

Federal Contaminated Sites Accelerated Action Plan  
Annual Report  
2003-2004

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## Executive Summary

Federal contaminated sites are a legacy of past practices that have resulted in contamination, posing significant risks to human health and the environment. These sites are the result of federal actions or operations that occurred on federal lands in the past, or at sites that are now the direct responsibility of the federal government such as abandoned mines in the North and former military bases located on federal lands.

The 2003 federal budget included a commitment that enabled the establishment of the Federal Contaminated Sites Accelerated Action Plan (FCSAAP) Program in June 2003. The FCSAAP is a collaborative effort among federal departments and agencies to ensure effective risk management and/or remediation of the highest-risk sites. FCSAAP provides a long-term mechanism to accelerate the remediation of these higher-risk federal contaminated sites, thereby reducing the financial liabilities associated with them. The FCSAAP Program is administered jointly by Environment Canada and the Treasury Board of Canada Secretariat, with a FCSAAP Secretariat established at Environment Canada to coordinate the Program. The commitment made by the Government of Canada was \$175 million over two years followed by \$300 million over three years.

Fiscal year 2003-2004 was the first operational year for the FCSAAP Program, and a great deal was achieved. The governance structure for the Program is almost complete and the partners involved have a clear understanding of their roles and responsibilities. Many of the necessary steps to effectively administer the Program have also been developed, including a risk-based ranking methodology with supporting guidance documents.

With these pieces in place it has been possible for the Program to identify and provide risk-management/remediation funding and care-and-maintenance funding for activities at 18 higher-risk federal projects (28 sites). In addition, funding has been provided for 125 assessment projects (289 sites). In less than one full year of operation, the Program was already making a difference 'on the ground' and paying dividends in the form of reducing the potential federal liabilities resulting from contaminated sites.

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### ***By the numbers...***

<b>64.7</b>	millions of FCSAAP Program funds approved for contaminated sites projects in Fiscal Year 2003-2004
<b>29.2</b>	millions of custodian department funds allocated to FCSAAP-funded projects
<b>18</b>	priority projects (28 sites) funded
<b>3.4</b>	millions of FCSAAP Program funds approved for assessment projects in Fiscal Year 2003-2004
<b>125</b>	assessment projects funded (289 sites)

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## 1.0 Introduction

The Federal Contaminated Sites Accelerated Action Plan (FCSAAP) was established following the 2003 budget commitment of \$175 million over two years to address high-priority federal contaminated sites. It is a collaborative effort among 14 federal departments and agencies to identify and prioritize contaminated sites for which they are responsible, and ensure that they are managed effectively based on the level of risk they pose to human health and the environment.

Federal contaminated sites are a legacy of past practices that have resulted in contamination, posing significant risks to human health and the environment. These sites are the result of federal actions or operations that occurred on federal lands in the past, or at sites that are now the direct responsibility of the federal government, such as abandoned mines in the North and former military bases located on federal lands. In recent years, departmental expenditures to risk-manage or remediate federal contaminated sites have been estimated at \$100 million per year. Ninety percent of this spending has been by four departments: National Defence, Indian and Northern Affairs Canada, Public Works and Government Services Canada and Transport Canada. As federal departments were undertaking this work within their existing resource base, progress was slow and uneven in the absence of a coordinated federal effort to address these sites.

Over the past decade, reports by the Office of the Auditor General (OAG) and the Commissioner of the Environment and Sustainable Development (CESD) have highlighted major shortcomings in the way the federal government manages its contaminated sites (see box).

In response, the government adopted a Federal Contaminated Sites Management Framework consisting of Treasury Board policies and best practices to guide federal custodian departments in managing contaminated sites for which they are responsible (Appendix 2: Federal Contaminated Sites Management Framework). These policies, which continue to guide FCSAAP implementation, include:

- The Contaminated Sites and Solid Waste Landfills Inventory Policy (2000)
- The Federal Contaminated Sites Management Policy (2002)
- The Policy on Accounting for Costs and Liabilities Related to Contaminated Sites (2002)

Since the *Contaminated Sites and Solid Waste Landfills Inventory Policy* was approved by Treasury Board in 2000, federal departments have undertaken extensive work to identify and assess suspected federal contaminated sites and to record information on these sites in the Federal Contaminated Sites Inventory (FCSI) <http://www.tbs-sct.gc.ca/dfrp-rbif/cs-sc/home-accueil.asp>. Over 4,200 sites, with an estimated total financial liability of \$3.4 billion (2003 Public Accounts) are now recorded in the Inventory.

The FCSAAP Program is administered jointly by Environment Canada (EC) and the Treasury Board of Canada Secretariat (TBS). **Program delivery** is undertaken by federal custodian departments with technical expertise

### Federal contaminated sites management – Auditor General's views

In December 1998, the Office of the Auditor General's (OAG) follow-up to its 1996 report on the management of federal contaminated sites reported:

- Limited progress;
- No accurate picture of health, safety and environmental risks posed by the current estimate of 5,000 federal contaminated sites;
- No accurate picture of related contingent or actual liabilities; and,
- No central leadership on the issue.

The 2002 *Report of the Commissioner of the Environment and Sustainable Development* (CESD) drew similar conclusions. The CESD observed that the federal government still did not have:

- A complete inventory of federal contaminated sites;
- A comprehensive assessment of the health and environmental risks;
- Reliable estimates of the costs of site remediation;
- A government-wide priority ranking of sites;
- Stable, long-term funding; nor
- Central commitment and leadership, including an action plan to deal with the sites in a timely manner.

While work to identify and assess federal contaminated sites has been underway for a decade, it is the operationalization of the FCSAAP Program that represents the concrete steps necessary to expedite action.

provided by three **expert support** departments: Environment Canada, Health Canada (HC), and Fisheries and Oceans Canada (DFO). The program is **administered and coordinated** by the FCSAAP Secretariat (EC). TBS is responsible for policy guidance and administering the fund.

The FCSAAP Program has a number of objectives:

1. Accelerate the management of federal contaminated sites based on human health and ecological risks;
2. Reduce federal financial liability related to known federal contaminated sites;
3. Reduce human health and ecological risks at specific highest-risk federal sites; and,
4. Increase public confidence in the overall management of federal contaminated sites and in the risk-management/remediation of individual contaminated sites.

## Program Resources

In addition to the \$75 million for 2003-2004 and \$100 million for 2004-2005 announced in the 2003 federal budget for accelerated action on federal contaminated sites, \$100 million per year has been approved for an additional three years to March 2008. Approximately 90 percent of the annual amount (\$89.6 million from 2004 to 2008) is identified for assessment, care and maintenance, and long-term management or remediation of federal contaminated sites. Program management and administration, including the provision of expert support in the assessment of human health and ecological risks, accounts for the remaining 10 percent.

To respond to departmental concerns about the amount and potential costs of uncompleted assessment work, a maximum of five percent of FCSAAP funds (\$4.48 million per year from 2005 to 2008) is available to conduct assessments of suspected contaminated sites, as described in Steps 1 to 6 of the Ten-Step Process of the *Federal Approach to Contaminated Sites* published by the Contaminated Sites Management Working Group (CSMWG) in 2000.

## Program Administration

FCSAAP is a cost-shared program created to address the highest-risk federal contaminated sites that have an estimated liability over \$1 million and are Class 1 projects as defined by the CCME<sup>1</sup> NCS (National Classification System).<sup>2</sup> Sites with costs under \$25 million receive funding of 70 percent of the total cost from the FCSAAP program, based on a 70:30 percent cost-share. The remaining 30 percent is provided by the custodian department. Projects with total costs over \$25 million are funded on a 90/10 cost-share basis.

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<sup>1</sup> The Canadian Council of Ministers of the Environment (CCME) provides the principle forum among governments in Canada for the joint development of environmental policies and technical guidance for environmental management.

<sup>2</sup> The National Classification System (NCS) is a screening tool for the evaluation of contaminated sites according to their current or potential adverse impacts on human health and the environment. Sites determined to pose a very high level of risk are given the rating of Class 1.

## 2.0 2003-2004 Program Achievements – Program Management

The development of a systematic approach to address the challenges posed by contaminated sites required coordinated advancement on a number of fronts. While the 2003 federal budget included a commitment of \$175 million to accelerate the development and implementation of strategies to manage highest-risk federal contaminated sites, a number of equally critical issues needed to be resolved. These included:

- Accountability, governance and leadership – the challenge of developing a government-wide strategy to address contaminated sites when accountability for the management of these sites resides at the level of the individual custodian department;
- Information gaps – the overall lack of information regarding the number, location, and extent of contaminated sites held by federal departments; and,
- Centralized scientific expertise – the need for departments to have access to consistent and timely science-based advice and guidance on human health and ecological risks related to contamination.

Beyond these challenges, a consistent, science-based system was required to rank and prioritize contaminated sites in order that funding could be allocated to those representing the highest risk to human health and the environment.

By necessity, the first year of the FCSAAP Program required substantial focus on program design and delivery components. This focus was balanced with the need to allocate program funds to departments based on national priority setting using a risk-based approach. This allowed the program to concentrate on the highest-risk sites in an efficient and timely manner. More importantly, the willingness to look at the Program design as an evolutionary process – incorporating lessons learned in successive iterations – served to improve program design and delivery while maintaining the flow of funding to departments. The responsiveness of the Program to the needs of departments has contributed to its success and the realization of results 'on the ground' in its first year of operation.

Highlights of the key Program achievements for 2003-2004 are described below.

### 2.1 Governance Structure

Key to the success of the first year of the FCSAAP Program was capitalizing on elements that were already in existence. For example, the Contaminated Sites Management Working Group (CSMWG) played a critical role in the development of a horizontal strategy to deal with federal contaminated sites in a consistent way across departments through the development of a standardized vocabulary and the definition of a ten-step process that provides a consistent way of describing progress in assessing suspected sites and managing identified contamination. The long history of the CSMWG -established in 1995 - and the collaborative working relationships this group had fostered among custodian departments supported the development of the FCSAAP Program and facilitated information dissemination through already existing channels.

An ADM-level Steering Committee was established to provide overall direction and accountability for the Program, and institute a more formal mechanism to ensure that the allocation of FCSAAP funds was undertaken in a way that would ensure that priority was given to highest-risk sites.

The FCSAAP Secretariat, housed at Environment Canada, coordinates activities of the Steering Committee and the CSMWG, as well as the day-to-day management of the Program. The work of the Secretariat is supported by the three expert support departments (Health Canada, Environment Canada, and Fisheries and Oceans Canada) which provide technical advice and guidance to custodian departments.

#### Program Policy Development

In 2003-2004, the Secretariat worked with TBS, the FCS Steering Committee, the CSMWG, and the expert support departments (Health Canada, Environment Canada, and Fisheries and Oceans Canada) to develop, recommend and manage administrative and program policies in the following areas:

- Eligibility criteria for sites;
- Project ranking and project selection procedures;
- Options for project cost sharing;
- Options for unexpected sites; and
- Options for lapsing funds and reallocation of funds.

A diagrammatic representation of the Program structure is presented in Figure 1. Further details relating to the roles and responsibilities of these groups can be found in Appendix 3: Federal Contaminated Sites Accelerated Action Program Management Structure.

## **2.2 Accountability**

As a horizontal program, it was important to ensure that appropriate tools were in place to promote better accountability across departments. The program-wide, Results-based Management and Accountability Framework (RMAF) defines the roles and performance expectations for departments and the short-and long-term outputs for the program as a whole. The RMAF is an essential tool for program management, reporting and evaluating on how program activities and outputs are contributing to key policy objectives related to the highest-risk federal contaminated sites. It is intended to explicitly delineate activities directly related to FCSAAP, as compared with ongoing contaminated sites management activities within custodian departments.

## **2.3 Project Ranking and Selection Process**

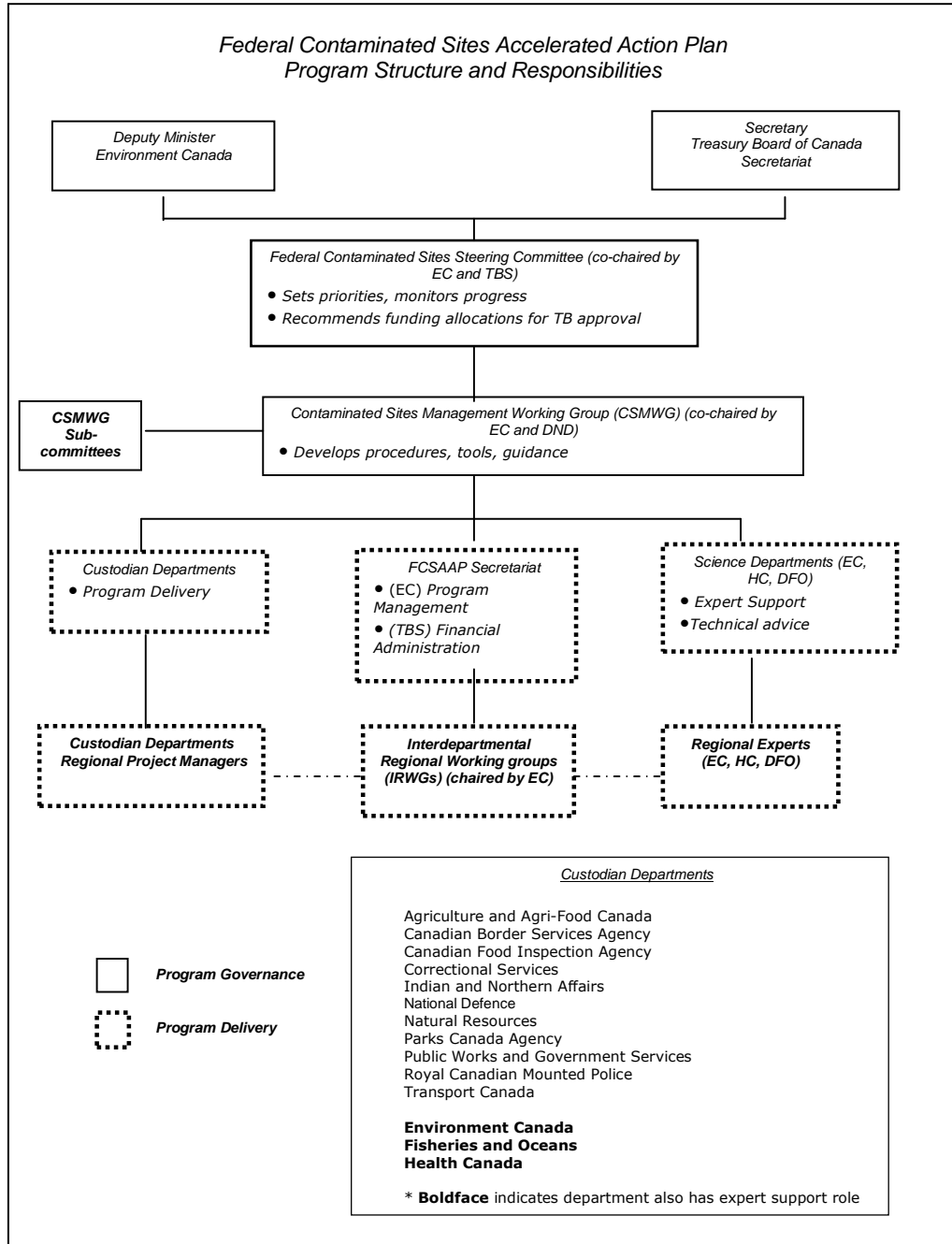
In June 2003, Treasury Board approved a two-tiered ranking and project selection approach for the 2003-2004 project submission process. Tier 1 considered risk-based factors including the CCME NCS score, a health score derived by Health Canada from the NCS score, an environmental risk score provided by Environment Canada, and a fish and fish habitat risk score provided by Fisheries and Oceans Canada. Tier 2 considered other factors such as traditional lands and lifestyles, and legal obligations.

Analysis of the 2003-2004 project ranking process revealed that although the two-tier approach was appropriate considering the short timeline (less than two months) available for the first round of funding submissions, a more objective, nationally consistent, science-based relative ranking approach should be developed for the second round submissions (for 2004-2005 and future year funding).

In consultation with external experts, a CSMWG sub-committee developed a science-based ranking system to ensure that the Program's project ranking and selection process was based on nationally consistent methodologies of health and environmental risk assessment. The revised project ranking and selection process was approved by Treasury Board and applied to projects receiving funds in 2004-2005.



**Figure 1: Federal Contaminated Sites Accelerated Action Plan Program Structure and Responsibilities**



## **2.4 Managing Information Requirements**

### **2.4.1 IDEA Website**

The Interdepartmental Data Exchange Application (IDEA) is a secure website providing departments with a single point of access for the exchange of FCSAAP-related information. IDEA facilitates the electronic receipt and tracking of proposals, enables experts to access proposals online, and provides departments and central agencies with secure access to sensitive information. Along with the Federal Contaminated Sites Inventory, IDEA is an important component of an online accountability and reporting system. IDEA was successfully used for the 2004-2005 FCSAAP submission process (November 2003).

Plans for 2004-2005 include the addition of sections for report submission and for CSMWG minutes, and extending the interfaces to allow data replication to other servers. The most common functions associated with the secure website/database will also be streamlined and simplified.

### **2.4.2 Guidance Documents**

A number of guidance documents were developed to provide consistent advice and guidance to departments in preparing their project submissions for FCSAAP. Many of these were developed collaboratively with departments through sub-committees of the CSMWG, with assistance from external experts in the field. These included:

- **FCSAAP Classification System**

The National Classification System (NCS) was designed as a screening tool for the evaluation of contaminated sites according to their current or potential adverse impacts on human health and the environment. Most federal departments were using the NCS, but lack of consistency in the application of the methodology between departments was identified as a key concern with regard to government-wide site prioritization.

The *FCSAAP Classification System for Contaminated Sites* is an enhanced site classification guidance document. The document was developed to improve the quality and reliability of NCS scores by reducing variability in interpretations. The FCSAAP classification document provides additional guidance in several key areas including a table of proposed hazard rankings (high, medium, low) for more than 300 specific chemical parameters.

- **Ecological Risk Evaluation**

To address gaps in the ecological component of the FCSAAP classification system, an ecological risk evaluation tool was developed by EC and DFO. This two-level Ecological Risk Evaluation (ERE) includes impacts, operable pathways and exposures, as well as data quality, fish habitat and regulatory considerations.

- **Human Health Risk Assessment**

Developed by Health Canada, the Human Health Screening Level Risk Assessment (HHSLRA) protocol is used by professional risk assessors to calculate hazard quotients for contaminants. The total hazard quotient for a site is converted to a normalized health risk score by Health Canada.

- **Significant Engineering Failure Risk**

The Significant Engineering Failure Risk (SEFR) score was developed primarily for care and maintenance projects where catastrophic failure of engineered structures such as dams and tailing ponds was an important consideration.

- **FCSAAP Handbook 2004**

This manual was developed to coordinate and manage the project selection process for the highest-risk federal contaminated sites. The steps in the process of submitting and evaluating a FCSAAP project proposal, taken from the Handbook, are outlined in Appendix 4: FCSAAP Project Selection Methodology.

For ease of reference, the key activities undertaken by the FCSAAP Secretariat and the expert support departments in support of the FCSAAP Program are summarized in the chart below.

## 2.5 Key Activities 2003-2004

<b>FCSAAP Secretariat</b>		
<ul style="list-style-type: none"> <li>• Developed and managed FCSAAP administrative and program policies and procedures in consultation with the Treasury Board of Canada Secretariat (TBS) and custodian and expert support departments</li> <li>• Developed a project ranking system through the Contaminated Sites Management Working Group (CSMWG) sub-committees, assisted by sub-consultants with expertise in specific fields</li> <li>• Facilitated the development of guidance documents to support the project ranking process</li> <li>• Developed a secure website and the Interdepartmental Data Exchange Application (IDEA) for the efficient exchange of FCSAAP-related information</li> <li>• Developed a communications strategy</li> <li>• Established a Results-based Management and Accountability Framework (RMAF) for monitoring Program activities</li> <li>• Prepared funding approval documents</li> <li>• Held expert support workshops, Federal Contaminated Sites Steering Committee meetings and Contaminated Sites Management Working Group (CSMWG) meetings</li> </ul>		
<b>Expert Support Departments</b>		
<p><b>Environment Canada</b></p> <ul style="list-style-type: none"> <li>• Provided technical and scientific advice to the FCSAAP Secretariat and custodian departments</li> <li>• Provided expert peer reviews for technical submissions</li> <li>• Reviewed <i>Canadian Environmental Assessment Act</i> submissions</li> <li>• Coordinated meetings with interdepartmental working groups, FCSAAP expert support partners (HC, DFO and EC), site-specific committees, and the public and site stakeholders</li> <li>• Provided input to, and review of, guidance and training materials</li> <li>• Developed an Ecological Risk Evaluation tool used to identify level and nature of risks to the environment at sites</li> <li>• Coordinated training programs within the regions</li> <li>• Established and coordinated Interdepartmental Regional Working Groups (IRWGs)</li> <li>• Responded to media inquiries</li> </ul>	<p><b>Health Canada</b></p> <ul style="list-style-type: none"> <li>• Provided health risk assessment training courses and project ranking training; developed health-based criteria for projects</li> <li>• Developed a Human Health Screening Level Risk Assessment (HHSLRA) tool and guidance document</li> <li>• Provided health-related expert advice to custodian departments</li> <li>• Compiled information necessary for human health risk assessments (HHRA) and ensured CEAA compliance</li> </ul>	<p><b>Fisheries and Oceans Canada</b></p> <ul style="list-style-type: none"> <li>• Provided advice related to fish and fish habitats</li> <li>• Supported enforcement requirements ensuring the protection of the public's navigational rights</li> <li>• Inputted site data in the DFO Habitat Referral Tracking System</li> <li>• Assisted EC in the development of the Ecological Risk Evaluation tool</li> </ul>

### 3.0 2003-2004 Program Achievements – FCSAAP Priority Sites

Three types of projects were funded under the FCSAAP Program: assessment, care and maintenance, and remediation/risk-management. Care and maintenance projects are those where risks of human health and environmental catastrophes are imminent. This category is treated under the same envelope as remediation projects because, for both categories, selection is based on health and environmental risks/impacts.

#### 3.1 Achievements at FCSAAP Priority Sites

Over the course of 2003-2004 a number of activities have been undertaken at FCSAAP-funded sites that have led to the reduction of risk to human health and the environment. Information on the work accomplished at each of the 18 priority projects is provided in Appendix 1: Reports on Progress at Individual FCSAAP Sites.

Progress in managing these highest-risk sites is tracked according to the ten steps of the CSMWG *Federal Approach to Contaminated Sites* (see box at right).

Figure 2 (following page) illustrates, using the Ten-Step Process, the progress made at each FCSAAP-funded project in the fiscal year 2003-2004.

#### **Federal Approach for Addressing Contaminated Sites: Ten-Step Process**

Step 1 – *Identify Suspect Sites*: Identifies potentially contaminated sites based on activities (past or current) on or near the site.

Step 2 – *Historical Review*: Assembles and reviews all historical information pertaining to the site.

Step 3 – *Initial Testing Program*: Provides a preliminary characterization of contamination and site conditions.

Step 4 – *Classify Contaminated Site Using the CCME National Classification System*: Prioritizes the site for future investigations and/or remediation/risk-management actions.

Step 5 – *Detailed Testing Program*: Focuses on specific areas of concern identified in Step 3 and provides further in-depth investigations and analysis.

Step 6 – *Reclassify the Site Using CCME National Classification System*: Updates the ranking based on the results of the detailed investigations.

Step 7 – *Develop Remediation/Risk Management Strategy*: Develops a site-specific plan to address contamination issues.

Step 8 – *Implement Remediation/Risk Management Strategy*: Implements the site-specific plan that addresses contamination issues.

Step 9 – *Confirmatory Sampling and Final Reporting*: Verifies and documents the success of the remediation/risk-management strategy.



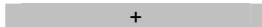
Step 10 – *Long-Term Monitoring*: If required, ensures remediation and long-term risk-management goals are achieved.

Source: A Federal Approach to Contaminated Sites, 1999.

Note: The Steps indicate the stage a site is at and not the effort associated with each Step. Much more time and energy is required to complete Step 8 than any other step.

**Figure 2: Progress at FCSAAP-funded Projects 2003-2004**

Steps in Ten-Step Process													FCSAAP Funds Spent (\$)
Department	Project	1	2	3	4	5	6	7	8	9	10		
	<b>Care and Maintenance</b>												
INAC-NAP	Clinton Creek	■	■	■	■	■	■						604,265
INAC-NAP	Colomac	■	■	■	■	■	■						10,500,000
INAC-NAP	Faro	■	■	■	■	■							9,847,858
INAC-NAP	Giant	■	■	■	■	■							5,787,844
INAC-NAP	Mount Nansen	■	■	■	■	■	■						667,162
INAC-NAP	United Keno	■	■	■	■	■							1,354,786
	<b>Remediation/ Risk - Management Projects</b>												
DFO	Belleville	■	■	■	■	■	■						41,415
DND	CFS St John's*	■	■	■	■	■	■						53,000
DND	Fox-M	■	■	■	■	■	■	■					3,389,000
DND	Harvey Barracks	■	■	■	■	■	■	■	■				6,304,738
DND	PIN 4	■	■	■	■	■	■						1,603,000
DND	Saglek	■	■	■	■	■	■	■					12,068,000
DND	Suffield	■	■	■	■	■	■	■					64,000
DND	Valcartier*	■	■	■	■	■	■	■					449,000
EC	Pacific Enviro Centre*	■	■	■	■	■	■						1,009,384
HC	Weagamow Lake	■	■	■	■	■	■	■					309,517
INAC-IIABL	Goodfish	■	■	■	■	■	■	■					1,122,300
INAC-NAP	Resolution	■	■	■	■	■	■	■					8,936,700

 : Step completed at commencement of FCSAAP funding  
 : Step completed at end of fiscal year 2003-2004  
 \* : Not all sites within the project have completed the step identified above.  
 + : Step 10 - Long-Term Monitoring not eligible for FCSAAP funding

### 3.2 Identification and Prioritization of Projects

Higher-risk projects are submitted by departments and reviewed against selection criteria (see Appendix 4: FCSAAP Project Selection Methodology) by a panel consisting of three expert support departments (Health Canada, Environment Canada and Fisheries and Oceans Canada) and the Treasury Board of Canada Secretariat. Only sites with a Class 1 (action required) designation based on the National Classification System (NCS) and estimated remediation costs greater than \$1 million were considered for funding.

Expert departments then assigned scores that reflected the level of risk in each of their areas of expertise, with a primary focus on health and ecological risks. Scores were also assigned for other factors such as the impact on the lifestyle of local First Nations or legal obligations. On the basis of these scores, sites were prioritized and funding options were developed by the FCSAAP Secretariat in consultation with TBS. Funding allocation proposals were then vetted by the CSMWG and ratified by the ADM Steering Committee prior to Treasury Board approval.

The geographical distribution of the funded projects is shown in Figure 3. Figure 4 illustrates the number of project submission requests for FCSAAP funding and the actual funding allocation by project type. This table also provides a summary of the actual FCSAAP fund and departmental expenditures, demonstrating that 70/30 and 90/10 cost-shared funding agreements were upheld or surpassed.

**Figure 3: Distribution of FCSAAP-Funded Projects 2003-2004**



**Figure 4: Summary of Project Funding Requests, Approved Allocation and Actual Expenditures for 2003-2004**

Project Type	Projects Proposed		Projects Approved		Project Work Completed Fiscal Year 2003-2004			
	Number of Projects	Funding Requested	Number of Projects	FCSAAP Funding Allocated	FCSAAP Fund Expenditures	Percent of Total Expenditure	Departmental Expenditures	Percent of Total Expenditure
Care and Maintenance	7	\$33.1M	6	\$29.3M	\$28.8M <sup>(1)</sup>	67%	\$13.9M	33%
Remediation	59	\$75.4M	12	\$35.4M	\$35.4M <sup>(1)</sup>	55%	\$28.8M	45%
Assessment	819	\$10.4M	125	\$3.4M	\$3.0M	65%	\$1.6M	35%
<b>TOTAL</b>	<b>885</b>	<b>\$118.9M</b>	<b>143</b>	<b>\$68.1M</b>	<b>\$67.2M <sup>(1)</sup></b>		<b>\$44.2M</b>	

<sup>(1)</sup> Expenditures include funding that was transferred from Expert Support departments to custodial departments for projects (\$1,160,416).



### **3.3 FCSAAP Program Priority Site Accomplishments**

#### **3.3.1 Care and Maintenance Projects**

Care and maintenance projects are initiated in exceptional circumstances to prevent severe environmental damage from occurring before a site assessment is completed. They are typically undertaken at abandoned or idled mines, or other sites where there is extensive contamination, and immediate action is required to avoid an imminent environmental disaster that would harm human and wildlife populations. Because of the imminent danger at these sites, short-term care and maintenance measures are used to stop the spread of contamination while remediation options can be fully studied and developed.

These projects involve managing health and environmental concerns and maintaining necessary infrastructure such as retaining structures and other risk-management measures used to collect and treat water. Various methods and approaches can be used depending on the circumstances. They include monitoring the site, posting warnings, restricting access to the site, changing land-use patterns at or around the site, isolating contaminants or pollutants by stabilizing them, erecting barrier walls, capping the site, and partial remediation. The approach to each site differs depending on the nature of the risks that are present.

#### **Indian and Northern Affairs: Care and Maintenance at Giant Mine**

Giant Mine is a gold mining operation located within the Yellowknife city limits. Approximately 237,000 tonnes of highly toxic arsenic trioxide was created during the production of more than seven million ounces of gold between 1948 and 1999. In addition, arsenic-contaminated buildings, soils, and tailings on the site represent hazards to human health.

Almost all of the arsenic trioxide at Giant Mine is stored in 15 underground chambers cut into solid rock and sealed with a cement bulkhead. Initially this storage method relied on the area's permafrost, which worked naturally as a frozen barrier. However, the permafrost has thawed because of ongoing mining activity, causing water seepage through some of the storage areas. All contaminated water from the mine is currently being collected and pumped to a water treatment facility above ground, on site.

Work on care and maintenance of the site is continuing while additional site assessments and engineering studies are undertaken to investigate alternatives for remediation of this site. Wells have been installed to monitor groundwater conditions and natural flow patterns to provide baseline data. The clean-up of the site will take several years.

#### **3.3.2 Remediation / Risk-management Projects**

After a site assessment is completed, a remediation/risk-management action plan is developed for priority sites. The plan describes the various alternatives under consideration and identifies the preferred option to reduce the risk to human health and the environment.

The chosen remediation method is designed to address the unique conditions at the site where it will be implemented. The custodian department oversees the development of the remediation plan and works closely with the consultants, contractors, and trades people hired to design and implement it. Common remediation activities involve reducing exposure to dangerous contaminants by removing, destroying, or containing them.

Public consultation and community involvement are important elements of the remediation process, and information is shared with surrounding communities through public information sessions, workshops, and other communication activities.

A 'remediated' site has moved through Step 9 in the *Ten-Step Process*, and long-term monitoring is in place where necessary.

The Annual Report Expenditure Tables in Appendix 5 provide an overview of FCSAAP expenditures by department, and broken down by contaminated site.

### **National Defence: Remediation at Harvey Barracks**

Between 1910 and 1981, the Harvey Barracks in Calgary was a busy training facility for the Canadian Forces where Canadian soldiers conducted a variety of military training activities. The site included an artillery range, small arms ranges, an obstacle course, housing, a mess, a fire hall, and a hospital. When CFB Calgary was closed in the 1990s, the Harvey Barracks bore the scars of years of training and other military activities. Contaminants detected in the Harvey Barracks area include petroleum hydrocarbons (including benzene, toluene, ethylbenzene, and xylenes, or BTEX), metals, polycyclic aromatic hydrocarbons or PAHs, and volatile organic compounds (VOCs).

The plan involved DND restoring the site to its original condition (prior to military use) and returning the parcel of land to the Tsuu T'ina Nation. A partnership was established between DND and the Tsuu T'ina Nation for the remediation project. DND passed on to the Tsuu T'ina Nation, a great deal of technical expertise and knowledge about environmental remediation and UXO clearance operations. This knowledge has assisted the Nation in developing its own companies with the required expertise to perform clean-ups at other sites across the country.

The Harvey Barracks project is almost finished. To date, the Buffalo Butress site, which was contaminated with lead, has been remediated; two sites on the Elbow River escarpment that contained waste material, paints, solvents, PAHs, and metals have been remediated; and waste materials at a former chemical warfare storage area have been excavated and separated.

Excavation and separation of waste materials at a former chemical medical facility site are currently ongoing. The work is expected to be completed in 2005. Due to the nature of the contamination and the effectiveness of the remediation plan, there will be no need for long-term monitoring of this site once the work is completed.

In total, \$64,700,000 was approved for FCSAAP for care and maintenance and remediation/risk-management work. Over the course of the year, custodian departments spent a total of \$64,111,969 of FCSAAP funds and contributed departmental funds amounting to \$42,649,604. Differences between planned and actual expenditures can be related to a number of variance factors including:

- Progress on site remediation was greater than originally expected and required additional FCSAAP/departmental funds to complete the work projects that had been initiated in the construction season;
- Change in scope of work;
- Actual costs different from estimates;
- Some activities were postponed to future years;
- Required access to site was not possible due to weather, transportation, or other factors;
- Litigation or legal issues prevented work from proceeding; and,
- Acquisition of a new site that was not originally funded during the fiscal year but which required urgent attention (e.g., United Keno Hill Mine).

### **3.3.3 Assessment Projects**

In addition to conducting care-and-maintenance and remediation activities at the 18 priority sites, FCSAAP also funded 125 assessment projects. This allocation of FCSAAP funds is carried out annually, with no provision for multi-year funding.

FCSAAP Assessment funding allocated to assessment projects can be used to complete Steps 1-6 of the Ten-Step Process. Funding options for assessment projects consider various fractions of the total funding available to departments. A smaller percentage of the funds may be allocated to departments receiving

significant funds under the remediation envelope of FCSAAP. This is to ensure that as many departments as possible have access to the fund, especially those with many assessment sites.

In 2003-2004, assessment projects were associated with nine custodian department sites, the large majority of these belonging to DFO. After the allocation of assessment funds to each department, funds are allocated according to departmental priorities.

It is likely that this assessment work will lead to the identification of additional contaminated sites that will require risk-management/remediation, and contribute to an increase in federal liability. Funding assessment work is an important component of the Program and will give the federal government a more accurate estimate of the level of financial liability associated with federal contaminated sites.

#### **Fisheries and Oceans: Assessment of Lightstations**

DFO maintains one of the largest inventories of sites in the federal government (approximately 8,000). Over the course of 2003-2004, 155 DFO sites were assessed, including major facilities (laboratories and Canadian Coast Guard bases), small craft harbours and lightstations. Approximately one-third of those sites assessed were lightstations.

Lightstations have been identified by DFO as a high priority for assessment due to the potential contamination resulting from historic activities and operations. The primary contaminants that could be found at these sites included heavy metals from the application of lead-based paints and/or the operation of mercury baths; petroleum hydrocarbons resulting from on-site fuel storage; and solid waste disposed on-site.

Under the department's national lighthouse divestiture strategy, surplus lightstation sites will be transferred or sold to other levels of government and hence the next phase for these sites will either be further assessment, remediation or risk management.

A total of \$3.4 million was approved for site assessment expenditures for 2003-2004. Over the course of the year, custodian departments contributed funds amounting to \$1,646,866 and utilized \$2,955,617 of the FCSAAP funding. Sites receiving funds that could not complete the assessment work in this funding year carried over the funds and rescheduled the work for the next season.

Variance between planned and actual expenditures can be attributed to the following:

- Difficulty in initial estimation of the projected costs of assessments as the nature and extent of contamination is unknown at the outset of the project;
- Initial assessments may indicate that the site requires more or less assessment work than previously anticipated;
- New information on site ownership/legal status may come to light;
- Reallocation of funding from previously approved sites to address a more urgent assessment requirement;
- Site has changed character due to property erosion, flooding or other events;
- More cost effective for a remote location to use fiscal years 2003-2004 and 2004-2005 funding all in one year;
- More cost effective to undertake more assessments than originally planned at a particular site;
- Progress on sites was greater than originally expected, and these sites required additional FCSAAP and departmental funds to complete the assessment projects that had been initiated in the construction season;
- Shifting departmental demands or priorities; and
- Additional funding was received from the department through internal reallocation of Fiscal Year 2003-2004 FCSAAP Funds.

### **3.4 Nature of Contamination at FCSAAP Funded Sites**

Determining the risk posed by the presence of a contaminated site involves identifying the contaminants of concern, identifying potential receptors, determining potential exposure pathways and estimating the level of risk based on the pathways. A contaminated site is an area at which 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.

The sites targeted for FCSAAP funding in 2003-2004 are contaminated with a wide variety of substances, but most often as a result of the presence of metals, petroleum hydrocarbons and polycyclic aromatic hydrocarbons (PAHs). This contamination was most commonly found in soils and surface water, followed closely by contamination of groundwater and surface sediment. The graphs in this section were constructed using the contamination information provided by departments at year-end.

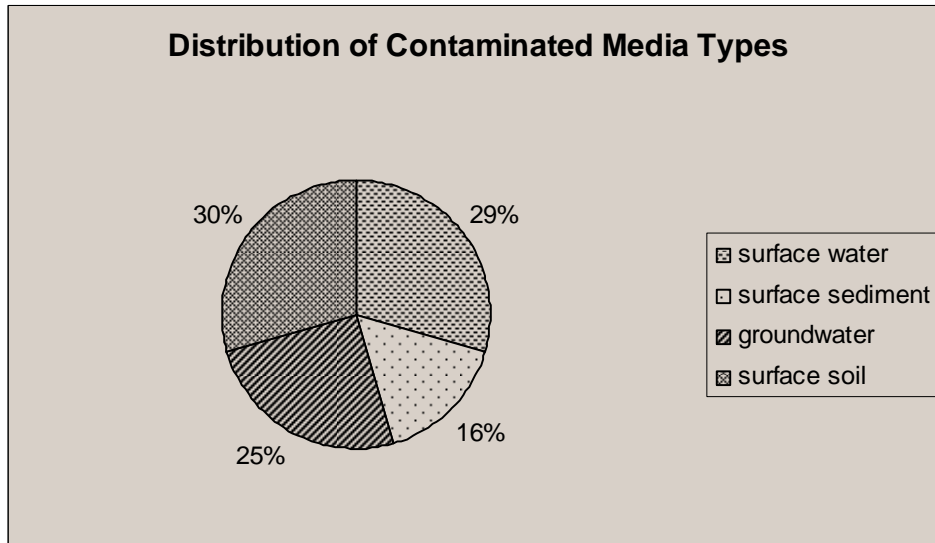
Figure 5 depicts the distribution of each type of contaminant across the projects.

**Figure 5: Remediation/Care and Maintenance sites – Type of Contamination**

Contaminated Site	Types of Contamination											
	Metals, Metalloids and Organo-metallics	Petroleum Hydro-carbons	BTEX	PAH	PCBs and PCDD/Fs	Halogenated Hydro-carbons	Pesticides	Other Organics	Other In-organics	Micro-organisms	Physical/ Chemical	Isotopes
INAC IABL - Goodfish Lake	X					X						
DFO - SCH Belleville	X	X	X	X								
EC - BC - 1	X	X	X									
HC - Weagamow Lake		X	X									
INAC - NAP-Colomac Mine	X	X				X		X	X			
INAC - NAP - United Keno Hill Mine	X	X		X								
INAC - NAP - Clinton Creek Mine								X				
INAC - NAP – Faro Mine	X	X		X				X				
INAC - NAP-Giant Mine	X	X	X	X		X		X				
INAC - NAP - Mount Nansen Mine	X	X		X				X				
INAC - NAP-Resolution Island	X	X			X			X				
DND - Fox-M Hall Beach	X	X		X	X							
DND - Harvey Barracks Aggregate	X	X	X	X	X	X			X			
DND - Pin-4 Byron Bay	X	X			X							
DND - Saglek PCB					X							
DND - CFS St John's Aggregate	X	X		X								
DND - Suffield EPG Aggregate	X							X	X			
DND - Valcartier TCE						X						

Figure 6 shows where the contamination was found for each of the projects. This is important to know because the quality guidelines for each contaminant may be different depending on whether the contaminant was found in surface water, groundwater, soil or sediment.

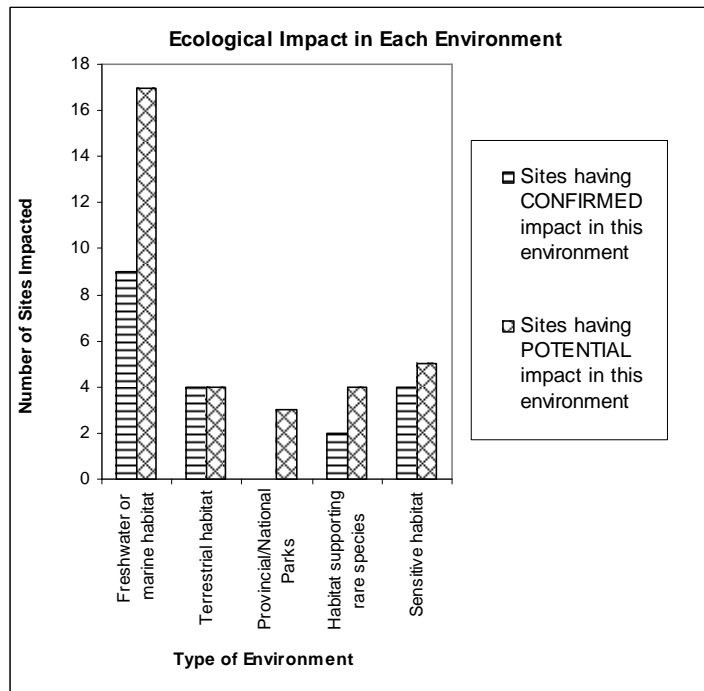
**Figure 6: Remediation/Care and Maintenance sites – Contaminated Media**



The environmental impact of the contamination at each site was measured in terms of the risk it posed to the ecology. Half of the 18 projects were found to have confirmed contaminated site impacts to their freshwater or marine ecology.

Specific habitats for plants and wildlife were categorized into five environments. The effect on each habitat for each individual project was determined through the Ecological Risk Evaluation process. The potential threat to the marine ecology was found to be the most common condition across all the projects.

**Figure 7: Ecological Impact in Each Environment**



## **4.0 Measuring Performance and Looking Forward**

### **4.1 Federal Contaminated Sites Financial Liability**

The FCSAAP RMAF (Results-based Management Accountability Framework) identifies and elaborates measurement strategies for key program activity objectives for FCSAAP, including accelerating remediation, reducing human and ecological risks and financial liabilities, and increasing public confidence in the management of federal contaminated sites. Some progress has been made in each of these areas, but the major accomplishments of 2003-2004 centred on the development of a strong program structure that would ensure the management of federal contaminated sites in a responsive and effective manner in accordance with Treasury Board policy.

In its first year, \$28.8 million of FCSAAP funds were expended for six care and maintenance projects at abandoned mines in the Yukon and North West Territories. This prevented further migration of contaminants at these sites as well as associated potential increases in costs and federal financial liabilities. Care and maintenance activities typically do not reduce liability on an annual horizon, but are crucial to managing ecological and health risks while longer-term strategies to address contamination are developed.

Although federal liability was reduced due to the completion by DND of the Harvey Barracks remediation, there was a net increase in federal financial liability (\$4 million) for the 18 FCSAAP-funded priority projects. The net increase was largely the result of a new high-risk project being identified by INAC-Northern Program (United Keno Hill Mine) during the year and better definition of expected remediation costs. This is consistent with our expectation that, in the initial stages of the program, net liability would increase as new sites are identified through the assessment process and more accurate remediation cost estimates are produced.

The key achievements of the program in its first year of operation were the development of a robust program management framework and a reliable, science-based methodology that allowed projects to be selected for funding primarily on the basis of the risks they pose to human health and the environment.

### **4.2 Conclusions**

In its first year of operation the Federal Contaminated Sites Accelerated Action Plan has accomplished a great deal in terms of laying the groundwork for an accountable and sustainable program to address federal contaminated sites - even if the Program has so far had only limited impact on the reduction of human health and ecological risk related to these sites. The cost-shared nature of the Program ensures ongoing departmental commitment. The scoring and ranking methodology has been developed in consultation with stakeholder departments. Priorities are established using science-based health and ecological risk assessment methodologies.

Environment Canada and Treasury Board of Canada Secretariat, the program coordinating departments, are committed to continued monitoring of program performance and improvement. Areas that have already been identified as requiring attention in future include the Federal Contaminated Sites Inventory, IDEA, development of contaminated sites project-management tools, dissemination of information on innovative technologies and professional development. We look forward to working with our stakeholder departments in addressing these and other challenges in coming years.

## **Appendices**

1. Reports on Progress at Individual FCSAAP Sites
2. Federal Contaminated Sites Management Framework
3. Federal Contaminated Sites Accelerated Action Plan Program Management Structure
4. Federal Contaminated Sites Accelerated Action Plan Project Eligibility, Ranking and Selection Process
5. Expenditure Tables – a: Program Expenditure b: Detailed Department Expenditures



## **Appendix 1: Reports on Progress at Individual FCSAAP Sites**

### **INDIAN AFFAIRS AND NORTHERN DEVELOPMENT/ NORTHERN AFFAIRS PROGRAM**

Site Name: **Giant Mine**

Location: Northwest Territories

Nature of contamination: Approximately 237,000 tonnes of highly toxic arsenic trioxide is stored underground at the site. In addition, arsenic-contaminated buildings, soils and tailings on the site represent hazards to human health. Pathways (routes through which chemicals can move and affect human health and the environment) of exposure would involve release of arsenic-contaminated water from the mine into Baker Creek and/or Back Bay/Yellowknife Bay. There is also potential for airborne release of arsenic from contaminated sources on surface.

Work Completed Fiscal Year 2003-2004: Continued care and maintenance of site to comply with regulatory requirements (Water License) and to ensure that adequate levels of environmental protection and public health and safety are met until a long-term management alternative for the underground arsenic trioxide is implemented and surface restoration has been completed. Completed interim surface and underground remediation measures to reduce or mitigate high-risk elements identified on the site.

Site Name: **Faro Mine**

Location: Yukon

Nature of contamination: The site was the largest zinc/lead mining operation in Canada. A large tailings depression holds an estimated 54 million tonnes of zinc-contaminated tailings. The primary concern is the chemical stability of the tailings solids and the potential for oxidation/acid generation and the subsequent flushing of contaminants from the tailings into the sand and gravel aquifer (underground body of water) that underlies this area. Proactive water management is critical to protecting the surrounding aquatic environment from zinc contamination.

Numerous health and safety hazards exist within the mine complex, including deteriorating buildings, open excavations, and lead exposure.

Work Completed Fiscal Year 2003-2004: Care and maintenance activities are ongoing and will be until 2008, focusing on water treatment operations and maintenance of all water-retaining structures. In addition, progress has been made in seeking regulatory approvals, conducting an environmental assessment, submitting water licence application and conducting public hearings for the relocation of oxide fines ores for 2004-2005.

The development of a final comprehensive abandonment plan must begin next year and be finalized by 2006. An environmental assessment will follow. Public consultation on the EA and licensing has continued with the community liaison officer in Ross River and with the identified affected First Nations. There have also been stakeholder meetings and information sessions.

Site Name: **Colomac Mine**

Location: Northwest Territories

Nature of contamination: The main concerns at Colomac are the Tailing Containment Area (TCA) which is leaking underneath one dam (and will be filled by about 2006); hydrocarbon contamination around the tank farm; contamination from tailings and other spills; and hazardous chemicals and chemical conditions (e.g., open pits, buildings in disrepair).

The main pathways for exposure to cyanides and metals are discharges of tailings water to the environment now and in the future when the TCA is full. This impacts the food chains of wildlife and humans at downstream Colomac. Caribou, moose and other wildlife are exposed to the tailings. The impacts are to humans consuming these animals and workers and visitors at the site. The main pathway for exposure to the hydrocarbons is seepage (percolation of water through the soil) to nearby Steeves Lake and aquatic food chain transfers.

Work Completed Fiscal Year 2003-2004: This year was devoted to permitting and the subsequent two years will be for remediation. Care and maintenance is continuing and will be for the next three years ensuring that immediate impacts are mitigated (e.g., seepage, collection, water diversion) and the infrastructure (e.g., airstrip, roads, power, fuel, accommodation) is adequate to support other site activities. Monitoring and reporting required under the Water Licences Surveillance Network Program is continuing throughout the planning period; other monitoring of the water treatment process is taking place during the first three years. Regulatory approvals, consultations and site assessments are peaking during the first two years while the remediation plan, the water license and land use permit applications are made to the Land and Water Board.

Site Name: **Clinton Creek Mine**

Location: Yukon

Nature of contamination: There is concern about the physical stability of the lake outlet, failure of which will result in catastrophic flooding (12,000,000 m<sup>3</sup> of water) causing potential loss of life, loss of property and loss of critical salmon habitat. A breach could potentially impact the international waters of the Yukon River.

Also unstable are the asbestos tailings (10 million tonnes) and asbestos waste rock (60 million tonnes). The potential physical impacts are as above, and the uncontrolled release of large quantities of air- and water-borne asbestos fibres will result in the contamination of a large area. Concentrations of airborne fibres are anticipated being in excess of health guidelines and would impact several km<sup>2</sup> surrounding the site.

Seasonal hydrogen sulphide gas releases from the lake potentially impact the local area. Hydrogen sulphide gases in water negatively impact lake water quality.

Work Completed Fiscal Year 2003-2004: Care and maintenance activities are continuing. Other activities being carried out are related to regulatory approvals including environmental assessments and permitting of activities (land use permits, water license). Closure planning sessions and workshops have been held with the Tr'on d'ek Hw'ech'in First Nation. Assessments have included an air-borne asbestos risk assessment and report completion, and the conducting of tailings remediation investigations. Clinton Creek stabilization has been completed. Physical hazards have been reduced. An annual water and air sampling program is ongoing.

Site Name: **Mount Nansen Mine**

Location: Yukon

Nature of contamination: The tailings pond at the site was not properly constructed or operated, as a result water levels must be carefully managed to prevent instability. Each summer, accumulated contaminated

water is withdrawn from the tailings pond, treated, and then discharged to the environment to make room for the next winter's snowmelt and summer runoff. Contaminated water also seeps below the dam and must be continually captured and pumped back into the pond.

Another significant source of contaminants on the site is heavy metals contamination of the Brown-McDade open pit water. Each fall this water is pumped to the mill's treatment plant, treated and released to the environment. This provides sufficient storage for the winter inflow from seeps and groundwater leakage from the adjacent Back Creek.

Work Completed Fiscal Year 2003-2004: The tailings water continues to be pumped in the summer, treated and released. Seepage water is pumped year round. Geotechnical, hydrological and traditional knowledge is being employed in support of the final closure of the project. Preparations for and submission of the closure plan into the regulatory process are being made along with closure planning sessions and workshops with the First Nation and community.

**Site Name: BAF 5 – Resolution Island**

Location: Nunavut

Nature of contamination: The site contains a number of health and safety hazards including 20 buildings in various states of disrepair; approximately 20,000 m<sup>3</sup> of soil contaminated with polychlorinated biphenyl (PCB), lead, cobalt, hydrocarbons, mercury and copper; various hazardous materials including batteries, PCB liquids, asbestos, fuels, fuel-tank sludge, lubricating oils, solvents, alcohol, glycol, heavy metals and contaminated liquids; and eight landfills.

There are several sources of aquatic contaminants that represent previous and potential violations of Section 36 of the *Fisheries Act* including PCB liquids draining to the sea.

Work Completed Fiscal Year 2003-2004: The following activities occurred: mobilization and demobilization of the camp; excavation of contaminated soil at various locations on the island; containerization of soil and shipment south for destruction; production of clean fill; remediation of old dump sites; construction of two non-hazardous landfills; management of physical debris as required; training of junior operators; analytical work; and permanent barrier testing.

**Site Name: United Keno Hill Mine**

Location: Yukon

Nature of contamination The contaminants of concern at the site are groundwater from the mine containing elevated concentrations of zinc, arsenic, cadmium, lead and other metals; tailings with elevated metals (arsenic, lead, cadmium); PCBs; asbestos; tailings dust; and there is a potential for acid rock drainage if the metals are exposed to oxygen.

Work Completed Fiscal Year 2003-2004: Care and maintenance activities are continuing. These include water treatment at the tailings facility; year-round site security; and adit (horizontal tunnel from a mine) discharge treatment. Regulatory approvals were secured, including an environmental assessment and permits for the year's activities. There were consultations with the Nacho Nyak Dun First Nation and community and these are ongoing through the community update process, planning sessions and workshops. An evaluation of alternative water treatment systems was completed. PCBs were destroyed off site, an abandoned power line removed, and hazardous chemicals removed. Reconstruction was undertaken on a valley tailings facility spillway. Other ongoing activities are water sampling and project management.

**INDIAN AFFAIRS AND NORTHERN DEVELOPMENT /**

## INDIAN AND INUIT AFFAIRS BUSINESS LINE

Site Name: **Goodfish Lake**

Location: Alberta

Nature of contamination: Sludge produced by the Goodfish dry-cleaning plant since 1977 contains perchlorethylene was discharged into an adjacent marsh and deposited into the former landfill. Additional perchlorethylene spills onto lands surrounding the plant also led to significant contamination of the area. In 1987, a Health Canada report confirmed the site to be contaminated.

Contaminated soils have been excavated and stockpiled and require removal. Barriers have been installed to limit the movement of contamination that could not be removed due to depth or inaccessibility. Some stockpiled material has been removed but 14,000 tonnes of soil still require removal to a landfill designed for handling of hazardous soils. Groundwater monitoring has been instituted.

Work Completed Fiscal Year 2003-2004: Remediation of the toxic soils and sludge from the dry-cleaning plant have been initiated. The bulk of the remaining previously stockpiled soils have been trucked to a landfill handling hazardous materials.

In future, the plant building needs to be demolished and soils beneath it excavated and treated. Contaminated sludge in the sewage lagoon associated with the plant will also be excavated during building removal.

## NATIONAL DEFENCE

Site Name: **FOX-M Hall Beach**

Location: Nunavut

Nature of contamination: Contaminants present are arsenic, cadmium, copper, chromium, lead and total petroleum hydrocarbons (TPH) which exceed Canada-wide Standards for petroleum hydrocarbons (PHC) in soil.

Work Completed Fiscal Year 2003-2004: On-site contamination was remediated during the summer months. This involved packaging hazardous contamination and shipping it off-site to a hazardous waste disposal facility. Hydrocarbon-contaminated soils were excavated and placed in an engineered landfarm. Other contaminated soils were excavated and placed in an engineered landfill. Confirmatory sampling was conducted and short- and long-term monitoring is continuing following remediation.

Site Name: **Harvey Barracks– COMPLETED**

Location: Alberta

Nature of contamination: The Practice Area lands consist of the former small arms ranges, obstacle course and dry training areas, and the Barracks area lands encompasses the former housing area, mess, fire hall, hospital, etc. Types of contamination detected above the acceptable limits for the Harvey Barracks area (Tsuu T'ina residential area), include TPH, Metals, BTEX (fuels), PAHs (polycyclic aromatic hydrocarbons), VOCs (solvents, degreasers, paints, thinners and fuels), asbestos and medical waste. There was a need to address these sites as quickly as possible since there was a risk of contamination of the Elbow River. In addition, the government was required to meet its obligations with respect to the 1991 Settlement Agreement signed between DND, INAC, and the Tsuu T'ina Nation.

Work Completed Fiscal Year 2003-2004: Chemical wastes have been excavated and separated from other waste materials. The different waste streams were screened for unexploded ordnance and neutralized

where appropriate. The waste material was then classified and sent to appropriate licensed landfill sites. Environmental Screening Assessments have been completed for the different elements of the work.

By the end of March 2004, the remedial activities were completed and DND completed closure activities. Upon completion of the work scheduled in Fiscal Year 2004-2005, DND will have no further liabilities at the site with the exception of any unexploded ordnance items that may be found. *DND will have reached Step 10 of the Ten-Step Process for addressing a contaminated site.*

**Site Name: PIN-4 (DEW Line)**

Location: Nunavut

Nature of contamination: Soils are contaminated with petroleum hydrocarbons, PAHs and heavy metals. Toxic organics such as PCBs exist in painted surfaces on various structures.

Work Completed Fiscal Year 2003-2004: On-site contamination was remediated during the summer months. This involved packaging hazardous contamination and shipping it off-site to a hazardous waste disposal facility. Hydrocarbon-contaminated soils were excavated and placed in an engineered landfarm. Other contaminated soils were excavated and placed in an engineered landfill. Confirmatory sampling was conducted and short- and long-term monitoring are continuing following remediation.

**Site Name: Suffield EPG**

Location: Alberta

Nature of contamination: The contamination on this site has resulted from past practices for destruction and dumping of chemical and biological warfare agents and lab chemicals. In some sites actual agents may still remain whereas in others their residual breakdown by-products remain. The agents most likely to remain include mustard and VX. The by-products of natural breakdown of agents include thiodiglycol and polysulfides. Analysis of areas where mustard was destroyed by burning or stored has indicated elevated levels of many compounds including arsenic, boron, copper, sulphur and zinc. The sites are considered toxic, and if either disturbed or dug into by animals or humans exposure could be fatal.

Work Completed Fiscal Year 2003-2004: The remedial action plan is being refined and will soon be implemented. Some parts of the site were considered to be of special concern and require specific expertise, personnel and equipment to accomplish clean-up. Some lower-risk sites will be addressed, and project staff will mount capability for high-risk sites, which requires considerable resources with strategic considerations for the future. The sites to be remediated have had an Ecological Risk Assessment completed.

**Site Name : TCE Contamination Valcartier**

Location: Quebec

Nature of contamination: A major regional aquifer has been contaminated by tetrachloroethylene (TCE). The primary concern at the site is the contamination of the groundwater which is used as a potable drinking water source within the surrounding area (Shannon Township).

Work Completed Fiscal Year 2003-2004: DND has completed delineation of the site and is in the process of developing appropriate remedial strategies to address the contamination. The final approach to address the contamination may include remediation, risk management or a combination of both. The following

studies were completed: a remediation options analysis, an evaluation of the value of the groundwater resource, a detailed complementary and targeted risk assessment, an impact study on the rivers, a study on the expertise of Environment Canada and of the INRS eau, terres et géoressources, and remediation investigation/feasibility studies.

Site Name: **Saglek PCB**

Location: Newfoundland

Nature of contamination: The Saglek Soil Remediation project is a project to deal with 20,000 m<sup>3</sup> of excavated PCB-contaminated soil which migrated via erosion/sedimentation within DND property and off DND property into Saglek Bay, impacting the ecosystem and the food chain. This soil required action as the staging area it was located in was only temporary in nature and not a long-term solution for protection.

Work Completed Fiscal Year 2003-2004: The project activities carried out during the field season include the following: Oversized material (crushed rocks and stones) washed and disposed of in the washed rock disposal area; sampling and analysis of the footprint of the site area; excavation and containerization of the underburden soil and stockpiled underburden; shipment of remaining containerized PCB-contaminated soil; site restoration; treatment, sampling and analysis of water in the settling pond and discharge of the treated water; rocks and stones levelled, area covered with native soil; and groundwater monitoring wells installed and post-remediation ambient air monitoring conducted.

Site Name: **CFB St. John's Southside Tank Farm/Shea Heights Aggregate**

Location: Newfoundland

Nature of contamination: Shea Heights is a tank farm with several above-ground storage tanks at which extensive TPH contamination has been confirmed. Free product (liquid present in large enough amounts to 'float' on the water table) and contaminated soil near property boundaries at Shea Heights were suspected. A residential community is adjacent to the contaminated site and monitoring of sediment and surface water on-site and off-site indicated the site-specific threshold levels were exceeded.

Southside is also a former tank farm. However, it has undergone extensive remediation. Contaminated material and free product have been removed and disposed of. Water encountered during site remediation activities was treated by an on-site wastewater treatment facility. Pockets of contamination remain on-site and require further delineation and remediation.

Work Completed Fiscal Year 2003-2004: Additional site investigation was required at both sites to further delineate TPH, PAH and metal contamination, and a human health risk assessment was also completed to improve knowledge of the site and support determination of appropriate remedial action. Monitoring programs and site visits are planned for the next fiscal year, with remediation expected to begin in 2005-2006.

## **FISHERIES AND OCEANS**

Site Name: **Belleville Small Craft Harbour**

Location: Ontario

Nature of contamination: There are two contaminated sites on federally-owned property: Zwick's Island East has been impacted by an inactive landfill directly adjacent to the federal property. Contaminants on the site include iron, manganese, TPH, PAHs, and ammonia.

Meyers Pier Park site is primarily comprised of industrial waste fill from use by oil companies to store fuel. Elevated levels of PAHs, TPH and heavy metals have been detected. Contamination reportedly extends

off-site to residential areas. There are contaminated sediments in the harbour basin and at the mouth of the Moira River, and elevated zinc levels have been identified in the surface water of the marina.

Work Completed Fiscal Year 2003-2004: The following activities were conducted: Site-specific risk assessment, peer review of the proposed remediation strategy, and finalization of the remedial action plan. This information will allow DFO to initiate the implementation of the remedial action plan early in the following fiscal year.

The plan will detail measures to treat soil contamination and prevent contaminants in the groundwater from discharging into the adjacent Bay of Quinte. A risk management/parkland redevelopment plan is being developed in partnership with the City of Belleville along with public consultation of the chosen risk-management concept as part of the CEEA process.

## HEALTH CANADA

Site Name: <b>Weagamow Lake</b>
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Location: Ontario

Nature of contamination: The former nursing station at Weagamow Lake is contaminated with PHCs. There are 14,600 tonnes that exceed the applicable criteria. It is estimated that 39,000 litres of liquid-phase petroleum hydrocarbons are present at the site.

Work Completed Fiscal Year 2003-2004: To excavate the site, HC decommissioned and removed the old Nursing Station building. Pump and Treat activities have been underway for the last three years and will continue this year. A cell for land farming was constructed this year.

## ENVIRONMENT CANADA

Site Name: <b>Pacific Environment Centre</b>
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Location: British Columbia

Nature of contamination: This 55 acre parcel has been subjected to unauthorized deposit and dispersal of contaminants, including waste ore concentrates and waste acid rock drainage containing heavy metals and sulphur.

Work Completed Fiscal Year 2003-2004: An estimated volume of 2,000 cubic meters of contaminated soils were excavated and remediated. These soils were contaminated with heavy metals, including copper and zinc. Future plans involve excavation of 1,000 cubic meters of overburden and remediation of an estimated 2,000 cubic meters of soil/tar mixture.

## **Appendix 2: Federal Contaminated Sites Management Framework**

Treasury Board Secretariat policies<sup>3</sup> for the management of federal contaminated sites include:

- The *Federal Contaminated Sites Management Policy* which requires custodian departments to:
  - Manage contaminated sites in a consistent and appropriate manner and address worst sites on a priority basis;
  - Use the National Classification System (NCS)—established by the Canadian Council of Ministers of the Environment (CCME) in 1992—to classify sites;
  - Apply the CCME Environmental Quality Guidelines, and, where applicable, the Canada Wide Standards for Petroleum Hydrocarbons in Soil; and
  - Develop a departmental contaminated sites management plan.
  
- The *Policy on Accounting for Costs and Liabilities Related to Contaminated Sites* requires custodian departments to account for and report to TBS on the costs of all NCS Class 1 and 2 sites for which the department is liable or likely to be liable in the fiscal year that they are identified.
  
- The *Contaminated Sites and Solid Waste Landfills Inventory Policy* led to the development of the Federal Contaminated Sites Inventory (FCSI), which has been publicly available since July 2002, and currently contains information on over 4,000 federal contaminated sites. Information is provided to Treasury Board on the progress by custodian departments in remediation or risk-management of federal contaminated sites, and that information is captured in the FCSI.

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<sup>3</sup> More information on these policies can be found at <http://www.tbs-sct.gc.ca/rpm-gbi>



### ***Appendix 3: Federal Contaminated Sites Accelerated Action Program Management Structure***

#### **■ Federal Contaminated Sites Steering Committee**

Co-chaired by Environment Canada and TBS, this ADM-level Steering Committee provides overall direction and accountability for the FCSAAP Program. The Committee includes representatives from all custodian departments with contaminated sites and the expert support departments.

The Committee oversees the implementation of the FCSAAP Program, and is responsible for setting Program and project priorities, monitoring progress, and providing recommendations on the funding allocations for FCSAAP projects to the Deputy Minister of Environment and the Secretary of the TBS.

#### **■ Contaminated Sites Management Working Group (CSMWG)**

The CSMWG was originally established in 1995 to investigate and propose a common federal approach for the management of contaminated sites under federal custody, and related issues. This working-level committee comprises all custodian departments with contaminated sites and the expert support departments.

CSMWG has contributed to the development of procedures, tools, guidance and other key FCSAAP Program outputs, as well as reviewing the list of high-risk sites.

CSMWG sub-committees were used to develop processes related to the Program, including the ranking system, the RMAF, and the Canada-Wide Standards for Petroleum Hydrocarbons.

#### **■ Custodian Departments**

Custodian departments have direct responsibility for the contaminated sites under their control, including identifying sites and associated financial liabilities; prioritizing sites according to risk; developing a management plan; implementing assessment and risk-management or remediation activities; and ongoing monitoring.

Departments participating in FCSAAP have additional responsibilities with respect to highest-risk federal sites that include: conducting screening-level risk assessments and preparing risk scores; preparing proposals for funding under FCSAAP and implementing approved projects; reporting on progress; and 'care and maintenance' of sites to prevent contaminant migration and further increases in federal financial liability.

#### **■ FCSAAP Secretariat**

The FCSAAP Secretariat is housed at the Contaminated Sites Division of Environment Canada in the National Capital Region. The Secretariat provides overall leadership and day-to-day management for the Program, in consultation with TBS and CSMWG, and reports directly to the Federal Contaminated Sites Steering Committee.

The Secretariat's functions include: establishing clear policy direction; providing the resources needed to achieve Program objectives; and coordinating the flow of data and information on Program requirements and results.

#### **■ Treasury Board of Canada Secretariat**

TBS has responsibility for developing federal policy related to contaminated sites management.

With respect to FCSAAP, the TBS role includes: reviewing financial aspects of project proposals and departments' reallocation capacity; administering the Fund to ensure consistency with the policy

framework; advising on the monitoring of government-wide progress and reporting results; and, seeking appropriate Treasury Board approvals. In addition, TBS co-chairs the ADM-level Steering Committee.

▪ **Expert Support Departments and Interdepartmental Regional Working Groups**

Health Canada, Fisheries and Oceans, and Environment Canada provide an expert support function to custodian departments, the Program Secretariat, and the FCS Steering Committee. This role includes: provision of scientifically sound, nationally consistent advice on the highest-risk sites; review of risk assessments; and, review of risk-management/remediation plans for proposed projects.

These departments provide technical review of proposals, ensure that eligible sites meet basic criteria and are subsequently prioritized according to the nature, severity and immediacy of the risk they pose to human health and the environment. They also score ecological and human health risks at the sites for which proposals have been submitted.

Expert support is coordinated centrally but is delivered primarily in the regions through the Interdepartmental Regional Working Groups (IRWGs). As of March 31, 2004, two IRWGs were established in the Atlantic Region and Prairie Northern Region (Manitoba). Over time, IRWGs will be established in five regions and sub-regions, with potential for two additional IRWGs for the North.

IRWGs comprise staff from departments with contaminated sites in the regions, and will provide advice and support in areas such as:

- Promoting regulatory compliance;
- Determining health and environmental impacts related to regional contaminated sites;
- Reviewing and determining the appropriateness of risk-assessment approaches; and,
- Assisting custodian departments with development of remediation, risk-management, and/or care-and-maintenance plans for highest-risk sites.

#### **Appendix 4: FCSAAP Project Selection Methodology**

The following list outlines the eligibility requirements for contaminated sites seeking remediation/risk-management or care-and-maintenance funding under the Program in 2003-2004.

- The site must meet the definition of a contaminated site as stated in the TBS Federal Contaminated Sites Management Policy (a site at which substances occur at concentrations (1) above background levels and pose (or are likely to pose) an immediate or long-term risk to human health or the environment, or (2) exceeding levels specified in relevant policies or regulations.)
- The site must be listed in the Federal Contaminated Sites Inventory and subject to the TBS Federal Contaminated Sites Management Policy, including the requirement for the departments to “develop a departmental Contaminated Sites Management Plan”.
- The site must be identified as a Class 1 site under the Canadian Council of Ministers of the Environment (CCME) National Classification System (NCS) (CCME, 1992).
- The site must have total estimated multi-year remediation/risk-management or care-and-maintenance costs for a single property greater than or equal to \$1 million but not more than \$15 million per year (projects that fall outside these parameters could still be considered on an exception basis).
- The site must be included in the department’s current Federal Contaminated Sites Management Plan.
- In the case of remediation/risk-management projects, the site must have completed Step 5 (Detailed Testing Program) of the Ten-Step Process for addressing a contaminated site as described in *A Federal Approach to Contaminated Sites* (CSMWG, 2000; refer to Annex 1); or, in the case of care and maintenance projects, the site must have completed Step 4 (Classification using the CCME National Classification System).
- The Program requires that departments contribute 30 percent of the cost of the project for the first \$25 million and 10 percent for costs over \$25 million.

In 2003-2004, federal contaminated sites were prioritized according to a number of factors approved by CSMWG including:

- National Classification System (NCS) multiplicative score (a slight derivation of the CCME NCS for contaminated sites);
- NCS health score (derived by Health Canada from the CCME NCS emphasizing human health impacts); and
- A severity score (derived by CSMWG which included special considerations and legal obligations).

All of these attributes were translated into scores. The NCS and health scores were used to rank the sites and arrive at a list of the top 50 highest-risk sites. Sites were then ranked according to their cumulative score, and given ‘equal weight for equal score’. The goal of the project selection process was to create a prioritized list of highest-risk sites and priority projects across the departments. Based on this process, 18 high-risk contaminated sites (from four federal departments) were targeted for FCSAAP funding, all of which are Class 1 sites according to the CCME NCS.

## **Prioritization of 2004-2005 FCSAAP Project Submissions:**

### **Site Ranking System Developed**

Analysis of the project ranking system applied during the 2003-2004 selection process identified the need to develop a more scientifically defensible site ranking system that was based on nationally consistent methodologies of health and environmental risk assessment. This new ranking system was developed through a sub-committee of the CSMWG with the assistance of external consultants.

As in the first year of the program, sites will be prioritized according to the nature, severity, and immediacy of the risk they pose to human health and safety and to the environment. It was decided that 2004-2005 projects would be ranked by a single score consisting of a weighted sum of Tier 1 (science-based) and Tier 2 (socio-economic) factors. The final weighting of Tier 1 to Tier 2 is 3:1.

Tier 1 considers risk-based, science factors which include:

- FCSAAP site classification system score, a system based on the CCME National Classification System for Contaminated Sites (NCS) but which uses a guidance document that was newly developed during 2003-2004 to reduce variability and improve consistency;
- a health score derived by Health Canada; and,
- an integrated ecological risk score determined by Environment Canada and DFO.

Equal weighting is placed on each of the three risk scores in Tier 1. A final Tier 1 (risk) score for a maximum of 300 points is assigned to each site submitted for funding. The sites then undergo a comparative ranking with the top 50 sites identified as the highest-risk federal contaminated sites for the fiscal year in question.

Following the risk ranking under Tier 1, a Tier 2 score will be applied to the top 50 highest-risk sites. The Tier 2 score is based on non-scientific factors, including:

- Potential increase in financial liability due to inaction;
- Expected progress in remediation by March 2008;
- Legal considerations; and,
- Special considerations (impact on traditional lands and lifestyles).

The Tier 2 score (maximum 100) will be added to the Tier 1 score of each of the highest ranked sites for a maximum score of 400. A priority list is then produced by sorting based on total score. Funding options are developed for projects on the priority list from the top down and to the limit of available funding for the fiscal year in question.

**Appendix 5: Expenditure Tables**

a: Program Expenditures

<b>Federal Contaminated Sites Projects</b>	<b>Planned FCSAAP Expenditures</b>	<b>Actual FCSAAP Expenditures</b>
<i>INAC (Northern Program)</i>	37,219,500	37,759,865
<i>INAC (IIABL)</i>	<u>3,552,500</u>	<u>1,192,300</u>
Total DIAND	40,772,000	38,952,165
National Defence	23,742,500	24,377,238
Fisheries and Oceans	1,759,629	1,591,033
Health Canada	420,000	329,871
Environment Canada	350,000	1,009,384
RCMP	249,014	143,592
CFIA	49,733	45,616
Transport Canada	333,861	234,515
PWGSC	246,122	238,383
AAFC	84,574	84,574
Parks Canada	<u>92,567</u>	<u>61,215</u>
<b>Total Project Expenditures</b>	<b>68,100,000</b>	<b>67,067,586</b>
<b>Secretariat and Expert Support Services</b>		
Environment Canada Secretariat and Expert Support	2,922,000	2,356,486
Health Canada Expert Support	2,656,000	1,759,646
DFO Expert Support	<u>1,322,000</u>	<u>677,910</u>
<b>Total Secretariat and Expert Support</b>	<b>6,900,000</b>	<b>4,794,042</b>
<b>Total FCSAAP Expenditures</b>	<b>75,000,000</b>	<b>71,861,628</b>
<b>NOTE</b>		
Above totals include the following amounts for PWGSC Accommodation costs		
<b>PWGSC Accommodation costs</b>		
Environment Canada	110,916	110,916
Health Canada	73,684	73,684
Fisheries and Oceans	<u>72,800</u>	<u>72,800</u>
	257,400	257,400

b: Detailed Project Expenditures

Federal Contaminated Sites Projects	Planned FCSAAP Funding		Adjustments <sup>a</sup>	Actual FCSAAP Expenditures		FCSAAP Variance planned - actual
	FCSAAP Fund	Department Share		FCSAAP Fund	Department Share	
<b>INAC (Northern Program)</b>						
Giant Mine (NWT)	6,965,000	2,985,000		5,787,844	2,480,505	1,177,156
Faro Mine (YU)	9,660,000	4,140,000		9,847,858	4,220,511	-187,858
Colomac Mine (NWT)	10,500,000	4,500,000		10,500,000	6,034,508	0
Clinton Creek Mine (YU)	934,500	400,500		604,265	258,971	330,235
Mount Nansen Mine (YU)	1,284,500	550,500		667,162	285,926	617,338
Resolution Island (NU)	7,805,500	3,345,214		8,936,700	3,830,014	-1,131,200
United Keno Hill Mine (YU)	0	0		1,354,786	580,622	-1,354,786
FCS Assessments (2)	70,000	30,000		61,250	16,500	8,750
<b>Sub-total INAC-NAP</b>	<b>37,219,500</b>	<b>15,951,214</b>	<b>2,219,700<sup>b</sup></b>	<b>37,759,865</b>	<b>17,707,557</b>	<b>1,679,335</b>
<b>INAC (IIABL)</b>						
Goodfish Lake (AB)	700,000	300,000		1,122,300	481,200	-422,300
Attawapiskat (ON)	2,642,500	1,132,500		0	0	2,642,500
FCS Assessments (2)	210,000	90,000		70,000	30,000	140,000
<b>Sub-total INAC-IIABL</b>	<b>3,552,500</b>	<b>1,522,500</b>	<b>-2,219,700<sup>b</sup></b>	<b>1,192,300</b>	<b>511,200</b>	<b>140,500</b>
<b>Total INAC</b>	<b>40,772,000</b>	<b>17,473,714</b>		<b>38,952,165</b>	<b>18,218,757</b>	<b>1,819,835</b>
<b>National Defence</b>						
FOX-M LRR (DEW line) (NU)	3,650,000	1,564,286		3,389,000	2,250,000	261,000
Harvey Barracks (AB)	5,670,000	2,430,000		6,304,738	9,445,000	-634,738
PIN-4 (DEW line) (NU)	1,600,000	685,714		1,603,000	898,000	-3,000
Suffield EPG (AB)	210,000	90,000		64,000	28,000	146,000
TCE Valcartier (QC)	628,000	269,143		449,000	192,000	179,000
Saglek (NFLD)	11,400,000	4,885,714		12,068,000	10,575,000	-668,000
CFS St. John's Southside Tank Farm (NFLD)	70,000	30,000		53,000	24,000	17,000
FCS Assessments (3)	514,500	220,500		446,500	430,000	68,000
<b>Total National Defence</b>	<b>23,742,500</b>	<b>10,175,357</b>	<b>634,738<sup>c</sup></b>	<b>24,377,238</b>	<b>23,842,000</b>	<b>0</b>

<sup>a</sup> Adjustments include the transfer of funds from one custodian/expert support department to another custodian.

<sup>b</sup> \$2,219,700 transferred from INAC IIABL to INAC NAP

<sup>c</sup> Funds transferred to the Department of National Defence from Fisheries and Oceans Expert Support (\$466,738) and Fisheries and Oceans custodian (\$168,000).

Federal Contaminated Sites Projects	Planned FCSAAP Funding		Adjustments <sup>a</sup>	Actual FCSAAP Expenditures		FCSAAP Variance planned - actual
	FCSAAP Fund	Department Share		FCSAAP Fund	Department Share	
<b>Fisheries and Oceans</b>						
SCH Belleville (ON)	210,000	90,000		41,415	19,000	168,585
FCS Assessments (209)	1,549,629	664,127		1,549,618	738,834	11
<b>Total Fisheries and Oceans</b>	<b>1,759,629</b>	<b>754,127</b>	<b>-168,000<sup>d</sup></b>	<b>1,591,033</b>	<b>757,834</b>	<b>596</b>
<b>Health Canada</b>						
Weagamow Lake (ON)	420,000	180,000	10,627	309,517	128,097	121,110
FCS Assessments (2)	0	0	20,354	20,354	0	0
<b>Total Health Canada</b>	<b>420,000</b>	<b>180,000</b>	<b>30,981<sup>e</sup></b>	<b>329,871</b>	<b>128,097</b>	<b>121,110</b>
<b>Environment Canada</b>						
PEC (BC)	350,000	150,000		1,009,384	918,250	3,313
<b>Total Environment Canada</b>	<b>350,000</b>	<b>150,000</b>	<b>662,697<sup>f</sup></b>	<b>1,009,384</b>	<b>918,250</b>	<b>3,313</b>
<b>Other FCS Assessments</b>						
Royal Canadian Mounted Police (19)	249,014	106,720		143,592	61,551	105,422
Canadian Food Inspection Agency (7)	49,733	21,314		45,616	19,031	4,117
Transport Canada (7)	333,861	143,083		234,515	120,507	99,346
Public Works and Government Services Canada (12)	246,122	105,481		238,383	124,035	7,739
Agriculture and Agri-Food Canada (20)	84,574	36,246		84,574	84,374	0
Parks Canada (6)	92,567	39,672		61,215	22,034	31,352
<b>Total Other FCS Assessments</b>	<b>1,055,871</b>	<b>452,516</b>		<b>807,895</b>	<b>431,532</b>	<b>247,976</b>
<b>Remediation/ Risk Management Total</b>	<b>35,356,000</b>	<b>15,152,571</b>	<b>1,140,062</b>	<b>35,350,054</b>	<b>28,788,561</b>	<b>1,146,008</b>
<b>Care and Maintenance Total</b>	<b>29,344,000</b>	<b>12,576,000</b>	<b>0</b>	<b>28,761,915</b>	<b>13,861,043</b>	<b>582,085</b>
<b>Total Remediation, Risk Management and Care and Maintenance Projects</b>	<b>64,700,000</b>	<b>27,728,571</b>	<b>1,140,062</b>	<b>64,111,969</b>	<b>42,649,604</b>	<b>1,728,093</b>
<b>Assessment Total</b>	<b>3,400,000</b>	<b>1,457,143</b>	<b>20,354</b>	<b>2,955,617</b>	<b>1,646,866</b>	<b>464,737</b>
<b>Program Total</b>	<b>68,100,000</b>	<b>29,185,714</b>	<b>1,160,416</b>	<b>67,067,586</b>	<b>44,296,470</b>	<b>2,192,830</b>

<sup>a</sup> Adjustments include the transfer of funds from one custodian/expert support department to another custodian.

<sup>d</sup> Funds transferred to the Department of National Defence (\$168,000).

<sup>e</sup> Funds transferred from Health Canada Expert Support to Health Canada custodian (\$30,981).

<sup>f</sup> Funds transferred from Fisheries and Oceans Expert Support (\$83,051), Health Canada Expert Support (\$24,646), and Environment Canada Expert Support/Secretariat (\$555,000).