



## **10 Worst Pollution Sources of the Petitcodiac River System in 2009**

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# Executive Summary

Since 2001, Petitcodiac Riverkeeper has released an annual report detailing the 10 worst pollution sources of the Petitcodiac River system, an area which includes the Petitcodiac and Memramcook Rivers, Shepody Bay, and all their tributaries. The purposes of the report are to:

- Document the ten most immediate pollution threats to the health of the river ecosystem and quality of life in the region;
- Recommend effective solutions to pollution problems; and
- Increase public awareness of pollution issues in our watershed.

In 2009, pollution sources in the Petitcodiac River system continued to threaten ecosystem and public health. While some progress was made on certain issues, evidence suggests pollution sources in the watershed continue to affect the quality of life of residents. In summary, the Top Ten Pollution Sources of 2009 in the watershed are:

1. Petitcodiac Causeway
2. Sewage
3. Former Moncton Landfill
4. Memramcook and Shepody Causeways
5. Urban Development – Watercourse and Habitat Destruction
6. Sediment
7. Various Abandoned Dams and Barriers
8. Stormwater Discharge
9. Cosmetic Pesticide Use
10. Uranium Exploration and Mining

In summary, the 2009 rankings for pollution sources in the Petitcodiac River System remain unchanged. On a more positive note, construction to prepare for the long awaited river restoration project began in 2009 with the opening of the gates planned for spring 2010. The diversion project for Jonathan’s Creek, associated with the Former Moncton Landfill court order to cease all discharges of leachate into this watercourse, also finally began in the fall of 2009 and will be completed by March of 2010. Every community of the Petitcodiac River Watershed will greatly benefit from the positive environmental effects of these two projects. It is also very likely that for the first time since publishing these annual reports in 2001, the top rankings in this “worst pollution list” will change in 2010.



## Introduction

Petitcodiac Riverkeeper's mission is to lead in the restoration, protection and promotion of the ecological integrity of the Petitcodiac and Memramcook watersheds and the Shepody Bay estuary, an area of approximately 3,000 km<sup>2</sup> situated in southeastern New Brunswick and the Bay of Fundy. Our mission is accomplished by engaging in public education, promoting the rivers' cultural heritage, social and economic values, monitoring the watershed, addressing pollution sources, and initiating watercourse rehabilitation projects.

Since 2001, Petitcodiac Riverkeeper has released an annual report detailing the 10 worst pollution sources of the Petitcodiac River system. The purposes of the report are to:

- Document the ten most immediate pollution threats to the health of the river ecosystem and quality of life in the region;
- Recommend effective solutions to pollution problems; and
- Increase public awareness of pollution issues in our watershed.

The 2008 version of the report represents the 8<sup>th</sup> edition of the list. In 2009, various pollution sources continued to threaten the health of the watershed. While governments and other responsible authorities continue to take little or no action to correct these environmental problems, quality of life in the watershed continues to deteriorate.

## Methodology

The term "pollution source" in this document refers to an activity by individuals, corporations or government agencies that has caused and continues to cause a single or multiple negative impact on water quality, species habitat and the ecological integrity of the Petitcodiac River system. In selecting the "10 Worst Pollution Sources" of the Petitcodiac River System in 2008, the following criteria were applied:

1. Activities that have **multiple negative impacts** on water quality, species habitat, biodiversity and the ecological integrity of the watershed;
2. Activities that **continue to create negative impacts** on the watershed; and
3. Activities that have both **short and long-term negative impacts** on the watershed.

# 10 Worst Pollution Sources in 2009

## 1. Petitcodiac Causeway

**Responsible Authority:** Province of New Brunswick, Government of Canada

Built in 1968 and owned and operated by the Province of New Brunswick, the Petitcodiac causeway has dramatically and extensively altered the natural functions of the entire 3,000 km<sup>2</sup> Petitcodiac River and Shepody Bay ecosystem. The causeway continues to create an obstruction to natural fish passage to nearly half (1,340 km<sup>2</sup>) of the river system, has caused the elimination of 21 km of upstream estuary, and has changed the historical tidal characteristics of the river from the Village of Salisbury to Moncton.

The Petitcodiac causeway is responsible for the elimination of at least five aquatic species from the river system as follows:

- Dwarf wedgemussel (the first case of a mussel being declared extirpated from Canada – the Petitcodiac River was its only known Canadian location);
- Inner Bay of Fundy Atlantic salmon (declared eliminated from the Petitcodiac in the mid-1990s and now declared endangered in Canada);
- American shad (formerly a run of over 75,000 in the Petitcodiac and declared eliminated in the late-1990s);
- Striped bass; and
- Atlantic tomcod (Locke et al. 2003).

The Petitcodiac causeway is also responsible for the buildup of massive silt deposits downstream from the structure, reducing the width of the Petitcodiac River from an average of one kilometre in 1968 to a mere 100 metres currently in Moncton. The Petitcodiac causeway continues to be responsible for ongoing buildup of massive deposits of silt reaching as far as 35 kilometres downstream to Shepody Bay. In recent years, the Petitcodiac has acquired the unfortunate distinction of being one of the few rivers in North America where you can see man's destructive influence from space.

The Petitcodiac causeway has further caused the near elimination of the once world-renowned Petitcodiac River tidal bore, formerly Canada's most spectacular tidal bore and one of Atlantic Canada's top tourist attractions. Once the pride of Moncton's tourism industry, the Petitcodiac River tidal bore has become an embarrassment for local tourism operators, as well as the focus of ridicule by visitors and local residents.

Moncton was once home to a thriving and proud shipbuilding industry, but natural navigational conditions for commercial and recreational boaters have been eliminated on the Petitcodiac River as a result of extreme sediment deposits. The Greater Moncton community has become one of

the few in North America to lose its inherent right to a navigable waterway because of the Petitcodiac causeway.

The battle to restore free flow to the Petitcodiac River now spans four decades, making this one of the longest standing environmental battles in Canada. Between 1961 and 2001, over 132 studies were conducted on the Petitcodiac River and its causeway. This body of research on the Petitcodiac River constitutes one of the most documented cases of a declining ecosystem in Canada (AMEC Earth & Environmental 2005; Locke and Bernier 2000). In 2003, as a result of the extensive ecological damage brought about by the Petitcodiac causeway, the environmental organization Wildcanada.net designated the Petitcodiac Canada's Most Endangered River.

However, in 2009, a historic milestone was reached in the battle to save this cherished watercourse. The Province of New Brunswick began a \$20 million project to begin Phases 1 and 2 of the Petitcodiac River Restoration Project.

Phase 1 of the project involves planning, remediation work and site preparation to prevent erosion at various sites along the river. It was begun in 2009 and will be completed by the spring of 2010. Work includes shoreline and erosion protection up and down the river channel, waterline relocation, drainage improvements, and dyke and aboiteaux construction. Once this work is complete, the gates of the causeway will be opened in the spring of 2010. Phase 2 will involve allowing the river to flow freely as a tidal river. With the gates open, the seasonal response will be monitored for up to two annual cycles as the river, fish populations, and surrounding habitat adjust to changes.

However, federal funding for the estimated \$48 million Phase 3 project to dismantle a portion of the causeway and replace it with a partial bridge has yet to be secured. While acting as partners with the provincial government all along, the federal government continues to stall the project by stating publicly that they are not interested in providing their share of the funding.

### **Solutions to correct the problem:**

- The Province must ensure that the full restoration project is implemented by aggressively pursuing the federal government for a project funding agreement and ensuring that project work is completed in a timely manner.
- The federal government must commit to becoming an equal partner and announce that they will fund their portion of the project.

## **2. Sewage**

**Responsible Authority:** Federal, provincial and municipal governments, sewerage commissions

Municipal wastewater is the largest single source of effluent discharge by volume in Canada. Scientific research has identified several environmental and health impacts resulting from insufficient wastewater treatment such as negative impacts on fish and wildlife populations, depletion of dissolved oxygen, restrictions on recreational water use and fishing, and restrictions

on drinking water consumption. Pollutants in wastewater which can impact ecosystems and human health include:

- Decaying organic matter and debris;
- Nutrients such as nitrogen (including ammonia) and phosphorus;
- Chlorine compounds and inorganic chloramines;
- Bacteria, viruses, and other disease-causing agents;
- Metals such as mercury, lead, cadmium, chromium and arsenic; and
- Other substances such as pharmaceutical and personal care products (Environment Canada 2001 and 2007).

In Canada, sewage treatment involves all three levels of government. Federal and provincial governments are responsible for creating and enforcing rules to prevent sewage pollution through laws such as the federal *Fisheries Act* and the provincial *Clean Water Act*. In addition, municipal governments and sewage commissions are responsible for treating our region's wastewater effluent, complying with the law, and taking a lead role in upgrading facilities to achieve the highest quality of sewage treatment available.

In the Petitcodiac watershed, sewage is treated in a number of different ways. In rural areas, most people have a septic system on their property. However, in the case of the Greensboro subdivision in Lower Coverdale, raw sewage is discharged directly into the Petitcodiac River. In rural municipalities, sewage is treated through a type of lagoon system that filters out some pollutants before discharging the remaining waste into the river system.

In Moncton, Riverview and Dieppe, sewage is treated by the Greater Moncton Sewage Treatment Facility located in Riverview. The facility is operated by the Greater Moncton Sewerage Commission (GMSC), an organization established by the Province in 1983. Before the GMSC was created, our sewage was dumped directly into the Petitcodiac River without any treatment. Therefore, a facility was built in 1994 and promoted in the early 1990s as a state-of-the-art plant that would eventually offer full wastewater treatment. This was an excellent achievement at the time, however, today the facility is out-of-date and wastewater effluent continues to receive advanced primary treatment only before being released directly into the Petitcodiac River at Outhouse Point.

More than twenty years after the project was first initiated and fifteen years after the plant was commissioned (1994), the GMSC has still not publicly released any plans to upgrade the facility to secondary or tertiary treatment.

On average, the plant directly discharges 70 to 100 million liters of primary treated effluent every day into the Petitcodiac River. Not only are there suspected toxic substances and hormone-related chemicals entering the river at the outfall, but the extreme richness of the wastewater effluent likely causes river water to be overloaded with nutrients. Nutrient overload

can cause excessive microbial activity and deoxygenation. Trying to navigate a stretch of river lacking in oxygen is a big hazard to any fish that might be swimming upstream or downstream. In addition, coliform bacteria counts at the outfall are also known to routinely exceed the Canadian Water Quality Guidelines set for recreational use.

While some cities in Canada still discharge raw sewage directly into oceans and waterways, information from Environment Canada points out that about 78% of Canadians on sewer systems are serviced by secondary treatment or better. Only about 19% are serviced by primary treatment, similar to the Greater Moncton facility (Sierra Legal Defence Fund 2004).

However, primary wastewater treatment will not be acceptable in Canada for much longer. After a five year review process, new regulations under the *Fisheries Act* were introduced by the federal government in 2009, requiring secondary wastewater treatment for all municipal systems in Canada by 2020. It is unclear as to whether the federal government will force the GMSC to complete its upgrades prior to this 10-year deadline.

#### **Solutions to correct the problem:**

- Municipalities and sewage commissions must publicly release detailed plans to upgrade treatment to an advanced secondary or tertiary system and develop financial scenarios (federal/provincial/municipal partnerships, long-term borrowing arrangements, etc.) to achieve this objective;
- The federal government must ensure that all municipal facilities, including the GMSC, are upgraded to secondary or tertiary levels as soon as possible;
- Federal, provincial, and municipal governments and sewage commissions must make adequate funding available to upgrade treatment facilities to secondary or tertiary levels throughout the watershed;
- Private septic systems should be eliminated where possible by requiring users to connect to municipal systems; and
- Existing sewage systems should be monitored more frequently to detect and resolve problems in a timely manner.



### **3. Former Moncton Landfill**

**Responsible Authority:** City of Moncton

The former Moncton landfill is owned and operated by the City of Moncton and is located on 35 hectares (87 acres) of land along the Petitcodiac riverfront. It began operating shortly after the causeway was built in 1968, and was closed in 1992 after more than 20 years of operation. Historical records reference the following dangerous wastes disposed of at the facility: petroleum waste oil, liquid animal waste, asbestos pipe insulation, urea-formaldehyde foam insulation (UFFI), cleaning solution - sodium hydroxide SCA-134, septic waste, sewage sludge and medical wastes. (GEMTEC Limited 1995).

An environmental investigation conducted by the Environmental Bureau of Investigations (EBI) and Petitcodiac Riverkeeper in the summer and fall of 2000, revealed that between 100,000 and 300,000 litres of toxic leachate was entering the Petitcodiac River every day from various discharge points at the former Moncton landfill along Jonathan Creek. In February 2002, charges were subsequently laid by Environment Canada's Enforcement Branch against the City of Moncton and a consulting firm in relation to this case.

The City of Moncton pled guilty to these charges in September 2003 and agreed to a closure plan that would eliminate the toxic discharges into Jonathan Creek and the Petitcodiac River. In 2007, the consulting firm was found guilty by the courts and ordered to pay \$28,000 in fines. More than six years after this court order and nine years after the toxic discharges were discovered, a closure plan was still not been implemented in 2009.

However, progress on the landfill case was made in 2009. The City of Moncton obtained all necessary federal and provincial permits and approvals to divert part of Jonathan Creek away from the landfill to eliminate leachate from being discharged directly into the creek. Work on the diversion project began in the late fall of 2009 and is expected to be completed during the winter of 2010, after having been delayed for many years.

#### **Solution to correct the problem:**

- The City of Moncton must finish construction work on the Jonathan Creek Diversion and must construct a leachate collection system to comply with the court order.
- The City of Moncton should also construct an impermeable cap to cover the landfill in order to limit the production of leachate at this site in the long term.

## 4. Memramcook and Shepody Causeways

**Responsible Authority:** Province of New Brunswick

The Memramcook and Shepody River causeways, built in 1973 and 1958 respectively, are owned and operated by the Province of New Brunswick. The causeways have completely altered natural ecosystem functions in the 400 km<sup>2</sup> Memramcook River system and the 550 km<sup>2</sup> Shepody River system. The two causeways, designed with no fish ladders, continue to create an obstruction to natural fish passage conditions to over 85 percent (approximately 350 km<sup>2</sup>) of the Memramcook River system and to over 90 percent (500 km<sup>2</sup>) of the Shepody River system. Both causeways have also caused the elimination of several kilometres of upstream estuary, affecting the historical tidal range and salt-fresh water exchange in the system.

Both the Memramcook and the Shepody causeways are responsible for the elimination of nearly every historical fish species in the river systems, including the distinct Inner Bay of Fundy Atlantic salmon (formerly a run believed to have exceeded 1,000 in each river), American shad, Striped bass, Atlantic tomcod, Sea run brook trout and others. The Memramcook and Shepody causeways also continue to be responsible for the buildup of massive sediment deposits downstream from these structures, reducing the width of the Memramcook and Shepody Rivers and affecting Shepody Bay's mudflats, a critical habitat for migrating shore birds.

In the fall of 1999, the Province of New Brunswick initiated the process of restoring free flow to the Memramcook River at the request of the community. Eight years after this public commitment was made, the plan to restore the Memramcook River has yet to be implemented. However, removal of the Memramcook causeway remains a top priority for the community. Village Council passed the community's first Green Plan in 2008. One of the top priorities outlined in the Plan is to address river restoration and potential removal of the causeway.

### **Solution to correct the problem:**

- The Province of New Brunswick must return the Memramcook and Shepody Rivers to free flow conditions in the interim; and
- The Province of New Brunswick must undertake a detailed assessment to return the rivers to full tidal flow by replacing these causeways with partial bridges.

## 5. Urban Development – Watercourse and Habitat Destruction

**Responsible Authority:** Federal, provincial and municipal governments, private developers

Urban sprawl and land development carried out by residential, commercial and industrial developers with the endorsement of the watershed's Planning Commissions can have multiple, severe and irreversible impacts on the ecological components of river systems. Urban development creates negative impacts in the watershed by:

- Decreasing the amount of wetlands and forested areas available for aquatic and terrestrial habitat;
- Increasing the amount of impermeable surfaces (eg. concrete and asphalt) which in turn increases stormwater runoff into watercourses and erosion in riparian areas;
- Increasing the amount sediment discharged into watercourses as a result of soil disturbance activities which affects water quality and the health of fish populations; and
- Increasing the quantity of water needed to support new commercial, residential, or industrial activities.

Watersheds must have healthy wetlands, riparian zones, and forested areas to support aquatic and terrestrial life. In addition, these areas have an important role in maintaining and improving water quality. Upland and riparian areas work together to support ecosystem structure and function. Physical characteristics of wetlands and watercourses determine the types of plant and animal life which can be supported. Fish need certain types of substrate to lay eggs during the spawning season and for adequate shelter and food. Vegetation along streams and riverbanks (i.e. the riparian zone) also has an important role to play in the river system. Vegetation filters water trickling down along the edge of a watercourse, reduces erosion and provides shade, thereby keeping water temperatures cool in the summer time and promoting high levels of dissolved oxygen which are critical to fish survival.

Habitat destruction and declining water quality continue at an accelerated rate in the Petitcodiac River system as a result of urban sprawl and land development, causing both ecological and socioeconomic consequences. For example, increases in stormwater runoff and watercourse sedimentation not only can affect water quality (i.e. ecological impact), but may also lead to a decline in commercial and sport fish populations (i.e. socioeconomic impact). As a result, fishermen may suffer reduced catches, fewer economic opportunities and potential loss of their livelihood in areas well beyond watershed boundaries.

**Solution to correct the problem:**

- Federal, provincial and municipal governments must implement stronger regulations and policies to protect sensitive areas, fish habitat, wetlands, watercourses and riparian zones, in addition to increasing enforcement capabilities.

**6. Sediment**

**Responsible Authority:** Various Private Developers, Municipal Governments and Province of New Brunswick

Sediment pollution associated with residential, commercial or industrial quarry development can create severe impacts on aquatic environments. Inappropriate construction practices carried out by various private developers in the Petitcodiac River system continued to have negative effects on watercourses and aquatic habitat in 2009.

Sediments are soil particles, such as sand and gravel that become suspended in water as a result of land use activities and accumulate on the bed of the watercourse. Sources of sedimentation include erosion from soils exposed from forestry operations, agriculture, overgrazing, construction or development activities as well as deposition of particles into watercourses from quarries and gravel roads.

Sediment pollution causes problems by covering aquatic organisms, reducing light penetration, filling in watercourses, and transporting insoluble toxic pollutants into water bodies. Sediment pollution also increases water turbidity and reduces the ability of fish to find food. Food sources such as aquatic insects and plants can be smothered or displaced as a result of sedimentation. High sediment levels can cause respiratory problems in fish, smother eggs and cover spawning beds. In addition, sediments can carry organic and inorganic toxic pollutants, further affecting water quality (Environment Canada 2004).

**Solutions to correct the problem:** Responsible authorities must:

- Establish conservation easements near watercourses;
- Further restrict development activities within 30 metres of a watercourse in accordance with the Watercourse and Wetland Alteration Regulation of the New Brunswick *Clean Water Act*;
- Ensure that private developers implement and maintain adequate mitigation measures for sedimentation as part of development activities (e.g. silt fences, temporary and permanent settling ponds); and
- Increase enforcement of established federal and provincial environmental laws.

## 7. Various Abandoned Dams and Barriers

**Responsible Authority:** Various Parties

Abandoned dams and barriers located on tributaries of the Petitcodiac River continue to create obstacles to fish passage and to affect the ecological integrity of the watershed. Abandoned dams and barriers in this category include:

- Jones Lake Dam (affecting 48 km<sup>2</sup>, City of Moncton);
- Mill Creek Navy Dam (affecting 50 km<sup>2</sup>, Town of Riverview);
- Humpreys Brook Dam (affecting 37 km<sup>2</sup>, Tandem Fabrics Ltd.);
- McLaughlin and Irishtown Reservoirs (affecting 34 km<sup>2</sup>, City of Moncton); and
- Fox Creek Aboiteau (affecting 34 km<sup>2</sup>, Province of New Brunswick).

Dams and barriers listed above are believed to be responsible for the elimination of historical fish species in these tributaries, including the distinct Inner Bay of Fundy Atlantic salmon, Sea run brook trout and others. All of these barriers and abandoned dams continue to be responsible for the buildup of sediment deposits upstream from the structures, for increasing water temperatures and for decreasing water quality. Built for a variety of uses (eg. aesthetic, energy, flood control, water supplies) as far back as the 1800's and as late as the 1950's, some of these barriers have since been abandoned and no longer serve their intended purpose.

Decommissioning plans have been prepared for the abandoned Navy Dam on Mill Creek (Riverview) and the abandoned dam on Humphreys Brook (Moncton) since 2003. However, the plans still await approval from the owners and funding must be secured before restoration projects can begin on these streams. In addition, one of the gates of the Fox Creek Aboiteau could also be opened to free flow conditions, but this option needs further study. The reservoirs of Irishtown and McLaughlin have long since been utilized for the purposes of supplying drinking water or emergency water to city residents, but these dams may no longer be required since the City of Moncton has plans to expand the Turtle Creek Reservoir in the near future. Jones Lake in Moncton has filled up with sediment as a result of increasing urban development activities and the City is considering dredging the lake, which would have significant economic costs.

**Solutions to correct the problem:** Responsible authorities must:

- Remove abandoned dams on Mill Creek and Humphreys Brook;
- Conduct assessments on restoring partial free flow conditions to Fox Creek;
- Conduct assessments on the future of the Irishtown and McLaughlin reservoirs; and
- Undertake a feasibility study on restoring fish passage and/or tidal flow in the Jones Lake/Jonathan Creek system.

## **8. Stormwater Runoff**

**Responsible Authority:** Federal, provincial and municipal governments

Stormwater is a term used to describe water that originates during precipitation events. Stormwater that does not soak into the ground becomes surface runoff and either flows directly into watercourses or is channeled to storm sewers, settling ponds, and/or treatment facilities. Due to the widespread presence of hard surfaces such as roads, buildings, and parking lots, urban areas contribute a considerable amount of stormwater runoff into our local waterways. Impermeable surfaces also reduce groundwater infiltration, which in turn causes flooding in low-lying areas.

While new residential, commercial, and industrial land uses are required to include adequate stormwater management systems, existing urban areas continue to discharge stormwater directly into watercourses. In addition, municipalities are increasingly burdened with aging and leaking

sewer infrastructure. As a result, toxic chemicals and other pollutants in stormwater are affecting water quality.

Stormwater runoff can reach high velocities during heavy rainfall events, causing erosion of adjacent watercourse banks. Stormwater runoff can also elevate stream water temperatures during summer months and such drastic temperature changes can be lethal to a variety of aquatic organisms. Pollutants, such as sediments, petroleum, metals, pesticides, bacteria and nutrients, accumulate on impermeable surfaces and, in some cases, are discharged directly into watercourses.

**Solution to correct the problem:** Federal, provincial and municipal governments must:

- Develop and adopt more stringent standards for stormwater management, similar to other jurisdictions in North America.
- Commit significant financial resources to upgrade and maintain existing sewer infrastructure in urban areas.

## 9. Cosmetic Pesticide Use

**Responsible Authority:** Federal, provincial and municipal governments, residential, commercial, industrial and institutional users

The cosmetic use of pesticides and herbicides by residential, commercial, industrial and institutional property owners is widespread throughout the Petitcodiac River system. Some pesticides have been linked with the development of cancer, while others are suspected to contain hormone disrupting chemicals. The risks are greatest for children and the unborn because of hormonal activity that occurs during development of their immune, nervous, and reproductive systems (Conservation Council of New Brunswick 2008b; Daborn 2001; Williston 2000).

Synthetic organic compounds in pesticides find their way into surface and ground water by leaching into the soil or as part of stormwater runoff. Effects of pesticide exposure on aquatic and terrestrial species can be devastating and may include direct mortality, loss of reproductive function, behavioral change, weight loss, and habitat loss. In addition, pesticides bioaccumulate in the food chain and impacts on animal and plant species increase over time. The effects of pesticide pollution are even more significant when we consider their widespread distribution in our communities.

However, in 2009, progress was made towards regulating cosmetic pesticide use in New Brunswick. In the spring of 2009, the Province of New Brunswick declared a new province-wide prohibition against the sale and use of certain pesticide products and regulation concerning application techniques for landscaping companies. However, this new regulation is not going far enough for Petitcodiac Riverkeeper as well as many other environmental groups. The use of cosmetic pesticides is still tolerated in places like playgrounds and hospitals yards where children and animals can be exposed to toxic substances.

### **Solutions to correct the problem:**

- The New Brunswick Minister of Environment must ban the cosmetic use of pesticides province-wide.
- Municipalities within the watershed must enact bylaws to phase-in a similar ban as many communities across Canada have already done.
- The federal government must require chemical manufacturers to disclose all ingredients on labels and display clear health warning labels; evaluate cumulative and synergistic health risks of long-term exposure in children and wildlife; and implement a comprehensive public education campaign on the risks of cosmetic pesticide use.

## **10. Uranium Exploration and Mining**

**Responsible Authority:** Province of New Brunswick

Uranium is the heaviest naturally occurring mineral and is typically found in hard rock and sandstone. The substance is primarily used as a fuel source for nuclear reactors, in the manufacturing of weapons, and in production of radioisotopes for medical and scientific purposes. Uranium has been mined across Canada, including in the Northwest Territories, Saskatchewan and Ontario. Significant deposits of uranium have been discovered in Nova Scotia and British Columbia, but due to public opposition and research on the dangers associated with the substance, uranium mining has been banned in these provinces. (Conservation Council of New Brunswick 2008a).

Over the past few years, uranium exploration and mining companies have staked many acres of land in New Brunswick, including in the Turtle Creek watershed area which supplies Greater Moncton with drinking water. Scientific evidence has confirmed that uranium mining and exploration cause irreversible effects to the health of ecosystems, watersheds, wildlife, agriculture, recreation, and public health. Exposure to radioactive elements has been linked to serious health conditions such as lung and other cancers and reproductive system deficiencies.

Three main environmental risks are associated with uranium as follows:

- Release and deposition of radon gas during mining activities;
- Spread of radioactive dust particles in water and vegetation which bioaccumulate up the food chain and eventually are ingested by fish, animals, and people; and
- Surface and groundwater pollution by chemicals and radioactive by-products of mining activities. (BC Medical Association 1980; Conservation Council of New Brunswick 2008a; Edwards 1992, Winfield et al. 2006).

In 2008, Petitcodiac Riverkeeper and 30 other environmental groups teamed up to call for a permanent ban on uranium exploration and mining in New Brunswick. In response to

widespread public opposition to uranium exploration, the provincial government implemented new rules that would prohibit uranium exploration in protected drinking water areas, within municipalities, and within 300 metres of any residence. While the new rules are a step in the right direction, a permanent and complete ban is the only way to ensure that citizens and the environment are protected against the dangers of uranium development.

**Solution to correct the problem:**

- The Province of New Brunswick must enact a permanent ban on uranium exploration and mining province-wide.

## **Conclusion**

In 2009, pollution sources in the Petitcodiac River system continued to threaten ecosystem and public health. Causeways, barriers to fish passage, wastewater and sediment pollution, and use of cosmetic pesticides continue to pose significant risks. While some progress was made on certain issues, the evidence suggests pollution sources in the watershed continue to affect the quality of life of watershed residents. Furthermore, progress on some issues has been slow and responsible parties continue to take little action to correct environmental damage.

In summary, the 2009 rankings for pollution sources in the Petitcodiac River System remain unchanged. On a more positive note, construction to prepare for the long awaited river restoration project began in 2009 with the opening of the gates planned for spring 2010. The diversion project for Jonathan’s Creek, associated with the Former Moncton Landfill court order to cease all discharges of leachate into this watercourse, also finally began in the fall of 2009 and will be completed by March of 2010. Every community of the Petitcodiac River Watershed will greatly benefit from the positive environmental effects of these two projects. It is also very likely that for the first time since publishing these annual reports in 2001, the top rankings in this “worst pollution list” will change in 2010.



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