB	Type II	Industrial
2018-05-15	E2K Engineering Ltd.	Edmonton	AB	Type II	Industrial
2018-05-15	Imperial Oil Resources Limited	Wood Buffalo	AB	Type II	Industrial
2018-05-16	Héma-Québec	Sainte-Foy	QC	Type II	Medical
2018-05-16	Thurber Engineering Ltd.	Edmonton	AB	Type II	Industrial
2018-05-16	Labo S.M. Inc.	Montreal	QC	Type II	Industrial
2018-05-16	Labo S.M. Inc.	Montreal	QC	Type II	Industrial
2018-05-16	Englobe Corp.	Laval	QC	Type II	Industrial

2018-05-16	SNC-Lavalin GEM Québec Inc.	Laval	QC	Type II	Industrial
2018-05-16	SNC-Lavalin GEM Québec Inc.	Montreal	QC	Type II	Industrial
2018-05-16	SNC-Lavalin GEM Québec Inc.	Montreal	QC	Type II	Industrial
2018-05-16	WSP Canada Inc.	Cambridge	ON	Type II	Industrial
2018-05-16	Golder Associates Ltd.	Cambridge	ON	Type II	Industrial
2018-05-16	Peter Kiewit Infrastructure Co.	Fort McMurray	AB	Type II	Industrial
2018-05-16	Metalcare Group Inc.	Edmonton	AB	Type II	Industrial
2018-05-16	WSP Canada Inc.	Cambridge	ON	Type II	Industrial
2018-05-16	Metalcare Group Inc.	Edmonton	AB	Type II	Industrial
2018-05-16	Triquest Nondestructive Testing Corp.	Fort McMurray	AB	Type II	Industrial
2018-05-16	Metalcare Group Inc.	Edmonton	AB	Type II	Industrial
2018-05-17	Parkland Geotechnical Consulting Ltd.	Fort McMurray	AB	Type II	Industrial
2018-05-17	Parkland Geotechnical Consulting Ltd.	Fort McMurray	AB	Type II	Industrial
2018-05-17	Centerline Geomatics Geotechnical Division Ltd.	Fort McMurray	AB	Type II	Industrial
2018-05-17	XE Inspection Inc.	Fort McMurray	AB	Type II	Industrial
2018-05-17	Parkland Geotechnical Consulting Ltd.	Fort McMurray	AB	Type II	Industrial
2018-05-17	Tetra Tech Canada Inc.	Calgary	AB	Type II	Industrial
2018-05-17	BAKOSNDT Ltd.	Edmonton	AB	Type II	Industrial
2018-05-17	Tracerco Radioactive Diagnostic Services Canada, Inc.	Edmonton	ON	Type II	Industrial
2018-05-17	Di-Med Services Limited	Vaughan	ON	Type II	Medical
2018-05-17	Alberta Health Services	Calgary	AB	Type II	Medical
2018-05-18	Cox Construction Limited	Guelph	ON	Type II	Industrial
2018-05-18	Niagara College Canada	Welland	ON	Type II	Industrial
2018-05-22	Ministère des Transports, de la Mobilité durable et de l'Électrification des transports	Québec	QC	Type II	Industrial
2018-05-22	Pavage Sartigan Ltée	St-Georges	QC	Type II	Industrial
2018-05-23	Juravinski Hospital and Cancer Centre at Hamilton Health Sciences	Hamilton	ON	Type II	Medical
2018-05-23	Cégep Limoilou	Charlesbourg	QC	Type II	Industrial
2018-05-23	Hamilton Health Sciences Corporation	Hamilton	ON	Type II	Medical

2018-05-23	Élite Technologies Inc.	St-Nicolas	QC	Type II	Commercial
2018-05-24	Groupe ABS Inc.	Québec	QC	Type II	Industrial
2018-05-24	Groupe ABS Inc.	Québec	QC	Type II	Industrial
2018-05-24	CRT Construction Inc.	Levis	QC	Type II	Industrial
2018-05-25	Niagara Health System	St. Catharines	ON	Type I	Medical
2018-05-25	Groupe ABS Inc.	Montreal	QC	Type II	Industrial
2018-05-25	Stantec Consulting Ltd.	Laval	QC	Type II	Industrial
2018-05-25	Groupe TNT Inc.	Laval	QC	Type II	Industrial
2018-05-25	Les Entreprises P.E.B. Ltée	St-Charles	QC	Type II	Industrial
2018-05-25	Les Entreprises P.E.B. Ltée	Québec	QC	Type II	Industrial
2018-05-26	Englobe Corp.	Toronto	ON	Type II	Industrial
2018-05-28	Canada Engineering Services Inc.	Toronto	ON	Type II	Industrial
2018-05-28	Canada Engineering Services Inc.	Toronto	ON	Type II	Industrial
2018-05-28	Shawcor Ltd.	Edmonton	AB	Type II	Industrial
2018-05-28	EXP Services Inc.	Timmins	ON	Type II	Industrial
2018-05-28	Intertape Polymer Inc.	Truro	NS	Type II	Industrial
2018-05-28	BJ Services Holdings Canada, ULC	Red Deer	AB	Type II	Industrial
2018-05-28	Baker Hughes Canada Company	Mount Pearl	NL	Type II	Industrial
2018-05-29	CT & Associates Engineering Inc.	Edmonton	AB	Type II	Industrial
2018-05-29	CT & Associates Engineering Inc.	Edmonton	AB	Type II	Industrial
2018-05-29	V.A. Wood (Guelph) Inc.	Guelph	ON	Type II	Industrial
2018-05-29	Stantec Consulting Ltd.	Antigonish	NS	Type II	Industrial
2018-05-29	SNC -Lavalin Industrial Atlantic Inc.	Mount Pearl	NL	Type II	Industrial
2018-05-29	Aker Solutions Asset Integrity and Management Canada Inc.	St. John's	NL	Type II	Industrial
2018-05-29	Kirkland Lake Gold Inc.	Matheson	ON	Type II	Industrial
2018-05-29	Northern Pulp Nova Scotia Corporation	New Glascow	NS	Type II	Industrial
2018-05-29	Port Hawkesbury Paper GP Ltd.	Port Hawkesbury	NS	Type II	Industrial
2018-05-29	Lehigh Hanson Materials Limited	Edmonton	AB	Type II	Industrial
2018-05-30	CT & Associates Engineering Inc.	Edmonton	AB	Type II	Industrial
2018-05-30	Stantec Consulting Ltd.	Membertou	NS	Type II	Industrial

2018-05-30	Shawcor Ltd.	Nisku	AB	Type II	Industrial
2018-05-30	Meridian Engineering Inc.	Clarenville	NL	Type II	Industrial
2018-05-30	Building Products of Canada Corp.	Edmonton	AB	Type II	Industrial
2018-05-30	Alamos Gold Inc.	Matachewan	ON	Type II	Industrial
2018-05-30	Kameron Coal Management Ltd.	Donkin	NS	Type II	Industrial
2018-05-30	Public Works and Government Services Canada	New Victoria	NS	Type II	Industrial
2018-05-31	EXP Services Inc.	Sydney	NS	Type II	Industrial
2018-05-31	The Corporation of the City of Timmins	Timmins	ON	Type II	Industrial
2018-05-31	C. Villeneuve Construction Co. Ltd.	Cochrane	ON	Type II	Industrial
2018-05-31	ALSTOM Power Installation Canada Inc.	Lingan	NS	Type II	Industrial
2018-05-31	College of the North Atlantic	Burin	NL	Type II	Industrial
2018-05-31	ALSTOM Power Installation Canada Inc.	Lingan	NS	Type II	Industrial
2018-05-31	Copol International Ltd.	North Sydney	NS	Type II	Industrial
2018-05-31	Labatt Brewing Company Ltd.	Edmonton	ON	Type II	Industrial
2018-05-31	IMTT-NTL, LTD.	Arnold's Cove	NL	Type II	Industrial
2018-05-31	Nova Scotia Health Authority	Sydney	NS	Type II	Medical
2018-05-31	Nova Scotia Health Authority	Sydney	NS	Type II	Medical
2018-06-01	Wood Canada Limited	St. John's	NL	Type II	Industrial
2018-06-01	EXP Services Inc.	Sydney	NS	Type II	Industrial
2018-06-01	EXP Services Inc.	Cambridge	ON	Type II	Industrial
2018-06-01	NARL Refining Inc.	Come by Chance	NL	Type II	Industrial
2018-06-07	Cruickshank Construction Limited	Morrisburg	ON	Type II	Industrial
2018-06-07	Kinectrics Inc.	Tiverton	ON	Type II	Commercial
2018-06-11	Parkland Geotechnical Consulting Ltd.	Red Deer	AB	Type II	Industrial
2018-06-11	Inline Group Inc.	Edmonton	AB	Type II	Industrial
2018-06-11	DGE Group Inc.	Edmonton	AB	Type II	Industrial
2018-06-12	42256 Yukon Inc.	Edmonton	AB	Type II	Industrial
2018-06-12	Wood Canada Limited	Corner Brook	NL	Type II	Industrial
2018-06-12	MR Engineering Ltd.	Edmonton	AB	Type II	Industrial
2018-06-12	Imperial Oil Limited	Waterdown	ON	Type II	Industrial

2018-06-12	Imperial Oil Limited	Toronto	ON	Type II	Industrial
2018-06-12	Imperial Oil Limited	Waterdown	ON	Type II	Industrial
2018-06-12	Imperial Oil Limited	Hamilton	MB	Type II	Industrial
2018-06-13	PCL Construction Management Inc.	Edmonton	AB	Type II	Industrial
2018-06-13	Atomic NDT Ltd.	Rocky Mountain House	AB	Type II	Industrial
2018-06-13	College of the North Atlantic	Port-Aux-Basques	NL	Type II	Industrial
2018-06-13	Coanda Research and Development Corporation	Edmonton	BC	Type II	Industrial
2018-06-14	CHUS/Centre intégré universitaire de santé et de services sociaux de l'Estrie	Sherbrooke	QC	Type I	Medical
2018-06-14	CHUS/Centre intégré universitaire de santé et de services sociaux de l'Estrie	Sherbrooke	QC	Type II	Medical
2018-06-14	CHUS/Centre intégré universitaire de santé et de services sociaux de l'Estrie	Sherbrooke	QC	Type II	Medical
2018-06-14	Logco Wireline Services Ltd.	Calmar	AB	Type II	Industrial
2018-06-14	Stantec Consulting Ltd.	Corner Brook	NL	Type II	Industrial
2018-06-14	Galey Inspection Services Ltd.	Carvel	AB	Type II	Industrial
2018-06-14	Janco Steel Ltd.	Stoney Creek	ON	Type II	Industrial
2018-06-14	Memorial University of Newfoundland	Corner Brook	NL	Type II	Academic and research
2018-06-14	Logco Wireline Services Ltd.	Calmar	AB	Type II	Industrial
2018-06-18	Fermar Asphalt Limited	Rexdale	ON	Type II	Industrial
2018-06-18	Wood Canada Limited	Regina	SK	Type II	Industrial
2018-06-19	Aecon Construction and Materials Limited	Caledon	ON	Type II	Industrial
2018-06-19	Mosaic Canada ULC	Belle Plaine	SK	Type II	Industrial
2018-06-19	Mosaic Canada ULC	Belle Plaine	SK	Type II	Industrial
2018-06-19	Royal Victoria Regional Health Centre	Barrie	ON	Type II	Medical
2018-06-19	Collingwood General & Marine Hospital	Collingwood	ON	Type II	Medical
2018-06-19	Stuart Hunt and Associates	Edmonton	AB	Type II	Commercial

2018-06-19	Royal Victoria Regional Health Centre	Barrie	ON	Type II	Medical
2018-06-19	Vingrity NDT & Technical Inc	Edmonton	AB	Type II	Industrial
2018-06-20	Tulloch Contract Administration Inc.	Sault Ste Marie	ON	Type II	Industrial
2018-06-20	FB Nondestructive Examination Ltd.	Moose Jaw	SK	Type II	Industrial
2018-06-20	Eclipse E-Line Services Inc.	Moose Jaw	SK	Type II	Industrial
2018-06-20	Eclipse E-Line Services Inc.	Moose Jaw	SK	Type II	Industrial
2018-06-20	Northern Alberta Institute of Technology	Edmonton	AB	Type II	Industrial
2018-06-21	Siemens Molecular Imaging, Inc.	Ottawa	ON	Type II	Commercial
2018-06-21	City of Regina	Regina	SK	Type II	Industrial
2018-06-21	SNC-Lavalin Inc.	Regina	SK	Type II	Industrial
2018-06-21	10497339 Canada Inc.	Cambridge	ON	Type II	Industrial
2018-06-22	Davroc Testing Laboratories Inc.	Brampton	ON	Type II	Industrial
2018-06-22	Taylor Steel Inc.	Stoney Creek	ON	Type II	Industrial
2018-06-22	Taylor Steel Inc.	Stoney Creek	ON	Type II	Industrial
2018-06-22	Taylor Steel Inc.	Stoney Creek	ON	Type II	Industrial
2018-06-25	Smith Dow & Associates Ltd.	Red Deer	AB	Type II	Industrial
2018-06-25	Wood Canada Limited	Red Deer	AB	Type II	Industrial
2018-06-25	McMaster University	Hamilton	ON	Type II	Academic and research
2018-06-25	CGC Acquisition Corporation	Red Deer	AB	Type II	Industrial
2018-06-25	Teck Coal Limited	Hamilton	BC	Type II	Industrial
2018-06-26	Tuboscope Vetco Canada ULC	Nisku	AB	Type II	Industrial
2018-06-26	CRH Canada Inc.	London	ON	Type II	Industrial
2018-06-26	Artech Consulting Ltd.	Cranbrook	BC	Type II	Industrial
2018-06-26	GDML Medical Laboratories Inc.	London	ON	Type II	Academic and research
2018-06-26	Resolute FP Canada Inc.	Mistassini	QC	Type II	Industrial
2018-06-26	Skookumchuck Pulp Inc.	Shookumchuck	BC	Type II	Industrial
2018-06-26	Insight Medical Holdings Ltd.	Edmonton	AB	Type II	Medical
2018-06-26	Insight Medical Holdings Ltd.	Leduc	AB	Type II	Medical
2018-06-27	Peter Kiewit Infrastructure Co.	Calgary	AB	Type II	Industrial
2018-06-27	Peter Kiewit Infrastructure Co.	Calgary	AB	Type II	Industrial

2018-06-27	Peter Kiewit Infrastructure Co.	Calgary	AB	Type II	Industrial
2018-06-27	WSP Canada Inc.	Edmonton	AB	Type II	Industrial
2018-06-27	EXP Services Inc.	Brampton	ON	Type II	Industrial
2018-06-27	Barrie MacKay Contracting Ltd.	Cranbrook	BC	Type II	Industrial
2018-06-27	Peter Kiewit Infrastructure Co.	Calgary	AB	Type II	Industrial
2018-06-27	GHD Consultants Ltd.	St-Félicien	QC	Type II	Industrial
2018-06-27	Sacopan Inc.	Sacré-Coeur-Saguenay	QC	Type II	Industrial
2018-06-27	Heemskirk Canada Limited	Golden	BC	Type II	Industrial
2018-06-27	Lawson Health Research Institute	London	ON	Type II	Academic and research
2018-06-27	Lawson Health Research Institute	London	ON	Type II	Academic and research
2018-06-27	Lawson Health Research Institute	London	ON	Type II	Academic and research
2018-06-27	Medical Imaging Consultants	St Albert	AB	Type II	Medical
2018-06-27	London Health Sciences Centre	London	ON	Type II	Medical
2018-06-27	London Health Sciences Centre	London	ON	Type II	Medical
2018-06-27	Medical Imaging Consultants	Edmonton	AB	Type II	Medical
2018-06-27	Lawson Health Research Institute	London	ON	Type II	Medical
2018-06-27	Lawson Health Research Institute	London	ON	Type II	Medical
2018-06-28	The Regional Municipality of Halton	Oakville	ON	Type II	Industrial
2018-06-28	Ministère des Transports, de la Mobilité durable et de l'Électrification des transports	Jonquière	QC	Type II	Industrial
2018-06-28	Mistras Services Inc.	Sacré-Coeur-Saguenay	QC	Type II	Industrial
2018-06-28	Université du Québec à Chicoutimi	Chicoutimi	QC	Type II	Academic and research
2018-06-28	Niobec Inc.	St-Honoré-de-Chicoutimi	QC	Type II	Industrial
2018-06-28	Moly-Cop Altasteel Ltd.	Edmonton	AB	Type II	Industrial
2018-06-28	London Health Sciences Centre	London	ON	Type II	Medical
2018-06-28	London Health Sciences Centre	London	ON	Type II	Medical
2018-06-29	Sintra Inc.	Laterrière	QC	Type II	Industrial

2018-06-29	Inter-Cité Construction Limitée	Chicoutimi	QC	Type II	Industrial
2018-07-03	Englobe Corp.	Toronto	QC	Type II	Industrial
2018-07-04	GeoPacific Consultants Ltd.	Calgary	AB	Type II	Industrial
2018-07-04	Wood Canada Limited / Wood Canada Limitée	Mississauga	ON	Type II	Industrial
2018-07-05	IKO Industries Ltd.	Calgary	AB	Type II	Industrial
2018-07-06	Trican Well Service Ltd.	Red Deer County	AB	Type II	Industrial
2018-07-09	Atomic Inspection Services Ltd.	Fort St. John	BC	Type II	Industrial
2018-07-09	West-Can Inspection Ltd.	Winnipeg	MB	Type II	Industrial
2018-07-09	Pembina Pipeline Corporation	Dawson Creek	BC	Type II	Industrial
2018-07-10	Manitoba Infrastructure	Brandon	MB	Type II	Industrial
2018-07-10	Manitoba Infrastructure	Portage la Prairie	MB	Type II	Industrial
2018-07-10	SNC- Lavalin GEM Ontario Inc.	Kingston	ON	Type II	Industrial
2018-07-10	GHD Consultants Ltd.	Kingston	ON	Type II	Industrial
2018-07-10	Acciona Infrastructure Canada Inc.	Fort St. John	BC	Type II	Industrial
2018-07-10	Winnipeg Regional Health Authority	Winnipeg	MB	Type II	Commercial
2018-07-10	Winnipeg Regional Health Authority	Winnipeg	MB	Type II	Commercial
2018-07-10	Northern Health Authority	Fort St. John	BC	Type II	Medical
2018-07-11	City of Brandon	Brandon	MB	Type II	Industrial
2018-07-11	EXP Services Inc. / Les Services EXP Inc.	Kingston	ON	Type II	Industrial
2018-07-11	HMR Engineering Inc.	Fort Nelson	AB	Type II	Industrial
2018-07-11	Westcoast Energy Inc.	Fort Nelson	AB	Type II	Industrial
2018-07-11	Koch Fertilizer Canada, ULC	Brandon	MB	Type II	Industrial
2018-07-11	Fisheries and Oceans Canada	Burlington	ON	Type II	Academic and research
2018-07-12	Loyalist College of Applied Arts and Technology	Belleville	ON	Type II	Industrial
2018-07-12	Coco Paving Inc.	Belleville	ON	Type II	Industrial
2018-07-12	Cambium Inc.	Trenton	ON	Type II	Industrial
2018-07-12	Owl Inspection Services Ltd.	Fort St. John	BC	Type II	Industrial
2018-07-12	Deka Inspection Services Ltd.	Charlie Lake	BC	Type II	Industrial
2018-07-12	Manitoba Hydro	Brandon	MB	Type II	Industrial

2018-07-12	Agriculture and Agri-Food Canada	Brandon	MB	Type II	Academic and research
2018-07-12	Prairie Mountain Health	Brandon	MB	Type II	Medical
2018-07-12	Prairie Mountain Health	Brandon	MB	Type II	Medical
2018-07-12	Kar-Basher Manitoba Ltd.	Brandon	MB	Type II	Industrial
2018-07-13	Eng-Tech Consulting Limited	Winnipeg	MB	Type II	Industrial
2018-07-13	Coco Paving Inc.	Elginburg	ON	Type II	Industrial
2018-07-16	WAV Inspection Ltd.	Brooks	AB	Type II	Industrial
2018-07-16	Boss Wireline Services Ltd.	Brooks	AB	Type II	Industrial
2018-07-16	Kaye Edmonton Clinic	Red Deer	AB	Type II	Medical
2018-07-16	Kaye Edmonton Clinic	Red Deer	AB	Type II	Medical
2018-07-17	DST Consulting Engineers Inc.	Black Hawk	ON	Type II	Industrial
2018-07-17	Allnorth Consultants Limited	Saskatoon	SK	Type II	Industrial
2018-07-17	Allnorth Consultants Limited	Prince George	BC	Type II	Industrial
2018-07-17	Allnorth Consultants Limited	Logan Lake	BC	Type II	Industrial
2018-07-17	Klohn Crippen Berger Ltd.	Logan Lake	BC	Type II	Industrial
2018-07-17	Shelby Engineering Ltd.	Edmonton	AB	Type II	Industrial
2018-07-17	Mike Abbot	Mackenzie	BC	Type II	Industrial
2018-07-17	Vision Integrity Engineering Ltd.	Medicine Hat	AB	Type II	Industrial
2018-07-17	AuRico Metals Inc.	Mackenzie	BC	Type II	Industrial
2018-07-17	New Gold Canada Inc.	Emo	ON	Type II	Industrial
2018-07-17	1788966 Alberta Ltd.	Redcliff	AB	Type II	Industrial
2018-07-17	Best Theratronics Ltd.	Ottawa	ON	Type II	Commercial
2018-07-17	Alara Consultants Inc.	Edmonton	AB	Type II	Commercial
2018-07-17	Alara Consultants Inc.	Edmonton	AB	Type II	Commercial
2018-07-17	RadTag Technologies Inc.	Edmonton	AB	Type II	Medical
2018-07-17	Alara Consultants Inc.	Edmonton	AB	Type II	Commercial
2018-07-17	Alara Consultants Inc.	Edmonton	AB	Type II	Commercial
2018-07-17	Alara Consultants Inc.	Edmonton	AB	Type II	Commercial
2018-07-17	Alara Consultants Inc.	Edmonton	AB	Type II	Commercial
2018-07-18	Wood Canada Limited	Rainy River	ON	Type II	Industrial
2018-07-18	EXP Services Inc.	Brampton	ON	Type II	Industrial

2018-07-18	Soil-Mat Engineers & Consultants Ltd.	Hamilton	ON	Type II	Industrial
2018-07-18	Thurber Engineering Ltd.	Kamloops	BC	Type II	Industrial
2018-07-18	Soil Engineers Ltd.	Mississauga	ON	Type II	Industrial
2018-07-18	BCG Engineering Inc.	Kamloops	BC	Type II	Industrial
2018-07-18	Wood Canada Limited	Kamloops	BC	Type II	Industrial
2018-07-18	Parkland Geotechnical Consulting Ltd.	Medicine Hat	AB	Type II	Industrial
2018-07-18	Tom Veert Contracting Limited	Fort Frances	ON	Type II	Industrial
2018-07-18	LAW Inspection Services Inc.	Lethbridge	AB	Type II	Industrial
2018-07-18	Vision Integrity Engineering Ltd.	Medicine Hat	AB	Type II	Industrial
2018-07-18	Trillium Health Partners	Mississauga	ON	Type II	Medical
2018-07-18	Trillium Health Partners	Mississauga	ON	Type II	Medical
2018-07-19	West Carleton Sand & Gravel Inc.	Carp	ON	Type II	Industrial
2018-07-19	WSP Canada Inc.	Edmonton	AB	Type II	Industrial
2018-07-19	Golder Associates Ltd.	Kelowna	BC	Type II	Industrial
2018-07-19	Bruno's Contracting (Thunder Bay) Ltd.	Thunder Bay	ON	Type II	Industrial
2018-07-19	Alberta Agriculture and Rural Development	Brooks	AB	Type II	Industrial
2018-07-19	MDG Contracting Services Inc.	Likely	BC	Type II	Industrial
2018-07-19	Innotech Alberta Inc.	Devon	AB	Type II	Academic and research
2018-07-19	Innotech Alberta Inc.	Vegreville	AB	Type II	Academic and research
2018-07-19	Medicine Hat Regional Hospital	Medicine Hat	AB	Type II	Medical
2018-07-20	AT Films Inc.	Edmonton	AB	Type II	Industrial
2018-07-23	Buffalo Inspection Services (2005) Inc.	Camrose	AB	Type II	Industrial
2018-07-23	Pacific Western Brewing Company Ltd.	Prince George	BC	Type II	Industrial
2018-07-24	J.R. Paine & Associates Ltd.	Grande Prairie	AB	Type II	Industrial
2018-07-24	Peterson Contracting Ltd.	Williams Lake	BC	Type II	Industrial
2018-07-24	Gamma Spec NDT Ltd.	Grande Prairie	AB	Type II	Industrial
2018-07-24	Gibraltar Mines Ltd.	McLeese Lake	BC	Type II	Industrial
2018-07-24	Sanjel Energy Services Inc.	Grande Prairie	AB	Type II	Industrial

2018-07-24	Provincial Health Services Authority	Kelowna	BC	Type II	Medical
2018-07-25	Evergreen Geotechnical Inc.	150 Mile House	BC	Type II	Industrial
2018-07-25	Cantex-Okanagan Construction Ltd.	Williams Lake	BC	Type II	Industrial
2018-07-25	Anode NDT Ltd.	Grande Prairie	AB	Type II	Industrial
2018-07-25	20/20 ND Technology Inc.	Grande Prairie	AB	Type II	Industrial
2018-07-25	Brainlab	Vancouver	BC	Type II	Commercial
2018-07-25	Bonnett's Energy Services Ltd.	Grande Prairie	AB	Type II	Industrial
2018-07-26	Soil-Mat Engineers & Consultants Ltd.	Hamilton	ON	Type II	Industrial
2018-07-26	Breton N.D. Testing Incorporated	Prince George	BC	Type II	Industrial
2018-07-26	Safety-Kleen Canada Inc.	Breslau	ON	Type II	Industrial
2018-07-26	4159110 Canada Inc.	Prince George	BC	Type II	Industrial
2018-07-26	Elemental Controls Limited	Mississauga	ON	Type II	Commercial
2018-07-26	Elemental Controls Limited	Mississauga	ON	Type II	Commercial
2018-07-27	Provincial Health Services Authority	Vancouver	BC	Type II	Medical
2018-07-27	GeoNorth Engineering Ltd.	Prince George	BC	Type II	Industrial
2018-07-27	Davroc Testing Laboratories Inc.	Brampton	ON	Type II	Industrial
2018-07-27	Enviro-Ex Contracting Ltd.	Prince George	BC	Type II	Industrial
2018-07-27	Acuren Inc.	Prince George	BC	Type II	Industrial
2018-07-31	Eng-Tech Consulting Limited	Lac Brochet	MB	Type II	Industrial
2018-07-31	Mistras Canada, Inc.	Red Deer	AB	Type II	Industrial
2018-07-31	Danahar Canada Partners Inc.,	Mississauga	ON	Type II	Commercial
2018-07-31	University Health Network	Toronto	ON	Type II	Medical
2018-07-31	University Health Network	Toronto	ON	Type II	Medical
2018-07-31	University Health Network	Toronto	ON	Type II	Medical
2018-07-31	University Health Network	Toronto	ON	Type II	Medical
2018-07-31	University Health Network	Toronto	ON	Type II	Medical
2018-08-01	Vale Canada Limited	Thompson	MB	Type II	Industrial
2018-08-01	Canadian General-Tower Limited	Cambridge	ON	Type II	Industrial
2018-08-01	Sonoco Canada Corporation	Brantford	ON	Type II	Industrial
2018-08-02	Maple Leaf Construction Ltd.	Winnipeg	MB	Type II	Industrial
2018-08-02	Q Test Inspection Ltd.	Sylvan Lake	AB	Type II	Industrial

2018-08-02	Pro-Test Professional Testing & Inspection Co. Ltd.	Winnipeg	MB	Type II	Industrial
2018-08-02	Pro-Test Professional Testing & Inspection Co. Ltd.	Winnipeg	MB	Type II	Industrial
2018-08-03	Aecon Construction and Materials Limited	Caledon	ON	Type II	Industrial
2018-08-08	Golder Associates Ltd.	Calgary	AB	Type II	Industrial
2018-08-08	Golder Associates Ltd.	Calgary	AB	Type II	Industrial
2018-08-08	Wood Canada Limited	Calgary	AB	Type II	Industrial
2018-08-09	Morpho Detection Inc.	Mississauga	ON	Type II	Commercial
2018-08-09	Philips Electronics Ltd.	Markham	ON	Type II	Commercial
2018-08-10	Wood Canada Limited	Calgary	AB	Type II	Industrial
2018-08-13	Flatiron Construction Canada Limited	East St. Paul	MB	Type II	Industrial
2018-08-13	Pioneer Construction Inc.	Sault Ste Marie	ON	Type II	Industrial
2018-08-13	Robert S. Wilson	Sault Ste Marie	ON	Type II	Industrial
2018-08-13	Manitoba Infrastructure	East St. Paul	MB	Type II	Industrial
2018-08-14	Kresin Engineering Corporation	Sault Ste Marie	ON	Type II	Industrial
2018-08-14	Hudbay Minerals Inc	Snow Lake	MB	Type II	Industrial
2018-08-14	Hudbay Minerals Inc	Snow Lake	MB	Type II	Industrial
2018-08-14	Hudbay Minerals Inc	Snow Lake	MB	Type II	Industrial
2018-08-14	Natural Resources Canada/ Ressources naturelles Canada	Sault Ste Marie	ON	Type II	Academic and research
2018-08-14	M & L Testing Equipment (1995) Inc.	Dundas	ON	Type II	Commercial
2018-08-14	M & L Testing Equipment (1995) Inc.	Dundas	ON	Type II	Commercial
2018-08-14	Triple M Metal Inc.	Sault Ste Marie	ON	Type II	Industrial
2018-08-15	Manitoba Infrastructure	The Pas	MB	Type II	Industrial
2018-08-15	Flakeboard Company Limited	Sault Ste Marie	NB	Type II	Industrial
2018-08-15	Glencore Canada Corporation	Rouyn-Noranda	QC	Type II	Industrial
2018-08-15	Mines Abcourt Inc.	Amos	QC	Type II	Industrial
2018-08-15	Sault Area Hospital	Sault Ste Marie	ON	Type II	Medical
2018-08-15	Sault Area Hospital	Sault Ste Marie	ON	Type II	Medical
2018-08-16	Down to Earth Geotechnical Engineering	Sault Ste Marie	ON	Type II	Industrial

2018-08-16	Ministère des Transports, de la Mobilité durable et de l'Électrification des transports	Rouyn-Noranda	QC	Type II	Industrial
2018-08-16	Sintra Inc.	Rouyn-Noranda	QC	Type II	Industrial
2018-08-16	Englobe Corp.	Rouyn-Noranda	QC	Type II	Industrial
2018-08-16	Université du Québec en Abitibi-Témiscamingue	Rouyn-Noranda	QC	Type II	Industrial
2018-08-16	Down to Earth Geotechnical Engineering	Sault Ste Marie	ON	Type II	Industrial
2018-08-16	Coca-Cola Refreshments Canada Company/	Rouyn-Noranda	ON	Type II	Industrial
2018-08-17	Clear Image Inspection Ltd.	Bentley	AB	Type II	Industrial
2018-08-17	Essar Steel Algoma Inc.	Sault Ste Marie	ON	Type II	Industrial
2018-08-21	Apotex Inc.	Toronto	ON	Type II	Academic and research
2018-08-21	Lac des Iles Mines Ltd.	Thunder Bay	ON	Type II	Industrial
2018-08-22	TBT Engineering Limited	Thunder Bay	ON	Type II	Industrial
2018-08-22	Hatch Ltd.	Thunder Bay	ON	Type II	Industrial
2018-08-22	EXP Services Inc.	Thunder Bay	ON	Type II	Industrial
2018-08-22	Knight Vision Inspections Inc.	Regina	SK	Type II	Industrial
2018-08-22	Danahar Canada Partners Inc.,	Mississauga	ON	Type II	Commercial
2018-08-22	Corcare Nuclear Medicine Inc.	Toronto	ON	Type II	Medical
2018-08-22	Markham Stouffville Hospital	Markham	ON	Type II	Medical
2018-08-22	Markham Stouffville Hospital	Markham	ON	Type II	Medical
2018-08-23	TBT Engineering Limited	Thunder Bay	ON	Type II	Industrial
2018-08-23	Teranorth Construction & Engineering Limited	Nipigon	ON	Type II	Industrial
2018-08-23	Taranis Contracting Group Ltd.	Thunder Bay	ON	Type II	Industrial
2018-08-23	EXP Services Inc. / Les Services EXP Inc.	Thunder Bay	ON	Type II	Industrial
2018-08-23	Hunt Inspection Ltd.	Lacombe	AB	Type II	Industrial
2018-08-23	Brock University	St Catharines	ON	Type II	Academic and research
2018-08-23	Brock University	St Catharines	ON	Type II	Academic and research

2018-08-24	True Grit Engineering Limited	Thunder Bay	ON	Type II	Industrial
2018-08-24	Taranis Contracting Group Ltd.	Thunder Bay	ON	Type II	Industrial
2018-08-27	Davroc Testing Laboratories Inc.	Brampton	ON	Type II	Industrial
2018-08-27	Davroc Testing Laboratories Inc.	Brampton	ON	Type II	Industrial
2018-08-27	Shad & Associates Inc.	Vaughan	ON	Type II	Industrial
2018-08-27	Bare Contracting Services Ltd.	Mississauga	ON	Type II	Industrial
2018-08-27	GHD Consultants Ltd.	Mississauga	ON	Type II	Industrial
2018-08-27	GHD Consultants Ltd.	Mississauga	ON	Type II	Industrial
2018-08-27	CRH Canada Inc.	Oakville	ON	Type II	Industrial
2018-08-28	Bare Contracting Services Ltd.	Mississauga	ON	Type II	Industrial
2018-08-28	Wood Canada Limited	Richmond Hill	ON	Type II	Industrial
2018-08-28	Orbit Engineering Limited	Brampton	ON	Type II	Industrial
2018-08-28	EXP Services Inc.	Brampton	ON	Type II	Industrial
2018-08-28	DS Consultants Ltd.	Vaughan	ON	Type II	Industrial
2018-08-28	Golder Associates Ltd.	Whitby	ON	Type II	Industrial
2018-08-28	Golder Associates Ltd.	Whitby	ON	Type II	Industrial
2018-08-28	Regional Municipality of Peel	Brampton	ON	Type II	Industrial
2018-08-29	Regional Municipality of Peel	Brampton	ON	Type II	Industrial
2018-08-29	Engtec Consulting Inc.	Vaughan	ON	Type II	Industrial
2018-08-29	GHD Consultants Ltd.	Mississauga	ON	Type II	Industrial
2018-08-29	Thurber Engineering Ltd.	Oakville	ON	Type II	Industrial
2018-08-29	PEI Department of Health	Charlottetown	PE	Type I	Medical
2018-08-29	Engtec Consulting Inc.	Vaughan	ON	Type II	Industrial
2018-08-29	Ambashi Engineering & Management Inc.	Toronto	ON	Type II	Industrial
2018-08-30	Soil Engineers Ltd.	Richmond Hill	ON	Type II	Industrial
2018-08-30	V.A. Wood Associates Limited	Scarborough	ON	Type II	Industrial
2018-08-30	Patriot Engineering Ltd.	Toronto	ON	Type II	Industrial
2018-08-30	Patriot Engineering Ltd.	Toronto	ON	Type II	Industrial
2018-08-30	Landtek Limited	Hamilton	ON	Type II	Industrial
2018-08-30	Nasiruddin Engineering Limited	Mississauga	ON	Type II	Industrial
2018-08-30	Nasiruddin Engineering Limited	Mississauga	ON	Type II	Industrial
2018-08-30	GHD Consultants Ltd.	Mississauga	ON	Type II	Industrial
2018-08-30	Parkland Geotechnical Consulting Ltd.	Calgary	AB	Type II	Industrial
2018-08-30	Fermar Asphalt Limited	Redxdale	ON	Type II	Industrial

2018-08-30	EXP Services Inc.	Hamilton	ON	Type II	Industrial
2018-08-30	WSP Canada Inc.	Toronto	ON	Type II	Industrial
2018-08-30	Unitech	Bowmanville	ON	Type II	Commercial
2018-08-31	Lamb Weston Canada ULC	Taber	AB	Type II	Industrial
2018-08-31	Lantic Inc.	Taber	AB	Type II	Industrial
2018-09-06	Terrapex Environmental Ltd.	Nepean	ON	Type II	Industrial
2018-09-10	MPE Engineering Ltd.	Medicine Hat	AB	Type II	Industrial
2018-09-10	Tuboscope Vetco Canada ULC	Brooks	AB	Type II	Industrial
2018-09-11	Graham Bros. Construction Limited	Brampton	ON	Type II	Industrial
2018-09-11	MPE Engineering Ltd.	Medicine Hat	AB	Type II	Industrial
2018-09-11	WSP Canada Inc.	Medicine Hat	AB	Type II	Industrial
2018-09-11	Aecon Transportation West Ltd.	Medicine Hat	AB	Type II	Industrial
2018-09-11	City of Estevan	Estevan	SK	Type II	Industrial
2018-09-11	Tuboscope Vetco Canada ULC	Bow Island	AB	Type II	Industrial
2018-09-11	Buffalo Inspection Services (2005) Inc.	Estevan	SK	Type II	Industrial
2018-09-11	Canadian Fertilizers Limited	Medicine Hat	AB	Type II	Industrial
2018-09-11	Natural Resources Canada	Ottawa	ON	Type II	Industrial
2018-09-11	Weatherford Canada Ltd.	Estevan	SK	Type II	Industrial
2018-09-12	Highway Construction Inspection Ontario Inc.	Barrie	ON	Type II	Industrial
2018-09-12	WSP Canada Inc.	Toronto	ON	Type II	Industrial
2018-09-12	MPE Engineering Ltd.	Lethbridge	AB	Type II	Industrial
2018-09-12	Alberta Agriculture and Rural Development	Lethbridge	AB	Type II	Industrial
2018-09-12	AM Inspection Limited	Weyburn	SK	Type II	Industrial
2018-09-12	Tomahawk Inspection Inc.	Weyburn	SK	Type II	Industrial
2018-09-13	GEM Testing Ltd.	Dunmore	AB	Type II	Industrial
2018-09-13	Landtek Limited	Hamilton	ON	Type II	Industrial
2018-09-13	WSP Canada Inc.	Regina	SK	Type II	Industrial
2018-09-13	Knight Vision Inspections Inc.	Regina	SK	Type II	Industrial
2018-09-13	Iron Horse Coiled Tubing Inc.	Redcliff	AB	Type II	Industrial
2018-09-13	Ryerson University	Toronto	ON	Type II	Academic and research

2018-09-13	Ryerson University	Toronto	ON	Type II	Academic and research
2018-09-14	SGS Canada Inc.	Québec	QC	Type II	Industrial
2018-09-14	GE Ground Engineering Ltd.	Regina	SK	Type II	Industrial
2018-09-14	GHD Consultants Ltd.	Mississauga	ON	Type II	Industrial
2018-09-14	Trican Well Service Ltd.	Redcliff	AB	Type II	Industrial
2018-09-17	Pioneer Construction Inc.	Sudbury	ON	Type II	Industrial
2018-09-17	Teranorth Construction & Engineering Limited	Sudbury	ON	Type II	Industrial
2018-09-17	Tulloch Contract Administration Inc.	Sudbury	ON	Type II	Industrial
2018-09-17	EXP Services Inc.	Sudbury	ON	Type II	Industrial
2018-09-17	BAKOSNDT Ltd.	Whitecourt	AB	Type II	Industrial
2018-09-17	A-Tech N.D.T. Limited	Whitecourt	AB	Type II	Industrial
2018-09-18	Aecon Construction and Materials Limited	Caledon	ON	Type II	Industrial
2018-09-18	Terraprobe Testing Ltd.	Sudbury	ON	Type II	Industrial
2018-09-18	Interpaving Asphalt and Aggregate Supply Ltd.	Sudbury	ON	Type II	Industrial
2018-09-18	Wood Canada Limited / Wood Canada Limitée	Lively	ON	Type II	Industrial
2018-09-18	Tusk Inspection Services Inc.	Fox Creek	AB	Type II	Industrial
2018-09-19	KDT Consulting Services	St. Charles	ON	Type II	Industrial
2018-09-19	Oshanek Inspection Services (1972) Ltd.	Whitecourt	AB	Type II	Industrial
2018-09-19	Laurentian University	Sudbury	ON	Type II	Academic and research
2018-09-19	Laurentian University	Sudbury	ON	Type II	Academic and research
2018-09-19	Laurentian University	Sudbury	ON	Type II	Academic and research
2018-09-19	Laurentian University	Sudbury	ON	Type II	Academic and research
2018-09-19	Laurentian University	Sudbury	ON	Type II	Academic and research

2018-09-19	Laurentian University	Sudbury	ON	Type II	Academic and research
2018-09-19	Voltage Wireline Inc.	Whitecourt	AB	Type II	Industrial
2018-09-19	Lakeside Process Controls Ltd.	Mississauga	ON	Type II	Commercial
2018-09-19	Lakeside Process Controls Ltd.	Mississauga	ON	Type II	Commercial
2018-09-20	R.M. Belanger Limited	Chelmsford	ON	Type II	Industrial
2018-09-20	Klohn Crippen Berger Ltd.	Sudbury	ON	Type II	Industrial
2018-09-20	A-Tech N.D.T. Limited	Whitecourt	AB	Type II	Industrial
2018-09-20	BAKOSNDT Ltd.	Whitecourt	AB	Type II	Industrial
2018-09-20	Iron Ore Company of Canada	Labrador City	NL	Type II	Industrial
2018-09-20	Reliance OFS Canada Ltd.	Whitecourt	AB	Type II	Industrial
2018-09-20	Thermo Process Instruments GP, LLC	Ottawa	ON	Type II	Commercial
2018-09-20	SGS Canada Inc.	Various Cities	AB, ON, QC	Type I	Industrial
2018-09-21	University Health Network	Toronto	ON	Type I	Medical
2018-09-21	University Health Network	Toronto	ON	Type II	Medical
2018-09-21	Pioneer Construction Inc.	Sudbury	ON	Type II	Industrial
2018-09-25	Structural Inspections Limited	Milton	ON	Type II	Industrial
2018-09-26	The Regional Municipality of Halton	Oakville	ON	Type II	Industrial
2018-09-26	Miller Paving Limited	Wainfleet	ON	Type II	Industrial
2018-09-26	2539393 Ontario Inc.	Mississauga	ON	Type II	Medical
2018-09-26	Joseph Brant Hospital	Burlington	ON	Type II	Medical
2018-09-26	Joseph Brant Hospital	Burlington	ON	Type II	Medical
2018-09-26	Isomedix Corporation	Whitby	ON	Type II	Industrial
2018-09-27	University of Alberta	Calgary	AB	Type II	Commercial
2018-09-27	Cambium Inc.	Peterborough	ON	Type II	Industrial
2018-09-27	SNC- Lavalin GEM Ontario Inc.	North York	ON	Type II	Industrial
2018-09-27	MNA Engineering Ltd.	Toronto	ON	Type II	Industrial
2018-09-27	Cambium Inc.	Peterborough	ON	Type II	Industrial
2018-09-27	Ontario Power Generation Inc.	Pickering	ON	Type II	Industrial
2018-09-27	WSP Canada Inc.	Peterborough	AB	Type II	Industrial
2018-09-27	Berthold Technologies U.S.A., LLC	Mississauga	ON	Type II	Commercial
2018-09-28	CRH Canada Inc.	Oakville	ON	Type II	Industrial

2018-09-28	Coco Paving Inc.	Toronto	ON	Type II	Industrial
2018-09-28	Unican International Ltd.	Toronto	ON	Type II	Industrial
2018-10-02	GHD Consultants Ltd.	Mont-Temblant	QC	Type II	Industrial
2018-10-02	Pangeos Inc.	Laval	QC	Type II	Industrial
2018-10-02	IRISNDT Corp.	Fort McMurray	AB	Type II	Industrial
2018-10-02	Breton N.D. Testing Incorporated	Fort McMurray	AB	Type II	Industrial
2018-10-02	Acuren Inc.	Bonnyville	AB	Type II	Industrial
2018-10-03	Englobe Corp.	Varennes	QC	Type II	Industrial
2018-10-03	Pangeos Inc.	Laval	QC	Type II	Industrial
2018-10-03	Soil Engineers Ltd.	Oshawa	ON	Type II	Industrial
2018-10-03	Wood Canada Limited	Thorold	ON	Type II	Industrial
2018-10-03	Metalcare Group Inc.	Fort McMurray	AB	Type II	Industrial
2018-10-03	Cave Inspection Ltd.	Wainwright	AB	Type II	Industrial
2018-10-03	Edge Wireline Inc.	Provost	AB	Type II	Industrial
2018-10-04	Wood Canada Limited / Wood Canada Limitée	Fort McMurray	AB	Type II	Industrial
2018-10-04	RTD Quality Services Inc.	Fort McMurray	AB	Type II	Industrial
2018-10-04	Titanium Tubing Technology Ltd.	Vermillion	AB	Type II	Industrial
2018-10-10	Solmatech Inc.	Le Gardeur	QC	Type II	Industrial
2018-10-10	GEM Testing Ltd.	Dunmore	AB	Type II	Industrial
2018-10-11	WSP Canada Inc.	St. Catharines	AB	Type II	Industrial
2018-10-11	Honeywell Ltd	St. Catharines	QC	Type II	Commercial
2018-10-11	Alberta Health Services	Calgary	AB	Type II	Medical
2018-10-12	Stuart Hunt & Associates Ltd.	Edmonton	AB	Type II	Commercial
2018-10-12	Alberta Health Services	Calgary	AB	Type II	Medical
2018-10-15	42256 Yukon Inc.	Whitehorse	YT	Type II	Industrial
2018-10-15	RTD Quality Services Inc.	Edmonton	AB	Type II	Industrial
2018-10-15	Canadian Engineering & Inspection Ltd.	Nisku	AB	Type II	Industrial
2018-10-15	Grumble Hill Limited	Port Perry	ON	Type II	Medical
2018-10-15	RTD Quality Services Inc.	Edmonton	AB	Type II	Industrial
2018-10-16	Tetra Tech Canada Inc.	Whitehorse	YT	Type II	Industrial
2018-10-16	Soil Engineers Ltd.	Barrie	ON	Type II	Industrial
2018-10-16	Cambium Inc.	Barrie	ON	Type II	Industrial
2018-10-16	Tetra Tech Canada Inc.	Whitehorse	YT	Type II	Industrial

2018-10-16	All Can Inspection Services (2011) Inc.	Edmonton	AB	Type II	Industrial
2018-10-16	Recon Petrotechnologies Ltd.	Edmonton	AB	Type II	Industrial
2018-10-17	Schlumberger Canada Limited	Nisku	AB	Type II	Industrial
2018-10-17	Chilkoot Geological Engineers Ltd.	Whitehorse	YT	Type II	Industrial
2018-10-17	Government of Yukon	Whitehorse	YT	Type II	Industrial
2018-10-17	Schlumberger Canada Limited	Nisku	AB	Type II	Industrial
2018-10-18	V.A. Wood Associates Limited	Scarborough	ON	Type II	Industrial
2018-10-18	Viva Media Packaging (Canada) Ltd.	Toronton	ON	Type II	Industrial
2018-10-19	Centre hospitalier Universitaire de Québec	Québec	QC	Type I	Medical
2018-10-19	Centre hospitalier Universitaire de Québec	Québec	QC	Type II	Medical
2018-10-23	Advance Testing Ltd.	Surrey	BC	Type II	Industrial
2018-10-23	Braun Geotechnical Ltd.	Surrey	BC	Type II	Industrial
2018-10-23	York Central Hospital	Richmond Hill	ON	Type II	Medical
2018-10-23	York Central Hospital	Richmond Hill	ON	Type II	Medical
2018-10-24	BAKOSNDT Ltd.	Whitecourt	AB	Type II	Industrial
2018-10-24	Agriculture and Agri-Food Canada	Agassiz	BC	Type II	Academic and research
2018-10-24	Fisheries and Oceans Canada	Cultus Lake	BC	Type II	Academic and research
2018-10-24	York University	Toronto	ON	Type II	Academic and research
2018-10-24	York University	Toronto	ON	Type II	Academic and research
2018-10-24	Bathurst Lawrence Nuclear Imaging Inc.	Toronto	ON	Type II	Medical
2018-10-25	City of Vancouver	Vancouver	BC	Type II	Industrial
2018-10-25	University Health Network	Toronto	ON	Type II	Commercial
2018-10-25	University of Toronto	Toronto	ON	Type II	Academic and research
2018-10-25	University of Toronto	Toronto	ON	Type II	Academic and research

2018-10-25	University of Toronto	Toronto	ON	Type II	Academic and research
2018-10-25	University of Toronto	Toronto	ON	Type II	Academic and research
2018-10-25	Isologic Innovative Radiopharmaceuticals Ltd.	Vancouver	ON	Type II	Commercial
2018-10-25	Isologic Innovative Radiopharmaceuticals Ltd.	Vancouver	ON	Type II	Commercial
2018-10-26	General Electric Nova Soctia #1 Company	Mississauga	ON	Type II	Commercial
2018-10-26	GHD Consultants Ltd.	Pembroke	ON	Type II	Industrial
2018-10-26	Quantum Petrophysics Inc.	Blackfalds	AB	Type II	Industrial
2018-10-26	Centre for Probe Development and Commercialization	Hamilton	ON	Type II	Commercial
2018-10-26	Pembroke Regional Hospital Inc.	Pembroke	ON	Type II	Medical
2018-10-26	Almadon Holdings Ltd.	Calgary	AB	Type II	Medical
2018-10-29	TISI Canada Inc.	Saskatoon	SK	Type II	Industrial
2018-10-29	Candu Energy Inc.	Mississauga	ON	Type II	Commercial
2018-10-30	Slick Inspection Limited	Kindersley	SK	Type II	Industrial
2018-10-31	Terraprobe Testing Ltd.	Barrie	ON	Type II	Industrial
2018-10-31	Allnorth Consultants Limited	Saskatoon	SK	Type II	Industrial
2018-10-31	FCE Materials Testing Inc.	Markham	ON	Type II	Industrial
2018-10-31	Pavement Scientific International Inc.	Saskatoon	SK	Type II	Industrial
2018-10-31	Soil-Mat Engineers & Consultants Ltd.	Hamilton	ON	Type II	Industrial
2018-11-01	Clifton Associates Ltd.	Saskatoon	SK	Type II	Industrial
2018-11-01	MNA Engineering Ltd.	Kitchener	ON	Type II	Industrial
2018-11-01	Tetra Tech Canada Inc.	Saskatoon	SK	Type II	Industrial
2018-11-02	Agriculture and Agri-Food Canada	Swift Current	SK	Type II	Academic and research
2018-11-05	Saskatchewan Ministry of Highways and Infrastructure	Regina	SK	Type II	Industrial
2018-11-06	Clifton Associates Ltd.	Regina	SK	Type II	Industrial
2018-11-06	Plastipak Industries Inc.	Regina	SK	Type II	Industrial
2018-11-06	Enbridge Employee Services Canada Inc.	Regina	SK	Type II	Industrial

2018-11-06	Enbridge Employee Services Canada Inc.	Regina	SK	Type II	Industrial
2018-11-06	Woodstock General Hospital	Woodstock	ON	Type II	Medical
2018-11-07	Saskatchewan Power Corporation	Estevan	SK	Type II	Industrial
2018-11-07	Saskatchewan Power Corporation	Estevan	SK	Type II	Industrial
2018-11-07	Wild Rose Brewery Ltd.	Calgary	AB	Type II	Industrial
2018-11-07	The University of Western Ontario	London	ON	Type II	Academic and research
2018-11-07	The University of Western Ontario	London	ON	Type II	Academic and research
2018-11-07	The University of Western Ontario	London	ON	Type II	Academic and research
2018-11-07	The University of Western Ontario	London	ON	Type II	Academic and research
2018-11-07	The University of Western Ontario	London	ON	Type II	Academic and research
2018-11-07	Boss Wireline Services Ltd.	Brooks	AB	Type II	Industrial
2018-11-08	Englobe Corp.	Laval	QC	Type II	Industrial
2018-11-08	Mosaic Esterhazy Holdings Ltd.	Esterhazy	SK	Type II	Industrial
2018-11-08	Mosaic Esterhazy Holdings Ltd.	Esterhazy	SK	Type II	Industrial
2018-11-08	Trican Well Service Ltd.	Red Deer	AB	Type II	Industrial
2018-11-08	Core Laboratories Canada Ltd.	Red Deer	AB	Type II	Industrial
2018-11-13	EastTech Engineering Consultants Inc.	Mount Stewart	PE	Type II	Industrial
2018-11-13	Agriculture and Agri-Food Canada	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Dow Chemical Canada ULC	Fort Saskatchewan	AB	Type II	Industrial
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research

2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	University of Prince Edward Island	Charlottetown	PE	Type II	Academic and research
2018-11-14	Université de Sherbrooke	Sherbrooke	QC	Type II	Academic and research
2018-11-14	Dow Chemical Canada ULC	Fort Saskatchewan	AB	Type II	Industrial
2018-11-14	University of Prince Edward Island	Charlottetown	PE	Type II	Medical
2018-11-15	Sintra Inc.	Hatley	QC	Type II	Industrial
2018-11-15	Stantec Consulting Ltd.	Moncton	NB	Type II	Industrial
2018-11-15	Construction DJL Inc.	Hatley	QC	Type II	Industrial
2018-11-15	WSP Canada Inc.	Moncton	NB	Type II	Industrial
2018-11-15	Gemtec Consulting Engineers and Scientists Limited	Moncton	NB	Type II	Industrial

2018-11-15	University of Alberta	Edmonton	AB	Type II	Academic and research
2018-11-15	University of Alberta	Edmonton	AB	Type II	Academic and research
2018-11-16	Omni-McCann Consultants Ltd.	Edmonton	AB	Type II	Industrial
2018-11-16	AV Group NB Inc.	Nackawic	NB	Type II	Industrial
2018-11-19	TISI Canada Inc.	Slave Lake	AB	Type II	Industrial
2018-11-19	Saskatchewan Research Council	Saskatoon	SK	Type II	Academic and research
2018-11-19	Saskatchewan Research Council	Saskatoon	SK	Type II	Academic and research
2018-11-19	Saskatchewan Research Council	Saskatoon	SK	Type II	Academic and research
2018-11-19	1583345 Alberta Ltd.	Slave Lake	AB	Type II	Industrial
2018-11-19	Saskatchewan Health Authority	Saskatoon	SK	Type II	Medical
2018-11-19	Saskatchewan Health Authority	Saskatoon	SK	Type II	Medical
2018-11-19	Saskatchewan Health Authority	Saskatoon	SK	Type II	Medical
2018-11-20	Gunron Inspections Ltd.	Edson	AB	Type II	Industrial
2018-11-20	Agnico-Eagle Mines Ltd.	Meadowbank	NU	Type II	Industrial
2018-11-20	Accel Energy Canada Ltd	Swan Hills	AB	Type II	Industrial
2018-11-20	Saskatchewan Research Council	Saskatoon	SK	Type II	Academic and research
2018-11-20	National Research Council of Canada	Saskatoon	SK	Type II	Academic and research
2018-11-21	Greenwood Paving (Pembroke) Ltd.	Pembroke	ON	Type II	Industrial
2018-11-21	Foothills Radiography & Inspection Services Ltd.	Edson	AB	Type II	Industrial
2018-11-21	Prairie Mines & Royalty ULC	Edson	AB	Type II	Industrial
2018-11-21	Lakeside Process Controls Ltd.	Mississauga	ON	Type II	Commercial
2018-11-21	Pembroke Regional Hospital Inc.	Pembroke	ON	Type II	Medical
2018-11-22	Brody Inspection Ltd.	Valleyview	AB	Type II	Industrial
2018-11-22	SGS Canada Inc.	Mississauga	ON	Type II	Academic and research

2018-11-22	Alberta Health Services	Edmonton	AB	Type II	Medical
2018-11-23	Alberta Health Services	Edmonton	AB	Type II	Medical
2018-11-23	Alberta Health Services	Edmonton	AB	Type II	Medical
2018-11-23	Lethbridge College	Lethbridge	AB	Type II	Industrial
2018-11-23	Roseke Engineering Ltd.	Lethbridge	AB	Type II	Industrial
2018-12-04	City of Calgary	Calgary	AB	Type II	Industrial
2018-12-04	Canada Border Services Agency	Burnaby	BC	Type II	Industrial
2018-12-04	Bonduelle Canada Inc.	Tecumseh	ON	Type II	Industrial
2018-12-04	Best Theratronics Ltd.	Ottawa	ON	Type II	Commercial
2018-12-05	McIntosh Lalani Engineering Ltd.	Calgary	AB	Type II	Industrial
2018-12-05	Advanced PET/CT Imaging Inc.	Windsor	ON	Type II	Medical
2018-12-05	St. Thomas Ultrasound Services Inc.	Belleriver	ON	Type II	Medical
2018-12-05	Centre Hospitalier de l'Université de Montréal	Montreal	QC	Type II	Medical
2018-12-05	Centre hospitalier de l'Université de Montréal	Montreal	QC	Type II	Medical
2018-12-05	University of Western Ontario	London	ON	Type II	Academic and research
2018-12-06	Canadian Border Services Agency	Various cities	BC	Type II	Industrial
2018-12-06	Canadian Border Services Agency	Various cities	BC	Type II	Industrial
2018-12-05	Advanced PET/CT Imaging Inc.	Windsor	ON	Type II	Medical
2018-12-08	Timmins and District Hospital	Timmins	ON	Type II	Medical
2018-12-10	Nelson's Welding Inspection Limited	Drayton Valley	AB	Type II	Industrial
2018-12-10	Goldcorp Canada Ltd.	South Porcupine	ON	Type II	Industrial
2018-12-11	B.I.G. Consulting Inc.	Mississauga	ON	Type II	Industrial
2018-12-11	Institut universitaire de cardiologie et de pneumologie de Québec	Québec	QC	Type II	Academic and research
2018-12-11	Lake Shore Gold Corp.	Porcupine	ON	Type II	Industrial
2018-12-11	Imerys Talc Canada Inc.	Timmins	ON	Type II	Industrial
2018-12-11	Texel Technical Materials	Sainte-Marie	QC	Type II	Industrial
2018-12-11	Halliburton Canada	Nisku	AB	Type II	Industrial
2018-12-12	Saga Engineering Inc.	Edmonton	AB	Type II	Industrial
2018-12-12	Buffalo Inspection Services (2005) Inc.	Edmonton	AB	Type II	Industrial

2018-12-12	Groupe Tilton Inc.	St-Augustin-de-Desmaures	QC	Type II	Industrial
2018-12-12	Northern Sun Mining Corp.	South Porcupine	ON	Type II	Industrial
2018-12-12	MPI Paper Mills of Porneuf	Portneuf	QC	Type II	Industrial
2018-12-12	Magnum Perforating Services Inc.	Drayton Valley	AB	Type II	Industrial
2018-12-12	Timmins and District Hospital	Timmins	ON	Type II	Medical
2018-12-13	Streamline Inspection Limited	Fort Saskatchewan	AB	Type II	Industrial
2018-12-14	Thurber Engineering Ltd.	Calgary	AB	Type II	Industrial
2018-12-14	Terraprobe Testing Ltd.	Stoney Creek	ON	Type II	Industrial
2018-12-14	Mistras Canada, Inc.	Calgary	AB	Type II	Industrial
2018-12-15	Davroc Testing Laboratories Inc.	Brampton	ON	Type II	Industrial
2018-12-15	Englobe Corp.	Toronto	ON	Type II	Industrial
2018-12-18	RTD Quality Services Inc.	Calgary	AB	Type II	Industrial
2018-12-18	The Pepsi Bottling Group (Canada), ULC	Calgary	MB	Type II	Industrial
2018-12-19	Taylor Geotechnical Ltd.	Canmore	AB	Type II	Industrial
2018-12-20	Soil Engineers Ltd.	Richmond Hill	ON	Type II	Industrial
2018-12-20	LEA Consulting Ltd.	Markham	ON	Type II	Industrial
2018-12-20	Glatfelter Gatineau Ltée	Gatineau	QC	Type II	Industrial