1. Air Quality Management in the Context of the Sustainable Region Initiative

The 2005 Air Quality Management Plan

Under the BC Environmental Management Act and 1977 Letters Patent, Metro Vancouver has been delegated authority to manage air quality within Greater Vancouver. In October 2005, the Greater Vancouver Regional District Board approved the Air Quality Management Plan for Greater Vancouver (AQMP). The AQMP is a comprehensive action-oriented plan that aims to address air quality with an adaptive management approach. As such, the plan requires a progress report every two years and a comprehensive review every five years.

The 2005 AQMP established a vision of clean and healthy air for current and future generations, and the following three goals:

1. Minimize the risk to public health from air pollution
2. Improve visibility
3. Minimize Greater Vancouver’s contribution to global climate change

Strategies for achieving these goals include:

- Reduce emissions from major regional sources
- Develop and implement local air quality management programs
- Enhance air quality information and public awareness

The AQMP contains 33 actions which flow from these strategies.

The Sustainability Framework

The Sustainability Framework provides insight to Metro Vancouver’s operational and planning philosophy in its three primary roles – service delivery (primarily the water, sewage and solid waste utilities); plans, policies and regulations (regional growth, air quality, liquid and solid waste, drinking water, parks and greenways management plans, for example), and; political leadership (through outreach, advocacy and educational activities). In addition to a broad vision and set of principles, the framework also describes the organization, how decisions are made, and a set of evolving strategies, priorities and actions towards a sustainable Metro Vancouver.
With respect to policy-focused priorities, Metro Vancouver will pursue an Integrated System of Management Plans – the suite of sustainability-based Metro Vancouver management plans. The Air Quality Management Plan was part of the initial suite of plans adopted in 2005, along with the Drinking Water Management Plan and Regional Parks and Greenways Plan. In 2008, the following regional strategies and plans are under development:

- Regional Growth Strategy;
- Solid Waste Management Plan;
- Liquid Waste Management Plan.

In addition, TransLink is consulting on its Transport 2040 plan.

Assessment of cross-cutting issues such as eco-density, mitigating and adapting to climate change, reducing greenhouse gas emissions, peak oil, and rising energy costs will be factored into the implementation of AQMP actions.
The Sustainability Framework includes several strategies and priority goals, including the following air quality and climate change mitigation targets:

- Reduce diesel particulates by 75% from Metro Vancouver corporate sources by 2012.
- Be carbon neutral by 2012 excluding solid waste operations.
- Reduce regional GHGs by 15% by 2015 and 33% by 2020.

Complimentary to the goals, strategies and actions set out in the 2005 AQMP, these targets will facilitate the implementation of regional emission reduction measures and solidify Metro Vancouver’s corporate priorities.

Outline of this Report

Section 1 of this report provides context on the 2005 Air Quality Management Plan and other regional planning efforts.

Section 2 discusses progress toward achieving the goals of the plan based on trends in several performance measures.

Section 3 discusses the implementation status of the plan’s actions.

Section 4 discusses changes in air quality issues and priorities which have occurred since the AQMP was adopted in 2005.

The Appendix contains a detailed listing of the 33 actions in the 2005 AQMP, and their status of implementation.
2. PERFORMANCE MEASURES
The 2005 AQMP’s performance measures were designed to track emission reductions and improvements in ambient air quality.

Performance Measure #1 | Reduce emissions of inhalable particulate matter (PM$_{10}$), fine particulate matter (PM$_{2.5}$), and precursors to PM$_{10}$, PM$_{2.5}$, and ozone formation

Metro Vancouver prepares a comprehensive inventory of emission sources and trends, to identify priority areas for action and track progress in reducing emissions. Inventories are prepared every five years, including forecasts of future emissions on a 25 year horizon, based on the best information available with respect to growth trends and changes in emission rates or controls. The latest emission inventory for the Lower Fraser Valley (LFV) was compiled for the year 2005, including a forecast to 2030.

Figure 1 shows the trends in PM$_{10}$ and PM$_{2.5}$ emissions in the LFV, as well as the forecast to 2020. Reductions in PM$_{10}$ and PM$_{2.5}$ emissions have occurred since 1990, but have leveled off in recent years. PM$_{10}$ is predicted to increase slightly from 2020 onwards.

Figure 2 illustrates the trends and forecast for volatile organic compounds (VOCs) and nitrogen oxide (NOx) emissions. NOx emissions have decreased in recent years and are expected to continue to decrease over the next 15 years primarily due to improvements in vehicle emission control technology. VOC emissions have decreased since 1990, but are expected to level off in the next 10 years.

Figure 3 shows the trends and forecast for ammonia (NH$_3$) and sulphur oxide (SOx) emissions in the LFV. Emissions of both pollutants are expected to increase due to increased agricultural production and marine transportation, respectively.

It is important to note that Figures 1 to 3 show direct emissions only. Many of the contaminants shown in these figures also play a role in secondary formation of...
other air pollutants; they are referred to as “precursors”:

- atmospheric reactions between NOx, SOx and NH₃ can form secondary PM₂.₅ which can impact both visibility and human health. This additional secondary PM formation is not reflected in Figure 1.

- ground-level ozone can be formed when volatile organic compounds and nitrogen oxides react in the presence of sunlight.

**Implications for the AQMP:**

Efforts to reduce emissions of several pollutants in the LFV have been relatively successful over the past 15 years. Although direct PM₁₀ and PM₂.₅ emissions have leveled off in recent years, emissions of two secondary PM precursors - NH₃ and SO₂ - are predicted to rise. Current health research indicates that even low levels of particulate matter exposure can be harmful to human health. Current PM levels can also impede regional visibility. Therefore, Metro Vancouver should continue to influence improvements and implement actions to reduce emissions of air contaminants, with consideration of their direct health and environmental effects, as well as their role in the formation of secondary pollutants.

### Performance Measure #2

**Reduce regional ambient PM₁₀, PM₂.₅ and ground-level ozone levels**

Metro Vancouver monitors ambient (or outdoor) air quality via a network of stations called the LFV Ambient Air Quality Monitoring Network. A discussion of the overall trends in ambient air quality at these regional stations is presented here. Many factors contribute to the year-to-year variation in ambient air quality levels, including changes in emissions from local and distant sources and meteorology.

### Particulate Matter Trends

Figure 4 illustrates the annual trend in inhalable particulate matter (PM₁₀) concentrations in the LFV. This figure reflects the average of the peaks and mean values measured at 6 regionally-representative stations in Metro Vancouver and one in the Fraser Valley Regional District. These data indicate that PM₁₀ concentrations have decreased slightly since the mid-90s, but have been relatively constant in recent years.

Continuous monitoring of PM₂.₅ levels has only been in place in the LFV since 1999. Figure 5 shows the annual trend in fine particulate matter (PM₂.₅) levels over this time period. This figure reflects the average of the peaks and mean values measured at 2 regionally-representative stations in Metro Vancouver and one in the Fraser Valley.
Regional District. These data indicate that PM$_{2.5}$ concentrations have been relatively constant in recent years, with some year-to-year variability.

**Implications for the AQMP:**

The long-term regional trends in particulate matter levels indicate some improvement over the last 15 years, although levels in recent years have been relatively constant. Current health research indicates that even low levels of particulate matter exposure can be harmful to human health. Current PM levels can also impede regional visibility. Therefore, efforts to improve regional ambient PM levels should continue in order to yield significant health benefits and improve visibility in the region. Given the growing evidence on its toxicity, efforts to reduce diesel PM have emerged as a priority for Metro Vancouver. To measure performance in reducing diesel PM, there is a need to purchase and integrate appropriate equipment into the monitoring network to improve characterization on both a regional level, and in localized areas subject to elevated concentrations of diesel PM.

**Ground-level Ozone Trends**

Figure 6 illustrates the annual trend in ground-level ozone concentrations in the western portion of the LFV. This figure reflects the average of the short-term peaks and mean values from six regionally-representative stations in Metropolitan Vancouver. Since the mid-1990s there has been no discernable trend in the short-term peak and average ground-level ozone concentrations in Metropolitan Vancouver.

Figure 7 shows the annual trend in ground-level ozone concentrations in the eastern portion of the LFV. This figure reflects the average of the peaks and mean values measured at three stations in the Fraser Valley Regional District. Although there is no discernable trend in short-term peaks, average ozone levels appear to have increased slightly since the mid-1990s.

The average ground-level ozone concentrations in the eastern portions of the LFV are comparable to those in the western portion of the airshed. The short-term peak concentrations, however, are higher in the east, and result in occasional exceedances of the Canada Wide Standard for ozone. These exceedances occur during short term episodic events under conditions conducive to ozone formation such as hot, sunny stagnant weather.

**Implications for the AQMP:**

Ozone formation is highly dependent on regional atmospheric chemistry and meteorology. Of note is that while the emission inventory indicates that emissions of ozone precursors (Figure 2) have generally decreased over time, ambient levels of ground level ozone have not shown a
parallel decrease. Metro Vancouver will continue to work in partnership with other air quality agencies to improve the understanding of ozone chemistry and the influences of regional and transboundary ozone precursor emissions, meteorology, topography and other factors. Specialized airshed models must continue to be used to determine the possible impacts of new and existing emission sources on ambient air quality and determine the best strategies to minimize or avoid these impacts.

Performance Measure #3  **Improve local air quality**

The 2005 AQMP recognizes that even where overall regional air quality may be acceptable, localized air quality, health or nuisance impacts can occur. In response, Metro Vancouver has developed a framework for managing air quality at the local scale. The framework outlines a phased approach beginning with a screening assessment of local air quality impacts, more detailed assessment, and where warranted, development of an action plan to resolve air quality issues. Over the past two years Metro Vancouver has been working with several municipalities and other partners to design and initiate localized ambient air quality monitoring programs in several priority locations. Metro Vancouver has also received numerous requests from municipalities, including the City of New Westminster, City of Surrey, City of Vancouver and District of West Vancouver, to conduct localized air quality monitoring.

**Implications for the AQMP:**

Management of air quality at the community or neighbourhood scale is an increasing area of focus for many air quality management agencies. As this program area develops, there is a need for enhanced monitoring capabilities, including capabilities to measure diesel PM, and new instruments and technologies are being put in place. The challenge for Metro Vancouver will be to develop this new program area and provide timely response to requests for air sampling and investigation, and problem resolution within existing resource limitations.

Performance Measure #4  **Reduce regional greenhouse gas (GHG) emissions**

Figure 8 shows the trend and forecast for GHG emissions in the LFV from 1990 to 2020.

Total GHG emissions in Metropolitan Vancouver increased gradually between 1990 and 2000 due to growth in population and economic activity in the region, and decreased between 2000 and 2005, mainly as a result of the reduced operation of the Burrard Thermal Power Generation Plant. Post-2005, GHG emissions are forecast to continue to increase slightly. This forecast is based on the assumption that all measures...
announced by the federal and the provincial governments would be implemented by 2020.

**Implications for the AQMP:**

Preliminary analysis of the mitigation measures announced by the provincial and the federal governments indicate that additional measures are needed to meet the regional target of reducing GHGs by 33% from current levels by 2020. It is also recognized that Metro Vancouver has limited authority over many of the most significant sources of GHGs in the region, and that collaborative efforts with all levels of government are essential to meeting our target. Given the significance of climate actions, policies and associated funding announced by the BC government in 2007 and 2008, it is important to align Metro Vancouver’s climate change initiatives/programs with senior government activities to maximize both the economic and the GHG reduction benefits for the region. It is also important to ensure that climate change policies and GHG reduction efforts will not have negative impacts on air quality but would support the air quality goals of Metro Vancouver.
3. ACTIONS

Metro Vancouver has made significant progress on many of the AQMP actions, often in partnership with other government agencies. Actions within the three strategy areas are highlighted below, with an indication of areas where significant progress has been made, as well as where barriers to progress have been identified. Table A-1 in the Appendix provides a more detailed listing of the status of each of the 33 AQMP actions.

### 3.1 Strategy #1: Reduce Emissions from Major Regional Sources

#### 3.1.1 Actions for Marine Sources

**Key Progress Areas**

Through the BC Marine Vessel Air Quality Working Group, Metro Vancouver has played an important role in developing and implementing emission reduction measures for marine vessels and port operations. Metro Vancouver has continued to work with port authorities on developing emission reduction measures for trucks, rail and equipment at port facilities.

Metro Vancouver and other air quality agencies encouraged Port Metro Vancouver, Port of Seattle and Port of Tacoma to develop their Northwest Ports Clean Air Strategy. The strategy includes emission reduction performance goals for port-related sources, and represents a cooperative effort amongst the three ports to improve marine-related air quality in the international airshed.

Metro Vancouver has also collaborated with federal government agencies to pursue more stringent ship emission standards under International Maritime Organization (IMO) regulations. Amendments to IMO regulations were proposed in 2008 and Metro Vancouver has urged the federal government to ratify these amendments under Canadian law.

**Areas for Further Development**

The implementation of shore power systems has emerged as a key priority since 2005, and Metro Vancouver will work with port authorities, the shipping industry, other governments, BC Hydro and others to advance electrification of port facilities.

#### 3.1.2 Actions for Cars, Trucks and Buses

**Key Progress Areas**

After a thorough program review, AirCare, the LFV’s emission inspection and maintenance program for light-duty vehicles, was extended to the end of 2011. Modifications to the program, such as a 7-year exemption for new vehicles and onboard diagnostic testing, were also implemented to provide longer-term emissions reductions while reducing the impact on motorists whose vehicles are least likely to fail.

In early 2008, the BC Ministry of Transportation and Highways changed the AirCare On-Road (ACOR) program for heavy-duty diesel vehicles from “voluntary/outreach” mode to enforcement mode. Under the Motor Vehicle Act Regulation, vehicles in violation of diesel emission standards may be ticketed and ordered to be repaired and retested.

In consultation with Metro Vancouver and various stakeholders, TransLink adopted an Emissions Policy in 2006 related to 1) direct emissions from the TransLink fleet of vehicles, rail,
and vessels, and 2) overall regional transportation emissions which can be influenced by TransLink’s programs. As part of this policy, TransLink committed to purchase clean/low emission new buses, retrofit older buses with emission control equipment, use cleaner fuels and increase the fuel-efficiency of its fleet. Metro Vancouver has subsequently worked with TransLink on other environmental policies and provided input on the development of TransLink’s Transport 2040 Plan.

Areas for Further Development
Enhancement of the current ACOR program for heavy duty trucks and buses in BC, and effective enforcement are key for the successful implementation of this program. Tightening the opacity standards as well as requiring fleets to conduct periodic inspections of their own vehicles would significantly improve the effectiveness of the ACOR program. Metro Vancouver will continue to work with the Province and other partners to implement beneficial changes.

Metro Vancouver, in partnership with Environment Canada and the Fraser Valley Regional District, developed a program in 2006 to provide incentives for diesel fleet retrofits. However, the private fleet portion of the program has not been able to proceed due to legal issues and the loss of funding from the federal government. A new strategy for diesel emission reduction is under development.

3.1.3 Actions for Construction, Rail and Agricultural Equipment

Key Progress Areas
The government of Canada has increased the stringency of regulations pertaining to the sulphur content of diesel fuel sold for use in non-road engines, mandating a decrease to 500 mg/kg as of October 2007, and a further decrease to 15 mg/kg after September 30, 2010. Ultra low sulphur diesel (15 mg/kg) has been mandated for on-road vehicles since 2006, and in Metro Vancouver this has meant that most non-road equipment operators are already using cleaner diesel in advance of the requirement by law.

The federal government has plans to amend the regulation for non-road compression-ignition engine emissions to align with U.S. EPA standards. This would require engine manufacturers to produce new engines with advanced emission-control technologies, resulting in a 90% decrease in exhaust emissions. The proposed amendments are expected to be published in 2008.

Areas for Further Development
As noted in Section 3.1.2 above, an incentive program for retrofits or replacements of on-road and non-road diesel engines was developed in 2006, but has not proceeded due to legal and funding issues. A new strategy for diesel emission reduction is under development.

The full benefit of federal regulations and standards noted above may not be realized for some time because of the longevity of existing non-road engines. Metro Vancouver intends to consider a regulatory program that would address emissions from existing non-road diesel engines, potentially providing substantial air quality and health benefits at relatively low societal cost. A regional emission bylaw would address emissions from existing non-road engines, such as forklifts, tractors, backhoes, cranes and excavators, within the construction and industrial sectors. Jurisdiction for regulating these emissions will be reviewed.
3.1.4 Actions for Industrial, Commercial and Institutional (ICI) Sources

Key Progress Areas
Beginning in 2006, Metro Vancouver has been developing amendments to the Air Quality Management Bylaw, and engaged in stakeholder and public consultation. The Metro Vancouver Board approved the following bylaw revisions in July 2008:

- Changes to the air quality regulatory fee structure to allocate fees more equitably amongst emission sources and encourage reductions in emissions of the most harmful air contaminants; and
- Additional changes, including amalgamation of existing Bylaws, conversion of existing Emission Regulations to separate Bylaws, and modifications to better align the Bylaw with the provincial Environmental Management Act.

Areas for Further Development
A draft Bylaw specifying emission requirements for natural gas and wood-fired boilers and heaters has also been developed. However, the Board has deferred consideration of this Bylaw until October 2008 pending the outcome of a judicial review of an Environmental Appeal Board ruling that a Metro Vancouver permit may not impose more stringent emission limits than a provincial regulation.

3.1.5 Actions for Communities

Key Progress Areas
The Metro Vancouver Board has committed the region to achieve the same GHG emission reduction targets that have been announced province-wide - 33% below 2007 levels by the year 2020, and 80% below 2007 levels by 2050. The Board has also directed staff to develop a regional climate change strategy that addresses both mitigation of GHGs and adaptation to the impacts of climate change.

In 2008, Metro Vancouver staff facilitated the re-establishment of a climate protection sub-committee under REAC (Regional Engineers Advisory Committee) and this will be one venue for coordination of community energy plans and climate action plans with Metro Vancouver member municipalities.

In addition to regional targets, Metro Vancouver became a signatory to the BC Climate Action Charter in 2007, committing to a goal of being carbon neutral with respect to its own corporate emission sources by 2012. Metro Vancouver staff have actively participated and provided input to a number of provincial and local climate change initiatives.

Areas for Further Development
While the Climate Action Charter excludes GHG emissions from solid waste operations, the Metro Vancouver Board has directed staff to develop actions to address GHG emissions from regional solid waste operations, in recognition of their significance. Corporate actions to address GHG emissions from solid waste operations will be developed in accordance with Metro Vancouver’s new Solid Waste Management Plan which is under development.

In 2008, Metro Vancouver initiated a consulting study that will investigate effective strategies and programs to reduce the impacts of wood smoke in the Canadian portion of the LFV, and recommend the most suitable options for implementation in Metro Vancouver. This study will look at a range of options from regulatory approaches to public outreach. Metro Vancouver has also submitted a proposal and request for funding under the provincial Wood Stove Exchange
Program. If the application is successful, a wood stove exchange program will be implemented in Metro Vancouver in the winter of 2009.

3.1.6 Actions for Agriculture

**Key Progress Areas**
Through work on amendments to the Air Quality Management Bylaw, described in Section 3.1.4, Metro Vancouver has improved dialogue with the agricultural industry and provincial agencies on regulation of air emissions from this sector.

**Areas for Further Development**
Metro Vancouver staff is continuing collaborative efforts with other levels of government, public interest groups and agricultural producers to implement effective strategies to reduce ammonia and particulate matter emissions, reduce odour complaints, and improve visibility. These efforts include the development and implementation of Best Management Practices to minimize the environmental impact of agricultural operations.

### Strategy #2: Development and Implement Local Air Quality Management Programs

**Key Progress Areas**
The 2005 AQMP highlights an increasing need to manage air quality at the local (neighbourhood or community) scale, recognizing that localized air quality, health or nuisance impacts can occur even while overall regional air quality remains acceptable.

A framework has been developed to guide local air quality management plans; the framework provides a stepwise approach to identify possible localized air quality problem areas, assess the magnitude of the problem, identify contributing sources and recommend corrective action. To support the local air quality management framework, enhanced air quality monitoring and modelling capabilities have been put in place.

As of 2008, Metro Vancouver has initiated local air quality studies in New Westminster and the Burrard Inlet area, and has continued to respond to requests for monitoring and assessment.

**Areas for Further Development**
As Metro Vancouver has worked with municipalities, health agencies and the public to develop and implement a local air quality management framework, awareness has grown and interest has been heightened. There have been numerous requests for studies to address issues such as residential wood smoke, nuisance impacts, idling emissions and accidental releases. The challenge for Metro Vancouver will be to develop this new program area and provide timely response to requests for air sampling and investigations within existing resource limitations.

### Strategy #3: Enhance Air Quality Information and Public Awareness

**Key Progress Areas**
In 2007 Metro Vancouver staff completed the 2005 emission inventory, including a backcast to 1990 and forecast to 2030. Notable enhancements from previous inventories include improvements to marine vessel emissions estimates, with significant input from the shipping industry, and the application of new methods to estimate particulate matter from construction and demolition activities and bulk commodities shipping and handling.
In 2007 Metro Vancouver retained a team of air quality consultants and academics to complete a review of the LFV Air Quality Monitoring Network. The review produced a series of recommendations which respond to emerging priorities around health impacts, changes in spatial air quality patterns in the region, and recognizes new monitoring technologies and data acquisition systems. In particular, the network review has identified a need to augment the permanent air quality monitoring network (fixed station sites) with increased special monitoring (portable and mobile) capabilities.

The Air Quality Health Index (AQHI) was developed in cooperation with the BC Lung Association, and provincial and federal environment and health agencies. The AQHI is an improvement over the existing air quality index because it incorporates the effects of multiple rather than single pollutants and provides information to the public on air quality in relation to human health. The new AQHI was first introduced in Metro Vancouver and parts of BC in 2006 on a pilot basis, and then extended to other areas in Canada in 2008. Metro Vancouver and several BC communities are transitioning to the AQHI during 2008, with a public education campaign. Metro Vancouver plans to collaborate with local health authorities to incorporate the AQHI, relevant health messages and improved communications strategies into a revised air quality advisory system.

**Areas for Further Development**

With the adoption of the AQMP in 2005, Metro Vancouver also adopted new ambient air quality objectives for PM$_{2.5}$ which were among the most stringent in the world. In 2007, the BC government began a consultation process to develop provincial objectives for PM$_{2.5}$. The annual objective of 8 µg/m$^3$ proposed for BC is more stringent than the level set in the 2005 AQMP.

Recognizing that there is no safe level of exposure for PM$_{2.5}$, and consistent with the AQMP principle of continuous improvement, it is expected that Metro Vancouver will revise its PM$_{2.5}$ objective to be at least as stringent as the provincial objective, once it is adopted.
4. ADAPTING THE AQMP TO TODAY’S PRIORITIES

Some issues, opportunities, and priorities have evolved since October 2005 when the AQMP was adopted by the GVRD Board. Concerns about climate change, GHG emissions and rising energy costs have increased significantly in recent years. This section briefly discusses the implications of several emerging initiatives.

Since 2007 the provincial government has significantly increased its efforts on air quality management in BC, and to respond to the challenge of climate change. In February 2008 the BC Climate Action Secretariat was formed to take a leading role in reaching BC's GHG emission reduction targets. In June 2008 the provincial government unveiled the BC Climate Action Plan and the BC Air Action Plan. Many of the actions and initiatives in these two provincial plans align well with the goals and actions of Metro Vancouver’s Air Quality Management Plan. To ensure maximum benefit, Metro Vancouver will continue to coordinate air quality and GHG management efforts with its provincial government counterparts, and where possible leverage provincial funding to accelerate and/or improve the effectiveness of AQMP actions within Metropolitan Vancouver.

In March 2008, after consulting with environmental groups, industry and other stakeholders, the federal government announced further details of the GHG emissions regulations of the Turning the Corner plan. The plan will establish a market price for carbon; set up a carbon emissions trading market, including a carbon offset system; set a target to require new oil sands carbon capture and storage; and ban the construction of new dirty coal plants. It includes a federal regulatory framework to reduce industrial GHG emissions and meet the federal government’s target of reducing emissions by 20% from 2006 levels by 2020. It is expected that the proposed GHG emission regulations will be published in the Canada Gazette in late 2008, finalized in 2009 and come into force on January 1, 2010.

Both Metro Vancouver’s Environment and Energy Committee and the Fraser Valley Regional District’s Air Quality and Environment Committee have expressed support for the development and implementation of measures to improve visibility in the LFV. During the compilation of this AQMP progress report, it was determined that while many of the AQMP actions will lead to visibility improvements, there are no actions specifically related to AQMP Goal #2, “Improve visibility”. However, multiple agencies have been collaborating on this issue. Since late 2006, Metro Vancouver has been actively involved in the BC Visibility Coordinating Committee (BCVCC) which includes partners such as Environment Canada, BC Ministry of Environment and the Fraser Valley Regional District. The BCVCC has established science, policy and communication working groups to develop and implement a regional visibility improvement pilot within the LFV. The BC Ministry of Environment and Environment Canada intend to use information gathered from the LFV pilot to develop provincial and national visibility strategies.
### APPENDIX

#### Table A-1 Summary of AQMP Action Implementation as of September 22, 2008

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<thead>
<tr>
<th>AQMP Action</th>
<th>Progress since October 2005</th>
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| **Action #1: Increase GVRD’s influence with respect to marine vessels and port operations.** | Metro Vancouver is collaborating with the Vancouver Fraser Port Authority (Port Metro Vancouver) and Environment Canada to develop an improved emissions inventory for land-based sources associated with port facilities, such as cargo handling equipment and truck and rail traffic. This work is expected to be completed in 2008 and will complement detailed ocean-going marine vessel emissions work completed in 2006, providing a comprehensive assessment of both land-based and water-based emissions from marine and port operations in the region.  

As part of Port Metro Vancouver’s Project and Environmental Review Process, port tenants are required to commit to continuous improvement in operations-related air emissions, and reduction of construction-related emissions. A number of these facilities hold air quality permits with Metro Vancouver, and Metro Vancouver staff participates in the review processes.  

Metro Vancouver has also initiated the Burrard Inlet Area Local Air Quality Study which is currently collecting air quality information in several port-side communities (see Action #28). |
| **Action #2: Partner with other government organizations to identify and implement emission reduction measures for ocean-going vessels, ferries, harbour vessels, and port operations.** | Through the BC Marine Vessel Air Quality Working Group, Metro Vancouver has played an important role in developing and implementing emission reduction measures for marine vessels and port operations. Metro Vancouver and other air quality agencies encouraged Port Metro Vancouver, Port of Seattle and Port of Tacoma to develop their Northwest Ports Clean Air Strategy. The strategy includes emission reduction performance goals for port-related sources, and represents a cooperative effort amongst the three ports to improve air quality in the shared Georgia Basin-Puget Sound Airshed. Port Metro Vancouver is consulting with stakeholders, customers and the public and plans to incorporate any changes or improvements into a final strategy for implementation in late 2008.  

Metro Vancouver has also collaborated with federal government agencies to pursue more stringent ship emission standards under International Maritime Organization (IMO) regulations. Amendments to IMO regulations were proposed in 2008 and in September 2008 Metro Vancouver urged the federal government to expedite the ratification of these amendments under Canadian law.  

Metro Vancouver has also continued to work with port authorities on developing emission reduction measures for trucks, rail and equipment at port facilities (described under Action #1). The implementation of shore power systems has emerged as a key priority since 2005. |
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<tr>
<th>AQMP Action</th>
<th>Progress since October 2005</th>
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<tr>
<td>Action #3: Seek to continue emissions inspection and maintenance programs that effectively reduce emissions from light and heavy-duty vehicles.</td>
<td>After a thorough program review, AirCare, the LFV’s emission inspection and maintenance program for light-duty vehicles, was extended until December 31, 2011. Modifications to the program, such as a 7-year exemption for new vehicles and onboard diagnostic testing, were implemented to provide longer-term emissions reductions while reducing the impact on motorists whose vehicles are least likely to fail. In early 2008, the BC Ministry of Transportation announced that the AirCare On-Road (ACOR) program for heavy-duty diesel vehicles would change from “voluntary/outreach” mode to enforcement mode. Under the Motor Vehicle Act Regulation, vehicles in violation of diesel emission standards may be ticketed and ordered to be repaired and retested. In September 2008, the Metro Vancouver Board requested that the provincial government tighten opacity standards for heavy-duty diesel vehicles, ensure that adequate resources are available to enforce the ACOR program, and require large fleet owners to inspect their own fleets for compliance with standards.</td>
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<td>Action #4: Facilitate on-road diesel engine retrofits and accelerate the use of cleaner fuels.</td>
<td>In 2005-2006, Environment Canada, BC Ministry of Environment, Metro Vancouver and the Fraser Valley Regional District, facilitated voluntary retrofits of school buses and municipal fleets with diesel oxidation catalyst (DOC) systems. Under the BC Air Action Plan announced in June 2008, the provincial government has committed new funding for cleaning up school buses in BC, including additional retrofits. In 2007, the provincial government announced plans to introduce a regulation to require the retrofits of 1989-1993 model year commercial diesel trucks with DOCs or any equally effective technology. Metro Vancouver has encouraged the provincial government to extend diesel emission reduction requirements to additional model years (1994-2006). Metro Vancouver has also introduced diesel emission reduction requirements for its own corporate fleet of on-road vehicles and non-road equipment. The Sustainability Framework includes a goal of reducing diesel particulates from Metro Vancouver corporate sources by 75% by 2012.</td>
</tr>
<tr>
<td>Action #5: Request that the GVTA achieve emission reductions by incorporating the regional air quality objective of continuous improvement into management of the transit fleet through acquisition of low emission vehicles/fuels and retrofits to older</td>
<td>In consultation with Metro Vancouver and various stakeholders, TransLink developed an Emissions Policy related to 1) direct emissions from the TransLink fleet of vehicles, rail, and vessels, and 2) overall regional transportation emissions which can be influenced by transit services, ridership and other programs supported by TransLink. The TransLink Board officially adopted this Emissions Policy in June 2006. As part of this policy, TransLink committed to purchase clean/low emission (electric, natural gas, diesel-electric hybrid) buses, retrofit older buses with emission control equipment, use cleaner fuels and increase the fuel-efficiency of its fleet. Subsequent to the adoption of the Emissions Policy, Metro Vancouver has worked with TransLink on an Infrastructure Policy (to address construction and operational impacts of TransLink’s buildings, transit exchanges, parking facilities, rail guideways, road network, greenways and other assets), and the development of outcome indicators to assess reductions in criteria air contaminant and GHG emissions.</td>
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<tr>
<td>AQMP Action</td>
<td>Progress since October 2005</td>
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<td>action vehicles.</td>
<td>Metro Vancouver staff also provided air quality and GHG guidance during the development of TransLink’s <em>Transport 2040</em> Plan. After public consultation, it is expected that the TransLink Board will consider the adoption of <em>Transport 2040</em> in early fall 2008.</td>
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**Action #6: Promote adoption of the GVRD’s model anti-idling bylaw by local governments, and assist major transport centres with the introduction of anti-idling measures.**

Since 2005, several Metro Vancouver municipalities have adopted idling bylaws, including the City of North Vancouver, Vancouver, Surrey, and Bowen Island Municipality. The City of New Westminster is collecting baseline information to assist with bylaw adoption in the near future. The City of Burnaby and Township of Langley are focusing their efforts on education and signage. The City of Richmond and Port Moody have adopted fleet anti-idling policies. Through the BC Ministry of Environment’s Idle-Free Ambassador program, Metro Vancouver obtained 2008 survey information about idling hotspots, prevalence and public opinion within the region. This information will assist municipalities with the introduction of idling reduction measures such as bylaws, signage and public education campaigns.

With assistance from Better Environmentally Sound Transportation and the City of Vancouver, Port Metro Vancouver conducted a truck idling reduction assessment and education campaign in 2006-2007. Idling education packages were distributed to tenants and drivers. In addition, some of the terminal operators and the International Longshore and Warehouse Union have implemented programs to reduce unnecessary idling of terminal equipment. Port Metro Vancouver will be assessing the effectiveness of both the trucking and terminal equipment anti-idling programs in the near future.

**Action #7: Develop a model Sustainable Fleet Management Policy for use by businesses and local governments.**

Under the SmartSteps program, Metro Vancouver has created a set of sector guides which promote the adoption of eco-efficient work practices in the local business community. The SmartSteps *Transportation Sector Guide* provides recommendations to improve fuel-efficiency, reduce fuel costs and reduce air emissions from vehicle fleets, such as reducing idling, providing driver training and route planning.

In November 2007, the Fraser Basin Council and BC Ministry of Environment launched the *GreenFleets* Program which is designed to help fleets in British Columbia access information about fuel efficient technologies and lower carbon fuels, successful business casing, and tools to evaluate fuel efficient alternatives. The Fraser Basin Council also administers the E3 (Energy Environment Excellence) Fleet rating system. The *E3 Fleet* program provides services and resources to assist fleets by increasing fuel efficiency, reducing costs and minimizing emissions.

**Action #8: Promote trip reduction services in business and residential outreach programs.**

Metro Vancouver produces the *Home Pages*, which appear in the annual regional telephone directory. One of the Home Pages recommends several personal vehicle emission reduction options.

Metro Vancouver also promotes trip reduction services as one of many sustainable business practices in the SmartSteps program’s business guide to eco-efficiency: *10 Strategies to Maximizing Efficiency, Improving Profits and Competitiveness*. 
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<td><strong>Action #9:</strong> Strongly encourage the federal government to implement stringent national fuel efficiency standards for light and heavy-duty vehicles.</td>
<td>Prime Minister Harper reaffirmed in a speech on February 6, 2007 that the federal government will regulate the fuel efficiency of motor vehicles, beginning with the 2011 model year. Working with the United States, Canada plans to pursue a Clean Auto Pact that would create a North American standard for cars and light-duty trucks. In May 2008, the provincial government passed Bill 39 – The Greenhouse Gas Reduction (Vehicle Emissions Standards) Act. Under this Act, automakers’ fleets or groups of vehicles will be required to meet fleet-average GHG emission standards, equivalent to the stringent California standards. GHG emission standards apply to light-duty vehicles beginning with the 2009 model year. Metro Vancouver intends to continue encouraging both the federal and the provincial governments to improve national fuel efficiency or GHG emission standards from 2016 and beyond. Heavy-duty vehicle fuel efficiency is being addressed through the GreenFleets Program (see Action #6). The provincial government is also considering regulating GHG emissions from heavy-duty vehicles.</td>
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<td><strong>Action #10:</strong> Strongly encourage the federal and provincial governments to promote cleaner, fuel-efficient vehicle purchases by providing financial incentives.</td>
<td>In 2005, the provincial government introduced a PST rebate of up to $2,000 for British Columbians who buy new hybrid-electric vehicles. In June 2008, the provincial government committed to extending the rebate for hybrids to April 1, 2011 and providing incentives for other fuel efficient vehicles. The provincial government also announced an enhancement of the Scrap-It program, designed to get older, higher-polluting vehicles off the road. The level of incentive available under this program increases with the level of emission reduction of the replacement vehicle or transportation mode (e.g. $2000 for transit passes or zero or very low emission vehicles). The federal government had also introduced an incentive (ecoAUTO rebate) program, for fuel-efficient vehicle purchases. Although the ecoAUTO program will be discontinued as of December 31, 2008, the provincial government has committed to provide BC residents with a maximum PST reduction for other vehicles which meet the federal government's current ecoAUTO fuel efficiency criteria. The tax reduction equates to $1,000, $1,500, and $2,000, based on vehicle type and fuel efficiency.</td>
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<td><strong>Action #11:</strong> Strongly encourage ongoing federal government actions to improve national non-road engine emission and fuel standards.</td>
<td>The government of Canada amended the sulphur in diesel regulation requiring diesel fuel sold for use in non-road engines not to exceed: (a) 500 mg/kg from October 1, 2007 until September 30, 2010; and (b) 15 mg/kg after September 30, 2010. Since ultra low sulphur diesel is now mandatory for trucks, most non-road equipment operators are now using cleaner diesel in advance of the requirement by law. The federal government has plans to amend the Non-road Compression-Ignition Engine Emission Regulations to align with the U.S. EPA standards. To meet these emission standards, engine manufacturers would produce new engines with</td>
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advanced emission-control technologies, resulting in a 90% decrease in exhaust emissions. The proposed amendments are expected to be published in 2008. Metro Vancouver will continue to participate in the federal consultation process regarding emerging non-road regulations, and recommend implementation of the strictest feasible non-road engine and fuel emission standards that will reduce particulate matter, sulphur dioxide, nitrogen oxide, volatile organic compound and GHG emissions as soon as possible.

**Action #12: Facilitate non-road diesel engine retrofits and accelerate the use of cleaner fuels.**

The federal government regulates new on- and non-road diesel engines. However, the full benefit of these standards may not be realized for some time because of the longevity of existing non-road engines. Metro Vancouver intends to consider a regulatory program that would address emissions from existing non-road diesel engines, potentially providing substantial air quality and health benefits at relatively low societal cost. A regional emission bylaw would address emissions from existing non-road engines, such as forklifts, tractors, backhoes, cranes and excavators, within the construction and industrial sectors. Jurisdiction for regulating these emissions will be reviewed.

**Action #13: Partner with other governments to investigate and implement measures to reduce emissions from locomotives and railway maintenance equipment.**

Emissions from railway locomotives operated by Canadian railway companies are currently addressed under a Memorandum of Understanding (MOU) between the Railway Association of Canada, Environment Canada and Transport Canada. The MOU is effective until December 31, 2010, after which time the federal government intends to develop and implement new regulations for rail emissions that are harmonized with US air pollutant standards. To bridge the gap until new regulations are enacted, Metro Vancouver has worked with industry and other agencies to form a BC Locomotive and Rail Air Quality Working Group. The inaugural meeting of the Working Group was held in July 2008 with attendees from Metro Vancouver, Environment Canada, BC Ministry of Environment, Port Metro Vancouver, the Railway Association of Canada, as well as several BC passenger and freight rail lines, railway tour operators and port tenants. The Working Group is intended to provide a forum for industry-government collaboration to reduce rail emissions and address local air quality concerns.

**Action #14: Require continuous improvement from ICI point sources by developing a tiered approach that includes incentives, voluntary and mandatory initiatives, and innovative approaches.**

Beginning in 2006, Metro Vancouver has been developing amendments to the Air Quality Management Bylaw, and engaged in consultation with representatives from various federal, provincial and municipal governments, new and existing regulated emission sources, existing permitted facilities, health and environmental non-government organizations, First Nations and the public. Following two phases of consultation, the Metro Vancouver Board approved the following bylaw revisions in July 2008:

- Changes to the air quality regulatory fee structure to allocate fees more equitably amongst emission sources and encourage reductions in emissions of the most harmful air contaminants; and
- Additional changes, including amalgamation of existing Bylaws, conversion of existing Emission Regulations to separate Bylaws, and modifications to better align the Bylaw with the provincial Environmental Management Act.
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<td>A draft Bylaw specifying emission requirements for natural gas and wood-fired boilers and process heaters has also been developed. However, the Board has deferred consideration of this Bylaw until October 2008. The deferral will allow time for further discussions with the Province on coordinating emission requirements with development of an amended Agricultural Waste Control Regulation, as well as potential completion of a judicial review of a previous Environmental Appeal Board decision which has implications on Metro Vancouver’s ability to impose more stringent emission limits in a permit than a provincial regulation.</td>
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<td>Action #15: Strongly encourage Washington State authorities to implement ICI actions that support continuous improvement.</td>
<td>Metro Vancouver has communicated its concerns about sulphur dioxide emissions from primary metals facilities and petroleum refineries in Whatcom County to the Northwest Clean Air Agency (NWCAA). The NWCAA has indicated that it shares Metro Vancouver’s concern and reports that total actual sulfur dioxide emissions from the two refineries in Whatcom County continued to decrease in 2007 and have declined over 1,000 tons per year compared to 2003. NWCAA will also continue to apply a requirement for Best Available Control Technology, which is mandatory under U.S. New Source Review provisions.</td>
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<td>Action #16: Develop, promote and implement best management practices for priority area emission sources.</td>
<td>Metro Vancouver actively assists businesses to adopt sustainable business practices through promotion of the SmartSteps and BuildSmart programs. SmartSteps targets small and medium-sized businesses promoting eco-efficient work practices. BuildSmart targets building professionals helping them make informed choices when designing, constructing and retrofitting new and existing buildings. Each program provides a range of business tools promoting resource conservation (energy – electricity and fuel, and water conservation), sustainable materials selection and reuse, waste reduction and recycling. Metro Vancouver has also created a set of 11 sector guides which promote the adoption of sector-specific eco-efficient work practices in the local business community. Guides have been produced for the Automotive, Health, Recreation, Accommodations, Education, Manufacturing, Office, Restaurant, Retail, Transportation and Warehousing sectors. The Air Quality Management Bylaw includes regulatory requirements for a number of area source sectors, such as gasoline distribution, automotive refinishing and concrete batch plants. Amendments to the Air Quality Management Bylaw (described in Action #14) extend the system of regulatory fees to these regulated sources.</td>
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<td>Action #17: Support the development of federal and provincial government ICI emission reduction programs, and implement locally relevant actions that support continuous improvement.</td>
<td>In April 2008, the federal government published proposed regulations to reduce volatile organic compound emissions from consumer products, architectural coatings, and automotive refinishing products. It is expected that the proposed regulations will result in an average annual reduction in VOC emissions of 33% from consumer products, 28% from architectural coatings, and 40% from automotive refinishing products. Following consultation, stakeholder comments will be reviewed and considered by the federal government during the finalization of the regulations. Metro Vancouver has produced a Product/Services Directory recommending products which meet the following criteria: Low/Non-toxic (contributing to good air quality and occupational health), Energy Efficient, Utilize Materials in a More Efficient Manner, Conserve Water, and Third-Party Certified.</td>
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<td>Through the SmartSteps program, Metro Vancouver works with the provincial and federal governments, as well as other industry service providers (BC Hydro, Terasen Gas) and business associations, to promote pollution prevention and eco-efficient practices.</td>
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<td><strong>Action #18: Implement an odour management strategy.</strong></td>
<td>In early 2008, Metro Vancouver established odour limits for one permitted facility. However, these limits have been appealed by both the permittee and the community. The outcome of the Environmental Appeal Board hearing will determine the direction for a regional odour management strategy.</td>
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<td>Metro Vancouver is coordinating with the City of Vancouver and the City of Burnaby to use heat from Metro Vancouver’s waste-to-energy facility in Burnaby to heat homes and businesses in the East Fraserland district of Vancouver and nearby neighbourhoods in Burnaby. A feasibility study is underway.</td>
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| **Action #19: Partner with local governments, businesses and major utilities to develop and promote clean and efficient energy sources and technologies for space heating.** | Under the BC Energy Plan, the BC Climate Action Plan and the Energy Efficient Building Strategy, the provincial government has:  
  • established the Innovative Clean Energy Fund to support development of clean power and energy efficient technologies in the electricity, alternative energy, transportation, and oil and gas sectors, and  
  • invested $5 million in the SolarBC program to encourage the installation of solar hot water heaters in homes, municipal buildings, schools, social housing and First Nations communities. |
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<td>the manufacture and sale of wood-burning appliances, and implement an old wood-burning appliance change-out program.</td>
<td>Metro Vancouver has also submitted a proposal and request for funding under the provincial Wood Stove Exchange Program. If the application is successful, a wood stove exchange program will be implemented in Metro Vancouver in the winter of 2009, initially targeting the replacement of 100 older technology wood stoves with newer, certified low emission appliances and with the goal of expanding the program in subsequent years.</td>
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<td><strong>Action #22:</strong> Assist interested parties to identify and implement energy reduction measures in new building construction, renovation and retrofit projects by providing them with educational materials, business case analyses and technical assistance.</td>
<td>Metro Vancouver promotes green building strategies and technologies via the BuildSmart program. The <a href="http://www.buildsmart.ca">BuildSmart website</a> provides many green building resources including a repository of case studies, sources of incentives and funding, and an events calendar. In 2007, Metro Vancouver coordinated two workshops with local municipal representatives to identify barriers to green buildings. Four <a href="http://www.buildsmart.ca/leed">Leadership for Energy and Environmental Design (LEED®) for Contractors</a> workshops were delivered in 2007, and six are being planned for 2008. Metro Vancouver also participated actively in the development of the new provincial Green Building Code. Metro Vancouver has established a corporate Leadership in Energy &amp; Environmental Design (LEED®) policy requiring all facilities/buildings over 500 m² to be LEED® certified, unless proven unviable.</td>
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<td><strong>Action #23:</strong> Pilot and demonstrate the use of shared or renewable energy source technologies.</td>
<td>Metro Vancouver created a new energy planning program in 2007, which has led to the piloting and demonstration of renewable energy technologies in several projects, including: 1. In cooperation with Questair Technologies, the Metro Vancouver Lions Gate wastewater treatment plant biogas upgrading project will make use of currently unused, renewable biogas by cleaning the gas and distributing it to natural gas buyers through Terasen’s gas pipeline. The provincial government’s Innovative Clean Energy Fund and Terasen Gas have committed funds to implement this project. 2. A project to use renewable, clean heat from the sewer system to heat residences and businesses near the Metro Vancouver Sapperton pump station has been established, and a feasibility study is nearly complete. 3. In cooperation with Paradigm Technologies, the Metro Vancouver Lulu Island wastewater treatment plant biogas enhancement project is expected to increase biogas generation, and the heat and electricity it can produce, using high efficiency co-generating engines. The provincial government’s Innovative Clean Energy fund and Metro Vancouver have committed funds to implement this project. 4. A project has been initiated to explore harnessing wind power at Jericho Beach, which would be used to power the Metro Vancouver Jericho pump station.</td>
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<td><strong>Action #24:</strong> Expand the delivery of a natural yard care outreach program for homeowners.</td>
<td>A <a href="http://www.gvrd.ca">natural yard care guide</a> was produced by the GVRD in 2006.</td>
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<td><strong>Action #25:</strong> Incorporate the AQMP's goals into long-range plans, such as the Regional Growth Strategy, and Transportation Plan.</td>
<td>The AQMP is part of the suite of integrated management plans included in the Metro Vancouver Sustainability Framework. The goals of the AQMP have been incorporated into three other plans under development in 2008 – the Regional Growth Strategy, the Solid Waste Management Plan and the Liquid Waste Management Plan.</td>
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<td>In addition, Metro Vancouver staff provided input on air quality and climate change issues, consistent with the AQMP goals, during the development of TransLink’s <em>Transport 2040</em> Plan and environmental policy development related to emissions, infrastructure and indicators (described in more detail in Action #5).</td>
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<td>Metro Vancouver staff has also been involved in reviewing the environmental impact assessments associated with several major projects (such as the Deltaport third berth expansion, North and South Fraser Perimeter Roads, Port Mann/Highway 1 Project and Canada Line).</td>
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<td><strong>Action #26:</strong> Establish a regional greenhouse gas emission reduction target and program objectives, and work with local governments on the development and implementation of greenhouse gas reduction initiatives.</td>
<td>The Metro Vancouver Board has committed the region to achieve BC’s GHG emission reduction targets of 33% below 2007 levels by the year 2020, and 80% below 2007 levels by 2050. The Board has also directed staff to develop a regional climate change strategy that addresses both mitigation of GHGs (and achieves the reduction targets) and adaptation to the impacts of climate change.</td>
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<td>In 2008, Metro Vancouver staff facilitated the re-establishment of a climate protection sub-committee under REAC (Regional Engineers Advisory Committee) and this will be one venue for coordination of community energy plans and climate action plans with Metro Vancouver member municipalities.</td>
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<td>In addition to regional targets, Metro Vancouver became a signatory to the BC Climate Action Charter in 2007, committing to a goal of being carbon neutral with respect to its own corporate emission sources by 2012. While the Climate Action Charter excludes GHG emissions from solid waste operations, the Metro Vancouver Board has also directed staff to develop actions to address GHG emissions from regional solid waste operations, in recognition of their significance.</td>
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<td><strong>Action #27:</strong> Partner with other governments to investigate and implement measures that will reduce emissions from farm operations.</td>
<td>Through the Georgia Basin-Puget Sound Agriculture Working Group, and collaboration with other levels of government, public interest groups and agricultural producers, Metro Vancouver staff is working to implement effective strategies to reduce ammonia and particulate matter emissions, reduce odour complaints, and improve visibility. These efforts include the development and implementation of Best Management Practices to minimize the environmental impact of agricultural operations.</td>
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<td>Regulatory developments with respect to combustion sources are described in Action #14.</td>
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| **Action #28**: Assess and monitor possible local air quality priority areas and where needed partner with the appropriate governments, health agencies, the public and emission sources to develop and implement local air quality action plans. | The 2005 AQMP highlights an increasing need to manage air quality at the local or neighbourhood scale, recognizing that localized air quality, health or nuisance impacts can occur while overall regional air quality remains acceptable.

A framework for managing local air quality has been developed, and to support that, enhanced air quality monitoring and modelling capabilities have been put in place.

As of 2008, Metro Vancouver has initiated two local air quality studies:

- New Westminster -- As a follow-up to the New Westminster (Front Street) Air Quality Monitoring Study in 2004, Metro Vancouver is working with the City of New Westminster on a one-year monitoring study. This study will provide a better understanding of the impact of vehicle emissions on local air quality and neighbourhood-scale variability of pollutants.
- **Burrard Inlet Area** -- This is a two-year study designed to determine how air quality in Burrard Inlet communities compares to other areas in Metro Vancouver. Detailed information about air emission sources has been collected, additional ambient monitoring equipment is now in place at several locations, and air quality modelling is being completed to provide additional information where monitoring is not feasible.

In addition to these studies, Metro Vancouver has responded to requests for monitoring and assessment from other agencies and municipalities, for issues such as residential wood smoke, idling emissions and accidental releases. |

| **Action #29**: Develop and implement an integrated episode advisory and management program. | The **Air Quality Health Index** (AQHI) was developed in cooperation with the BC Lung Association, BC MoE, Environment Canada, and Health Canada. The AQHI replaces the existing air quality index and is an improvement because it incorporates the effects of multiple rather than single pollutants and provides information to the public on air quality in relation to human health.

The new AQHI was first introduced in Metro Vancouver and parts of BC in 2006 on a pilot basis, and then extended to other areas in Canada in 2008. Metro Vancouver and several BC communities are transitioning to the AQHI during 2008, with a public education campaign consisting of bus stop signage, radio public service announcements and a website.

Metro Vancouver plans to collaborate with local health authorities to incorporate the AQHI, relevant health messages and improved communications strategies into a revised air quality advisory system. |

| **Action #30**: Continue to conduct and enhance detailed emission inventories in concert with other jurisdictions in Canada. | In 2007 Metro Vancouver staff completed the 2005 emission inventory, including a backcast to 1990 and forecast to 2030. Notable enhancements from previous inventories include improvements to marine vessel emissions estimates, with significant input from the shipping industry, and the application of new methods to estimate particulate matter from construction and demolition activities and bulk commodities shipping and handling.

Some of this information has been presented in Section 3 of this progress report and feeds into the adaptive management |
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<td>of air quality in Metropolitan Vancouver. Metro Vancouver is partnering with Environment Canada in the development of a GIS-based emission inventory tool which will assist with local air quality studies and development of the 2010 emission inventory.</td>
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| Action #31: Update and improve the ambient monitoring network to respond to ongoing changes in regional and local air quality management priorities and needs. | In 2007 Metro Vancouver retained a team of air quality consultants and academics to complete a review of the LFV Air Quality Monitoring Network. The review produced a series of recommendations which respond to emerging priorities around health impacts, changes in spatial air quality patterns in the region, and recognizes new monitoring technologies and data acquisition systems. In particular, the network review has identified a need to augment the permanent air quality monitoring network (fixed station sites) with increased special monitoring (portable and mobile) capabilities. Some key initiatives which are being implemented in the near term are:  
• Special air quality monitoring in the City of Surrey to assess how well this municipality is served by existing monitoring stations and determine the need for a permanent air quality monitoring station.  
• Commissioning of a new air quality monitoring station in Tsawwassen, in partnership with Port Metro Vancouver as part of their commitment to fund air quality monitoring in the local community during the Deltaport Environmental Assessment process.  
• Installation of a data acquisition system which is modern, efficient and consistent with provincial and national ambient air quality monitoring networks. |
| Action #32: Improve communication of air quality information, and promote actions for local governments, businesses and residents. | Metro Vancouver continues to provide air quality information to other agencies and post reports and real-time air quality information on its website. The move to a new, health-based Air Quality Health Index is described under Action #29. In addition, Metro Vancouver has partnered with several organizations to produce the following outreach tools:  
• Metro Vancouver was a major partner in the creation of Making a Difference: Air Quality and Your Health. This episode of the Sustainable Region TV show aired 38 times on Novus (20,000 viewers) and 8 times on Shaw Cable (channel 4). The video was also distributed on DVD to all BC Lung Association members and municipalities across BC.  
• Metro Vancouver, as an active partner of the BC Lung Association Air Quality and Health Steering Committee, contributes to the publication of the State of the Air Report which provides information annually about air quality across the province, pollutants of greatest concern from a human health perspective, the various initiatives underway in BC and ways for citizens to take personal action.  
• Metro Vancouver was heavily involved with the creation of the Greenhouse Gas Action Guide, a compilation of straightforward and cost-effective GHG emission reduction initiatives. Hosted by the BC Climate Exchange, this tool is intended to help local governments carry out immediate actions to decrease GHG emissions. |
<p>|              | As mentioned under Action #6, Metro Vancouver also partnered with the BC Ministry of Environment to implement the Idle- |</p>
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<td>Free Ambassador Program. During the summer of 2008, two Ambassadors assisted some Metro Vancouver municipalities to implement idling reduction measures and conducted public outreach with the help of several volunteers. Metro Vancouver participates in a number of business and public expositions to deliver the sustainability/eco-efficiency message each year including: Buildex, the BC Hospitality Industry Conference Exposition, BC Food Service Expo, Canadian Waste &amp; Recycling Expo, Living Green Expo and GLOBE. Metro Vancouver responds to approximately 300 business requests for information and assistance each year.</td>
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**Action #33:** Utilize the Ambient Air Quality Objectives to evaluate and report on ambient air quality in Greater Vancouver, evaluate permits, and develop regulations and air quality management programs.

Metro Vancouver's ambient air quality objectives have been used to evaluate and report on regional air quality, and to guide policy and regulatory decision-making.

With the adoption of the AQMP in 2005, Metro Vancouver also adopted new ambient air quality objectives for PM$_{2.5}$ which were among the most stringent in the world. In 2007, the BC government began a consultation process to develop provincial objectives for PM$_{2.5}$. The annual objective of 8 µg/m$^3$ proposed for BC is more stringent than the level set in the 2005 AQMP.

Recognizing that there is no safe level of exposure for PM$_{2.5}$, and consistent with the AQMP principle of continuous improvement, it is expected that Metro Vancouver will revise its PM$_{2.5}$ objective to be at least as stringent as the provincial objective, once it is adopted.