City of Burnaby

Building Information

BURNABY PLANNING AND BUILDING DEPARTMENT

Methane gas

The purpose of this brochure is to provide information to owners and builders about applying or considering application for building permits to build on or otherwise develop properties where methane gas may be present.

"This information is provided for convenience only and is not in substitution of applicable City Bylaws or Provincial or Federal Codes or laws. You must satisfy yourself that any existing or proposed construction or other works complies with such Bylaws, Codes or other laws."

What is methane gas?

Methane is a colourless, odourless gas which is lighter than air. It is formed by the decomposition of organic carbons under oxygen poor (anaerobic) conditions and is commonly found in or near swamps and wetland areas, peat deposits, woodwastes such as hogfuel, or in the area of old landfills.

Why is methane a concern?

The major concern is that, under certain conditions, the mixture of methane in air can be explosive in a confined area. The explosive range is between 5% and 15% methane-in-air.

Both the U.S. Environmental Protection Agency and our own Provincial Landfill Criteria for Municipal Solid Waste Regulations state that at no time should combustible gas concentrations be allowed that exceed, or are predicted to exceed, the lower explosive limit in soils at the property line or 25% of the lower explosive limit at or in structures. The lower explosive limit corresponds to 5% concentration of methane-in-air.

In addition to the risk of explosion at lower concentrations of methane-in-air, higher concentrations are also of concern, since such higher concentrations can be flammable and may also lead to asphyxiation due to lack of sufficient oxygen in the methane-air mixture.

Some jurisdictions appear to recognize methane as an explosive hazard if it originates from solid waste or a landfill but not if the source is peat or other natural organic deposits. It should be recognized that the methane produced from waste or landfill deposits is the same as naturally generated marsh gas from peaty or marsh lands. All such methane gas generation could become a

problem if the concentration levels exceed acceptable limits.

How is methane produced and how does it migrate?

As described above, methane is produced by decay and decomposition of organic matter in oxygen poor conditions. The rate and rapidity of methane production depends on many factors, including the amount of rainfall penetrating to and through the organic matter, the temperature, and the type of the organic materials. Changes in these conditions, even many years after the organic matter has been placed on a site, can result in marked changes in the rate of methane production.

The direction, rate and extent of gas migration from the production area is often determined by the conditions both within the organic fills or natural soils and by conditions in the subsoils adjoining or overlying the gas producing zones. Most importantly, the ability of the overlying cover soils or fills and the adjacent subsoils to permit unrestricted movement of gases from the source area will largely dictate the areal extent of gas migration that may occur within and adjacent to such sites. Similarly, the ground conditions (dry, frozen or saturated surface soils) will help determine the degree of migration which may occur due to the degree of restriction to gas migration through the cover layer and venting at surface.

Building on or adjacent to sites containing a methane gas producing zone may result in development of dangerous conditions due to the potential for the methane gas to migrate beneath and into structures or associated facilities such as buried services and subsequently move upward due to natural temperature and pressure differentials into the building wall spaces, furnace or utility rooms and subfloors.

Applications for building permits on properties where methane may exist

Applicants for building permits are required to submit a soils report for the property being developed. The soils report must indicate refuse from a landfill or the presence of peat, hog fuel or any other organic material that may generate methane gas, the percentage of concentration of the methane gas and advise if these levels are within acceptable limits.

If the concentrations exceed acceptable levels, a separate report will be required to deal specifically with the methane gas issue. A specialist consultant, qualified in the field of methane gas, may be required to specifically investigate the methane gas and prepare the report as part of testing and follow up procedures. The methane gas report should include the following:

- description of the testing procedure for methane gas in the location of the proposed building and in relation to organic matter encountered on the site and/or organic matter or methane gas sources known or identified as being adjacent to the site;
- proposed corrective or protective methods to be used to control the methane gas;
- in the event that no corrective or protective methods are proposed for control of methane gas at sites having organic soils or detectable methane gas in the subsoils, outline in detail those mitigative or design measures which will prevent development of dangerous methane-in-air

conditions;

- identify requirements for an ongoing methane gas monitoring programme; and
- submission of the results of the monitoring to the Building Inspector, with recommendations for future remedial action or continuation of monitoring for the duration of the programme.

Where special measures are required, prior to the issuance of a building permit, the consultant must submit a Letter of Assurance for the design, installation and monitoring of the control system.

All of the accepted recommendations of the consultant shall be implemented under the direct supervision of the consultant and to the satisfaction of the Building Inspector.

The consultant shall provide an appropriate letter of completion/compliance when the work is completed in accordance with said recommendations.

Any sanitary sewers, storm drains, water line bedding, B.C. Tel and B.C. Hydro conduits that penetrate the footings, or enter the building from the adjacent soil, are potential conveyance systems and should be appropriately addressed.

Further information

If you have any questions or if you require additional information please contact the Burnaby Building Department at 604-294-7130.