



PROJECT LISTING

Sponsor	Study (<i>*Italics Denote Multiple Contracts</i>)	On-road	Non-road	Rail	Marine	Aircraft	Stationary	Fuels	Period
Metro Vancouver	Spatially resolved on-road emission inventory (base case and forecast) for criteria air contaminants and greenhouse gases for the Lower Fraser Valley; MOVES model training (subcontractor)	✓							2022 - 2023
Texas Department of Environmental Quality	Examination of Phase 2 nonroad regulatory compliance, non-road electrification rates and State Implementation Plan credits for the small engine non-road sector (subcontractor)		✓						2022 - 2023
Environment and Climate Change Canada	Port-level emission rate database development for criteria air contaminants and greenhouse gases (on-road vehicles, cargo handling equipment, other non-road)	✓	✓					✓	2022 - 2023
Manufacturers of Emission Controls Association	Examination of potential federal PM exhaust certification levels, forecasted electrification scenarios and the impacts of gasoline particulate filters.	✓							2022
Diesel Technology Forum	Examination of diesel off-highway sector by exhaust certification tier.		✓	✓	✓				2022
Manufacturers of Emission Controls Association	Examination of potential federal PM exhaust certification levels, forecasted electrification scenarios and the impacts of gasoline particulate filters.	✓							2022
Colorado State Auditor	Performance Audit of the Colorado Automobile I/M Program (subcontractor); MOVES modeling impacts; ambient air quality impact	✓							2022
Environment and Climate Change Canada	MOVES3 modeling support; NONROAD model development; GHG emission rates for UNFCCC reporting following IPCC guidelines	✓	✓						2022
Confidential	Environmental assessments and compliance assistance for an on-road engine manufacturer	✓							2021-2022
Middleton, Wisconsin	Examination of airport-level Pb emissions from aircraft (subcontractor).					✓			2021-2022
Vancouver Fraser Port Authority	MOVES3 emission factor modeling for on-road and non-road sources	✓	✓						2021 - 2022
Environment and Climate Change Canada	Conversion of the national modeling framework to the MOVES3 model; updated fleet and activity input; inventory support for federal, annual emission inventory submissions and reporting (GHGs, criteria air contaminants)	✓							2021
Confidential	MOVES3 Emission inventory analyses to support Expert Testimony in a product liability litigation effort	✓	✓					✓	2021
Environment and Climate Change Canada	MOVES modeling support for federal, annual emission inventory submissions and reporting (GHGs, criteria air contaminants)	✓							2020 - 2021
USEPA	Expert peer review of the draft national fuel supply inputs proposed for MOVES3	✓	✓					✓	2020
Manufacturers of Emission Controls Association	48-state, county-level, photochemical-model-ready emission inventory modeling of the federally proposed Cleaner Trucks Initiative; modified MOVES model to handle new control program	✓							2019 - 2020
Environment and Climate Change Canada	National fleet update and MOVES technical Support for mid-term fuel economy review of Phase 2 light-duty fuel efficiency standards.	✓							2019 - 2020
Environment and Climate Change Canada	Updates to the NONROAD2012C model: species expansion; comprehensive refueling & PFCs; forecasts; improved 2-stroke engine algorithms		✓					✓	2019 - 2021
Transport Canada	Off-Road GHG Emissions Review: Test Procedure Development (subcontractor)		✓						2019
Confidential	Evaporative emissions impact at standardized test conditions due to ethanol and RVP variation, regulatory compliance issues with changes in in-use fuels	✓						✓	2018 - 2019
Oregon DEQ	Oregon Nonroad Diesel Equipment Survey and Emissions Inventory: locally derived modeling input for the entire nonroad sector in Oregon to replace federal default assumptions (subcontractor)		✓						2018 - 2020
Confidential	Impact of Complex Model "VOC Control Level" and RVP on Macro-Scale In-Use Emissions: on-road, non-road, PFC, gasoline marketing	✓	✓				✓	✓	2018 - 2019
Ontario Ministry of the Environment, Conservation and Parks	Performance evaluation of the heavy-duty diesel inspection and maintenance program and integration with MOVES (subcontractor)	✓							2018
Confidential	Environmental assessments and compliance assistance for an off-road engine manufacturer		✓						2017-2019
Ontario Ministry of the Environment and Climate Change	<i>Performance evaluation of the light and heavy-duty gasoline inspection and maintenance program; integration with MOVES; development and delivery of the Province's first MOVES modeling platform (subcontractor)</i>	✓							2017
Colorado State Auditor	Performance Audit of the Colorado Automobile I/M Program (subcontractor); MOVES modeling impacts; ambient air quality impact	✓							2017
Environment and Climate Change Canada	Speciation profiles and emission rates to cover pollutants not included in mobile source models (subcontractor)	✓	✓	✓	✓	✓		✓	2017
Environment and Climate Change Canada	Update N2O and CH4 Emission Factors in NONROAD2012C		✓					✓	2017
Coordinating Research Council	Project E-116: Review and update to evaporative emissions inputs to the MOVES model (subcontractor)	✓						✓	2016-2017
EPA OTAQ	Technical assistance and review of data collection effort for the non-road mobile source sector (subcontractor)		✓						2016-2017



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TRB (ACRP)	Improving project-scale modeling of ground access vehicle emissions modeling (subcontractor)	✓							2016-2017
Confidential	Environmental assessments and compliance assistance for an on-road vehicle manufacturer	✓							2016-2017
Global Automakers of Canada	Examination of Canadian GHG targets, the light-duty on-road sector GHG contribution and light-duty policy options (subcontractor)	✓						✓	2016
Canadian Fuels Association	MOVES2014 2-Day Workshop, MOVES Applications in the Canadian Context	✓	✓						2016
API	Examination of criteria pollutant lifecycle emissions of high-octane mid-level ethanol-gasoline blends (subcontractor)	✓						✓	2016
Confidential	Oversight and training of an environmental consultancy staff member with MOVES2014	✓							2015-2016
Environment Canada	Technical support for the Phase 2 heavy-duty on-road fuel efficiency regulatory development	✓							2015-2016
TRB (ACRP)	Aircraft lead (Pb) mitigation strategies at airports (subcontractor)					✓			2014-2015
Environment Canada	Training of Canadian NONROAD model		✓						2014-2015
Coordinating Research Council	Project E-101: Critical Review of MOVES2014: underlying methods & data sources; case study analyses; sensitivity analyses; fuel validation exercises.	✓						✓	2013-2016
TRB (ACRP)	Methodology to improve EDMS/AEDT quantification of aircraft taxi/idle emissions					✓			2013-2015
TRB (ACRP)	Quantifying aircraft lead (Pb) emissions at airports					✓			2011-2014
<i>Confidential</i>	<i>Provided emission inventory analyses to support Expert Testimony in an on-going series of product liability litigation efforts*</i>	✓	✓					✓	2005-2014
API	Technical review of EPA's on-road Tier 3 regulation and gasoline sulfur content regulation (NPRM)	✓						✓	2013
Environment Canada	Comprehensive evaluation of off-highway equipment usage in Canadian oil sands mining (facility level aggregated to the national level) and update to the Canadian NONROAD model		✓						2013
Environment Canada	Review of equipment population data inputs for the development of the Canadian NONROAD model		✓						2013
Environment Canada	Regulatory evaluation of Tier 3 on-road vehicle standards and gasoline sulphur control using a regulatory version of the Canadian MOVES model	✓						✓	2013
<i>City of Surrey</i>	<i>Development of on-road emission factors for evaluating the impact of the Port of Vancouver: freight & private vehicles; drayage truck registration program.*</i>	✓							2011-2013
Colorado State Auditor	Performance Audit of the Colorado Automobile I/M Program	✓							2012
Environment Canada	Peer review of life-cycle analysis of transportation fuels (GHG and criteria emissions)	✓					✓	✓	2012
Environment Canada	Development of a national analysis system of life-cycle emissions from transportation fuel production and use (GHG and criteria pollutants) using MOBILE6.2C and GHGenius; examination of impacts of various on-highway renewable fuel scenarios	✓						✓	2012
Confidential	For an ethanol manufacturer: California low-carbon fuel applications, technical support, sensitivity analyses and life-cycle analyses						✓	✓	2011-2012
Coordinating Research Council	Project A-73: Development of inventory and speciation Inputs for representing ethanol blends (photochemical model inputs for E15 and E20 gasoline)	✓						✓	2011-2012
<i>Environment Canada</i>	<i>Continued updates to the Canadian MOVES model*</i>	✓						✓	2011-2012
Government of Hong Kong	Update to the EMFAC-HK model for the Environmental Protection Department	✓							2011-2012
<i>Confidential</i>	<i>For two clients: evaluation of mitigation measures to compensate for environmental non-compliance (voluntary notification of agencies to avoid enforcement action)*</i>	✓					✓		2010-2012
<i>Confidential</i>	<i>For an ethanol manufacturer: California and EU low-carbon fuel applications, technical support and life-cycle analyses*</i>						✓	✓	2009-2012
<i>Union Pacific</i>	<i>Provided on-road and off-road emission factor support in conjunction with California railyard health risk assessments*</i>	✓	✓						2009-2012
Environment Canada	<i>Development and subsequent updates to the Canadian NONROAD model*</i>	✓						✓	2008-2012
Environment Canada	Development of a Canadian MOVES model and regulatory evaluation support for modeling heavy-duty gasoline fuel economy regulations	✓							2011
Translink	Review of Vancouver (BC) I/M program effectiveness and recommended changes	✓							2011
<i>Confidential</i>	<i>For an on-road vehicle manufacturer, examination of OBD scan data to identify individual analyzer/software deficiency in correctly identifying individual product line vehicles (make, model, model year)*</i>	✓							2010



OAK LEAF ENVIRONMENTAL INC.

JEREMY G. HEIKEN

PROJECT LISTING

Sponsor	Study (<i>*Italics Denote Multiple Contracts</i>)	On-road	Non-road	Rail	Marine	Aircraft	Stationary	Fuels	Period
Confidential	For an on-road vehicle manufacturer: Evaluation of compliance strategy on in-use exhaust and evaporative emissions using MOVES2010	✓							2010
Union Pacific	Provided detailed, temporal emission inventory work for a California railyard construction project covering each phase of the project and including all on-road, off-road and fugitive sources.	✓	✓				✓		2010
San Diego Gas & Electric	<i>Evaluation of natural gas quality on emissions from light-duty and heavy-duty on-road natural gas vehicles*</i>	✓						✓	2009-2010
API	<i>Technical Review of EPA's Regulatory Impact Analysis Methodology for the Renewable Fuel Standard (draft and final regulation)*</i>	✓						✓	2008-2010
Environment Canada	<i>Continued updates to the Canadian MOBILE6.2 model (fugitive dust algorithms, fuel economy updates, revised sulfur corrections, cold temperature standards, renewable fuel impacts, PM temperature corrections)*</i>	✓							2006-2010
EPA OTAQ	MOVES Case Study Analysis of using SIP inputs in draft MOVES2008	✓							2009
LADCO	Rougemere Rail Yard emission inventory in support of Phase 1 of the Midwest Rail Study	✓	✓	✓			✓		2009
AAM	<i>Evaluation of CAA Section 177 States adoption of California standards and the impacts on criteria pollutant emissions (states evaluated included VT, CT, ME, MA, PA, OR, WA, RI, NY)*</i>	✓							2006-2009
AAM	Comparative effectiveness of proposed US federal and California fuel economy standards	✓							2008
National Association of Manufacturers	<i>Estimated attainment costs and economic impacts in selected regions of proposed revisions to the EPA 8-Hour ozone standard *</i>	✓	✓		✓			✓	2008, 2010
Coordinating Research Council	Effects of vapor pressure, oxygen content, and temperature on CO exhaust emissions	✓						✓	2007-2008
EPA OTAQ	Peer review of EPA's regulatory support document inventory and methods for commercial marine applications				✓				2007-2008
AAM	Comparative effectiveness of on-road vehicle standards (US federal and California) including the ZEV Mandate	✓							2007
Clark Co. Dept. AQ & Env. Management	Demonstration of Necessity of regulations requiring 7.0 PSI RVP gasoline in Clark County, Nevada as an ozone control strategy	✓						✓	2007
Sacramento International Airport	<i>Two projects estimating "emission reduction credits" (ERCs) for aircraft gate electrification and fuel delivery via pipeline*</i>	✓				✓	✓		2006-2007
Colorado State Auditor	Performance Audit of the Colorado Automobile I/M Program	✓							2006
American Trucking Association	Review of CARB Staff's estimates of the benefits, costs, and cost effectiveness of the airborne toxic control measure (ATCM) for transport refrigeration units (TRUs)		✓						2005-2006
National Renewable Energy Laboratory	Proximate modeling of weekday versus weekend ozone (identified and integrated updates of local data for day-of-week variation in off-road sources)	✓	✓						2005-2006
AAM	Review of draft MOVES2004	✓							2005
API	Examination of issues related to MOVES-GREET integration	✓						✓	2005
Environment Canada	Update to Canadian MOBILE6.2 model for motorcycle emission rates and regulatory context	✓							2005
NJ Motor Vehicle Services	Evaluation of enhanced I/M program data and estimated effectiveness	✓							2005
Translink	Review of Vancouver (BC) I/M program effectiveness and recommended changes	✓							2005
API	Effects of ethanol-blended California reformulated gasoline on vehicle permeation emissions	✓	✓					✓	2004
EMA	Impacts of vehicle pre-buy on regulatory benefits of 2007 model year heavy-duty diesel standards	✓							2004
EPA OTAQ	NONROAD model updates: modal evaporative HC emission rates.		✓						2004
General Motors	Effects of ethanol-blended California reformulated gasoline on vehicle permeation emissions	✓						✓	2004
LADCO	Database enhancements to the MOBILE6.2 model, created customized version of MOBILE6.2 to facility inventory processing model output	✓							2004
Southeast Michigan COG	Evaluation of gasoline and diesel control programs for consideration in SIP development	✓	✓					✓	2004
Valero Energy Corporation	Review of the Draft Bay Area 2004 Ozone Strategy.	✓	✓						2004
EMA	Technical support to engine industry on California ARB Tier III exhaust and evaporative rule (small SI non-road)		✓						2003-2004
Environment Canada	Development of the Canadian MOBILE6.2 model	✓						✓	2003-2004
Southeast Michigan COG	On-road emission inventory methodology review and fuel survey data analysis	✓						✓	2003-2004



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Confidential	<i>For engine manufacturers: On-road Diesel engine modeling of the occurrence of conditions when AECDs go into effect and estimated emissions consequences*</i>	✓							2002-2004
AAM	Review of the modeling and attainment demonstrations of the 2003 AQMP of the South Coast Air Quality Management District	✓	✓		✓			✓	2003
EMA	Critical review of NONROAD2002 growth projections		✓						2003
General Motors	Evaluation of the potential market penetration of 10% ethanol gasoline blends	✓						✓	2003
General Motors	GHG reduction potential from in-use flexible fueled vehicles in the U.S.	✓						✓	2003
Lubrizon Corporation	Evaluation of PuriNOx test data and estimated benefits	✓	✓					✓	2003
EPA OTAQ	Peer review of EPA's regulatory support document inventory and methods for commercial marine applications				✓				2002-2003
Confidential	<i>For an on-road vehicle manufacturer: Computer model for confirming product plan compliance strategy with federal and California regulatory requirements*</i>	✓							2000-2003
API	Review of NONROAD model emission factors and fuel corrections		✓					✓	2002
CPPI	Impact of ethanol containing gasoline on Saskatchewan emission inventories	✓						✓	2002
Detroit Diesel	Impacts of vehicle pre-buy on regulatory benefits of Consent Decree heavy-duty diesel standards	✓							2002
Environment Canada	Evaluation of future vehicle and fuel control programs	✓						✓	2002
California ARB	OFFROAD model updates (evaporative emissions, toxics, GHGs)		✓						2001
Confidential	<i>For two engine manufacturers: completed product plan compliance calculations relative to a voluntary agreement with California ARB*</i>		✓						2001
Environment Canada	Development of regulatory on-highway emission inventories	✓							2001
EMA	<i>EMFAC2000 and EMFAC2001 Heavy-duty Emissions Modeling Advisory Committees*</i>	✓							1999-2001
AAM	Review and Commentary on EPA's Mobile Source Toxics Analysis	✓							2000
Colorado State Auditor	Performance Audit of the Colorado Automobile I/M Program	✓							1999
AAM	Benefits of nationwide sulfur and Distillation Index (DI) control	✓						✓	1998-1999
AAMA	California LEV II regulatory review	✓							1998-1999
AAMA	Air quality impacts of the U.S. federal Clean-Fueled Fleet Program in six U.S. cities	✓						✓	1998
AIAM	Impacts of gasoline Distillation Index (DI) on emissions: obtained data from the auto manufacturers for Tier 0 vehicles, Tier 1 vehicles, and LEVs that was used to develop emission vs. distillation index curves and to estimate the benefits of a nationwide DI cap	✓						✓	1998
Clark Co. Dept. of Planning	Emission inventory and air quality modeling (SIP development support)	✓	✓			✓	✓	✓	1998
EMA	California off-highway LSI regulatory review of the proposed large spark-ignited (LSI) regulation, technology feasibility, statewide emissions impact, and program cost-effectiveness		✓						1998
EMA	NONROAD model review		✓						1998
API	Review of the EPA's 112(k) air toxics inventories						✓		1997-1998
Colorado State Auditor	Performance Audit of the Colorado Automobile I/M Program	✓							1997-1998
Confidential	Evaluation of the EPA's Urban Air Toxics Strategy	✓							1997-1998
Confidential	Examination of Toxics and Ozone Precursor Emissions Impacts from Fuel Additives and Fuel Reformulations	✓						✓	1997-1998
Coordinating Research Council	Evaluation of methods and emissions uncertainty in California's MVEI7G model	✓							1997-1998
Envirotest	Review and evaluation of the Minnesota redesignation request Technical Support Document	✓							1997-1998
EPA OMS	Development of a US federal nonroad emission inventory model (original NONROAD model code development)		✓						1997-1998
EPA OMS	Update to EPA's particle emission factor model (i.e., PART5) and PM emissions databases	✓							1997-1998
Oregon DEQ	Medford, Oregon PM10 SIP and CO Maintenance Plan: Update for Medford, OR estimating anthropogenic inventories, completing a local fugitive dust study, and developing an interface between travel demand modeling and inventory processing. Assisted with public outreach.	✓	✓				✓		1997-1998



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City of Los Angeles	Assistance for Air Pollution Technical and Policy Issues	✓							1996-1998
Clark Co. Dept. of Planning	Field Study, Emission Inventory and Air Quality Modeling	✓	✓			✓	✓		1996-1998
Colorado DOT	Evaluation of project-level air quality procedures and development of a screening tool	✓							1996-1998
Ethyl Canada	NOx emissions impacts associated with use of MMT in Canadian gasoline	✓						✓	1995-1998
AAMA	Evaluation of Need for Phase II Cold CO Standards	✓							1997
Alamo Area COG	Emission inventory and ozone air quality modeling (in support of SIP development)	✓	✓	✓		✓	✓		1997
ARCO	Comparison of on-road emissions forecasts as new models are developed (a review of multiple versions of MOBILE and EMFAC and the evaluation of model predictions over time)	✓							1997
Clark Co. APCD	Critical Review of MOBILE Emission Factors	✓							1997
Confidential	Review of an Airport Expansion EIR	✓	✓			✓	✓		1997
CPPI	Chemical Assessment of Vehicle Tailpipe Emissions	✓							1997
CPPI	State of the Science of U.S. PM Emission Inventory Modeling Protocols	✓	✓						1997
Envirotest	Review of Remote Sensor Clean Screen Technologies in Motor Vehicle I/M Programs	✓							1997
Maricopa Assoc. of Govern.	1997 CO Federal Implementation Plan	✓							1997
TNRCC	Facility-level speciated VOC emissions for the Dallas/Fort Worth nonattainment area: Designed and developed a database and methodology to incorporating facility-specific, speciated VOC emissions data into the emission inventory methodology						✓		1997
EPA OMS	US EPA's Emission Inventory Improvement Program: lawn and garden equipment		✓						1996-1997
Maricopa Assoc. of Govern.	PM10 emission inventory and air quality modeling (in support of the SIP)	✓							1996-1997
Denver Regional AQ Council	On-road and Nonroad Inventory Review and Control Program Development	✓	✓					✓	1996
New United Motor Manufacturing	Development of an emissions and air toxics database for inventorying and permitting responsibilities						✓		1996
Southern California Edison	Development of an emissions and air toxics database for inventorying and permitting responsibilities						✓		1996
WSPA	A Review and Comment Upon the South Coast Air Quality Management District's Emission Inventory for the Combined Ozone and PM10 AQMP	✓						✓	1996
WSPA	Comparison of MVEI7g and EMFAC7f	✓							1996
WSPA	Examination of Inconsistencies in Fuel Sulfur Content in California's Regulatory Emission Inventories	✓						✓	1996
EPA OMS	Emission Inventory Improvement Program: Mobile-source Locality Specific Data	✓							1995-1996
Pennsylvania Power and Light	Emission Inventory and Ozone Air Quality Modeling	✓	✓	✓	✓	✓	✓		1995-1996
Puget Sound APCD	Evaluation of project-level air quality procedures and development of a screening tool	✓							1995-1996
Confidential	Review of a Municipal Solid Waste Landfill EIR	✓	✓				✓		1995
Environment Canada	PM10 Emission and air quality impacts associated with changes to Canadian gasoline and diesel fuels: developed province-wide Canadian emission inventories for each province providing support of proposed regulations for the control of sulfur content in diesel and gasoline.	✓						✓	1995
TNRCC	Development of boundary conditions for the Texas SIP: completed a multi-state, photochemical-model-ready, episodic inventory assessment to address regions not covered by the EPA's Ozone Transport Assessment Group and needed to establish photochemical modeling boundary conditions for the Texas's SIP activities	✓	✓	✓	✓	✓	✓	✓	1995
Coordinating Research Council	Auto/Oil Air Quality Improvement Research Program (emission inventory development and software for interfacing between EPS and MOBILE/EMFAC)	✓						✓	1990-1995
AAMA	Emissions Benefit Analysis of Alternatives to the California Zero Emission Vehicle (ZEV) Mandate	✓					✓		1994
API	Investigation of MOBILE5a Emission Factors	✓						✓	1994
City of Coronado	City of Coronado Third and Fourth Street Corridor Air Quality Study	✓							1994



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EPA OMS	Methodologies For Estimating Emission and Travel Activity Effects of TCMs	✓							1994
General Motors	The Federal Low Emission Vehicle Program analysis (the study that became the basis for the NLEV program)	✓							1994
Minnesota APCA	Evaluation of mobile source emission control cost-effectiveness for Minneapolis-St. Paul	✓						✓	1994
Pacific Gas & Electric	Emission benefits of electric vehicles in the Pacific Gas and Electric service territory	✓					✓		1994
AAMA	Review of Mobile Source Control Strategies in the Baltimore Non-attainment Area	✓						✓	1993
EPA OMS	Development of Specifications for a Nonroad Emissions Model (original NONROAD model scoping/logic)		✓						1993
General Motors	Review of E.H. Pechan and Associates Emissions Analysis of the LEV Program in the Mid-Atlantic States	✓							1993
San Diego Gas & Electric	Emission Benefits of Electric Vehicles in the San Diego Gas & Electric service territory	✓					✓		1993
Coordinating Research Council	Comparison of remote sensing data and vehicle emission models	✓							1992
EPA OMS	Update to the TECH5 model; development of U.S. EPA particulate emission factor model	✓							1992
California ARB	Transportation control measure analysis procedures and guidance documentation	✓							1991
Coordinating Research Council	Assessment of computer models for estimating vehicle emission factors	✓							1991
EPA Region IX	Carbon Monoxide air quality modeling of the Phoenix metropolitan area in support of the Federal Implementation Plan	✓	✓						1991
California ARB	OFFROAD model development from NEVES (original OFFROAD development)		✓						1990-1991
Coordinating Research Council	Urban formaldehyde and methanol concentrations for alternative-fuel methanol vehicle scenarios	✓						✓	1990
Exxon Corporation	Emission changes associated with the use of a reformulated Exxon premium unleaded fuel in Los Angeles, San Francisco, and Sacramento	✓						✓	1990