APPENDIX D

Air Quality Assessment

Class Environmental Assessment

New East-West Road Corridor (Highway 6 to Brant Street) Air Quality Assessment
Final Report

August 2009

Project No. 08-9020

Submitted by

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Executive Summary

This air quality impact study was undertaken for the proposed new east-west roadway located north of the community of Waterdown, extending from Highway 6 easterly to Brant Street. The new roadway includes a combination of new road sections and the widening of existing road sections (Parkside Drive and Dundas Street). The study was conducted using the following predictive mobile source emission and transportation dispersion models for the existing and future scenarios:

- U.S. EPA model MOBILE 6.2 - Vehicle emission modelling software used for predicting emission factors for various types of vehicles and for different vehicle-related emissions; and,

- U.S. EPA model CAL3QHCR (Lakes Environmental CALRoads View) - designed for modelling dispersion of roadway emissions, including those from idling vehicles queued at intersections.

Maximum concentrations of nitrogen oxides (NOx), carbon monoxide (CO) and fine particulate matter with aerodynamic diameter 2.5 microns and less ($PM_{2.5}$) related to road traffic were estimated at selected existing and potential future receptors that were expected to be most impacted (i.e. closest to the roadway). In order to determine the impact of the proposed road redevelopment, the following three scenarios were modelled:

- *Scenario 1* – Existing 2008 configuration, based on current traffic data;

- *Scenario 2* – Future 2021 "no road-build" option, based on forecasted traffic volumes under the existing roadway configuration. This scenario assumes that anticipated future land development in Waterdown would be in place; and

- *Scenario 3* – Future 2021 Mature State of Development based on forecasted traffic volumes with the proposed new land development and proposed road improvements in place. In generating future traffic volumes for this "future build" scenario, it was assumed that Parkside Drive would be closed at Highway 6. This creates a more conservative scenario for modelling future air quality impacts along the new East-West Road under this scenario.

Modelling was undertaken to predict changes in NOx, CO, and $PM_{2.5}$ concentrations for the various receptor locations under the three scenarios. The air quality modelling work was based on peak hourly PM traffic data forecasts that were generated through the Phase 2 traffic modelling results. Additional traffic modelling work was undertaken to produce traffic data appropriate for use in this study. It is noted that the same traffic volumes would be generated under the future no-build and future build scenarios (it is assumed that the same amount of future development would be in place by 2021). How these scenarios differ though is with respect to how the traffic volumes are distributed to exiting and future roadways.

For the air quality modelling, both free flow traffic on the affected roads and idling traffic at the intersections were considered. In order to estimate the worst-case air quality impacts due to the traffic generated air pollutants, it was assumed that the truck percentages of the peak hourly PM traffic volumes consisted of all heavy trucks (i.e., truck percentages were not broken down into medium and heavy truck volumes). As part of this assessment, the existing (background) ambient air quality data from MOE Station No. 29000 (Hamilton Downtown) were also reviewed and summarized. This data was added to the predicted contaminant concentrations associated with vehicular traffic along the affected roadways in order to derive cumulative contaminant concentrations.

For the receptors selected for the purposes of this assessment, the future build scenario resulted in changes in the predicted air quality that was not considered to be significant when compared to the air quality impacts predicted for the future no-build scenario. It was predicted that NOx concentration levels would change by up to 15 ppb for the future build scenario in comparison to the future no-build scenario. The predicted CO and $PM_{2.5}$ concentrations at the selected receptors would have a negligible change under the future build scenario when compared to the future no-build scenario as concentration changes were less than 1 ppm and 1 $\mu g/m^3$, respectively.

For the future build scenario at the mature state of development, the predicted NOx and CO levels within the study area were below the Ontario Ministry of the Environment's (MOE's) air quality standards for these contaminants. For $PM_{2.5}$ the predicted concentrations were below the Canada Wide Standard (CWS) for this air contaminant. The predicted cumulative NOx concentrations (vehicular + background) within the study area were below the MOE's 1-hour standard of 200 ppb. The maximum predicted cumulative NOx concentration was approximately 68% of the standard. The contribution by vehicular emissions was approximately 43% of the

MOE's 1-hour NOx standard. For CO, the predicted maximum cumulative concentration within the study area was significantly lower, at approximately 13%, than the Ministry's 1-hour standard of 30 ppm. For $PM_{2.5}$, the predicted maximum 24-hour cumulative concentration was approximately 72% of the CWS. It should be noted that the contribution from the vehicular traffic to $PM_{2.5}$ was approximately 5% of the CWS.

Due to concerns expressed by residents regarding the potential for increase use of the road by heavy trucks, a sensitivity analysis was conducted on pollutant concentrations resulting from increasing the volume of heavy-truck traffic along the section of Parkside Drive that is to be improved. For this sensitivity analysis, the impact on the air quality of doubling the heavy truck volumes on the new East-West Road was investigated. This assumption results in heavy truck volumes on the new East-West Road being approximately 9% of the increased peak hourly PM volumes. The impact of doubling the heavy truck volumes on the air quality of the selected receptors was not predicted to be significant. For all the selected receptors along the study route that would be impacted by this increase in heavy truck volumes, a negligible increase in the concentrations of $PM_{2.5}$ and CO were predicted and concentrations of NOx were predicted to increase by a maximum of 2 ppb.

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1. INTRODUCTION

Dillon Consulting Limited has been retained by The City of Hamilton in coordination with the City of Burlington and Halton Region to conduct an air quality impact assessment of the proposed new East-West Road Corridor development. This project has of the following components:

1) A new road way north of Parkside Drive starting at Highway 6 and extending east through the North Waterdown Development, crossing Centre Road and then connecting to Parkside Drive just west of Grindstone Creek;
2) The widening of Parkside Drive from approximately the Grindstone Creek Crossing to a point east of Robson Road;
3) A new north-south connector road between Parkside Drive and Dundas Street; and
4) Widening of Dundas Street East between the new east-west road and Brant Street which will result in the widening of Dundas Street to six lanes.

The following are other roads/segments that will experience changes in traffic volume:

- Parkside Drive west of Hamilton Street North;
- Hamilton Street North north and south of Parkside Drive;
- Centre Road north of Main Street North and Hamilton Street North;
- Evans Road which currently links Parkside Drive (east of Robson Road) to Dundas Street East; and
- Dundas Street East between Pamela Street and Brant Street/Cedar Springs Road.

1.1 Air Quality Assessment Objectives

The objective of this air quality assessment was to consider the impacts of vehicular emissions on the current and future ambient air quality in the vicinity of the proposed new road sections and sections of existing roads to be improved.

1.2 Traffic Related Pollutants

The following pollutants are the key conventional air contaminants associated with vehicular traffic and were assessed for this study.

- Carbon monoxide (CO);
- Oxides of nitrogen (NO_x); and
- Respirable particulate matter ($PM_{2.5}$).

The gaseous emissions (i.e. CO and NO_x) are associated with tailpipe emissions only whereas particulate matter ($PM_{2.5}$) emissions are associated with re-suspension of road dust, vehicular braking and tailpipe emissions.

1.3 Study Area

The study considered the impact on existing and future land uses adjacent to the sections of the proposed new road and existing roads that are to be improved. The 2021 Mature State of Development concept plan which illustrates the scope of the project is presented in *Figure A-1 in Appendix A*.

The new East-West Road Corridor project spans across the municipalities of the City of Hamilton and the City of Burlington/Halton Region. Dundas Street East from Kerns Road to Brant Street/Cedar Springs Road is in the City of Burlington/Halton Region.

There are currently several detached residential dwellings and subdivisions along Parkside Drive from Highway 6 eastward to Evans Road, along Evans Road, and Dundas Street East from Evans Road eastward to Brant Street/Cedar Springs Road. Other land uses along the road corridors include commercial, industrial, institutional, agricultural, open spaces, and conservation areas. One sensitive institution that was considered in this assessment was the Alexander Place nursing home/long-term-care facility located at 329 Parkside Drive opposite the intersection of Victoria Street and Parkside Drive. For the lands surrounding the new sections of the East-West Road, the current land use is primarily agricultural with some residences located along Highway 6 near its intersection with the new East-West Road, and near the intersection with Centre Road, and along Northlawn Avenue.

2. AMBIENT AIR QUALITY

2.1 Air Quality Guidelines

The Ontario Ministry of the Environment (MOE) and the Canadian Council of Ministers of the Environment (CCME) have developed standards for various contaminants, including those that are being considered in this air quality assessment. A summary of the standards is presented in *Table 2.1*.

Table 2.1: Standards for Relevant Air Contaminants (1-hour & 24-hour)

Contaminant	Ministry of the Environment O.Reg. 419/05 Schedule 3 1-hour Standards	Ministry of the Environment O.Reg. 419/05 Schedule 3 24-hour Standards
CO (µg/m^3)	36,200	15,700 (1)
CO (ppm)	30	13 (1)
NO_x (µg/m^3)	400	200
NO_x (ppb)	200	100
$PM_{2.5}$ (µg/m^3)	N/A	30 (2)

Notes: (1) 8-hour carbon monoxide standard
(2) CCME Canada Wide Standard for the fine fraction of Particulate Matter $PM_{2.5}$
N/A – Not applicable; guideline not established

2.2 Air Quality Monitoring

Air quality monitoring is often used to determine ambient pollutant levels, establish trends, and assess the effectiveness of mitigation strategies. The MOE and Environment Canada (EC) own and operate many ambient air quality monitoring stations across Ontario. There are four MOE ambient air quality monitoring stations located within the jurisdictions of the City of Burlington and the City of Hamilton which are: Burlington (Station 44008), Hamilton Downtown (Station 29000), Hamilton Mountain (Station 29114), and Hamilton West (Station 29118). These are the closest air quality monitoring stations to the study area and are all within 12.7 km of the project. Of these, Hamilton Downtown had the most comprehensive data record and a summary of ambient measurements for the year 2007 from this station is presented in *Table 2.2*. The 90th percentile ambient measurements were used in the assessment. This is to ensure a conservative assessment of the existing ambient air quality conditions without the inclusion of unusually high level that may be associated with rare events such as fires upwind of the monitoring stations.

Table 2.2: Summary of Ambient Air Measured Contaminant Concentrations MOE Station No. 29000 (Hamilton Downtown)

Contaminant	Statistic	2007
CO (ppm)	1-hr Max	5.97
	24-hr Max	0.89
	Annual Mean	0.22
	1-hr 90th Percentile	0.45
NOx (ppb)	1-hr Max	258
	24-hr Max	109
	Annual Mean	25
	1-hr 90th Percentile	49
$PM_{2.5}$ ($\mu g/m^3$)	1-hr Max	71
	24-hr Max	45
	Annual Mean	8.9
	24-hr 90th Percentile	20

3. CAL3QHCR INPUT PARAMETERS

This section describes the parameters that were used in the Lakes Environmental Software CALRoads View user interface version of the US EPA CAL3QHCR model. CAL3QHCR is a modelling methodology for predicting criteria air contaminant concentrations along roadways and intersections.

3.1 Scenario 1

Scenario 1 consists of the current road configuration (Highway 6, Parkside Drive, Evans Road, and Dundas Street East) and current traffic conditions. Vehicle emission factors were those determined for the year 2008 using the US EPA vehicular contaminant emission model MOBILE v.6.2.

Road Traffic

Existing traffic volumes for the primary intersections in the study area were obtained from the City of Hamilton, City of Burlington, Region of Halton, and Ministry of Transportation of Ontario. These traffic volumes were used to determine AM and PM peak hour volumes along subject roadway segments. Truck percentages were determined from intersection or 24-hour counts at various intersections on Parkside Drive, Dundas Street East, and Centre Road. For all road segments, the peak PM hourly traffic volume was conservatively used in the model with the volume assumed to be equal in either direction. The peak PM hourly volumes were used in this assessment as they were predicted to be higher than the peak AM volumes. The truck volumes were also conservatively assumed to be consisting of all heavy trucks for the purposes of the air quality impact assessment. *Table 3.1* summarizes the model input traffic data for these road segments.

Table 3.1: Scenario 1 – Current Traffic Volumes (2008)

Road Segment	Posted Speed (km/h)	Road Lanes	AADT (24 hours) (veh./day)	Peak PM hourly traffic (veh./hr)	Heavy vehicle (%)
Highway 6, north of Parkside Drive	60	4	35,000	3,000	12
Highway 6, south of Parkside Drive	50	4	35,000	3,000	12

Table 3.1: Scenario 1 – Current Traffic Volumes (2008)					
Road Segment	**Posted Speed (km/h)**	**Road Lanes**	**AADT (24 hours) (veh./day)**	**Peak PM hourly traffic (veh./hr)**	**Heavy vehicle (%)**
Parkside Drive, Hwy 6 to Hollybush Drive	60	2	6,000	600	5
Parkside Drive, Hollybush Drive to Duncan Avenue	60	2	7,500	700	5
Parkside Drive, Duncan Avenue to Keewaydin Street	50	2	7,500	700	5
Parkside Drive, Keewaydin Street to Hamilton Street North	50	2	9,500	950	5
Parkside Drive, Hamilton Street North to Mill Street	50	2	7,500	950	5
Parkside Drive, Mill Street to Grindstone Creek	60	2	7,500	950	5
Parkside Drive, Grindstone Creek to Robson Road	60	2	8,000	1,000	5
Parkside Drive, Robson Road to Evans Road	60	2	8,000	1,000	5
Evans Road, Parkside Drive to Dundas Street East	60	2	7,500	750	7
Dundas Street East, west of Evans Rd	60	4	21,500	2,000	8
Dundas Street East, Evans Rd to of Kerns Road	60	4	28,000	2,600	8
Dundas Street East, east of Kerns Road	80	4	28,000	2,600	8
Cedar Springs Road, north of Dundas Street East	60	2	5,500	450	4
Brant Street, south of Dundas Street East	60	2	16,000	1,550	5
Hamilton Street North, north of Parkside	60	2	7,500	700	6
Hamilton Street North, south of Parkside	50	2	10,500	1,000	5
Main Street, north of Parkside	50	2	2,500	200	8
Main Street, south of Parkside	50	2	2,500	200	8

There are five (5) traffic signals and three (3) stop signs involved in the study area. The traffic signals are located at the intersections of Parkside Drive and Highway 6, Parkside Drive and Keewaydin, Parkside Drive and Hamilton Street North, Dundas Street East and Evans Road, and Dundas Street East and Brant Street/Cedar Springs Road. The stop signs are located at Parkside Drive and Evans Road, and Main Street and Hamilton Street North. The parameters that were used in the model for the traffic lights and stop sign are summarized in *Table 3.2*.

Table 3.2: Traffic Light Input Parameters – Scenario 1 and 2

Intersection	Direction	Average signal cycle length (s)	Average red time length (s)	Clearance lost time (s)	Saturation flow rate (veh./hr/lane)
Highway 6 and Parkside Drive	North/ South	70	35	2	1600
	East/ West	70	35	2	1600
Keewaydin Street and Parkside Drive	East/ West	70	25	2	1600
Hamilton Street North and Parkside Drive	North/ South	70	35	2	1600
	East/ West	70	35	2	1600
Evans Road and Dundas Street East	North/ South	80	54	2	1600
	East/ West	80	26	2	1600
Cedar Springs Road/ Brant Street and Dundas Street East	North/ South	120	78	2	1600
	East/ West	120	42	2	1600

The parameters that were used in the model for the intersections with stop signs are summarized in *Table 3.3*.

Table 3.3: Intersection with Stop Signs Input Parameters – Scenario 1 and 2					
Intersection	**Direction**	**Average cycle length (s)**	**Average stop time length (s)**	**Clearance lost time (s)**	**Saturation flow rate (veh./hr/lane)**
Evans Road and Parkside Drive	East turning South	Through traffic	Through traffic	Through traffic	1600
	North turning West	70	25	2	1600
Hamilton Street North and Main Street	North/ South	Through traffic	Through traffic	Through traffic	1600
	East/ West	70	25	2	1600
Main Street and Dundas Street East	North/ South	70	25	2	1600
	East/ West	Through traffic	Through traffic	Through traffic	1600

Vehicular Emissions

Vehicular emissions factors for relevant contaminants for the year 2008 were generated for free flow and idling traffic using the U.S. EPA vehicular emission prediction model, MOBILE6.2. This model produces emission factors in grammes per vehicle-mile travelled (g/VMT) for Carbon Monoxide (CO), Nitrogen Oxides (NO_x), and Particulate Matter ($PM_{2.5}$) under various conditions such as travel speed and vehicle class (EPA, 2003). Emission factors were determined for free flow speeds of 50 km/h, 60 km/h and 80 km/h. Since the model does not predict emission factors for vehicles at a stand-still, the emission factors for idling vehicles were estimated for a speed of 4 km/h, the lowest speed for which MOBILE6.2 will produce emission factors. The emission factors obtained for 4 km/h were then converted from g/VMT to grammes per vehicle per hour (g/veh-hr) by assuming that 4 kilometres are travelled in an hour. The MOBILE6.2 model output files are provided in *Appendix B*.

The emission factors that were predicted by MOBILE6.2 for the various road segments involved are presented in *Table 3.4*.

Table 3.4: Emission Factors for the Road Segments – Scenario 1							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Highway 6, north of Parkside Drive	NO_x	60	0.715	3.194	88	12	1.012
	CO		14.630	10.240			14.10
	$PM_{2.5}$		0.011	0.053			0.016
Highway 6, south of Parkside Drive	NO_x	50	0.722	3.042	88	12	1.000
	CO		14.310	11.760			14.00
	$PM_{2.5}$		0.011	0.053			0.016
Parkside Drive, Highway 6 to Hollybush Drive	NO_x	60	0.715	3.194	95	5	0.839
	CO		14.630	10.240			14.41
	$PM_{2.5}$		0.011	0.053			0.013
Parkside Drive, Hollybush Drive to Duncan Avenue	NO_x	60	0.715	3.194	95	5	0.839
	CO		14.630	10.240			14.41
	$PM_{2.5}$		0.011	0.053			0.013
Parkside Drive, Duncan Avenue to Keewaydin Street	NO_x	50	0.722	3.042	95	5	0.838
	CO		14.310	11.760			14.18
	$PM_{2.5}$		0.011	0.053			0.013

Table 3.4: Emission Factors for the Road Segments – Scenario 1							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Parkside Drive, Keewaydin Street to Hamilton Street North	NO_x	50	0.722	3.042	95	5	0.838
	CO		14.310	11.760			14.18
	$PM_{2.5}$		0.011	0.053			0.013
Parkside Drive, Hamilton Street North to Mill Street	NO_x	50	0.722	3.042	95	5	0.838
	CO		14.310	11.760			14.18
	$PM_{2.5}$		0.011	0.053			0.013
Parkside Drive, Mill Street to Grindstone Creek	NO_x	60	0.715	3.194	95	5	0.839
	CO		14.630	10.240			14.41
	$PM_{2.5}$		0.011	0.053			0.013
Parkside Drive, Grindstone Creek to Robson Road	NO_x	60	0.715	3.194	95	5	0.839
	CO		14.630	10.240			14.41
	$PM_{2.5}$		0.011	0.053			0.013
Parkside Drive, Robson Road To Evans Road	NO_x	60	0.715	3.194	95	5	0.839
	CO		14.630	10.240			14.41
	$PM_{2.5}$		0.011	0.053			0.013
Evans Road, Parkside Drive to Dundas Street East	NO_x	60	0.715	3.194	93	7	0.889
	CO		14.630	10.240			14.32
	$PM_{2.5}$		0.011	0.053			0.014

Table 3.4: Emission Factors for the Road Segments – Scenario 1							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Dundas Street East, west of Evans Road	NO_x	60	0.715	3.194	92	8	0.913
	CO		14.630	10.240			14.28
	$PM_{2.5}$		0.011	0.053			0.015
Dundas Street East, Evans Road to Kerns Road	NO_x	60	0.715	3.194	92	8	0.913
	CO		14.630	10.240			14.28
	$PM_{2.5}$		0.011	0.053			0.015
Dundas Street East, east of Kerns Road	NO_x	80	0.747	3.493	92	8	0.966
	CO		15.910	9.915			15.43
	$PM_{2.5}$		0.011	0.053			0.015
Cedar Springs Road, north of Dundas Street East	NO_x	60	0.715	3.194	96	4	0.814
	CO		14.630	10.240			14.45
	$PM_{2.5}$		0.011	0.053			0.013
Brant Street, south of Dundas Street East	NO_x	60	0.715	3.194	95	5	0.839
	CO		14.630	10.240			14.41
	$PM_{2.5}$		0.011	0.053			0.013
Hamilton Street North, north of Parkside	NO_x	60	0.715	3.194	94	6	0.864
	CO		14.630	10.240			14.37
	$PM_{2.5}$		0.011	0.053			0.014

Table 3.4: Emission Factors for the Road Segments – Scenario 1							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Hamilton Street North, south of Parkside	NO_x	50	0.722	3.042	95	5	0.838
	CO		14.310	11.760			14.18
	$PM_{2.5}$		0.011	0.053			0.013
Main Street, north of Parkside	NO_x	50	0.722	3.042	92	8	0.907
	CO		14.310	11.760			14.11
	$PM_{2.5}$		0.011	0.053			0.015
Main Street, south of Parkside	NO_x	50	0.722	3.042	92	8	0.907
	CO		14.310	11.760			14.11
	$PM_{2.5}$		0.011	0.053			0.015

The emission factors that were predicted by MOBILE6.2 for idling vehicles at the various intersections involved are presented in *Table 3.5.*

Table 3.5: Emission Factors for Vehicles Idling at the Intersections – Scenario 1

Intersection	Vehicles Idling On	Contaminant	Emission Factor (g/VMT)		Vehicle breakdown (%)		Average Emission Factor (g/veh-hr)
			Light Duty Vehicle (LDV)	Heavy Duty Vehicle (HDV)	Light Duty Vehicle (LDV)	Heavy Duty Vehicle (HDV)	
Highway 6 and Parkside Drive	Parkside Drive	NO_x	1.460	2.342	95	5	3.737
		CO	41.295	67.205			105.863
		$PM_{2.5}$	0.012	0.053			0.034
Highway 6 and Parkside Drive	Highway 6	NO_x	1.460	2.342	88	12	3.891
		CO	41.295	67.205			110.371
		$PM_{2.5}$	0.012	0.053			0.041
Parkside Drive and Keewaydin Street	Parkside Drive	NO_x	1.460	2.342	95	5	3.737
		CO	41.295	67.205			105.863
		$PM_{2.5}$	0.012	0.053			0.034
Parkside Drive and Hamilton Street North	Parkside Drive	NO_x	1.460	2.342	95	5	3.737
		CO	41.295	67.205			105.863
		$PM_{2.5}$	0.012	0.053			0.034
Parkside Drive and Hamilton Street North	Hamilton Street North, south of Parkside	NO_x	1.460	2.342	95	5	3.737
		CO	41.295	67.205			105.863
		$PM_{2.5}$	0.012	0.053			0.034

Table 3.5: Emission Factors for Vehicles Idling at the Intersections – Scenario 1

Intersection	Vehicles Idling On	Contaminant	Emission Factor (g/VMT)		Vehicle breakdown (%)		Average Emission Factor (g/veh-hr)
			Light Duty Vehicle (LDV)	Heavy Duty Vehicle (HDV)	Light Duty Vehicle (LDV)	Heavy Duty Vehicle (HDV)	
Parkside Drive and Hamilton Street North	Hamilton Street North, North of Parkside	NO_x	1.460	2.342	94	6	3.759
		CO	41.295	67.205			106.507
		$PM_{2.5}$	0.012	0.053			0.035
Main Street North and Hamilton Street North	Main Street North	NO_x	1.460	2.342	92	8	3.803
		CO	41.295	67.205			107.795
		$PM_{2.5}$	0.012	0.053			0.037
Main Street North and Parkside Drive	Parkside Drive	NO_x	1.460	2.342	95	5	3.737
		CO	41.295	67.205			105.863
		$PM_{2.5}$	0.012	0.053			0.034
Parkside Drive and Evans Road	Evans Road	NO_x	1.460	2.342	93	7	3.737
		CO	41.295	67.205			105.863
		$PM_{2.5}$	0.012	0.053			0.034
Evans Road and Dundas Street East	Evans Road	NO_x	1.460	2.342	93	7	3.737
		CO	41.295	67.205			105.863
		$PM_{2.5}$	0.012	0.053			0.034
Evans Road and Dundas Street East	Dundas Street East	NO_x	1.460	2.342	92	8	3.803
		CO	41.295	67.205			107.795
		$PM_{2.5}$	0.012	0.053			0.037

Table 3.5: Emission Factors for Vehicles Idling at the Intersections – Scenario 1							
Intersection	**Vehicles Idling On**	**Contaminant**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/veh-hr)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Dundas Street East and Brant Street/ Cedar Springs Road	Dundas Street East	NO_x	1.460	2.342	92	8	3.803
		CO	41.295	67.205			107.795
		$PM_{2.5}$	0.012	0.053			0.037
Dundas Street East and Brant Street/ Cedar Springs Road	Brant Street	NO_x	1.460	2.342	95	5	3.737
		CO	41.295	67.205			105.863
		$PM_{2.5}$	0.012	0.053			0.034
Dundas Street East and Brant Street/ Cedar Springs Road	Cedar Springs	NO_x	1.460	2.342	96	4	3.715
		CO	41.295	67.205			105.219
		$PM_{2.5}$	0.012	0.053			0.033

3.2 Scenario 2 – Future 2021 No-Build

Scenario 2 consists of the current road configuration (Highway 6, Parkside Drive, Evans Road, and Dundas Street East) and 2021 traffic conditions. Vehicle emission factors were those determined for the year 2021 using the US EPA vehicular contaminant emission model MOBILE v.6.2. Under Scenario 2 it was assumed that future land development would be in place by 2021 in the Waterdown area and a corresponding increase in traffic volumes (on the existing road network) would result.

Road Traffic

Estimates of future traffic volumes under the “no-build” road network scenario (Scenario 2) and the “future build” road network scenario (Scenario 3) were obtained from traffic modelling undertaken as part of the WATMP Phase 1 and 2. Additional traffic modelling work was undertaken to produce traffic data appropriate for use in an air quality study. This modelling provided projections for AM peak hour traffic volumes at the 2021 horizon based on anticipated future development levels. PM peak hour volumes and AADT volumes were then estimated assuming a similar hourly distribution as under existing conditions.

It was assumed that all road laneway configurations, traffic controls, truck volume fractions, and speed limits for the above study roads would remain the same in 2021 but with the changed hourly peak and AADT volumes. The peak PM hourly volumes were used in this assessment as they were predicted to be higher than the peak AM volumes. It should be noted that truck volumes were conservatively assumed to be all consisting of heavy trucks for the purposes of the air quality assessment. *Table 3.6* summarizes the model input traffic data for these road segments.

Table 3.6: Scenario 2 – Future Traffic Volumes (2021)

Road Segment	Posted Speed (km/h)	Road Lanes	AADT (24 hours) (veh./day)	Peak PM hourly traffic (veh./hr)	Heavy vehicle (%)
Highway 6, north of Parkside Drive	60	4	42000	3600	12
Highway 6, south of Parkside Drive	50	4	42000	3600	12
Parkside Drive, Hwy 6 to Hollybush Drive	60	2	15000	1550	5
Parkside Drive, Hollybush Drive to Duncan Avenue	60	2	17000	1700	5
Parkside Drive, Duncan Avenue to Keewaydin Street	50	2	17000	1700	5
Parkside Drive, Keewaydin Street to Hamilton Street North	50	2	17500	1750	5
Parkside Drive, Hamilton Street North to Mill Street	50	2	17000	2050	5
Parkside Drive, Mill Street to Grindstone Creek	60	2	17000	2050	5
Parkside Drive, Grindstone Creek to Robson Road	60	2	14500	1750	5
Parkside Drive, Robson Road to Evans Road	60	2	14500	1750	5
Evans Road, Parkside Drive to Dundas Street East	60	2	13500	1650	7

Table 3.6: Scenario 2 – Future Traffic Volumes (2021)					
Road Segment	**Posted Speed (km/h)**	**Road Lanes**	**AADT (24 hours) (veh./day)**	**Peak PM hourly traffic (veh./hr)**	**Heavy vehicle (%)**
Dundas Street East, west of Evans Rd	60	4	33,000	2,950	8
Dundas Street East, Evans Rd to of Kerns Road	60	4	34,500	3,250	8
Dundas Street East, east of Kerns Road	80	4	34,500	3,250	8
Cedar Springs Road, north of Dundas Street East	60	2	8,000	750	4
Brant Street, south of Dundas Street East	60	2	17,500	1,650	5
Hamilton Street North, north of Parkside	60	2	10,000	950	6
Hamilton Street North, south of Parkside	50	2	14,500	1,350	5
Main Street, north of Parkside	50	2	3,000	250	8
Main Street, south of Parkside	50	2	3,000	250	8

The parameters that were used in the model for the traffic lights and intersections with stop signs are summarized in *Table 3.2* and *Table 3.3* above.

Vehicular Emissions

Vehicular emissions factors for relevant contaminants for the year 2021 were generated for free flow and idling traffic using the U.S. EPA vehicular emission prediction model, MOBILE6.2. These emission factors on a g/VMT bases were used in both Scenario 2 and Scenario 3. It should be noted that due to improvements in vehicular emissions by year 2021, the emission factors of the various tail-pipe pollutants for future years are typically lower than the current emission rates. The same approach as described in *Section 3.1* above was used in the prediction of emission factors. The MOBILE6.2 model output files for year 2021 are provided in *Appendix B*. The emission factors that were predicted by MOBILE6.2 for the various road segments involved are presented in *Table 3.7.*

Table 3.7: Emission Factors for the Road Segments – Scenario 2							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Highway 6, north of Parkside Drive	NO_x	60	0.261	0.562	88	12	0.297
	CO		10.44	6.195			9.931
	$PM_{2.5}$		0.011	0.021			0.012
Highway 6, south of Parkside Drive	NO_x	50	0.264	0.535	88	12	0.296
	CO		10.26	7.115			9.878
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Highway 6 to Hollybush Drive	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.44	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Hollybush Drive to Duncan Avenue	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.44	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Duncan Avenue to Keewaydin Street	NO_x	50	0.264	0.535	95	5	0.277
	CO		10.26	7.115			10.10
	$PM_{2.5}$		0.011	0.021			0.012

Table 3.7: Emission Factors for the Road Segments – Scenario 2							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Parkside Drive, Keewaydin Street to Hamilton Street North	NO_x	50	0.264	0.535	95	5	0.277
	CO		10.26	7.115			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Hamilton Street North to Mill Street	NO_x	50	0.264	0.535	95	5	0.277
	CO		10.26	7.115			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Mill Street to Grindstone Creek	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.44	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Grindstone Creek to Robson Road	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.44	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Robson Road To Evans Road	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.44	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012

Table 3.7: Emission Factors for the Road Segments – Scenario 2

Road Segment	Contaminant	Vehicle speed (km/h)	Emission Factor (g/VMT)		Vehicle breakdown (%)		Average Emission Factor (g/VMT)
			Light Duty Vehicle (LDV)	Heavy Duty Vehicle (HDV)	Light Duty Vehicle (LDV)	Heavy Duty Vehicle (HDV)	
Evans Road, Parkside Drive to Dundas Street East	NO_x	60	0.261	0.562	93	7	0.282
	CO		10.44	6.195			10.14
	$PM_{2.5}$		0.011	0.021			0.012
Dundas Street East, west of Evans Road	NO_x	60	0.261	0.562	92	8	0.285
	CO		10.44	6.195			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Dundas Street East, Evans Road to Kerns Road	NO_x	60	0.261	0.562	92	8	0.285
	CO		10.44	6.195			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Dundas Street East, east of Kerns Road	NO_x	80	0.272	0.615	92	8	0.299
	CO		11.275	6.000			10.85
	$PM_{2.5}$		0.011	0.021			0.012
Cedar Springs Road, north of Dundas Street East	NO_x	60	0.261	0.562	96	4	0.273
	CO		10.44	6.195			10.27
	$PM_{2.5}$		0.011	0.021			0.012
Brant Street, south of Dundas Street East	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.44	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012

Table 3.7: Emission Factors for the Road Segments – Scenario 2							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Hamilton Street North, north of Parkside	NO_x	60	0.261	0.562	94	6	0.279
	CO		10.44	6.195			10.19
	$PM_{2.5}$		0.011	0.021			0.012
Hamilton Street North, south of Parkside	NO_x	50	0.264	0.535	95	5	0.277
	CO		10.26	7.115			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Main Street, north of Parkside	NO_x	50	0.264	0.535	92	8	0.285
	CO		10.26	7.115			10.00
	$PM_{2.5}$		0.011	0.021			0.012
Main Street, south of Parkside	NO_x	50	0.264	0.535	92	8	0.285
	CO		10.26	7.115			10.00
	$PM_{2.5}$		0.011	0.021			0.012

The emission factors that were predicted by MOBILE6.2 for idling vehicles at the various intersections involved are presented in *Table 3.8.*

Table 3.8: Emission Factors for Vehicles Idling at the Intersections – Scenario 2

Intersection	Vehicles Idling On	Contaminant	Emission Factor (g/VMT)		Vehicle breakdown (%)		Average Emission Factor (g/veh-hr)
			Light Duty Vehicle (LDV)	Heavy Duty Vehicle (HDV)	Light Duty Vehicle (LDV)	Heavy Duty Vehicle (HDV)	
Highway 6 and Parkside Drive	Parkside Drive	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Highway 6 and Parkside Drive	Highway 6	NO_x	0.544	0.412	88	12	1.313
		CO	27.60	40.66			72.49
		$PM_{2.5}$	0.011	0.021			0.031
Parkside Drive and Keewaydin Street	Parkside Drive	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Parkside Drive and Hamilton Street North	Parkside Drive	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Parkside Drive and Hamilton Street North	Hamilton Street North, south of Parkside	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029

Table 3.8: Emission Factors for Vehicles Idling at the Intersections – Scenario 2							
Intersection	**Vehicles Idling On**	**Contaminant**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/veh-hr)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Parkside Drive and Hamilton Street North	Hamilton Street North, North of Parkside	NO_x	0.544	0.412	94	6	1.332
		CO	27.60	40.66			70.54
		$PM_{2.5}$	0.011	0.021			0.029
Main Street North and Hamilton Street North	Main Street North	NO_x	0.544	0.412	92	8	1.326
		CO	27.60	40.66			71.19
		$PM_{2.5}$	0.011	0.021			0.030
Main Street North and Parkside Drive	Parkside Drive	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Parkside Drive and Evans Road	Evans Road	NO_x	0.544	0.412	93	7	1.329
		CO	27.60	40.66			70.86
		$PM_{2.5}$	0.011	0.021			0.030
Evans Road and Dundas Street East	Evans Road	NO_x	0.544	0.412	93	7	1.329
		CO	27.60	40.66			70.86
		$PM_{2.5}$	0.011	0.021			0.030
Evans Road and Dundas Street East	Dundas Street East	NO_x	0.544	0.412	92	8	1.326
		CO	27.60	40.66			71.19
		$PM_{2.5}$	0.011	0.021			0.030

Table 3.8: Emission Factors for Vehicles Idling at the Intersections – Scenario 2							
Intersection	**Vehicles Idling On**	**Contaminant**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/veh-hr)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Dundas Street East and Brant Street/ Cedar Springs Road	Dundas Street East	NO_x	0.544	0.412	92	8	1.326
		CO	27.60	40.66			71.19
		$PM_{2.5}$	0.011	0.021			0.030
Dundas Street East and Brant Street/ Cedar Springs Road	Brant Street	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Dundas Street East and Brant Street/ Cedar Springs Road	Cedar Springs	NO_x	0.544	0.412	96	4	1.339
		CO	27.60	40.66			69.89
		$PM_{2.5}$	0.011	0.021			0.029

3.3 Scenario 3 – Future 2021 Mature State of Development

Scenario 3 entails the construction of a new road way starting at Highway 6 and extending east through the North Waterdown Development, crossing Centre Road and then connecting to Parkside Drive. Parkside Drive will be widened to 4 lanes between the new road's intersection (near Grindstone Creek) and a new north-south connector road linking Parkside Drive to Dundas Street East along the east boundary of the Upcountry development area. Dundas Street East will be widened to seven lanes (which included a centre turning lane) from the intersection of the new connector road to Brant Street/Cedar Springs Road.

The urban segment along the new East-West Road (Waterdown North urban development area) and Parkside Drive will have a speed limit of 50 km/h, while the speed limit for the rural segments will be at 60 km/h. The widened segment of Dundas Street East will have a speed limit of 60 km/h. Dundas Street East currently has posted speed limits of 60 km/h from Pamela Street to Kerns Road and 80 km/h from Kerns Road to Brant Street/Cedar Springs Road. The project also assumed the closure of the Parkside Drive access to Highway 6 resulting in reduced traffic volumes along Parkside Drive. Vehicle emission factors were those determined for the year 2021 using MOBILE6.2.

Road Traffic

Traffic volumes would increase in Scenario 3 when compared to the 2021 no-build Scenario 2 for the new East-West Road and the redeveloped Dundas Street East. Volumes would decrease for the segment of Parkside Drive from Highway 6 to the new road intersection, for the Parkside Drive segment east of the new north-south road linking Parkside Drive with Dundas Street East, and for Evans Road. This assumption would represent the worst-case scenario for the air quality impact assessment along the new East-West Road. The projected changes in volumes were based on traffic modelling undertaken as part of the WATMP Phase 1 and 2. Additional traffic modelling work was undertaken to produce traffic data appropriate for use in this study. *Table 3.9* summarises the traffic data for the future mature state of development scenario (Scenario 3); the table also includes the traffic volumes, in parentheses, if the access of Parkside Drive to Highway 6 were to remain open. The peak PM hourly volumes were conservatively used in this assessment as they were predicted to be higher than the peak AM volumes.

Table 3.9: Scenario 3 – Future Traffic Volumes (2021)

Road Segment	Posted Speed (km/h)	Road Lanes	AADT (24 hours) (veh./day)	Peak PM hourly traffic (veh./hr)	Heavy vehicle (%)
Highway 6, north of New East-West Rd	60	4	42000 (42000)	3600 (3600)	12
Highway 6, south of New East-West Rd	60	4	42000 (42000)	3600 (3600)	12
Parkside Drive, Highway 6 to edge of subdivision	60	2	0 (10000)	0 (1000)	5
Parkside Drive, edge of subdivision to Duncan Avenue	60	2	7500 (11500)	750 (1150)	5

Table 3.9: Scenario 3 – Future Traffic Volumes (2021)					
Road Segment	**Posted Speed (km/h)**	**Road Lanes**	**AADT (24 hours) (veh./day)**	**Peak PM hourly traffic (veh./hr)**	**Heavy vehicle (%)**
Parkside Drive, Duncan Avenue to Keewaydin Street	50	2	7500 (11500)	750 (1150)	5
Parkside Drive, Keewaydin Street to Hamilton Street North	50	2	13500 (13000)	1350 (1300)	5
Parkside Drive, Hamilton Street North to Mill Street	50	2	11000 (11500)	1350 (1350)	5
Parkside Drive, Mill Street to New East-West Rd interchange	60	2	11000 (11500)	1350 (1350)	5
Parkside Drive, New East-West Rd interchange to new north-south link	60	4	14500 (14500)	1750 (1750)	5
Parkside Drive, new north-south link to Evans Road	60	4	4000 (4000)	450 (450)	7
New north-south link, Parkside drive to Dundas Street East	60	4	11000 (11000)	1300 (1300)	7
Evans Road, Parkside Drive to Dundas Street East	60	2	2500 (2500)	350 (350)	7
Dundas Street East, west of new north-south link	60	4	28000 (28000)	2700 (2700)	8
Dundas Street East, new north-south link to Brant Street/Cedar Springs Road	60	4	42000 (42000)	3450 (3450)	8
Cedar Springs Road, north of Dundas Street East	60	4	8000 (8000)	750 (750)	4
Brant Street, south of Dundas Street East	60	4	17500 (17500)	1650 (1650)	5
New East-West Rd, Highway 6 to Waterdown North subdivision	60	4	10000 (5500)	1250 (650)	5
New East-West Rd, Waterdown North subdivision to Centre St	50	4	10000 (5500)	1250 (650)	5
New East-West Rd, Centre St to Parkside Drive	60	4	6000 (6000)	750 (700)	5
Centre St, north of New East-West Rd	60	1	13500 (13500)	1200 (1200)	7
Hamilton Street North, New East-West Rd to Parkside Drive	60	1	10500 (10500)	950 (950)	7

Table 3.9: Scenario 3 – Future Traffic Volumes (2021)					
Road Segment	**Posted Speed (km/h)**	**Road Lanes**	**AADT (24 hours) (veh./day)**	**Peak PM hourly traffic (veh./hr)**	**Heavy vehicle (%)**
Hamilton Street North, south of Parkside Drive	50	1	15000 (15000)	1350 (1350)	5

Notes: Indicated volumes include both directions.
Volumes as a result of Parkside Drive remaining open to Highway 6 are given in parentheses.

There are eight (8) traffic signals and four (4) stop signs involved in the study area. The traffic signals are located at the intersections of Highway 6 and the New East-West Road corridor, Keewaydin and Parkside Drive, Hamilton Street North and Parkside Drive, Hamilton Street North and the New East-West Road corridor, the new north-south link and Dundas Street East, the New East-West Road corridor and Parkside Drive, Dundas Street East and Evans Road and Dundas Street East and Brant Street/ Cedar Springs Road. The stop signs are located at Parkside Drive and Evans Road, the new north-south link and Parkside Drive, Main Street and Parkside Drive, and Main Street and Hamilton Street North. The parameters that were used in the model for the traffic lights are summarized in *Table 3.10*.

Table 3.10: Traffic Light Input Parameters – Scenario 3					
Intersection	**Direction**	**Average signal cycle length (s)**	**Average red time length (s)**	**Clearance lost time (s)**	**Saturation flow rate (veh./hr/lane)**
Highway 6 and New East-West corridor	North/ South	70	35	2	1600
	East/ West	70	35	2	1600
Keewaydin Street and Parkside Drive	East/ West	70	25	2	1600
Hamilton Street North and Parkside Drive	North/ South	70	35	2	1600
	East/ West	70	35	2	1600

Table 3.10: Traffic Light Input Parameters – Scenario 3					
Intersection	**Direction**	**Average signal cycle length (s)**	**Average red time length (s)**	**Clearance lost time (s)**	**Saturation flow rate (veh./hr/lane)**
Hamilton Street North and New East-West corridor	North/ South	70	35	2	1600
	East/ West	70	35	2	1600
New north-south link and Dundas Street East	North/ South	80	54	2	1600
	East/ West	80	26	2	1600
New East-West corridor and Parkside Drive	North/ South	70	35	2	1600
	East/ West	70	35	2	1600
Evans Road and Dundas Street East	North/ South	80	54	2	1600
	East/ West	80	26	2	1600
Cedar Springs Road/ Brant Street and Dundas Street East	North/ South	120	78	2	1600
	East/ West	120	42	2	1600

The parameters that were used in the model for the intersections with stop signs are summarized in *Table 3.11*.

Table 3.11: Intersection with Stop Sign Input Parameters – Scenario 3					
Intersection	**Direction**	**Average cycle length (s)**	**Average stop time length (s)**	**Clearance lost time (s)**	**Saturation flow rate (veh./hr/lane)**
Evans Road and Parkside Drive	East turning South	Through traffic	Through traffic	Through traffic	1600
	North turning West	70	25	2	1600
New north-south link and Parkside Drive	East turning South	Through traffic	Through traffic	Through traffic	1600
	West bound at new north-south link	70	25	2	1600

Table 3.11: Intersection with Stop Sign Input Parameters – Scenario 3					
Intersection	**Direction**	**Average cycle length (s)**	**Average stop time length (s)**	**Clearance lost time (s)**	**Saturation flow rate (veh./hr/lane)**
Hamilton Street North and Main Street	North/ South	Through traffic	Through traffic	Through traffic	1600
	East/ West	70	25	2	1600
Main Street and Dundas Street East	North/ South	70	25	2	1600
	East/ West	Through traffic	Through traffic	Through traffic	1600

Vehicular Emissions

The emission factors that were predicted by MOBILE6.2 for the various road segments involved are presented in *Table 3.12* for free flowing traffic and *Table 3.13* for idling traffic. The MOBILE6.2 model output files are provided in *Appendix B*.

Table 3.12: Emission Factors for the Road Segments – Scenario 3							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Highway 6, north of new east-west corridor	NO_x	60	0.261	0.562	88	12	0.297
	CO		10.440	6.195			9.931
	$PM_{2.5}$		0.011	0.021			0.012
Highway 6, south of new east-west corridor	NO_x	60	0.261	0.562	88	12	0.297
	CO		10.440	6.195			9.931
	$PM_{2.5}$		0.011	0.021			0.012

Table 3.12: Emission Factors for the Road Segments – Scenario 3							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Parkside Drive, edge of subdivision to Duncan Avenue	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.440	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Duncan Avenue to Keewaydin Street	NO_x	50	0.264	0.535	95	5	0.277
	CO		10.26	7.115			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Keewaydin Street to Hamilton Street North	NO_x	50	0.264	0.535	95	5	0.277
	CO		10.26	7.115			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Hamilton Street North to Mill Street	NO_x	50	0.264	0.535	95	5	0.277
	CO		10.26	7.115			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Mill Street to Grindstone Creek	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.440	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012
Parkside Drive, Grindstone Creek to new north-south link	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.440	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012

Table 3.12: Emission Factors for the Road Segments – Scenario 3							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Parkside Drive, new north-south link To Evans Road	NO_x	60	0.261	0.562	93	7	0.282
	CO		10.440	6.195			10.14
	$PM_{2.5}$		0.011	0.021			0.012
New north-south link, Parkside drive to Dundas Street East	NO_x	60	0.261	0.562	93	7	0.282
	CO		10.440	6.195			10.14
	$PM_{2.5}$		0.011	0.021			0.012
Evans Road, Parkside Drive to Dundas Street East	NO_x	60	0.261	0.562	93	7	0.282
	CO		10.440	6.195			10.14
	$PM_{2.5}$		0.011	0.021			0.012
Dundas Street East, west of new north-south link	NO_x	60	0.261	0.562	92	8	0.285
	CO		10.440	6.195			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Dundas Street East, new north-south link to Brant Street/ Cedar Springs Road	NO_x	60	0.261	0.562	92	8	0.285
	CO		10.440	6.195			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Cedar Springs Road, north of Dundas Street East	NO_x	60	0.261	0.562	96	4	0.273
	CO		10.440	6.195			10.27
	$PM_{2.5}$		0.011	0.021			0.012

Table 3.12: Emission Factors for the Road Segments – Scenario 3							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Brant Street, south of Dundas Street East	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.440	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012
New east-west corridor, Highway 6 to subdivision	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.440	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012
New east-west corridor, subdivision to Hamilton Street North	NO_x	50	0.264	0.535	95	5	0.276
	CO		10.255	7.115			10.23
	$PM_{2.5}$		0.011	0.021			0.012
New east-west corridor, Hamilton Street North to Parkside Drive	NO_x	60	0.261	0.562	95	5	0.276
	CO		10.440	6.195			10.23
	$PM_{2.5}$		0.011	0.021			0.012
Centre Street, north of new east-west corridor	NO_x	60	0.261	0.562	93	7	0.282
	CO		10.440	6.195			10.14
	$PM_{2.5}$		0.011	0.021			0.012
Hamilton Street North, new east-west corridor to Parkside Drive	NO_x	60	0.261	0.562	93	7	0.282
	CO		10.440	6.195			10.14
	$PM_{2.5}$		0.011	0.021			0.012

Table 3.12: Emission Factors for the Road Segments – Scenario 3							
Road Segment	**Contaminant**	**Vehicle speed (km/h)**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/VMT)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Hamilton Street North, south of Parkside Drive	NO_x	50	0.264	0.535	95	5	0.277
	CO		10.255	7.115			10.10
	$PM_{2.5}$		0.011	0.021			0.012
Main Street	NO_x	50	0.264	0.535	99	1	0.264
	CO		10.255	7.115			10.398
	$PM_{2.5}$		0.011	0.021			0.011

Table 3.13: Emission Factors for Vehicles Idling at the Intersections – Scenario 3							
Intersection	**Vehicles Idling On**	**Contaminant**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/veh-hr)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Highway 6 and New east-west corridor	New east-west corridor	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Highway 6 and New east-west corridor	Highway 6	NO_x	0.544	0.412	88	12	1.313
		CO	27.60	40.66			72.49
		$PM_{2.5}$	0.011	0.021			0.031
Parkside Drive and Keewaydin Street	Parkside Drive	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Parkside Drive and Hamilton Street North	Parkside Drive	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Parkside Drive and Hamilton Street North	Hamilton Street North, south of Parkside	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029

Table 3.13: Emission Factors for Vehicles Idling at the Intersections – Scenario 3							
Intersection	**Vehicles Idling On**	**Contaminant**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/veh-hr)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Parkside Drive and Hamilton Street North	Hamilton Street North, North of Parkside	NO_x	0.544	0.412	93	7	1.329
		CO	27.60	40.66			70.86
		$PM_{2.5}$	0.011	0.021			0.030
New east-west corridor and Hamilton Street North	New east-west corridor	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
New east-west corridor and Hamilton Street North	Hamilton Street North	NO_x	0.544	0.412	93	7	1.329
		CO	27.60	40.66			70.86
		$PM_{2.5}$	0.011	0.021			0.030
Main Street North and Hamilton Street North	Main Street North	NO_x	0.544	0.412	99	1	1.349
		CO	27.60	40.66			68.915
		$PM_{2.5}$	0.011	0.021			0.028
Main Street North and Parkside Drive	Parkside Drive	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
New east-west corridor and Parkside Drive	Parkside Drive	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029

Table 3.13: Emission Factors for Vehicles Idling at the Intersections – Scenario 3							
Intersection	**Vehicles Idling On**	**Contaminant**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/veh-hr)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
New east-west corridor and Parkside Drive	New east-west corridor	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Parkside Drive and New north-south link	Parkside Drive, idling westbound	NO_x	0.544	0.412	93	7	1.329
		CO	27.60	40.66			70.86
		$PM_{2.5}$	0.011	0.021			0.030
Parkside Drive and New north-south link	New north-south link	NO_x	0.544	0.412	93	7	1.329
		CO	27.60	40.66			70.86
		$PM_{2.5}$	0.011	0.021			0.030
Parkside Drive and Evans Road	Evans Road	NO_x	0.544	0.412	93	7	1.329
		CO	27.60	40.66			70.86
		$PM_{2.5}$	0.011	0.021			0.030
Evans Road and Dundas Street East	Evans Road	NO_x	0.544	0.412	93	7	1.329
		CO	27.60	40.66			70.86
		$PM_{2.5}$	0.011	0.021			0.030
Evans Road and Dundas Street East	Dundas Street East	NO_x	0.544	0.412	92	8	1.326
		CO	27.60	40.66			71.19
		$PM_{2.5}$	0.011	0.021			0.030

Table 3.13: Emission Factors for Vehicles Idling at the Intersections – Scenario 3							
Intersection	**Vehicles Idling On**	**Contaminant**	**Emission Factor (g/VMT)**		**Vehicle breakdown (%)**		**Average Emission Factor (g/veh-hr)**
			Light Duty Vehicle (LDV)	**Heavy Duty Vehicle (HDV)**	**Light Duty Vehicle (LDV)**	**Heavy Duty Vehicle (HDV)**	
Dundas Street East and Brant Street/ Cedar Springs Road	Dundas Street East	NO_x	0.544	0.412	92	8	1.326
		CO	27.60	40.66			71.19
		$PM_{2.5}$	0.011	0.021			0.030
Dundas Street East and Brant Street/ Cedar Springs Road	Brant Street	NO_x	0.544	0.412	95	5	1.336
		CO	27.60	40.66			70.21
		$PM_{2.5}$	0.011	0.021			0.029
Dundas Street East and Brant Street/ Cedar Springs Road	Cedar Springs	NO_x	0.544	0.412	96	4	1.339
		CO	27.60	40.66			69.89
		$PM_{2.5}$	0.011	0.021			0.029

4. DISPERSION MODELLING

4.1 Dispersion Modelling Selection

The US EPA's CAL3QHCR dispersion model included in the Lakes Environmental Software CALRoads View (Version 3.9) was used to predict contaminant concentrations attributable to vehicular emissions from current and future traffic volumes in the study area. The CAL3QHCR model is based on the Gaussian plume equation used to predict air pollutant concentrations near highways and arterial streets due to emissions from motor vehicles. The CAL3QCHR model calculates maximum 1-hour and 24-hour averaged contaminant concentrations. For the purposes of this assessment maximum 1-hour concentrations were evaluated for CO and NOx, and maximum 24-hour concentrations were evaluated for $PM_{2.5}$.

The MOE prepared hourly meteorological data for the West Central Region was used in the dispersion modelling. Data for the West Central Region was selected as the study area is located in this region of Ontario.

4.2 Receptor Selection

The US EPA's CAL3QHCR dispersion model calculates contaminant concentrations at defined grid-points and at specified receptors. A grid spacing of 50 m by 50 m extending approximately 300 m from the roadside was used. Twenty-six discrete residential receptors along the study roadways were selected for this assessment and are identified in *Table 4.1* below and illustrated in *Figure A-1 in Appendix A*. The discrete receptors were chosen for their potential to be impacted by road traffic emissions based on their relative location (proximity) to the new or improved roads, and the configuration of the roadways.

Thirteen residential receptors were selected along Parkside Drive and identified as EW01 to EW12 for the existing dwellings and EW23 representing a future potential dwelling on Parkside Drive in the Upcountry designated development area. The receptors are all detached two storey dwellings which are located approximately 14 m to 36 m from Parkside Drive relative to the centre of the nearest lane and are primarily influenced by road traffic emissions along Parkside Drive. Receptor EW01 is located approximately 345 m from the Highway 6. The air quality at receptor EW06 near the junction of Parkside Drive and Hamilton Street North is also impacted by vehicular emissions along Hamilton Street North and Main Street North. Existing residential receptor EW09 was selected due to its location opposite the proposed new East-West intersection with Parkside Drive. Dwelling EW10 was selected to assess the impact of Parkside Drive slated to be expanded under this project. Receptor EW12 is at the junction of Parkside Drive and Evans Road. Alexander Place is a large two storey nursing home/long-term-care facility. It was assessed using receptor EW26 and is primarily impacted by emissions due to traffic along Parkside Drive.

Six residential receptors EW17 to EW22 were selected to assess the air quality impact of the proposed East-West Road between Highway 6 and its connection with Parkside Drive under the mature state of development scenario in 2021. Receptor EW17 is an existing dwelling and will be impacted by the intersection proposed for Highway 6 and the East-West Road. EW18 represents a potential future dwelling in the middle of the proposed subdivision of the Waterdown North development area. EW19 is also a potential future residence adjacent to the junction of the East-West Road with Centre Road and has the potential to be impacted by traffic emissions from both roads. Existing residence EW20 is located approximately 106 m north of the proposed East-West Road on Centre Road (28 m from Centre Road) and is surrounded by the wooded conservation area. Receptor EW21 is a residence located at Northlawn Avenue and Centre Road approximately 134 m south of the East-West Road and 30 m from Centre Road (distances with respect to centre of nearest lane). Receptor EW22 is at the eastern end of Northlawn Avenue approximately 228 m from Centre Road (centre of nearest lane).

The East-West Road corridor also consists of a new roadway that links Parkside Drive with Dundas Street East on the eastern border of the Upcountry development area. The new roadway is approximately 480 m west of Evans Road and will run parallel to it. Two receptors EW24 and EW25 represent potential residences in the subdivision development mid-way along the new roadway between Parkside Drive and Dundas Street East, and at the junction of the new roadway with Dundas Street East, respectively. These receptors will be used to assess the air quality impact due to estimated traffic on the new roadway during the mature stage of development in 2021.

Table 4.1: Sensitive Discrete Receptors				
Receptors	**UTM Coordinates (m)**		**Status**	**Associated Roadway**
	Easting	**Northing**		
EW01	587134	4797163	Existing Residence	Parkside Drive
EW02	587631	4797587	Existing Residence	Parkside Drive
EW03	587787	4797740	Existing Residence	Parkside Drive
EW04	588049	4798017	Existing Residence	Parkside Drive
EW05	588634	4798683	Existing Residence	Parkside Drive
EW06	588830	4798880	Existing Residence	Parkside Drive
EW07	589228	4799245	Existing Residence	Parkside Drive
EW08	589224	4799293	Existing Residence	Parkside Drive
EW09	589562	4799585	Existing Residence	Parkside Drive
EW10	589993	4800100	Existing Residence	Parkside Drive
EW11	590075	4800117	Existing Residence	Parkside Drive
EW12	590780	4800861	Existing Residence	Parkside Drive
EW13	591117	4800524	Existing Residence	Evans Road
EW14	591425	4800323	Existing Residence	Dundas St. East
EW15	592216	4801274	Existing Residence	Dundas St. East
EW16	592582	4801627	Existing Residence	Dundas St. East
EW17	586365	4797455	Existing Residence	Highway 6
EW18	587998	4798767	Future Potential Residence	New East-West Road
EW19	588446	4799243	Future Potential Residence	New East-West Road
EW20	588390	4799372	Existing Residence	Centre Road
EW21	588569	4799203	Existing Residence	Northlawn/Centre Road
EW22	588704	4799350	Existing Residence	Northlawn/Centre Rd/New E-W Road
EW23	590306	4800363	Future Potential Residence	Parkside Drive
EW24	590740	4800188	Future Potential Residence	New East-West Road
EW25	591052	4799916	Future Potential Residence	New East-West Road
EW26	589105	4799422	Long-term Care Facility	Parkside Drive

5. MODELLING RESULTS AND DISCUSSION

5.1 Modelling Results for Scenario 1

For the purpose of this assessment 1-hour concentrations were evaluated for CO and NOx, and 24-hour concentrations were evaluated for $PM_{2.5}$. The maximum concentrations predicted for the study area were 3 ppm for CO, 182 ppb for NOx, and 2 µg/m^3 for $PM_{2.5}$. Concentrations of the air contaminants predicted at the discrete receptors are presented in *Table 5.1* and the isopleths graphs can be found in *Appendix C*.

Table 5.1: CAL3QHCR Model Results – Scenario 1

Receptor ID	Carbon Monoxide (CO) [ppm]	Nitrogen Oxides (NOx) [ppb]	Particulate Matter ($PM_{2.5}$) [µg/m^3]
EW01	0.4	19	0.11
EW02	0.3	18	0.11
EW03	0.2	16	0.08
EW04	0.3	20	0.14
EW05	0.3	24	0.16
EW06	0.5	31	0.22
EW07	0.5	27	0.20
EW08	0.5	26	0.18
EW09	0.3	20	0.16
EW10	0.4	24	0.17
EW11	0.4	21	0.19
EW12	0.5	32	0.22
EW13	0.4	21	0.16
EW14	0.7	44	0.36
EW15	0.8	54	0.40
EW16	0.8	52	0.34
EW17	1.2	70	0.48
EW18	0.0	6	0.00
EW19	0.4	17	0.07
EW20	0.0	12	0.00
EW21	0.2	17	0.05
EW22	0.0	6	0.00
EW23	0.5	24	0.20
EW24	0.2	12	0.00
EW25	0.7	39	0.27
EW26	0.0	8	0.00

Table 5.1: CAL3QHCR Model Results – Scenario 1			
Receptor ID	**Carbon Monoxide (CO) [ppm]**	**Nitrogen Oxides (NOx) [ppb]**	**Particulate Matter ($PM_{2.5}$) [μg/m^3]**
Maximum Predicted Concentration	3.1	182	2.2

Notes: For CO and NOx, the concentrations indicated are for 1-hour averaging time
For $PM_{2.5}$, the concentrations indicated are for 24-hour averaging time

For each contaminant, the background ambient air concentrations (from MOE monitoring station, see *Table 2.2*) were added to the predicted maximum concentrations for the corresponding averaging period. The cumulative concentrations of relevant contaminants (i.e. background plus maximum predicted concentrations) were compared with the regulatory standards (*Table 2.1*). This is summarized in *Table 5.2*. The cumulative maximum NOx concentration that is predicted (maximum predicted plus 1-hour 90th percentile) exceeds the MOE's air quality standard for NOx by approximately 16%. However for the sensitive receptors selected for this assessment, the highest cumulative NOx concentration (at EW17 on Highway 6) was predicted to be approximately 60% of the MOE's air quality standard. The cumulative maximum CO and $PM_{2.5}$ concentrations were predicted to be below their respective MOE and CCME CWS standards.

Table 5.2: Total Concentration versus Existing Standards – Scenario 1					
Contaminant	**Highest Predicted Concentration**	**Ambient (Background) Concentration**	**Total (Cumulative) Concentration**	**Existing Standard**	**Percent of Standard**
CO (ppm)	3.1	0.5	3.6	30	12
NOx (ppb)	182	49	231	200	116
$PM_{2.5}$ (μg/m^3)	2.2	20	22.2	30	74

Notes: For CO and NOx, the concentrations indicated are for 1-hour averaging time
For $PM_{2.5}$, the concentrations indicated are for 24-hour averaging time

5.2 Modelling Results for Scenario 2

The maximum concentrations predicted for the study area were 3 ppm for CO, 69 ppb for NOx, and 1 μg/m^3 for $PM_{2.5}$. These maxima were predicted to occur on Highway 6 south of Parkside Drive. The concentrations of NOx were predicted to be lower in the future Scenario 2 than in the current Scenario 1 at all receptors and for the maximum with a reduction of up to 113 ppb. This is due to MOBILE6.2 accounting for the future improvements in vehicular NOx emissions which resulted in the NOx emission rates for free flowing and idling traffic to be on average approximately a third of the emission rate predicted for current vehicles. The increases in the future 2021 no-build predicted peak traffic volumes over the current peak traffic volumes did not offset the influence of the reduced NOx emission factor predicted for the future condition.

There was essentially no change in the CO concentrations predicted for the future no-build scenario when compared to the concentrations predicted under the current scenario. For the selected sensitive receptors along the study route, there was an insignificant change (both an increase and decrease of less than 0.6 ppm) in the predicted CO concentrations of the future no-build scenario when compared to the concentration predicted under the current condition. The CO emission rates for the free flowing and idling traffic along the study route resulted in the CO emission rates in the future no-build scenario to be approximately 30% lower on average than the emission rates estimated under the existing condition. This decrease in the emission rate combined with the predicted increase in the peak traffic volumes in Scenario 2 resulted in a negligible change in the predicted CO concentrations when compared to the current condition of Scenario 1.

Similar to CO, there was little change in the $PM_{2.5}$ concentration predicted in the future no-build scenario when compared to the concentrations predicted under the current conditions (i.e., difference of less than 1µg/m^3). The $PM_{2.5}$ emission rates in the future no-build scenario was approximately 14% lower on average than the emission rates estimated for the existing condition. However, this decrease in the emission rate combined with the predicted increase in the peak traffic volumes in Scenario 2 resulted in the negligible change in the predicted $PM_{2.5}$ concentrations when compared to the current condition of Scenario 1.

The CAL3QHCR isopleths graphs can be found in *Appendix C*.

Table 5.3: CAL3QHCR Model Results – Scenario 2			
Receptor ID	**Carbon Monoxide (CO) [ppm]**	**Nitrogen Oxides (NOx) [ppb]**	**Particulate Matter ($PM_{2.5}$) [μg/m^3]**
EW01	0.5	12	0.19
EW02	0.5	15	0.25
EW03	0.5	12	0.21
EW04	0.5	15	0.27
EW05	0.8	16	0.34
EW06	0.9	20	0.45
EW07	0.7	21	0.41
EW08	0.7	17	0.38
EW09	0.5	15	0.31
EW10	0.5	13	0.29
EW11	0.5	12	0.26
EW12	0.8	22	0.38
EW13	0.5	15	0.33
EW14	0.8	21	0.40
EW15	0.7	21	0.50
EW16	0.7	20	0.42
EW17	1.0	27	0.30
EW18	0.0	3	0.00
EW19	0.3	8	0.14
EW20	0.0	4	0.00
EW21	0.2	7	0.09
EW22	0.0	4	0.00
EW23	0.5	14	0.28
EW24	0.2	5	0.05
EW25	0.7	17	0.41
EW26	0.2	5	0.07
Maximum Predicted Concentration	2.6	69	1.4

Notes: For CO and NOx, the concentrations indicated are for 1-hour averaging time
For $PM_{2.5}$, the concentrations indicated are for 24-hour averaging time

For each contaminant, the background ambient air concentrations (from MOE monitoring station, see *Table 2.2*) were added on to the predicted maximum concentrations for the corresponding averaging period. The cumulative maximum concentrations for all contaminants modelled for this assessment were below the respective air quality standards (*Table 5.4*).

Table 5.4: Total Concentration versus Existing Standards – Scenario 2

Contaminant	Highest Predicted Concentration	Ambient (Background) Concentration	Total (Cumulative) Concentration	Existing Standard	Percent of Standard
CO (ppm)	2.6	0.45	3.1	30	10
NOx (ppb)	69	49	118	200	59
$PM_{2.5}$ (µg/m^3)	1.4	20	21.4	30	71

Notes: For CO and NOx, the concentrations indicated are for 1-hour averaging time
For $PM_{2.5}$, the concentrations indicated are for 24-hour averaging time

5.3 Modelling Results for Scenario 3

The maximum concentrations predicted for the study area were 4 ppm for CO, 86 ppb for NOx, and 2 µg/m^3 for $PM_{2.5}$. These maxima occur on Highway 6 north of the new East-West Road. The CAL3QHCR isopleths graphs can be found in *Appendix C*.

Table 5.5: CAL3QHCR Model Results – Scenario 3

Receptor ID	Carbon Monoxide (CO) [ppm]	Nitrogen Oxides (NOx) [ppb]	Particulate Matter ($PM_{2.5}$) [µg/m^3]
EW01	0.3	6	0.08
EW02	0.2	5	0.13
EW03	0.2	6	0.09
EW04	0.2	7	0.14
EW05	0.3	12	0.23
EW06	0.5	14	0.32
EW07	0.6	15	0.26
EW08	0.5	12	0.24
EW09	0.3	10	0.05
EW10	0.5	14	0.34
EW11	0.4	11	0.26
EW12	0.2	7	0.05
EW13	0.2	6	0.08

Table 5.5: CAL3QHCR Model Results – Scenario 3

Receptor ID	Carbon Monoxide (CO) [ppm]	Nitrogen Oxides (NOx) [ppb]	Particulate Matter ($PM_{2.5}$) [µg/m^3]
EW14	0.7	18	0.42
EW15	0.9	26	0.63
EW16	0.7	20	0.42
EW17	1.2	35	0.71
EW18	0.5	11	0.21
EW19	0.6	13	0.32
EW20	0.2	9	0.14
EW21	0.2	7	0.09
EW22	0.0	4	0.00
EW23	0.6	13	0.31
EW24	0.7	17	0.30
EW25	0.8	21	0.45
EW26	0.0	4	0.00
Maximum Predicted Concentration	3.5	86	1.52

Notes: For CO and NOx, the concentrations indicated are for 1-hour averaging time
For $PM_{2.5}$, the concentrations indicated are for 24-hour averaging time

The cumulative maximum concentrations for all contaminants modelled for this assessment were below the respective air quality standards (*Table 5.6*). Therefore, the predicted cumulative concentrations of the air contaminants at the receptors selected for the purposes of this assessment were all below the respective MOE and CCME CWS standards.

Table 5.6: Total Concentration versus Existing Standards – Scenario 3

Contaminant	Highest Predicted Concentration	Ambient (Background) Concentration	Total (Cumulative) Concentration	Existing Standard	Percent of Standard
CO (ppm)	3.5	0.45	4.0	30	13
NOx (ppb)	86	49	135	200	68
$PM_{2.5}$ (µg/m^3)	1.5	20	21.5	30	72

Notes: For CO and NOx, the concentrations indicated are for 1-hour averaging time
For $PM_{2.5}$, the concentrations indicated are for 24-hour averaging time

A comparison of the results for Scenario 2 future no-build condition and Scenario 3 future build condition is presented in *Table 5.7*.

Table 5.7: Comparison Between Scenario 2 and Scenario 3									
Receptor ID	**Carbon Monoxide (CO) [ppm]**			**Nitrogen Oxides (NOx) [ppb]**			**Particulate Matter ($PM_{2.5}$) [μg/m^3]**		
	Scenario 2	**Scenario 3**	**Change**	**Scenario 2**	**Scenario 3**	**Change**	**Scenario 2**	**Scenario 3**	**Change**
EW01	0.5	0.3	-0.2	12	6	-6	0.19	0.08	-0.11
EW02	0.5	0.2	-0.3	15	5	-10	0.25	0.13	-0.12
EW03	0.5	0.2	-0.3	12	6	-6	0.21	0.09	-0.12
EW04	0.5	0.2	-0.3	15	7	-8	0.27	0.14	-0.13
EW05	0.8	0.3	-0.5	16	12	-4	0.34	0.23	-0.11
EW06	0.9	0.5	-0.4	20	14	-6	0.45	0.32	-0.13
EW07	0.7	0.6	-0.1	21	15	-6	0.41	0.26	-0.15
EW08	0.7	0.5	-0.2	17	12	-5	0.38	0.24	-0.14
EW09	0.5	0.3	-0.2	15	10	-5	0.31	0.05	-0.26
EW10	0.5	0.5	0.0	13	14	1	0.29	0.34	0.05
EW11	0.5	0.4	-0.1	12	11	-1	0.26	0.26	0.00
EW12	0.8	0.2	-0.6	22	7	-15	0.38	0.05	-0.33
EW13	0.5	0.2	-0.3	15	6	-9	0.33	0.08	-0.25
EW14	0.8	0.7	-0.1	21	18	-3	0.40	0.42	0.02
EW15	0.7	0.9	0.2	21	26	5	0.50	0.63	0.13
EW16	0.7	0.7	0.0	20	20	0	0.42	0.42	0.00
EW17	1.0	1.2	0.2	27	35	8	0.30	0.71	0.41
EW18*	0.0	0.5	0.5	3	11	8	0.00	0.21	0.21
EW19*	0.3	0.6	0.3	8	13	5	0.14	0.32	0.18
EW20	0.0	0.2	0.2	4	9	5	0	0.14	0.14
EW21	0.2	0.2	0.0	7	7	0	0.09	0.09	0.00
EW22	0.0	0.0	0.0	4	4	0	0.00	0.00	0.00
EW23*	0.5	0.6	0.1	14	13	-1	0.28	0.31	0.03
EW24*	0.2	0.7	0.5	5	17	12	0.05	0.30	0.25
EW25*	0.7	0.8	0.1	17	21	4	0.41	0.45	0.04
EW26	0.2	0.0	-0.2	5	4	-1	0.07	0.00	-0.07
Overall Maximum Predicted Concentration	2.6	3.5	0.9	69	86	17	1.40	1.52	0.12

Note: Receptors with an "*" are potential future residential receptors and do not exist under Scenario 1 or 2.

For all three contaminants of NOx, CO, and $PM_{2.5}$ the maximum predicted concentration was higher for the future build Scenario 3 than for the future no-build Scenario 2. However, the increases were negligible for CO and $PM_{2.5}$ as they were less than 1 ppm and 1 µg/m^3, respectively. For NOx the maximum increase was only 17 ppb.

Scenario 3 assumed the closure of Parkside Drive's access to Highway 6. This resulted in reduced peak hourly volumes along Parkside Drive from Highway 6 to Grindstone Creek in comparison to the future no-build scenario. Corresponding to this reduction in peak hourly volumes, the predicted concentrations of the modelled contaminants were all lower under Scenario 3 for the receptors along this section of Parkside Drive (i.e., receptors EW01 to EW09) when compared to Scenario 2. Reductions were however considered insignificant for CO and $PM_{2.5}$ as they were less than 1 ppm for CO and less than 1 µg/m^3 for $PM_{2.5}$, and reductions in NOx was 10 ppb or less. In comparison to the current condition (Scenario 1), NOx concentrations were predicted to decrease by up to 17 ppb for this section of Parkside Drive, however there was no significant change in the predicted CO and $PM_{2.5}$ concentrations at the receptors in Scenario 3.

For the section of Parkside Drive east of Grindstone Creek that will undergo improvement (i.e., widened from two to four lanes) in Scenario 3, there is an insignificant change in the concentrations of the contaminants at receptors EW10 and EW11 that are along this section of the roadway when compared to Scenario 2. Predicted changes in CO concentrations were less than 1 ppm, changes in NOx were on the order of 1 ppb, and changes in $PM_{2.5}$ were less than 1µg/m^3. It should be noted that for both the future no-build and future build scenarios that a similar future volume of traffic is predicted for this section of Parkside Drive (despite it being only a 2-lane road under the future no-build scenario). This additional traffic volume is being generated by the future development that is assumed to be in place in the Waterdown area by 2021 and which would potentially utilise this roadway. It is further noted that when air contaminant levels for existing conditions are compared to the air contaminant levels under the future build scenario that a decrease of approximately 10 ppb is predicted for NOx, and a negligible change in CO and $PM_{2.5}$ is predicted for the receptors along this section of Parkside Drive that is to be improved.

The reduced traffic volumes on Evans Road predicted for the Scenario 3 condition resulted in a reduction in the predicted concentrations for the air contaminants in comparison to Scenario 2. For receptors EW12 and EW13 under Scenario 3, NOx concentration was reduced by up to 15 ppb, however the reductions in CO and $PM_{2.5}$ were negligible as they were less than 1 ppm and 1 µg/m^3, respectively when compared to the Scenario 2 condition. Scenario 3 resulted in a greater reduction in NOx concentrations (up to 25 ppb) predicted at the receptors when compared to the current condition of Scenario 1. CO and $PM_{2.5}$ concentrations were however predicted to change negligibly between Scenarios 3 and 1. For receptors EW14, EW15, and EW16 along Dundas Street East, the predicted NOx concentrations under Scenario 3 were lower than the concentrations under Scenario 2 at EW14 by 3 ppb, they were higher by 5 ppb at EW15, and there was no change at receptor EW16. For the predicted CO and $PM_{2.5}$ concentrations, the changes between Scenario 3 and 2 were not significant as they were less than 1 ppm and 1 $\mu g/m^3$, respectively. When compared with the current condition of Scenario 1, there was a consistent and significant decrease in the predicted NOx concentrations of up to 32 ppb at the receptors for the future Scenario 3 condition. However, as with the comparison with Scenario 2, there was no significant change in the predicted concentrations of CO and $PM_{2.5}$ between Scenarios 1 and 3.

For receptor EW17 on Highway 6 and near the intersection with the new East-West Road, NOx concentration was predicted to increase by approximately 8 ppb under the future build scenario in comparison to the future no-build scenario. The predicted concentrations in CO and $PM_{2.5}$ for the future build Scenario 3 increased by a negligible amount over the concentrations predicted under future no-build Scenario 2. Comparison of the predicted NOx concentrations between the future build scenario and the current condition indicated a decrease in concentration of approximately 35 ppb for the future build scenario. Negligible change was predicted in the CO and $PM_{2.5}$ concentrations between the current and future conditions.

Receptors along Northlawn Avenue (EW21 and EW22) are predicted to have no change in the concentrations of NOx, CO and $PM_{2.5}$ between the future build and future no-build scenarios. Due to the separation distance between the receptors and the new East-West Road, the impact of the new roadway is predicted to be negligible. NOx concentrations were predicted to decrease by up to 10 ppb under the future build scenario in comparison to the current condition. Changes in the CO and $PM_{2.5}$ concentrations are predicted to be insignificant.

Since the maximum predicted cumulative concentrations (background plus predicted levels) under Scenario 3 for NOx, CO and $PM_{2.5}$ are below their respective MOE and CCME air quality standards, the concentrations of the air contaminants at potential future residential receptors along the new East-West Road would also be expected to be below these limits.

Scenario 3 assumes the closure of Parkside Drive at Highway 6 (i.e., Parkside Drive without access to Highway 6). If the access of Parkside Drive to Highway 6 were maintained (i.e., Parkside Drive with access to Highway 6), then the predicted peak hourly traffic volumes under this Scenario 3 condition would be those provided in parentheses in *Table 3.9*. Traffic volumes along Parkside Drive from Highway 6 to Grindstone Creek under this modified Scenario 3 were predicted to be 65% to 74% of the volumes under Scenario 2. Therefore, receptors along this segment of Parkside Drive would also experience an improvement in the air quality due to this reduction in predicted traffic volumes.

The change in traffic volumes that were predicted for the segments of Parkside Drive east of Grindstone Creek, Hamilton Street North, Main Street, Centre Road, Evans Road, Dundas Street East, and Brant/Cedar Springs Road, were the same under Scenario 3 with and without access of Parkside drive to Highway 6. The air quality impact at the sensitive receptors along these road segments would therefore be the same in either forms of Scenario 3 (i.e., with or without the closure of Parkside Drive to Highway 6). Traffic volumes along the new East-West Road would change only between Highway 6 and Centre Road when the Parkside Drive access to Highway 6 was maintained. The peak hourly volume was predicted to be approximately 52% of the volume under the Scenario 3 without Parkside Drive access to Highway 6. This would result in a lower impact at receptors along this segment of the new East-West Road in comparison to Scenario 3 without the Parkside Drive access to Highway 6.

Overall, Scenario 3 without Parkside Drive access to Highway 6 represents a more conservative or worst-case scenario for air quality impacts at sensitive receptors since there is a predicted greater change in peak hourly volumes in comparison to Scenario 2 than the change in peak hourly volumes under a Scenario 3 with Parkside Drive accessing Highway 6 when compared to Scenario 2.

In the event that daytime heavy truck volumes on the new East-West Road were to increase beyond the predicted levels, the effect on pollutant concentrations at receptors along the new East-West Road including the segment of redeveloped Parkside Drive was assessed. Conservatively, a doubling of the heavy truck volumes was assumed resulting in volumes that were approximately 9% of the increased peak hourly volumes. It should be noted that for the air quality assessment, it was conservatively assumed that all non-light vehicles were heavy trucks and a breakdown into medium and heavy truck classes was not conducted. The increase in heavy truck volumes along the new East-West Road was also assumed to increase the peak hourly heavy truck volumes on Dundas Street East from the new East-West Road to Brant/ Cedar Springs Road. For all receptors (EW09 to EW26) along the study route that would be impacted by this increase in heavy truck volumes, a negligible increase in the concentrations of $PM_{2.5}$ and CO were predicted and concentrations of NOx were predicted to increase by a maximum of 2 ppb. The impact of doubling the heavy truck volumes on the air quality of the selected receptors can be regarded as being low.

6. AIR QUALITY IMPACT DURING CONSTRUCTION PHASE

The construction phase of the proposed New East-West Corridor development has the potential to affect the air quality in the vicinity of the site. Emissions which are associated with construction activities are primarily dust and typical combustion emissions from construction equipment such as CO, NOx, SO_2 and Volatile Organic Compounds (VOCs). As with any construction site, these emissions will be of relatively short duration and unlikely to have any effect on the surrounding areas.

During the construction phase, in order to reduce/control dust emissions, effective dust suppression methods, such as on-site watering of active areas, sweeping of paved areas, (e.g. street and parking lot), as well as limiting the travel speed of the nearby roads to reduce re-suspension of road dust are recommended. During the construction phase, it is recommended that the "*Best Practices for the Reduction of Air Emissions from Construction and Demolition activities* (March 2005)" prepared by ChemInfo Services Inc. in conjunction with Construction & Demolition Multi-Stakeholders Working Group for Environment Canada be implemented.

In addition to the construction activities that would impact the local air quality, traffic congestion and re-routing of the traffic during the construction phase has the potential to further impact the local air quality. This may be more noticeable during the widening of Parkside Drive and Dundas Street East. During the widening of Parkside Drive between Grindstone Creek and the new East-West Road linking Parkside to Dundas Street, there is a potential for increased traffic and therefore air quality impacts along Hamilton Street North, Main Street North, Mill Street North, Dundas Street between Hamilton Street and Evans Road, and Evans Road as traffic may be re-directed along these routes. During the widening of Dundas Street, there is a potential for increased traffic and air quality impacts along Side Road 1/Millburough Line, Parkside Drive, Kerns Road, Waterdown Road/Mill Street South, Hamilton Street North, Main Street North, Mill Street North, and Dundas Street west of Pamela Street.

7. CONCLUSION

The air quality impact of the new East-West Road Corridor project defined under Scenario 3 was assessed by comparing the predicted nitrogen oxides (NOx), carbon monoxide (CO) and fine particulate matter ($PM_{2.5}$) levels of the mature state of development in 2021 to that under the future no-build condition (Scenario 2). For the "future build" scenario (Scenario 3), it was assumed that Parkside Drive's access to Highway 6 would be closed. This represents a more conservative or worst-case scenario for air quality impacts at sensitive receptors along the new/improved sections of roadway than if the Parkside Drive access to Highway 6 is assumed to remain open.

For the future build scenario at the mature state of development, the predicted NOx and CO levels within the study area were below the Ontario Ministry of the Environment's (MOE's) air quality standards for these contaminants for all receptors. For $PM_{2.5}$ the predicted concentrations were below the Canadian Council of Ministers of the Environment (CCME) Canada Wide Standard (CWS) for this air contaminant. The predicted cumulative NOx concentrations (vehicular + background) within the study area were below the MOE's 1-hour standard of 200 ppb. The maximum predicted cumulative NOx concentration was approximately 68% of the standard. The contribution by vehicular emissions was approximately 43% of the MOE's 1-hour NOx standard. For CO, the predicted maximum cumulative concentration within the study area was significantly lower, at approximately 13%, than the Ministry's 1-hour standard of 30 ppm. For $PM_{2.5}$, the predicted maximum 24-hour cumulative concentration was approximately 72% of the CCME CWS of 30 $\mu g/m^3$. It should be noted that the contribution from the vehicular traffic to $PM_{2.5}$ was approximately 5% of the CWS.

For the receptors selected for the purposes of this assessment, the future build scenario resulted in changes in the predicted air quality that was not considered to be significant when compared to the air quality impacts predicted for the future no-build scenario. It was predicted that NOx concentration levels would both increase and decrease, with the greatest change resulting in a decrease of 15 ppb for the future build scenario in comparison to the future no-build scenario. The predicted CO and $PM_{2.5}$ concentrations at the selected receptors would have a negligible change under the future build scenario when compared to the future no-build scenario as concentration changes were less than 1 ppm and 1 $\mu g/m^3$, respectively. When compared to the current condition, the NOx concentrations at the receptors in the future build scenario were predicted to decrease by as much as 35 ppb. However there were no significant changes in the predicted CO and $PM_{2.5}$ concentrations when compared to the current condition.

In the event that daytime heavy truck volumes on the new East-West Road were to increase beyond the predicted levels, the effect on pollutant concentrations at receptors along the new East-West Road including the segment of redeveloped Parkside Drive was assessed. As a worst-case air quality impacts scenario, a doubling of the heavy truck volumes was considered resulting in volumes that were approximately 9% of the increased peak hourly PM volumes. It should be noted that for the air quality assessment, it was conservatively assumed that all truck volumes were heavy trucks and a breakdown into medium and heavy truck classes was not considered. The impact of doubling the heavy truck volumes on the air quality of the selected receptors was not predicted to be significant.

8. REFERENCES

1. Ontario Ministry of the Environment. Summary of O.Reg. 419/05 Standards, and Point of Impingement Guidelines, and Ambient Air Quality Criteria (AAQCs), December 2005.

2. United States Environmental Protection Agency. User's Guide to CAL3QHC Version 2.0: A Modelling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections. EPA-454/R-92-006. September 1995.

3. United States Environmental Protection Agency. User's Guide to MOBILE6.1 and MOBILE6.2. EPA420-R-03-010. September 2003

4. Lakes Environmental. User's Guide to CALRoads View. 2001-2007 Lakes Environmental Software.

Appendix A – New East-West Road and Receptor Locations

East - West Road Class EA

Legend

- Receptor Locations
- Proposed East - West Corridor Alignment Option

East - West Road Class Environmental Assessment

1 : 19,000

0 500 1,000 1,500

Figure A-1.

New East-West Road Corridor 2021 Mature State of Development with Sensitive Receptors

Appendix B – MOBILE 6.2 Output Files

Scenario 1 – 2008 Mobile 6.2 Files

```
***** HEADER SECTION *****

MOBILE6 INPUT FILE

REPORT FILE        : WTRDWN.OUT
POLLUTANTS         : NOX CO
PARTICULATES       :
DATABASE VEHICLES  : 22222 22222221 2 222 22222222 222

RUN DATA

***** RUN SECTION *****
FUEL RVP           : 9.0

***** SCENARIO SECTION *****

***** 50KM/H *****

SCENARIO REC       : 50km/h (31.1 mph) WINTER 2.5
MIN/MAX TEMP       : 0.00 51.62
CALENDAR YEAR      : 2008
ALTITUDE           : 1
EVALUATION MONTH   : 1
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 31.1 ARTERIAL

SCENARIO REC       : 50km/h (31.1 mph) WINTER 10
MIN/MAX TEMP       : 0.00 51.62
CALENDAR YEAR      : 2008
ALTITUDE           : 1
EVALUATION MONTH   : 1
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 31.1 ARTERIAL

SCENARIO REC       : 50km/h (31.1 mph) SUMMER 2.5
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2008
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 31.1 ARTERIAL

SCENARIO REC       : 50km/h (31.1 mph) SUMMER 10
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2008
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 31.1 ARTERIAL

***** 80 KM/H *****

SCENARIO REC       : 80km/h (49.7 mph) WINTER 2.5
MIN/MAX TEMP       : 0.00 51.62
CALENDAR YEAR      : 2008
ALTITUDE           : 1
EVALUATION MONTH   : 1
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
```

```
AVERAGE SPEED      : 49.7 ARTERIAL

SCENARIO REC       : 80km/h (49.7 mph) WINTER 10
MIN/MAX TEMP       : 0.00 51.62
CALENDAR YEAR      : 2008
ALTITUDE           : 1
EVALUATION MONTH   : 1
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 49.7 ARTERIAL

SCENARIO REC       : 80km/h (49.7 mph) SUMMER 2.5
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2008
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 49.7 ARTERIAL

SCENARIO REC       : 80km/h (49.7 mph) SUMMER 10
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2008
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 49.7 ARTERIAL

***** END OF THIS RUN *****

END OF RUN


****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                               *
* Input file: WTRDWN.IN (file 1, run 1).                                   *
****************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) WINTER 2.5
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 37.3
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
```

```
              there are no sales for vehicle class HDGV8b

* Reading Ammonia (NH3) Basic Emissiion Rates
* from the external data file PMNH3BER.D

* Reading Ammonia (NH3) Sulfur Deterioration Rates
* from the external data file PMNH3SDR.D

                    Calendar Year:  2008
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:   0.0 (F)
              Maximum Temperature:  51.6 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   9.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3803    0.3662    0.1249              0.0357    0.0004    0.0019    0.0852    0.0055    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.83     22.31     30.49     24.39     11.05     0.929     0.806     1.815     12.93    19.759
     Composite NOX :     0.766     1.025     1.545     1.157     3.424     0.596     0.832     7.410      1.58     1.624
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) WINTER 10
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 37.3
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2008
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:   0.0 (F)
              Maximum Temperature:  51.6 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
```

```
              Weathered RVP:   9.0 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  No
           Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:               <6000    >6000   (All)
                      ------    ------   ------   ------   ------   ------   ------   ------   ------    ------
 VMT Distribution:    0.3803    0.3662   0.1249            0.0357   0.0004   0.0019   0.0852   0.0055    1.0000
 -------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite CO  :     18.83     22.31    30.49    24.39    11.05    0.929    0.806    1.815    12.93    19.759
   Composite NOX :     0.766     1.025    1.545    1.157    3.424    0.596    0.832    7.410     1.58     1.624
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) SUMMER 2.5
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 37.3
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

              Calendar Year:  2008
                      Month:  July
                   Altitude:  Low
        Minimum Temperature:  45.0 (F)
        Maximum Temperature:  91.9 (F)
          Absolute Humidity:   75. grains/lb
           Nominal Fuel RVP:   9.0 psi
              Weathered RVP:   8.6 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  No
           Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:               <6000    >6000   (All)
                      ------    ------   ------   ------   ------   ------   ------   ------   ------    ------
 VMT Distribution:    0.3728    0.3705   0.1273            0.0359   0.0004   0.0019   0.0857   0.0055    1.0000
 -------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite CO  :     10.43     12.25    16.67    13.38     9.43    0.923    0.784    1.697    11.57    11.098
```

```
    Composite NOX :      0.664     0.846     1.227     0.943     2.964     0.575     0.788     7.032      1.21      1.434
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) SUMMER 10
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 37.3
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2008
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  45.0 (F)
              Maximum Temperature:  91.9 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000      (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3728    0.3705    0.1273              0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     10.43     12.25     16.67     13.38      9.43     0.923     0.784     1.697     11.57     11.098
    Composite NOX :      0.664     0.846     1.227     0.943     2.964     0.575     0.788     7.032      1.21      1.434
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* km/h (2.5 mph) WINTER 2.5
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
```

```
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2008
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:   0.0 (F)
              Maximum Temperature:  51.6 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   9.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV       MC   All Veh
              GVWR:              <6000     >6000     (All)
                       ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3803   0.3662    0.1249              0.0357    0.0004    0.0019    0.0852    0.0055    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     49.34     54.11     79.96     60.69     72.53     3.303     2.834    10.963    111.56    52.707
     Composite NOX :     1.467     1.939     2.864     2.174     2.511     1.148     1.606    14.216      1.42     2.938
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4km/h (2.5 mph) WINTER 10
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
```

```
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2008
                          Month:  Jan.
                       Altitude:  Low
            Minimum Temperature:   0.0 (F)
            Maximum Temperature:  51.6 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   9.0 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

       Vehicle Type:      LDGV     LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:                <6000     >6000    (All)
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3803    0.3662    0.1249              0.0357    0.0004    0.0019    0.0852    0.0055    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     49.34     54.11     79.96     60.69     72.53     3.303     2.834    10.963    111.56    52.707
     Composite NOX :      1.467     1.939     2.864     2.174     2.511     1.148     1.606    14.216      1.42     2.938
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4km/h (2.5 mph) SUMMER 2.5
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
          The user supplied arterial average speed of  2.5
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2008
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  45.0 (F)
            Maximum Temperature:  91.9 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
```

```
                ATP Program:  No
           Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3728    0.3705    0.1273              0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     33.25     33.97     48.32     37.64     61.88     3.266     2.738    10.251    118.23    34.898
    Composite NOX :     1.452     1.651     2.343     1.828     2.173     1.107     1.520    13.505      1.09     2.695
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4km/h (2.5 mph) SUMMER 10
* File 1, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2008
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  45.0 (F)
              Maximum Temperature:  91.9 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3728    0.3705    0.1273              0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     33.25     33.97     48.32     37.64     61.88     3.266     2.738    10.251    118.23    34.898
    Composite NOX :     1.452     1.651     2.343     1.828     2.173     1.107     1.520    13.505      1.09     2.695
 ------------------------------------------------------------------------------------------------------------------------


***************************************************************************
```

```
* MOBILE6.2.03 (24-Sep-2003)                                             *
* Input file: WTRDWN.IN (file 1, run 1).                                 *
**************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) WINTER 2.5
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

Calendar Year: 2008
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3803	0.3662	0.1249		0.0357	0.0004	0.0019	0.0852	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0038	0.0039	0.0044	0.0040	0.0456	------	------	------	0.0142	0.0051
ECARBON:	------	------	------	------	------	0.0599	0.0331	0.1442	------	0.0124
OCARBON:	------	------	------	------	------	0.0169	0.0477	0.0728	------	0.0063
SO4:	0.0002	0.0004	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0004
Total Exhaust PM:	0.0040	0.0044	0.0049	0.0045	0.0472	0.0770	0.0811	0.2179	0.0143	0.0243
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0114	0.0117	0.0123	0.0118	0.0547	0.0843	0.0885	0.2297	0.0206	0.0320
SO2:	0.0068	0.0088	0.0114	0.0095	0.0168	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1010	0.0995	0.1006	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) WINTER 10
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

Calendar Year: 2008
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3803	0.3662	0.1249		0.0357	0.0004	0.0019	0.0852	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0041	0.0043	0.0049	0.0044	0.0527	------	------	------	0.0205	0.0057
ECARBON:	------	------	------	------	------	0.0651	0.0360	0.1568	------	0.0134
OCARBON:	------	------	------	------	------	0.0184	0.0519	0.0791	------	0.0068
SO4:	0.0002	0.0004	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0004
Total Exhaust PM:	0.0044	0.0047	0.0054	0.0049	0.0542	0.0836	0.0882	0.2368	0.0206	0.0265
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0087	0.0080	0.0080	0.0259	0.0040	0.0095
Total PM:	0.0249	0.0253	0.0260	0.0254	0.0754	0.1042	0.1087	0.2752	0.0371	0.0486
SO2:	0.0068	0.0088	0.0114	0.0095	0.0168	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1010	0.0995	0.1006	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) SUMMER 2.5
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
                       Calendar Year:  2008
                               Month:  July
        Gasoline Fuel Sulfur Content:   30. ppm
          Diesel Fuel Sulfur Content:   15. ppm
                Particle Size Cutoff:  2.50 Microns
                    Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0038	0.0039	0.0044	0.0040	0.0427	------	------	------	0.0142	0.0050
ECARBON:	------	------	------	------	------	0.0574	0.0310	0.1336	------	0.0115
OCARBON:	------	------	------	------	------	0.0162	0.0446	0.0675	------	0.0059
SO4:	0.0002	0.0004	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0040	0.0043	0.0049	0.0045	0.0443	0.0737	0.0758	0.2020	0.0143	0.0229
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0114	0.0117	0.0122	0.0118	0.0518	0.0810	0.0832	0.2138	0.0206	0.0306
SO2:	0.0068	0.0088	0.0114	0.0095	0.0167	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1011	0.0996	0.1007	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) SUMMER 10
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                       Calendar Year:  2008
                               Month:  July
        Gasoline Fuel Sulfur Content:   30. ppm
          Diesel Fuel Sulfur Content:   15. ppm
                Particle Size Cutoff: 10.00 Microns
                    Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0041	0.0042	0.0048	0.0044	0.0493	------	------	------	0.0205	0.0056
ECARBON:	------	------	------	------	------	0.0624	0.0337	0.1452	------	0.0125
OCARBON:	------	------	------	------	------	0.0176	0.0484	0.0733	------	0.0064
SO4:	0.0002	0.0004	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0044	0.0047	0.0053	0.0049	0.0509	0.0801	0.0824	0.2195	0.0206	0.0250
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0087	0.0080	0.0080	0.0259	0.0040	0.0095
Total PM:	0.0249	0.0252	0.0259	0.0254	0.0721	0.1006	0.1029	0.2579	0.0371	0.0470
SO2:	0.0068	0.0088	0.0114	0.0095	0.0167	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1011	0.0996	0.1007	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* km/h (2.5 mph) WINTER 2.5
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                       Calendar Year:  2008
                               Month:  Jan.
        Gasoline Fuel Sulfur Content:   30. ppm
          Diesel Fuel Sulfur Content:   15. ppm
                Particle Size Cutoff:  2.50 Microns
                    Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3803	0.3662	0.1249		0.0357	0.0004	0.0019	0.0852	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0038	0.0044	0.0040	0.0457	------	------	------	0.0142	0.0051
ECARBON:	------	------	------	------	------	0.0599	0.0331	0.1442	------	0.0124
OCARBON:	------	------	------	------	------	0.0169	0.0477	0.0728	------	0.0063
SO4:	0.0005	0.0006	0.0006	0.0006	0.0011	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0045	0.0050	0.0046	0.0468	0.0770	0.0811	0.2179	0.0144	0.0244
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0115	0.0118	0.0123	0.0119	0.0543	0.0843	0.0885	0.2297	0.0207	0.0321
SO2:	0.0067	0.0087	0.0114	0.0094	0.0169	0.0030	0.0056	0.0132	0.0033	0.0089
NH3:	0.1017	0.1010	0.0995	0.1006	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

* #
* 4km/h (2.5 mph) WINTER 10
* File 1, Run 1, Scenario 6.
* #

Calendar Year: 2008
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3803	0.3662	0.1249		0.0357	0.0004	0.0019	0.0852	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0042	0.0048	0.0044	0.0528	------	------	------	0.0205	0.0057
ECARBON:	------	------	------	------	------	0.0651	0.0360	0.1568	------	0.0134
OCARBON:	------	------	------	------	------	0.0184	0.0519	0.0791	------	0.0068
SO4:	0.0005	0.0006	0.0006	0.0006	0.0011	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0045	0.0048	0.0055	0.0050	0.0539	0.0836	0.0882	0.2368	0.0207	0.0266
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0087	0.0080	0.0080	0.0259	0.0040	0.0095
Total PM:	0.0251	0.0254	0.0260	0.0255	0.0751	0.1042	0.1087	0.2752	0.0372	0.0486
SO2:	0.0067	0.0087	0.0114	0.0094	0.0169	0.0030	0.0056	0.0132	0.0033	0.0089
NH3:	0.1017	0.1010	0.0995	0.1006	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

* #
* 4km/h (2.5 mph) SUMMER 2.5
* File 1, Run 1, Scenario 7.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0038	0.0043	0.0039	0.0429	------	------	------	0.0142	0.0049

ECARBON:	------	------	------	------	------	0.0574	0.0310	0.1336	------	0.0115
OCARBON:	------	------	------	------	------	0.0162	0.0446	0.0675	------	0.0059
SO4:	0.0005	0.0006	0.0006	0.0006	0.0011	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0044	0.0049	0.0045	0.0440	0.0737	0.0758	0.2020	0.0144	0.0230
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0115	0.0118	0.0123	0.0119	0.0515	0.0810	0.0832	0.2138	0.0207	0.0307
SO2:	0.0067	0.0087	0.0114	0.0094	0.0169	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1011	0.0996	0.1007	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

* #
* 4km/h (2.5 mph) SUMMER 10
* File 1, Run 1, Scenario 8.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0042	0.0047	0.0043	0.0495	------	------	------	0.0205	0.0055
ECARBON:	------	------	------	------	------	0.0624	0.0337	0.1452	------	0.0125
OCARBON:	------	------	------	------	------	0.0176	0.0484	0.0733	------	0.0064
SO4:	0.0005	0.0006	0.0006	0.0006	0.0011	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0045	0.0048	0.0054	0.0049	0.0506	0.0801	0.0824	0.2195	0.0207	0.0250
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0087	0.0080	0.0080	0.0259	0.0040	0.0095
Total PM:	0.0251	0.0253	0.0259	0.0255	0.0718	0.1006	0.1029	0.2579	0.0372	0.0471
SO2:	0.0067	0.0087	0.0114	0.0094	0.0169	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1011	0.0996	0.1007	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

***** HEADER SECTION *****

MOBILE6 INPUT FILE

REPORT FILE : WTRDWN.OUT
POLLUTANTS : NOX CO
PARTICULATES :
DATABASE VEHICLES : 22222 22222221 2 222 22222222 222

RUN DATA

***** RUN SECTION *****
FUEL RVP : 9.0

***** SCENARIO SECTION *****

***** 50KM/H *****

SCENARIO REC : 50km/h (31.1 mph) WINTER 2.5
MIN/MAX TEMP : 0.00 51.62
CALENDAR YEAR : 2008
ALTITUDE : 1
EVALUATION MONTH : 1

```
PARTICLE SIZE       : 2.5
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 31.1 ARTERIAL

SCENARIO REC        : 50km/h (31.1 mph) WINTER 10
MIN/MAX TEMP        : 0.00 51.62
CALENDAR YEAR       : 2008
ALTITUDE            : 1
EVALUATION MONTH    : 1
PARTICLE SIZE       : 10
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 31.1 ARTERIAL

SCENARIO REC        : 50km/h (31.1 mph) SUMMER 2.5
MIN/MAX TEMP        : 44.96 91.94
CALENDAR YEAR       : 2008
ALTITUDE            : 1
EVALUATION MONTH    : 7
PARTICLE SIZE       : 2.5
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 31.1 ARTERIAL

SCENARIO REC        : 50km/h (31.1 mph) SUMMER 10
MIN/MAX TEMP        : 44.96 91.94
CALENDAR YEAR       : 2008
ALTITUDE            : 1
EVALUATION MONTH    : 7
PARTICLE SIZE       : 10
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 31.1 ARTERIAL

***** 80 KM/H *****

SCENARIO REC        : 80km/h (49.7 mph) WINTER 2.5
MIN/MAX TEMP        : 0.00 51.62
CALENDAR YEAR       : 2008
ALTITUDE            : 1
EVALUATION MONTH    : 1
PARTICLE SIZE       : 2.5
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 49.7 ARTERIAL

SCENARIO REC        : 80km/h (49.7 mph) WINTER 10
MIN/MAX TEMP        : 0.00 51.62
CALENDAR YEAR       : 2008
ALTITUDE            : 1
EVALUATION MONTH    : 1
PARTICLE SIZE       : 10
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 49.7 ARTERIAL

SCENARIO REC        : 80km/h (49.7 mph) SUMMER 2.5
MIN/MAX TEMP        : 44.96 91.94
CALENDAR YEAR       : 2008
ALTITUDE            : 1
EVALUATION MONTH    : 7
PARTICLE SIZE       : 2.5
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 49.7 ARTERIAL

SCENARIO REC        : 80km/h (49.7 mph) SUMMER 10
MIN/MAX TEMP        : 44.96 91.94
CALENDAR YEAR       : 2008
```

```
ALTITUDE          : 1
EVALUATION MONTH  : 7
PARTICLE SIZE     : 10
PARTICULATE EF    : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR     : 15
AVERAGE SPEED     : 49.7 ARTERIAL

***** END OF THIS RUN *****

END OF RUN


***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                              *
* Input file: WTRDWN.IN (file 1, run 1).                                  *
***************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) WINTER 2.5
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 31.1
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

* Reading Ammonia (NH3) Basic Emissiion Rates
* from the external data file PMNH3BER.D

* Reading Ammonia (NH3) Sulfur Deterioration Rates
* from the external data file PMNH3SDR.D

                    Calendar Year:  2008
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:   0.0 (F)
              Maximum Temperature:  51.6 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   9.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000    (All)
```

```
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:     0.3803    0.3662    0.1249              0.0357    0.0004    0.0019    0.0852    0.0055    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :      18.49     21.92     30.00     23.98     12.69     1.010     0.875     2.125     14.63    19.523
     Composite NOX :      0.769     1.028     1.551     1.161     3.261     0.593     0.827     7.367      1.52     1.617
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) WINTER 10
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 31.1
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2008
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:   0.0 (F)
              Maximum Temperature:  51.6 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   9.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:     0.3803    0.3662    0.1249              0.0357    0.0004    0.0019    0.0852    0.0055    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :      18.49     21.92     30.00     23.98     12.69     1.010     0.875     2.125     14.63    19.523
     Composite NOX :      0.769     1.028     1.551     1.161     3.261     0.593     0.827     7.367      1.52     1.617
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) SUMMER 2.5
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV
```

```
* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 31.1
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                     Calendar Year:  2008
                             Month:  July
                          Altitude:  Low
               Minimum Temperature:  45.0 (F)
               Maximum Temperature:  91.9 (F)
                 Absolute Humidity:   75. grains/lb
                  Nominal Fuel RVP:   9.0 psi
                     Weathered RVP:   8.6 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  No
                  Evap I/M Program:  No
                       ATP Program:  No
                  Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	10.13	11.93	16.29	13.05	10.83	1.003	0.851	1.987	13.41	10.906
Composite NOX :	0.674	0.851	1.236	0.950	2.823	0.572	0.784	6.992	1.16	1.432

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) SUMMER 10
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
```

```
  M583 Warning:
            The user supplied arterial average speed of 31.1
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2008
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  45.0 (F)
              Maximum Temperature:  91.9 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV     LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:                <6000     >6000    (All)
                         ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:     0.3728    0.3705    0.1273             0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :      10.13     11.93     16.29     13.05     10.83     1.003     0.851     1.987     13.41    10.906
     Composite NOX :      0.674     0.851     1.236     0.950     2.823     0.572     0.784     6.992      1.16     1.432
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) WINTER 2.5
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 49.7
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2008
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:   0.0 (F)
              Maximum Temperature:  51.6 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
```

```
              Weathered RVP:   9.0 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  No
           Reformulated Gas:  No

       Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
               GVWR:              <6000    >6000   (All)
                       ------    ------   ------  ------   ------   ------   ------   ------   ------    ------
   VMT Distribution:   0.3803    0.3662   0.1249           0.0357   0.0004   0.0019   0.0852   0.0055    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    20.24     23.88    32.58    26.09    10.70    0.879    0.763    1.623    11.43    21.098
     Composite NOX :    0.807     1.073    1.600    1.207    3.744    0.699    0.976    8.677     1.73     1.784
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) WINTER 10
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 49.7
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

              Calendar Year:  2008
                      Month:  Jan.
                   Altitude:  Low
        Minimum Temperature:   0.0 (F)
        Maximum Temperature:  51.6 (F)
          Absolute Humidity:   75. grains/lb
           Nominal Fuel RVP:   9.0 psi
              Weathered RVP:   9.0 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  No
           Reformulated Gas:  No

       Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
               GVWR:              <6000    >6000   (All)
                       ------    ------   ------  ------   ------   ------   ------   ------   ------    ------
   VMT Distribution:   0.3803    0.3662   0.1249           0.0357   0.0004   0.0019   0.0852   0.0055    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    20.24     23.88    32.58    26.09    10.70    0.879    0.763    1.623    11.43    21.098
```

```
    Composite NOX :      0.807     1.073     1.600     1.207     3.744    0.699     0.976     8.677      1.73     1.784
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) SUMMER 2.5
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 49.7
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2008
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  45.0 (F)
              Maximum Temperature:  91.9 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3728    0.3705    0.1273              0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     11.58     13.43     18.13     14.64      9.13     0.874     0.743     1.518      9.96    12.117
    Composite NOX :     0.686     0.880     1.264     0.978     3.241     0.675     0.925     8.238      1.32     1.574
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) SUMMER 10
* File 1, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
```

```
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 49.7
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2008
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  45.0 (F)
              Maximum Temperature:  91.9 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:              <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3728    0.3705    0.1273             0.0359    0.0004    0.0019    0.0857    0.0055    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    11.58     13.43     18.13    14.64      9.13     0.874     0.743     1.518      9.96    12.117
     Composite NOX :     0.686     0.880     1.264    0.978     3.241     0.675     0.925     8.238      1.32     1.574
  -----------------------------------------------------------------------------------------------------------------------


***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                              *
* Input file: WTRDWN.IN (file 1, run 1).                                  *
***************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) WINTER 2.5
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                              Calendar Year:  2008
                                      Month:  Jan.
               Gasoline Fuel Sulfur Content:   30. ppm
                 Diesel Fuel Sulfur Content:   15. ppm
                       Particle Size Cutoff:  2.50 Microns
                           Reformulated Gas:  No

       Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:              <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3803    0.3662    0.1249             0.0357    0.0004    0.0019    0.0852    0.0055    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
               Lead:   0.0000    0.0000    0.0000   0.0000    0.0000    ------    ------    ------    0.0000    0.0000
              GASPM:   0.0038    0.0039    0.0044   0.0040    0.0457    ------    ------    ------    0.0142    0.0051
            ECARBON:   ------    ------    ------   ------    ------    0.0599    0.0331    0.1442    ------    0.0124
```

	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
OCARBON:	------	------	------	------	------	0.0169	0.0477	0.0728	------	0.0063
SO4:	0.0003	0.0005	0.0005	0.0005	0.0014	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0041	0.0044	0.0050	0.0045	0.0471	0.0770	0.0811	0.2179	0.0143	0.0243
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0114	0.0117	0.0123	0.0119	0.0546	0.0843	0.0885	0.2297	0.0206	0.0320
SO2:	0.0068	0.0088	0.0114	0.0094	0.0168	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1010	0.0995	0.1006	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

* #
* 50km/h (31.1 mph) WINTER 10
* File 1, Run 1, Scenario 2.
* #

Calendar Year: 2008
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3803	0.3662	0.1249		0.0357	0.0004	0.0019	0.0852	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0041	0.0043	0.0049	0.0044	0.0527	------	------	------	0.0205	0.0057
ECARBON:	------	------	------	------	------	0.0651	0.0360	0.1568	------	0.0134
OCARBON:	------	------	------	------	------	0.0184	0.0519	0.0791	------	0.0068
SO4:	0.0003	0.0005	0.0005	0.0005	0.0014	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0044	0.0047	0.0054	0.0049	0.0541	0.0836	0.0882	0.2368	0.0206	0.0265
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0087	0.0080	0.0080	0.0259	0.0040	0.0095
Total PM:	0.0249	0.0253	0.0260	0.0255	0.0753	0.1042	0.1087	0.2752	0.0371	0.0486
SO2:	0.0068	0.0088	0.0114	0.0094	0.0168	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1010	0.0995	0.1006	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

* #
* 50km/h (31.1 mph) SUMMER 2.5
* File 1, Run 1, Scenario 3.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0038	0.0039	0.0044	0.0040	0.0427	------	------	------	0.0142	0.0050
ECARBON:	------	------	------	------	------	0.0574	0.0310	0.1336	------	0.0115
OCARBON:	------	------	------	------	------	0.0162	0.0446	0.0675	------	0.0059
SO4:	0.0003	0.0005	0.0005	0.0005	0.0014	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0041	0.0044	0.0049	0.0045	0.0442	0.0737	0.0758	0.2020	0.0143	0.0229
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0114	0.0117	0.0122	0.0118	0.0517	0.0810	0.0832	0.2138	0.0206	0.0306
SO2:	0.0068	0.0088	0.0114	0.0095	0.0168	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1011	0.0996	0.1007	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

---

* #
* 50km/h (31.1 mph) SUMMER 10
* File 1, Run 1, Scenario 4.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0041	0.0042	0.0048	0.0044	0.0493	------	------	------	0.0205	0.0056
ECARBON:	------	------	------	------	------	0.0624	0.0337	0.1452	------	0.0125
OCARBON:	------	------	------	------	------	0.0176	0.0484	0.0733	------	0.0064
SO4:	0.0003	0.0005	0.0005	0.0005	0.0014	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0044	0.0047	0.0053	0.0049	0.0508	0.0801	0.0824	0.2195	0.0206	0.0250
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0087	0.0080	0.0080	0.0259	0.0040	0.0095
Total PM:	0.0249	0.0253	0.0259	0.0254	0.0720	0.1006	0.1029	0.2579	0.0371	0.0471
SO2:	0.0068	0.0088	0.0114	0.0095	0.0168	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1011	0.0996	0.1007	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

---

* #
* 80km/h (49.7 mph) WINTER 2.5
* File 1, Run 1, Scenario 5.
* #

Calendar Year: 2008
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3803	0.3662	0.1249		0.0357	0.0004	0.0019	0.0852	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0038	0.0039	0.0044	0.0040	0.0456	------	------	------	0.0142	0.0051
ECARBON:	------	------	------	------	------	0.0599	0.0331	0.1442	------	0.0124
OCARBON:	------	------	------	------	------	0.0169	0.0477	0.0728	------	0.0063
SO4:	0.0002	0.0004	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0004
Total Exhaust PM:	0.0040	0.0044	0.0049	0.0045	0.0472	0.0770	0.0811	0.2179	0.0143	0.0243
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0114	0.0117	0.0123	0.0118	0.0547	0.0843	0.0885	0.2297	0.0206	0.0320
SO2:	0.0068	0.0088	0.0114	0.0095	0.0168	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1010	0.0995	0.1006	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

---

* #
* 80km/h (49.7 mph) WINTER 10
* File 1, Run 1, Scenario 6.
* #

Calendar Year: 2008

Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3803	0.3662	0.1249		0.0357	0.0004	0.0019	0.0852	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0041	0.0043	0.0049	0.0044	0.0527	------	------	------	0.0205	0.0057
ECARBON:	------	------	------	------	------	0.0651	0.0360	0.1568	------	0.0134
OCARBON:	------	------	------	------	------	0.0184	0.0519	0.0791	------	0.0068
SO4:	0.0002	0.0004	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0004
Total Exhaust PM:	0.0044	0.0047	0.0054	0.0049	0.0542	0.0836	0.0882	0.2368	0.0206	0.0265
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0087	0.0080	0.0080	0.0259	0.0040	0.0095
Total PM:	0.0249	0.0253	0.0260	0.0254	0.0754	0.1042	0.1087	0.2752	0.0371	0.0486
SO2:	0.0068	0.0088	0.0114	0.0095	0.0168	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1010	0.0995	0.1006	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

* #
* 80km/h (49.7 mph) SUMMER 2.5
* File 1, Run 1, Scenario 7.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0038	0.0039	0.0044	0.0040	0.0427	------	------	------	0.0142	0.0050
ECARBON:	------	------	------	------	------	0.0574	0.0310	0.1336	------	0.0115
OCARBON:	------	------	------	------	------	0.0162	0.0446	0.0675	------	0.0059
SO4:	0.0002	0.0004	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0040	0.0043	0.0049	0.0045	0.0443	0.0737	0.0758	0.2020	0.0143	0.0229
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0114	0.0117	0.0122	0.0118	0.0518	0.0810	0.0832	0.2138	0.0206	0.0306
SO2:	0.0068	0.0088	0.0114	0.0095	0.0167	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1011	0.0996	0.1007	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

* #
* 80km/h (49.7 mph) SUMMER 10
* File 1, Run 1, Scenario 8.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						

	------	------	------	------	------	------	------	------	------	------
VMT Distribution:	0.3728	0.3705	0.1273		0.0359	0.0004	0.0019	0.0857	0.0055	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0041	0.0042	0.0048	0.0044	0.0493	------	------	------	0.0205	0.0056
ECARBON:	------	------	------	------	------	0.0624	0.0337	0.1452	------	0.0125
OCARBON:	------	------	------	------	------	0.0176	0.0484	0.0733	------	0.0064
SO4:	0.0002	0.0004	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0044	0.0047	0.0053	0.0049	0.0509	0.0801	0.0824	0.2195	0.0206	0.0250
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0087	0.0080	0.0080	0.0259	0.0040	0.0095
Total PM:	0.0249	0.0252	0.0259	0.0254	0.0721	0.1006	0.1029	0.2579	0.0371	0.0470
SO2:	0.0068	0.0088	0.0114	0.0095	0.0167	0.0030	0.0056	0.0132	0.0033	0.0090
NH3:	0.1017	0.1011	0.0996	0.1007	0.0451	0.0068	0.0068	0.0270	0.0113	0.0921

Scenario 2 & 3 – 2021

```
***** HEADER SECTION *****

MOBILE6 INPUT FILE

REPORT FILE         : WTRDWN.OUT
POLLUTANTS          : NOX CO
PARTICULATES        :
DATABASE VEHICLES   : 22222 22222221 2 222 22222222 222

RUN DATA

***** RUN SECTION *****
FUEL RVP            : 9.0

***** SCENARIO SECTION *****

***** 60KM/H *****

SCENARIO REC        : 60km/h (37.3 mph) WINTER 2.5
MIN/MAX TEMP        : 0.00 51.62
CALENDAR YEAR       : 2021
ALTITUDE            : 1
EVALUATION MONTH    : 1
PARTICLE SIZE       : 2.5
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 37.3 ARTERIAL

SCENARIO REC        : 60km/h (37.3 mph) WINTER 10
MIN/MAX TEMP        : 0.00 51.62
CALENDAR YEAR       : 2021
ALTITUDE            : 1
EVALUATION MONTH    : 1
PARTICLE SIZE       : 10
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 37.3 ARTERIAL

SCENARIO REC        : 60km/h (37.3 mph) SUMMER 2.5
MIN/MAX TEMP        : 44.96 91.94
CALENDAR YEAR       : 2021
ALTITUDE            : 1
EVALUATION MONTH    : 7
PARTICLE SIZE       : 2.5
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 37.3 ARTERIAL

SCENARIO REC        : 60km/h (37.3 mph) SUMMER 10
MIN/MAX TEMP        : 44.96 91.94
CALENDAR YEAR       : 2021
ALTITUDE            : 1
EVALUATION MONTH    : 7
PARTICLE SIZE       : 10
PARTICULATE EF      : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR       : 15
AVERAGE SPEED       : 37.3 ARTERIAL

***** 4 KM/H *****

SCENARIO REC        : km/h (2.5 mph) WINTER 2.5
MIN/MAX TEMP        : 0.00 51.62
CALENDAR YEAR       : 2021
ALTITUDE            : 1
```

```
EVALUATION MONTH   : 1
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 2.5 ARTERIAL

SCENARIO REC       : 4km/h (2.5 mph) WINTER 10
MIN/MAX TEMP       : 0.00 51.62
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 1
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 2.5 ARTERIAL

SCENARIO REC       : 4km/h (2.5 mph) SUMMER 2.5
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 2.5 ARTERIAL

SCENARIO REC       : 4km/h (2.5 mph) SUMMER 10
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 2.5 ARTERIAL

***** END OF THIS RUN *****

END OF RUN


****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                               *
* Input file: WTRDWN.IN (file 1, run 1).                                   *
****************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) WINTER 2.5
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 37.3
```

```
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

* Reading Ammonia (NH3) Basic Emissiion Rates
* from the external data file PMNH3BER.D

* Reading Ammonia (NH3) Sulfur Deterioration Rates
* from the external data file PMNH3SDR.D

                    Calendar Year:  2021
                            Month:  Jan.
                         Altitude:  Low
             Minimum Temperature:   0.0 (F)
             Maximum Temperature:  51.6 (F)
               Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   9.0 psi
              Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2790    0.4400    0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.01     13.50     17.36     14.49      6.66     0.518     0.370     0.323     12.93    12.790
     Composite NOX :     0.274     0.397     0.771     0.492     0.595     0.046     0.207     1.277      1.58     0.508
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) WINTER 10
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
           The user supplied arterial average speed of 37.3
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12
```

```
                   Calendar Year:  2021
                           Month:  Jan.
                        Altitude:  Low
             Minimum Temperature:   0.0 (F)
             Maximum Temperature:  51.6 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   9.0 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  No
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
              GVWR:              <6000    >6000     (All)
                       ------    ------   ------   ------   ------   ------   ------   ------   ------    ------
  VMT Distribution:    0.2790    0.4400   0.1500            0.0363   0.0003   0.0022   0.0872   0.0050    1.0000
 ------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.01     13.50    17.36    14.49     6.66    0.518    0.370    0.323    12.93    12.790
     Composite NOX :     0.274     0.397    0.771    0.492    0.595    0.046    0.207    1.277     1.58     0.508
 ------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) SUMMER 2.5
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 37.3
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2021
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  45.0 (F)
             Maximum Temperature:  91.9 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   9.0 psi
                   Weathered RVP:   8.6 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
```

```
                  ATP Program:  No
             Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     6.87      7.56      9.61      8.09      5.73     0.522     0.367     0.311     11.57     6.978
    Composite NOX :    0.248     0.354     0.632     0.425     0.529     0.045     0.200     1.211      1.21     0.451
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) SUMMER 10
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 37.3
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                Calendar Year:  2021
                        Month:  July
                     Altitude:  Low
          Minimum Temperature:  45.0 (F)
          Maximum Temperature:  91.9 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:   9.0 psi
                Weathered RVP:   8.6 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  No
             Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     6.87      7.56      9.61      8.09      5.73     0.522     0.367     0.311     11.57     6.978
    Composite NOX :    0.248     0.354     0.632     0.425     0.529     0.045     0.200     1.211      1.21     0.451
 ------------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* km/h (2.5 mph) WINTER 2.5
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                     Calendar Year:  2021
                             Month:  Jan.
                          Altitude:  Low
              Minimum Temperature:   0.0 (F)
              Maximum Temperature:  51.6 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   9.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:              <6000     >6000    (All)
                      ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2790   0.4400    0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :      33.67     31.98     43.17     34.83     43.71     1.944     1.363     1.952    111.56    32.267
     Composite NOX :      0.524     0.741     1.398     0.908     0.436     0.089     0.398     2.490      1.42     0.923
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4km/h (2.5 mph) WINTER 10
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV
```

```
* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2021
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:   0.0 (F)
              Maximum Temperature:  51.6 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   9.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2790    0.4400    0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     33.67     31.98     43.17     34.83     43.71     1.944     1.363     1.952    111.56    32.267
     Composite NOX :     0.524     0.741     1.398     0.908     0.436     0.089     0.398     2.490      1.42     0.923
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4km/h (2.5 mph) SUMMER 2.5
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
```

```
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2021
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  45.0 (F)
            Maximum Temperature:  91.9 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   8.6 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
              Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
              GVWR:              <6000    >6000   (All)
                       ------   ------   ------  ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 -----------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     21.52    21.66    27.23    23.08    37.60    1.951    1.350    1.877   118.23   21.756
     Composite NOX :     0.564    0.689    1.190    0.817    0.388    0.087    0.385    2.363     1.09    0.866
 -----------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4km/h (2.5 mph) SUMMER 10
* File 1, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
          The user supplied arterial average speed of  2.5
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2021
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  45.0 (F)
            Maximum Temperature:  91.9 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
```

```
              Weathered RVP:   8.6 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  No
           Reformulated Gas:  No

    Vehicle Type:     LDGV     LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
            GVWR:               <6000     >6000     (All)
                    ------     ------    ------    ------    ------    ------    ------    ------    ------    ------
VMT Distribution:   0.2788     0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     21.52      21.66     27.23     23.08     37.60     1.951     1.350     1.877    118.23    21.756
     Composite NOX :     0.564      0.689     1.190     0.817     0.388     0.087     0.385     2.363      1.09     0.866
  ---------------------------------------------------------------------------------------------------------------------


***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                              *
* Input file: WTRDWN.IN (file 1, run 1).                                  *
***************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) WINTER 2.5
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                              Calendar Year:  2021
                                      Month:  Jan.
              Gasoline Fuel Sulfur Content:   30. ppm
                Diesel Fuel Sulfur Content:   15. ppm
                      Particle Size Cutoff:  2.50 Microns
                          Reformulated Gas:  No

    Vehicle Type:     LDGV     LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
            GVWR:               <6000     >6000     (All)
                    ------     ------    ------    ------    ------    ------    ------    ------    ------    ------
VMT Distribution:   0.2790     0.4400    0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
            Lead:   0.0000     0.0000    0.0000    0.0000    0.0000    ------    ------    ------    0.0000    0.0000
           GASPM:   0.0037     0.0035    0.0035    0.0035    0.0115    ------    ------    ------    0.0142    0.0036
         ECARBON:   ------     ------    ------    ------    ------    0.0085    0.0058    0.0168    ------    0.0015
         OCARBON:   ------     ------    ------    ------    ------    0.0024    0.0084    0.0086    ------    0.0008
             SO4:   0.0002     0.0004    0.0004    0.0004    0.0020    0.0002    0.0003    0.0009    0.0001    0.0005
Total Exhaust PM:   0.0039     0.0039    0.0039    0.0039    0.0135    0.0110    0.0145    0.0263    0.0143    0.0063
           Brake:   0.0053     0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053
            Tire:   0.0020     0.0020    0.0020    0.0020    0.0022    0.0020    0.0020    0.0065    0.0010    0.0024
        Total PM:   0.0112     0.0112    0.0113    0.0112    0.0210    0.0184    0.0218    0.0381    0.0206    0.0140
             SO2:   0.0068     0.0088    0.0115    0.0095    0.0164    0.0029    0.0056    0.0131    0.0033    0.0093
             NH3:   0.1017     0.1017    0.1017    0.1017    0.0451    0.0068    0.0068    0.0270    0.0113    0.0925
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60km/h (37.3 mph) WINTER 10
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                              Calendar Year:  2021
                                      Month:  Jan.
              Gasoline Fuel Sulfur Content:   30. ppm
                Diesel Fuel Sulfur Content:   15. ppm
                      Particle Size Cutoff: 10.00 Microns
                          Reformulated Gas:  No

    Vehicle Type:     LDGV     LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
            GVWR:               <6000     >6000     (All)
                    ------     ------    ------    ------    ------    ------    ------    ------    ------    ------
```

	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0038	0.0038	0.0038	0.0127	------	------	------	0.0205	0.0039
ECARBON:	------	------	------	------	------	0.0092	0.0063	0.0183	------	0.0016
OCARBON:	------	------	------	------	------	0.0026	0.0091	0.0093	------	0.0008
SO4:	0.0002	0.0004	0.0004	0.0004	0.0020	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0147	0.0120	0.0157	0.0285	0.0206	0.0068
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0086	0.0080	0.0080	0.0259	0.0040	0.0096
Total PM:	0.0247	0.0247	0.0248	0.0248	0.0359	0.0325	0.0362	0.0669	0.0371	0.0289
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* #
* 60km/h (37.3 mph) SUMMER 2.5
* File 1, Run 1, Scenario 3.
* #

Calendar Year: 2021
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0035	0.0035	0.0035	0.0112	------	------	------	0.0142	0.0036
ECARBON:	------	------	------	------	------	0.0084	0.0056	0.0161	------	0.0014
OCARBON:	------	------	------	------	------	0.0024	0.0081	0.0082	------	0.0007
SO4:	0.0002	0.0004	0.0004	0.0004	0.0020	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0132	0.0109	0.0140	0.0252	0.0143	0.0062
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0112	0.0112	0.0113	0.0112	0.0207	0.0183	0.0214	0.0370	0.0206	0.0139
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0924

* #
* 60km/h (37.3 mph) SUMMER 10
* File 1, Run 1, Scenario 4.
* #

Calendar Year: 2021
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0038	0.0038	0.0038	0.0123	------	------	------	0.0205	0.0039
ECARBON:	------	------	------	------	------	0.0091	0.0061	0.0175	------	0.0015
OCARBON:	------	------	------	------	------	0.0026	0.0088	0.0089	------	0.0008
SO4:	0.0002	0.0004	0.0004	0.0004	0.0020	0.0002	0.0003	0.0009	0.0001	0.0005

```
   Total Exhaust PM:   0.0042    0.0042    0.0042    0.0042    0.0143    0.0119    0.0152    0.0274    0.0206    0.0067
              Brake:   0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125
               Tire:   0.0080    0.0080    0.0080    0.0080    0.0086    0.0080    0.0080    0.0258    0.0040    0.0096
           Total PM:   0.0247    0.0247    0.0248    0.0248    0.0355    0.0324    0.0358    0.0658    0.0371    0.0288
                SO2:   0.0068    0.0088    0.0115    0.0095    0.0164    0.0029    0.0056    0.0131    0.0033    0.0093
                NH3:   0.1017    0.1017    0.1017    0.1017    0.0451    0.0068    0.0068    0.0270    0.0113    0.0924
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* km/h (2.5 mph) WINTER 2.5
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                              Calendar Year:  2021
                                      Month:  Jan.
               Gasoline Fuel Sulfur Content:   30. ppm
                 Diesel Fuel Sulfur Content:   15. ppm
                       Particle Size Cutoff:  2.50 Microns
                           Reformulated Gas:  No

       Vehicle Type:     LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:              <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2790    0.4400    0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
               Lead:   0.0000    0.0000    0.0000    0.0000    0.0000    ------    ------    ------    0.0000    0.0000
              GASPM:   0.0034    0.0033    0.0034    0.0033    0.0121    ------    ------    ------    0.0142    0.0034
            ECARBON:   ------    ------    ------    ------    ------    0.0085    0.0058    0.0168    ------    0.0015
            OCARBON:   ------    ------    ------    ------    ------    0.0024    0.0084    0.0086    ------    0.0008
                SO4:   0.0005    0.0006    0.0006    0.0006    0.0013    0.0002    0.0003    0.0009    0.0002    0.0006
   Total Exhaust PM:   0.0039    0.0039    0.0040    0.0039    0.0134    0.0110    0.0145    0.0263    0.0144    0.0063
              Brake:   0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053
               Tire:   0.0020    0.0020    0.0020    0.0020    0.0022    0.0020    0.0020    0.0065    0.0010    0.0024
           Total PM:   0.0113    0.0113    0.0113    0.0113    0.0209    0.0184    0.0218    0.0381    0.0207    0.0140
                SO2:   0.0067    0.0088    0.0115    0.0095    0.0166    0.0029    0.0056    0.0131    0.0033    0.0092
                NH3:   0.1017    0.1017    0.1017    0.1017    0.0451    0.0068    0.0068    0.0270    0.0113    0.0925
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4km/h (2.5 mph) WINTER 10
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                              Calendar Year:  2021
                                      Month:  Jan.
               Gasoline Fuel Sulfur Content:   30. ppm
                 Diesel Fuel Sulfur Content:   15. ppm
                       Particle Size Cutoff: 10.00 Microns
                           Reformulated Gas:  No

       Vehicle Type:     LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:              <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2790    0.4400    0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
               Lead:   0.0000    0.0000    0.0000    0.0000    0.0000    ------    ------    ------    0.0000    0.0000
              GASPM:   0.0037    0.0036    0.0036    0.0036    0.0133    ------    ------    ------    0.0205    0.0038
            ECARBON:   ------    ------    ------    ------    ------    0.0092    0.0063    0.0183    ------    0.0016
            OCARBON:   ------    ------    ------    ------    ------    0.0026    0.0091    0.0093    ------    0.0008
                SO4:   0.0005    0.0006    0.0006    0.0006    0.0013    0.0002    0.0003    0.0009    0.0002    0.0006
   Total Exhaust PM:   0.0042    0.0042    0.0042    0.0042    0.0146    0.0120    0.0157    0.0285    0.0207    0.0068
              Brake:   0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125
               Tire:   0.0080    0.0080    0.0080    0.0080    0.0086    0.0080    0.0080    0.0259    0.0040    0.0096
           Total PM:   0.0248    0.0248    0.0248    0.0248    0.0358    0.0325    0.0362    0.0669    0.0372    0.0289
                SO2:   0.0067    0.0088    0.0115    0.0095    0.0166    0.0029    0.0056    0.0131    0.0033    0.0092
                NH3:   0.1017    0.1017    0.1017    0.1017    0.0451    0.0068    0.0068    0.0270    0.0113    0.0925
 ------------------------------------------------------------------------------------------------------------------------
```

* #
* 4km/h (2.5 mph) SUMMER 2.5
* File 1, Run 1, Scenario 7.
* #

Calendar Year: 2021
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0034	0.0033	0.0034	0.0033	0.0117	------	------	------	0.0142	0.0034
ECARBON:	------	------	------	------	------	0.0084	0.0056	0.0161	------	0.0014
OCARBON:	------	------	------	------	------	0.0024	0.0081	0.0082	------	0.0007
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0039	0.0039	0.0040	0.0039	0.0131	0.0109	0.0140	0.0252	0.0144	0.0062
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0206	0.0183	0.0214	0.0370	0.0207	0.0139
SO2:	0.0067	0.0088	0.0115	0.0095	0.0166	0.0029	0.0056	0.0131	0.0033	0.0092
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0924

* #
* 4km/h (2.5 mph) SUMMER 10
* File 1, Run 1, Scenario 8.
* #

Calendar Year: 2021
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0036	0.0036	0.0036	0.0130	------	------	------	0.0205	0.0037
ECARBON:	------	------	------	------	------	0.0091	0.0061	0.0175	------	0.0015
OCARBON:	------	------	------	------	------	0.0026	0.0088	0.0089	------	0.0008
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0143	0.0119	0.0152	0.0274	0.0207	0.0067
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0086	0.0080	0.0080	0.0258	0.0040	0.0096
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0355	0.0324	0.0358	0.0658	0.0372	0.0288
SO2:	0.0067	0.0088	0.0115	0.0095	0.0166	0.0029	0.0056	0.0131	0.0033	0.0092
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0924

***** HEADER SECTION *****

MOBILE6 INPUT FILE

REPORT FILE : WTRDWN.OUT
POLLUTANTS : NOX CO
PARTICULATES :

```
DATABASE VEHICLES  : 22222 22222221 2 222 22222222 222

RUN DATA

***** RUN SECTION *****
FUEL RVP           : 9.0

***** SCENARIO SECTION *****

***** 50KM/H *****

SCENARIO REC       : 50km/h (31.1 mph) WINTER 2.5
MIN/MAX TEMP       : 0.00 51.62
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 1
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 31.1 ARTERIAL

SCENARIO REC       : 50km/h (31.1 mph) WINTER 10
MIN/MAX TEMP       : 0.00 51.62
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 1
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 31.1 ARTERIAL

SCENARIO REC       : 50km/h (31.1 mph) SUMMER 2.5
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 31.1 ARTERIAL

SCENARIO REC       : 50km/h (31.1 mph) SUMMER 10
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 31.1 ARTERIAL

***** 80 KM/H *****

SCENARIO REC       : 80km/h (49.7 mph) WINTER 2.5
MIN/MAX TEMP       : 0.00 51.62
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 1
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 49.7 ARTERIAL

SCENARIO REC       : 80km/h (49.7 mph) WINTER 10
MIN/MAX TEMP       : 0.00 51.62
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 1
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
```

```
DIESEL SULFUR      : 15
AVERAGE SPEED      : 49.7 ARTERIAL

SCENARIO REC       : 80km/h (49.7 mph) SUMMER 2.5
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 49.7 ARTERIAL

SCENARIO REC       : 80km/h (49.7 mph) SUMMER 10
MIN/MAX TEMP       : 44.96 91.94
CALENDAR YEAR      : 2021
ALTITUDE           : 1
EVALUATION MONTH   : 7
PARTICLE SIZE      : 10
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
DIESEL SULFUR      : 15
AVERAGE SPEED      : 49.7 ARTERIAL

***** END OF THIS RUN *****

END OF RUN


***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                              *
* Input file: WTRDWN.IN (file 1, run 1).                                  *
***************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) WINTER 2.5
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 31.1
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

* Reading Ammonia (NH3) Basic Emissiion Rates
* from the external data file PMNH3BER.D

* Reading Ammonia (NH3) Sulfur Deterioration Rates
* from the external data file PMNH3SDR.D
```

```
                 Calendar Year:  2021
                         Month:  Jan.
                      Altitude:  Low
           Minimum Temperature:   0.0 (F)
           Maximum Temperature:  51.6 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   9.0 psi
                 Weathered RVP:   9.0 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  No
             Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2790    0.4400    0.1500             0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.79     13.26     17.04     14.22      7.65     0.566     0.404     0.378     14.63    12.623
     Composite NOX :     0.275     0.398     0.774     0.493     0.567     0.046     0.206     1.269      1.52     0.507
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) WINTER 10
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
          The user supplied arterial average speed of 31.1
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                 Calendar Year:  2021
                         Month:  Jan.
                      Altitude:  Low
           Minimum Temperature:   0.0 (F)
           Maximum Temperature:  51.6 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   9.0 psi
                 Weathered RVP:   9.0 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
```

```
                 ATP Program:  No
            Reformulated Gas:  No

     Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------    ------
 VMT Distribution:     0.2790   0.4400   0.1500            0.0363   0.0003   0.0022   0.0872   0.0050    1.0000
 -----------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     13.79    13.26    17.04    14.22     7.65    0.566    0.404    0.378    14.63    12.623
    Composite NOX :     0.275    0.398    0.774    0.493    0.567    0.046    0.206    1.269     1.52     0.507
 -----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) SUMMER 2.5
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 31.1
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

               Calendar Year:  2021
                       Month:  July
                    Altitude:  Low
         Minimum Temperature:  45.0 (F)
         Maximum Temperature:  91.9 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:   9.0 psi
               Weathered RVP:   8.6 psi
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  No
            Reformulated Gas:  No

     Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------    ------
 VMT Distribution:     0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :      6.72     7.39     9.39     7.90     6.58    0.570    0.401    0.364    13.41     6.871
    Composite NOX :     0.252    0.356    0.637    0.428    0.503    0.045    0.199    1.204     1.16     0.453
 -----------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) SUMMER 10
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 31.1
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                     Calendar Year:  2021
                             Month:  July
                          Altitude:  Low
              Minimum Temperature:  45.0 (F)
              Maximum Temperature:  91.9 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   8.6 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34    LDGT      HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:               <6000    >6000    (All)
                        ------   ------   ------   ------    ------   ------   ------   ------   ------   ------
  VMT Distribution:     0.2788   0.4388   0.1507             0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO   :      6.72     7.39     9.39     7.90      6.58    0.570    0.401    0.364    13.41    6.871
    Composite NOX :      0.252    0.356    0.637    0.428     0.503    0.045    0.199    1.204     1.16    0.453
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) WINTER 2.5
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV
```

```
* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 49.7
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2021
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:   0.0 (F)
              Maximum Temperature:  51.6 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   9.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2790    0.4400    0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 --------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.99     14.56     18.74     15.62      6.45     0.488     0.349     0.289     11.43    13.718
     Composite NOX :     0.289     0.416     0.798     0.513     0.651     0.054     0.243     1.503      1.73     0.547
 --------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) WINTER 10
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 49.7
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
```

```
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2021
                          Month:  Jan.
                       Altitude:  Low
            Minimum Temperature:   0.0 (F)
            Maximum Temperature:  51.6 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
                  Weathered RVP:   9.0 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  No
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2790    0.4400    0.1500             0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    14.99     14.56     18.74    15.62      6.45     0.488     0.349     0.289     11.43    13.718
     Composite NOX :    0.289     0.416     0.798    0.513     0.651     0.054     0.243     1.503      1.73     0.547
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) SUMMER 2.5
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
          The user supplied arterial average speed of 49.7
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2021
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  45.0 (F)
            Maximum Temperature:  91.9 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   9.0 psi
```

```
                Weathered RVP:   8.6 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  No
             Reformulated Gas:  No

     Vehicle Type:     LDGV    LDGT12    LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:              <6000     >6000   (All)
                     ------    ------    ------  ------   ------   ------   ------   ------   ------    ------
 VMT Distribution:   0.2788    0.4388    0.1507           0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :    7.56      8.33     10.56    8.90     5.55    0.492    0.347    0.278     9.96     7.635
    Composite NOX :   0.255     0.368     0.652   0.441    0.578    0.053    0.235    1.425     1.32     0.484
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) SUMMER 10
* File 1, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 49.7
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                Calendar Year:  2021
                        Month:  July
                     Altitude:  Low
          Minimum Temperature:  45.0 (F)
          Maximum Temperature:  91.9 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:   9.0 psi
                Weathered RVP:   8.6 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  No
             Reformulated Gas:  No

     Vehicle Type:     LDGV    LDGT12    LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:              <6000     >6000   (All)
                     ------    ------    ------  ------   ------   ------   ------   ------   ------    ------
 VMT Distribution:   0.2788    0.4388    0.1507           0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
```

Composite Emission Factors (g/mi):

Composite CO :	7.56	8.33	10.56	8.90	5.55	0.492	0.347	0.278	9.96	7.635
Composite NOX :	0.255	0.368	0.652	0.441	0.578	0.053	0.235	1.425	1.32	0.484

```
****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                               *
* Input file: WTRDWN.IN (file 1, run 1).                                   *
****************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) WINTER 2.5
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

Calendar Year: 2021
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000

Composite Emission Factors (g/mi):

	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0036	0.0034	0.0035	0.0034	0.0116	------	------	------	0.0142	0.0035
ECARBON:	------	------	------	------	------	0.0085	0.0058	0.0168	------	0.0015
OCARBON:	------	------	------	------	------	0.0024	0.0084	0.0086	------	0.0008
SO4:	0.0003	0.0005	0.0005	0.0005	0.0018	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0135	0.0110	0.0145	0.0263	0.0143	0.0063
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0112	0.0112	0.0113	0.0113	0.0209	0.0184	0.0218	0.0381	0.0206	0.0140
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) WINTER 10
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

Calendar Year: 2021
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000

Composite Emission Factors (g/mi):

	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0039	0.0037	0.0038	0.0037	0.0128	------	------	------	0.0205	0.0039
ECARBON:	------	------	------	------	------	0.0092	0.0063	0.0183	------	0.0016
OCARBON:	------	------	------	------	------	0.0026	0.0091	0.0093	------	0.0008
SO4:	0.0003	0.0005	0.0005	0.0005	0.0018	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0147	0.0120	0.0157	0.0285	0.0206	0.0068
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0086	0.0080	0.0080	0.0259	0.0040	0.0096
Total PM:	0.0247	0.0247	0.0248	0.0248	0.0358	0.0325	0.0362	0.0669	0.0371	0.0289
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093

NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) SUMMER 2.5
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                   Calendar Year:  2021
                           Month:  July
       Gasoline Fuel Sulfur Content:   30. ppm
         Diesel Fuel Sulfur Content:   15. ppm
              Particle Size Cutoff:  2.50 Microns
                  Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0036	0.0034	0.0035	0.0034	0.0113	------	------	------	0.0142	0.0035
ECARBON:	------	------	------	------	------	0.0084	0.0056	0.0161	------	0.0014
OCARBON:	------	------	------	------	------	0.0024	0.0081	0.0082	------	0.0007
SO4:	0.0003	0.0005	0.0005	0.0005	0.0018	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0131	0.0109	0.0140	0.0252	0.0143	0.0062
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0112	0.0112	0.0113	0.0113	0.0206	0.0183	0.0214	0.0370	0.0206	0.0139
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0924

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50km/h (31.1 mph) SUMMER 10
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                   Calendar Year:  2021
                           Month:  July
       Gasoline Fuel Sulfur Content:   30. ppm
         Diesel Fuel Sulfur Content:   15. ppm
              Particle Size Cutoff: 10.00 Microns
                  Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0039	0.0037	0.0038	0.0037	0.0125	------	------	------	0.0205	0.0039
ECARBON:	------	------	------	------	------	0.0091	0.0061	0.0175	------	0.0015
OCARBON:	------	------	------	------	------	0.0026	0.0088	0.0089	------	0.0008
SO4:	0.0003	0.0005	0.0005	0.0005	0.0018	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0143	0.0119	0.0152	0.0274	0.0206	0.0067
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0086	0.0080	0.0080	0.0258	0.0040	0.0096
Total PM:	0.0247	0.0247	0.0248	0.0248	0.0355	0.0324	0.0358	0.0658	0.0371	0.0288
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0924

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) WINTER 2.5
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

Calendar Year: 2021
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0035	0.0035	0.0035	0.0115	------	------	------	0.0142	0.0036
ECARBON:	------	------	------	------	------	0.0085	0.0058	0.0168	------	0.0015
OCARBON:	------	------	------	------	------	0.0024	0.0084	0.0086	------	0.0008
SO4:	0.0002	0.0004	0.0004	0.0004	0.0020	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0135	0.0110	0.0145	0.0263	0.0143	0.0063
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0112	0.0112	0.0113	0.0112	0.0210	0.0184	0.0218	0.0381	0.0206	0.0140
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* #
* 80km/h (49.7 mph) WINTER 10
* File 1, Run 1, Scenario 6.
* #

Calendar Year: 2021
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0038	0.0038	0.0038	0.0127	------	------	------	0.0205	0.0039
ECARBON:	------	------	------	------	------	0.0092	0.0063	0.0183	------	0.0016
OCARBON:	------	------	------	------	------	0.0026	0.0091	0.0093	------	0.0008
SO4:	0.0002	0.0004	0.0004	0.0004	0.0020	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0147	0.0120	0.0157	0.0285	0.0206	0.0068
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0086	0.0080	0.0080	0.0259	0.0040	0.0096
Total PM:	0.0247	0.0247	0.0248	0.0248	0.0359	0.0325	0.0362	0.0669	0.0371	0.0289
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* #
* 80km/h (49.7 mph) SUMMER 2.5
* File 1, Run 1, Scenario 7.
* #

Calendar Year: 2021
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh

GVWR:		<6000	>6000	(All)						
	------	------	------	------	------	------	------	------	------	------
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0035	0.0035	0.0035	0.0112	------	------	------	0.0142	0.0036
ECARBON:	------	------	------	------	------	0.0084	0.0056	0.0161	------	0.0014
OCARBON:	------	------	------	------	------	0.0024	0.0081	0.0082	------	0.0007
SO4:	0.0002	0.0004	0.0004	0.0004	0.0020	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0132	0.0109	0.0140	0.0252	0.0143	0.0062
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0065	0.0010	0.0024
Total PM:	0.0112	0.0112	0.0113	0.0112	0.0207	0.0183	0.0214	0.0370	0.0206	0.0139
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0924

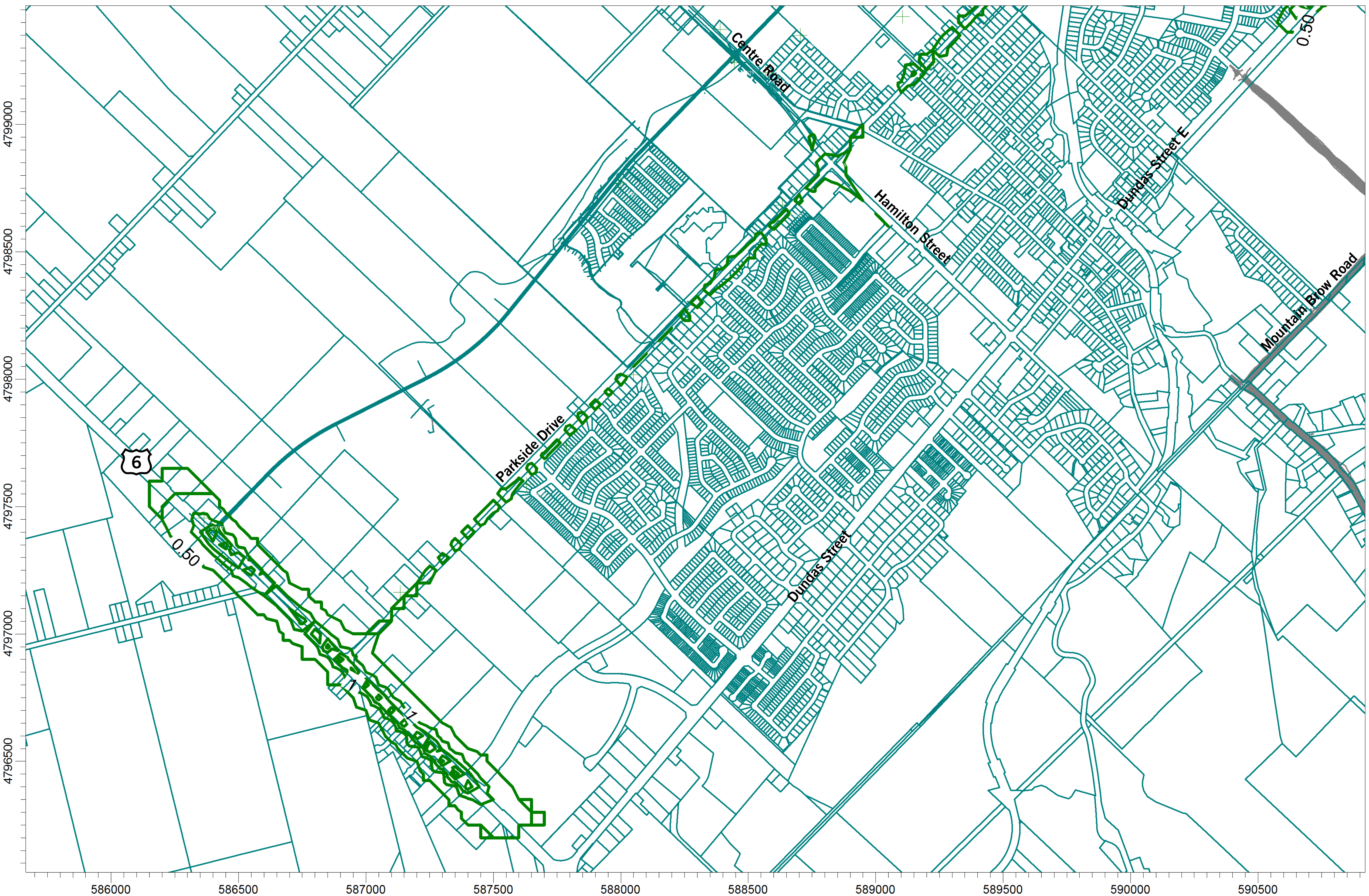
```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 80km/h (49.7 mph) SUMMER 10
* File 1, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                     Calendar Year:  2021
                             Month:  July
         Gasoline Fuel Sulfur Content:   30. ppm
           Diesel Fuel Sulfur Content:   15. ppm
              Particle Size Cutoff: 10.00 Microns
                  Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	------	------	------	------	------	------	------	------	------	------
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0038	0.0038	0.0038	0.0123	------	------	------	0.0205	0.0039
ECARBON:	------	------	------	------	------	0.0091	0.0061	0.0175	------	0.0015
OCARBON:	------	------	------	------	------	0.0026	0.0088	0.0089	------	0.0008
SO4:	0.0002	0.0004	0.0004	0.0004	0.0020	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0143	0.0119	0.0152	0.0274	0.0206	0.0067
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0086	0.0080	0.0080	0.0258	0.0040	0.0096
Total PM:	0.0247	0.0247	0.0248	0.0248	0.0355	0.0324	0.0358	0.0658	0.0371	0.0288
SO2:	0.0068	0.0088	0.0115	0.0095	0.0164	0.0029	0.0056	0.0131	0.0033	0.0093
NH3:	0.1017	0.1017	0.1017	0.1017	0.0451	0.0068	0.0068	0.0270	0.0113	0.0924

Appendix C – CAL3QHCR Isopleth Graphs

PROJECT TITLE:

New East-West Road Corridor - Year 2008 - Current Road Configuration
Carbon Monoxide (CO)



COMMENTS:
Concentrations shown are for 1-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	CO
MAX:	UNITS:
3.10	ppm
LINKS:	RECEPTORS:
101	5839

COMPANY NAME:
Dillon Consulting Limited

MODELER:

DATE:
4/29/2009

SCALE: 1:16,000
0 — 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:
08-9020-2030

CALRoads View - Lakes Environmental Software

C:\Alex files\Alex CV\Alex timesheet\08-9020 Waterdown EA\East-West Road\Completed runs - September 22, 2008\East-West Existing 2008 - CO\EWE08CO.clv

PROJECT TITLE:

New East-West Road Corridor - Year 2008 - Current Road Configuration
Carbon Monoxide (CO)

COMMENTS:

Concentrations shown are for 1-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	CO
MAX:	UNITS:
3.10	ppm
LINKS:	RECEPTORS:
101	5839

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:

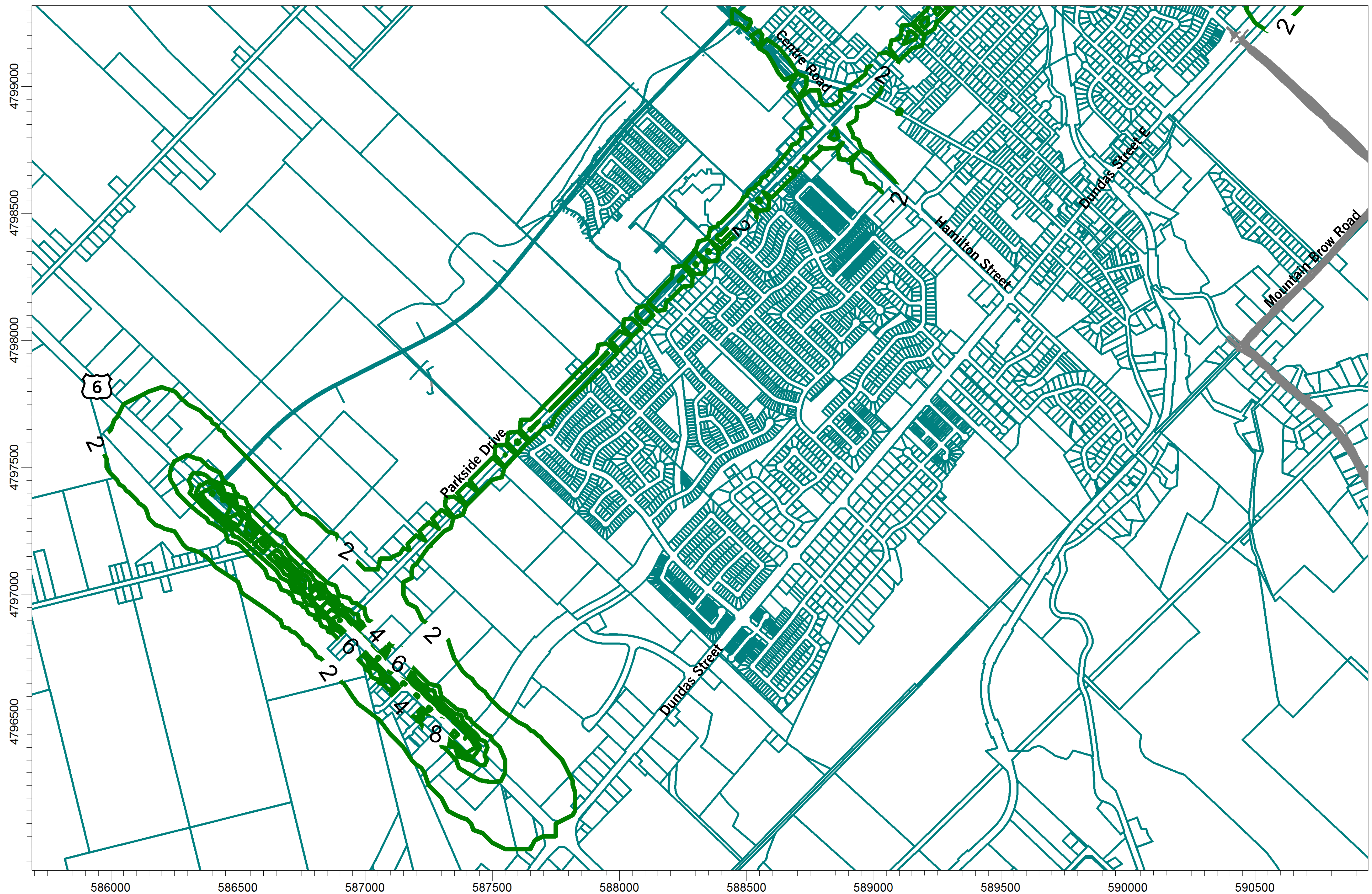
08-9020-2030

CALRoads View - Lakes Environmental Software

C:\Alex files\Alex CV\Alex timesheet\08-9020 Waterdown EA\East-West Road\Completed runs - September 22, 2008\East-West Existing 2008 - CO\EWE08CO.clv

PROJECT TITLE:

New East-West Road Corridor - Year 2008 - Current Road Configuration
Nitrogen Oxides (NOx)



COMMENTS:

Concentrations shown are for 1-hr averaging periods

Concentrations shown should be multiplied by 10 to obtain ppb. For example, the maximum NOx concentration is 18.2 x 10 = 182 ppb

MODEL: **CAL3QHCR**	
MAX: **18.20**	
LINKS: **101**	RECEPTORS: **5839**
COMPANY NAME: **Dillon Consulting Limited**	
MODELER:	
DATE: **4/29/2009**	
SCALE: 1:16,000	0 — 0.5 m
PROJECT / PLOT NO.: **08-9020-2030**	

PROJECT TITLE:

New East-West Road Corridor - Year 2008 - Current Road Configuration
Nitrogen Oxides (NOx)

COMMENTS:

Concentrations shown are for 1-hr averaging periods

Concentrations shown should be multiplied by 10 to obtain ppb. For example, the maximum NOx concentration is 18.2 x 10 = 182 ppb

MODEL: CAL3QHCR	
MAX: 18.20	
LINKS: 101	RECEPTORS: 5839
COMPANY NAME: Dillon Consulting Limited	
MODELER:	
DATE: 4/29/2009	
SCALE: 1:16,000 (0 – 0.5 m)	
PROJECT / PLOT NO.: 08-9020-2030	

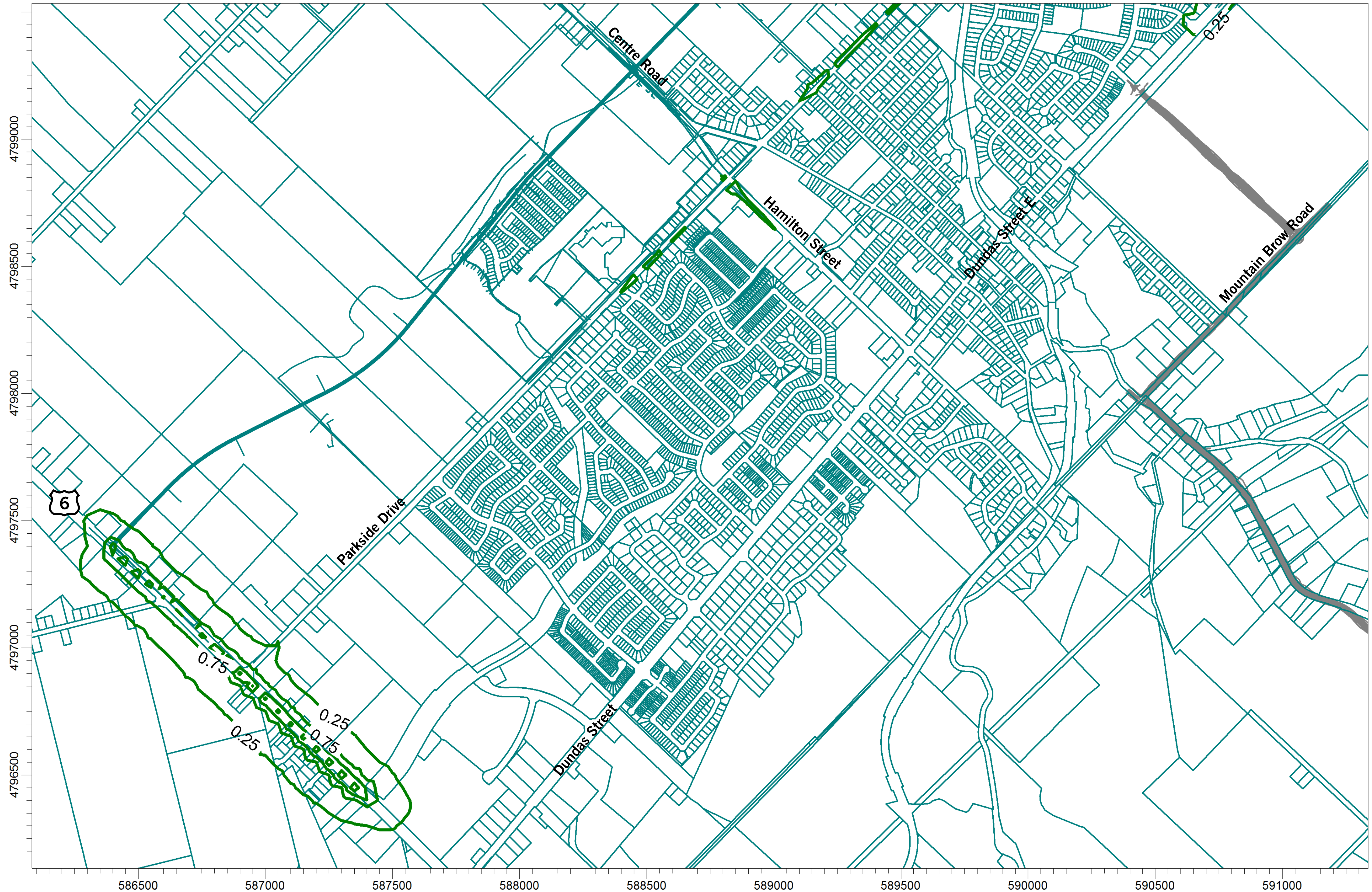
DILLON CONSULTING

CALRoads View - Lakes Environmental Software

C:\Alex files\Alex CV\Alex timesheet\08-9020 Waterdown EA\East-West Road\Completed runs - September 22, 2008\East-West Existing 2008 - NOx\EWE08NOx.clv

PROJECT TITLE:

New East-West Road Corridor - Year 2008 - Current Road Configuration
Particulate Matter (PM2.5)



COMMENTS:

Concentrations shown are for 24-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	**Particulate**
MAX: **2.24**	UNITS: **ug/m**3**
LINKS: **101**	RECEPTORS: **5839**

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 — 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:

08-9020-2030

CALRoads View - Lakes Environmental Software

C:\Alex files\Alex CV\Alex timesheet\08-9020 Waterdown EA\East-West Road\Completed runs - September 22, 2008\East-West Existing 2008 - PM2.5\EWE08PM.clv

PROJECT TITLE:

New East-West Road Corridor - Year 2008 - Current Road Configuration
Particulate Matter (PM2.5)

COMMENTS:

Concentrations shown are for 24-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	**Particulate**
MAX: **2.24**	UNITS: **ug/m**3**
LINKS: **101**	RECEPTORS: **5839**

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 0.5 m

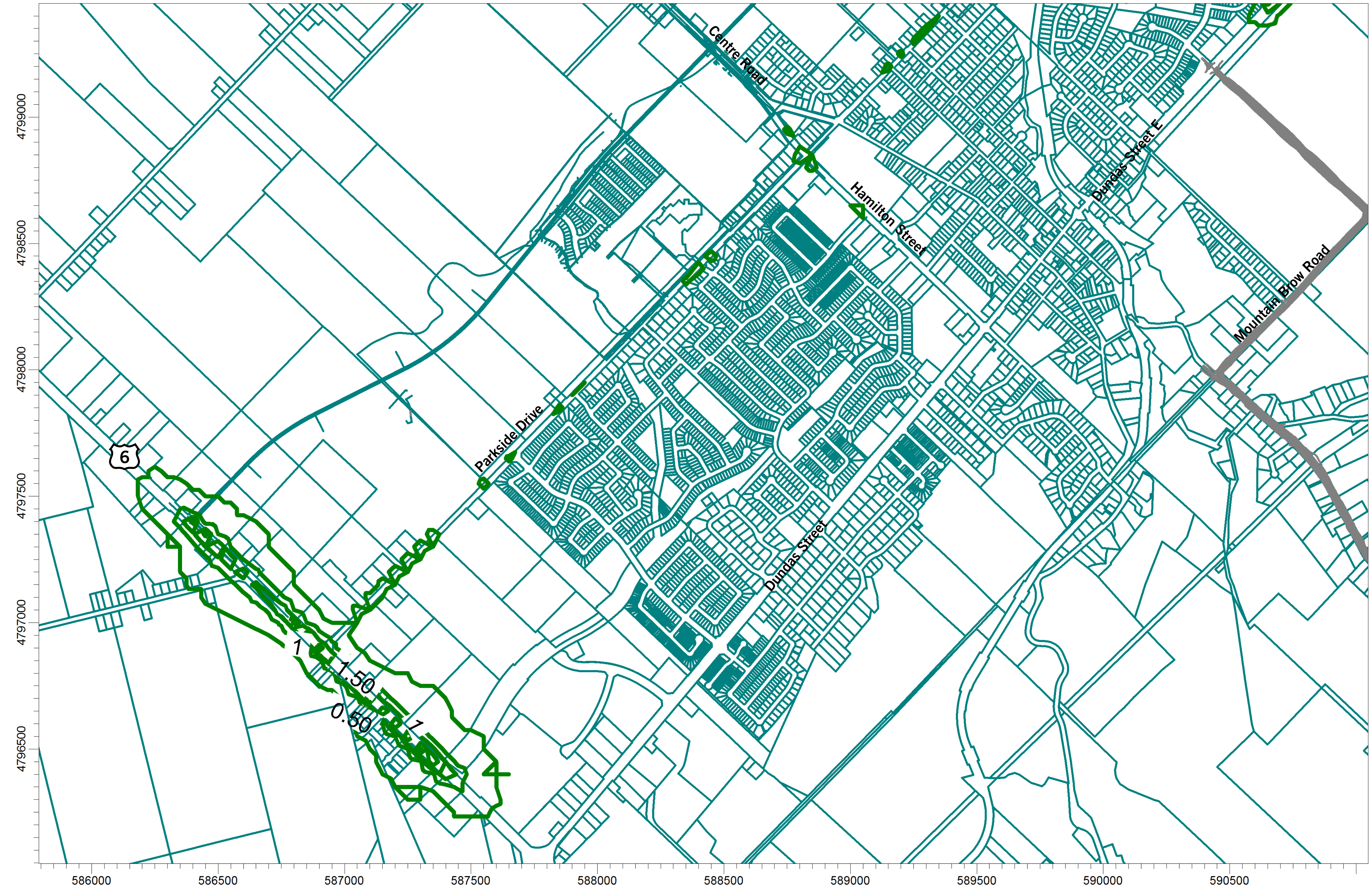
DILLON CONSULTING

PROJECT / PLOT NO.:

08-9020-2030

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Current Road Configuration
Carbon Monoxide (CO)



COMMENTS:

Concentrations are shown for 1-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	**CO**
MAX:	UNITS:
2.60	**ppm**
LINKS:	RECEPTORS:
101	**5839**

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:

08-9020-2030

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Current Road Configuration
Carbon Monoxide (CO)

COMMENTS:

Concentrations are shown for 1-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	CO
MAX:	UNITS:
2.60	ppm
LINKS:	RECEPTORS:
101	5839

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 0.5 m

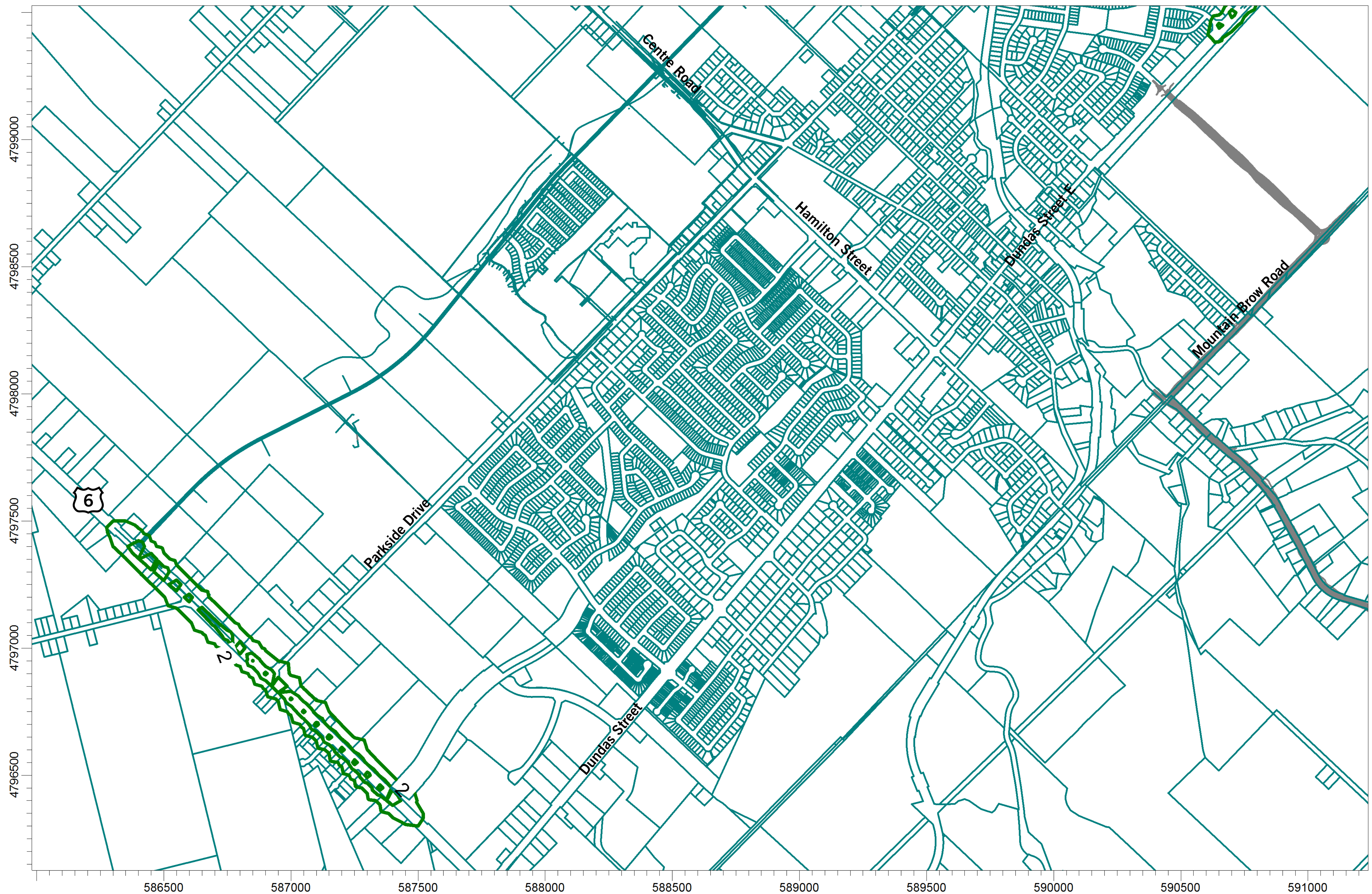
DILLON CONSULTING

PROJECT / PLOT NO.:

08-9020-2030

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Current Road Configuration
Nitrogen Oxides (NOx)



COMMENTS:

Concentrations shown are for 1-hr averaging periods.

Concentrations shown should be multiplied by 10 to obtain ppb. For example, the maximum NOx concentration is 6.9 x 10 = 69 ppb.

MODEL: **CAL3QHCR**	
MAX: **6.90**	
LINKS: **101**	RECEPTORS: **5839**
COMPANY NAME: **Dillon Consulting Limited**	
MODELER:	
DATE: **4/29/2009**	
SCALE: 1:16,000 (0 – 0.5 m)	
PROJECT / PLOT NO.: **08-9020-2030**	

DILLON CONSULTING

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Current Road Configuration
Nitrogen Oxides (NOx)

COMMENTS:

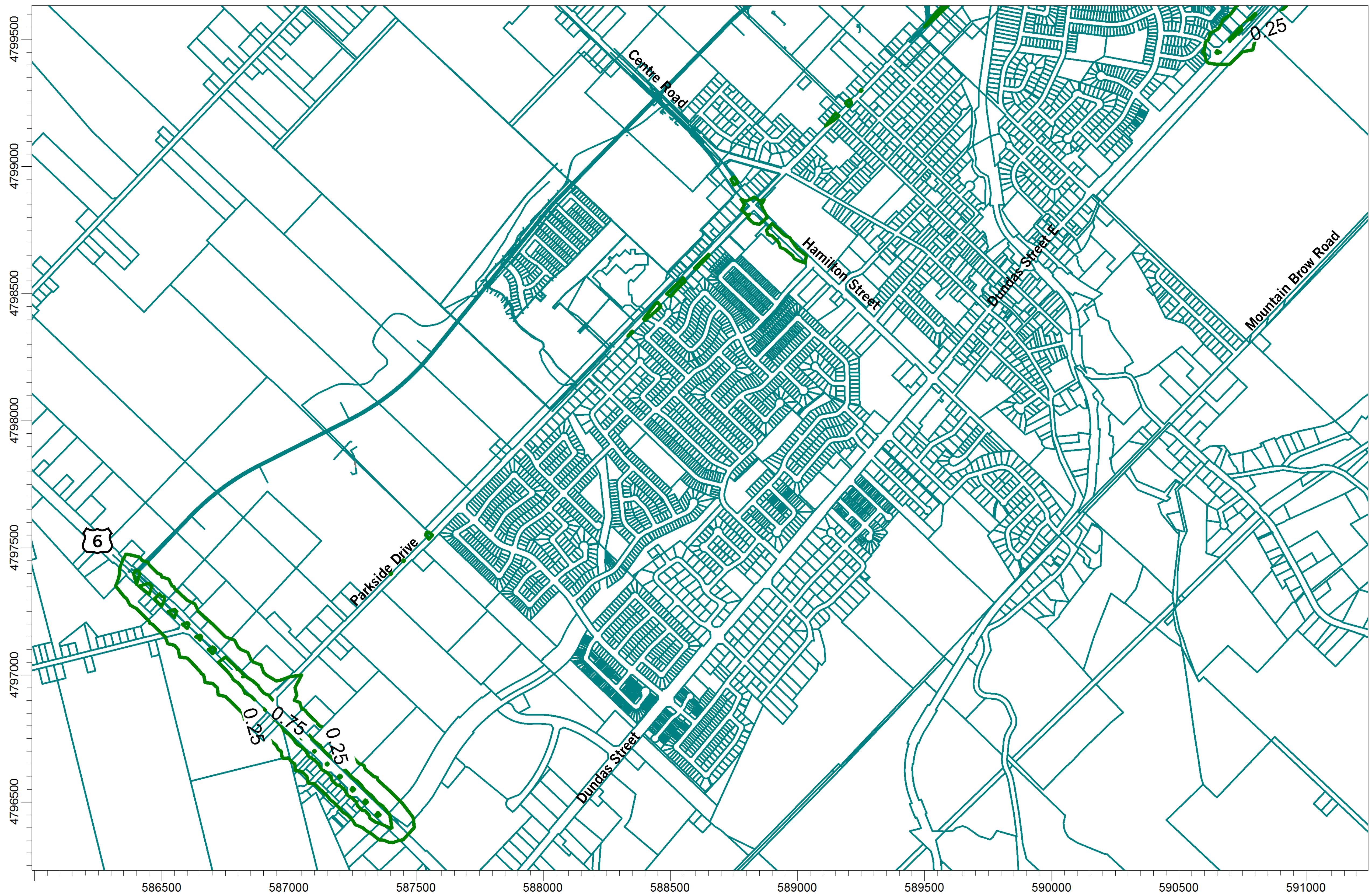
Concentrations shown are for 1-hr averaging periods.

Concentrations shown should be multiplied by 10 to obtain ppb. For example, the maximum NOx concentration is 6.9 x 10 = 69 ppb.

MODEL: **CAL3QHCR**	
MAX: **6.90**	
LINKS: **101**	RECEPTORS: **5839**
COMPANY NAME: **Dillon Consulting Limited**	
MODELER:	
DATE: **4/29/2009**	
SCALE: 1:16,000 (0 — 0.5 m)	
DILLON CONSULTING	
PROJECT / PLOT NO.: **08-9020-2030**	

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Current Road Configuration
Particulate Matter (PM2.5)



COMMENTS:

Concentrations shown are for 24-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	**Particulate**
MAX: **1.40**	UNITS: **ug/m**3**
LINKS: **101**	RECEPTORS: **5839**

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:

08-9020-2030

CALRoads View - Lakes Environmental Software

C:\Alex files\Alex CV\Alex timesheet\08-9020 Waterdown EA\East-West Road\Completed runs - September 22, 2008\East-West Existing 2021 - PM2.5\EWE21PM.clv

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Current Road Configuration
Particulate Matter (PM2.5)

COMMENTS:

Concentrations shown are for 24-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	Particulate
MAX: 1.40	UNITS: ug/m**3
LINKS: 101	RECEPTORS: 5839

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 — 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:

08-9020-2030

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Mature State of Development
Carbon Monoxide (CO)

COMMENTS:

Concentrations shown are for 1-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	CO
MAX:	UNITS:
3.50	ppm
LINKS:	RECEPTORS:
306	7014

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 0.5 m

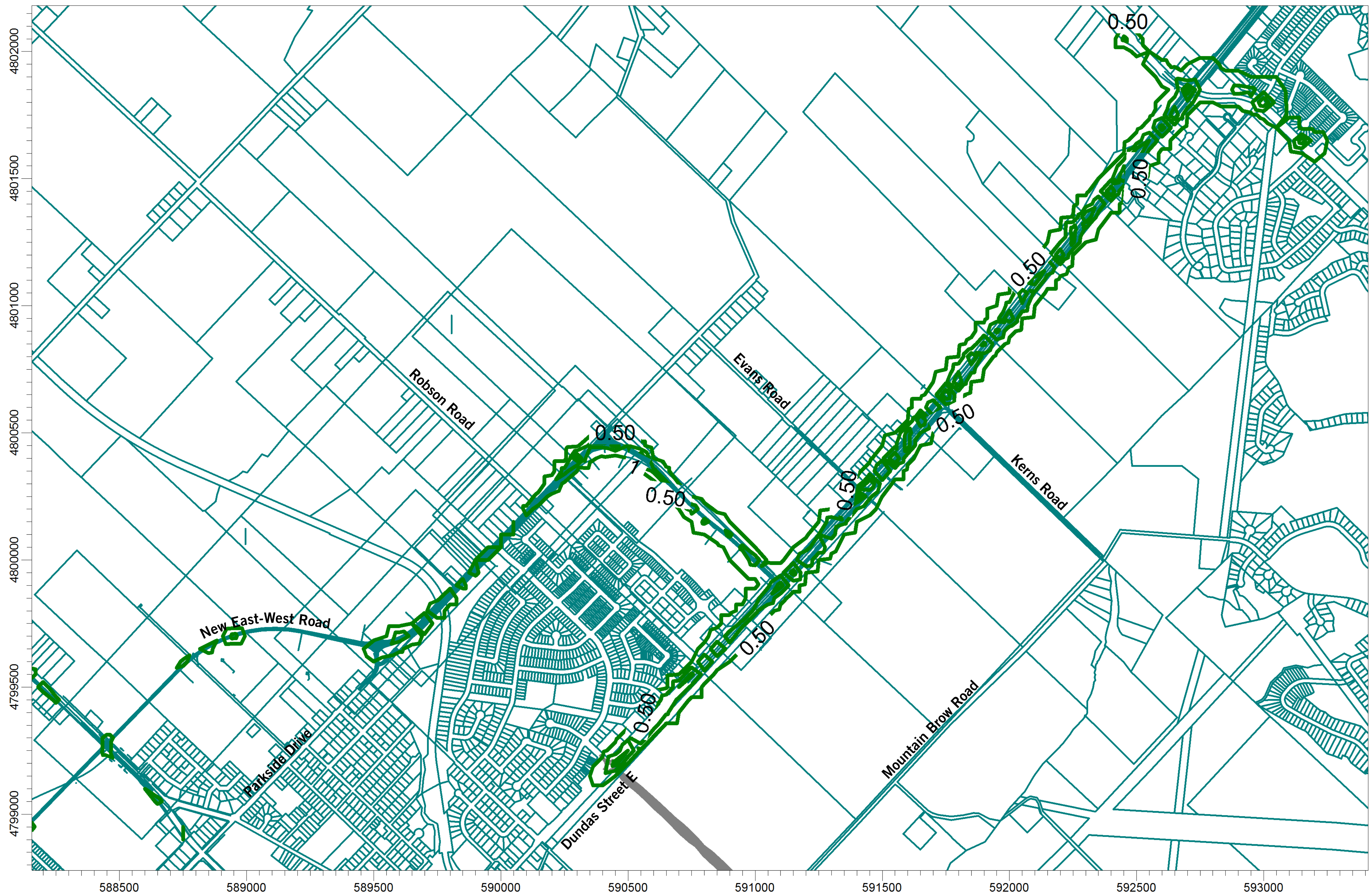
DILLON CONSULTING

PROJECT / PLOT NO.:

09-9020-2030

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Mature State of Development
Carbon Monoxide (CO)



COMMENTS:

Concentrations shown are for 1-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	**CO**
MAX: **3.50**	UNITS: **ppm**
LINKS: **306**	RECEPTORS: **7014**

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 — 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:

09-9020-2030

CALRoads View - Lakes Environmental Software

C:\Alex files\Alex CV\Alex timesheet\08-9020 Waterdown EA\East-West Road\Completed runs - September 22, 2008\East-West Expansion 2021 - CO\EWExp21CO.clv

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Mature State of Development
Nitrogen Oxides (NOx)

COMMENTS:

Concentrations shown are for 1-hr averaging periods.

Concentrations shown should be multiplied by 10 to obtain ppb. For example, the maximum NOx concentration is 8.6 x 10 = 86 ppb.

MODEL:	
CAL3QHCR	
MAX:	
8.60	
LINKS:	RECEPTORS:
306	7014

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 — 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:

08-9020-2030

PROJECT TITLE:
New East-West Road Corridor - Year 2021 - Mature State of Development
Nitrogen Oxides (NOx)

COMMENTS:

Concentrations shown are for 1-hr averaging periods.

Concentrations shown should be multiplied by 10 to obtain ppb. For example, the maximum NOx concentration is 8.6 x 10 = 86 ppb.

MODEL: **CAL3QHCR**	
MAX: **8.60**	
LINKS: **306**	RECEPTORS: **7014**
COMPANY NAME: **Dillon Consulting Limited**	
MODELER:	
DATE: **4/29/2009**	
SCALE: 1:16,000 (0 — 0.5 m)	
DILLON CONSULTING	
PROJECT / PLOT NO.: **08-9020-2030**	

CALRoads View - Lakes Environmental Software

C:\Alex files\Alex CV\Alex timesheet\08-9020 Waterdown EA\East-West Road\Completed runs - September 22, 2008\East-West Expansion 2021 - NOx\EWExp21NOx.clv

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Mature State of Development
Particulate Matter (2.5)

COMMENTS:

Concentrations shown are for 24-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	**Particulate**
MAX:	UNITS:
1.52	**ug/m**3**
LINKS:	RECEPTORS:
306	**7014**

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 ——— 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:

08-9020-2030

CALRoads View - Lakes Environmental Software

C:\Alex files\Alex CV\Alex timesheet\08-9020 Waterdown EA\East-West Road\Completed runs - September 22, 2008\East-West Expansion 2021 - PM2.5\EWExp21PM.clv

PROJECT TITLE:

New East-West Road Corridor - Year 2021 - Mature State of Development
Particulate Matter (2.5)

COMMENTS:

Concentrations shown are for 24-hr averaging periods

MODEL:	POLLUTANT:
CAL3QHCR	**Particulate**
MAX:	UNITS:
1.52	**ug/m**3**
LINKS:	RECEPTORS:
306	**7014**

COMPANY NAME:

Dillon Consulting Limited

MODELER:

DATE:

4/29/2009

SCALE: 1:16,000

0 0.5 m

DILLON CONSULTING

PROJECT / PLOT NO.:

08-9020-2030