

## AREAS OF SPECIALIZATION

- New Vehicle and Engine Certification
- Development and Assessment of Mobile Source Emission Control Strategies
- Development and Assessment of Strategies for Reduction of Criteria Pollutant and GHG Emissions Related to Transportation Fuels – Including Alternative Fuels and Fuel Additives
- Design and Implementation of Vehicle Testing Programs and Data Analysis
- Enforcement and Litigation Support Related to Mobile Sources and Transportation Fuels
- Intellectual Property Disputes Involving Engine and Emission Control System Design, Function, and Novelty
- Tracking and Reporting of California Air Resources Board Activities Related to the Regulation of Mobile Source Emissions and Transportation Fuels
- Emission Inventories and Quantification

## EDUCATION

M.S., Chemical Engineering, University of California, Los Angeles

B.S., Cum Laude, Chemistry, University of California, Irving

## AFFILIATIONS

Society of Automotive Engineers  
American Chemical Society

## TECHNICAL EXPERTISE

**Fuels Regulations.** Managed numerous projects related to assessments of Low Carbon Fuel Standard (LCFS) regulations adopted or being prepared by California and a number of other jurisdictions. Has also been involved in the review of reformulated gasoline and diesel fuel regulations, including the federal RFS 1, RFS 2, and Tier 3 regulations.

**Mobile Source Emissions Control.** Participated in the design and evaluation of mobile source emission control measures and emission control systems; development of mobile source emissions modeling software; development of mobile source emission inventories; design and management of supporting field and laboratory studies; and the design and evaluation of vehicle emissions inspection and maintenance programs. Mobile source categories include on- and off-road vehicles, locomotives, marine vessels, and aircraft. Directly involved in assessing changes in vehicle technology required to comply

## SUMMARY OF EXPERIENCE

A Principal Consultant and head of Trinity's Mobile Source and Fuels team, Mr. Lyons has extensive experience related to fuels issues and emissions, including the emission impacts of changes in gasoline and diesel fuel composition and substitution of alternative fuels for petroleum-based fuels. Specific projects have required work on issues related to the emissions impacts of changes in gasoline and diesel fuel as well as compliance with California Air Resources Board (CARB) and U.S. EPA regulations related to gasoline and diesel fuel properties and specifications, assessment of costs and benefits of alternative fuels and alternatively fueled vehicles, and direct involvement in analyses of issues related to CARB and EPA fuels regulations, including the Renewable Fuel Standards (RFS) and Low Carbon Fuel Standards. He has also provided expert services in fuels-related litigations.

Additional responsibilities include oversight and execution of complex analyses of the emission benefits, costs, and cost-effectiveness of mobile source air pollution control measures. Mr. Lyons has developed particular expertise with respect to the assessment of control measures involving accelerated vehicle/engine retirement programs; the deployment of advanced emission control systems, including electric fuel cell and hybrid technologies for on- and non-road gasoline- and diesel-powered vehicles and engines, as well as on-vehicle evaporative and refueling emission control systems. Other duties include assessments of the activities of federal, state, and local regulatory agencies with respect to motor vehicle emissions and reports to clients regarding those activities. Mr. Lyons has extensive litigation experience related to air quality and fuels including gasoline property and renewable fuels regulations, product liability, and intellectual property issues.

with federal, California, and Mexican new-vehicle greenhouse gas and fuel economy standards for light-duty vehicles.

**New Vehicle and Engine Certification.** Directly participated in and managed efforts related to obtaining U.S. EPA and California Air Resources Board certification for new engines and vehicles, including activities related to agency enforcement actions and on-going compliance requirements.

**Air Quality Planning and Strategy Development.** Has been involved in the development and critical assessment of mobile source and transportation fuels elements of State Implementation Plans.

**Emission Control System Design and Evaluation.** Provided support for the design and assessment of alternative emission control techniques, and for troubleshooting control system issues. Issues assessed have include VOC, CO, NO<sub>x</sub>, SO<sub>x</sub>, and PM control systems in various applications.

**Expert Witness Services.** Presented testimony and served as an expert or consulting expert on numerous cases in federal and state courts involving issues related to government regulations affecting mobile source certifications, in-use emissions issues, fuel regulations, intellectual property issues related to emission controls and fuels, and product liability.

## EMPLOYMENT HISTORY

2014 – Present Trinity Consultants  
1991 – 2014 Sierra Research  
1985 – 1991 California Air Resources Board

## SELECTED LITIGATION EXPERIENCE

In addition to his experience in dealing with regulatory enforcement actions targeting on- and non-road motor vehicles, handheld engines, gasoline vapor recovery systems and consumer products, Mr. Lyons has extensive litigation experience as both a testifying expert witness and as a consulting expert. A listing of selected cases where Mr. Lyons has provided expert witness or consulting expert services is provided below. These cases have involved issues related to gasoline composition, gasoline additives, gasoline regulations, gasoline vapor recovery systems, California's Zero Emission Vehicle and Greenhouse Gas Regulations, state regulations regarding heavy-duty Diesel vehicle idling and engine control system retrofits, and the design of engine combustion chambers.

### Testifying Expert:

PEOPLE OF THE STATE OF CALIFORNIA, EX REL. CALIFORNIA AIR RESOURCES BOARD v. BP WEST COAST PRODUCTS LLC, Superior Court of California, County of Contra Costa, Case No. C12-00567: On-going case regarding compliance with the State of California's regulations regarding reformulated gasoline. Testimony will be directed to the emissions and air quality impacts associated with the use of reformulated gasolines with specific properties. Activities included deposition and trial testimony on behalf of the defendants.

STANT USA CORPORATION v. BRIGGS & STRATTON CORPORATION, Case No. No. 1:13-cv-01908-TWP-TAB, U.S. District Court Southern District of Indiana, Indianapolis Division: Settled patent case involving understanding of the design and function of evaporative emission control systems for application to lawn and garden equipment. Activities on behalf of the defendant include preparation of declarations as well as deposition testimony.

AMERICAN COMMERCIAL LINES LLC, v. THE LUBRIZOL CORPORATION, ET AL., Case No. 4:12-cv-00135 SEB-WGH, U.S. District Court for the Southern District of Indiana, New Albany Division: Settled case related to the efficacy of multi-functional diesel-fuel additives. Activities included review of case documents and the preparation of an Expert Rebuttal report regarding the use of specific multi-functional diesel-fuel additives.

EVA CAPERON v. Chevron Corporation, et al., Case No. 34-2008-00029004: Completed case dealing with personal injury related to the performance of a gasoline dispenser equipped with a Stage II vapor recovery system. Activities included deposition and trial testimony and preparation of a declaration in support of defendant's motion for summary judgment. Case ended with a limited award to the plaintiff.

ZANGARA DODGE, INC., et al., v. CURRY, et al., Case No. CIV-07-1305 ACT/LFG, U.S. District Court for the District of New Mexico: Suspended case dealing with the adoption of California new vehicle greenhouse gas/fuel economy standards by the State of New Mexico. Activities included preparation of declarations in support of plaintiff's motions that address history of vehicle emissions control and issues associated with the impact of implementation of the state regulations on vehicle manufacturers.

UNITED STATES OF AMERICA v. PAUL REVERE TRANSPORTATION LLC, Case No. 06 CA 12297, U.S. District Court for the District of Massachusetts: Completed case involving enforcement of Massachusetts regulations restricting vehicle idling times. Activities on behalf of the defendant include expert report, supplemental expert report, and affidavit preparation as well as deposition testimony and assistance in preparation of cross-examination of defendant's experts. Expert and supplemental expert report addresses air quality in the Boston area, sources of emissions and their relative impacts on air quality, emissions from idling diesel vehicles, the efficacy of different emission control strategies in reducing emissions from diesel vehicles, including diesel particulate filters, and valuation of pollutant emissions. Case ended in settlement.

CATERPILLAR INC., et al, v. CALIFORNIA AIR RESOURCES BOARD, Superior Court of California, County of Sacramento, Case No. 05AS01133: Completed case regarding state regulations requiring acceleration of changes to engine control calibrations that conflicted with provisions of a previously executed memorandum of understanding. Case ended with decision for the plaintiffs following bench trial. Activities included deposition and trial testimony on behalf of the plaintiffs regarding expected lifetimes and emissions associated with heavy-duty Diesel vehicles.

DAIMLERCHRYSLER AG and MERCEDES-BENZ USA, INC. v. FUELING ADVANCED TECHNOLOGIES, INC., et al., Case No. CV No. 00 CV 1541 B (NLS), U.S. District Court, Southern District of California: Completed case related to infringement of patents addressing combustion chamber design. Case ended with decisions for the plaintiffs following bench trial. Activities on behalf of plaintiffs included preparation of declarations, preparation of expert and supplemental reports, deposition, and trial testimony. Issues addressed included history of combustion chamber design, identification and collection of relevant prior art documents and engine components, characterization of patent teachings, and characterization of prior art in light of patent teachings.

SOUTH TAHOE PUB. UTIL. DIST. V. ATLANTIC RICHFIELD CO. ET AL., Case No. 999128, Superior Court of California, County of San Francisco: Completed MTBE product liability case. Case ended with decision for the plaintiff following jury trial. Activities on the behalf of defendants included extensive review of documents and other materials during discovery, development of a detailed history and chronology of the development of California fuel regulations, documented information available to regulators and positions of regulators on various issues at various times, deposition, and deposition of opponent's experts.

ALBERT L. WOKAS v. GILBARCO, Case No. No. 1:98CV00236, U.S. District Court, Middle District of North Carolina, Greensboro Division: Completed case related to infringement of a patent addressing the design of systems to recover fuel vapors displaced from vehicle fuel tanks during refueling. Case settled prior to trial. Activities on behalf of the defendant included identifying potential prior art, locating and interviewing individuals with direct knowledge associated with potential prior art, preparing expert report and deposition. Issues addressed included history of vapor recovery systems designs and regulatory requirements, characterization of patent teachings, and characterization of prior art in light of patent teachings.

ETHYL CANADA INC. v. ATTORNEY GENERAL OF CANADA, et al., Court File No. 97-CV-126708, Ontario Court (General Division): Completed case related to Canadian federal statutes imposing restrictions on the use of the octane-enhancing gasoline additive methylcyclopentadienyl manganese tricarbonyl, commonly known as MMT®. Case ended with settlement. Activities on behalf of the defendants included preparation of an expert report and declarations and assistance in the deposition of opponent's experts. Issues addressed included the impact of combustion of gasoline containing MMT® on engine and emission control system components including catalysts, oxygen sensors, and on-board diagnostic systems; requirements imposed on vehicle manufacturers by new vehicle emission standard and warranty regulations; the design and execution of laboratory and vehicle test programs; and the relationship of vehicle testing methodologies to vehicle operation in customer service.

UNOCAL v. ARCO et al., Case No. CV-95-2379 KMW (JRX), U.S. District Court, Central District of California: Completed case related to infringement of a patent addressing the reformulation of gasoline in order to achieve lower vehicle exhaust and evaporative emissions. Case ended with a decision in favor of the plaintiffs following a jury trial. Activities on behalf of the defendants included preparation of declarations and expert report, extensive review of documents and other materials produced during discovery, deposition and trial testimony, assistance in the deposition of opponent's experts in cross examination. Issues addressed included history of federal and state regulations on gasoline composition as a means of reducing vehicle emissions, characterization of the understanding that regulators and other parties had regarding the impact of gasoline composition changes on vehicle emissions at various points in time, characterization of patent teachings, and characterization of prior art in light of patent teachings

#### **Consulting Expert:**

MTBE PROD. LIAB. LITIG., Case No. MDL – 1358, U.S. District Court, Southern District of New York and Related Cases: Several related MTBE product liability cases have been completed and ended with settlement. Other related cases are on-going. Activities on the behalf of defendants included technical support related to the history of federal gasoline composition regulations, the reductions in vehicular emissions resulting from those regulations and the effect that replacement of MTBE by ethanol would have had on vehicular emissions. Also assisted with deposition of opponent's experts.

GREEN MOUNTAIN CHRYSLER-PLYMOUTH-DODGE, et al. v. CROMBIE et al, U.S. District Court for the District of Vermont Civil File No. 05-302 & 304: Completed case related to state adoption of California new vehicle greenhouse gas/fuel economy standards. Case ended with decision for the defendants following bench trial. Activities on behalf of plaintiffs included extensive review of documents and materials produced during discovery; assisting with the depositions of fact witnesses and opponent's experts; and providing technical support related to vehicle manufacturers' compliance strategies and costs, effects of higher new vehicle prices on vehicle fleet turnover and vehicular emissions, and emission effects of reductions in gasoline usage.

OXYGENATED FUELS ASSOCIATION v. PATAKI, Case No. 00, CV-1073, U.S. District Court, Northern District of New York: Completed case related to state regulations banning the use of MTBE as a gasoline additive. Case ended with decision for the defendant following a bench trial. Activities on behalf of the plaintiff involved technical support associated with assessing the effects of the regulation on vehicular emissions in New York and the consequences of those effects on attainment of the National Ambient Air Quality Standard for ozone.

CENTRAL VALLEY CHRYSLER-PLYMOUTH et al. v. CALIFORNIA AIR RESOURCES BOARD, Case No. CIV F-02-05017 REC SMS, U.S. District Court, Eastern District of California, Fresno: Completed case related to California Zero Emission Vehicle Regulations. Case ended with settlement. Activities involved providing technical support to plaintiffs related to emission impacts of reductions in new vehicle sales in response to higher vehicle prices resulting from the regulations as well as vehicle manufacturer compliance strategies and costs. Also assisted with the depositions of fact witnesses.

### SELECTED PUBLICATIONS (AUTHOR OR CO-AUTHOR)

"Follow-On Study of Transportation Fuel Life Cycle Analysis: Review of Current CARB and EPA Estimates of Land Use Change (LUC) Impacts," Sierra Research Report No. SR2016-08-01, prepared for the Coordinating Research Council, CRC Project No. E-88-3b, August 2016.

"Review of EPA's MOVES2014 Model," Sierra Research Report No. SR2016-07-01, prepared for the Coordinating Research Council, CRC Project No. E-101, July 2016.

"Development of Vehicle Attribute Forecasts for the '2015 Integrated Energy Policy Report,'" prepared for the California Energy Commission, February 5, 2016.

"Sensitivity Analysis of Key Assumptions on Energy and Environmental Economics (E3) 'California Pathways GHG Scenario Results' as They Pertain to the Light-Duty Vehicle Sector," prepared for the Alliance of Automobile Manufacturers, October 2015.

"Review of Energy and Environmental Economics (E3) 'California Pathways GHG Scenario Results' as They Pertain to the Light-Duty Vehicle Sector," prepared for the Alliance of Automobile Manufacturers, October 2015.

"International Light-Duty Vehicle Fuel Economy and Greenhouse Gas Standards Analysis," prepared for the Alliance of Automobile Manufacturers, July 2015.

"Quantifying Aircraft Lead Emissions at Airports," prepared for the Transportation Research Board, Airport Cooperative Research Program, October 2014.

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