



Cambridge Environmental Inc
Selected Recent Projects, Presentations, and Publications
June 2008

PROJECTS

COMPLEX ENVIRONMENTAL ASSESSMENT

In partnership with our subcontractor, Geosyntec Consultants, Cambridge Environmental led the most extensive environmental and public health evaluation yet developed for any facility in Vermont. Our 18-month study shed new light on the largest calcium carbonate ore-processing plant in North America. Decades of placement of wet tailings, the residue of marble processing, in unlined pits, plus other practices, had engendered concern among local residents and prompted a legislative mandate for an environmental and public health study. Reporting to a team of unusually disparate stakeholders, we reviewed existing environmental data, identified data gaps, and conducted additional investigations. Additional activities included drilling monitoring wells, identifying preferred analytical methods for detection of process chemicals in environmental samples, conducting a dust monitoring study, assessing emissions to air of potentially hazardous chemicals, surveying local aquatic systems receiving industrial or quarry discharges, developing drinking water guidelines for process chemicals in water, monitoring noise levels around the facility, and assessing the impacts of the plant operations on public health. We met with citizens, stakeholder representatives, and state officials, and testified before Ver-

mont Senate and House committees. For more information, contact Steve Zemba.

MOBILE SOURCE AIR TOXICS

Under subcontract to the Federal Highway Administration, we critically reviewed the *Multiple Air Toxics Exposure Study II (MATES-II)* prepared by the State of California. We found that, while MATES-II was a sophisticated and informative study of air quality in the South Coast air basin (Los Angeles and surroundings), its predictions of the cancer risk posed by the 30 or so pollutants emitted by vehicles were less informative and somewhat misleading. We found that the authors did not describe adequately the significant uncertainties surrounding low-dose cancer risk assessment, such as whether rodent carcinogens are necessarily human carcinogens, and whether high-dose carcinogens are necessarily low-dose carcinogens. We also found that the uncertainties regarding the carcinogenic potency of diesel engine exhaust particulate matter (DPM) developed and used by the California analysts were particularly significant, given both the very large contribution of DPM to the overall assessment of risk, and the toxicologic, epidemiologic, and statistical issues involved. For more information, contact Laura Green.

PESTICIDE REVIEWS

Cambridge Environmental scientists support the pesticide registration activities of U.S. EPA and Canada's Pest

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Management Regulatory Agency by evaluating the fate and transport of conventional and antimicrobial pesticides in soil and water and the toxicity of these pesticides to nontarget species such as plants, birds, insects, zooplankton, and fish. We review the sponsor's laboratory and field research data, then prepare reports that include a detailed, critical summary of the experimental methodology and results. We conduct a statistical analysis of the data, assess the scientific validity of the research, and determine whether the data are acceptable to regulators. We have prepared more than 1,000 summary reports every year since the award of these federal contracts. We also prepare Environmental Fate and Ecological Hazard Assessments for individual pesticides. For more information, contact Kathleen Ferguson.

PROBABILISTIC EXPOSURE AND RISK ASSESSMENT

For a major chemical company, we developed sophisticated variability and uncertainty distributions for a probabilistic risk assessment of the contamination (primarily dioxins) around the Tittabawassee River in Midland, Michigan. The distributions were based on local surveys and measurements where available, otherwise on regional or national measurements. Parameters from these preliminary distributions were incorporated into a one-dimensional sensitivity analysis to evaluate the parameters requiring further attention. For more information, contact Edmund Crouch.

AIR DISPERSION MODELING

For a hot-mix asphalt plant in Alexandria, Virginia, we carried out an extensive air pollution emissions and disper-

sion modeling program. The plant was required by the City to demonstrate that its operations would not lead to modeled exceedances of national ambient air quality standards in the local neighborhood. In an unprecedented request, the City insisted that we model fugitive dust emissions for PM_{2.5}. By employing site-specific and meteorology-dependent emissions modeling, and a set of practicable changes to the plant's pollution control equipment and operating procedures, we demonstrated that the plant would meet the City's stringent requirements and could continue its operation. We also attended several public meetings and answered a wide range of technical questions posed by local residents. For more information, contact Mike Ames.

RADIOFREQUENCY RADIATION

Cambridge Environmental recently completed an evaluation of radiofrequency radiation from Coast Guard communications towers on Martha's Vineyard and Long Island. We measured radiation in the vicinity of existing towers, discussed technical aspects of a proposed new tower with the Coast Guard, and compared radiation from the proposed tower to that from existing towers. We participated in a meeting of the Chilmark Board of Selectmen at which issues related to the proposed tower were discussed. We found that radiation from the new communications equipment would be similar to that from the equipment it was designed to replace. At nearby residences, radiofrequency radiation would be comparable to median levels at U.S. residences. For more information, contact Rich Lester.



ENDANGERED SPECIES ASSESSMENTS

We have helped several clients assess potential risks to threatened and endangered wildlife species from contaminant emissions to air. Our analyses have been an important part of consultations between the U.S. EPA Region 5 and the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act pursuant to Clean Air Act (Title 5) permitting of various air pollution sources, including cement kilns, power plants, and other facilities. Most of these analyses have involved multi-media assessments of contaminant deposition to soil, surface water, and sediment, followed by species-specific foodweb modeling and comparison to ecological screening benchmarks. In several cases, particularly when standard guidance was insufficient, we developed and applied innovative approaches. In one case, we extended air dispersion models to predict deposition rates of nitrogen close to a combustion source, and evaluated the potential for this deposition to promote the growth of invasive species that might hamper restoration efforts in an adjacent prairie. In a second case, we constructed and implemented an acid fog model to determine whether localized concentrations of sulfur dioxide due to an industrial source could lower the pH of mists to levels damaging to vegetation. For more information, contact Steve Zemba.

EMERGENCY PLANNING GUIDANCE

For a specialty chemicals manufacturer, we reviewed toxicological data pertaining to acute inhalational exposures to chemicals of interest and developed short-term exposure guidelines for use in emergency planning. Consideration was given to methods used by other groups

to develop various forms of acute exposure guidance such as ERPGs, AEGs, and TEELs. For more information, contact Sarah Armstrong.

PRESENTATIONS

At the Electric Utility Environmental Conference in January 2008, Laura Green delivered the talk, "Assessing the health effects of sulfur dioxide (SO₂) in ambient air: Where has all the science (skepticism) gone?"


At the New York Federation's Solid Waste & Recycling Conference in May 2008, Stephen Zemba delivered the talk "Nanotechnology and risk assessment."

At the International Thermal Treatment Technologies Conference in May 2008, Stephen Zemba delivered the talk "Recent observations on risk assessments of combustor stack emissions."

At a recent Mobile Source Air Toxics Workshop, Laura Green delivered the talk, "Uncertainties in causal inference-making: does diesel engine exhaust/diesel engine particulate matter cause lung cancer?"

NATIONAL SERVICE

Edmund Crouch, Ph.D., is serving on two National Academy of Sciences committees. The first of these, the National Research Council's Committee on Health Risks of Phthalates, is evaluating human health risks and the potential for conducting a cumulative risk assessment for phthalate esters. The second, the National Institute of Medicine's Committee on Review of the ATSDR's (Agency for Toxic Substances and Disease Registry's) Great Lakes Reports, is reviewing



the ATSDR draft report “Public Health Implications of Hazardous Substances in Twenty-Six U.S. Great Lakes Areas of Concern.”

RESEARCH GRANTS

Cambridge Environmental received two Federal Phase I Small Business Innovative Research (SBIR) Grants to investigate contaminant fate and transport. In one project, we demonstrated the utility of computational fluid dynamics (CFD) in assessing occupational exposures to contaminants near emission points, where spatial and temporal gradients in concentration make it difficult to characterize the significance of numerous intermittent sources. In a second project, we investigated the fundamental forces affecting the resuspension of particles from surfaces. The possibility of remobilizing biological agents, nanoparticles, and other particle-bound contaminants may present residual hazards in indoor air. For more information, contact Steve Zemba or Edmund Crouch.

PUBLICATIONS

Taniguchi, C., Armstrong, S., Green, L., Golan, D., Tashjian, A., Jr. (2008). “Drug toxicity.” In: D. Golan, *et al.*, editors, *Principles of Pharmacology:*

The Pathophysiologic Basis of Drug Therapy, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins.

Armstrong, S., Galanter, J., Green, L., and Tashjian, A., Jr. (2008). “Poisoning by drugs and environmental toxins.” In: D. Golan, *et al.*, editors, *Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy*, 2nd Edition. Philadelphia: Lippincott Williams & Wilkins.

Crouch, E. and Green, L. (2007). Comment on “Persistent organic pollutants in 9/11 World Trade Center rescue workers: reduction following detoxification” by J. Dahlgren, M. Cecchini, H. Takhar, and O. Paepke [*Chemosphere* 69(8) (2007) 1320-1325]. *Chemosphere* 69(8):1330-2.

Lester, R., Green, L., and Linkov, I. (2007). Site-specific applications of probabilistic health risk assessment: review of the literature since 2000. *Risk Analysis* 27(3):635-658.

Popp, J., Crouch, E., and McConnell, E. (2006). A weight-of-evidence analysis of the cancer dose-response characteristics of 2,3,7,8-tetrachlorodibenzodioxin (TCDD). *Toxicol. Sci.* 89(2)361–369.

For more information about any of these activities, call us at (617)-225-0810 or e-mail to the scientist mentioned at LastName@CambridgeEnvironmental.com (for example, Ames@CambridgeEnvironmental.com)

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