Environment and Climate Change Canada
Environnement et Changement climatique Canada

Federal Contaminated Sites Action Plan

2018–2019 Annual Report

Canada

Federal Contaminated Sites Action Plan: Annual Report 2018-2019

Issued also in French under title:
Plan d'action pour les sites contaminés fédéraux : Rapport annual 2018-2019

ISSN: 1929-2333
Cat. No.: En1-43E-PDF

Environment and Climate Change Canada
Public Inquiries Centre
12th Floor, Fontaine Building
200 Sacré-Coeur Boulevard
Gatineau QC K1A 0H3
Telephone: 819-938-3860
Toll Free: 1-800-668-6767 (in Canada only)
Email: ec.enviroinfo.ec@canada.ca

Aussi disponible en français

Executive Summary

Established by the Government of Canada in 2005, the Federal Contaminated Sites Action Plan (FCSAP) is a 15-year, $4.54-billion program. The program was renewed for another 15 years (2020 to 2034) with $1.16 billion announced in Budget 2019 for the first five years (Phase IV, 2020 to 2024). Its primary objective is to reduce environmental and human-health risks from known federal contaminated sites and their related financial liabilities.

In Phase I of FCSAP, federal departments, agencies and consolidated Crown corporations (also referred to as custodians) made significant progress in addressing contaminated sites. The focus of Phase II was to characterize and prioritize the federal inventory of sites, and to advance remediation on the highest-priority sites. Phase III of FCSAP increased the focus on remediation, as well as on reducing the associated environmental and human-health risks and financial liabilities. This report describes the progress made in 2018–2019, the third year of Phase III.

Phase I: 2005–2011

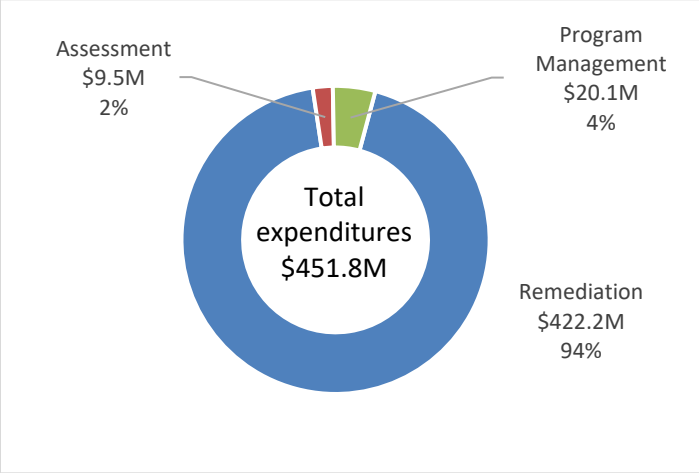
Phase II: 2011–2016

Phase III: 2016–2020

Phase IV: 2020–2025

Nationally, federal custodians involved in FCSAP reported total expenditures of $451.8 million, which includes the custodian cost share. In 2018–2019, 2% was spent on assessments, 94% was spent on remediation and risk management and 4% was spent on program management activities (Figure 1).

Figure 1: Distribution of Expenditures in 2018–2019



Overview of program results for the 2018–2019 fiscal year

- Custodians conducted assessments at 230 sites to characterize environmental conditions. Of the 96 sites that were fully assessed, 39 sites (41%) require remediation or risk management, while 57 sites (59%) require no further action because they pose no significant risk. The remaining 134 sites require further assessment.
- Custodians conducted remediation and risk-management activities at 422 sites, reducing risks to the environment and human health and reducing federal financial liability. Remediation was completed at 24 sites. The remaining 398 sites require further work.
- Approximately 2,200 jobs (person-years) were created or maintained.

Every year, the main results of the FCSAP program, including expenditures and site status, are reported in the Federal Contaminated Sites Inventory (FCSI), which is maintained by the Treasury Board of Canada Secretariat. At the end of 2018–2019, the FCSI listed a total of 23,667 sites. Compared to the inventory at the end of 2017–2018, this represents a 7% decrease in the number of suspected sites, a 2% decrease in the number of active sites being assessed or remediated and a 2% increase in sites that are closed and require no further action.

FCSAP funding allows custodians to conduct assessment and remediation work at their sites. In 2018–2019, approximately 70% of expenditures reported to the FCSI were attributable to FCSAP sites, which included both FCSAP funding and custodian cost share. The remaining 30% was for expenditures on non-FCSAP sites and federal organizations that are not part of FCSAP.

Contamination of federal sites may translate into liability for the Government of Canada. This depends on meeting certain accounting criteria. In 2018–2019, the total liability for the remediation of all federal contaminated sites increased by $768 million, from $5.710 billion to $6.478 billion. The estimated liability for sites that may be eligible for FCSAP funding increased by $695 million, from $4.695 billion to $5.390 billion. Changes in liability can occur due to adjustments for inflation and discount rate, the recording of new liabilities for unassessed sites and revised cost estimates for the remediation of federal contaminated sites. The estimated liability associated with sites that may be FCSAP eligible is expected to decline as fewer new sites are added to the federal inventory and more existing sites are remediated and closed.

For questions or comments on this report, contact:

FCSAP Secretariat
Contaminated Sites Division
Environmental Protection Operations Directorate
Environment and Climate Change Canada
351 St. Joseph Boulevard, 17th Floor
Gatineau QC K1A 0H3
Email: ec.pascf-fcsap.ec@canada.ca

Table of Contents

Executive Summary……..2

1 Introduction……..7

2 Program Results (2018–2019)…….9

2.1 Assessment…….9

2.2 Reduction of Risks to Human Health and the Environment……..……12

2.3 Liability Reduction……15

2.4 FCSAP Secondary Benefits……18

2.5 Impact of FCSAP on the Federal Contaminated Sites Inventory……..18

3 FCSAP Approvals and Expenditures…….22

3.1 Types of Funding……...22

3.2 Funding Approvals and Oversight……..22

3.3 Funding Allocations, Expenditures and Variances……..22

4 Case Studies of FCSAP-Funded Assessment and Remediation Sites……...25

5 Updates on Priority Projects……...45

Appendix A – Program Administration

Appendix B – Federal Approach to Managing Contaminated Sites

Appendix C – Data Tables

Appendix D – Environmental Liability for Federal Contaminated Sites

Abbreviations and Acronyms

AAFC	Agriculture and Agri-Food Canada
CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CSC	Correctional Service of Canada
DFO	Fisheries and Oceans Canada
DND	Department of National Defence
ECCC	Environment and Climate Change Canada
FCSAP	Federal Contaminated Sites Action Plan
FCSI	Federal Contaminated Sites Inventory
JCCBI	Jacques Cartier and Champlain Bridges Incorporated
LED	Lands and Economic Development
NAO	Northern Affairs Organization
NCC	National Capital Commission
NRC	National Research Council of Canada
NRCan	Natural Resources Canada
PCA	Parks Canada Agency
PSPC	Public Services and Procurement Canada
TBS	Treasury Board of Canada Secretariat
TC	Transport Canada

1 Introduction

The Federal Contaminated Sites Action Plan (FCSAP) is a 15-year, $4.54-billion program introduced by the Government of Canada in 2005. The program was renewed for another 15 years (2020 to 2034) with $1.16 billion announced in Budget 2019 for the first five years (Phase IV, 2020 to 2024). Its goal is to reduce environmental and human-health risks posed by the highest-priority federal contaminated sites, along with the associated federal financial liabilities. The program also provides socio-economic benefits by supporting brownfield redevelopment, promoting innovative and sustainable remediation technologies, and creating or maintaining jobs and training opportunities in the Canadian environmental remediation industry. These jobs and training opportunities extend to Indigenous people and those living in rural areas.

Federal contaminated sites are located on land or in aquatic areas owned or leased by the federal government, or where the federal government has accepted responsibility for the contamination. FCSAP projects on federal properties can include harbours and ports, military bases, airports, lighthouses, school facilities and fuel-storage tanks on reserve land, and abandoned mines. Contamination at these sites is usually the result of historical activities that took place without an understanding of the environmental consequences.

The FCSAP program provides a consistent federal approach to dealing with contaminated sites. Since the start of the program in 2005 to March 31, 2019, $4.30 billion, including the custodian cost share, has been spent on the management of federal contaminated sites through this program. This also includes funding from Canada's Economic Action Plan (2009–2011) and the Federal Infrastructure Initiative (2016–2018).

Environment and Climate Change Canada provides program administration through the FCSAP Secretariat, with support from the Treasury Board of Canada Secretariat. Environment and Climate Change Canada, Fisheries and Oceans Canada, Health Canada and Public Services and Procurement Canada provide expert advice and technical assistance to custodians in support of the program. For more information about the administration of FCSAP, see Appendix A.

FCSAP objective

Reduce human-health and environmental risks and associated federal financial liabilities at the highest-priority federal contaminated sites.

Contaminated site

According to the Treasury Board *Policy on Management of Real Property*, a contaminated site is "a site at which substances occur at concentrations that: (1) are above background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment, or (2) exceed the levels specified in policies and regulations."

Funding

FCSAP provides funding for the assessment and remediation of contaminated sites that are under the responsibility of federal departments, agencies or consolidated Crown corporations and have been contaminated by historical activities, defined as occurring before April 1, 1998.

FCSAP funds the remediation of two classes of terrestrial[1] and aquatic[2] sites:

- Class 1 – sites where there is a high priority for action or where action is required.
- Class 2 – sites where there is a medium priority for action or where action is likely required. To be eligible for funding in FCSAP Phase III, Class 2 sites must have reported FCSAP remediation expenditures before April 1, 2011.

Federal Infrastructure Initiative funding was also available to custodians in the 2016–2017 and 2017–2018 fiscal years for the assessment and remediation of federal contaminated sites.

Cost Share

FCSAP is a cost-shared program that funds 85% of total remediation costs for projects under $90 million, with custodians funding the balance. Remediation projects with total cost estimates of more than $90 million may be funded entirely by FCSAP. The program also funds 80% of total site-assessment costs, with custodians funding the balance.

This report presents program results and achievements from the 2018–2019 fiscal year, the third year of Phase III. More information on federal contaminated sites is available online at https://www.canada.ca/en/services/environment/pollution-waste-management/contaminated-sites.html.

[1] Terrestrial sites are classified in accordance with the Canadian Council of Ministers of the Environment's National Classification System for Contaminated Sites (2008): www.ccme.ca/en/resources/contaminated_site_management/management.html.
[2] Aquatic sites are classified in accordance with the FCSAP Aquatic Sites Classification System (2012).

2 Program Results (2018–2019)

This section describes the achievements of the custodians who conducted assessment and remediation activities in the 2018–2019 fiscal year. It also compares program progress against performance measurement targets established for Phase III of the Federal Contaminated Sites Action Plan (FCSAP). Case studies of assessment and remediation activities conducted during 2018–2019 at several FCSAP-funded sites are included in Section 4 of this report.

Federal departments, agencies and consolidated Crown corporations that manage federal contamininated sites are referred to as custodians in this annual report.

The indicators and targets identified in the FCSAP performance measurement strategy fall into three key program areas:

1. assessment,
2. risk reduction, and
3. liability reduction.

Overview of program results for the 2018–2019 fiscal year

- Assessment activities on 230 sites cost $9.5 million, including the custodians' share of the costs. Of the 96 sites that were fully assessed, 39 sites (41%) require remediation or risk management, while 57 sites (59%) require no further action. The remaining 134 sites require further assessment.
- Remediation and risk-management activities on 422 sites cost $422.2 million, including the custodians' share of the costs. Custodians finalized remediation activities on 24 of these sites. The remaining 398 sites require further work.
- The estimated liability for federal contaminated sites that may be eligible for FCSAP funding increased by $695 million during 2018–2019. This was mainly due to revised cost estimates for remediation, the recording of new liabilities for unassessed sites and adjustments for inflation.

2.1 Assessment

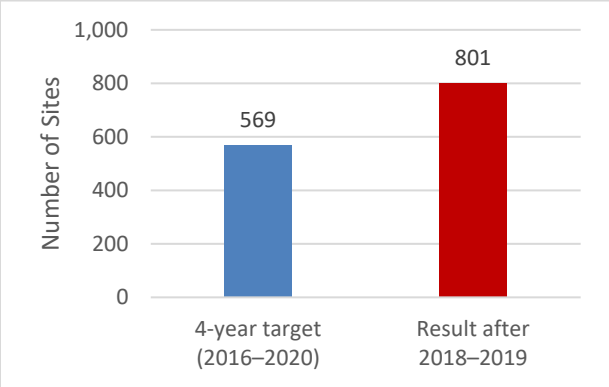
Custodians may suspect a site of being contaminated as a result of past activities – for example, in places where fuel-storage tanks may have leaked. In such cases, custodians can conduct environmental site assessments to determine the nature and extent of contamination,

or contract a specialized firm to carry out this work. An assessment determines whether remediation or risk-management activities are required at the site.

In 2018–2019, FCSAP funded assessment activities on 230 sites at a program cost of $7.5 million. An additional $2.0 million was spent as part of the custodian cost-share requirement. Table C.1 in Appendix C provides a detailed breakdown of the number of sites with assessment activity, assessment funding available and assessment expenditures for each custodian.

By the end of the third year of Phase III, the 4-year performance target for conducting assessment was exceeded (Figure 2). The target was based on planning information provided by custodians. The target provides an estimate of the number of assessment sites to be worked on in Phase III. One reason for exceeding the target was that the Federal Infrastructure Initiative provided custodians with additional funding and resources to undertake more assessment work during the 2016–2017 and 2017–2018 fiscal years. Although targets were adjusted to reflect the additional funding, custodians were able to assess more sites than originally forecasted.

Figure 2: Performance indicator 1: Number of sites where FCSAP-funded assessments are being conducted



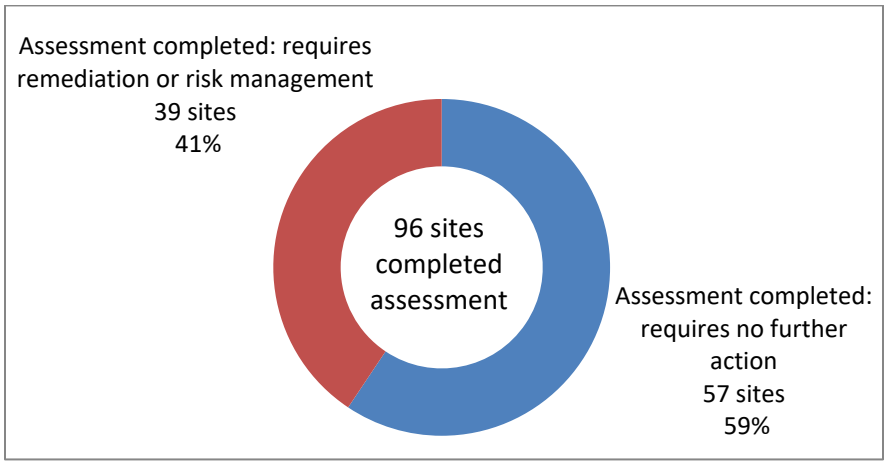
An environmental site assessment may involve the collection and analysis of samples to determine levels of contamination. These levels are compared with environmental quality guidelines on the management of contaminants in soils, sediments, freshwater and marine water,[3] as published by the Canadian Council of Ministers of the Environment (CCME).

Federal contaminated sites are classified and prioritized in accordance with the CCME National Classification System for Contaminated Sites and the Aquatic Sites Classification System developed by FCSAP. To ensure that custodians take a common approach to managing federal contaminated sites, FCSAP follows a 10-step process to identify, assess and remediate contaminated sites. This process is detailed in Appendix B.

[3] www.ccme.ca/en/resources/canadian_environmental_quality_guidelines/index.html

At the 230 sites where assessments took place in 2018–2019, custodians completed the assessment process at 96 sites; 39 of these sites require remediation or risk management and 57 sites require no further action (Figure 3).

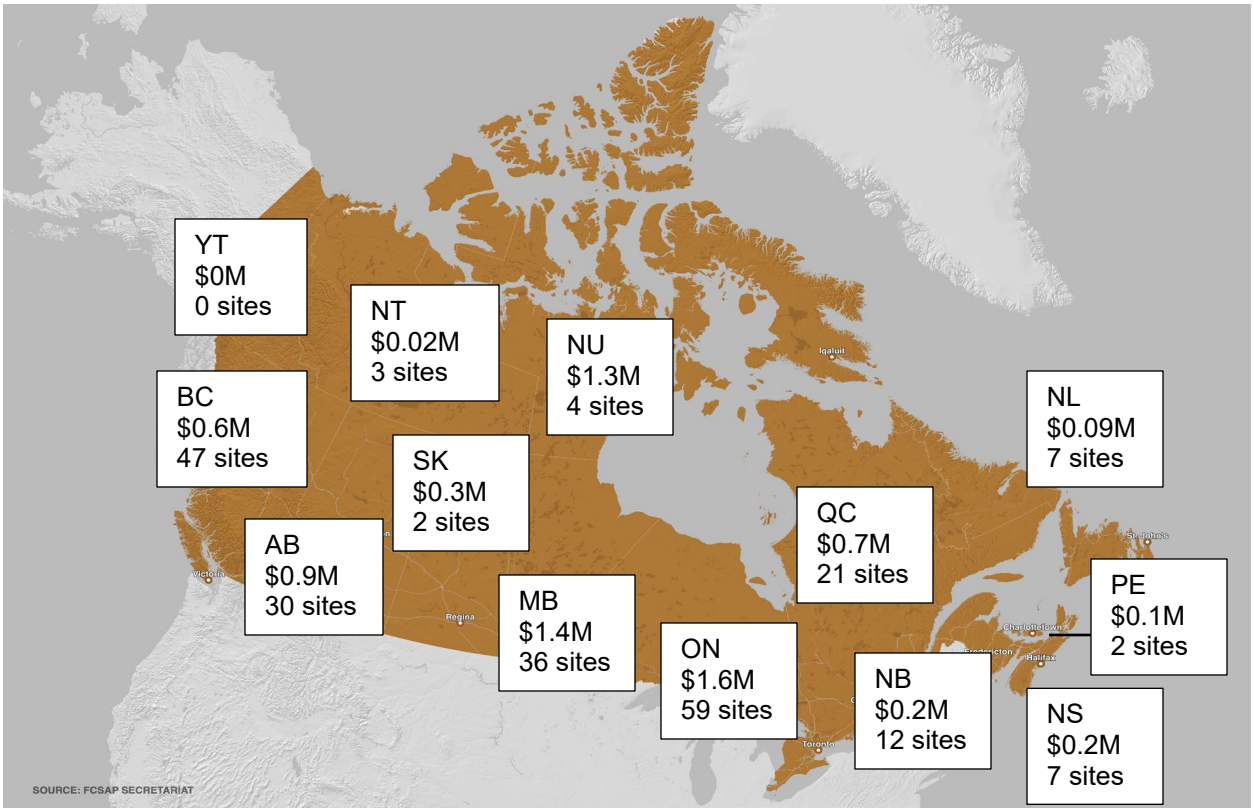
Figure 3: Results of completed site assessments (2018–2019)



The custodians that spent the most on assessments were Crown-Indigenous Relations and Northern Affairs Canada - Lands and Economic Development (CIRNAC-LED) and Environment and Climate Change Canada (ECCC). Together, they spent $4.6 million of the $7.5 million (or 61%) of the FCSAP assessment expenditures reported in the 2018–2019 fiscal year. These two custodians conducted 51% of FCSAP-funded site assessments (118 of 230 sites) in 2018–2019.

As Figure 4 shows, the largest expenditures occurred in Ontario, Manitoba and Nunavut, accounting for 57% of all FCSAP assessment expenditures. The provinces with the largest numbers of sites with assessment activity were Ontario, British Columbia and Manitoba (62% of the total).

Figure 4: Distribution of FCSAP assessment expenditures and sites, by province and territory



2.2 Reduction of Risks to Human Health and the Environment

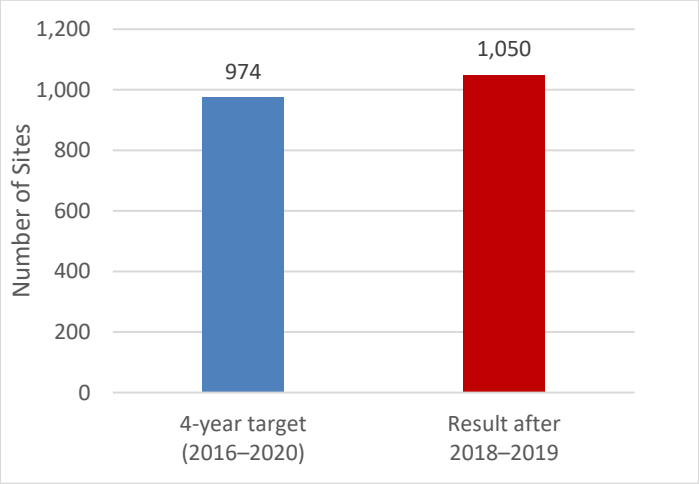
Completed site-assessment activities determine whether the risks to human health or the environment are within established guidelines for contaminant limits. Custodians may then conduct remediation and risk-management activities at these sites. These activities can include the removal, treatment, reduction or containment of contaminants to prevent exposure that could affect human health or the environment. The methods used to address the contamination at each site depend on their efficacy, cost-effectiveness and the unique circumstances of the site.

In 2018–2019, FCSAP funded remediation activities at 422 sites, at a cost of $394.1 million. An additional $28.1 million was spent as part of the custodian cost-share requirement. Table C.2 in Appendix C provides a detailed breakdown of the number of sites with remediation activity, remediation funding available and remediation expenditures for each custodian.

By the end of the third year of Phase III, the 4-year performance target for conducting risk-reduction activities was exceeded (Figure 5). The target was based on planning information provided by custodians. The target provides an estimate of the number of remediation sites that

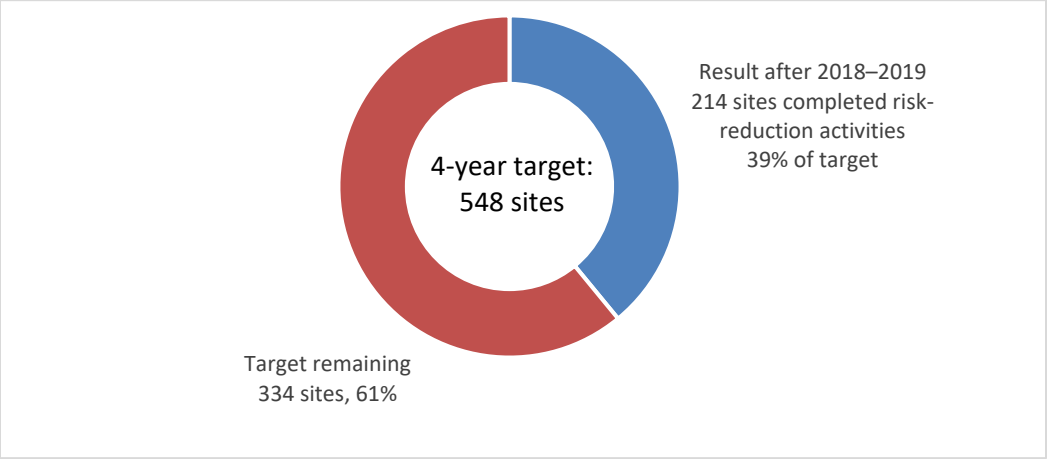
will be worked on in Phase III. One reason for exceeding the target was that the Federal Infrastructure Initiative provided custodians with additional funding and resources to undertake more remediation work during the 2016–2017 and 2017–2018 fiscal years. Although targets were adjusted to reflect the additional funding, custodians were able to conduct remediation activities at more sites than originally forecasted.

Figure 5: Performance indicator 2: Number of FCSAP-funded sites where risk-reduction activities are being conducted



The number of sites undergoing remediation varies from year to year. Weather or unanticipated technical issues may cause delays at some sites, especially at remote northern sites. In 2018–2019, remediation was completed at 24 sites and risks to human health and the environment were reduced to safe levels. After the third year of Phase III, 39% of the 4-year target for completing risk-reduction activities was met (Figure 6).

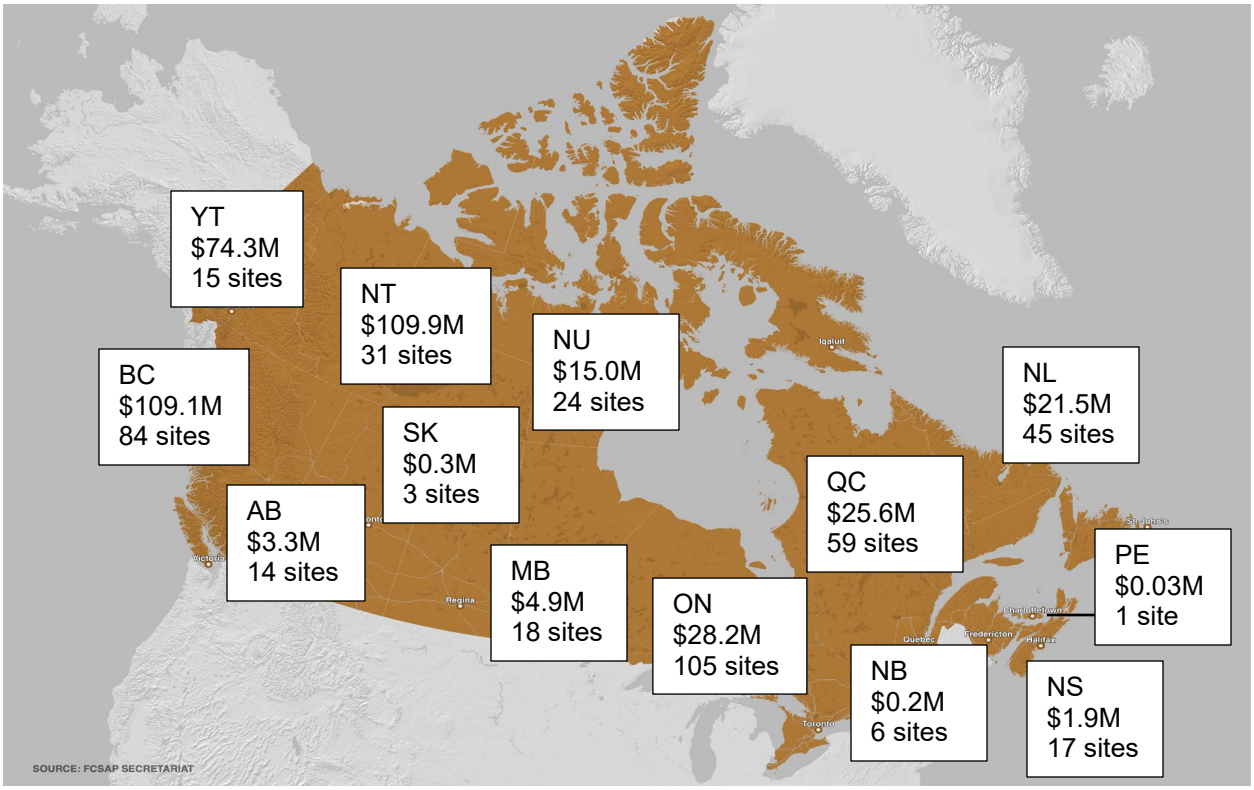
Figure 6: Performance indicator 3: Number of FCSAP-funded sites where risk-reduction activities have been completed



Two custodians accounted for 69% of the FCSAP remediation expenditures in 2018–2019. Crown-Indigenous Relations and Northern Affairs Canada - Northern Affairs Organization (CIRNAC-NAO) spent $189 million and the Department of National Defence (DND) spent $85 million. Both of these custodians are working on the remediation of large, complex and remote sites. These custodians represented approximately $152 million (39%) of total 2018–2019 FCSAP remediation expenditures at three projects: Giant Mine in the Northwest Territories (CIRNAC-NAO), Faro Mine in Yukon (CIRNAC-NAO), and 5 Wing Goose Bay in Newfoundland and Labrador (DND). For a complete list of sites with FCSAP remediation expenditures, see Table C.5 in Appendix C.

As Figure 7 shows, the largest expenditures occurred in the Northwest Territories, British Columbia and Yukon. This accounts for 74% of all FCSAP remediation expenditures. The provinces with the largest numbers of sites with remediation activity were Ontario, British Columbia and Quebec (59% of the total).

Figure 7: Distribution of FCSAP remediation expenditures and sites, by province and territory



2.3 Liability Reduction

Environmental liabilities are the estimated remaining costs related to the remediation of contaminated sites – specifically, where the Government of Canada is obligated, or will likely be obligated, to incur such costs. Liabilities are recorded annually in the Public Accounts of Canada.

Changes to the liability for the remediation of contaminated sites can be attributed to several factors. Remediation expenditures at contaminated sites contribute to decreases in liability. Increases to remediation costs may result from the completion of assessment activities at sites and the reporting of liabilities for the first time. Changes to the estimated remediation costs can also occur as more information becomes available at sites. Furthermore, variability in the Consumer Price Index (through inflation) and in the discount rate (through calculation of net present value) can affect the liabilities, especially for large projects. Liability reduction is not linear: a decrease in liability in one year may be followed by an increase in the next year.

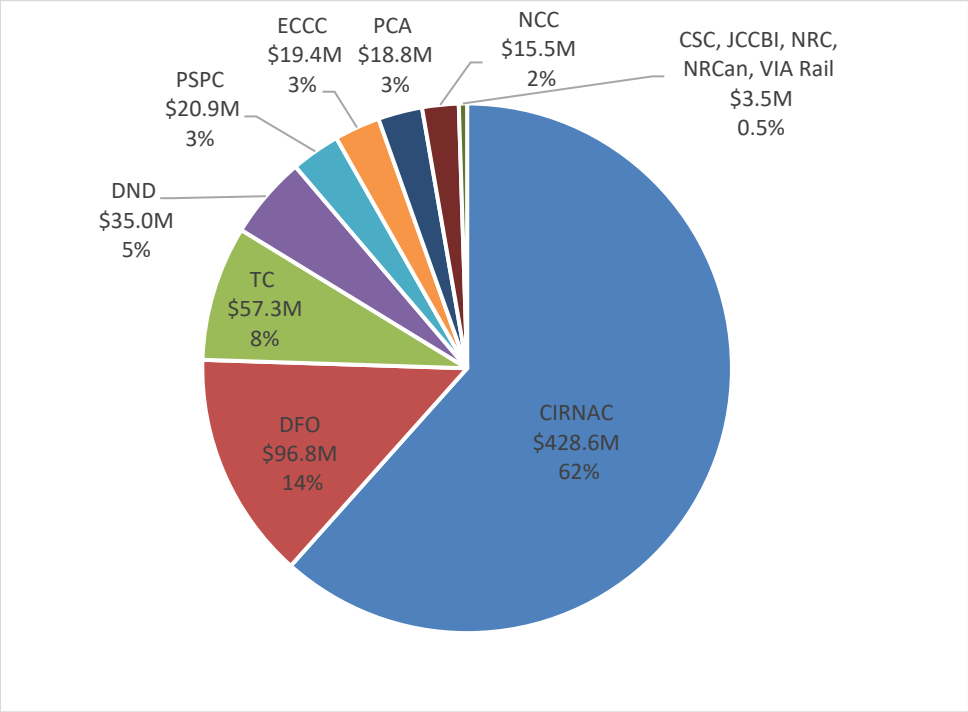
FCSAP provides funding for a portion of the sites that make up the total environmental liability reported in the Public Accounts of Canada. Custodians also conduct work at contaminated sites that are not eligible to receive FCSAP funding. However, regardless of the funding source, custodians are required to report all remediation expenditures and environmental liabilities to the Public Accounts of Canada. Examples of sites that are not eligible for FCSAP funding in Phase III include lower-risk sites and sites where the contamination occurred after April 1, 1998. Some sites, such as the low-level radioactive waste sites of the Port Hope Area Initiative, have their own funding sources. A more accurate estimate of the impact of FCSAP on the Government of Canada's total liability can be found in Table D.1 in Appendix D. This table provides the estimated environmental liability associated with federal contaminated sites that may be eligible for FCSAP funding.

From March 31, 2018 to March 31, 2019, the total liability for the remediation of contaminated sites, as reported in the Public Accounts of Canada, increased by $768 million, from $5.710 billion for 4,414 sites to $6,478 billion for 3,911 sites. There are 14 custodians responsible for the portion of environmental liability associated with federal contaminated sites that may be eligible for FCSAP, which increased by $695 million over the same period.

Thirteen custodians reported increases in liability in 2018–2019, totalling $696 million. The custodian with the largest increase in liability was Crown-Indigenous Relations and Northern Affairs Canada, which reported an increase in liability of $428 million. This increase was mainly due to revised cost estimates, adjustments for inflation and net present value calculations. Fisheries and Oceans Canada also reported an increase in liability of $97 million, mainly due to the reporting of liabilities for the first time at multiple sites after the completion of assessment activities. Of the 13 custodians that reported increases in liability, these two custodians accounted for approximately 75% of the $696 million increase in liability. Six other custodians reported increases in liability greater than $10 million, accounting for 24% of the overall increase. The remaining five custodians reported increases of less than $10 million and accounted for less than 1% of the overall increase. (Figure 8). One custodian reported a

decrease in liability in 2018–2019, Agriculture and Agri-Food Canada ($0.7 million). The overall increase in liability of $695 million is mainly due to revised cost estimates, new liability for sites not previously recorded and adjustments for inflation. The breakdown of liability by custodian can be found in Table D.2 in Appendix D.

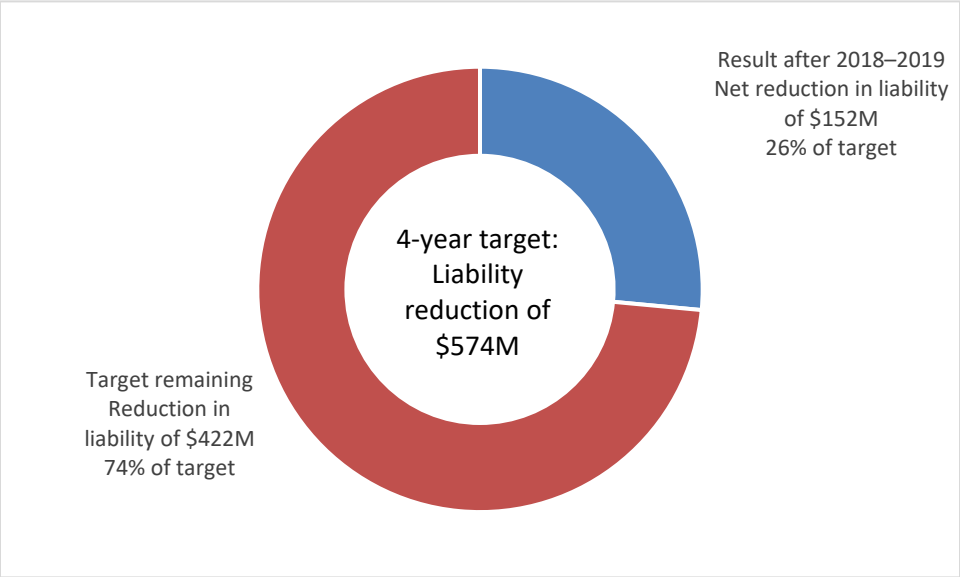
Figure 8: Custodians with liability increases in 2018–2019



In 2018–2019, the Public Accounts of Canada showed that remediation expenditures reduced the environmental liability by $583 million. However, these reductions were offset by $1.128 billion in changes to estimated remediation costs and $223 million in new liability for sites not previously recorded. As detailed in Table D.3 in Appendix D, these were factors in the $768 million increase in liability.

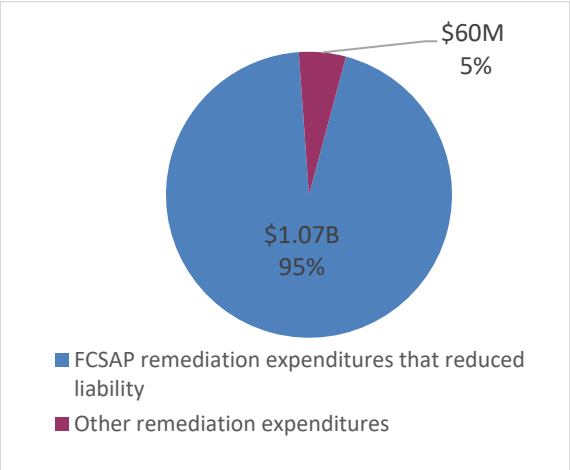
The FCSAP performance measurement strategy has two indicators for the reduction of liability. The first indicator is based on a list of sites where the remedial action plan has been developed and remediation activities are planned for Phase III. Custodians have estimated that liability will be reduced at these sites by $574 million by the end of Phase III. After the third year of Phase III, the liability at these sites decreased by $379 million during the third year of Phase III. This reduction was offset by an increase in liability of $227 million, resulting in a net reduction in liability of $152 million (Figure 9).

Figure 9: Performance indicator 4: Reduction in liability at FCSAP-funded sites



The second indicator relates to the percentage of remediation expenditures that reduce liability over the four years of Phase III. After the third year of Phase III, 95% of FCSAP remediation expenditures ($1.07 billion of $1.13 billion) led to reductions in liability (Figure 10). This meets the target of 95%. While most of a given site's remediation expenditures may be included in the liability estimate for the site, some remediation activities do not reduce liability – for example, at a site where remediation activities are conducted but liability had not yet been recorded.

Figure 10: Performance indicator 5: Percentage of FCSAP remediation expenditures that reduce liability related to FCSAP sites in Phase III, result as of 2018-2019



More information on the environmental liability of federal contaminated sites, including a detailed breakdown by custodian, can be found in Appendix D.

2.4 FCSAP Secondary Benefits

Many FCSAP projects have socio-economic benefits, especially in Indigenous communities and in northern or rural areas. Through joint ventures between custodians and local communities, work conducted on FCSAP sites offers opportunities for local residents and contractors to learn and develop skills, as well as build careers and businesses. The partnerships forged among workers and businesses, especially at the local level, help foster a sense of ownership of project results.

During the 2018–2019 fiscal year, FCSAP activities led to the creation of approximately 2,200 jobs.[4]. These jobs provide income and fuel economic growth. FCSAP activities help workers develop skills, which can then be applied at other contaminated sites or other types of construction and engineering projects. For example, FCSAP remediation projects regularly employ northerners and northern Indigenous people as welders, heavy-duty mechanics, electricians and millwrights.

Through FCSAP, the Canadian remediation industry has an opportunity to advance new solutions when cleaning up federal contaminated sites. The program builds awareness of innovative and sustainable technologies by sharing success stories within the federal community and with the private sector. Case studies are profiled online, as well as in reports and at workshops for federal contaminated-site managers and industry representatives.

2.5 Impact of FCSAP on the Federal Contaminated Sites Inventory

The Federal Contaminated Sites Inventory (FCSI), managed by the Treasury Board of Canada Secretariat, includes information on federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations, and on non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility.

Before FCSAP was established in 2005–2006, the FCSI contained approximately 2,000 suspected and 4,200 active federal contaminated sites. Since then, custodians have added sites to the FCSI when they suspected contamination and have conducted assessment and remediation activities at these sites, if required.

[4] Based on a multiplier from ECO Canada issued in 2007 and validated in 2014.

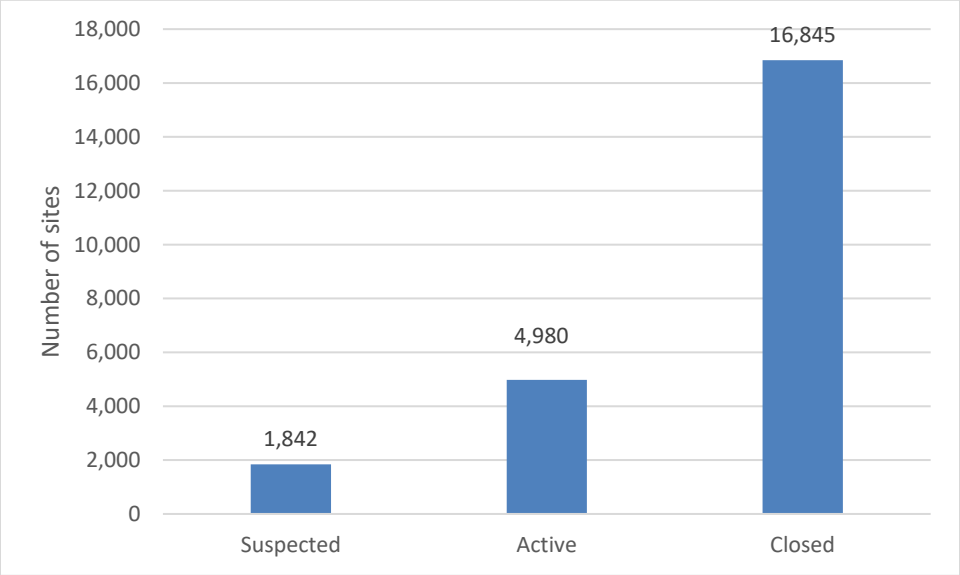
As of March 31, 2019, the FCSI contained 23,667 sites, of which 16,845 (71%) have been closed. The sites are closed either because remediation work was completed or was not required after the site was assessed. There are 4,980 active sites (21%) where contamination has been confirmed and remedial action is or may be required. A total of 1,842 sites (8%) may be contaminated but have not yet been assessed (Figure 11).

Suspected: Further assessment work is required to confirm whether the site is considered a "federal contaminated site."

Active: Active sites are confirmed contaminated sites where remedial action is or may be required.

Closed: No further action is required.

Figure 11: Status of sites in the FCSI, as of 2018–2019



Not all sites on the FCSI are eligible for FCSAP remediation funding in Phase III. Only Class 1 sites and Class 2 sites where remediation had started in Phase I (before April 1, 2011) are eligible. The sites must also have been contaminated by activities that took place on or before April 1,1998. FCSAP is the main source of funding for federal contaminated-site management, covering about 85% of all site expenditures reported in the FCSI since 2005–2006.

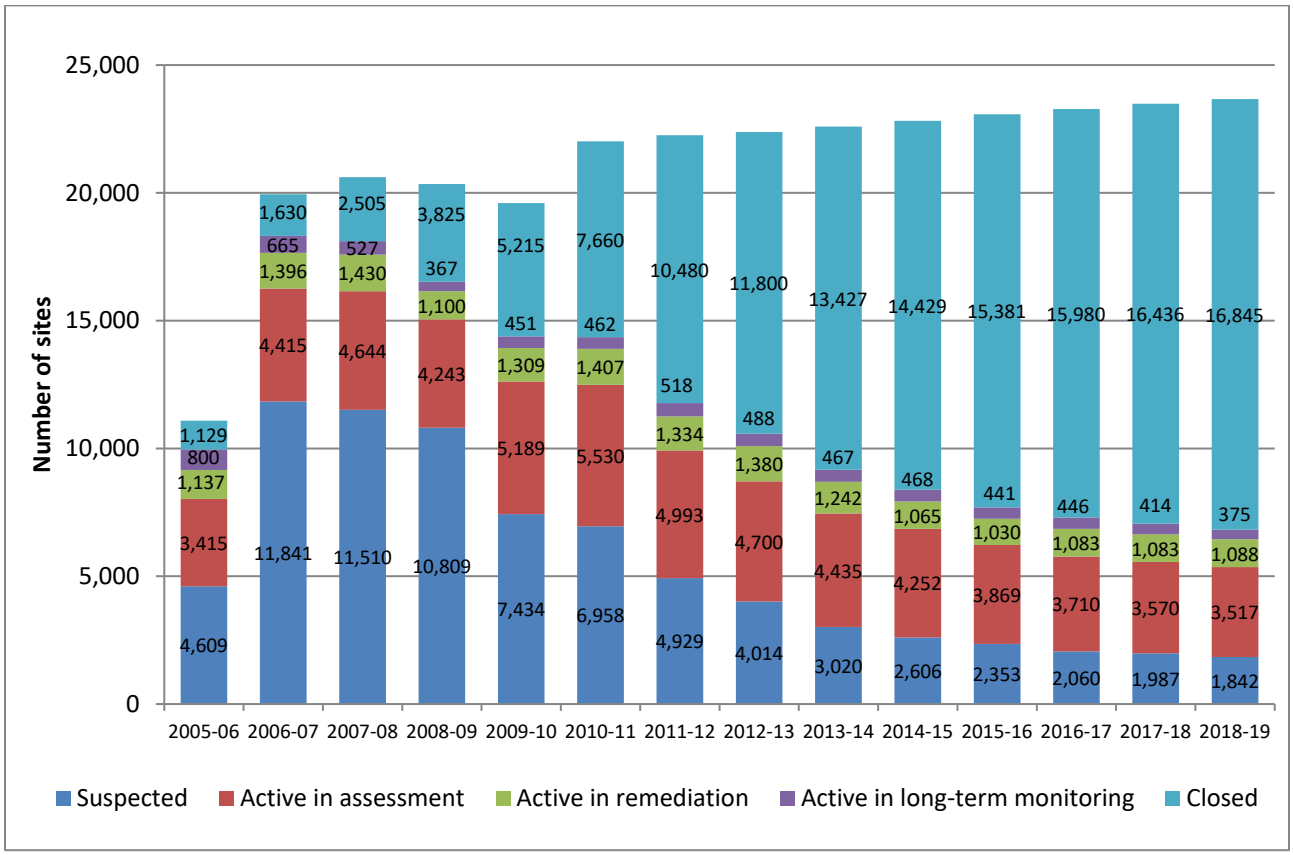
Sites move from “suspected” to “active” status once the contamination has been confirmed. Suspected sites may be closed if a desktop review or a Phase I environmental site assessment determines that historical activities would not likely have caused contamination. The number of suspected sites decreased by 7% from 1,987 to 1,842 over the 2018–2019 fiscal year. The number of active sites decreased by 2% from 5,067 to 4,980.

The status of active sites depends on the highest step completed. The steps are set out in the federal approach to managing contaminated sites[5]. Details on the approach can be found in Appendix B. The number of active sites in the assessment stage (steps 3 to 6) decreased by 1%, from 3,570 to 3,517. The number of active sites in the remediation stage (steps 7 to 9) remained about the same as in the 2017–2018 fiscal year, at 1,088 sites. The number of sites in long-term monitoring (step 10) decreased by 9%, from 414 sites to 375 sites.

A closed site requires no further action. A decision to close a site may be made at various points in the 10-step process. For example, a suspected site (steps 1 or 2) may be closed when a review of past activities indicates that these activities would not likely lead to contamination. Sites undergoing assessment (steps 3 to 6) are usually closed if the assessment determines that contaminants are not present or do not pose an unacceptable risk to human health or the environment. Sites are also closed after remediation, risk-management or long-term monitoring activities (steps 7 to 10) have reduced the risks to acceptable levels. The total number of closed sites in the FCSI increased by 2% in 2018–2019, from 16,436 sites to 16,845 sites. Since 2005, the total number of closed sites has increased by 1,392%, from 1,129 sites to 16,845 sites. These results, illustrated in Figure 12, demonstrate that FCSAP is having a significant positive effect on the status of sites in the FCSI.

[5] *A Federal Approach to Contaminated Sites* (Contaminated Sites Management Working Group, 1999), https://www.canada.ca/en/environment-climate-change/services/federal-contaminated-sites/federal-approach.html

Figure 12: Status of sites in the FCSI from 2005–2006 to 2018–2019



3 FCSAP Approvals and Expenditures

This section describes the three types of funding that the Federal Contaminated Sites Action Plan (FCSAP) provides. It also describes the funding-approval process, the amounts of funding allocations, as well as expenditures and variances.

3.1 Types of Funding

FCSAP provides three types of funding: assessment, remediation/risk-management and program management. Assessment and remediation/risk-management funding are provided to allow custodians to perform work at contaminated sites. Program management funding is provided by FCSAP to assist custodians with the management of their site portfolios through activities such as procurement, contract management, expert support and reporting. Funding is also provided to the FCSAP Secretariat and the Treasury Board of Canada Secretariat to administer the program.

3.2 Funding Approvals and Oversight

Treasury Board approves the allocation of FCSAP funding on the basis of federal custodians' planned assessment and remediation activities.

A committee of program partner Assistant Deputy Ministers provides strategic direction for FCSAP in areas such as program design and funding parameters. A Federal Contaminated Sites Director General Steering Committee, on the advice of the FCSAP Secretariat and the Treasury Board of Canada Secretariat, provides general oversight and direction to the program and approves priority sites for remediation.

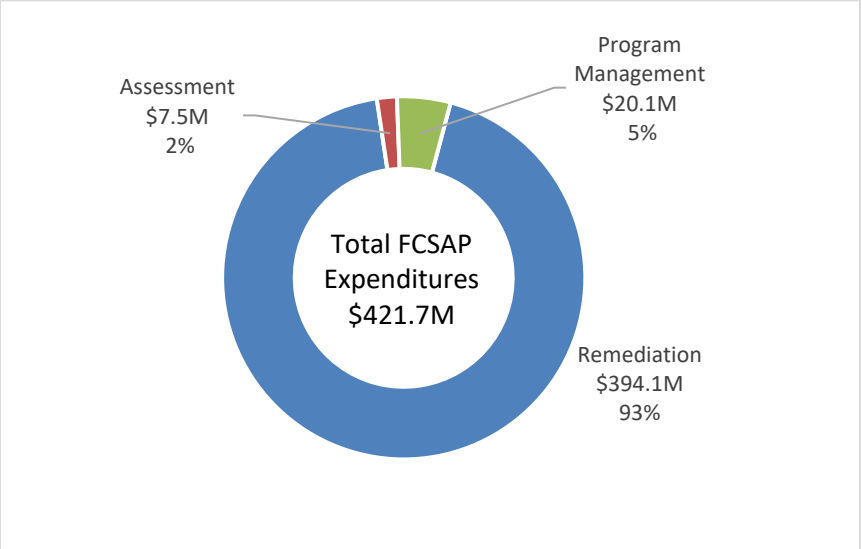
Federal custodians are accountable for the FCSAP funding they receive. They must ensure that their sites meet funding-eligibility requirements. Custodians must have grounds to suspect that a site is contaminated (normally on the basis of past activities at the site) before environmental site-assessment activities can be funded. The FCSAP Secretariat has developed a tool to assist custodians in determining the priority of sites that should undergo assessment, due to the fact that funds and/or resources are not be available to assess all sites. Guidance on the eligibility of project costs helps to ensure that remediation activities focus on reducing risks associated with contaminants.

3.3 Funding Allocations, Expenditures and Variances

FCSAP expenditures in the 2018–2019 fiscal year were $421.7 million. This represents 83% of the FCSAP funding available. In addition, custodians spent $30.1 million of their own funding to meet the cost-share requirements.

In the 2018–2019 fiscal year, FCSAP remediation and risk-management expenditures represented 93% of total FCSAP expenditures. FCSAP assessment expenditures represented 2% of the total and program management expenditures accounted for 5% of the total (Figure 13). Table C.3 in Appendix C details the allocations for the three types of FCSAP funding.

Figure 13: Distribution of FCSAP Expenditures in 2018–2019



Custodians did not spend all of the FCSAP funding available to them in 2018–2019. This is because of contracting and project delays. For example, weather conditions might either prevent access to the sites or limit the types of work that could be carried out. The tendering of some projects was also delayed, which led to postponement of the remediation and risk-management work to the next fiscal year. Revised work plans and project schedules also contributed to lowering project costs, as some planned work was rescheduled to the next fiscal year.

Custodians used various mechanisms to account for these unspent funds (also known as variances). These variances are detailed in Table C.4, along with the associated amounts. The overall variance between available FCSAP funding and expenditures for the 2018–2019 fiscal year was $85.0 million.

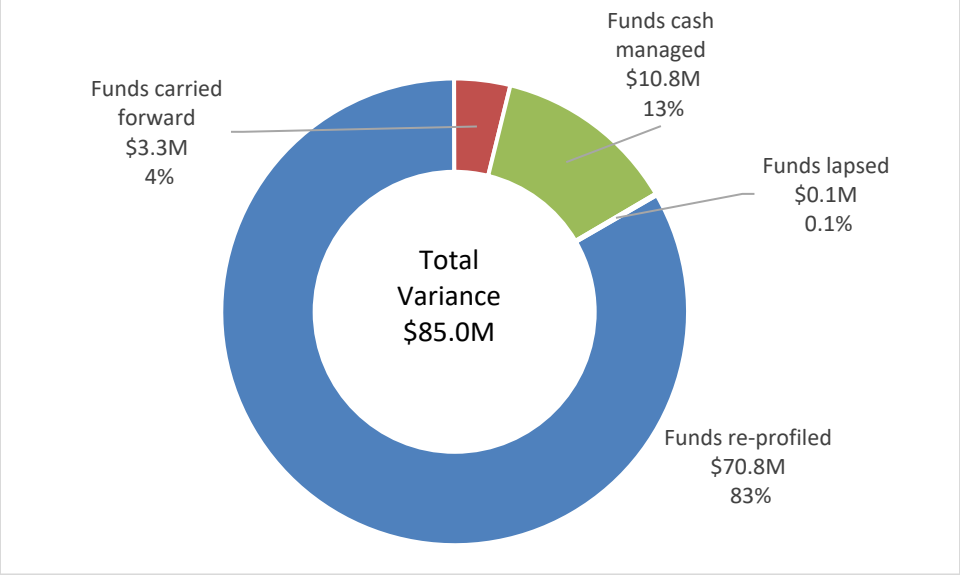
Unspent funds can be brought forward for FCSAP activities in future years through:

- government re-profiling, which must be approved by the Department of Finance;
- carry-forward processes, which require internal approval from the custodian's Chief Finance Officer; or
- cash-management processes, which involve the custodian lending the unspent funds to another part of the organization, with the commitment that the funds be returned in the next fiscal year.

These processes allow custodians flexibility at FCSAP-eligible sites to respond to unpredictable situations, such as weather. The FCSAP Secretariat promotes and facilitates the transfer of funds among custodians. Funding that is not brought forward or transferred between custodians is lapsed. This means that the funds will not be available for FCSAP activities in the future.

In 2018–2019, 83% of the FCSAP funding variance was re-profiled, 4% was carried forward, 13% was internally cash-managed and less than 0.1% was lapsed (Figure 14). Two custodians reported internally cash managing some of the funding variance. The FCSAP Secretariat confirms with custodians that any funds internally cash managed to another part of their organization is returned to the custodian and is available to be spent on FCSAP activities in the next fiscal year. Of the $85.0 million of available funding not spent in 2018–2019, $84.9 million (99%) will be available in future years.

Figure 14: Distribution of FCSAP Variance



4 Case Studies of FCSAP-Funded Assessment and Remediation Sites

Site 13.3, Lachine Canal National Historic Site

Location: Montreal, Quebec
Custodian: Parks Canada Agency

Site 13.3 lies on the north shore of the Lachine Canal in the heart of southwest borough in Montreal. The Lachine Canal National Historical Site is a 13.5-km urban route running between the Old Port and Lake Saint-Louis. Along its banks, a linear green urban park is lined with remnants of the industrial era when the canal boomed.

In 2012, the City of Montréal announced plans to transform the Griffintown area, which was once industrial, into a pleasant, family-oriented neighbourhood. The concept involved the development of parks, playgrounds and bicycle paths and the building of condo projects.

At that time, a portion of Site 13.3 was closed off to the public; the bicycle path along the Lachine Canal had to branch off from the north side to the south side. Over time, the increasing density of the commuting traffic from cyclists, pedestrians and other users, combined with the narrowness of the bicycle path on the south side, was likely to increase the number of accidents.

In response, Parks Canada Agency envisioned the creation of a multi-use link called the North Link (combining a multipurpose track and pedestrian path) and the establishment of a recreational and rental area in that sector of the Lachine Canal. The project aligns with the strategies of the Lachine Canal Master Plan, which was recently tabled in the House of Commons, and was the subject of extensive public consultations.

Sampling studies conducted from 1993 to the present have revealed contamination in soils above the Canadian Council of Ministers of the Environment recommendations for

residential/parkland use. This includes contamination by heavy metals, volatile organic compounds and polycyclic aromatic hydrocarbons throughout the site to a depth of 3.0 m. Two areas were also contaminated by hydrocarbons from former underground petroleum storage tanks. The studies also found spot contamination of dioxins and furans in surface soils around wooden poles treated with pentachlorophenol.

In 2001, Parks Canada Agency commissioned a quantitative risk assessment, followed by a qualitative risk assessment in 2014. Those studies concluded that the hydrocarbons and the dioxin- and furan-contaminated “hot spots” had to be removed to prevent risk to visitors and the environment. A project team deconstructed the former Lapalme garage on Site 13.3 and built a new washroom and rest stop on its footprint. The project team also implemented vapour-mitigation measures at the new building, because of a residual volume of hydrocarbon-contaminated soil that could not be excavated without risking damage to the canal wall. The entire area of Site 13.3 was capped with 30 cm of clean soil. The resulting topography helped shape the design of the public areas.

The creation of the North Link, the site remediation, the building of the new facility and the landscaping were all done as a single project, to avoid duplication of effort, achieve economies of scale, and ensure that the construction did not disturb the restoration work underway.

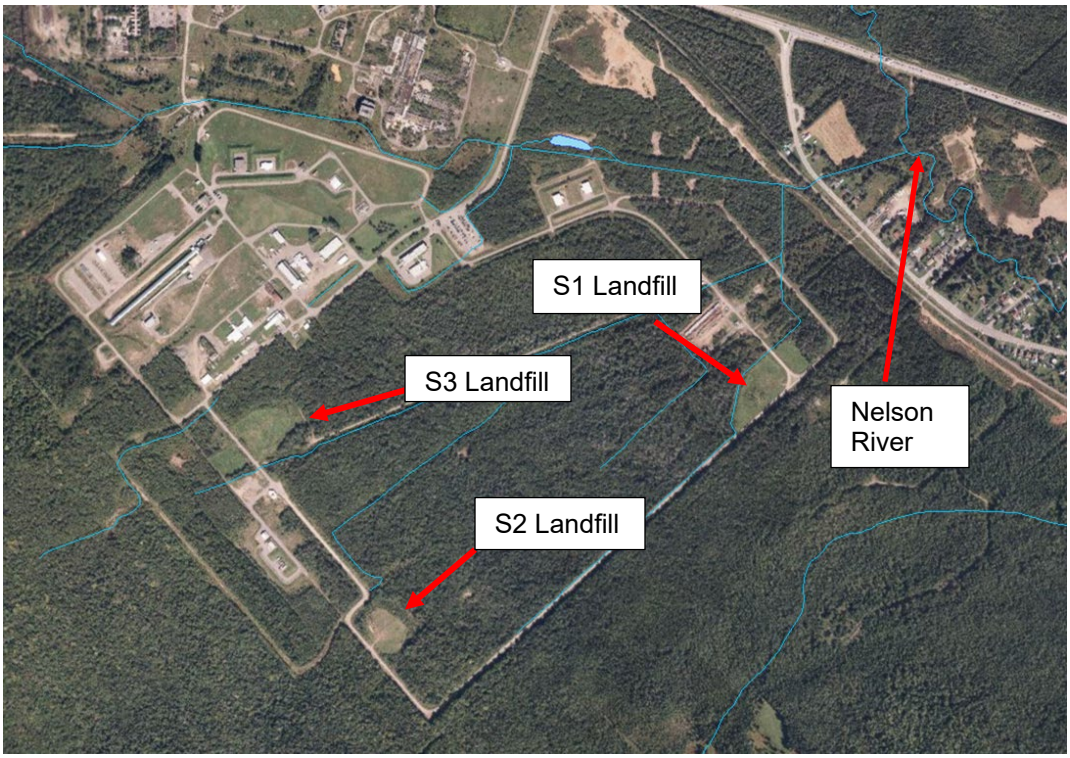
Remediation Work at the Valcartier Research Centre

Location: Valcartier Research Centre, Quebec
Custodian: Department of National Defence (DND)

The Valcartier Research Centre has been in operation for more than 70 years, with a mandate to support the mission of the Canadian Armed Forces through various advanced scientific and technical services. The Centre's facilities include several buildings and test areas, spread over an area of more than 2 km^2, separated into northern and southern parts by the Route de la Bravoure. The property is bordered by Canadian Forces Base Valcartier to the north and west, abandoned industrial facilities to the southwest, and wooded land owned by Québec City to the east.

Three dumpsites – referred to here as S1, S2, and S3 – operated from 1960 to 1990 in the southern part of the Centre. The S1 dump, with a surface area of approximately 16,000 m^2, was entirely below the surrounding ground level, leaving no visible mounds. The other two dumps, S2 and S3, each cover approximately 10,000 m^2 and are located more than 1.5 km upstream of the Nelson River (Figure 1). The S2 and S3 dumps are mounds, and a small amount of the waste has been found in the free groundwater.

Figure 1: Location of sites



DND consulted expert support from Environment and Climate Change Canada, Fisheries and Oceans Canada and Health Canada early in the process of developing the 2012–2013 remediation and risk-management strategy for the site. Various studies conducted over the years on the three landfills had revealed the presence of various contaminants. A modelling study conducted in 2016–2017 validated certain remediation and risk-management scenarios. After this study, a consultant carried out an option analysis in 2017–2018, leading to the design of plans and specifications for the rehabilitation of one of the S1 dump and the sealing of the other two.

The option that DND chose for the work carried out in 2018–2019 was to excavate all the waste from the S1 dump, to divert it to landfills S2 and S3, which were properly shaped and covered with impermeable membranes and clean soils, allowing adequate surface drainage. At the same time, a contractor engaged by DND also waterproofed part of the ditches draining the dumpsites, to prevent contaminated groundwater from resurfacing (Figure 2).

Figure 2: Excavation and waterproofing work

Several elements required DND to take precautions:

- During excavation work at the S1 dump, constant supervision was required by an unexploded ordnance (UXO) specialist, which limited the pace of excavation. However, because the waste was transported less than a kilometre for disposal, the productivity gain was significant.

- The project team had to pay particular attention to groundwater during excavations to ensure that no contaminants were being released directly into the outlet ditches. Thus, the main ditch was closed during the work, and the project team deployed a pumping and treatment system during the excavation to remove contaminants in particulate form. Finally, the team carried out the work during low-water periods, which reduced the volume of water to be managed.

- Much of the work was carried out in winter conditions, which can be a monumental challenge in Quebec. For example, after a heavy snowfall, the entire cover of the S2 and S3 dumps had to be cleared of snow with a snowblower to prevent membrane breakage, thus allowing the covering soils to be placed directly in contact with the membranes.

- Previous studies conducted in the dump area had revealed the presence of a few wildlife species with status under the *Species at Risk Act* or the *Migratory Birds Convention Act*: monarch butterflies, common nighthawks, and little brown bats. Although no unique habitat had been observed directly at any of the dump sites, DND ensured that the work was carried out from late October to February, outside the nesting or breeding season of these species.

Finally, the project team is converting the now-waste-free S1 dump into a retention basin, because the natural level of the free water table is about 1.3 m deep (Figure 3). The final work to develop the basin will be completed in 2019–2020, after which more than 450 trees and shrubs with aquatic affinities will be planted. The project team did pay attention to the choice of plants – for example, by reintroducing milkweed, known to attract monarch butterflies. The team also installed bat nesting boxes in strategic locations.

Figure 3: Retention basin at former landfill S1

The work will have removed more than 25,000 m^3 of waste, while significantly reducing the potential for the resurgence of contaminated water from the property. Environmental monitoring and maintenance of these facilities will be carried out in the coming years.

The environmental sustainability assessment of the project concluded that minimizing waste transport, along with taking advantage of the carbon-sink effect of the new growing wetland, will avoid emissions of more than 160 tonnes (CO_2-equivalent) of greenhouse gases.

Remediation at the Former Doman Wood Waste Site

Location: Cowichan Tribes Indian Reserve #1 near Duncan, British Columbia
Custodian: Crown-Indigenous Relations and Northern Affairs Canada - Lands and Economic Development (CIRNAC-LED)

The former Doman Wood waste site is located on Cowichan Tribes Indian Reserve #1 near Duncan, British Columbia. The site covers approximately 544 hectares and is adjacent to the fish-bearing Koksilah River, which is of significant cultural importance to the Cowichan.

Historical use of the site included:

- hog-fuel storage and handling from the early 1970s to 2007 by Doman Lumber Inc.;
- activities associated with a former Canadian National railway from as far back as 1945 to 1988;
- gravel extraction; and
- dumping of household and commercial wastes.

The dumping of the fibrous hog fuel, around 1977, was an attempt to build up soil by improving the quality of the native sand and gravel. However, these activities had a negative effect on soil, sediment, surface water and groundwater quality on the site. Contaminants have dissolved into the groundwater and surface water which have migrated towards the Koksilah River.

In 2007, Canada and Cowichan Tribes retained environmental consultants to undertake an environmental site assessment. The initial investigations determined that natural soils on the site were almost entirely covered by wood waste – an estimated area of 43,850 m^2 (85% of the site) and an estimated volume of 56,070 m^3. Most of the site's wood waste occurred within a 0.2 to 3.8 m thick surface blanket and eight conical stockpiles on top of the blanket. The consultants found widespread presence of acidic groundwater on the site, with less-acidic conditions measured in off-site wells. They also detected tannins and lignins, natural components of wood, in groundwater below the site's wood-waste deposit.

Aluminum, arsenic, cadmium, copper, iron and manganese have been measured at concentrations that exceed the applicable federal groundwater and surface quality guidelines on the site. Conditions produced from the decaying wood waste had likely contributed to the dissociation of metals within the natural underlying sediments, resulting in a plume of metals contaminated groundwater.

As part of an effort to reduce environmental and human-health risks from the site, CIRNAC, Indigenous Services Canada, Cowichan Tribes and consultants worked closely on developing a remedial action plan, which would have to consider future economic development opportunities for the site. Cowichan Tribes are in the process of signing on to the Framework Agreement on First Nations Land Management, an agreement that enables First Nations to assume jurisdiction and control of their reserve lands and develop and enact laws that apply to land, the environment and natural resources.

The remedial action plan investigated several options for the re-use of the wood waste:

- fuel for power cogeneration
- topsoil production
- site restoration
- cover application

Due to the pile's moisture content, degree of decomposition, and type of wood, the only viable option, other than direct disposal, was to use the material for cover application. The remediation turned into a standard dig-and-dump operation. The project also included construction of a bridge across the Koksilah Riverto improve access to the site and facilitate removal of the material. In-stream work included removal of a large log jam, which facilitated construction of the bridge, reduced flooding risks to nearby properties and reduced obstacles to the salmon run. The in-stream work was timely and significantly reduced the impacts of a significant flood that occurred a few months later.

Cowichan Tribes expressed interest in having local Cowichan Tribe member-owned construction companies do all or part of the work. This would enable the band to hire local, member-owned companies to address historical and future contaminated sites on Cowichan Tribes' lands. However, this was not possible because there was not enough time to run the tender under the Procurement Strategy for Aboriginal Business, and because the member-owned companies, although experienced in construction tenders, did not have enough remedial experience.

To give local Cowichan Tribes' member-owned companies an opportunity to seek out, partner and bid with other remedial companies, Canada and Cowichan Tribes decided to keep the tender open for longer than usual. Furthermore, the tender was weighted for significant First Nation experience and the use of local community labour and equipment.

The winning bidder was a partnership between a Cowichan Tribes member-owned company and an experienced remedial contractor, with more than 50% of the estimated contract directly attributed to local Cowichan Tribes contractors. CIRNAC also provided funding and training for the contractors to take management and tendering courses, so that they will be able to bid solely on future contracts on Cowichan Tribes lands, as well as on other nearby Indigenous and non-Indigenous territories.

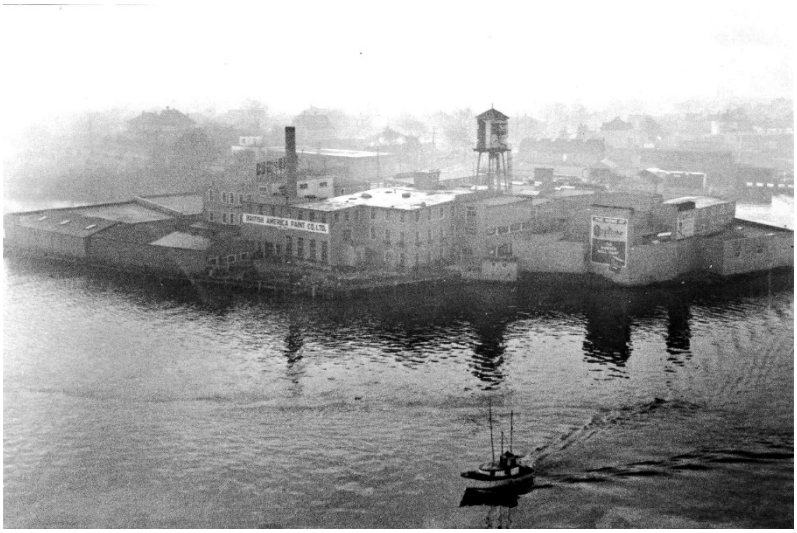
The remediation was successfully completed in January 2020.

Middle Harbour Remediation Project

Location: Middle Harbour Fill Site, Victoria, British Columbia
Custodian: Transport Canada

The Middle Harbour Fill Site lies near the downtown core of Victoria, British Columbia, and within the traditional territory of the Esquimalt and Songhees Nations. The site includes sediments on the harbour floor and in upland soil at Laurel Point Park (renamed Peter Pollen Waterfront Park in October 2019). Cleanup of the Victoria Middle Harbour Fill Site happened in two phases, addressing the sediment first and then the upland contamination.

Laurel Point Park was the site of a paint factory from 1906 until the early 1970s. The industrial activities at the site left polychlorinated biphenyls, metals, inorganics, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, volatile organic compounds, dioxins and furans in the sediment and soil. While these contaminants did not pose a risk to residents and park users, they did threaten the environment and marine life.



British America Paint Co. (BAPCo) at Laurel Point, 1950s. City of Victoria Archives image M06564

The first phase of the Project was the remediation of contaminated underwater sediments in Victoria Harbour adjacent to Laurel Point Park. This was completed in February 2018. Transport Canada dredged approximately 3,000 tonnes of contaminated sediments from the harbour floor, backfilled the area, and treated and/or disposed of the contaminated material at approved facilities offsite.

The second phase of the Project remediated the contaminated upland soils at Laurel Point Park and was completed in June 2019. Transport Canada dug up approximately 75,000 tonnes of contaminated soil from Laurel Point Park, took it offsite for treatment and/or disposal at approved facilities, backfilled the area with clean soil, and restored the park with gravel paths and grass. The City of Victoria is developing an improvement plan for the Laurel Point Park, which will include new trees and landscaping, furniture, public art and upgrades to the pedestrian pathway.

Noteworthy challenges and opportunities presented during Phase 2 of the Victoria Middle Harbour Fill Site Remediation Project include:

- Because Laurel Point Park is a visible and popular waterfront park for both tourists and residents of Victoria, it was important to engage the community. Transport Canada's community engagement strategy included presentations to local residents, a mailout to residents and businesses, an open-house event at City Hall, a web page, and an e-mail address and phone line for the public to contact Transport Canada about the Project.

- The mosaic of many types of contaminants across the site at varying depths made removal challenging. In total, Transport Canada carefully excavated six separate waste classifications, up to 7 m below ground surface.
- Transport Canada did not want to move contaminated soil from the downtown site through city streets. The solution was to transport all contaminated soil off Vancouver Island by barge. Barges were loaded through the use of two large barge ramps installed for the Project.
- Public health and well-being was a priority for Transport Canada throughout the Project. The Department developed and implemented an extensive neighbourhood air-quality monitoring program for the Project to protect neighbours living and working close to the remediation activities. The program monitored for dusts, vapours, odours and noise.

With the Project complete, Transport Canada will transfer approximately 1.91 acres of federally owned land at the Middle Harbour Fill Site to the City of Victoria. The land-transfer agreement is pending a minimum year-long post-remediation review, which includes environmental sampling of soil and groundwater. The agreement also requires that all parties be satisfied with the monitoring results before transferring ownership.

In all, approximately 78,000 tonnes of contaminated material (soil and sediment) was removed from the Victoria Middle Harbour Fill Site. This important work improves the overall health of the harbour and ecosystem, ensuring that residents, tourists and marine species can enjoy a clean Victoria Harbour for generations to come.

CAM-E (Keith Bay)

Location: Nunavut
Custodian: Crown-Indigenous Relations and Northern Affairs Canada - Northern Affairs Organization (CIRNAC-NAO)

The CAM-E (Keith Bay) site was an Intermediate Distant Early Warning (DEW) Line Station built in 1957. The station is about 75 km east of Kugaaruk, Nunavut, and operated for six years before being decommissioned in 1963. In 1965, the responsibility for the site was assumed by Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). Environmental concerns at the site involve all of the historical facilities at the station, as well as soil and water contamination.

In 1985, Environment and Climate Change Canada and the Department of National Defence (DND) worked with CIRNAC to remove some of the hazardous materials from the CAM-E site. Some surface contaminants, such as petroleum, oil, lubricants and materials that contained polychlorinated biphenyls, were also removed. However, several contaminants remained at the site.

In 1994, 2011 and 2012, separate environmental site assessment activities were carried out to identify and estimate the quantities and extent of the contaminants. In 2014, CIRNAC developed a remediation plan on the basis of these assessments. The remediation commenced in 2016 and was scheduled to be completed in 2020.

Challenges encountered at the project include the logistics of getting to and from site, as well as managing a greater volume of contaminants than originally estimated. The amount of petroleum hydrocarbon contaminated soil initially estimated in the assessments was 1,900 m^3 but, during remediation, the project team conducted more soil sampling and determined that the total was 11,000 m^3 – more than six times as much.

The project team was nevertheless able to manage this effectively, without extensions to the project's schedule. To do this, the project team built a second treatment cell, and limited soil excavation to the active layer of the ground, through which contamination can move. Below this layer is permafrost, where contamination is permanently immobilized. The active layer at the CAM-E site extends about 1.5 m below the ground surface. Limiting excavation to the active layer significantly reduced the volume of soil that had to be excavated and disposed of in the treatment cell, allowing for all of the contaminated soil to be contained onsite.

After excavation, the project team stockpiled the soil before treatment could begin. They sampled and tested various sections of each stockpile; sections that showed no contamination were used to backfill excavation holes.

Finally, the team passed all the excavated soil that required treatment through a 63-mm screen, to remove big stones before taking the soil to the treatment cell, as the stones did not require

treatment. After the project is completed in 2020, it will undergo long-term monitoring for up to 25 years.

Rayrock Mine

Location: Northwest Territories
Custodian: Crown-Indigenous Relations and Northern Affairs Canada - Northern Affairs Organization (CIRNAC-NAO)

The Rayrock Mine site is 145 km northwest of Yellowknife. The Rayrock Group Remediation Project involves cleaning up the former Rayrock Mine site, Sun Rose Property and Rex Property, five satellite sites, a barge landing site, and a former power line. These sites were included in a single remedial action plan because of their close proximity to one another. The largest of the sites to be remediated is the former Rayrock Mine.

Operation and abandonment

Rayrock Mine was an underground uranium mine in operation from 1957 to 1959. Approximately 70,000 tonnes of ore were processed, yielding 207 tonnes of uranium concentrate. Its operator, Rayrock Mines Ltd, failed to locate enough ore, leading to the mine's closure within two years.

According to Tłı̨cho Elders, the landscape around Rayrock used to be beautiful and the resources plentiful. People would gather there several times a year, arriving by canoe or dogsled and sleeping on the rock. Depending on the time of year, the Tłı̨cho would trap, hunt, or harvest.

The Government of Canada remediated the site in 1996 under the Arctic Environmental Strategy. Tailings were covered and all entries to the underground mine were sealed with concrete or large rocks. This work addressed the most immediate risks, and made the site safer to visit.

The 1996 remediation was completed at a time when CIRNAC had not yet developed an engagement strategy. As a result, the Tłı̨chǫ were not involved with the project. The Tłı̨chǫ's response to this exclusion was to develop a report, *The Trees All Changed to Wood*, which expressed how the mine killed local trees and harmed the environment. Concerns about cancer incidence and drinking-water safety lingered for many years afterward among residents of the Tłı̨chǫ community of Behchokǫ̀, approximately 75 km downstream from the Rayrock site.

The Tłı̨cho had been concerned about Rayrock when it was in operation; their concerns have continued since the site was abandoned. Former workers have consistently expressed concerns over occupational exposures while employed at the mine and poor environmental protection practices by the mine operator.

A new approach

CIRNAC resumed assessment work in 2013 and, in 2015, completed an in-house conceptual site model. This work, combined with traditional-knowledge studies, have identified many contaminants and hazards at the site and surrounding area. The rock taken from the ground

during mining contained large amounts of uranium and copper, and smaller amounts of lead. Uranium is the main concern, but other metals are also above the Canadian Council of Ministers of the Environment standards. Contamination is particularly high close to the mill building beside Mill Lake and in the tailings from the building. Hydrocarbon contamination from petroleum products, such as spilled diesel, is also a concern.

In 2017, CIRNAC confirmed that further remedial work was required to address these risks, and remediation planning began. CIRNAC is finalizing the remedial action plan, and working toward submission of applications for a Type A water licence and land-use permit in 2020–2021. Final site assessments and tests were completed. All sites continue to be monitored and are on track for remediation work to begin in 2022.

The sediments contain uranium at concentrations of up to 6,500 mg/kg, which could pose a hazard to remediation workers. The successful remediation contractor will be required to have a robust radiation protection program.

Engagement with the Tłı̨cho people

Given the past exclusion of the Tłı̨cho people from the Rayrock remediation, CIRNAC is mindful of the need to involve them in the process – as active participants whose knowledge is essential to the Project's long-term success.

The Government of Canada will maximize socio-economic benefits to the Tłı̨cho for the final remediation contract, to be posted in 2021–2022. As the procurement authority and contract manager, Public Services and Procurement Canada has taken measures since 2013 to ensure that consideration of opportunities for Indigenous people form part of the contracts they issue. CIRNAC has also funded the Tłı̨cho through grants and contributions, which has allowed them to increase their capacity through training, retention of subject-matter experts for traditional-knowledge studies and technical reviews, and networking at conferences on remediation and geoscience forums.

Traditional-knowledge studies are a way for the Government to learn how the land was used before Rayrock Mine was active, how people and wildlife use the land today and how they can in the future. This can inform decisions about how to clean up the area. CIRNAC continues to engage the Tłı̨chǫ to update members about the Project and to gain insight into traditional knowledge.

In 2010, CIRNAC struck the Kwetı̨ı̨ʔaà Elders Committee, a forum for CIRNAC to engage with the Tłı̨chǫ. For the Committee membership, the Tłı̨chǫ Government selected Elders who either had direct knowledge or experience at the mine site or surrounding area. This engagement began in 2012 with a two-day mapping exercise, where Committee members shared their knowledge and experience of the old transportation route to southern markets.

There have been several highlights of engagement since then:

- In 2013, a Tłı̨cho citizen was employed by CIRNAC's engineering and consulting contractor as a field assistant. The individual proved to be so effective that he was offered a job by that consulting firm, but he chose to leverage his experience to secure a full-time position with the Tłı̨cho Government.

- Between 2014 and 2016, site-access improvement, waste consolidation, and asbestos-abatement programs were conducted at Rayrock, and several Tłı̨cho citizens were employed through a sub-contract with Tłı̨cho Construction to carry out that work.

- In response to concerns about cancer incidence in Behchokǫ̀ and compensation for former workers, CIRNAC arranged a workshop in 2014 and brought in the appropriate subject-matter experts and trusted sources, including the territorial Chief Medical Officer of Health and Chief Mines Inspector, to answer questions.

- In 2015, CIRNAC funded the Tłı̨cho to carry out a four-day tour along the Marian River to allow Committee members to assess the water and land downstream from the Rayrock site, a first for the program.

- In 2016, CIRNAC, along with the Department of Fisheries and Oceans (Expert Support), co-funded the Tłı̨cho to carry out a pilot training program for contaminated-site management. The Tłı̨cho Government worked closely with staff from FCSAP and Environmental Careers Organization Canada to customize a curriculum. The training allowed twelve Tłı̨cho participants to earn their contaminated-site management certifications. Several of the graduates have been retained as field assistants, and two have participated in annual remedial action plan meetings.

- In 2018, CIRNAC's engagement efforts were expanded further with a multi-day site visit with the Tłı̨cho and Committee members – along with a fish-fry to demonstrate the healthiness of fish in Sherman Lake. This work continued in 2019, with CIRNAC funding expansion of the traditional-knowledge monitoring program around the Rayrock site and downstream to the communities of Rae and Edzo on Marian Lake.

- CIRNAC presented the human health and ecological risk assessment results, Class-C cost estimate, and Mill Lake conceptual design to the Tłı̨chǫ Government and Kwetı̨ʔaà Elders Committee in March 2018 as part of a workshop to begin the development of a remedial action plan. The Tłı̨chǫ and Kwetı̨ʔaà performed a site blessing and welcome for the new project team. The Tłı̨chǫ traditional-knowledge study and Elders' site visit were completed and the team consulted Elders on site assessments and testing.

Indigenous Engagement at the Faro Mine Remediation Project

Location: Faro, Yukon
Custodian: Crown-Indigenous Relations and Northern Affairs Canada - Northern Affairs Organization (CIRNAC-NAO)

Once the largest open-pit lead-zinc mine in the world, Faro Mine is one of the most complex remediation projects in Canada. Thirty years of mining left behind 70 million tonnes of tailings and 320 million tonnes of waste rock, which have the potential to leach heavy metals and acid into the surrounding land and water. When the last owner declared bankruptcy in 1998, the Government of Canada stepped in to fund the work required to keep the site safe.

The project is located on the asserted traditional territory of the Kaska Nation and upstream from the Selkirk First Nation. In support of Canada's reconciliation agenda, ongoing engagement with these groups has been a key aspect of the Faro Mine Remediation Project.

Important steps have been taken to revise the project's governance structure to provide affected communities with a direct voice in the project. During the 2018–2019 fiscal year, representatives from the Ross River Dena Council, the Liard First Nation, the Selkirk First Nation and their technical advisors participated in a series of technical meetings and workshops to discuss human health, adaptive management, project risks, water-quality objectives and monitoring.

The project team returned to the affected communities in June 2018 to discuss next steps in the remediation planning process and to solicit input on the measures being developed to mitigate project effects. The communities' feedback informed the development of the project proposal and associated assessment documents. This was the second phase of a formal consultation process initiated in 2017 to further support the environmental and socio-economic assessment process required for the project under the *Yukon Environmental and Socio-economic Assessment Act.*

Indigenous Engagement at the Giant Mine Remediation Project

Location: Yellowknife, Northwest Territories
Custodian: Crown-Indigenous Relations and Northern Affairs Canada - Northern Affairs Organization (CIRNAC-NAO)

Giant Mine was once a major economic driver for the Northwest Territories. Operating between 1948 and 2004, the mine produced over 7.5 million ounces of gold from arsenopyrite ore formations on the western shore of Yellowknife Bay. The processing of gold involved roasting the ore, creating a by-product of highly toxic arsenic trioxide dust. Control of the property, as well as the main environmental liabilities, was transferred to CIRNAC after the mine's closure.

The Giant Mine site lies within the asserted traditional territory of the Akaitcho Territory Dene First Nation, and within the extended Monfwi (Môwhì Gogha Dè Nîîtåèè) boundary, as defined in the Tlicho Land Claim and Self-Government Agreement. The site also lies on the boundary of the Interim Measures Agreement Area of the Northwest Territories Métis Nation. As custodian of the Giant Mine Remediation Project, CIRNAC recognizes the importance of providing opportunities for all stakeholders to engage meaningfully on key issues. The project team also appreciates the importance of showing how stakeholder input has been gathered and incorporated into decision-making.

Since the responsible Ministers' decision on the environmental assessment in 2014, the engagement process has matured and become more streamlined. Key activities, such as the engagement on surface design, helped establish momentum and trust with some stakeholder groups, particularly the Yellowknives Dene First Nation and the North Slave Métis Alliance. Through the ongoing consultation activities, the project team has also gained important insight that allowed the planning and execution of engagement sessions and public events to become easier and more effective.

Over the 2018–2019 fiscal year, the project team undertook or participated in 51 engagement activities or events. These included sessions on quantitative risk assessment, the archeological impact assessment, the Socio-Economic Advisory Body, Measure 6 of the Report of Environmental Assessment, an industry day, and pre-engagement on the water licence. The project team also conducted outreach to youth with local schools, providing students with hands-on science experiences and opportunities for classroom visits. As the project moves into the water-licence process, upcoming engagement is expected to include activities to gain input and feedback on the closure and reclamation plan for the site – specifically, on borrow sources and Baker Creek, and technical sessions. The project team also recognizes the importance of incorporating traditional knowledge into the planning for final site remediation, and will continue to work with the Yellowknives Dene First Nation and the North Slave Métis Alliance to ensure that the gathering and use of traditional knowledge continues to improve.

5 Updates on Priority Projects

Faro Mine Remediation Project

Location: Faro, Yukon
Custodian: Crown-Indigenous Relations and Northern Affairs Canada - Northern Affairs Organization (CIRNAC-NAO)

The Faro Mine complex is located in south-central Yukon, 22 km north of the town of Faro and almost 350 km northeast of Whitehorse. From Whitehorse, the mine is a 30-minute charter flight or a four-hour drive away. The mine complex is located in the traditional territory of the Kaska Nation and is upstream from the traditional territory of the Selkirk First Nation.

History

A former open-pit lead and zinc mine, Faro Mine operated for 30 years until its last operator, Anvil Range Mining Corporation, went into receivership in 1998. In 2003, the authority to manage public lands and resources, including abandoned mine sites, was transferred to the Government of Yukon, under the Yukon Northern Affairs Organization Devolution Transfer Agreement and the *Yukon Act (2002).* The Agreement left the federal government financially liable for remediation of the Faro Mine, with the Government of Yukon responsible for the management of the remediation project. This joint governance model has posed challenges for the management of this complex, high-risk and large-scale project. To align the project management with best practices and effectively manage the risks, the Government of Yukon and the Government of Canada have negotiated an agreement to alter their roles and transition the site to full federal control. The agreement is expected to be signed in 2019–2020.

Contamination

Faro Mine is one of the largest and most contaminated sites in Canada. The site consists of waste-rock dumps, ore-processing facilities, water-treatment plants, tailings-disposal facilities, offices and other buildings. There are approximately 70 million tonnes of tailings and 320 million tonnes of waste rock across the mine complex.

These materials have the potential for both metal release and acid rock drainage, which occurs when sulphide-containing waste rock and tailings are exposed to air and water. This will become more problematic as the acid concentrations reach saturation and begin releasing in high concentrations into the environment. If unchecked, this would make the waters downstream in the Pelly River watershed highly toxic to fish. Orange-red precipitate from sulphide oxidation would coat stream beds, making them inhospitable to aquatic organisms and fish spawning. The tailings are contained behind three impoundments, but these are physically unstable. If the main tailings impoundment fails, the damage downstream could be irreparable.

Maintenance and closure

CIRNAC continues to manage the necessary care and maintenance activities at Faro Mine to protect human health, public safety and the environment. These activities include water pumping and treatment, stream diversions, building maintenance, continuous inspection and monitoring of dams, and site security.

In 2008, CIRNAC, the Government of Yukon and First Nations developed the Faro Mine Preferred Remediation Plan. The plan involves stabilizing and capping the waste rock and tailings, and instituting a permanent water-management and treatment system.

Notable achievements in the 2018–2019 fiscal year were the procurement of the interim construction manager, Parsons Inc., to oversee urgent works such as the North Fork Rose Creek diversion and the completion of the 30% design of the conceptual remediation plan in preparation for the project proposal to be submitted for environmental assessment in 2019. CIRNAC also completed public consultation sessions to gather feedback on key environmental and socio-economic issues, and is incorporating feedback into the project proposal to be submitted to the Yukon Environmental Socio-economic Assessment Board.

Giant Mine Remediation Project

Location: Yellowknife, Northwest Territories
Custodian: Crown-Indigenous Relations and Northern Affairs Canada - Northern Affairs Organization (CIRNAC-NAO)

The Giant Mine site covers approximately 900 hectares within the city limits of Yellowknife. The site lies along the western shore of Yellowknife Bay, an arm of Great Slave Lake. The site is a former gold mine that operated from 1948 to 2004. The operations led to significant contamination, including 237,000 tonnes of arsenic trioxide dust stored in 15 underground chambers. Moreover, 16 million tonnes of arsenic-contaminated tailings are stored in surface tailings ponds. The underground mine water, industrial buildings and surface soil are all contaminated with arsenic. Furthermore, because a creek passes through the mine site, above the arsenic chambers and adjacent to mine openings, there is a potential for the mine to flood.

Giant Mine was operated by private interests until its last operator, Royal Oak Mines Inc., went into receivership in April 1999. The Ontario Superior Court, under the provisions of the *Bankruptcy and Insolvency Act* (1985), then ordered the transfer of the property, including all environmental liability, from the interim receiver to CIRNAC, on behalf of the federal Crown.

Site stabilization and risk management

Since 2006, CIRNAC has performed or contracted a large amount of work on the site:

- Advanced remediation activities have been completed to mitigate high risks at the site; these include the deconstruction of small buildings, the sealing of openings to the mine, the testing and evaluation of the arsenic chamber freezing process and asbestos removal from existing infrastructure.

- Remediation work was also initiated under the Site Stabilization Plan, developed to address the largest risks, in order to protect human health and safety and the environment. This plan required several project elements to proceed urgently, including the deconstruction of the roaster complex, completed in December 2014, and urgent backfilling to stopes from 2013 to 2016. Additionally, other high-risk infrastructure was removed in 2015 and 2016, including the deconstruction of the C-shaft headframe in 2015, and the A-shaft headframe and hoist room, the assay lab, and the curling club in 2016.

- In May 2018, contractors began construction under the final stage of the Site Stabilization Plan. This primarily consisted of backfilling stope complex C5-09 with paste and self-levelling concrete. Other key activities in 2018–2019 included carrying out quality-assurance work on criteria for backfill quality and void fullness, during ongoing underground stabilization void-backfilling processes, and removing equipment from the C5-09 backfilling activities after completion. The Site Stabilization Plan is now finalized, marking a significant milestone for the Project.

Carrying out the Giant Mine environmental assessment measures

In August 2014, the responsible Minister (then titled the Minister of Aboriginal Affairs and Northern Development) approved the decision to proceed with the Project. However, this approval was subject to 26 legally binding measures recommended through the environmental assessment, which altered the scope, timelines and cost of the Project. These measures required CIRNAC to perform an in-depth review of the Project, including extensive public and stakeholder scrutiny through numerous consultations.

Studies to be conducted over the next two to three years will allow the project team to develop accurate cost estimates and determine the scope, schedule, cost, and risk implications of the measures. Some of the measures are interdependent; for example, the final routing of Baker Creek (Measure 11) cannot be decided until final site-specific water-quality objectives (Measures 12 and 13) are determined. Consequently, their integration into the project plan and the collection of site-specific data will continue for the rest of the definition phase of the Project, and will inform the remediation strategy.

Measures completed to date deal with the negotiation of an environmental agreement and the creation of the Giant Mine Oversight Board (Measures 3, 4, 7 and 8), investigating and engaging stakeholders and the public in discussions of, the release of a final report on long-term funding options (Measure 6), and investigating options for Baker Creek (Measure 11).

The investments required to implement measures, such as the human health and ecological risk assessments and the determination of the final routing of Baker Creek, are currently being made and will continue over multiple field seasons.

Activities in 2018–2019

The past year's activities largely focused on work supporting the development of the final remediation plan, advancement of several measures, and finalizing the water-licence application. Activities included the following:

- The Project relies heavily on a strong engagement program. Over the 2018–2019 fiscal year, the Project undertook or participated in 51 engagement activities or events. These included sessions on quantitative risk assessment, the archeological impact assessment, the Socio-economic Advisory Body, Measure 6 of the Report of Environmental Assessment, an industry day, and water-licence pre-engagement. The project team also conducted outreach to youth, with local schools providing students with hands-on science experience and organizing classroom visits. As the project team moves into the water-licence process, upcoming engagement is expected to include activities to gain input and feedback on the closure and reclamation plan for the site – specifically, on borrow sources, Baker Creek, and technical sessions. The project team also recognizes the importance of incorporating traditional knowledge into the planning for final site remediation, and will continue to work with the Yellowknives Dene First Nation and the North Slave Métis Alliance to ensure that the gathering and use of traditional knowledge continues to improve.

- An independent consultant (Wood PLC) was retained in 2018 to complete the quantitative risk assessment (Measure 5). A separate consultant (Stratos) was retained to develop the engagement component. To date, the quantitative risk assessment team has prepared and presented an overall methodology and engagement strategy to the Giant Mine Remediation Project Working Group. The team held public sessions on risk identification, consequence criteria and acceptability thresholds, and adjusted the strategy in response to input.

- In 2016, the project team established an advisory committee for the Health Effects Monitoring Program (Measure 9). The committee is made up of health experts, territorial and federal government officials, and community members. The Program includes biological sampling; the first sampling period was completed in fall 2017 and included a total of 898 participants from Dettah, Ndilo and Yellowknife. The second sampling period was completed in the spring of 2018 and included 1,139 participants. This completes the baseline study, with 2,037 individuals aged 3 to 79, including Elders. Participants will receive results of the 2018–2019 sampling in 2019–2020. Follow-up sampling will occur in another five or ten years.

- A draft Aquatic Effects Monitoring Program (Measure 17) focusing on the early years of the remediation program (up to 2026) and a conceptual Aquatic Effects Monitoring Program looking past 2026 were developed, engaged upon, and revised. A monitoring program began in 2018–2019 to develop baselines for aquatic effects in Back Bay and further afield.

- The Dust Management and Monitoring Plan, which includes best practices to minimize the chances of dust and contaminants blowing into Yellowknife, Dettah and Ndilo (Measure 20), continued in 2018–2019. The Air Quality Monitoring Program also continued throughout 2018–2019, with the eight fenceline and three community stations (Ndilo, Niven Lake, and near Great Slave Sailing Club) operational (Measure 25).

- The Project finalized and submitted the water-licence application, which included the final Closure and Reclamation Plan, to the Mackenzie Valley Land and Water Board on April 1, 2019. This marks a major milestone toward remediation of the Giant Mine site. The water licence is expected to be approved by August 2020.

Socio-economic update

As part of CIRNAC's commitment to promote socio-economic benefits and support reconciliation efforts with Indigenous peoples in Canada, the project team completed the following activities as they relate to the socio-economic aspect of the Project:

- Working with Public Services and Procurement Canada and the Government of Northwest Territories, the project team has developed a socio-economic strategy to maximize economic opportunities for northern businesses and local Indigenous peoples, and to address socio-economic effects of the Project. The strategy, which was recently updated, describes the way the project team and its partners will strive to integrate socio-economic

considerations into its activities. The Project released the strategy to the public in September 2019.

- The project team established the Socio-economic Advisory Body, made up of federal, territorial and Indigenous partners. This body will provide information, advice and guidance to Canada and the Main Construction Manager on socio-economic aspects of the Project, and assistance in raising potential organizational barriers to implementation. This body meets quarterly.
- Likewise, the project team established the Socio-economic Working Group, which coordinates and integrates socio-economic activities for the Project, seeks opportunities to improve collaboration, and provides annual updates to the Socio-economic Action Plan. This group meets monthly.
- In response to stakeholder input and in alignment with the objectives of the Socio-economic Action Plan 2018–2019, the project team developed key performance indicators in four categories: employment, training, procurement, and other. The “other” category includes several areas identified by stakeholders as important, such as: changes in the overall employment process to support Indigenous traditions (e.g., hunting and fishing); new joint ventures and partnerships established in the local area and the Northwest Territories; and northern Indigenous and northern non-Indigenous apprentices supported. The key performance indicators will be reviewed annually and amended on the basis of feedback from the Socio-economic Working Group, the Socio-economic Advisory Body and stakeholders.

In 2019–2020, the Project plans to:

- establish the Indigenous Benefits Plan Monitoring and Advisory Committee and identify members;
- have the Socio-economic Working Group, with support from the Socio-economic Advisory Body, develop a more comprehensive Socio-economic Action Plan for 2018–2021;
- assess the newly developed key performance indicators and determine whether they should be amended for 2020–2021; and
- develop targets for select key performance indicators.

United Keno Hill Mine Remediation Project

Location: Central Yukon
Custodian: Crown-Indigenous Relations and Northern Affairs Canada - Northern Affairs Organization (CIRNAC-NAO)

The United Keno Hill Mines (UKHM) properties cover about 15,000 hectares near the former Elsa town site and the village of Keno City in central Yukon, approximately 350 km north of Whitehorse. An all-weather gravel highway connects the site to the town of Mayo, 60 km to the south. The site is within the traditional territory of the First Nation of Nacho Nyak Dun.

History

Over a century, the property operated under various ownership structures. From 1946 to 1989, 5,340,000 tons of ore were mined and milled, producing mainly silver, as well as lead and zinc. Production ceased in 1989. Attempts to re-open the mine in the 1990s were unsuccessful. On February 18, 2000, UKHM Limited filed for creditor protection. Several creditors tried to sell the assets but were unsuccessful, due to a lack of financing by buyers and the lack of a comprehensive plan to address the environmental issues on the site.

Environmental concerns associated with the site include:

- 19 open pits;
- 65 underground workings, some of which are discharging contaminated water into nearby water courses;
- 47 waste-rock dumps (estimated at over 5.5 million tonnes);
- tailings (estimated at over 4 million tonnes) with elevated concentrations of metals;
- tailings dams, which have settled and were constructed without spillways; and
- approximately 216 abandoned buildings, some containing asbestos and other contaminants.

Ownership and management

In June 2003, the property was declared abandoned under the *Waters Act (Yukon)* and *Quartz Mining Act (Yukon)*. As a result, it was classified in April 2003 as a Type II Site under the Yukon Northern Affairs Program Devolution Transfer Agreement, which sets out a cooperative (federal and territorial) approach to managing the site. The Agreement identifies the Government of Canada as financially responsible for historic environmental liabilities, while the Government of Yukon is responsible for the ongoing management.

On April 6, 2004, the Supreme Court of Yukon appointed Pricewaterhouse Coopers Inc. as interim receiver and receiver-manager of the property. It had a mandate to sell the assets and develop a long-term solution to the environmental issues at the mine site. Pricewaterhouse Coopers advertised the property for sale in January 2005. An evaluation process involving Pricewaterhouse Coopers and the federal and territorial governments concluded in July 2005 with the selection of Alexco Resource Corporation as the preferred purchaser.

In December 2007, the Government of Yukon determined that its role as the government project manager and contracting authority was not appropriate. As the site was no longer abandoned, the Government of Yukon requested that CIRNAC assume the role of government project manager and contracting authority. The overall project is now managed through a project team. The team consists of Elsa Reclamation and Development Corporation (ERDC) and CIRNAC, with the Government of Yukon and the First Nation of Nacho Nyak Dun taking on secondary roles.

Maintenance and closure

To protect human health, public safety and the environment, the project team has undertaken basic care and maintenance activities. These include compliance with the water licence, water management (pumping and treatment), surface and groundwater monitoring, building maintenance, continuous inspection and monitoring of dams, and site security.

To prepare for the eventual closure of the site, CIRNAC and ERDC have completed a comprehensive environmental site assessment of the property. They also developed a report that outlines remedial options to address the human-health and environmental risks. Consultations with the Government of Yukon and the First Nation of Nacho Nyak Dun selected preferred closure options, which the governments endorsed in 2014–2015. These preferred closure options involve stabilizing and capping mine openings, waste rock and tailings, and instituting a permanent water management and treatment system.

Through a collaborative review process, with input from CIRNAC, the Government of Yukon, and the First Nation of Nacho Nyak Dun, ERDC prepared a reclamation plan with costing to an indicative level (approved by the Government of Canada on March 15, 2018). The reclamation plan informed the development and submission of the project proposal on September 28, 2018 to the Yukon Environmental Socio-economic Assessment Board (YESAB) for environmental assessment.

Activities in 2018–2019 included compliance with the renewed care and maintenance water licence, advancing the reclamation plan and costing from the indicative level to the substantive level with detailed engineering design activities, and progression through the YESAB process, with the expectation that environmental assessment will be completed by the end of 2019.

Goose Bay Remediation Project

Location: 5 Wing Goose Bay, Happy Valley-Goose Bay, Newfoundland and Labrador
Custodian: Department of National Defence (DND)

DND is committed to environmental sustainability and minimizing the impact of military operations on the environment. In 2009, the Department launched the Goose Bay Remediation Project to reduce potential risks to human health and the environment posed by contamination at the base. Most of the contamination was attributed to the past handling and storage of various substances. Contaminants identified at the base included:

- petroleum hydrocarbons,
- polycyclic aromatic hydrocarbons,
- volatile organic compounds,
- metals,
- pesticides, and
- polychlorinated biphenyls.

DND applied lessons learned from its previous remediation projects to the approach for the Goose Bay Remediation Project. DND considered all contaminated areas collectively to understand the overall environmental condition of the site. Through this analysis, 10 areas were identified for remediation and risk management, with work underway at all 10 locations as of 2018–2019. Project-closure reporting continues, with closure reporting completed for two sub-projects (the upper tank farm and former hydrant area). Planning for long-term monitoring has also begun for various sub-projects.

DND has used several technologies as part of the project, depending on the type of contaminants and site characteristics. Fuel-recovery techniques, such as dual-phase and multi-phase vapour extraction, removed free-phase fuel from the subsurface. The Department also used landfarming, chemical oxidation and soil washing to treat contaminated soil. DND also used risk-management approaches at various sites – for example, by implementing an LNAPL (light non-aqueous phase liquid) framework, as numerous sites have free-phase liquid hydrocarbons; DND has also installed containment measures at historic dump sites and capped contaminated sediment.

Esquimalt Harbour Remediation Project

Location: Victoria, British Columbia
Custodian: Department of National Defence (DND)

Launched in 2014, the Esquimalt Harbour Remediation Project is addressing historical contamination that accumulated in the harbour seabed over almost 200 years of commercial, military and industrial use. The Project is primarily funded by FCSAP, and will reduce ecological health risks associated with contaminated sediments in the harbour.

There are over 25 known contaminants in the harbour seabed, all of which exceed the Canadian Environmental Quality Guidelines for sediments. These contaminants include:

- metals (such as arsenic, cadmium, lead and mercury);
- polycyclic aromatic hydrocarbons;
- organometals (such as tributyltin); and
- dioxins, furans and polychlorinated biphenyls.

The remediation work will reduce the exposure of marine life to contaminated sediments and will provide a healthier harbour for marine ecosystems. It will also minimize the potential for recontamination and provide economic development opportunities for surrounding communities. This work is being coordinated with major construction projects at Canadian Forces Base Esquimalt to provide modern, green and functional dockyard infrastructure to support the long-term operational success of the Royal Canadian Navy.

Specifically, the Project is cleaning up several prioritized areas in Esquimalt Harbour, including: A Jetty, B Jetty, C Jetty, ML Floats, Y Jetty and Lang Cove. In addition to the Project, cleanup is also progressing at four other areas of Esquimalt Harbour, including: D Jetty, F/G Jetty, Ashe Head and Plumper Bay (see Figure 1). A harbour-wide risk-management plan is also being developed to address any remaining contamination after the remediation of prioritized areas is completed.

During the 2018–2019 fiscal year, the sediment remediation work in Esquimalt Harbour passed several milestones:

- The remediation dredging around B Jetty was completed in 2018. Follow-up sampling will be completed in advance of the construction of the new B Jetty to confirm that the remedial objectives have been met.

- The remediation around Plumper Bay and Ashe Head was completed in May 2018. A monitoring program is now underway to confirm that the remedial objectives have been met.

- Remediation of the contaminated sediments around C Jetty and the ML Floats began in April 2018 and is expected to be complete by July 2019.

- The contract to remediate the contaminated sediments near Y Jetty and Lang Cove was awarded in December 2018 and will continue until March 2020.

Appendix A – Program Administration

Secretariat and Expert Support Funding

In the 2018–2019 fiscal year, $11.5 million was spent on the Federal Contaminated Sites Action Plan (FCSAP) Secretariat and expert support services. The breakdown of expenditures is shown in Table A.1.

Table A.1: Summary of FCSAP program management expenditures for Secretariat and expert support services (2018–2019)

Department	Available FCSAP funding ($)	FCSAP expenditures ($)	Variance ($)*
Fisheries and Oceans Canada (expert support)	1,992,702	1,941,901	50,801
Environment and Climate Change Canada: *Secretariat* *Expert support* Total	 *2,920,717* *2,629,164* 5,549,881	 *2,451,214* *3,217,086* 5,668,300	 *469,503* *-587,922* -118,419
Health Canada (expert support)	2,476,274	2,834,796	-358,522
Public Services and Procurement Canada (expert support)	560,000	559,960	40
Treasury Board of Canada Secretariat (Secretariat)	535,000	482,831	52,169
Total expenditures	**11,113,857**	**11,487,788**	**-373,931**

*Variance = available FCSAP funding - FCSAP expenditures

Key Activities

Federal Contaminated Sites Action Plan Secretariat

In its role as Secretariat of the FCSAP program, Environment and Climate Change Canada (ECCC), with support from the Treasury Board of Canada Secretariat, continued to provide overall program oversight, support and administration.

In the 2018–2019 fiscal year, the FCSAP Secretariat performed activities in the following areas:

- *Program governance and oversight* – The FCSAP Secretariat organized and co-chaired meetings of the Contaminated Sites Management Working Group, the Federal Contaminated Sites Director General Steering Committee and the Federal Contaminated Sites Assistant Deputy Minister Steering Committee. The Secretariat also coordinated Regional Integrated Planning Board meetings.

- *Engagement and outreach* – The FCSAP Secretariat organized engagement sessions with Indigenous communities in 2018–2019 to gather feedback and to listen to their concerns about the effects of contamination on the health, environment and social well-being of their communities.

- *Performance monitoring and reporting* – The FCSAP Secretariat worked with ECCC's Audit and Evaluation Branch to complete the FCSAP program evaluation by providing data, reviewing materials and proposing recommendations. The Secretariat also worked closely with federal custodians and the Treasury Board of Canada Secretariat to ensure that information reported to the Federal Contaminated Site Inventory (FCSI) was accurate and complete. It also finalized the 2016–2017 FCSAP annual report for publication and prepared a draft of the 2017–2018 annual report.

- *Strategic planning* – The FCSAP Secretariat developed a long-term strategy for the post-2020 management of federal contaminated sites. It also prepared for the renewal of FCSAP for 2020–2035, by developing options, preparing a memorandum to Cabinet, and preparing a Budget 2019 proposal and Treasury Board submission for FCSAP Phase IV (2020–2025).

Treasury Board of Canada Secretariat

In 2018–2019, the Treasury Board of Canada Secretariat (TBS) supported ECCC in the management of the FCSAP program through the provision of strategic advice and guidance. In this role, TBS:

- supported ECCC in the development of the Budget 2019 funding proposal, the memorandum to Cabinet for program renewal, and the Treasury Board submission to access funding for FCSAP Phase IV;

- supported ECCC in monitoring government-wide progress on federal contaminated sites by participating in key program activities such as annual reporting, organizing and co-chairing of governance meetings, and the FCSAP program evaluation;

- maintained and enhanced the FCSI through improved reporting and mapping functionality;

- supported custodians in meeting their FCSI reporting requirements;

- responded to public enquiries about FCSAP and the FCSI; and

- supported delivery of the Real Property Institute of Canada (RPIC) Federal Contaminated Sites National Workshop, held in Toronto, Ontario, June 13–15, 2018.

Expert Support Departments

In 2018–2019, expert support departments continued to develop guidance documents and deliver training on the management of federal contaminated sites. They also provided advice, conducted reviews of contaminated-site management projects, and promoted innovative and sustainable remediation technologies.

Details on each of the departments' activities include the following:

- Fisheries and Oceans Canada (DFO) provided scientific and technical advice to custodians on the management of their contaminated sites in relation to risks and impacts to fish and fish habitat. DFO conducted 19 site-classification reviews to confirm eligibility for FCSAP funding. It also conducted reviews of 52 technical documents. The reviews were in support of site assessment and remediation and risk management, to ensure that the potential impacts to fish and fish habitat were appropriately considered, and to promote compliance with relevant legislation and regulations.

  To develop guidance material and provide training on the management of FCSAP sites to custodial departments, DFO:

  a) initiated preliminary updates to the FCSAP *Ecological Risk Assessment Guidance* document, including addition of aquatic components;

  b) developed and delivered an in-class training session on the *FCSAP Guidance for Assessing and Managing Aquatic Contaminated Sites in Working Harbours* at the June 2018 RPIC Federal Contaminated Sites National Workshop; and

  c) delivered two webinars on the *FCSAP Guidance for Assessing and Managing Aquatic Contaminated Sites in Working Harbours*, one in French and one in English, in April 2018 and January 2019.

- ECCC was central to all regional expert services to federal custodial departments for the management of their contaminated sites. The Department coordinated expert support activities in the regions, involving the other expert support departments, including the operation of regional interdepartmental working groups, project-update meetings and integrated work planning. It also disseminated information on program tools and guidelines, shared lessons learned, addressed custodial departments' needs and oversaw national consistency.

  Some specific achievements include the following:

  a) In collaboration with the other expert support departments, ECCC conducted 24 site-classification reviews from federal custodians to confirm eligibility for funding, and reviewed 73 technical documents to assist custodians during assessment and remediation projects and to promote compliance with regulations.

b) ECCC developed or contributed to the development of guidance documents on the management of FCSAP sites for custodians in the following areas:

- ecological risk assessment (ERA) modules on defining background conditions and using background concentrations, ERAs for amphibians on federal contaminated sites, and default wildlife toxicity reference values recommended for use at FCSAP sites;
- monitored natural attenuation in soil and groundwater for federal contaminated sites;
- management of light non-aqueous phase liquids on federal contaminated sites;
- FCSAP risk management;
- supplemental guidance on implementation of the Canada-wide standard for petroleum hydrocarbons in soil on federal contaminated sites;
- management and treatment of values below the detection or quantification limit;
- ecological risk assessment; and
- provision of consistent expert advice.

c) ECCC provided training to custodians on the following subjects:

- an ERA module on defining background conditions and using background concentrations,
- quality-control and quality-assurance measures in assessment of contaminated sites, and
- assessing and managing aquatic contaminated sites in working harbours.

- Health Canada continued to provide scientific and technical advice to federal custodians. This involved close collaboration with the other expert support departments on addressing current and emerging chemical issues, such as perfluorooctane sulfonate and perfluorooctanoic acid, as they relate to federal contaminated sites.

  More specifically, Health Canada's activities included:

  a) publishing one human health risk assessment (HHRA) guidance document, as well as updating and releasing the HHRA framework for perfluoroalkylated substances;

  b) reviewing 22 sites for eligibility scoring of the National Classification System and reviewing 73 HHRAs and remediation plans for projects for custodians;

  c) participating in 14 national and nine regional working-group meetings, as well as in regularly scheduled and as-needed interdepartmental meetings;

  d) updating the screening values for perfluorononanoate and developing new departmental screening values for two fluorotelomer sulfonate; and,

e) conducted seven in-class courses for custodians on soil-quality guidelines, provided training on the “Direct Contact Pathway of Contaminated Sediments Preliminary Quantitative Risk Assessment” and “Detailed Quantitative Risk Assessment” checklists; and delivered a “Direct Contact Pathway of Contaminated Sediments” webinar.

- Public Services and Procurement Canada (PSPC) developed contaminated-site management tools. PSPC also collected and shared innovative and sustainable approaches with industry, addressed procurement issues and informed the private sector about the federal demand for services. PSPC organized the RPIC Federal Contaminated Sites National Workshop in Toronto. Finally, PSPC supported the integrated planning in preparation of FCSAP Phase IV by co-chairing the pilot session of the new Regional Integrated Planning Board (RIPB), which included custodians and expert support departments.

Appendix B – Federal Approach to Managing Contaminated Sites

A contaminated site is an area in which hazardous substances occur at concentrations above normally occurring background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment. Determining the risk posed by the presence of these substances includes determining potential exposure pathways and identifying potential receptors. Contamination can come from sources such as storage-tank leaks, long-term use of industrial facilities or accidents – such as spills of polychlorinated biphenyls.

To ensure that custodians take a common approach to managing federal contaminated sites, the Federal Contaminated Sites Action Plan (FCSAP) follows a 10-step process set out in *A Federal Approach to Contaminated Sites.*[6]

- *Step 1: Identify suspected sites* – Identify potentially contaminated sites on the basis of past or current activities on or near the site.
- *Step 2: Historical review* – Assemble and review all historical information pertaining to the site.
- *Step 3: Initial testing program* – Provide a preliminary characterization of contamination and site conditions.
- *Step 4: Classify contaminated site, using the Canadian Council of Ministers of the Environment (CCME) National Classification System* – Prioritize the site for future investigations and remediation or risk-management actions.
- *Step 5: Detailed testing program* – Focus on specific areas of concern identified in step 3 and provide further in-depth investigations and analysis.
- *Step 6: Reclassify the site, using the CCME National Classification System* – Update the ranking in response to the results of the detailed investigations.
- *Step 7: Develop remediation and risk-management strategy* – Develop a site-specific plan to address contamination issues.
- *Step 8: Implement remediation and risk-management strategy* – Implement the site-specific plan that addresses contamination issues.
- *Step 9: Confirmatory sampling and final reporting* – Verify and document the success of the remediation and risk-management strategy.

[6] *A Federal Approach to Contaminated Sites* (Contaminated Sites Management Working Group, 1999), https://www.canada.ca/en/environment-climate-change/services/federal-contaminated-sites/federal-approach.html

- *Step 10: Long-term monitoring* – If required, conduct long-term monitoring to ensure that remediation and long-term risk-management goals are achieved.

These steps indicate the stage of progress at a site. Step 8 tends to require significantly more time, energy and funding than any other step.

Process Walkthrough

Once a site is suspected of being contaminated (step 1), custodians may seek FCSAP funding to conduct a historical review through a Phase I environmental site assessment (step 2). The purpose of this work is to determine whether contamination is likely to exist on the property.

The next step consists of an initial testing program (step 3) to confirm the presence of contamination at the site. If contamination is present above levels specified in policies or guidelines or is above background levels and may cause risk, additional detailed testing (step 5) must occur to determine the extent of contamination. The results from assessments help to identify risks to human health and the environment. The results also determine what remediation or risk-management action is necessary.

To determine the priority of a site for management action, federal sites are classified according to the nature, severity and immediacy of the risk posed to human health and the environment. The CCME National Classification System for Contaminated Sites or the FCSAP Aquatic Sites Classification System is used, depending on whether the contaminated site is on land or in water (steps 4 and 6). To ensure that available funding is directed to the highest-risk sites, FCSAP funds the remediation or risk management of Class 1 (high priority for action) sites and Class 2 (medium priority for action) sites. Class 2 sites must have spent FCSAP remediation expenditures before April 1, 2011. Class 3 (low priority for action) sites are not eligible for FCSAP remediation funding.

Remediation is the act of removing, reducing or destroying contaminants and pollution from the environment (e.g., from soil, groundwater or surface water such as lakes and rivers). Risk management is a set of actions aimed at controlling and managing contaminants. Both remediation and risk management aim to protect the environment and human health. They do this by limiting exposure to hazardous substances, leading to improved quality of life, increased wildlife habitat and economic benefits.

Once assessment activities have confirmed that contamination levels pose a risk to human health or the environment, the custodian responsible for the site oversees the development of the remediation plan (step 7) and updates the federal environmental liability for the site with available information. The custodian then works closely with consultants, contractors and tradespeople to implement the plan (step 8). Usually, the final stage of the project is to confirm that the remediation or risk-management objectives have been reached (step 9). The site may then be closed. The closure of a site indicates that no further action is required and that the federal financial liability has been reduced to zero. For some sites, the most appropriate course of action is to risk-manage contamination. This is done by containing it on a site and reducing

exposure to people, plants and animals. Long-term monitoring (step 10) may be necessary at some sites to ensure that risks remain at acceptable levels.

Appendix C – Data Tables

Table C.1: Available assessment funding and expenditures, by custodian (2018–2019)

Custodian	Number of sites with activity	Available FCSAP funding ($)	FCSAP assessment expenditures ($)	Custodian expenditures (cost share) ($)	Total expenditures ($)
AAFC	0	0	0	0	0
CIRNAC-LED	114	3,113,675	3,113,675	1,023,245	4,136,920
CIRNAC-NAO	0	0	0	0	0
CSC	0	0	0	0	0
DFO	20	759,114	499,857	124,964	624,821
DND	13	791,852	616,725	154,181	770,906
ECCC	4	1,596,000	1,534,622	395,929	1,930,551
JCCBI	0	0	0	0	0
NCC	23	380,000	327,090	81,773	408,863
NRC	0	0	0	0	0
NRCan	21	231,775	231,775	0	231,775
PCA	24	799,944	634,828	134,680	769,508
PSPC	0	0	0	0	0
TC	11	507,216	498,459	124,615	623,074
VIA Rail	0	0	0	0	0
Total	**230**	**8,179,576**	**7,457,031**	**2,039,387**	**9,496,418**

Table C.2: Available remediation funding and expenditures, by custodian (2018–2019)

Custodian	Number of sites with activity	Available FCSAP funding ($)	FCSAP remediation expenditures ($)	Custodian expenditures (cost share) ($)	Total expenditures ($)
AAFC	1	92,000	92,000	6,771	98,771
CIRNAC-LED	80	33,496,940	26,584,477	9,978,028	36,562,505
CIRNAC-NAO	33	223,600,368	188,710,942	5,446,977	194,157,919
CSC	4	255,000	166,309	29,349	195,658
DFO	84	7,610,877	5,302,454	887,855	6,190,309
DND	83	100,104,479	85,030,745	2,725,748	87,756,493
ECCC	10	18,738,228	8,037,001	266,158	8,303,159
JCCBI	2	2,730,000	1,717,089	303,016	2,020,105
NCC	15	8,073,131	598,499	105,161	703,660
NRC	0	0	0	0	0
NRCan	1	404,359	15,513	0	15,513
PCA	42	13,556,254	10,920,886	1,140,552	12,061,438
PSPC	18	35,112,594	36,596,610	6,393,730	42,990,340
TC	49	34,739,292	30,376,371	799,120	31,175,491

VIA Rail	0	0	0	0	0
Total	**422**	**478,513,522**	**394,148,896**	**28,082,465**	**422,231,361**

Table C.3: Program-level summary of available FCSAP funding (2018–2019)

FCSAP funds	Program management ($)	Assessment ($)	Remediation ($)	Total ($)
FCSAP funding approved for 2018–2019	19,840,628	4,408,945	300,671,858	324,921,431
FCSAP funding brought forward from previous fiscal years	566,530	2,287,384	178,975,010	181,828,924
FCSAP funds received from another custodian (+)	149,971	0	2,624,473	2,774,444
FCSAP funds given to another custodian (-)	-149,971	0	-2,624,473	-2,774,444
FCSAP funds internally transferred to another stream (assessment, remediation, program management) (±)	-349,901	1,483,247	-1,133,346	0
Total available FCSAP funding	20,057,257	8,179,576	478,513,522	506,750,355

Table C.4: Program-level summary of FCSAP expenditures and variance (2018–2019)

FCSAP funds	Program management ($)	Assessment ($)	Remediation ($)	Total ($)
Total available FCSAP funding	20,057,257	8,179,576	478,513,522	506,750,355
FCSAP expenditures	20,090,404	7,457,031	394,148,896	421,696,331
Total variance	-33,147	722,545	84,364,625	85,054,023
Explanation of variance				
FCSAP funds reprofiled to a future year	0	259,114	70,567,904	70,827,018
FCSAP funds carried forward to a future year	148,597	165,116	3,024,213	3,337,926
Internal cash-management of FCSAP funds to a future year	136,802	228,037	10,407,336	10,772,175
Lapsed FCSAP funds	-318,546	70,278	365,172	116,904

Table C.5: List of remediation sites funded by FCSAP (2018–2019)

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
AAFC	The Atlantic Food and Horticulture Research Centre	02731004	NS	92,000	6,771
CIRNAC-LED	67 - Long Point First Nation - 06133 - WINNEWAY INDIAN SETTLEMENT - 2000051098	05352002	QC	10,200	2,442
CIRNAC-LED	79 - Atikamekw d'Opitciwan - 06105 - OBEDJIWAN 28 - 0301032102	05205004	QC	51,046	9,008
CIRNAC-LED	79 - Atikamekw d'Opitciwan - 06105 - OBEDJIWAN 28 - 0302543305	00005225	QC	4,717	833
CIRNAC-LED	126 - Couchiching First Nation - 06241 - COUCHICHING 16A - 3000014095	05152001	ON	1,262,160	195,020
CIRNAC-LED	136 - Wasauksing First Nation - 06205 - PARRY ISLAND FIRST NATION - 3000037495	05175006	ON	53,500	0
CIRNAC-LED	164 - Mohawks of the Bay of Quinte - 06217 - TYENDINAGA MOHAWK TERRITORY - ON04878217	00026491	ON	195,265	34,458
CIRNAC-LED	183 - Eabametoong First Nation - 06296 - FORT HOPE 64 - 3000025795	00000458	ON	1,214,381	214,302
CIRNAC-LED	183 - Eabametoong First Nation - 06296 - FORT HOPE 64 - 3000025895	00000457	ON	649,329	114,587
CIRNAC-LED	183 - Eabametoong First Nation - 06296 - FORT HOPE 64 - 3000025995	05157001	ON	940,128	306,844
CIRNAC-LED	183 - Eabametoong First Nation - 06296 - FORT HOPE 64 - 3000026095	05157006	ON	337,921	59,633
CIRNAC-LED	183 - Eabametoong First Nation - 06296 - FORT HOPE 64 - 3000026395	05157007	ON	35,371	6,242
CIRNAC-LED	201 - Serpent River - 06185 - SERPENT RIVER 7 - 3000047696	05185001	ON	319,532	43,418

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
CIRNAC-LED	204 - North Caribou Lake - 06315 - WEAGAMOW LAKE 87 - 0402702806	00006671	ON	36,161	6,381
CIRNAC-LED	204 - North Caribou Lake - 06315 - WEAGAMOW LAKE 87 - 0402705206	00006675	ON	43,393	7,657
CIRNAC-LED	204 - North Caribou Lake - 06315 - WEAGAMOW LAKE 87 - 3000005894	05190003	ON	75,103	13,254
CIRNAC-LED	204 - North Caribou Lake - 06315 - WEAGAMOW LAKE 87 - 3000020095	05190006	ON	30,597	5,400
CIRNAC-LED	204 - North Caribou Lake - 06315 - WEAGAMOW LAKE 87 - 3000020395	05190007	ON	69,540	12,272
CIRNAC-LED	207 - Bearskin Lake - 06319 - BEARSKIN LAKE - 0403509708	00006985	ON	468,722	1,731,278
CIRNAC-LED	207 - Bearskin Lake - 06319 - BEARSKIN LAKE - 3000006994	05147001	ON	37,464	6,611
CIRNAC-LED	207 - Bearskin Lake - 06319 - BEARSKIN LAKE - 3000017495	05147006	ON	20,038	3,536
CIRNAC-LED	207 - Bearskin Lake - 06319 - BEARSKIN LAKE - 3000054196	00007881	ON	112,335	19,824
CIRNAC-LED	207 - Bearskin Lake - 06319 - BEARSKIN LAKE - 3000117000	00007891	ON	21,694	3,828
CIRNAC-LED	207 - Bearskin Lake - 06319 - BEARSKIN LAKE / 0404783610	00007862	ON	19,747	3,485
CIRNAC-LED	208 - Pikangikum - 06320 - PIKANGIKUM 14 - 3000007494	05176001	ON	2,189,085	316,763
CIRNAC-LED	208 - Pikangikum - 06320 - PIKANGIKUM 14 - 3000007994	05176004	ON	280,652	40,611
CIRNAC-LED	208 - Pikangikum - 06320 - PIKANGIKUM 14 - 3000008294	05176006	ON	280,652	40,611
CIRNAC-LED	208 - Pikangikum - 06320 - PIKANGIKUM 14 - 3000062796	05176008	ON	28,066	4,061
CIRNAC-LED	208 - Pikangikum - 06320 - PIKANGIKUM 14 - 3000063096	05176010	ON	11,565	20,561

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
CIRNAC-LED	213 - Muskrat Dam Lake - 06327 - MUSKRAT DAM LAKE - 3000008694	05170001	ON	972,335	171,588
CIRNAC-LED	213 - Muskrat Dam Lake - 06327 - MUSKRAT DAM LAKE - 3000008794	05170002	ON	1,093,877	193,037
CIRNAC-LED	213 - Muskrat Dam Lake - 06327 - MUSKRAT DAM LAKE - 3000009094	05170004	ON	364,625	64,346
CIRNAC-LED	217 - Wunnumin - 06333 - WUNNUMIN 1 - 3000035195	05194001	ON	45,576	8,043
CIRNAC-LED	217 - Wunnumin - 06333 - WUNNUMIN 1 - 3000035695	05194003	ON	58,130	10,258
CIRNAC-LED	217 - Wunnumin - 06333 - WUNNUMIN 1 - 3000035895	05194014	ON	8,043	1,419
CIRNAC-LED	217 - Wunnumin - 06333 - WUNNUMIN 1 - 3000035995	05194004	ON	63,115	11,138
CIRNAC-LED	217 - Wunnumin - 06333 - WUNNUMIN 1 - 3000040896	05194007	ON	26,809	4,731
CIRNAC-LED	217 - Wunnumin - 06333 - WUNNUMIN 1 - 3000040996	05194008	ON	8,043	1,419
CIRNAC-LED	217 - Wunnumin - 06333 - WUNNUMIN 1 - 3000104197	05194010	ON	5,362	946
CIRNAC-LED	217 - Wunnumin - 06333 - WUNNUMIN 1 - 3000104297	05194011	ON	18,766	3,312
CIRNAC-LED	220 - Nipissing First Nation - 06152 - NIPISSING 10 - 3000034495	00006318	ON	119,176	7,500
CIRNAC-LED	239 - Neskantaga First Nation - 06355 - LANSDOWNE HOUSE INDIAN SETTLEMENT - 3000028795	05164002	ON	2,872,696	506,946
CIRNAC-LED	239 - Neskantaga First Nation - 06355 - LANSDOWNE HOUSE INDIAN SETTLEMENT - 3000029095	05164005	ON	248,358	43,828

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
CIRNAC-LED	239 - Neskantaga First Nation - 09213 - NESKANTAGA - ON04790610	00007873	ON	502,112	288,608
CIRNAC-LED	239 - Neskantaga First Nation - 09213 - NESKANTAGA - ON04795110	00008212	ON	93,566	16,512
CIRNAC-LED	240 - Webequie - 06337 - WEBEQUIE INDIAN SETTLEMENT - 0404167609	00007586	ON	29,588	5,299
CIRNAC-LED	240 - Webequie - 06337 - WEBEQUIE INDIAN SETTLEMENT - 0404167709	00007587	ON	344,052	61,623
CIRNAC-LED	240 - Webequie - 06337 - WEBEQUIE INDIAN SETTLEMENT - ON04827711	00008210	ON	5,690	1,019
CIRNAC-LED	269 - Peguis - 06373 - PEGUIS 1B - 4000024197	05321001	MB	401,029	61,467
CIRNAC-LED	269 - Peguis - 06373 - PEGUIS 1B / 4000044101	05321005	MB	445,490	78,616
CIRNAC-LED	277 - Poplar River First Nation - 06391 - POPLAR RIVER 16 - MB04850714	00025879	MB	220,046	38,832
CIRNAC-LED	297 - Garden Hill First Nations - 06448 - GARDEN HILL FIRST NATION - 0502583005	00005622	MB	138,497	24,441
CIRNAC-LED	297 - Garden Hill First Nations - 06448 - GARDEN HILL FIRST NATION - 0503396908	00006936	MB	13,698	2,417
CIRNAC-LED	297 - Garden Hill First Nations - 06448 - GARDEN HILL FIRST NATION - 4000018696	00025923	MB	1,392,753	236,478
CIRNAC-LED	298 - St. Theresa Point - 09147 - ST THERESA POINT - 0503606908	00007045	MB	734,723	129,657
CIRNAC-LED	298 - St. Theresa Point - 09147 - ST THERESA POINT - 4000038700	00006601	MB	40,375	7,125

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
CIRNAC-LED	299 - Wasagamack First Nation - 09148 - WASAGAMACK - 0502601305	00005805	MB	6,163	1,088
CIRNAC-LED	299 - Wasagamack First Nation - 09148 - WASAGAMACK - 4000043901	05306007	MB	6,163	1,088
CIRNAC-LED	299 - Wasagamack First Nation - 09148 - WASAGAMACK - MB04794710	00007916	MB	34,000	6,000
CIRNAC-LED	306 - Tataskweyak Cree Nation - 06461 - SPLIT LAKE 171 - 0502224705	00000532	MB	206,457	36,434
CIRNAC-LED	307 - Shamattawa First Nation - 06460 - SHAMATTAWA 1 - 0503403208	00006940	MB	141,495	24,970
CIRNAC-LED	307 - Shamattawa First Nation - 06460 - SHAMATTAWA 1 - 0503404808	00006941	MB	283,505	50,030
CIRNAC-LED	308 - Barren Lands - 06458 - BROCHET 197 - 0501870404	05260005	MB	258,493	10,833
CIRNAC-LED	311 - Mathias Colomb - 06456 - PUKATAWAGAN 198 - 4000002393	00006814	MB	129,183	22,797
CIRNAC-LED	317 - Northlands Denesuline First Nation - 06468 - LAC BROCHET 197A - 4000018896	05310001	MB	336,662	1,322,141
CIRNAC-LED	351 - Fond du Lac - 00178 - FOND DU LAC 231 - 0603056806	00006788	SK	212,500	37,500
CIRNAC-LED	502 - Liard First Nation - 08433 - LIARD RIVER 3 - 0801946205	05210004	BC	8,631	0
CIRNAC-LED	540 - Kitasoo - 07886 - KITASOO 1 - BC04825611	00008201	BC	9,733	0
CIRNAC-LED	554 - Tla'amin Nation - 07961 - SLIAMMON 1 - 7000055295	05379001	BC	102,955	16,500
CIRNAC-LED	555 - Squamish - 00009 - KITSILANO NO. 6 - 0901112102	00006889	BC	10,610	0

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
CIRNAC-LED	555 - Squamish - 07969 - CAPILANO 5 - BC04886418	00026582	BC	2,158,092	375,000
CIRNAC-LED	564 - Kwantlen First Nation - 08029 - WHONNOCK 1 - BC04791810	00008251	BC	19,689	0
CIRNAC-LED	564 - Kwantlen First Nation - 08033 - LANGLEY 5 - BC04790410	00008206	BC	700,123	120,809
CIRNAC-LED	569 - Semiahmoo - 08047 - SEMIAHMOO - 0903374908	00006932	BC	88,000	22,000
CIRNAC-LED	616 - Okanagan - 07390 - OKANAGAN 1 - 7000032694	05071015	BC	13,169	256,821
CIRNAC-LED	616 - Okanagan - 07394 - DUCK LAKE 7 - BC04879117	00026515	BC	13,169	0
CIRNAC-LED	642 - Cowichan - 06799 - COWICHAN 1 - 7000019894	05020004	BC	1,727,609	294,475
CIRNAC-LED	648 - Snuneymuxw First Nation - 06817 - NANAIMO RIVER 3 - 0903801608	00007210	BC	71,505	7,800
CIRNAC-LED	675 - Gitga'at First Nation - 07846 - KULKAYU (HARTLEY BAY) 4 - BC04845213	19118090	BC	75,604	18,660
CIRNAC-LED	679 - Nisga'a Village of Gitwinksihlkw - 07613 - GITWINKSIHLKW 7 - 7000108498	05337007	BC	26,720	4,030
CIRNAC-LED	Site 00026534 - AT04881617	00026534	NS	879,355	0
CIRNAC-NAO	BAF 5 - Resolution Island	C1017001	NU	611,351	107,885
CIRNAC-NAO	Beaulieu Mine (John Lake; Brandy; Irene; Norma; Tungsten and Gold Mines Limited)	00023544	NT	141,649	24,997
CIRNAC-NAO	Bullmose Lake Mine (Formerly Mann Lake)	00000068	NT	446,978	78,878
CIRNAC-NAO	Burnt Island (Ardogo, Good Hope, Goo, Giant Bay, Gordon Lake)	00023547	NT	433,933	76,576

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
CIRNAC-NAO	CAM E - Keith Bay	C1003001	NU	7,177,618	1,266,638
CIRNAC-NAO	Camlaren Mine (Hump Vein)	00000162	NT	3,471,465	612,611
CIRNAC-NAO	Canol Trail	00025577	NT	3,762,936	664,047
CIRNAC-NAO	Cantung Mine (Canada Tungsten Mine, Tungsten Mine)	00000154	NT	8,866,926	0
CIRNAC-NAO	Chipp Lake Mine (Cliff Lake, Eileen)	00023777	NT	95,176	16,796
CIRNAC-NAO	Clinton Creek	C1052001	YT	4,372,231	771,570
CIRNAC-NAO	Contact Lake Mine (International Uranium, M Group, Sam, Kayo)	C1051001	NT	9,808	0
CIRNAC-NAO	El Bonanza Mine (Bonanza East, Bonanza Vein, Spud Vein)	00000076	NT	6,758	0
CIRNAC-NAO	Faro Mine	C2503001	YT	58,742,771	0
CIRNAC-NAO	FOX D - Kivitoo	C1021001	NU	3,747,612	661,343
CIRNAC-NAO	Giant Mine (Giant Yellowknife Mines; Royal Oak Mines; A, B & C Shafts)	C1048001	NT	77,058,084	0
CIRNAC-NAO	Goodrock Mine (Gordon Lake)	00000351	NT	433,933	76,576
CIRNAC-NAO	Hottah-Beaverlodge Lake	00000842	NT	9,338	0
CIRNAC-NAO	Indore Gold Mine/Hottah Lake (Pitch 8)	C1026001	NT	15,353	0
CIRNAC-NAO	Joon Mine (Campbell Lake, June Mine, Strike Lake)	00000405	NT	138,896	24,511
CIRNAC-NAO	Knight Bay (Kidney Pond)	00024120	NT	2,603,599	459,459
CIRNAC-NAO	Mount Nansen Mine	C2505001	YT	2,587,410	0
CIRNAC-NAO	Rayrock Mine (Rob group; M.M. Group; Island 2; Beta)	C1031001	NT	1,242,031	219,182
CIRNAC-NAO	Ruth Gold Mine	C1033001	NT	383,478	67,673
CIRNAC-NAO	Sawmill Bay / Great Bear Lake	00000403	NT	28,699	0
CIRNAC-NAO	Spectrum Lake (AA/BB, Benventum)	00023964	NT	427,180	75,385

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
CIRNAC-NAO	Storm Mine (Consolation Lake 2)	00023548	NT	74,342	13,119
CIRNAC-NAO	Terra #1 (North Mine, Silver Bear Properties)	C1010001	NT	784,300	0
CIRNAC-NAO	Terra #2 (Northrim Mine, Silver Bear Properties, Silver Bay, White Eagle)	C1011001	NT	75,776	0
CIRNAC-NAO	Terra #3 (Norex Mine, Silver Bear Properties; Caeser Silver)	C1012001	NT	65,185	0
CIRNAC-NAO	Terra #4 (Smallwood Mine, Silver Bear Properties)	C1013001	NT	26,584	0
CIRNAC-NAO	Tundra-Taurcanis Mine (Bulldog Yellowknife Gold Mines, Tamcanis Mines Limited, Tundra Gold Mines)	C1035001	NT	5,787,986	0
CIRNAC-NAO	United Keno Hill Mine	C2509001	YT	3,779,759	0
CIRNAC-NAO	West Bay Mine (Black Ridge) (DAF) (MQ)	C1037001	NT	1,301,799	229,729
CSC	330-C01 Leclerc Institution - Former Tank Nest Beside Central Heating Plant	00013010	QC	2,764	488
CSC	441-L02 Collins Bay - Southern Landfill (near Front Road)	00024662	ON	50,983	8,997
CSC	451-C12-A Pittsburgh Former Underground Storage Tank	00024746	ON	17,135	3,024
CSC	530-L01 Drumheller - Former Landfill at South West	00013023	AB	95,427	16,840
DFO	Addenbroke Island	67677001	BC	7,151	1,262
DFO	Beauty Island - Metal & Petroleum Hydrocarbon Soil Contamination	00014156	ON	18,250	3,221
DFO	Big River (Groundwater)	00023109	SK	8,062	1,423
DFO	Boat Bluff	67678001	BC	7,151	1,262
DFO	Bonavista (Waterlot Property) DFRP # - 01122	01122003	NL	46,371	8,183
DFO	Bonilla Island - Sector Light	19482001	BC	7,151	1,262
DFO	Bragg's Island (Waterlot)	00019030	NL	50,942	8,990
DFO	Burgeo (L-Shape Finger Pier Site Waterlot - DFRP# 34528)	00022996	NL	16,562	2,923

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
DFO	Burgeo (Slipway Site - Waterlot - DFRP# 34527)	00022995	NL	16,562	2,923
DFO	Cabot Head - Old Lighthouse Dwelling, Lightkeepers Dwelling, Waste Pile	36440002	ON	86,597	15,282
DFO	Cap-de-la-Table (light station)	08024002	QC	32,768	5,783
DFO	Cape Beale	17809001	BC	7,151	1,262
DFO	Cape Gaspé - light station	05203001	QC	50,364	9,195
DFO	Cape Mudge	18225001	BC	7,151	1,262
DFO	Cape Scott - main station	19007001	BC	11,079	728
DFO	Carmanah Point	17533001	BC	7,151	1,262
DFO	Change Islands (Coastal Wharf Site - Waterlot - DFRP# 01376)	00019056	NL	40,723	7,186
DFO	Change Islands (Fish Plant Site - Waterlot - DFRP #31346)	00022958	NL	40,723	7,186
DFO	Channel-Port aux Basques (Waterlot)	00748001	NL	50,993	8,999
DFO	Chatham Point	18090001	BC	7,151	1,262
DFO	Chrome Island - Range Light	18001001	BC	7,151	1,262
DFO	Comfort Cove (Southern Finger Pier Site - Waterlot - DFRP #01430)	00022961	NL	50,397	8,894
DFO	Conception Harbour (Tidal Zone - DFRP# 26796)	00019062	NL	28,144	4,967
DFO	Conception Harbour (Waterlot - DFRP #26796)	00023129	NL	42,217	7,450
DFO	Coopers Point - PAH and metals in sediment	00017753	NS	14,153	2,498
DFO	Corossol Island - minor shore light	00000877	QC	3,060	540
DFO	Country Island - Hydrocarbons and Metals near Former Oil Pump	00013071	NS	212,485	37,489
DFO	Dryad Point	67679001	BC	7,151	1,262
DFO	Durand Island, former beacon	24464001	QC	52,704	9,301
DFO	Egg Island	67680001	BC	7,151	1,262
DFO	Entrance Island	17611001	BC	7,151	1,262
DFO	Estevan Point	17813001	BC	7,151	1,262
DFO	Fortune (Fish Plant Wharf - DFRP #00494 - Uplands)	00490002	NL	23,709	4,184

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
DFO	Francois (Community Stage Wharf - DFRP #34533 - Waterlot)	00022998	NL	43,714	7,714
DFO	Francois (Slipway Site DFRP #55602 - Waterlot)	00022999	NL	43,714	7,714
DFO	Gereaux Island (Britt IRB) - Waste Dump - south	00024547	ON	74,775	13,196
DFO	Grates Cove SCH - Waterlot DFRP #00198	00019116	NL	50,656	8,939
DFO	Green Island	67681001	BC	7,151	1,262
DFO	Griffith Island - Vicinity of Lighthouse	58231001	ON	80,361	14,401
DFO	Heart's Content (DFRP #00171 - Waterlot)	00173003	NL	26,532	4,682
DFO	Isle aux Morts (East - DFRP #00733 - Waterlot)	56631001	NL	50,483	8,909
DFO	Ivory Island	67682001	BC	7,151	1,262
DFO	Jacquet River (Arsenic, Cadmium and Lead in Sediment)	00018055	NB	33,995	5,999
DFO	Jannacks Narrows - Light Tower (former and current)	83474001	ON	60,313	10,643
DFO	Knapp Point (CCG Property)	07118001	ON	28,352	7,728
DFO	Kraut Point (Riverport) (Hydrocarbon and Metal Impacts Soil and GW)	00017804	NS	82,127	14,493
DFO	Langara Island	19401001	BC	7,151	1,262
DFO	Lennard Island	17812001	BC	7,151	1,262
DFO	Lepreau (Belas Basin) (PAH and metals in sediment)	00018028	NB	15,115	2,667
DFO	Long Pèlerin - light station structure and range light	00021639	QC	3,192	563
DFO	Lucy Islands - Hydrocarbon Contamination Near the Lighthouse	84377001	BC	84,991	15,000
DFO	Lunenburg - Fishermen's Wharf (Soil/GW Impacts - Former ASTs & Adjacent Property)	00013237	NS	24,604	4,342
DFO	Lyal Island - Surrounding the old dwelling and outhouse	10960001	ON	55,353	9,768
DFO	Marktosis (Ahousat Village)	00021360	BC	82,011	31,108

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
DFO	Mathers Creek - Enhancement	00021003	BC	170,036	30,000
DFO	McCoy Cove - Sector Light	00020345	BC	17,000	3,000
DFO	McInnes Island	67683001	BC	7,151	1,262
DFO	Merry Island	18460001	BC	7,151	1,262
DFO	Michipicoten Island East End (E. Landfill/Generator Building/Lighthouse)	67652001	ON	928,462	220,765
DFO	Michipicoten Island East End (SE & W of W. Landfill)	67652002	ON	928,462	220,765
DFO	Minstrel Island, Wharf and Floats - Waterlot	00021370	BC	53,175	1,093
DFO	Niagara River Range Rear - soils surrounding structure - metals	00013933	ON	135,145	0
DFO	Nootka Island	18086001	BC	7,151	1,262
DFO	Pachena Point	17810001	BC	7,151	1,262
DFO	Pallant Creek Hatchery	00021044	BC	166,179	33,864
DFO	Petites (SCH - Upland - DFRP #00767)	00019254	NL	23,852	4,209
DFO	Pilier de Pierre - light Station	05668001	QC	1,947	344
DFO	Pine Island	19125001	BC	7,151	1,262
DFO	Pointe au Baril Range Rear - Area around the range	00014837	ON	33,322	509,074
DFO	Prince Rupert Marine Station, Sourdough Bay - Fire Pit and Oil Change Ramp	00000881	BC	42,975	7,206
DFO	Pulteney Point	19084001	BC	7,151	1,262
DFO	Quatsino, Kains Island - Assistant keeper's house & engine room	19006001	BC	7,151	1,262
DFO	Rivière-St-Paul (Esquimaux Island, SCH, Water, Sediments)	00022172	QC	166,600	29,400
DFO	Rose Blanche (Waterlot - DFRP #34772)	34627002	NL	50,351	8,886
DFO	Sainte-Marie Island - minor shore light	08269001	QC	29,304	5,171
DFO	Scarlett Point	19052001	BC	7,151	1,262
DFO	Seldom Come By (South - Waterlot - DFRP #01333)	01333002	NL	50,759	8,957
DFO	Slate Island - Light Tower	56027002	ON	31,814	42,024

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
DFO	Slate Island - North Side of Slate Island	56027003	ON	70,992	54,576
DFO	Slate Island - South Side of the Island	56027001	ON	238,746	193,583
DFO	Souris SAR (Metals and PAHs in Sediment)	00016663	PE	25,505	4,532
DFO	St. John's (Prosser's Rock - Waterlot - DFRP# 55785)	00019349	NL	32,046	5,655
DFO	Steveston (Paramount) - Maintnance area (Building 33)	16760001	BC	189,858	20,000
DFO	Trial Islands	17330001	BC	7,151	1,262
DND	5 Wing Goose Bay - Canadian Side & Northside	01822018	NL	1,863,599	0
DND	5 Wing Goose Bay - Dome Mountain, RCAF and Camp Sites (5 W)	N7075001	NL	4,028,634	0
DND	5 Wing Goose Bay - Hydrant Area Fuel Plumes (HYD9010)	01822043	NL	229,267	222,921
DND	5 Wing Goose Bay - Lower Tank Farm (LTF 2000 Series)	01822094	NL	3,904,448	0
DND	5 Wing Goose Bay - Main Gate & Hamilton River Road Plume (UPL 16000 series)	N7077001	NL	566,544	0
DND	5 Wing Goose Bay - South Escarpment Landfills (SES 1000 Series)	01822087	NL	1,109,808	0
DND	5 Wing Goose Bay - South Escarpment Stillwaters (SES 1100 series)	00008429	NL	466,983	0
DND	5 Wing Goose Bay - Survival Tank Farm (STF 3000 Series)	01822086	NL	4,033,830	0
DND	5 Wing Goose Bay - Upper Tank Farm - Fuel Recovery Site (UTF 4000 Series)	01822085	NL	302,446	0
DND	8 W Fire Fighting Training Area / Hazardous Materials Storage	09540012	ON	348,162	61,440

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
DND	Adminstrative Area - Domaine, Lozeau and Bougainville Islands	06294001	QC	87,849	15,503
DND	Aerodrome - West of runway 18-36	07930004	QC	72,197	12,741
DND	Alert B-145 Cat House	20247019	NU	10,370	1,830
DND	Alert Baker's Dozen	20247035	NU	66,428	11,723
DND	AMDU Landfill Site	09540010	ON	210,744	37,190
DND	Atmosphere simulation (former dump), DRDC-South	29757003	QC	740,253	130,633
DND	BAF-3 Brevoort Island LRR	34422006	NU	70,843	12,502
DND	BAR-B, Stokes Point, SRR Site - Beach	00008374	YT	82,554	14,568
DND	Cadet Camp Landfill & Firing Range	00008347	ON	186,411	32,896
DND	Castor centre PHL T-610	05906059	QC	107,950	19,050
DND	Central Heating Plant	07930011	QC	170,759	30,134
DND	CFB Petawawa RTA - Area 8 (Demolition Range)	00008335	ON	6,286	1,109
DND	CFB Shearwater (211) - Landfill 1	02863011	NS	17,112	3,020
DND	CFB Shearwater (213) - Landfill 3	02863013	NS	44,456	7,845
DND	CFB Shearwater (214) - Landfill 4	02863014	NS	29,637	5,230
DND	CFB Shearwater (216) - Fill Area West of Alpha Taxiway	02863016	NS	74,050	13,068
DND	CFS St. John's (4710) - Cambrai Rifle Range	00273001	NL	51,770	9,136
DND	CFS St. John’s (5210) - Shea Heights Tank Farm	32044002	NL	71,379	12,596
DND	COL-20 Colwood F-Jetty Intertidal & Parking Lot	00008530	BC	93,500	16,500
DND	COL-8a & 8b Colwood Former OWWTP	17451007	BC	9,847	1,738
DND	COL-FOD Colwood Former Fuel Oil Depot (FOD) North Area	00024819	BC	91,371	16,124
DND	Comox FFTA	17970012	BC	1,454,707	256,713
DND	DCD School (907) - Fire Fighting Training Area	03044007	NS	222,921	66,191
DND	DEW Line - CAM-5 Mackar Inlet	C7020001	NU	3,435	5,123

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
DND	DEW Line - DYE-M Cape Dyer	C7026001	NU	365,054	4,530
DND	DEW Line - FOX-2 Longstaff Bluff	C7022001	NU	145,246	30,148
DND	DEW Line - FOX-3 Dewar Lakes	C7023001	NU	140,621	29,345
DND	DEW Line - FOX-4 Cape Hooper	C7024001	NU	126,072	26,778
DND	DEW Line - FOX-5 Broughton Island	C7025001	NU	6,412	8,894
DND	DEW Line - FOX-M Hall Beach	C7021001	NU	3,435	5,123
DND	DEW Line - PIN-2 Cape Young	C7013001	NU	152,229	31,380
DND	DEW Line - PIN-4 Byron Bay	C7015001	NU	3,435	5,123
DND	DRDC (1408) - Waste solvent dumping (East of building 2)	03013004	NS	58,116	10,256
DND	Dry material (former dump for), DRDC-South	29757002	QC	769,001	135,706
DND	DY-4 Dockyard FMF Consolidation	17403003	BC	176,208	31,095
DND	ESQ-1 - Esquimalt Harbour	17403011	BC	52,732,544	50,000
DND	Fire Fighting Training Area #1	11022039	ON	300,311	52,996
DND	Former CFS Moisie - Site Admin	N7096001	QC	144,714	81,841
DND	Former dump Château Road	05906047	QC	16,150	2,850
DND	Former skeet range	00008337	QC	27,498	4,853
DND	Hangar 5 & 6	00024810	ON	235,300	41,524
DND	HMCS Champlain - Chicoutimi Naval Reserve	69920001	QC	182,720	32,245
DND	Land adjacent to the former well P-2	05906061	QC	10,200	1,800
DND	Le RHIN former demolition area	05906041	QC	11,900	2,100
DND	MA-1a Masset Skeet Range	00008529	BC	55,250	9,750
DND	Marsh - North of highway 170	07930017	QC	100,987	17,821
DND	'MDR'' (former dump for), DRDC-Trials	29757006	QC	73,469	12,965
DND	Middleton Park Landfill Site	09540009	ON	42,912	7,573

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
DND	Mountain View - Inner Landfill Site	34476004	ON	158,223	27,922
DND	New ATESS Refinishing Shop	00008541	ON	1,313,304	231,759
DND	Niagara-on-the-Lake Rifle Range	10626002	ON	1,487,197	262,446
DND	Oxidator Building (Back of Building)	20247006	NU	15,300	2,700
DND	Plateau (demolition site), DRDC-Trials	29757009	QC	77,246	13,632
DND	POL Compound	04089001	NB	24,013	4,238
DND	POL Compound - area of removed tanks	09540020	ON	64,005	11,295
DND	POL tank farm	07930009	QC	1,387,385	244,833
DND	Refuelling Facility 2	10992006	ON	11,948	2,108
DND	Royal Roads Landfill Area	15684029	AB	933,949	164,815
DND	RV Compound	11378001	ON	81,418	14,368
DND	Saglek Bay Sediments	N7040001	NL	19,294	3,405
DND	Sector for Building 307, DRDC-Trials	29757005	QC	77,232	13,629
DND	Shearwater (230) - Building 31, 31A, 31B, 32 (Mobl Spprt Maint)	02863030	NS	28,436	5,018
DND	Small calibre (Former dump), DRDC-South	29757001	QC	946,118	166,962
DND	South Redoubt RMC St-Jean	00008463	QC	5,100	900
DND	Stony Point (former Camp Ipperwash)	10829001	ON	390,176	369,793
DND	Stream draining former DDT site in Farnham	00008562	QC	53,381	9,420
DND	Sudbury Armoury	00008448	ON	26,065	4,600
DND	TCE Contamination - Highbury Complex	10868001	ON	525,505	92,736
DND	TCE Contamination - Valcartier	29757007	QC	639,790	233,791
DND	Training areas, former CARPIQUET firing range	05906044	QC	4,250	750
DND	Wellington Anti-Tank Range	00008409	NB	1,004	177
DND	Wolseley Barracks	10869001	ON	26,914	4,749
DND	YA-1 Yarrows Former Hazardous Waste Containment Facility	17404004	BC	23,160	4,087
ECCC	335 River Road	00027484	ON	16,000	4,000
ECCC	Fort Reliance	00002376	NT	637,005	112,413

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
ECCC	Isle Haute - Metals/Benzene Impacted Soil - Former Buildings/Dump Area	00012315	NS	14,884	2,627
ECCC	Isachsen High Arctic Weather Station	07525123	NU	8,000	2,000
ECCC	Lansdowne House	12204000	ON	219,018	38,650
ECCC	Mould Bay (HAWS)	70944001	NT	459,579	81,102
ECCC	Pacific Environmental Centre	N/A	BC	6,538,773	0
ECCC	Sable Island	07610122	NS	70,800	12,494
ECCC	Sainte-Marie Island	00001288	QC	38,792	6,846
ECCC	Wilmer Marsh (dumping area)	16096079	BC	34,151	6,027
JCCBI	Parcel 1	00000903	QC	1,369,886	241,745
JCCBI	Parcel 3	00002327	QC	347,203	61,271
NCC	150 Middle Street	00024007	ON	29,492	5,205
NCC	156 Middle Street	00027600	ON	13,562	2,393
NCC	160 Middle Street	00023977	ON	13,562	2,393
NCC	160 Middle Street	00027601	ON	13,562	2,393
NCC	Bayview	00022831	ON	44,762	7,899
NCC	Leamy Lake - boul. Fournier	00023327	QC	1,092	0
NCC	LeBreton East	00023316	ON	4,086	721
NCC	Middle Street	00027602	ON	56,267	9,930
NCC	Montcalm	00022813	QC	102,546	18,096
NCC	Montcalm	00022815	QC	1,914	338
NCC	Ottawa River	00027614	ON	151,623	26,757
NCC	Pine Grove, Ottawa	00023325	ON	1,492	0
NCC	Ridge Road Former Landfill	00000001	ON	73,835	13,030
NCC	Victoria Island	00023306	ON	38,570	6,806
NCC	Victoria Island	00023990	ON	52,132	9,199
NRCan	555 Booth Street	58475001	ON	15,513	0
PCA	A1 Waste Transfer Station	15412001	AB	18,350	8,056
PCA	A13 Sleepy Hollow Road / Waste Disposal Site	15412012	AB	0	256
PCA	Abandoned Light Station	00023460	BC	3,485	1,605
PCA	Active Pass	00023457	BC	15,621	0
PCA	B1 Trade Waste Pit	15412015	AB	0	472
PCA	C1 JNP Maintenance Compound	15412016	AB	6,595	383
PCA	C2 JNP Tangle Creek Compound	15412017	AB	6,998	80,856
PCA	D26 Little Lake to Rice Lake	09731004	ON	44,097	57,933

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
PCA	Fort Conger Historic Site	00008328	NU	60,600	15,006
PCA	Forty Mile Creek Landfill	15404044	AB	25,416	8,208
PCA	Garage	20106005	YT	13,192	29,272
PCA	Garden River Old Dump	15841002	AB	2,128,499	15,249
PCA	Harriet Harbour	00024667	BC	0	991
PCA	Hay Camp	15841001	AB	39,235	6,552
PCA	K17 Nestor 2 living quarters building D	00012840	NU	12,000	3,690
PCA	Kingston Inner Harbour Marsh	00023391	ON	100,034	13,203
PCA	Maintenance Compound	10667002	ON	117,000	155,328
PCA	Major Shore Light	00023458	BC	4,960	3,380
PCA	McLean's Point	17800008	BC	417,018	9,493
PCA	Old Port of Montreal - Confinement Cell	55380001	QC	8,622	1,527
PCA	Old Sly's Lockstation	09412002	ON	60,000	8,078
PCA	Palace Grand Theatre Underground Storage Tank	20005001	YT	273,812	11,083
PCA	Rail Yard	00002377	AB	0	766
PCA	Reserve Land, Part 3, Extension of Lot 132/133	09412007	ON	12,204	1,580
PCA	Rogers Pass Maintenance Compound	18752001	BC	5,090,570	371,841
PCA	Russell Island Homestead	00024299	BC	6,970	1,915
PCA	Saturna Island Light Tower	00023462	BC	116,289	12,190
PCA	Site 04.3	06959028	QC	348,681	1,558
PCA	Site 13.3	06959007	QC	1,589,807	288,443
PCA	Site 13.5	06959034	QC	24,835	1,986
PCA	Site 13.6	06959009	QC	10,500	0
PCA	Site 13.7	06959082	QC	10,500	458
PCA	Site 13.8	06959010	QC	24,835	2,444
PCA	Site 13.9	06959011	QC	10,500	550
PCA	Site 13.10	06959076	QC	10,500	1,527
PCA	Site 14.3	06959084	QC	28,900	4,032
PCA	Site 15.5	06959018	QC	62,254	2,138
PCA	SS Klondike National Historic Site	19958002	YT	11,852	3,719
PCA	Walker Acquisition	00024680	SK	87,695	14,798
PCA	Wasagaming Drive Commercial Property	00025781	MB	101,275	1,325
PCA	Waste Disposal Midden (East)	56488005	AB	8,671	0
PCA	Waste Disposal Midden (West)	56488004	AB	8,671	0
PSPC	98 Manitoba St.	11181001	ON	424,199	0

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
PSPC	100 Lafontaine Street	43503003	QC	38,925	9,679
PSPC	Alaska Highway - 202 Road NWSC Maintenance Camp K-19	09401180	BC	739,803	130,553
PSPC	Alaska Highway - Fireside Maintenance Camp	09401080	BC	4,345,232	767,500
PSPC	Alaska Highway - Former Military Establishment (Ft Nelson Rec Centre) P-08I	09401270	BC	76,513	13,502
PSPC	Alaska Highway - Fort Nelson Gravel Pit	09401030	BC	95,055	16,774
PSPC	Alaska Highway - Muncho Lake Maintenance Camp	09401060	BC	5,657,925	999,401
PSPC	Alaska Highway - Sikanni Maintenance Camp	09401020	BC	1,032,639	182,164
PSPC	Alaska Highway - Steamboat Maintenance Camp	09401040	BC	5,365,692	947,090
PSPC	Alaska Highway - Wonowon Maintenance Camp	09401010	BC	554,068	97,754
PSPC	Canadian Forces Sailing Association (CFSA) Waterlot	17410014	BC	257,339	67,284
PSPC	Contrecoeur Landfill	23148001	QC	242,186	44,000
PSPC	Esquimalt Graving Dock	17410007	BC	259,804	0
PSPC	Former Sambault Garbage Dump	20625001	QC	9,165,584	1,636,284
PSPC	Former St-Germain Foundry Inc.	20624001	QC	5,088,022	907,654
PSPC	Pinetree Site - Area C	00854004	NL	1,585,005	279,668
PSPC	Pinetree Site - Area F	00854007	NL	1,585,005	279,668
PSPC	Unused Land (Prophet River)	22208001	BC	83,614	14,755
TC	Airside Operations and Maintenance Centre	15473005	AB	23,008	4,060
TC	Atlantic Remediation (1406)	EZ01	NL	149,000	0
TC	Cambridge Bay Apron	00024301	NU	46,684	8,238
TC	CSB Area A	N0002008	NL	115,500	0
TC	Disposal Site 2 and Fire Training Area	00339002	NL	64,600	11,400
TC	Drums in Watson Lake - APEC 5	N0281007	YT	492,959	0
TC	Esquimalt Harbour Fill Sites	00025820	BC	50,150	8,850
TC	Fire Training Area	04086002	NB	28,989	0
TC	Fire Training Area	N0010002	NU	79,727	14,070

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
TC	Fire Training Area	N0014002	NT	21,888	3,863
TC	Fire Training Area	N0016002	NT	1,019,423	0
TC	Fire Training Area	N0017001	NU	104,561	0
TC	Fire Training Area	03057001	NS	9,181	1,620
TC	Former Fire Training Area (PFAS)	00026098	NL	63,574	0
TC	Former Fire Training Area (PFAS)	00026099	NL	47,100	0
TC	Former Fire Training Area (PFAS)	00026100	NB	131,983	0
TC	Former Fire Training Area (PFAS)	00026101	NS	38,999	0
TC	Former Fire Training Area (PFAS)	00026104	QC	74,054	0
TC	Former Gas Station Site	00967016	NL	81,600	14,400
TC	Former H3 hangar and surroundings	05428003	QC	350,332	0
TC	Former Remote Radar Site	00967059	NL	298	53
TC	Former Tenant Air Fuelling Facility - APEC 6	20146003	YT	148,459	26,199
TC	Former USTs (Maintenance Garage and Hangar) - APEC 6	N0281008	YT	900,955	158,992
TC	Fort Nelson Airport EBS Contaminated Sites	N0025001	BC	66,300	11,700
TC	Gloucester Landfill	08708013	ON	658,062	0
TC	Historic Military Base West of Runways - APEC 20C	00024670	YT	544,645	96,114
TC	Historic Tank Farm - APEC 32	N0281016	YT	782,389	0
TC	Historical On-Site Buildings - APEC 40	20146009	YT	1,184,123	0
TC	Inner Harbour	22905009	ON	294,672	52,001
TC	Landfill/Scrap Metal Dump	N0015006	NU	36,729	0
TC	London Airport - Former Firefighting Training Areas	10855002	ON	158,602	27,989
TC	Lot 2A: Middle Harbour Fill Site; Harbour Floor	17348003	BC	16,220,544	0
TC	Lot 6A: Barclay Point; Rock Bay East Fill; Rock Bay North Fill; Bay Street East Fill; J-15 Bay Street Centre Fill; J-16 Bay Street	17348008	BC	224,725	0

Custodian	Site name	Federal site identifier	Province/ Territory	FCSAP remediation expenditures ($)	Custodian expenditures ($)
TC	Lot 17: Victoria Harbour Floor; Point Ellice (Bay Street); Johnson Street; East Selkirk; Macaulay	17348020	BC	867,542	0
TC	Marine Fire Training Area	00339015	NL	45,900	8,100
TC	NCR Remediation (916M)	EZ04	ON	96,967	0
TC	Norman Wells Taxiway C	00024131	NT	42,500	7,500
TC	Old Fire Training Area	N0002001	NL	119,000	0
TC	Old Landfill / Main Drum Cache	N0017003	NU	1,996,665	0
TC	Otter Creek Former Landfill / Asphalt Plant	01831001	NL	42,500	7,500
TC	Parcels in the Village of Kuujjuaq	08389003	QC	365,915	64,573
TC	Port Stanley - Land Lots	10611002	ON	402,040	70,948
TC	Reay Creek and Reay Creek Pond	00026091	BC	223,672	39,471
TC	Regional Fire Depot - APEC 8	20146004	YT	338,532	59,741
TC	Sault Ste. Marie Airport - Former Firefighting Training Area	N0009001	ON	896,804	0
TC	Sediments - Gaspé Wharf	72064003	QC	172,259	30,399
TC	Stephenville Sanitary Sewer Line	N0002020	NL	148,000	0
TC	Thunder Bay International Airport - Former Firefighting Training Area	11943001	ON	343,059	60,540
TC	Williams Lake Airport Former Fire Training Areas	N0033001	BC	61,200	10,800

Appendix D – Environmental Liability for Federal Contaminated Sites

Environmental liabilities are the estimated costs related to the remediation or risk management of contaminated sites for which the Government of Canada is obligated, or will likely be obligated, to incur costs. A contingent liability is disclosed when the Government's obligation to a contaminated site is unknown and where future events are expected to resolve the uncertainty. Recording environmental liability is a requirement found in the Treasury Board Directive on Contingencies; liabilities are reported annually in the Public Accounts of Canada.[7]

According to Treasury Board of Canada Secretariat guidance, a liability for remediation of contaminated sites should be recognized when, at the financial reporting date, the following applies:

- an environmental standard exists;
- contamination exceeds the environmental standard;
- the Government:
  - owns the land;
  - is directly responsible; or
  - accepts responsibility (e.g., when there is little, if any, discretion to avoid the obligation);
- it is expected that future economic benefits will be given up; and
- a reasonable estimate of the amount can be made.

An obligation for remediation or risk management of contaminated sites cannot be recognized as a liability unless all these criteria are satisfied.

A statistical model was used to estimate the liability for a group of unassessed sites on the basis of historical costs at similar sites. In 2018–2019, there were 1,478 unassessed sites, for which a total liability estimate of $248 million has been recorded prospectively in the Public Accounts of Canada.

[7] Public Accounts of Canada, 2019, Volume I (PSPC, 2019), www.tpsgc-pwgsc.gc.ca/recgen/cpc-pac/index-eng.html.

Table D.1: Estimated environmental liability for federal contaminated sites that may be eligible for FCSAP (2018–2019)

	March 31, 2018 ($)	March 31, 2019 ($)	Difference ($)
Total liability for remediation of contaminated sites[a]	5,710,488,358	6,478,074,737	767,586,379
Less:			
Atomic Energy of Canada Limited	988,243,000	1,054,978,000	66,735,000
Canada Border Services Agency	1,187,743	1,317,794	130,051
Canadian Broadcasting Corporation	367,000	352,000	-15,000
Federal Bridge Corporation Limited	0	0	0
Global Affairs Canada	15,591	15,934	343
Health Canada	38,713	0	-38,713
Indigenous Services Canada	0	38,534	38,534
Royal Canadian Mounted Police	9,693,093	11,088,614	1,395,521
Windsor-Detroit Bridge Authority	15,468,000	19,523,000	4,055,000
Estimated liability for federal contaminated sites that may be eligible for FCSAP	**4,695,475,218**	**5,390,760,861**	**695,285,643**

[a] Total liability for remediation of contaminated sites, as reported in the Public Accounts of Canada, 2019.

Some organizations are not part of FCSAP as they have their own funding sources or their sites do not meet the eligibility requirements of FCSAP.

Table D.2: Estimated environmental liability for federal contaminated sites that may be eligible for FCSAP, by participating custodian (2018–2019)

Custodian	March 31, 2018 ($)	March 31, 2019 ($)	Difference ($)
Agriculture and Agri-Food Canada	6,630,455	5,978,858	-651,597
Correctional Service of Canada	3,203,237	3,211,004	7,767
Environment and Climate Change Canada	194,163,433	213,611,159	19,447,726
Fisheries and Oceans Canada	129,545,542	226,345,681	96,800,139
Crown-Indigenous Relations and Northern Affairs Canada	3,343,532,437	3,772,146,710	428,614,273
Jacques Cartier and Champlain Bridges Incorporated	24,402,000	26,592,000	2,190,000
National Defence	491,413,076	526,425,304	35,012,228
National Capital Commission	49,884,000	65,354,000	15,470,000
National Research Council of Canada	3,224,044	3,458,402	234,358
Natural Resources Canada	1,755,936	1,800,845	44,909
Parks Canada Agency	58,050,670	76,892,665	18,841,995

Public Services and Procurement Canada	218,431,732	239,334,375	20,902,643
Transport Canada	171,038,656	228,297,858	57,259,202
VIA Rail Canada Inc.	200,000	1,312,000	1,112,000
Total	**4,695,475,218**	**5,390,760,861**	**695,285,643**

Table D.3: Changes in total liability for remediation of contaminated sites (2018–2019)

	March 31, 2018 ($)	March 31, 2019 ($)	Difference ($)
Opening balance	5,944,513,687	5,710,488,358	-234,025,329
Less: expenditures reducing opening liabilities	538,751,252	583,549,885	44,798,633
Add: changes in estimated remediation costs	253,777,187	1,127,718,946	873,941,759
Add: new liability for sites not previously recorded	50,948,736	223,417,318	172,468,582
Closing balance (gross)	5,710,488,358	6,478,074,737	767,586,379
Expected recoveries	23,431,315	23,161,964	-269,351
Closing balance (net)	5,687,057,043	6,454,912,773	767,855,730

Source: Public Accounts of Canada, 2019