PCBs and Five Island Lake

Five Island Lake Community Liaison Committee • Newsletter #13 • October, 2003

PCB CONTAMINATED SITE

DECISIONS NEEDED. PUBLIC MEETING OCTOBER 28

Dear Fellow Residents

We invite you to attend a community meeting on Tuesday, October 28 in the Bay Road Fire Hall, to get an update on the current status of the former Associated Metals salvage yard in Five Island Lake — a site contaminated by PCBs and other chemicals.

As you know, this is not a new problem for our community. The Five Island Lake Community Liaison Committee has been working with the Nova Scotia Departments of Transportation and Public Works and Environment and Labour to keep this issue moving forward since the community was made aware of the problem in 1994. In our last newsletter (available at www.gov.ns.ca/tran/Projects/FiveIsland.stm) we described the current situation and its history. Last year Transportation and Public Works completed an extensive clean-up of PCBs that had accumulated in the sediments of North Bay. This completed the effort to contain the spread of the PCBs in the environment. Prior to this effort, the contamination under the salvage yard site was contained with a clay and gravel cap and closely monitored. This was followed by the clean-up of the brook leading from the site, and then the removal and treatment of the sediments in the North Bay of Five Island Lake.

Now that this major clean-up has been accomplished, the Community Liaison Committee is now re-considering the site itself — what is there and what can and should be done about it. We hope we will see you at the community meeting. As residents, we all need to be aware of what is happening in our community.

This newsletter shares more detailed information, provided by Jacques Whitford Environment Limited, about the possible risks associated with different ways of managing or cleaning up the site. We will talk more about these at the meeting.

WE NEED YOUR INPUT!

As always, it is really important that we hear your views. Please e-mail us at fiveislandlake@hotmail.com or call your nearest committee member. (Contact numbers on page 8)

PCBs and Five Island Lake - The Way Forward

Community Meeting and Open House

Tuesday, October 28, 2003

Bay Road Fire Hall, St Margarets Bay Road

6:00 pm Open house display, 7:00 pm Meeting

The Associated Metals Contaminated Site

The site used to be operated as a salvage yard, receiving many different types of scrap material. Various wastes from the salvage activities were buried on site –plastic, ash from a small smelter on site, metallic debris, wood, wire, rubber, drums and buckets. The contamination from these wastes included heavy metals (in the waste ash), PCBs, chlorinated solvents, and some other chemicals. Some of these have dissolved in groundwater and continue to be monitored. Testing has shown the presence of PCBs, along with other organic contaminants, in the bedrock underlying the site. How far these have spread vertically and horizontally into the bedrock has not been determined. One well installed in 1989 did verify the presence of liquid PCB in a bedrock fracture at the base of the site. PCBs have not been found in any other wells around the perimeter of the site.

For years, soil carrying contaminants eroded from the site on to neighbouring properties and into North Bay. Since 1992, the site has been capped with a thick layer of clay topped by gravel to stop this erosion. The site is monitored regularly to make certain the cap remains intact and that no significant change in the groundwater leaving the site has occurred.

Groundwater monitoring, both on and off the site, continues to indicate that no organic substances of concern, such as PCBs, have exceeded Health Canada's drinking water guidelines.

Typically, other parameters that affect the taste and appearance of the water such as iron, manganese, colour, turbidity and acidity do exceed drinking water criteria. However, this is very common in the Halifax region.

As reported in Newsletter #12, Jacques Whitford has been testing groundwater every six months. Because this monitoring has shown that contaminant concentrations in groundwater are low and have been decreasing steadily, Transportation and Public Works has decided water quality need only be analyzed once a year from now on. However, groundwater levels in the wells will be checked twice a year.

Aerial view of of the site, showing the storage containers (soon to be removed) and the gravel cap over the buried wastes.

Caption: Jacques Whitford representative taking sample from groundwater monitoring well.

Fencing round the site.

Western Brook, below the site.

Dealing with the Associated Metals Site – Key Questions

Now that most of the contaminated sediments have been removed from North Bay[1] the Community Liaison Committee believes that it is time that government and residents jointly review future options for this contaminated site in our community.

The six key questions that must be answered are:

- What risks does this contaminated site currently present to both people and to the environment?
- Are there proven methods to clean up part or all of the contamination?
- Would these methods significantly reduce the risks (a) in the short term and (b) in the long term?[2]
- Are any of these methods economically feasible?
- If clean-up of all of the site is not possible at this time, how should it be managed to ensure the safety of the community and protection of the environment?
- What role should the community play in the ongoing management and monitoring of the site?

In 1996 the CLC made the following statement in Newsletter #2 in relation to the North Bay clean-up options.
It still applies today.

Many things have to be taken into consideration, but the Community Liaison Committee recognizes that cost will be a big issue. A cheap clean-up or management option is no bargain if it does not make a significant difference or is not permanent. A very costly clean-up option may achieve even less if funding is never found to implement it.

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[1] A Residual amount of PCBs still remains, but it is estimated that 98.5% have been removed.

[2] The CLC recognizes that some clean-up options would increase the risk in the short term by disturbing and exposing contaminants.

MANAGEMENT OPTIONS

There are three basic approaches (though many different technologies) to dealing with a contaminated site such as this one.

1. **Manage the Site**
   Ensure that contaminants are safely contained by preventing erosion and off-gassing and by limiting the amount of water that can soak into the site. Control unauthorized access to the site. Monitor groundwater and surface water regularly to observe any signs that would indicate that contaminants are leaching out. This is the approach currently being used, but additional measures such as modifying surface drainage controls, may be needed.

2. **Excavate the site and remove or treat the contents**
   This would involve digging into the buried waste, sorting the various components and either treating or stabilizing them on-site or removing them off-site for treatment or disposal.

3. **Treat or stabilize the contaminants without removing them from the ground (in-situ treatment)**
   Various commercially available, demonstrated technologies are used to treat contaminants in the ground so that they are no longer hazardous or to solidify them so they cannot move. These technologies include cementation, vitrification, soil flushing, thermal desorption and bio-remediation approaches.

Before selecting an approach, the following questions must be answered:

- Does it comply with applicable legislation?
- Is it technically feasible?
- Will it effectively reduce risks in both the short and long term?
- Does it have acceptance both in the community and with government?
- Is it cost-effective?

Options for the Associated Metals Salvage Yard Site

At the community meeting on October 28 we will be discussing these three broad approaches to try to understand the advantages and disadvantages of each and to see whether all or some of them should be investigated further. We do not have detailed information on these options to present to the community – first we need to explore what general direction the community wishes to take.

There are two important factors that must be taken into consideration:

At present there does not appear to be any completely effective way to remove PCBs and other chemicals from fractured bedrock. This means that total clean-up of the site will not be possible. There will always be a significant amount of contamination. Ongoing control and management of the site will therefore be unavoidable.

Any approach that requires disturbing the site in any way by drilling or digging will at least temporarily increase the risks of (a) exposing clean-up workers to the contaminants (b) also exposing local residents, or (c) re-contaminating the surrounding environment – including, possibly, North Bay.

Flat bed truck removing one of the containers used to store PCB contaminated soils and other materials.

UPDATE: All Containers Now Being Removed From Site

Transportation and Public Works have contracted with Material Resources Recovery S.R.B.P. Inc - a subsidiary of Bennett Environmental - to empty and remove all remaining containers from the site by early December.

OPTION 1

Managing the Contaminated Site

This option would be a continuation of the existing situation with some additional features. The clay and gravel cap on top of the site would be maintained with regular inspections to ensure its integrity. Trees and large weeds would be removed to prevent root damage. The site would remain fenced to prevent unauthorized access, and groundwater monitoring wells would be sampled regularly. As a precautionary measure, nearby residents would continue to obtain their water from a central source located away from the site. In addition, steps could be taken to re-route Western Brook and other surface drainage away from the site.

Positive features

- Proven approach: currently no indication that contaminants are leaving the site or being exposed to the wider environment.
- Long-term management of contaminated sites is a proven approach in other communities
- Does not require further exposure of contaminated soils or debris.
- Does not require large capital funding.
- Additional action could still be taken if, in the future, groundwater monitoring showed contaminant levels increasing significantly.

Limitations/Risks

- Risk that sidewalls of clay cap, if not maintained, could give way, resulting in contaminated soils washing off the site and back into North Bay.
- Trespassers could enter the site and damage the clay cap.
- Ongoing annual costs for monitoring.
- Contaminated site remains in community – site cannot be redeveloped and there is potential for a stigma effect.

OPTION 2

Excavating the site and removing or treating the contents

This option would involve re-routing Western Brook, lowering the water table under the site, removing the clay and gravel cap, excavating and sorting the different types of materials (wood and metal debris, plastics, soils contaminated with different chemicals etc). These would then be sorted and either removed for disposal elsewhere, treated first and then removed, or possibly treated and disposed of on site. An impermeable clay cap would then be replaced to seal the underlying bedrock. Groundwater would continue to be monitored over the long term. It would be necessary to cover part the site during excavation to keep rainwater out.

There are many variations to this option that would have to be investigated. These could include:

- creating a new, secure landfill on the site with liners
- on-site solvent extraction to remove the organic materials (including PCBs) and other chemicals from the soils and debris
- on-site thermal treatment to extract PCBs
- off-site thermal desorption.
- disposal of remaining soils containing heavy metals from waste ash and other debris.

Positive features

- Depending on the mix of methods selected, the contaminants would either be removed from the site or treated/stabilized and retained in a secure, lined landfill on site.
- There would no longer be any risk that the cap would fail and contaminated soil could re-contaminate North Brook.
- If long term monitoring shows that remaining contaminants are starting to move away from the site in the groundwater, access to the aquifer beneath the site would be easier because the overlying wastes would have been removed.

Limitations/Risks

Excavation

- Uncertainty with respect to contents of site would make planning very difficult and expensive.
- Dewatering the site requires complex treatment systems to deal with the various chemicals in the groundwater.
- Excavation would expose wastes and debris – risks to workers plus possibility that contaminants could escape into the environment (there would always be a risk of extreme weather events – Hurricane Juan being a case in point).

New On-Site Secure Landfill

- Most or all of the contaminants would remain on-site.
- Will require long-term monitoring and controls.

On-site treatment of wastes excavated from the site (solvent extraction or thermal treatment)

- Mobile treatment facilities will have to be installed in the community.
- Wide range of wastes; treatment methods not effective for everything.
- Will require shipping materials off site for final disposal with risk of a transportation-related accident.
- Air emissions could be an issue both from routine or upset operating conditions

Off-site treatment and disposal

- Large volumes of contaminated soil and debris would have to be shipped off site, with risk of a transportation-related accident.

All methods

- Extremely high costs
- PCBs and other chemicals remain in bedrock

OPTION 3

Treat or stabilize the contaminants in place

In-situ techniques would not require the clay/gravel cap to be removed. Instead the contaminants could be treated in place.
All methods would require lowering the water table under the site. Some possible approaches follow:

- Solidification through cementation, injecting grout into the wastes to solidify them into a concrete mass.
- Soil flushing injects and then removes solvents and surfactants (detergents) into the wastes, which strip out the contaminants.
- Biotreatment injects nutrients, surfactants and bacteria into the wastes to treat the contaminants.
- In-situ processes. For example, in-situ thermal desorption which uses thermal probes to raise temperatures, turning organics into gases that are then collected and turned into a liquid to be shipped off site for destruction.

Positive features

- All in-situ methods limit the exposure of the contaminants to the environment.
- The different wastes do not have to be sorted.

Limitations

- Many of the methods may be hampered by the presence of large debris and wire strands. May not be able to penetrate to the base of the wastes.
- Dewatering the site requires complex treatment systems to deal with the various chemicals in the groundwater.
- Soil flushing cannot deal with all contaminants; may be problems removing all the solvents afterwards.
- Biotreatment is not commercially proven to address the type of PCBs on this site.
- Thermal desorption does not deal with all contaminants and requires very careful controls.

All methods

- Extremely high costs
- PCBs and chemicals remain in bedrock.

More information about these various approaches will be presented at the community meeting. We do not expect community members to make instant decisions — more detailed assessments of options, and possibly field studies, will be required. But it is clear that we will be living with a contaminated site in our community for many years to come. How can we ensure that it is safe? Are there any viable clean-up options available today? If not, how should it be managed to reduce risks to a minimum?

We look forward to seeing you on October 28 at the Bay Road Fire Hall. In the meantime, please contact us if you have any questions.

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John Jardine,
Five Island Lake, 876-2724
Danny LeBlanc,
Sheldrake Lake, 876-8179
Joyce Milley,
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Wayne Nicholson,
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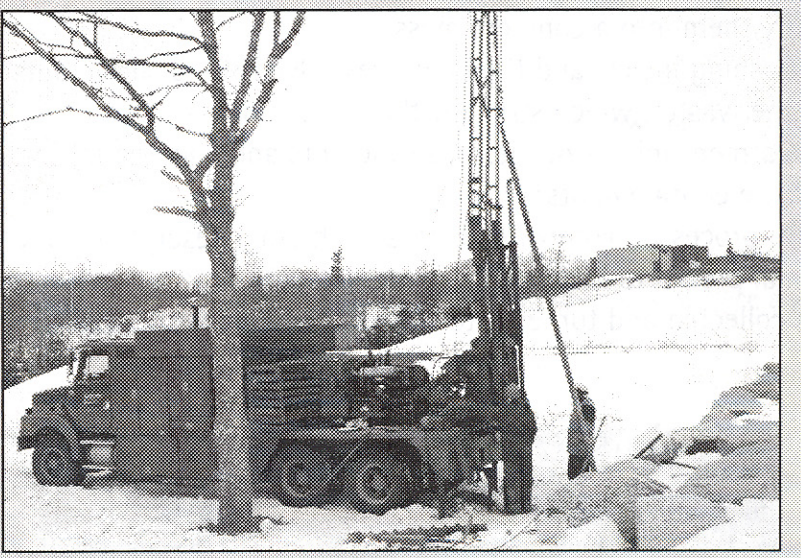
Community Involvement in Ongoing Management

Whatever happens to the site, it seems inevitable that there will have to be ongoing monitoring and management, until technology is developed to get the PCBs out of the bedrock (no such technology exists at present). Therefore the community needs to stay informed to continue to have input into decisions about the site. What is the best way to make sure this happens? Five years from now? Ten years from now?

Please bring your ideas to the public meeting on October 28



Drilling a monitoring well.

We Need To Hear From You

Please take a few minutes to send us your feedback by mail, e-mail, or fax.

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