

## *UNDERSTANDING RADON SOIL GAS, WHAT DOES IT MEAN TO YOU*

*As time passes our awareness of the world around us increases, a greater understanding of its fragility, its complexity, and how we interact with in it. As well as, what we do to alter it, and how we then deal with the negative impacts that we have induced.*

*At a time when energy conservation has become ever more important we all strive to do our part in reducing our carbon footprint. In our homes we continually upgrade with all the newest of technologies with the thought being, not only saving ourselves money but to also do our own little part to help improve the big picture. Spray foam insulations, Insulated concrete foundation, weather stripped doors, wrapping our homes with various air and vapour barriers and of course windows that will produce virtually no air leakage.*

*We have effectively created ourselves a completely closed environment (The building envelope)*

*Early on it was determined that in fact maybe we have created housing that was, “to tight” and with that thought came “Sick Houses” Indoor air quality became the newest of benchmarks that we needed to strive for.*

*As we seem to create one problem we quickly introduce new equipment to address the issue. Mechanical Air Exchangers (Heat Recovery Ventilators) is equipment that we have had, and perfected over the last two decades. The down side of them is the installation costs. Operating costs are quite manageable and air quality improves tremendously.*

*Indoor air quality is affected by many different contaminants. The one that seems to get the most press is of course mould. Its ill effects seem to be felt very quickly, it produces odour, and is very unsightly. However the number of people that succumb to the effects of mould is minimal in comparison to the soil gas RADON.*

*This is not something that is new to us, we have been aware of RADON for centuries, ever since its discovery in late 1800's. At that time, what was not completely understood were the health implications that can be associated with it. RADON Gas is present all around us outside, but at very low levels, +/- 10 Bq<sup>3m</sup>. It has no smell, it has no taste, and of course being a gas you cannot see it either. It is to some extent in all homes, (+- 45 Bq<sup>3m</sup>) due to its density it tends to be heavier than air so will concentrate in the lower levels of our homes. Outside, radon is virtually harmless due to the huge dilution factor of mixing with air. The health implications first became apparent in the mining industry. Miners became subjected to large amounts of exposure over a period of many years, day in and day out. Lung cancer was a common disease among them. This of course was in most cases contributed to tobacco use.*

*The key here is long term exposure and in concentrated levels.*

*RADON Gas is a naturally created element, its origin is in uranium. In time, it breaks down to create radium and from there breaks down to create RADON Gas. RADON is an inert chemical (meaning it is a very sluggish chemical, it does not react to other chemicals) It is however somewhat soluble in water. In our homes RADON Gas continues to disintegrate and produces RADON PROGENY. These PROGENY are called polonium 218 and polonium 214 which are ALPHA particles. These are the guys that are causing the problems. In short we breathe these little guys in and they collide with our lung tissue which causes cell damage or cell death. The damaged cells have the potential to become cancerous. This process will account for 10% of the lung cancer deaths in Canada, approximately 2000 people!*

*RADON is measured in units called "Becquerel" ( $Bq^{3m}$  One Becquerel is the radiation caused by 1 disintegrations/second of radon ) In June of 2007 Health Canada had set an action level for RADON to be more representative of the rest of the international community. In Canada concentration levels that exceed two hundred Becquerel's will now require mitigation.*

*Assessing RADON levels in our homes is a process that can be defined as short term monitoring or long term monitoring. Health Canada suggests that to perform effective short term monitoring a testing period should not be less than 7 days. Due to the vast amount of variables that can negatively affect the readings a 30 to 90 day test duration is likely to provide a more accurate reading. Long term readings are certainly preferred over short term. Long term monitoring 90 to 365 days is felt to provide a more accurate assessment of RADON levels in your home.*

*RADON infiltration is a process that in a lot of cases can be greatly reduced at low costs. Due to the fact that RADON is a soil gas, taking the steps to seal up a basement/crawlspace that has any exposed rock or soil is a great place to start. Remember it is a gas so the smallest of hair line cracks can provide an affective avenue for the gas to migrate into your home. Points where plumbing pipes pass through the floor much like, support columns, floor drains, and sump pumps are all areas where RADAON enters the home. Porous structure, block, stone, concrete and wood foundations all have areas that will provide some infiltration. Houses that are already equipped with HRV's (air exchange units) can be an effective way to mitigate low levels of all soil gasses including RADON. RADON Gas that is present in water will often(if tested) come back with extremely high levels when measured in a water test. It is important to understand that to date Health Canada, EPA, and the World Health Organization have found no ill effects consuming water with RADON Gas in it. As the radon dissipates out of the water source it is reduced to a ratio of 10,000:1. To put that into prospective it would not be uncommon to have a water test show a concentration of 37,000 Becquerel in a water test. When that dissipates into the air it will result in a count of 37  $Bq^{3m}$  which we understand is well below the action level of 200  $Bq^{3m}$ .*

*HomePro Inspections Central Ontario utilizes "Activated Charcoal Devices" for Radon testing this test takes approx. 7 days at a cost of approx 150 dollars.*

*This information has been provided by HomePro Inspections Central Ontario. We have been providing home and cottage inspections as well as WETT (wood energy technology transfer) and septic inspections in Haliburton County for 12 years. Michael Rahme, President of Home Pro is a certified Radon Inspector through the American Association of Radon Scientists and Technologists. Trained through the Midwest Universities Radon Consortium, U.S. EPA founded Regional Radon Training Center*

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