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RE: NPRI-CNSC ENGO Comments on Data Linkages

February 12, 2023

We have long been advocates for community right-to-know and as a result are involved in matters concerning the National Pollutant Release Inventory (NPRI). Our goal is to have a system that the average person can use to easily find out what pollutants are being released in their community. This is essential for the public to be able to take action to reduce or eliminate pollution threats and to affect government requirements around toxic pollution.

To make NPRI more effective at contributing to this goal, we push for the addition of pollutants to the NPRI reporting requirements so the public can get a more complete picture of contaminant threats to their communities. We are exposed to a complex mix of contaminants that cumulatively affect our well-being jointly – not just one at a time, but additively and in synergy. It is for this reason that we have pushed to have data on releases, disposal and off-site transfer of radionuclides to be readily accessible through the NPRI.

Environment and Climate Change Canada (ECCC) and the Canadian Nuclear Safety Commission (CNSC) decided to address this request by setting up “linkages between the NPRI and CNSC radionuclide data with access from the NPRI website.”

In November 2022, ECCC and CNSC invited us to test the system that they have put into place to achieve that goal. Attached is a report including in full the results and conclusions that each of us wrote as we were testing the system.

Sadly, our unanimous reaction was one of extreme disappointment with the results. The linkages made don't even begin to achieve the goals that we set in the above paragraphs.

In this brief statement, we summarize how the new system fails.

Problems at NPRI site:

- a) You can't use the NPRI search tools to search for radionuclides. You must know the name of a facility that you think may release radionuclides but often the name commonly used for the facility may not come up when you search for it.
- b) If you do get the proper company, you have to roll down several pages through the company's report before getting to any mention that they might release radionuclides or a link to CNSC.

In summary, the NPRI search function does not work for radionuclides and, therefore, one can spend a lot of often unsuccessful and frustrating time looking for the link to CNSC in a lengthy guess-work game.

Problems when transfer to CNSC site:

- a. To access the data on the CNSC site, you must download a csv file, which a lot of people aren't used to or don't have access due to a lack of computing and/or software capacity. Only very experienced users with high-capacity systems are likely to be able to use the CSV files for anything of importance. The system must work for average civil society users. The CSV system is not user friendly for non-experts and managing large data sets is intimidating. The NPRI is supposed to be available and accessible to people without special training, expertise or equipment.
- b. NPRI data are broken down for each facility by releases to air, land, water, and transfers off site or to disposal. All of this is essential information. In CNSC, only a number for stack emissions and a number for direct discharge are shown on the CNSC page that NPRI directs you to.
- c. It is not easy to compare releases, etc. from year to year. This is essential to be able to assess whether progress is being made.
- d. In CNSC, the facility is not required to report the radionuclide unless it is required by the CNSC license/permit. This means that facilities may be releasing radionuclides that are not reported to CNSC. In the NPRI, facilities must report all NPRI substances even if their permit doesn't require it.
- e. Having a bunch of facilities in one table, as is the case in the CNSC system, makes it more difficult to do facility-specific analysis.
- f. We found many facilities not reported, e.g., 10 CNSC licensed waste management facilities in Serpent River (Elliot Lake) did not show up in NPRI data. This means that a person searching on NPRI would not have been told to look on the CNSC site. In the opposite situation, there weren't even data on these waste management facilities in CNSC's CSV files on releases from uranium mines and mills.
- g. If you don't have a high-capacity computer and speedy downloading capacity, the CNSC site is too sophisticated to be useful for an average person. And it is just too frustrating to keep trying.
- h. There may be data elsewhere on the CNSC website on some of the items we couldn't find, but we don't know because there is no easy search mechanism to find data on the CNSC site through links, etc.

- i. NPRI-CNSC sites are not integrated to be able to easily compare any relationships between radionuclides and other pollutants released. Users are required to move back and forth between very different data bases to get information about a facility, and even when you do that, the data may not be comparable, e.g., CNSC not showing waste disposal and transfers off site or where they are transferred to. You need to be able to easily aggregate data on NPRI pollutants and radionuclides. This is essential to get an overall view of the risks that a facility poses to a community or a watershed.

This is only a brief summary of the problems. We urge you to carefully read the detailed results in the attached “NPRI-CNSC-Link-Test” file. It will help you understand in full detail how the system fails and show you what needs to be changed to make it more workable.

Radionuclides – NPRI-CNSC link – Testing

- John Jackson, January 19, 2023

The following observations are the result of several efforts of mine using the NPRI-CNSC link for radionuclides. Overall, I found it to be a very unsatisfactory experience. I am approaching it primarily from the perspective of a community activist wanting to know what is happening in their area.

1) Finding facilities in NPRI releasing radionuclides:

A prime benefit of NPRI is being able to find facilities and locations where a substance is used. That prime function doesn't exist in NPRI for radionuclides. The normal search functions of NPRI, e.g., finding which facilities are releasing radionuclides, being able to look by your community or province for releasers of radionuclides. You must already know the name of the facility that is likely to be releasing radionuclides to get confirmation and then all that does is take you to the link to the CNSC data for the facilities. And even that may be a challenge because you may not know the facility name that NPRI uses, and you may have to make several tries before you get the right name. This lack of a search function for radionuclides in NPRI basically takes away the value of using the NPRI to get to the NPRI-CNSC link.

Another problem in the NPRI search function is that once you get to the right facility, it is quite likely that you will hit the "releases" function to find radionuclides. If you do this, you won't find any reference to radionuclides. You have to hit the "facility" function in order to find the reference to CNSC and radionuclides.

It also raises a few questions. Who decides to put in the reference in NPRI under a facility to go to CNSC link? When a facility reports to NPRI is there a question for the reporter to state whether they release radionuclides?

2) Information found on CNSC website:

- On the CNSC site, all of the facilities are not required to report on all the same radionuclides as each other. When we asked EEEEC about that we were told that they only have to report on the radionuclides that are referenced in their individual operating permit. This is not the situation with NPRI. In NPRI, if they release a substance in the NPRI list, they have to report on it even if it isn't specifically referenced in their operating permit. This situation in the CNSC site is unacceptable because if a substance is released from one facility and is considered a dangerous pollutant, it is also a dangerous pollutant if released by another facility.
- In CNSC, there are not limits in terms of the amount of release below which they do not have to report, i.e., there aren't any thresholds. In NPRI with most substances (except for items like dioxins and furans) companies do not have to report if their release is below a certain threshold. The CNSC data set is better than the NPRI because facilities have to report regardless of how small their releases are.

- Categories for releases discharged to: On CNSC, the release data is reported by only two categories: stack emissions, and direct discharge. By contrast, the NPRI requires reporting of releases separately by air, land, and water. Knowing where a pollutant is being discharged to is very significant.
- Reporting of disposal or transfers off-site: Unlike the NPRI, CNSC does not provide data separately by disposal on site, disposal off site, transfer off site and recycling. This is important information in understanding the risks that a facility poses. This information may be available on other tables but the benefit of NPRI data is that you can get all of this data without having to seek out other tables. That is essential for useful community right to know – ease of access not long searches to find the right place.
- Multi-year data is not easily available
- It would be much simpler for the user, if it took you directly only to the facility you were searching for, e.g., Bruce Power. Instead, you get a list with all of the facilities in the same list.

Comments on NPRI-CNSC linkages
Jamie Kneen January 20, 2023

I reviewed the PDFs and the linked web pages and was shocked by how incomplete and difficult to use the web pages are.

1. Even if the CNSC site were not overrun with promotional material and even moderately accessible and intuitive to use, having radionuclide data separate from all other substances makes it impossible to get a picture of overall releases, whether from one facility or any aggregation of facilities, without creating one's own set of tables.
2. I looked at the CNSC open data for uranium mines and mills (<https://open.canada.ca/data/en/dataset/6ed50cd9-0d8c-471b-a5f6-26088298870e>). What's there is useless – it only gives total amounts, no indication whatsoever of what form releases were in or whether they are off site or on site. Given the amounts specified, it seems likely that we are looking at liquid effluent, not tailings or waste rock. There's an indication that stack releases are “NRM” (not required to monitor) but no explanation of that either. Finally, only uranium, thorium-230, radium-226, lead-210, and polonium-210 are reported, not radium. Radium 226 is covered by the MDMER, so presumably reporting on it would be easy.
3. Speaking of the MDMER, the latest annual report on <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/sources-industry/mining-effluent/metal-diamond-mining-effluent/data-annual-reports.html> is 2019 - Is that really the latest data available?
4. The open data map is useless – it looks nice but nothing appears on the map, though searching does produce a nice list of documents. I tried it in two different browsers in case it was a browser issue, but no luck.

I wish I had been able to attend the briefing session, as it might have spared me some (considerable) time in trying to navigate and decipher all of this on my own, but I think that in itself is a solid indictment of this system as I am an experienced researcher, and I can only conclude that what I want to find is either not there or excessively difficult to retrieve and interpret.

Radionuclides and NPRI Linkages with CNSC

Judi Krzyanowski, January 20, 2023

Objectives: Make NPRI and CNSC aware of 1) our concerns with NPRI-CNSC radionuclide data sharing mechanism, 2) tell them what changes need to be made in the CNSC reporting to make it more equivalent to the NPRI, and 3) state what still won't be achieved even if the steps in item 2 are carried out.

Objective 1:

Several concerns have emerged regarding how radionuclide data are supposedly 'shared' or 'linked' between the NPRI and CNSC databases. Most of these issues became apparent during the November meeting we had with CNSC, during which I took the liberty of following along with the presenters in trying to access the data as suggested. Although the meeting and presentations were very informative, the following issues stand out the most:

1. When you search for a known nuclear facility using the [NPRI data search](#), one must scroll, all the way to the bottom of the page, past information on pollution prevention (P2) plans, to a section entitled: "other environmental programs", which gives a link the CNSC for datasets on radionuclide releases from CNSC regulated facilities.
2. Conversely, when you search for a specific nuclear facility through the [NPRI dashboard](#), Darlington for example, it provides the usual information on NPRI-reported substances for that facility, but **no indication** that radionuclides are an additional regulated substance released from that facility, **nor is there any link** to the CNSC or related information to be found.
3. Following the [CNSC link](#) found through the data search query, provides the option to download datasets of radionuclide releases from Power Plants, Processing Facilities, Uranium Mines and Mills, or (at the bottom below Notes and MetaData) Canadian Nuclear Laboratories. The datasets contain data from all facilities in the category chosen, and for all substances dating back to 2011 for Power Plants, and 2013 for Processing Facilities, Mines and Mills, and Laboratories. It isn't clear whether any reporting was required prior to 2011, or why there is a discrepancy in the first reporting year between facility types. Luckily there are not too many nuclear facilities in Canada or the datasets would be enormous. The largest of the datasets, for Nuclear Power Plants, has only 499 data rows, whereas an NPRI datasets for all reporting facilities over even a single year has tens of thousands of rows of substance release data. That being said, members of the general public who may not be used to large datasets or spreadsheet manipulation, a few hundred rows of data can still be intimidating, if not impossible to manage.

Objective 2:

Comparing the CNSC data with the NPRI datasets, format, and user requirements; the following are suggestions to allow better integration of CNSC data with the NPRI. Suggestions are in reverse order—the simplest to implement and oft least effective, are given at the top of the list.

1. Standardize reporting requirements, at least among facilities of the same class (e.g., mines vs., research laboratories) so that data are meaningful. As it's being presented only as a single spreadsheet, comparability between data is implied and expected.
2. Have a link to CNSC data from DashBoard, that is at minimum identical to that on the NPRI data search page(s) (see above, 1.1).
3. Have a link within the NPRI data tables—be they downloaded .csv files; or on-screen, in-browser results seen at a facility-level—that take you to the CNSC site, allowing users to know that radionuclides are regulated at all; and illustrate the potential for other substances of concern to be emitted from facilities already regulated by the NPRI.
4. The CNSC could report data to the NPRI for data addition (as a single entity or separate ones).
5. the facilities who emit radionuclides, most of whom report some substance(s) to the NPRI already, could also report their radionuclide emissions (one stop shop for public users).

Objective 3:

1. both NPRI and CNSC should provide context as to how data compare, vary, provide when viewed between facilities, between years, etc. This is a consistent conundrum.
2. The list above has increased improvements.

Radionuclide Data Linkages

Review of Radionuclides Reporting and CNSC Data Site and NPRI Site

Review by Brennain Lloyd, Northwatch

1. Background and Context

The Canadian Environmental Law Association (CELA) invited Northwatch to prepare a brief setting out findings of a review of the Canadian Nuclear Safety Commission (CNSC) approach on radionuclides data, and within that review to consider the approach and accessibility, usability of the data and what needs to be changed, including accessibility to information through the NPRI website search function.

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of releases, disposals and transfers. It tracks over 320 pollutants from over 7,000 facilities across Canada. Reporting facilities include factories that manufacture a variety of goods, mines, oil and gas operations, power plants and sewage treatment plants.¹

As background to this review note, I participated in a series of stakeholders meetings, including a 3rd Meeting of the NPRI-CNSC Data Linkages Development Interested Stakeholders on Tuesday November 15, 2022, observed a related presentation by CNSC staff to the Commission on 25 January 2023, reviewed NPRI-CNSC meeting materials, and spent time utilizing both the NPRI and CNSC data platforms for purposes of observation and comparison.

Of note is that while a 25 January update from CNSC staff to the Commission was on the related matter of the assessment of the relevance of the inclusion of radionuclides as a chemical of mutual concern under Annex 3 of the Canada-United States Great Lakes Water Quality Agreement, the Commission Member Document and the staff presentation did not include any update or even mention of the NPRI-CNSC data linkages project. A search of the CNSC web site yielded no documents through which the CNSC staff briefed the Commission or sought direction from the Commission with respect to CNSC-NPRI linkages, although it must be noted that the search function of the CNSC web site is not wholly reliable.

A brief description of the NPRI is included in Environmental Reports prepared by CNSC staff as part of license reviews for nuclear facilities. A recent such report was prepared for the relicensing of the Darlington Waste Management Facility, and included the following description:

CNSC staff conducted a search of the NPRI database, reviewed the data for the DN site (in other words, the DNGS), and did not notice any trends or unusual results. It is worth noting that radionuclides are not included in the inventory of pollutants in the NPRI database. However, the CNSC receives radionuclide loadings from CNSC licensees through other means, such as annual and quarterly reports. This information has been used in this report, but the complete dataset is available for download on the CNSC's Open Government Portal.²

Environmental Protection reports, formerly referred to as "Environmental Assessment Reports" are not published on a regular basis and are not a substitute for regular public access to data about a facility's

emissions. For example, a report has not been published for the Darlington Nuclear Generating Station since 2015 or for BEST Theatronics since 2013.³

2. Observations with Respect to Accessing Radionuclide Data through the NPRI-CNSC Linkage

Following the demonstration and discussion provided during the 15 November 2022 stakeholder meeting, our next objective was to “test run” the linkages which had been described during the stakeholder session.

Our interest is primarily in assessing the usability of these tools for members of the public. It is likely that I have an above average level of comfort dealing with online registries and information systems (compared to the average member of the public) and I have been a frequent user of the CNSC web site and a more-than occasional user of the NPRI over a number of years, so the “test run” may not provide a true picture of the experience of an average Canadian attempting to access information through these systems, particularly as a first time user, i.e., that average Canadian may experience greater difficulties.

Initial Assessment

For the purpose of making this assessment, I first entered the systems several weeks after the meeting and without reviewing the meeting materials, seeking the best approximation of that average interested Canadian’s experience.

My first effort was to visit the NPRI web site and look for information about radioactive releases from nuclear facilities.

Knowing that there had been a recent Environmental Report for the Darlington Waste Management Facility, this was the first facility for which I did a “test run”.

I first entered “NPRI” into a google search, which yielded thousands of hits, with the first two having different urls:

[National Pollutant Release Inventory - Canada.ca](https://www.canada.ca/pollution-waste-management)

<https://www.canada.ca/pollution-waste-management>

Nov 25, 2022 — Guidance and tools on reporting to the inventory, accessing, analyzing and downloading data. Note. Reviewed NPRI data is now available up to ...

[Explore Data Page](#) · [Reporting to the NPRI](#) · [Substance list](#) · [Tools and resources](#)

[National Pollutant Release Inventory data search - Canada.ca](https://pollution-waste.canada.ca/national-release-inve...)

<https://pollution-waste.canada.ca/national-release-inve...>

Welcome to the new National Pollutant Release Inventory (NPRI) data search tool. You can use this tool to search detailed information on pollutant releases ...

The first url opened to the following links being displayed at the top of the page:

Reviewed NPRI data is now available up to 2021. You can download the data from our [Explore Data page](#). Additionally, NPRI data is also available on the [NPRI Dashboard](#) and [NPRI data search](#). For technical support to access the data, please email us at inrp-npri@ec.gc.ca.

The “Explore Data page” link then offered links – again – to the NPRI Dashboard and NPRI data search.

After clicking on the link to the NPRI Dashboard, a page opened that at the top of the page described the NPRI data search, and included a note that “other datasets are available for facilities that also report to the Greenhouse Gas Reporting Program (GHGRP) and the Canadian Nuclear Safety Commission (CNSC) on radionuclides” but there was no hyperlink those other datasets in the text, and there was no link provided in proximity to this text.⁴

National Pollutant Release Inventory data search

Welcome to the new National Pollutant Release Inventory (NPRI) data search tool. You can use this tool to search detailed information on pollutant releases (to air, water and land), disposals and transfers for recycling reported by facilities to the NPRI. You can also use this tool to display facility data by location, sector and substance as well as to view pollution prevention information. Links to other datasets are available for facilities that also report to the Greenhouse Gas Reporting Program (GHGRP) and the Canadian Nuclear Safety Commission (CNSC) on radionuclides.

There was additional text at the bottom of the same page which seemed like a likely location but also did not include an easily recognizable link to the CNSC data set on radionuclides.⁵

On the page titled “National Pollutant Release Inventory data search”⁶ there were two search boxes, one to indicate the year of the search and the one for the facility.

Entering the name of a known facility licensed by the CNSC, “Darlington Waste Management Facility”, the result was “Nothing found – Sorry. No Records Available”.

Entering just “Darlington”, the search produces two facilities, one for Darlington Nuclear and one for Port Darlington WCPC.

Selecting NPRI ID 3163 facility “Darlington Nuclear” the user is taken to a standard NPRI facility page.⁷

When a user clicks on the buttons for Substances, Releases, Disposals and Transfers the reported releases are for non-radionuclides (Ammonia, Hydrazine and Nitrogen oxides to air and / or water) with no reported releases to land. The only transfers identified for off-site disposals are Sulphuric acid and Hydrazine.

In the sections of the facility report related to Substances, Releases, Disposals and Transfers there is no identification of other information sources and no acknowledgement of other releases from the facility, i.e., releases of radionuclides. Only under the tab for “facility” is the source for information on the release of radionuclides identified.⁸

Under the tab for “facility” source for information on the release of radionuclides identified at the bottom of the page. On the system and screen being used for the test, with the screen set to zoom at 75%, this information was located five screens down from the top of the page.



Other environmental programs

Canadian Nuclear Safety Commission (CNSC)

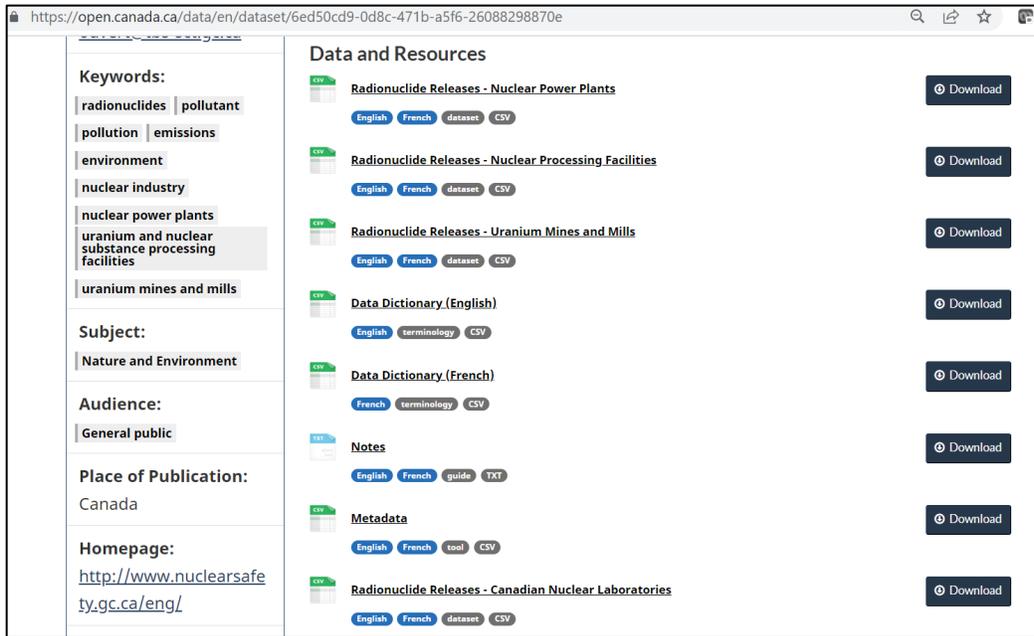
This is a nuclear facility regulated and licensed by the Canadian Nuclear Safety Commission (CNSC). [Click here](#) to obtain additional information including reporting on safety and environmental aspects of this facility and its operations. [Click here](#) to obtain datasets on radionuclide releases to the environment from CNSC licensed facilities.

The first link opens to a page with largely very general information about the Darlington Generating Station.⁹ There is no reference or link to information about the Darlington Waste Management Facility.

At the absolute bottom of this page, four screens from the top of the page, the final item reads as follows:

- [Radionuclide releases](#): Nuclear Power Plants dataset in the Open Government catalogue for information on releases from this facility

Selecting the [Radionuclide releases](#) link takes the user to the Open data web site and a page titled “Radionuclide Release Datasets”¹⁰.



There was no means of viewing the data except to download it as a CSV file and then open the CSV file from the user's storage drive. The exception was the "Notes" file, which downloaded as a text file.¹¹

Upon downloading and opening the CSV file, information is displayed per year, per facility. In the case of the Darlington Site, releases were listed for Elemental Tritium (HT), Tritium (HTO), Carbon-14, Total noble gases, Iodine-131, Particulate (gross beta/gamma), Particulate gross alpha, and Estimated public dose.

There was no identification of source, no distinction between the two licensed facilities (Darlington Waste Management Facility and Darlington Nuclear Generating Station), no clear identification of which releases were to land, water, or air, and the format made it difficult to compare year-to-year increases or decreases.

A "test run" for Cameco's uranium refinery in Blind River yielded similar results. In the NPRI search function, the search terms "Cameco" or "refinery" yielded results, but disappointingly the search term "uranium" produced no results in either the simple search or the advance search.

A search for data on releases from the ten CNSC-licensed uranium tailings management facilities in the Serpent River basin on the North Shore of Lake Huron (Elliot Lake) yielded no results in the NPRI facility search and no data was included in the CNSC's CSV of release from uranium mines and mills.

There was no data set listed by the CNSC for waste management facilities.

Review of Guidance to Accessing Data Provided during the November Meeting

After completing the initial assessment (described above) without the advantage of having reviewed the instructions and demonstration provided during the November 2022 stakeholders meeting, the presentation slides were reviewed.

In this retrospective review, it was determined that the slides by Environment Canada and Climate Change titled “Accessing Radionuclide Data and Next Steps” were not inaccurate, but they did not flag the fundamental flaws, such as the linkages to the radionuclides data from the NPRI page being placed in a position of least prominence and without prominence, making them very easy to miss. In essence only the user who knew that the link was to be there and persisted until finding it would be likely to make the connection to the CNSC data about radionuclides.

The slides on the Open Science and Data were helpful, but it must be stressed that no link could be found on the NPRI facility report pages¹² or on the CNSC “Radionuclide Release Datasets” page.¹³ If there is an explanatory note and link to the Open Science and Data site from either the NPRI facility reports, the NPRI “Explore National Pollutant Release Inventory data” page,¹⁴ the “Radionuclide Release Datasets” page¹⁵ it was not readily visible, even when looked for.

The Open Science and Data Platform appears to be a very valuable resource and likely to be of interest to users of the NPRI searching for information on the release of radionuclides and other contaminants from nuclear facilities. Unfortunately, it does not appear to be linked from the NPRI or from the “Radionuclide Release Datasets” page¹⁶. In addition, quite likely due to aging and other limitations on the computer being used, functionality was very limited and certain tools were not operable. This is likely to also be the case for at least some portion of public users.

Interestingly, when entering “radionuclides” as the search term in the Open Science and Data Platform, the first “hit” was a report on “Quantifying historical releases and pre-operation levels of metals and radionuclides” and fully pertained to releases of radionuclides in the Serpent River basin, for which the NPRI and CNSC searches had yielded no results, even using several different key word searches. The report¹⁷ was accessible by clicking through several layers. While of definite interest, the report included no information about ongoing releases from the water treatment plants for the ten uranium mine tailings management areas under CNSC licence in the Serpent River basin.

The slides from CNSC titled “CNSC Update for the NPRI CNSC Meeting with Stakeholders” were included in this retrospective review. As with the slides from Environment Canada and Climate Change titled “Accessing Radionuclide Data and Next Steps”, they were found to be largely accurate, although in our experience the statement that the CNSC facility pages “allow a user to find all relevant reports, environmental assessments, and other information provided by the CNSC” is not supportable.

As with the EC3 slides, the CNSC presentation did not flag the fundamental flaws, such as the linkages to the radionuclides data from the NPRI page being placed in a position of least prominence and without prominence, making them very easy to miss. In essence only the user who knew that the link was to be there and persisted until finding it would be likely to make the connection to the CNSC data about radionuclides.

Slide 8 in the CNSC presentation announces that “Partnered with NRCAN to get database on their geospatial platform”, but as noted it does not appear to be linked from the NPRI or from the “Radionuclide Release Datasets” page, or from the CNSC “facility” page¹⁸.

3. Concerns with NPRI-CNSC radionuclide data sharing mechanism

The largest concern is that the data is not integrated, requiring users to move between two differently structured data sets and data systems to acquire basic information about releases from a facility.

Related concerns include but are not limited to the following:

- The information user receives a disaggregated set of information about a single facility
- The information user is not able to consider releases from a facility in their totality
- If there are patterns between facilities, i.e., repeated co-occurrences of radio-contaminants and other contaminants these patterns or co-occurrences are more difficult to identify
- It potentially messages to members of the public that radionuclides are not contaminants of concern
- It messages to members of the public that radionuclides are not subject to an equivalent level of regulation and/or oversight as other contaminants
- Members of the public using the National Pollutants Release Inventory would have a reasonable expectation that the NPRI inventory includes all pollutants, not just non-radioactive pollutants

Presumably the intent of creating the linkages between the NPRI and the CNSC data set is a good faith effort to address the concerns outlined above. However, efforts to date show several serious limitations.

While addressing the failures set out in the following section of this review will not fully address the fundamental concern, they could be readily addressed within the present structure / system, which would make the current stop-gap approach more functional.

The flaws identified within the current system include but are not limited to the following:

- there are no well-placed and easily identified links to the CNSC data in the NPRI system, on either the search page or the facilities pages
- the only links to CNSC information (i.e., the only information about radio-contaminants) are at the very bottom of the page under the tab ‘Facility’ on the NPRI search result pages
- In the pages of the facility report related to Substances, Releases, Disposals and Transfers there is no identification of other information sources and no acknowledgement of other releases from the facility, i.e., releases of radionuclides (as noted above, the links appear only under the tab for ‘Facility’)

If and when a user arrives at the notice at the very bottom of the Facility page (having clicked on the ‘Facility’ tab, it being the only one that includes any link to the CNSC data), they will have finally arrived at the link to the data on the release of radionuclides. However, its placement at the very bottom of the page without any highlighting reduces the likelihood of a user ever arriving at these links. Further, the description associated with the links is somewhat misleading, in that the supporting sentence for the first link indicates that the user should ‘Click here to obtain additional information including reporting on safety and environmental aspects of this facility and its operations’, but the link leads to a page with only a subset of CNSC information about that facility. Similarly, the supporting sentence for the second link indicates that the user should ‘Click here to obtain datasets on radionuclide releases to the environment from CNSC licensed facilities’, but data is provided only for a subset of CNSC licensed facilities.

After clicking “to obtain datasets on radionuclide releases to the environment”, the user is confronted by a listing of links to CSV files as the only means of viewing the data. This is problematic for a number of reasons, including but not limited to the following:

- Many users are reluctant to download files from sites they are unfamiliar with, including government sites
- Users on public computers, such as in a library, are likely to be unable to download the information; if they are able to download the information to the hard drive of this public computer, they are quite likely to be unable to access the hard drive to retrieve the data
- Many users would be unfamiliar with CSV files and so more reluctant to go through the multiple steps when having to access the data in this manner
- Except for very experienced users, making the data available only through CSV files limits the users ability to display or review the data in any graphic or visual presentation.

With respect to the provision of data only in CSV files, the issue is not the provision of data in CSV files, the issue is that it is ONLY in CSV files. Making the data available in CSV format is fully supported, and some users will prefer accessing the data in this format. However, for the general public, this is not a user friendly method, particularly when a download of files is required. Again, the issues is that the data is available ONLY in CSV files.

In addition to the above observations about style and structure of the information system, there are two additional issues of significance:

- The CNSC data is overly aggregated; for example, the data for the Darlington site (presumably) combines releases from the waste management facility and the nuclear generating station, it does not identify sources, and does not clearly identify releases to air, water, land, etc.
- The CNSC data excludes some licensed facilities, and so provides an incomplete accounting of even the subset of sources of radio-contaminants coming from CNSC licensed facilities (noting that radionuclides are used and released to the environment from facilities and sectors which the CNSC does not license)

4. Changes Required to Make the CNSC Reporting System More Equivalent to the NPRI

Broadly speaking the only means of making the CNSC reporting system equivalent to the National Pollutants Release Inventory system is to include radionuclides in the NPRI reporting system.

In advance of that, several short term measures could make the CNSC reporting system at least somewhat more equivalent, although still not equivalent. Those measures include but are not limited to the following:

- Identify that the releases are to air, water or land
- Use a table system to depict the information, more similar to those used in the NPRI
- For substances being released, include links to additional information about each substance and its release, e.g., releases on a monthly basis, comments and reasons for changes in releases
- Include a link to the pollution prevention plan for each facility (such a plan should be required)
- For discharges to air, include sources, such as stack/point, storage/handling and fugitive
- For discharges to water, include direct discharges, spills and leaks

- Include discharges to land
- Include On-site disposals and Off-site disposals, including Transfers for off-site treatment prior to final disposal and Transfers for off-site recycling

At a very minimum and as an immediate measure, the links to the CNSC data page should be clearly and prominently displayed at the “entry” page on the NPRI, on each Facility page, and on the pages for Substances, Releases, Disposals and Transfers for each facility.

5. Consequence if Required Changes are Not Applied

The consequence of not implementing these changes are obvious: the continued exclusion of radio-contaminants from the NPRI reporting system means that Canadians relying on the NPRI to understand the range and load of contaminants they and their community are being exposed to are not being given access to the available information.

In effect, this is discriminatory against Canadians and communities which are host to nuclear facilities and nuclear activities. They may be subject to ongoing releases and may be accumulating the burden of these releases in their bodies, their soil, and their water, but they are not being provided the same access to this information as Canadians who are concerned about other contaminants being released into the environment.

Another potential or likely consequence is reduced confidence in the National Pollutants Release Inventory and in the administering agencies, namely Environment Canada and Climate Change and the Canadian Nuclear Safety Commission. By extension, this will be a loss of confidence in government more generally.

These consequences are avoidable. The NPRI is a developed information system which is relatively well known to Canadians. The Canadian Nuclear Safety Commission has a sophisticated system of collecting information from licensees and has within its internal information systems all the data required to supply equivalent information to the National Pollutants Release Inventory.

ENDNOTES

- ¹ <https://www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/about-national-pollutant-release-inventory.html>
- ² <https://nuclearsafety.gc.ca/eng/resources/publications/reports/dwmf22/index.cfm#sec6-1>
- ³ <https://nuclearsafety.gc.ca/eng/resources/environmental-protection/reviews/index.cfm>
- ⁴ <https://pollution-waste.canada.ca/national-release-inventory/>
- ⁵ <https://www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/tools-resources-data.html>
- ⁶ <https://pollution-waste.canada.ca/national-release-inventory/>
- ⁷ <https://pollution-waste.canada.ca/national-release-inventory/2021/3163>
- ⁸ <https://pollution-waste.canada.ca/national-release-inventory/2021/3163>
- ⁹ <https://nuclearsafety.gc.ca/eng/reactors/power-plants/nuclear-facilities/darlington-nuclear-generating-station/index.cfm>
- ¹⁰ <https://open.canada.ca/data/en/dataset/6ed50cd9-0d8c-471b-a5f6-26088298870e>
- ¹¹ Interestingly the “Notes” file indicated that “Data are current as of January 1, 2019” at the time of downloading in January 2023.
- ¹² See, for example, the Facility Report for Cameco’s uranium refinery at <https://pollution-waste.canada.ca/national-release-inventory/2021/3657>
- ¹³ <https://open.canada.ca/data/en/dataset/6ed50cd9-0d8c-471b-a5f6-26088298870e>
- ¹⁴ <https://www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/tools-resources-data/exploredata.html>
- ¹⁵ <https://open.canada.ca/data/en/dataset/6ed50cd9-0d8c-471b-a5f6-26088298870e>
- ¹⁶ <https://open.canada.ca/data/en/dataset/6ed50cd9-0d8c-471b-a5f6-26088298870e>
- ¹⁷ <https://www.sciencedirect.com/science/article/pii/S0265931X21001557?via%3Dihub>
- ¹⁸ See, for example, the Facility Report for the Bruce Nuclear Generation Station at <https://nuclearsafety.gc.ca/eng/reactors/power-plants/nuclear-facilities/bruce-nuclear-generating-station/index.cfm>

Comments on NPRI and Reporting on Radionuclides – “Linkages”

Anna Tilman, Jan 28, 2023

Objective: Indicate to NPRI and the CNSC concerns with the NPRI-CNSC radionuclide data sharing mechanism, what changes need to be made in to make the CNSC reporting or equivalent and/or similar to the NPRI, and even so, consider limitations as to what can be or not achieved even if recommended steps are carried out.

Overall Concerns:

I have been working on the CNSC data linkages as a test. To date, I have found these linkages awkward and incomplete – with no context, especially compared to the coverage of NPRI data for other facilities and substances.

Example of Radionuclide Release Datasets – Linkage to NPRI

The linkage table is massive, and at the same time limited and awkward. I have used this linkage table as an example of what is involved in extracting the data for a specific facility, in this case the Darlington Nuclear Station for 2 years. This station also reports to the NPRI for other (non-radioactive substances).

Nuclear Power Plants –Darlington- Stack Emissions (Becquerels)

Year 2019

Elemental Tritium (HT)	Tritium élémentaire	Bq	2.50E+13
Tritium (HTO)	Tritium (Eau tritiée)	Bq	2.00E+14
Carbon-14	Carbone-14	Bq	9.70E+11
Total noble gases	Total des gaz nobles	Bq- MeV	5.00E+13
Iodine-131	Iode-131	Bq	1.40E+08
Particulate (gross beta/gamma)	Particules (bêta brutes/gamma brutes)	Bq	2.60E+07
Particulate gross alpha	Particules alpha brutes	Bq	1.30E+06
Estimated public dose	Dose estimée au public	mSv/a	0.00004

Year 2016

Elemental Tritium (HT)	Tritium élémentaire	Bq	1.70E+13
Tritium (HTO)	Tritium (Eau tritiée)	Bq	1.80E+14
Carbon-14	Carbone-14	Bq	1.60E+12
Total noble gases	Total des gaz nobles	Bq- MeV	1.60E+13
Iodine-131	Iode-131	Bq	1.40E+08
Particulate (gross beta/gamma)	Particules (bêta brutes/gamma brutes)	Bq	3.20E+07
Particulate gross alpha	Particules alpha brutes	Bq	5.00E+06

Estimated public dose	Dose estimée au public	mSv/a	0.0006
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Commentary

While there are several years of data for nuclear power plants for specific radionuclides, as the tables above indicate, it is important to note that the data was with reference to stack emissions, none to water, land, or disposal, etc. These are the parameters of concern and, if not included, differentiate the level and depth of reporting to the NPRI from other industrial sectors. It is not clear whether all radioactive substances are included. There is no “permit limit” or “cap” to indicate how these reported emissions relate to permissible levels (although that would be unique compared to other sectors.)

Given the length of the linkage table and its actual physical layout, it is very awkward to use and takes time to extract the rather short amount of information provided. There would be no reason why each plant would not have its own listings, as other facilities do that report to the NPRI, rather than relying on such an approach.,

This could well be a problem that relates to CNSC and how it “manages” these facilities. For example, there are no values set that would **require** reporting on radionuclides. It is not clear what radionuclides should be reported, other than those listed on the CNSC linkage site (refer to tables above).

In that many of the nuclear facilities do report to the NPRI on other substances, one should be able to retrieve similar information on releases and transfers of radionuclides from a specific facility without having to peruse a list including all plants for several years. This complicates searching for information from one facility.

There is yet no data (linkages) for other nuclear facilities (e.g., nuclear processing facilities).

Furthermore, it is not clear whether **all** facilities that use radionuclides would be covered (e.g., educational institutes, hospitals).

In light of the noted limitations, these linkages do not provide the level of information one would expect in comparison to the NPRI data for other substances.

If the NPRI is to continue with this linkage approach for radionuclides, efforts need to be made to streamline and focus on the reporting process. Providing a table of linkages that is extensive (e.g., lists specific radionuclides for all nuclear plants for several years, for example for all nuclear power plants) may or may not be the best approach.