

Lincolnville Water Monitoring Project

Research By:

Lincolnville
Water
Monitoring
Committee

Environmental
Noxiousness,
Racial
Inequities &
Community
Health Project
(ENRICH
Project)

Based on research
conducted in Lincolnville,
Nova Scotia.

Why Lincolnville?



Environmental Racism



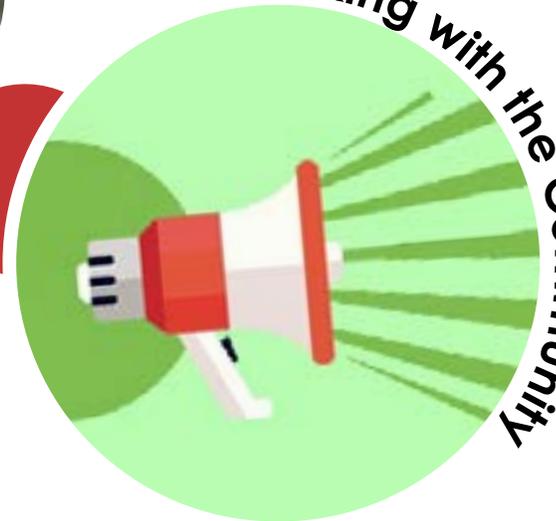
Developing A Plan



Water Testing



Working with the Community



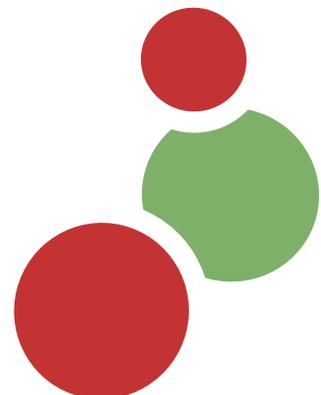
The ENRICH Project

[Click here](#) to find out about current ENRICH programs

The mission of the Environmental Noxiousness, Racial Inequities and Community Health Project (ENRICH Project) is to use community-based participatory action research and publications, multi-disciplinary partnerships, student training, community engagement, mobilizing and capacity building, government consultations, policy analysis and development, public education and workshops, media, art and other knowledge translation and mobilization approaches to support Mi'kmaw and African Nova Scotian communities in addressing and advocating on the socio-economic and health effects associated with environmental racism in their communities.

The ENRICH Project works on issues of environmental racism which refers to the disproportionate location of industrial polluters such as landfills, trash incinerators, coal plants, toxic waste facilities and other environmentally hazardous activities near to communities of colour and the working poor. It is also characterized by the lack of organization and political power that these communities hold for advocating against the siting of industrial polluters, the uneven negative impacts of environmental procedures, the uneven negative impacts of environmental policies, and the disproportionate access to environmental services such as garbage removal.

To learn more about the ENRICH Project and environmental racism you can visit the ENRICH website, explore the research and watch ["In Whose Backyard"](#).



Why Lincolnville?

To learn more about Lincolnville visit the [Save Lincolnville Campaign](#) webpage.

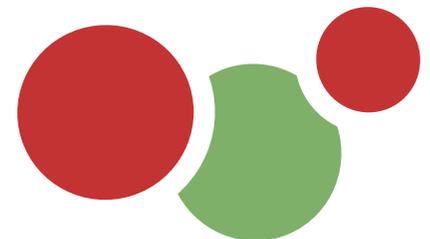
Click To Enlarge

Lincolnville First Generation Landfill (Chronicle Herald Archives)

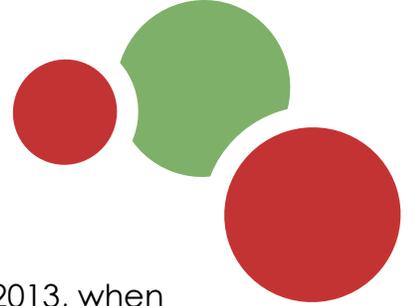
Polychlorinated biphenyl (PCBs) are an organic chlorine compound. They were once widely deployed as a coolant fluids in electrical apparatus. PCBs are a known carcinogen.

Lincolnville was founded by the black loyalists in 1784 after the British Government failed to follow through with the promised 3000 acres of land. Like many communities in Nova Scotia, Lincolnville was sustained through farming, forestry and shipping. Today, the community is in a state of slow decline due to few economic opportunities, decreasing property values, lack of community infrastructure, poor health and little support from the Municipality of the District of Guysborough. The younger community members leave after high school due to few economic opportunities. The health of the local residents is substandard; specifically, the community has exceptionally high cancer rates. The locals fear they will be driven from the land and lose their community, which is important in maintaining their culture and heritage.

In 1974, a first-generation landfill was opened one kilometer away from the community. According to community members, dangerous items and substances were thrown into the landfill at that time, including dead horses and other animals, transformers that leaked PCBs into the ground, and over 15,000 bags of industrial waste associated with beach cleanups. As Guysborough County struggled to maintain its tax base, the County Council expressed their interest in becoming a site for a second-generation landfill in the community in order to generate needed tax revenues. In 1995, the province of Nova Scotia adopted a Solid Waste Resource Management Strategy which required all municipalities to have, or have access to, second-generation landfills with a double liner by 2006. The Municipality of the District of Guysborough closed the first landfill and opened a second-generation landfill in Lincolnville in 2006 that accepted waste from across northern Nova Scotia and Cape Breton.



Why Lincolnville?



To learn more about The Enrich Project Team visit the [ENRICH Team page.](#)

The ENRICH Project began work in Lincolnville in 2013, when a workshop was hosted in the community. This was followed by focus group research involving the community in 2015, and the Lincolnville Water Monitoring Project in 2016. The community has had a history of water quality concerns related to the landfill located near to their community. A partnership was formed with experts, community members, volunteers and the Lincolnville Reserve Land Voice Council in order to address these concerns.

The Lincolnville Water Monitoring Committee (WMC) was fortunate to have a diverse group of professionals and interested community members. Together, they undertook various parts of the community profiling and water sampling program. Community members organized meetings and arranged sampling sites.

Forming this committee was fundamental to having a successful project. The focus was on trust and transparency, particularly between the researchers and the community. By hosting meetings with the community and having open discussions about their concerns and needs, a plan was created which fit the needs of Lincolnville residents.

Developing A Plan

The first task for the WMC was to research and develop a community profile. The profile outlines all relevant information about the issue at hand. For Lincolnville it included a history of the community, history of the landfill, and a study of the geology, hydrology and hydrogeology.

The result was a profile which showed many cases of racial inequality and a decline in the health of the community.

To understand the history of the landfill researchers used academic research, government documents and community member interviews.

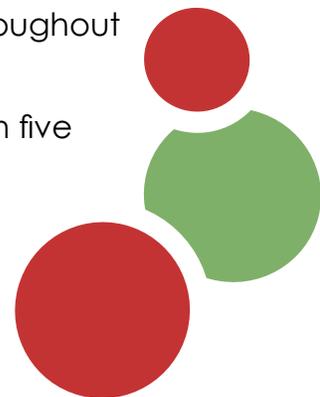
It was clear that consultation had never been sufficient during the construction of either landfill. During the second-generation landfill construction Guysborough County determined the suitability of the landfill site and conducted extensive surface and ground water testing. They did not consider the negative social, justice, or cumulative impacts of their decision to site the landfill in the area. Guysborough Council proceeded with approvals and the construction of the landfill because the public did not substantively oppose the project throughout the official Environmental Assessment (EA) process.

The new Municipality of Guysborough landfill is less than five

“If you look at the health of the community prior to 1974 before the landfill site was located near our community, our community seemed to be healthier. From 1974 on until the present day, we noticed our people’s health seems to be going downhill. Our people seem to be passing on at a younger age. They are contracting different types of cancer that we never heard of prior to 1974. Our stomach cancer seems to be on the rise. Diabetes is on the rise. Our people end up with tumours in their body. And, we’re at a loss of, you know of what’s causing it. The Municipality says that there’s no way that the landfill site is affecting us. But, if the landfill site located in other areas is having an impact on people’s health, then shouldn’t the landfill site located next to our community be having an impact on our health too?”

-Lincolnville Resident ([Waldron, 2016, p. 17](#))

Environmental Assessment is a systematic analysis of the potential impacts of proposed development projects on the natural and human environment. To find out more visit the [CEAA](#) webpage.



Developing a Plan



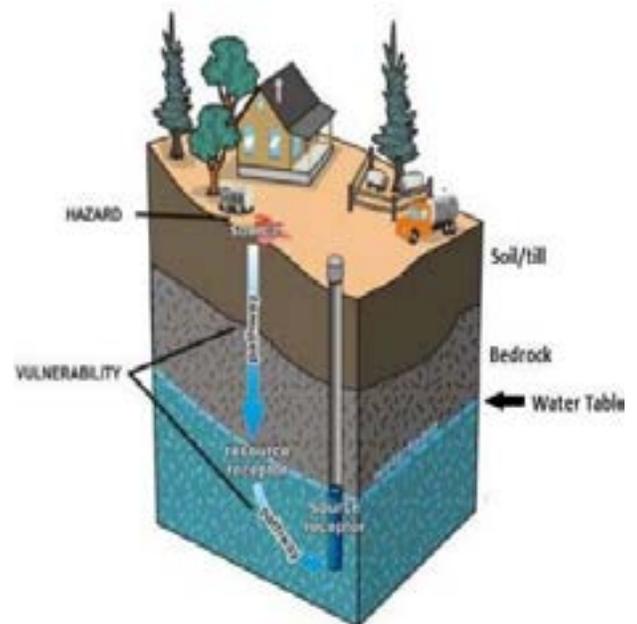
kilometres from the community of Lincolnville. The community thought they only had to bear the burden of being near a landfill for 20 years, but upon development of the second generation landfill this time extended to 45 years.

The WMC used academic research and a variety regional maps to create a profile of the geology, hydrology and geohydrology. It is important to understand how water and potential contaminants move throughout the area. Key results include that the area is **highly faulted, which can result in faster water movement**. Furthermore the surface had **minimal soil coverage**. This lack of soil cover offers little protection to groundwater from potential pollutants at the surface. Finally previous research found that **surface water generally flowed away from Lincolnville**, but well tests in 2008 raised the **concern for leachate contamination**.

Four wells were sampled for bacteria (only four sample containers

Leachate is the term for water that has passed through a substance and has leached out. Landfill leachate can carry many contaminants which pose a danger to human health.

Groundwater can be contaminated from fertilizers, pesticides, road salt, chemical/fuel spills, leaking septic systems, landfills, transport accidents as well as other human actions. Contaminants make their way down to the water table. Vulnerability to contamination cannot be directly measured. It requires assessment of many factors such as geology, depth to water, soil types, and precipitation. These properties are determined through well pump tests and observation of groundwater characteristics.



Water Testing

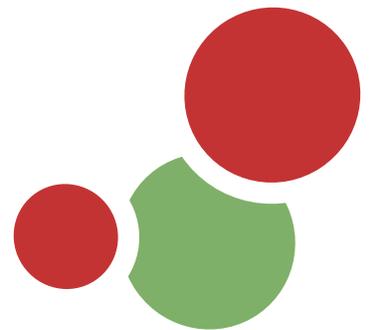
For a comprehensive guide to planning, building, and testing a well visit [A Guide For Private Well Owners](#).

For more information on well testing at home visit [Tips for testing Your Well Water](#).

This [online tool](#) helps interpret water testing results.

donated by NSCC were available) and five wells were sampled for major ions and elements (or parameters) that are normally included in a typical water analysis. The need for additional analysis that would test for the presence of lead, cadmium and arsenic as well as organic compounds that could be associated with landfill activities was also discussed. The sampling program was determined by the needs of community and the constraints of testing equipment.

Two 1-liter plastic bottles of water samples were collected from the taps of the residents. The water was left to run for about 3 minutes, to clean possible residues from the pipes, and then collected. During sampling on site two water quality parameters were measured: pH (how acid or basic the water is) and conductivity (the ability of the water to carry an electrical current, indication of the presence of ions). Samples were then placed in a cooler with ice for transportation to the NSCC-Waterfront Campus Chemistry lab for analysis. The analysis consisted of the measurement of a basic standard suit of chemical and physical parameters to characterize the quality of the water. These measurements included: pH, conductivity, Total Dissolved Solids (TDS), hardness, alkalinity, sodium, potassium, calcium, magnesium, bicarbonate, carbonate, sulfate, chloride, nitrate+nitrite, ammonia, iron, manganese, copper, zinc, and aluminum. These are the most abundant and common elements found in water samples.



Working with the Community

[Click here](#) to read the full Lincolnville Water Monitoring Report.

All the data from the testing was shared with the community. The WMC met with members of the Lincolnville Reserve Land Voice Council on several occasions to explain the results of their research and sampling through maps, diagrams and tables. A number of Council members participated in the project through meetings, by opening their homes for sampling, and by learning how to take water samples. Meetings were conducted to encourage the greatest participation from the community as possible. Comments and questions were recorded to help the WMC develop the project, and to better understand the concerns of the community with respect to water quality and the government framework regarding community water monitoring.

In order to help the community better understand the importance of sampling and protecting their water from different contaminant sources, the WMC compiled a series of links to important information brochures on many issues associated with protecting ground water quality. This project evolved over time through numerous discussions on water quality and the community's intense desire to simply determine if their water was safe to drink. The WMC could not have carried out sampling or achieved the understanding of the struggles Lincolnville has faced without the residents opening their homes for sampling and learning how to take water samples.

