

Companion Document

PART 1: INITIAL SET OF ACTIONS FOR CANADA-WIDE STANDARD FOR BENZENE PHASE 1

The following sectors have been pursued for Phase 1 reductions:

- Oil and Gas
- Transportation
- Petroleum
- Chemical Manufacturing
- Steel Manufacturing

For each of the above sectors, the following table outlines the instrument to be used to achieve the reductions in emissions/releases, the specific actions related to that instrument, the responsibility for the actions, reporting responsibilities and % reduction to be achieved expressed in terms of % reduction for that component and % contribution to the overall Phase 1 goal of 30%.

Table 1. Set of Initial Actions - Phase 1 of the Benzene Canada-Wide Standard

Sector - Oil and Gas						
Component	Instrument	Actions	Responsibility	Reporting Mechanism	Estimated % Reduction	
					% of the component goal	contribution to the 30% goal
Natural Gas Dehydrators	§ Best Management Practices	§ Implement through information letter process issued by jurisdictional regulatory agencies	§ Alberta, Saskatchewan, British Columbia - Lead § Environment Canada, Health Canada - Support	§ Technical Advisory Team (which includes Alberta, Saskatchewan, British Columbia and federal government (Environment and Health) as well as industry and environmental group representatives	60%	13%

Table 1. Set of Initial Actions - Phase 1 of the Benzene Canada-Wide Standard (cont'd)

Sector - Transportation						
Component	Instrument	Actions	Responsibility	Reporting Mechanism	Estimated % Reduction	
					% of the component goal	contribution to the 30% goal
Gasoline	§ CEPA Regulation limiting the benzene content in gasoline	§ Enforce the regulation	§ Environment Canada	§ Environment Canada	15%	10%
Vehicles	§ New vehicle emission standards and vapour recovery standards on new vehicles	§ Process for implementation	§ Environment Canada	§ Environment Canada	7%	4%

Table 1. Set of Initial Actions - Phase 1 of the Benzene Canada-Wide Standard (cont'd)

Sector - Petroleum						
Component	Instrument	Actions	Responsibility	Reporting Mechanism	Estimated % Reduction	
					% of the component goal	contribution to the 30% goal
Gasoline	§ CEPA Regulation on fuel dispensing rates	§ Enforce the regulation	§ Environment Canada	§ Environment Canada	44%	1%
Refineries	§ Voluntary agreement § Jurisdictional regulatory requirement	§ Modified CCME Environmental Code of Practice for Measurement and Control of Fugitive VOC Emissions from Equipment Leaks	§ Jurisdictions § Individual refineries	§ Jurisdictions	43%	1%

Table 1. Set of Initial Actions - Phase 1 of the Benzene Canada-Wide Standard (cont'd)

Sector - Chemical Manufacturing						
Component	Instrument	Actions	Responsibility	Reporting Mechanism	Estimated % Reduction	
					% of the component goal	contribution to the 30% goal
Chemical Manufacturing Plants	§ MOU between Environment Canada and the Canadian Chemical Producers Association (CCPA)	§ Ministerial approval of the MOU § Voluntary agreement to reduce plant emissions § CCME Environmental Code of Practice for Measurement and Control of Fugitive VOC Emissions from Equipment Leaks	§ CCPA/ Environment Canada § Jurisdictions	§ CCPA B through MOU with Environment Canada § Environment Canada § Jurisdictions	70%	1%

Table 1. Set of Initial Actions - Phase 1 of the Benzene Canada-Wide Standard (cont'd)

Sector - Steel Manufacturing						
Component	Instrument	Actions	Responsibility	Reporting Mechanism	Estimated % Reduction	
					% of the component goal	contribution to the 30% goal
Steel Mills	§ Environmental Code of Practices for Integrated Steel Producers § Canadian Steel Producers Association (CSPA) Benzene Environmental Best Practice Manual for Coke Producers in Ontario § MOU between Environment Canada and Dofasco	§ Implementations of Best Management Practices	§ Individual Mills	§ Accelerated Reduction / Elimination of Toxics (ARET) Program § National Pollutant Release Inventory (NPRI)	61%	Less than 1%

PART 2: FURTHER REDUCTIONS FROM INITIAL SET OF ACTIONS IN PHASE 1 TO ACHIEVE PHASE 2

Table 2. Estimated Emissions in Kilotonnes Adapted From *Benzene Emissions Inventory for Canada (1990-2010)*

	1995	2000	2010	2010 - 2000
Transportation	31	22	15	-7
Natural Gas Dehydrators	8.7	4	3.6	-0.4
Steel	1.2	0.4	0.1	-0.3
Petroleum Distribution	0.5	0.5		
Petroleum Refining	0.4	0.2	0.2	0
Chemicals	0.4	0.1	0.1	0
Residential Wood	11	11	12	1
Miscellaneous Combustion	4.7	4.8	5.5	0.7
Prescribed Burning	0.5	0.4	0.4	0
Forest Fires	58	27	27	0
total (all)	116.4	70.4	63.9	-6.0
total (no forest fires)	58.4	43.4	36.9	-6.0

The table above estimates further benzene emission reductions of 6.0 kilotonnes from year 2000 to year 2010 (emissions from petroleum distribution in the year 2010 are uncertain). These benzene emission reductions are achieved from Phase 1 initiatives and amount to approximately 10-11% further reductions from 1995 levels.

Benzene emissions from new and expanding facilities will be minimised by the application of best available pollution prevention and control techniques, as applicable in each jurisdiction. The following Best Management Practices and regulations are examples of these pollution prevention and control techniques.

For the Transportation Sector

- The benzene content in gasoline will be limited to a maximum concentration of 1.5% or a yearly pool average of 0.95% by volume, as stated in the Benzene in Gasoline Regulations (SOR/97-493).
- Dispensing flow rates of gasoline and gasoline blends into on-road vehicles will be limited to 38 litres per minute, as stated in the Gasoline and Gasoline Blend Dispensing Flow Rate Regulations (SOR/2000-43).
- On-road vehicles will meet the standards for exhaust, evaporative and refuelling emissions, beginning with the 1998 model year, as described in Schedule V of the Motor Vehicle Safety Act (MVSA).

For the Natural Gas Dehydrators Sector

For existing facilities:

- Benzene emissions from existing glycol dehydrators will be controlled to 9.0 tonnes per year or less by January 1, 1999.
- Benzene emissions from existing glycol dehydrators located within 0.75 km of permanent residences or public facilities will be controlled to 3.0 tonnes/year by January 1, 2001.
- Benzene emissions from existing glycol dehydrators located more than 0.75 km from permanent residences or public facilities will be controlled to 5.0 tonnes/year by January 1, 2001.

For new facilities:

- Glycol dehydrators built after January 1, 1999, will be designed and operated to control benzene emissions to 3.0 tonnes/year or less.

For the Steel Sector

Benzene releases from coke ovens and coke by-product plants used at integrated steel mills should be reduced in accordance with the following:

- to an industry production-based average of 120 g/tonne of coke produced in 2000,
- to a maximum of 71.7 g/tonne of coke produced in 2005, and
- to a maximum of 62.7 g/tonne of coke produced in 2015 and later.

Additional reductions will be achieved through co-benefits realized from control initiatives in other Canada-wide Standards such as PM & Ozone and Dioxins & Furans (see PART 3: DETERMINING AND TRACKING CO-BENEFITS).

PART 3: DETERMINING AND TRACKING CO-BENEFITS

Reduced benzene emissions and improved information on benzene levels and sources in Canada can be achieved through collaboration with other CWS processes. The report on *Technical Options and Costs to Reduce Environmental Releases of Benzene from Selected Sources* concludes that the potential to reduce benzene emissions from industrial sector sources (i.e., steel, petroleum, chemicals) is relatively low and the associated costs of reduction per tonne of benzene are high. The highest potential for reducing emissions lies with two anthropogenic sectors: residential fuelwood combustion and non-gasoline transportation sources. In these sectors, the benefits for reductions of other pollutants (i.e., PM & Ozone and Dioxins & Furans) are greater than those for reductions of benzene. An integrated multi-pollutant approach to reduce emissions from these sectors provides a practical means for achieving the additional benefits of reduced benzene emissions and improved sources of information.

Jurisdictions will track sector-specific reductions in benzene emissions and/or improvements in benzene inventories, monitoring, analysis, and source-emissions-control technologies through collaboration with the PM & Ozone CWS and the Dioxins & Furans CWS. The following table outlines preliminary thinking on co-benefits with other CWSs for a number of benzene-emitting sectors.

Table 3. Key Opportunities for Benzene Co-benefits from Other CWSs.

Sector	CWS Driver	Key Opportunities
Residential Wood Combustion	PM & Ozone CWS and Dioxins & Furans CWS	<ul style="list-style-type: none"> - use and improvement of the CSA published standard - national regulation of RWC through CEPA regulation
Pulp & Paper and Lumber & Allied Wood Products	PM & Ozone CWS and Dioxins & Furans CWS	<ul style="list-style-type: none"> - building knowledge on waste wood combustion (including benzene emissions and other co-benefits) - establishing a formal process, including governments and stakeholders
Transportation	PM & Ozone CWS and Dioxins & Furans CWS	<ul style="list-style-type: none"> - greater efficiency of vehicles and the use of less carbon-intensive fuels - transportation demand management - conversion to alternative modes of transportation - urban planning and development strategies that promote public transit and other less energy intensive transportation options
Steel	PM & Ozone CWS	<ul style="list-style-type: none"> - co-generation possibilities - application of consistent performance standards for relevant emissions

PART 4: MONITORING AND REPORTING

See ANNEX.