

First Nation Mold Remediation Case Study

Membertou First Nation



Canada Mortgage and Housing Corporation (CMHC) has a number of mold remediation and repair case studies that draw on the experiences of First Nations from across Canada to assist First Nation communities in managing moisture and mold problems in housing.

The case studies highlight current housing operations and the key milestones, decisions, changes and experiences that have led to effective solutions to mold problems. They were prepared based on interviews with key members of the community, including housing department staff, councillors and mold remediation contractors.

Many First Nations across Canada have important decisions to make regarding the way mold issues are addressed in their communities, and may find these case studies to be useful in preparing mold remediation and prevention strategies for their own purposes.

The Community

Named after the Grand Chief Membertou (1510–1611), the Membertou First Nation belongs to the greater tribal group of the Mi'kmaw Nation. Membertou is an urban community situated 3 km (1.8 mi.) from the centre of Sydney, Nova Scotia. It has more than 1,100 residents and is one of five communities that make up the Cape Breton Regional Municipality. It is one of the five Mi'kmaw communities in Cape Breton and is within the tribal district of Unama'ki (Cape Breton).

Being next to an urban centre, Membertou has many advantages. For instance, it has access to the city of Sydney's water and sewage systems. The community is also well connected by roads and a main highway giving it ready access to goods and services.

Winter temperatures vary from -2 to -7°C (28 to 20°F), but can be as low as -25°C (-17°F). Summer temperatures vary from 13 to 18°C (55 to 65°F) but can be as high as 33°C (92°F). The rainfall for the region is usually about 139 cm (54.7 in) a year.



Figure 1 Housing in Membertou First Nation

Housing Overview

The community has 262 houses:

- 65 per cent (170) of the houses have full basements;
- 30 per cent (78) have crawl spaces; and
- 5 per cent (14), including 8 mini-homes, have slab-on-grade foundations.

Most of the homes are owned by the First Nation while some are built by the owner.

Mold Issues

The community has been tracking and dealing with mold since 1990. From 1990 to 2005, the community took care of mold in a total of 113 homes. Mold contamination was mainly related to:

- flooding problems—full basements had been built without considering foundation depth, grading and the location of the water table;
- poor construction practices and moisture management—lack of training and knowledge and pressure to build houses quickly;
- poor water management in bathrooms—windows in shower/tub stalls, toilet tanks with condensation, spilled water; poor water sealing around tubs and showers;
- poor ventilation—the wrong type of range hoods in kitchens; low-cost, noisy and poorly working fans in bathrooms;
- moisture-damaged wood-frame windows—painted surfaces and caulked joints were not well maintained;
- home maintenance—occupants did not know what to do to prevent moisture and mold problems;
- storage—storing items like mattresses on damp floors, limited air circulation and trapped moisture causing mold growth; and
- leaks during major storms—buildings were not designed, constructed and maintained to resist wind-driven rain.

Dealing with mold becomes more difficult with overcrowding, loss of community knowledge and expertise because of the high turnover of housing staff and councillors, and the house construction tendering process. Even so, 113 houses were repaired including:

- 93 basement repairs;
- 68 bathroom repairs;
- 49 basement and bathroom repairs;
- 17 new basement installations or renovations to lift homes above the water table;
- 8 repairs to waste water drains to deal with sewage backup problems; and
- roof leaks, leaks below windows, and kitchen sink leaks.

Other community members began to notice the renovations and repairs being done. They raised health concerns about mold in their homes and other renovation needs to the First Nation's housing department and in some cases even to Health Canada. At one point, the community became concerned that mold might be causing breast cancer. Health officials looked into this and assured the community that there was no concern.



Figure 2 The house on the left had a history of leak problems and lack of maintenance. It is being replaced by the house on the right

Community's Approach to Solving Mold Problems

Because of the community's mold concerns and the repairs and renovations in the 113 homes, the community's housing coordinator decided to organize an approach for dealing with mold. The approach included getting the resources to identify, diagnose, prioritize and deal with mold problems.

First, the community hired an engineering company to inspect and test homes. Then the engineering company and/or Health Canada wrote reports for the community on the results of the inspections and testing. Finally, 15 to 20 community members were trained by the engineering company to find and deal with day-to-day home repairs and perform inspections and basic renovations. This helped to build a community approach for dealing with mold problems and it also helped provide jobs.

Funding for renovations and mold problems was a problem at first, but in the end it was provided. The Chief and Council also supported the approach by paying for courses, building materials and the work needed to deal with mold. Together with CMHC, a full range of Housing Quality Initiative¹ (HQI) courses for the housing department and renovation crews were offered. Other courses on ventilation, indoor air quality and home building were delivered as well. CMHC's Basic Home Maintenance course for home occupants was presented to community members several times.

In most cases it cost \$2,500 to \$3,000 per house to assess and test. Repairs were made based on priority and need, according to recommendations from inspection reports and visits by Health Canada staff. Homes of people with disabilities and seniors were repaired first, followed by homes of families with asthma or other respiratory concerns. On average it cost \$5,000 to \$15,000 per house for these renovations. Storm sewers were installed in problem areas of the community to take care of surface water runoff affecting several basements. For the most part, occupants were prepared to help in cleaning up mold. However, the amount of mold found usually meant that trained crews had to be called in. During the repairs and renovations, occupants stayed in the home or with family members. In approximately 75 per cent of the renovated houses, occupants had to change the way they took care of housekeeping, operation and maintenance to help prevent the reoccurrence of mold. Homeowners were open to and grateful for the work that was done in the community. Since 2005, mold problems have been fixed in about 20 homes.

¹ CMHC's Housing Quality Initiative is a series of information and training sessions to improve skills and knowledge in First Nation communities on housing quality, with a special focus on indoor air quality. These sessions also cover better building techniques, inspections, property management and basic home maintenance.

What This Meant for New Housing

The community changed its approach to location, design and construction of new housing, in part as a result of the lessons learned about the causes of mold. All new housing in the community will now have poured concrete basements. Slab-on-grade foundations and/or the use of insulated concrete form (ICF) foundations are also being considered.

Within the last few years, builders in the community are more aware of good water management practices including proper site grading, proper grade levels and placement of sod. For example, in the latest phase of construction, houses were built into a hillside with a basement entry on the street side to make better use of the space. The grading behind the houses was changed to improve surface drainage away from homes as shown in figures 3 and 4. Storm sewers have now been installed in the newer parts of the community, which provide better drainage.

Construction materials and practices were chosen to make houses more mold-resistant:

- oriented strand board (OSB) is used as wall sheathing;
- house wrap is used for moisture protection;
- foam insulation is used to fill gaps and joints;
- hardboard siding, mounted on strapping to provide a drainage and drying space, provides a rainscreen siding system;
- vinyl windows are used because they are easily maintained and mold-resistant;
- heat recovery ventilators (HRVs) are used for better ventilation; and
- vinyl composite tile, laminate flooring and/or cushion flooring are installed because they are easier to clean.

Construction of new houses still varies because different builders are used within the community and construction details and practices that affect house performance are not consistent. For example, some builders are still using fibre insulation around windows and doors while others are using foam. To deal with this, contractors involved in the construction of homes in the community may be required to take CMHC workshops, or workshop attendance lists may be used to create a preferred builder directory.



Figure 3 New hillside, basement-entry houses



Figure 4 Improved surface drainage behind the hillside houses



Figure 5 Membertou construction crew members attend an HQI ventilation workshop

The community feels that its new houses are also more energy-efficient because of the effort to prevent moisture and mold problems. For example, the air sealing done to prevent indoor humidity can also save on heating costs. The First Nation's housing department wants to explore energy-efficient housing practices because they work well with the practices it now use to control moisture and prevent mold. There is some interest in using the EnerGuide rating system for new houses as a tool to improve energy efficiency. The timing is good because the province of Nova Scotia plans to adopt energy efficiency requirements in its building code. Incorporating similar energy efficiency requirements for new houses in the First Nation's housing policy is an option.

Outcomes and Lessons Learned

Overall, the community's approach to deal with the mold problem has been successful. The 2007 community's housing policy shows the strong commitment to housing by the Chief and Council by:

- defining housing objectives;
- providing direction to housing staff;
- ensuring transparency in the management of First Nation housing; and
- ensuring First Nation government accountability to the community.

The housing policy defines:

- roles and responsibilities;
- housing allocations;
- new construction guidelines;
- maintenance obligations;
- renovation and new construction guidelines; and
- repair priorities.

It provides a structured approach for keeping up with renovations and the constant work needed to address the waiting list. The community's approach has developed skills in the community and it now has a workforce that can do good renovations as well as new construction work.

The Chief and Council and community members suggested that a training program to deal with mold issues earlier in the process would have helped. A council resolution to explain the rules, roles and actions of everyone involved in dealing with the mold problems would also have helped. More training and follow-up activities with home occupants are needed for success over the longterm.

Membertou's key messages for other communities:

1. Get training for everyone on preventing and dealing with mold.
2. Spend money on fixing the problems rather than on testing.
3. Get proper training and equipment for the workers dealing with mold, renovations and new construction.
4. Offer the CMHC Housing Quality Initiative courses.
5. Pay more attention to moisture management in the renovation and construction of homes.
6. Put a housing policy in place. Membertou would be pleased to share its policy and would like to acknowledge the support it received from other communities in developing its housing policy, in particular the Millbrook First Nation.
7. Adopt better maintenance programs and provide occupant training.
8. Communities should help and support their own maintenance departments to complete inspections, renovations and upkeep and have the work done by local contractors properly trained and equipped for the job. This would keep jobs and money within the community.

Conclusion

In general, all new houses in Membertou are built better to help prevent moisture and mold problems. The community and the First Nation's housing department now have a good core of skilled workers who are able to better deal with mold in existing houses and to prevent mold in new houses.

The development of the community's housing policy was a step forward. The policy provides important information on dealing with housing in the community and gives clear direction on the construction, renovation and upkeep of housing that will help take care of mold problems. The community is pleased with the progress it has made in dealing with mold and sees more opportunity for improvements in the future.

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