

# **Innovation et assainissement**

dans le

## **Plan d'action pour les sites contaminés fédéraux**

Soutien d'expert de TPSGC  
Mai 2012





### Aperçu

- But et activités PASCF Phase 1 – technologies et approches de restauration novatrices
- But revise et activités PASCF Phase 2 – consideration de restauration durable et verte





# Technologies et approches novatrices

- Le recours à des technologies et à des approches d'assainissement novatrices est reconnu comme étant un avantage secondaire dans le cadre du PASCF
- TPSGC a reçu pour mandat de promouvoir le recours aux technologies et aux approches novatrices pour les sites contaminés fédéraux
- TPSGC a mis en place plusieurs initiatives pour s'acquitter de ce mandat



# **PASCF : PHASE 1 (2006-2011)**

## **Pleins feux sur l'innovation**

- Définir l'INNOVATION
- Favoriser l'INNOVATION
- Afficher l'INNOVATION





### PHASE 1

## Définir l'INNOVATION

### Définition initiale des technologies novatrices...

- *tout sauf les activités habituelles d'excavation et de déchargement*

### Définition élargie...

- *processus/approche **peu appliqués** à l'échelle réelle*
- ***nouvelle application** dans le domaine de l'assainissement des sites*
- *innovation dans la **façon dont la technologie est appliquée***
- *l'approche doit être **plus écologique** que les méthodes conventionnelles*





## PHASE 1

# Favoriser l'INNOVATION

- **Ateliers sur les solutions novatrices**
- **Outils de prise de décisions**
- **Mécanismes d'exécution**





# Ateliers sur les solutions novatrices

## Ateliers sur les solutions novatrices (5)

- ont sensibilisé les quelque 1 000 gardiens de biens fédéraux, fournisseurs de technologies ou experts conseils en la matière et universitaires, aux problèmes liés à l'assainissement et aux solutions technologiques possibles
- ont fait un tour d'horizon des obstacles à l'innovation.

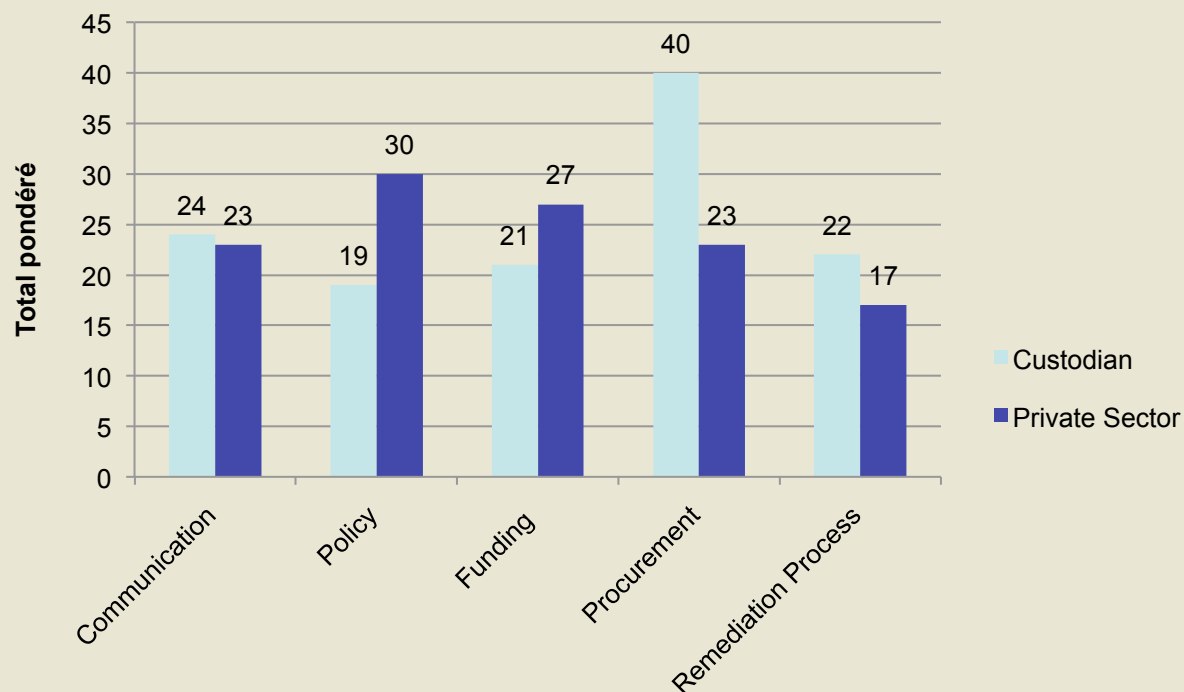
## Ateliers de présentation des fournisseurs

- présentation de différentes technologies novatrices en matière d'assainissement





## Conclusions des ateliers Problèmes et défis liés à l'innovation





## Outils de prise de décisions

- **Le GOST** (Guide d'orientation pour la sélection de technologies) présente des éléments pour orienter le choix des technologies d'assainissement;
- **L' ODD** (outil de développement durable) intègre les principes du DD au processus d'évaluation des technologies d'assainissement ...*en cours de création*;
- **Les normes d'orientation** indiquent la voie à suivre p. ex. orientation sur l'évaluation des risques pour la santé, uniformisation des caractéristiques des récepteurs fauniques...



## Mécanismes d'exécution

- Examen des outils et mécanismes d'exécution;
- Adoption de pratiques exemplaires régionales;
- Amélioration de l'uniformité dans les commandes subséquentes régionales;
- Fusion pour éviter la multiplicité des mécanismes et favoriser l'uniformité à l'échelle régionale;
- Étude des approches d'exécution possibles

## PHASE 1

# Afficher l'INNOVATION

- **Fiches descriptives de technologies novatrices**
- **Articles à la une**
- **Documents aux points de service**





# Federal Contaminated Sites

# Fiches descriptives des technologies

## INNOVATIVE REMEDIATION

Saviktok Point  
Tuktoyaktuk, NWT

This profile portrays one of several Case Studies featuring innovative technologies and approaches being used to remediate federal contaminated sites by way of the \$3.5 billion Federal Contaminated Sites Action Plan (FCSAP).

### The Challenge

Canada's North has some of the toughest geology and climate conditions in the world. When a former Department of National Defence (DND) tank farm site near Tuktoyaktuk, Northwest Territories, needed remediation, Defence Construction Canada (DCC) issued a public tender hoping to find a technology innovative enough to tackle these difficult conditions.

The soil in this former industrial land was contaminated with hydrocarbons that had migrated down to the permafrost. Levels of contaminants in the soil were well above the Government of NWT's industrial limits. With funding support by way of the Federal Contaminated Sites Action Plan (FCSAP) initiative, DCC was able to remediate the site.

Biogénie was chosen for its biostimulation technology—one that could be used on site and would work in difficult geographical conditions, while still remaining cost effective.

### The Difference: Innovation

The site was removed from the Tuktoyaktuk community and cut off from any potential power sources by a large body of water. Diesel generators are typically used to power such soil suction systems on remote sites. But this particular site, while challenging, also provided an opportunity for a unique environmental approach. The high wind velocities of the Tuktoyaktuk area allowed Biogénie to use a wind-powered venting system to enhance the biostimulation process.



Biogénie had to consider both temperature and wind conditions when designing the remediation process for this northern location.

"Wind-powered turbines allowed us to work without the diesel-powered generators that would typically be used on this type of site."

Eric Lacroix, Biogénie

### Biogénie's approach led to:

- The innovative use of a renewable energy source, significantly reducing fuel use and minimizing potential fuel spillage in transportation to the site.

- The remediation of contaminated
- Optimal use of local resources (no wind velocities and soil microbes, local inert substrates and soil)

In biostimulation, oxygen and soil contaminated soil to stimulate the soil microbes. Using an innovative approach of 17,000 cubic metres of soil. Following treatment, a human health that metal concentrations levels is 4 to below the calculated Site Specifics was deemed safe for both present and



Turbines were used to generate energy—made possible by the site's high wind vs

More details about 1 federalcontaminatedsites.ca



## FEDERAL REMEDIATION

Vessel Disposal  
Bay Roberts Harbour, NL

This profile portrays one of several case studies featuring unique, significant, and innovative projects being undertaken to remediate federal contaminated properties throughout Canada.

### The Challenge

In 2006, the Department of Fisheries and Oceans Canada (DFO) obtained ownership of two abandoned vessels in Bay Roberts Harbour, Newfoundland and Labrador.

DFO contracted with Public Works and Government Services Canada (PWGSC) to manage the safe disposal of the vessels. By the time DFO acquired the vessels, both were in a state of serious disrepair. Increasing the complexity were hazards posed by the ships' leaking refrigeration systems, damaged asbestos, and water ingress due to deteriorated valves and pipes raising concerns for potential sinking at the wharf.

Given limited capability for salvage in the area, various options for disposal were explored. Ocean disposal (safely sinking the ship) was one clear option proven successful in the past, but how would the public feel about that method for these ships? Was there a viable alternative? Salvage was the other potential solution, but it had its own set of varied and complex challenges. Could the vessels be safely towed a long distance? Was it feasible? Could it be done at the DFO wharf or alongside at another facility?

### The Difference: Unique and Significant

PWGSC put out a request for proposals for both the ocean disposal and salvage options, incorporating evaluation for sustainable development. The proposals included a preliminary work plan, schedule, and a list of recyclable/salvageable items. The contract was awarded to the Marine Recycling Corporation (MRC), which proposed to take the ships to its facilities in Port Colborne, Ontario. MRC obtained a certificate of Seaworthiness for both vessels, however, both vessels had a considerable list, one to port and the other to starboard. To get both trawlers upright, onboard materials were rearranged on deck and within the ships. The ships were secured towed by the tug boat Commodore Straits, and arrived in Port Colborne in September 2008. Recycling of both ships began at the MRC docks shortly after.

### Benefits and Outcome

In total, MRC managed to recover approximately 1,000 tonnes of iron, 40 tonnes of aluminium, and 120 tonnes of non-iron metal from both trawlers. These materials were sent to a smelter and approved facilities for recycling. The salvage process generated approximately 175 tonnes of garbage and waste, including 2,300 litres of liquid Ammonia, 6500 kg of Asbestos Containing Material (ACM), and 30,000 litres of polluted liquids. The project was a complete success without environmental or safety incident, accident or spill.



These vessels had straggled in Bay Roberts Harbour for five years. Both vessels were eventually dismantled piece by piece. The vessels were tied together and towed from Newfoundland's Bay Roberts to Port Colborne, Ontario.

## FEDERAL SITE REMEDIATION

Port Hope Area Initiative  
Port Hope, Ontario

This profile portrays one of several case studies featuring unique, significant, and innovative projects being undertaken to remediate federal contaminated sites throughout Canada.

### The Challenge

Port Hope had an active uranium refinery that operated from the 1930s to 1970s. Due to these activities, 90 per cent—or 1.7 million cubic metres (m<sup>3</sup>)—of Canada's historic low-level radioactive waste can be found in the Port Hope area. This waste had been managed through containment in various licensed and unlicensed facilities within the community of Port Hope and the nearby rural hamlet of Port Granby. The goal of both the government and local municipalities was to develop a plan for the long-term management of the historic low-level radioactive waste (LLRW) in these Ontario municipalities.

### The Difference: Unique and Significant

In 2001, the Port Hope Area Initiative (PHAI) was created. Essentially, the PHAI is the product of a legal agreement between the Government of Canada, the Town of Port Hope, the former Township of Hope (now amalgamated with the Town of Port Hope to form the Municipality of Port Hope) municipality of Charington to cleanup and remediate at Hope and Port Granby that are contaminated to low-level radioactive waste. The initiative was after several years of environmental and technical well as extensive public consultation.



part of the Municipality of Port Hope (in this foreground) and the Charington area areas of Hamlet in the Port Hope Area Initiative.

PORT HOPE AREA INITIATIVE Canada

Public Works a department of the government of Canada

Recently, under a tripartite Memorandum of Understanding, Natural Resources Canada (NRCan), Atomic Energy Canada Limited (AEC) and Public Works and Government Services Canada (PWGSC), formed the Port Hope Area Initiative Management Office to develop the final design and construction plans for the safe long-term management of facilities in the Port Hope area at both Port Hope and Port Granby. Under the MOU, NRCan is identified as sponsor, AEC as proponent, and PWGSC as major contractor manager.

The PHAI calls for two engineered aboveground mounds, one constructed at each site. The mounds will isolate waste within multiple thick layers of a double-bag liner and cover system.

The facilities will be able to isolate and provide secure management of approximately 2.3 million m<sup>3</sup> of waste. A long-term monitoring program will ensure the safety of the surrounding environment and community.

The presence a unique re were considerable health and re and ongoing

A detailed of construction remediation through Public Works and Atomic and construction Canada. Led begin in 2011

### The Future

Once project Port Granby begins. It will new facility monitoring a respective a been achieved for the mound

## INNOVATIVE REMEDIATION

Swallowtail Lightstation  
Grand Manan Island, New Brunswick

This profile portrays one of several Case Studies featuring innovative technologies and approaches being used to remediate federal contaminated sites by way of the \$3.5 billion Federal Contaminated Sites Action Plan (FCSAP).

### The Challenge

Built in 1859 on a rocky outcrop of remote Grand Manan Island, the Swallowtail Lightstation is one of the oldest surviving lighthouses in Eastern New Brunswick.

The remoteness of the location posed a challenge when Fisheries and Oceans Canada (DFO) decided to capitate on the opportunity provided by the Federal Contaminated Sites Action Plan (FCSAP) to clean up the site. The soil was contaminated with lead from previous lead use and structural painting. A phased environmental site assessment showed the soil surrounding the lighthouse to be in toxic waste, with lead concentrations exceeding the OCME Soil Quality Guidelines.

Halifax-based CleanEarth Technologies Inc. (CleanEarth) was brought in to develop a solution.

CleanEarth's patented soil washing process, proven to be particularly effective for soil contaminated with metals, worked particularly well in this scenario, as the mobile soil washing unit brought to site limited the removal of contaminated soil from the island. After treatment, only a small volume of residuals required further removal or disposal. This innovative technology uses a physical separation modules to concentrate and remove particulate metals from the bulk soil matrix, followed by leaching/extractors to remove any remaining fine particulate metals or molecular/ionic species that may remain bound to the soil following physical processing.

"This is genuine innovation. The process was developed specifically for the Grand Manan as a pilot, because of the site's remoteness. We can build on the lessons learned and apply this knowledge to future projects."

Colin Morrell, CleanEarth Technologies

### The Difference: Innovation

There is currently no other process to treat lead-based paint in soil. CleanEarth's soil washing technology, developed at the company's Nova Scotia facility, is unique in North America. Rather than just disposing of or containing contaminated soil, this method actually removes contaminants from the soil on-site.

It concentrates the contaminants, leaving behind a significantly smaller volume of material to be disposed of or recycled. Other technologies require the removal of contaminated soil from the island, transporting it long distances for disposal. CleanEarth developed a scaled-down version of its patented technology, lowering the cost and environmental footprint of the project.

When the process was complete, metal concentrations were well below the calculated SSTL identified in the human health risk assessment, making it safe for both its present use and any future land-uses.



All equipment, materials, and personnel had to be transported to and from Grand Manan Island by helicopter.



Thirty-Are a helicopter on the New Brunswick coast. Grand Manan Island is one of the more isolated communities in Canada.



More details about FCSAP at federalcontaminatedsites.ca



Government of Canada

Gouvernement du Canada



Public Works and Government Services Canada (PWGSC) is a federal department that delivers contracting and project management services to other departments in the remediation of federal contaminated sites.

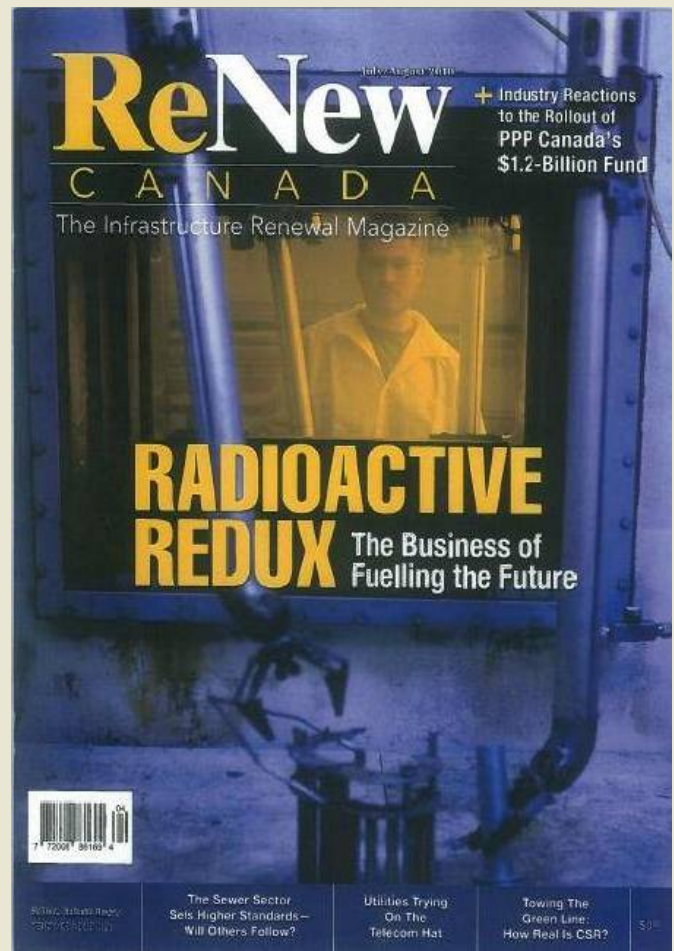
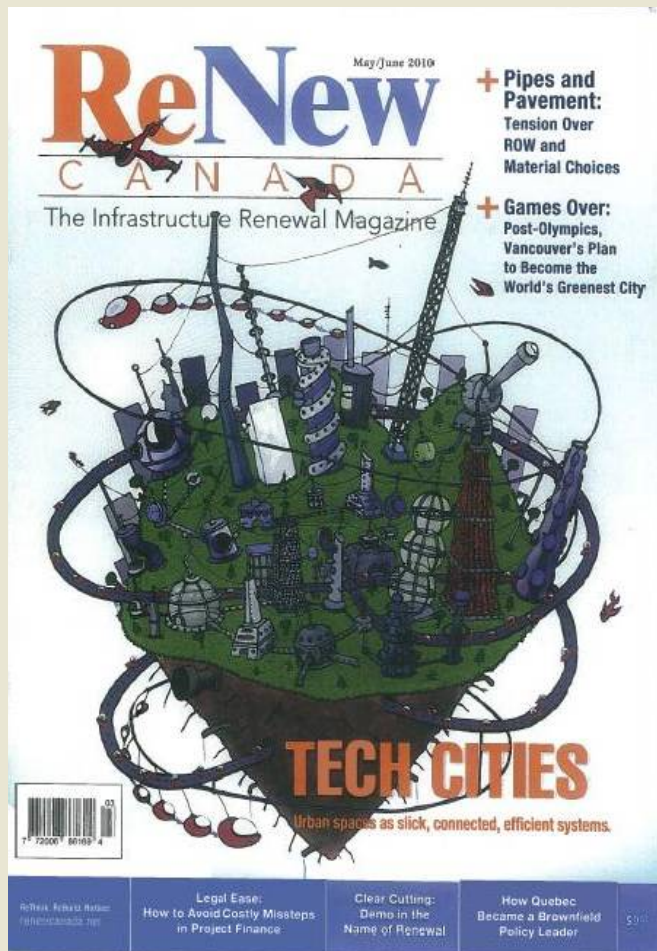






# Federal Contaminated Sites

## Articles à la une



Government of Canada

Gouvernement du Canada

Canada





## **PASCF : PHASE 2 (2011-2015)**

**Pleins feux sur l'INNOVATION**

grâce à des

*principes et des pratiques durables*

*« Pratiques exemplaires, approches et techniques d'assainissement innovantes, durables et écologiques »*





### PHASE 2

# Redéfinir l'INNOVATION

## Objectifs

- **Réduire l'empreinte écologique,**  
en réduisant l'utilisation des ressources tout en optimisant les avantages socioéconomiques;
- **Réduire les risques supplémentaires pour les humains et l'environnement ;**
- **Améliorer les compétences, profiter aux entreprises et aux emplois locaux existants et en créer de nouveaux.**



PHASE 2:

# Favoriser l'INNOVATION

- **Amélioration des compétences**
- **Outils de prise de décisions**
- **Mécanismes d'exécution**



# Compétences

## Ressources

- L'identification des ressources et des besoins en matière de compétences/formation est en cours;
- Partage de l'expertise entre les régions.

## Cours/séminaires sur les sujets suivants :

- Technologies d'assainissement;
- Recommandations du CCME pour la qualité de l'environnement;
- Études environnementales de sites;
- Contrôle de l'érosion et des sédiments;
- Approches et pratiques exemplaires durables et écologiques;
- Passation de marchés axée sur les objectifs.

# Outils pour la prise de décisions et la gestion de projets

**GOST accessible en ligne**

**ODD accessible en ligne (automne 2012)**

**Normes d'orientation**

- Outil pour la fermeture de sites (TPSGC)/Outil de validation de l'évaluation des risques (EC)
- Spécifications de résultats pour le webinaire sur la solidification/stabilisation (ITRC)
- Spécifications pour un assainissement durable

**Prévisions annuelles concernant la demande**





## Mécanismes d'exécution

Étude des méthodes pour un assainissement novateur, durable et écologique (ANDE) :

- **Politique...** nécessité de recourir à l'ANDE et d'en évaluer l'utilisation;
- **Passation de marchés...** exécution d'activités précises, réalisation d'objectifs précis grâce à l'ANDE;
- **Évaluations des propositions...** recensement des méthodes propres à l'ANDE; inventaire de l'expertise et de l'expérience en la matière et des bienfaits pour l'environnement; modes de présentation des avantages et des résultats de l'ANDE.

## Phase 2

# Afficher l'INNOVATION

### **Études de cas et présentation**

Technologies et approches uniques, importantes et novatrices, durables et écologiques décrites, montrées et affichées;

### **Brochures et affiches sur les projets**

exposées et distribuées lors des activités locales, régionales et nationales sur l'assainissement, p. ex. stand du PASC.

# Résumé sur le PASCF

## Phase I

- Pleins feux sur les technologies novatrices
- Élaboration du GOST et d'outils de DD
- Ateliers sur les solutions d'assainissement novatrices
- Mise en vitrine des technologies et des approches novatrices

## Phase 2

- Élargir la vision aux approches pour un assainissement durable et écologique
- Mettre au point l'outil de durabilité du PASCF, et l'ajouter au GOST
- Élaborer des outils d'approvisionnement facultatifs et écologiques
- Mettre en vitrine des approches pour un assainissement innovant, durable et écologique