

ST. JOE

MINERALS CORPORATION

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MONACA, PENNSYLVANIA 15061

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THOMAS E. JANECK
DIRECTOR
CORPORATE ENVIRONMENTAL PROGRAMS
(412) 773-2284

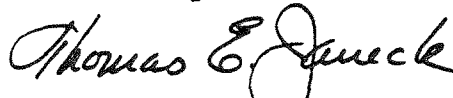
11 September 1986

Mr. G. F. Hoffnagle, Manager
Energy and Environmental
Planning Division
TRC Environmental Consultants
800 Connecticut Boulevard
East Hartford, CT 06108

Dear Mr. Hoffnagle:

Enclosed are copies of air dispersion modeling data for our Herculaneum lead smelter for the years 1973, 1974, 1976, and 1977 that you requested from Dan Vornberg. Since these reports were in my files, I am forwarding them to you on Dan's behalf. Note that the data for 1975 is missing. If you determine that the 1975 data are necessary to your work, please call Dan directly.

Sincerely,



Thomas E. Janeck

vlw
Enclosures
cc: D. L. Vornberg





Lead Industries Association, Inc.

292 Madison Avenue • New York, N.Y. 10017 • Telephone: (212) 578-4750

September 2, 1986

Mr. Gale F. Hoffnagle
Manager, Energy & Environmental
Planning Division
TRC Environmental Consultants, Inc.
800 Connecticut Boulevard
East Hartford, CT 06108

Dear Gale,

The Lead Industries Association has agreed to fund your proposal for the continuation of the work on the lead NAAQS as outlined in your letter of June 4, 1986. However, before you begin work on the contract, I feel that it would be best that we discuss it in some detail by telephone. Unfortunately, I will be out of the office until September 16 but I will call you on that date to get things started.

In my absence I have asked Dan Vornberg to arrange a conference call between you, Don Robbins and Mike Kearny to discuss what modeling data, if any, that can be used to develop the costs for total enclosure. Dan will be in touch with you regarding an appropriate date and time for the call. You should also know that Barry Lewis has resigned as the Director of Environmental Health for the Association. I will be working with you on the project until a replacement can be found for Barry.

Warmest regards,

Robert D. Putnam, Ph.D.
Consultant - Environmental Health

cc: Dan Vornberg ✓
Don Robbins
Mike Kearny
Werner T. Meyer



0R5901020

To DAN V.

Date 2/19 Time 9:30

WHILE YOU WERE OUT

M GALE HOFFNAGLE

of _____

Phone (203) 289-8631

TELEPHONED	☒ PLEASE CALL	☒
CALLED TO SEE YOU	WILL CALL AGAIN	
WANTS TO SEE YOU	URGENT	

☐ RETURNED YOUR CALL ☐

Message _____

Operator DIANN



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OR5901021

Pat Hanson

Gayle Hoffnagle

re LIA

9-4-86



DR5901022

Vainberg
11 AM Conference
Call
12/22/86

PROPOSAL TO
PROVIDE TECHNICAL
SUPPORT ON ALTERNATIVE
CONTROLS FOR LEAD
EXPOSURE

Prepared for:

Lead Industries Association

Prepared by:

Gale F. Hoffnagle, CCM

Proposal Number 8612-P51-38



0R5901026

1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) is reviewing the National Ambient Air Quality Standard (NAAQS) for lead. EPA is considering reducing NAAQS in order to provide increased protection to children exposed to lead around point sources, i.e., primary and secondary smelters, refineries and battery plants. This emphasis on point sources follows from the lead in gasoline phaseout which has already brought general lead ambient air quality below quarterly averages of $0.5 \mu\text{g}/\text{m}^3$.

EPA has provided a draft criteria document (EPA-600/8-83/028C) and a staff paper (OAQPS, Feb. 1986) which evaluate reductions of the NAAQS from a quarterly average concentration of $1.5 \mu\text{g}/\text{m}^3$ to a monthly average of 1.0 or $0.5 \mu\text{g}/\text{m}^3$. These were presented to the Clean Air Science Advisory Committee (CASAC) in March 1986 and LIA presented testimony, supported by TRC Environmental Consultants. The modeling of lead exposure to children presented in the EPA documents demonstrated clearly that exposure through the air pathway is a minor fraction of total exposure. This blood lead modeling even ignored exposure from lead-based paint and increased blood lead exposure in economically disadvantaged populations. Because the air pathway is a small portion of the exposure, meeting blood lead objectives would require substantial reductions in air lead concentrations. Because of the single media focus of the NAAQS process, the only option available to EPA's Office of Air Quality Planning and Standards (OAQPS) and to CASAC is to revise the NAAQS. CASAC did discuss, in March 1986, the possibility of changing lead from a NAAQS to a National Emission Standards for Hazardous Air Pollutants (NESHAP) pollutant. Such a change is within the jurisdiction of OAQPS and has the advantage of considering economics, which the NAAQS does not, and more flexibility for alternative approaches. LIA might pursue such a strategy on the air side of EPA. NESHAP has the disadvantages of being labeled



"hazardous" and the potential of source-by-source emission limitations rather than meeting just fenceline concentrations.

At the same time, other portions of EPA are dealing with lead exposure in their own separate media. The Office of Drinking Water is revising its standards to further reduce blood lead and the Superfund program is following the example of Dallas in pressing for lead in soil standards in clean up requirements. Each of these programs is attacking the same issue, blood lead concentrations in children. In each case, the agency seeks to meet the target blood lead concentration through control of a single medium of exposure. At the same time other media with sometimes more important exposures are ignored, e.g. lead in paint, tracked-in dirt, etc.

It is clear, however, that more direct control of exposures, directed at the children involved, is a viable alternative. Such an alternative could more effectively provide health protection and would not require clean-up through each media well beyond the requirements for such protection.

This proposal seeks to provide the technical basis for the development of such an alternative and to prepare appropriate documentation for the presentation of the alternative. TRC will also assist in preparing the exact language of the alternative as needed by the Lead Industries Association. Section 2 of this proposal presents the scope of work and Section 3 provides a cost proposal. Section 4 provides the Resumes of TRC assigned personnel.



2.0 SCOPE OF WORK

The scope-of-work has been organized into identifiable tasks which meet the objectives of the Lead Industries Association for a clear exposition of the technical support for an alternative method of controlling exposure to lead.

2.1 Task 1 - Literature and Data Acquisition

TRC will identify, obtain, codify and summarize environmental standards for lead in all media. The search will include all countries and jurisdictions. Care will be taken to include labor and health standards in addition to environmental requirements. Special emphasis will be placed on multi-media approaches where those exist.

TRC will also identify, obtain and summarize all studies of blood lead related to point sources. Many of the studies are already in TRC's possession, but it is important to insure that other studies in the literature do not contradict the results of those relied upon here. For each of the major studies an attempt will be made to gather any unpublished data and, with carefully prepared questions, talk to the researchers/writers involved about specific details on which to base a firmer understanding of their work. The true nature of each child's exposure is often masked in average data and an attempt will be made to discover true exposure sources.

2.2 Task 2 - Exposure Assessment

The relative importance of children's exposure to lead is the most difficult of the data requirements in any model of blood lead. The best data on which to base the relative importance of various pathways is field experience. Cleanup programs have valuable data on changes in some lead exposures which result in changes in children's blood-lead. Canada Metals,



RSR and Dixie Metals have undertaken cleanup of household dust, yard soil and changes in ambient concentration. The effect, in terms of blood-lead, on the exposed children will be documented and evaluated to determine:

- The independent rate of blood-lead reduction obtained with each type of cleanup.
- The cumulative rate of blood-lead reduction obtained with multiple clean-up approaches.
- The threshold or limit, if any, to the effectiveness of the clean-up approach.
- Whether limited area cleanup, e.g., yard and house, is effective at maintaining reduced blood-lead concentrations in light of the potential for redeposition of lead in the cleaned areas.

Each of the investigations undertaken will seek to provide more accurate input data for the EPA child lead absorption model. Discovering in real world situations which pathways of exposure are most important and which controls present the best response in terms of blood-lead will aid this effort.

2.3 Task 3 - Model Re-evaluations

EPA's child lead absorption model was presented in the criteria document as one of three theoretical choices of models. It was selected from the three since it makes the clearest demarcation between the various pathways. Re-evaluation of the model results should now be made with real world data (EPA presented only theoretical results using average or assumed input data). The model has been evaluated using data from Herculaneum. That modeling should be refined and supplemented by model exercises from Kellogg and East Helena. In addition, TRC will review the potential for modeling at other sites. Pre- and post- cleanup or source shut-down modeling would be very instructive at any of these sites. The objective of the modeling effort will be to: 1) test the validity of the model as a predictive tool, 2) determine

any valid change which could be made to the model or its assumptions and
3) demonstrate the ability of the model to estimate cleanup consequences.

2.4 Task 4 - Control Methodology Development

Given the importance of various pathways of exposure and the blood-lead results in the example cleanups, a consistent and broadly applicable control methodology will be developed. TRC will work closely with the LIA committee in developing the test strategy. The test strategy will be run on the model to determine the blood-lead results which can be expected. The sensitivity of the results to items like exact soil lead concentration and recontamination, etc. will be tested.

Once a control strategy is finalized, the costs of the control strategy will be assessed and presented along with control costs of other strategies, i.e., air emissions control from the TRC study, costs of total area soil cleanups such as those in Dallas, etc.

It should be noted that strategies may differ slightly from site-to-site given differences in climate, etc. This study will, however, be providing a thoroughly tested model with which to make control decisions at individual sites if a more generic result cannot be put forward.

2.5 Task 5 - Final Report and Presentation

TRC will be preparing a final report on its findings for the review of the LIA committee and revise the report as necessary given the committee comments. TRC will also be prepared to present the results of its findings to CASAC, headquarters EPA, OMB or any other appropriate forum as directed by the committee.



3.0 PROJECT MANAGEMENT AND COSTS

TRC proposes to provide Gale F. Hoffnagle, CCM, Vice President and Technical Director, as its project manager. Mr. Hoffnagle has worked with the LIA on previous efforts as well as having years of experience working for lead industry companies on lead contamination issues. Mr. Hoffnagle has provided testimony to CASAC and to EPA regulatory hearings over the years most recently on lead, for LIA, and particulate matter, for AMC.

Assisting Mr. Hoffnagle on the health exposure analyses will be Jim Kawecky, manager of TRC's Washington, D.C. office. Mr. Kawecky has been involved in the development and criticism of criteria documents throughout his career. He provides valuable insight into the most effective avenues of identifying and presenting data and results to CASAC and others. Dr. Sharon McCarthy will also provide extremely valuable assistance in risk assessment procedures and exposure methodologies.

Assisting on the technical side will be Dr. Richard DeCesar whose expertise in lead pathways and control of particulate lead comes from his years at NEA, Inc. where one of his project assignments was Bunker Hill. Also providing assistance will be Bradley Reynolds who, prior to joining TRC, provided SIP technical development for lead while at the Missouri Department of Natural Resources and whose technical background is directed toward resuspension of lead dust. Mrs. Inka Peczerski, TRC Librarian, will provide literature and standards search services.

TRC recognizes the urgency of the project in view of the preliminary scheduling of a CASAC meeting in March 1987. TRC proposes to have the draft report available for the LIA Committee by mid-February and a final ready prior to the meeting. As before, changes and enhancement can be provided after the meeting of CASAC up to the comment deadline, thus providing some flexibility

in exact approach. The greatest point of effectiveness, however, is in the meeting itself.

The estimated cost for this project is as follows:

Task 1 - Literature and Data Acquisition

Project Manager	10 hours	
Senior Scientists	30 hours	
Librarian	<u>20 hours</u>	
	60 hours	\$ 4,940
Document Retrieval and Telephone Costs		<u>500</u>
		\$ 5,440

Task 2 - Exposure Assessment

Project Manager	20 hours	
Senior Scientists	<u>200 hours</u>	
	220 hours	\$18,100

Task 3 - Model Re-evaluations

Project Manager	20 hours	
Senior Scientists	40 hours	
Computer Scientists	<u>80 hours</u>	
	140 hours	\$ 9,860
Computer Time		<u>2,000</u>
		\$11,860

Task 4 - Control Methodology Development

Project Manager	40 hours	
Senior Scientists	40 hours	
Computer Scientists	<u>20 hours</u>	
	100 hours	\$ 9,500
Computer Time		<u>500</u>
		\$10,000



Task 5 - Final Report and Presentation

Project Manager	50 hours	
Senior Scientists	40 hours	
Typing	<u>100 hours</u>	
	190 hours	\$13,130
Travel		2,500
Telephone, Copying, Postage		<u>500</u>
		\$16,130
Total Project Cost		\$61,530

Invoices will be submitted monthly according to the attached schedule of fees. TRC will not exceed the above cost without the express written consent of LIA.



STATEMENT OF TIME AND MATERIALS CHARGES

Work performed on time-and-materials basis is billed at TRC's hourly rates quoted below. These rates apply to time actually devoted to the job and to required travel (portal to portal). Required and/or client requested overtime is billed at a factor of 1.3 times the hourly rates charged. Overtime is defined as any hours worked beyond eight (8) hours in one (1) day or forty (40) hours in one (1) work week or Saturday, Sunday or a TRC holiday.

Expenses for travel, subsistence, telephone, use of computer, reproduction costs, subcontracting, material and equipment purchases, and miscellaneous other direct charges are billed at cost plus ten percent (10%) for handling and administration.

Usage charges for specialized instrumentation are billed at a fixed rate.

A twenty-five percent (25%) surcharge applies to direct time devoted to the preparation and presentation of expert testimony in court and commission proceedings.

Invoices are rendered monthly for work performed and costs incurred during the previous calendar month. Payment terms are net thirty (30) days. Amounts not paid within the stated terms are subject to a service charge of one and one-half percent (1-1/2%) per month or any portion thereof. In the event payment in full is not received within ninety (90) days of the invoice date, the account shall be subject to collection by our attorneys, and any and all costs of collection, including reasonable attorneys' fees, shall be paid by the invoiced party.

Prices quoted do not include State or local taxes.

This quotation is valid for a period of sixty (60) days and is based upon terms and conditions which are mutually acceptable.

		<u>Rate Per Hour</u>
Category 1	Senior Principal Consultant	\$135
Category 2	Principal Consultant	\$122
Category 3	Technical and Senior Project Managers	\$ 98
Category 4	Principal Scientist/Engineer	\$ 77
Category 5	Project Scientist/Engineer	\$ 64
Category 6	Scientist/Engineer	\$ 51
Category 7	Technical Specialist	\$ 40
Category 8	Technical Assistant	\$ 32
Category 9	Technical Aide/Clerk Typists	\$ 24

12/5/85



TRC

4.0 RESUMES

Resumes of the TRC project team follow.



GALE F. HOFFNAGLE, CCM
PRINCIPAL CONSULTING METEOROLOGIST

EXPERTISE: Expert Testimony, Dispersion Modeling, Air Quality Meteorology,
Fugitive Dust, Acidic Deposition, Toxic Air Pollutants

SUMMARY OF EXPERIENCE

Mr. Hoffnagle, a Vice President and Principal Consulting Meteorologist, has over 14 years of air quality meteorology and modeling experience providing consulting services to industrial clients across many industrial categories and in every region of the country. He provides the technology and experience to solve complicated meteorological and regulatory problems from conceptual design of regulatory approach, model methodology, comparison to existing air quality data, regulatory interface and negotiations, and report preparation to the expert testimony to defend meteorological evaluations.

He has carried projects through all these steps for such diverse situations as a coal-fired power plant in New Mexico, a copper smelter in Texas, a refinery in Louisiana, a lead smelter in Missouri, a coal-fired power plant in Pennsylvania, and a coal conversion project in New York. Several of these projects involved complex terrain meteorology and modeling in which Mr. Hoffnagle has considerable experience and a nationwide reputation. Other projects concentrated on particulate deposition modeling, multiple source urban area modeling, and aerodynamic downwash evaluations.

Mr. Hoffnagle has served as a consultant to the American Petroleum Institute, the utilities of Colorado, the American Mining Congress, the Houston Chamber of Commerce, and the Utility Air Regulatory Group. His prior employment includes Environmental Research and Technology, Intera Environmental Consultants, and the U.S. Air Force Environmental Health Laboratory.

EDUCATION

1972, M.B.A.	Golden Gate University
1968, M.S.	New York University, Meteorology
1967, B.S.	New York University, Meteorology and Oceanography

PROFESSIONAL REGISTRATIONS AND AFFILIATIONS

Certified Consulting Meteorologist

Air Pollution Control Association - Member, Board of Directors
- Member, JAPCA Editorial Review Board

American Meteorological Society - Past Chairman - Board on Industrial Meteorology



JAMES M. KAWECKI
PRINCIPAL POLICY CONSULTANT

EXPERTISE: Health and Risk Assessment, Toxicology, Environmental Chemistry

SUMMARY OF EXPERIENCE

James M. Kaweck, a Principal Policy Consultant at TRC, has fifteen years experience in environmental chemistry and toxicology. A former appointee to the U.S. EPA's Office of Standards and Regulations, Jim was involved with issues relating to the development of methodologies for assessing risk, "red border review" for criteria pollutant regulations, the Regulatory Agenda, and the incorporation of a "plain English" policy within the Agency, under Executive Order 12044. In addition to conducting numerous health assessments for multi-media pollutant exposures, he has focused on generic issues related to risk assessments. As part of EPA's Project ATLAS, he headed a team of multidisciplinary researchers to devise innovative methods for determining the potential risks to public health from hazardous waste sites. His two year association with the Love Canal assessments provided the testing ground for evaluating these techniques.

More recently, he has been involved in developing new approaches to refining risk assessment methodologies. Some of this work includes studies to determine the severity (or implications) of specific health endpoints, approaches to assessing risk from chemical mixtures, and ways to increase the confidence in the risk assessment results through probabilistic determinants. As a seasoned writer, Mr. Kaweck's journalistic interests in science reporting has led to his involvement with the issue of how science is interpreted and presented in the popular media, that is, how science is transferred from the laboratory to the living room.

As the former director of health and environmental research for a large Washington-based consulting firm, Mr. Kaweck had hands-on involvement in the development of new medical technologies, where he was a member of the Board of the Directors of the Johns Hopkins University joint venture to develop a microbiological identification instrument. This instrumentation was a modification of his company's life-detection system on Mars and also played in the development of the so-called "left-handed" sugars. Accordingly, Mr. Kaweck offers the breadth and depth of experience to assist on all phases of project leadership, management, design, and development.

EDUCATION

1976, Ph.D. University of Maryland, Biochemistry
(candidate)

1973, M.S. Goddard College, Environmental Chemistry

1971, B.S. University of Maryland, Biochemistry



COMMITTEES, CONFERENCES, AND OFFICES

- 1985 - Present: Chairman, Biomedical Effects Committee, Air Pollution Control Association
- 1985 (Nov.) : Organizer, Pathology Audit-Peer Review of two bioassays conducted at the Bologna Institute of Oncology
- 1985 (May) : Coordinator/Organizer, Second US-Dutch International Symposium on Aerosols, Williamsburg, VA
- 1984 (Nov.) : Symposium Speciality Conference on Photochemical Oxidants, Houston, TX, April, 1984
- 1983 (June) : Chairman, Health Basis for Photochemical Oxidant Standards, APCA, Atlanta
- 1982 (Dec.) : Chairman, Photochemical Oxidant Workshop, Welfare Effects
- 1981 (June) : Co-Chairman, APCA Specialty Conference on Biomedical Effects of Stratospheric Ozone Depletion, Philadelphia
- 1980 (April) : Chairman, Conference on Environmental Fate and Effects of Malathion and Parathion, New Orleans
- 1978 (May) : Chairman, Conference on Emissions of S-Bearing Compounds from Motor Vehicle and Aircraft Engines, Ann Arbor

PUBLICATIONS

Kaweck, J.M. and S.D. Lee. The Health and Environmental Effects of Chromium Compounds. Reviews of Environmental Contamination and Toxicology. Accepted for Publication, Spring 1987.

Stara, J.F., J.M. Kaweck, and J. Swartout. Solvent Research Needs for Risk Assessments. Presented at Collegium Ramazzini, Bologna Italy, October 1985, for publication in Bulletin of the New York Academy of Medicine, in press, Fall 1986.

Kaweck, J.M., and S.D. Lee. Regulation of Environmental Hazards, in, An Introduction to Environmental Medicine. A.B. Tarcer (Ed.), ISBN 0-87488476-4, Medical Examination Publishing Company, Inc., New Hyde Park, NY, in press, Fall 1986.

Yocom, J.E. and J.M. Kaweck. Overview of Soiling and Materials Damage from Aerosols, in Aerosols. Lee et al. (Eds.), Lewis Publishers, Chelsea, MI, 1986.

Stara, J.F. and J.M. Kaweck. Chemicals Mixtures: Prospective Assessments of Risk, in Transactions of the APCA Risk Assessment Conference (presented April 1986) for publication, APCA, Pittsburgh, Fall 1986.



JAMES M. KAWECKI (Continued)

Kawecki, J.M. Modernizing the Clean Air Act: Concentrations and Measurement of Sulfur Oxides and Particulate Matter. Presented at APCA Specialty Conference on the U.S. EPA proposed criteria for SO₂/MP, Atlanta, Georgia, August 31, 1981.

Lee, S.D., and J.M. Kawecki. Pollutants in the Environment - An Overview. Presented at the International Meeting of Life Sciences, Kuala Lumpur, Malaysia, October, 1980.

Kawecki, J.M. and D.J. McKee. Indoor Exposure to Air Pollutants. Draft Report. U.S. EPA, Research Triangle Park, NC, 1980.

Lee, S.D., D. Murkerjee, M. Dourson, J.F. Stara, L. Grant, R. McGaughy, and J.M. Kawecki. Rationale and Approach for Health Effects Assessment for Benzene in Ambient Water. Presented at the American College of Toxicology Workshop on Benzene, Washington, D.C., 1980. Accepted for publication in Journal of Environmental Pathology and Toxicology.

Kawecki, J.M. Properties and Analytical Methods. Chapter 3 in draft report on particulate matter/sulfur oxides air quality criteria document. U.S. EPA, Research Triangle Park, NC, 1979.

Bradow, R.L., F.M. Black, J.N. Braddock, C.T. Hare, M. Ingalls, and J.M. Kawecki. Study of Particulate Emissions from Motor Vehicles: A Report to Congress. Draft Report. U.S. EPA, Research Triangle Park, NC, 1979.

Kawecki, J.M. Emissions of Sulfur-Bearing Compounds from Motor Vehicle and Aircraft Engines: A Report to Congress. Environmental Protection Agency, EPA-600/9-78-028, August, 1978.

Kawecki, J.M. An Exercise in Prioritization of a Chemical List. Environmental Protection Agency, Office of Toxic Substances, Washington, D.C., Final Draft, March, 1978.

Kawecki, J.M. Tris-BP. Environmental Protection Agency, Office of Toxic Substances, Washington, D.C., Preliminary Draft, February, 1978.

Kawecki, J.M. Mycotoxins. Advances in Chemistry Series ACS (in press).

Kawecki, J.M. and G.E. Gordon. Modern Trends in Atmospheric Analysis. Technology Review, Massachusetts Institute of Technology. Research completed and outline accepted for publication, June, 1977.

Kawecki, M.M. Antithrombotic and Antihemostatic Effects of Methyl Salicylate. Research Report. Hunter Laboratories, Washington, D.C., May, 1975.

Kawecki, J.M. and B.F. Feingold. Prostaglandin Inhibition. Research Report. Hunter Laboratories, Washington, D.C., January, 1975.

Kawecki, J.M. Copolymers and Polymers. Advances in Chemistry Series ACS 142, 1975.



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JAMES M. KAWECKI (Continued)

Kawecki, J.M. Monolayers. Advances in Chemistry Series ACS 144, 1975.

Kawecki, J.M. Atmospheric Lead Concentrations in Urban Areas. Research Report. Department of Chemistry, University of Maryland, College Park, October, 1974.

Kawecki, J.M. Effects of Ascorbic Acid on Iron Binding Capacities. Research Report. Hunter Laboratories, Washington, D.C., June, 1974.

Kawecki, J.M. Ceramics and Toxic Pollutants. Chemical Communication. Department of Human Ecology, University of Maryland, College Park, April, 1973.



DR5901041

SHARON M. MCCARTHY, Ph.D.
SENIOR ENVIRONMENTAL HEALTH SCIENTIST

EXPERTISE: Indoor Air Quality, Statistics, Health Effects of Environmental Pollutants, Epidemiology

SUMMARY OF EXPERIENCE

Dr. McCarthy has 10 years experience in indoor and outdoor air quality monitoring, exposure assessment, health effects of air pollutants, and statistical analysis of air quality and exposure data. This experience was gained in work for the U.S. Environmental Protection Agency, Environmental Research and Technology, Inc., and at the Harvard School of Public Health. Her Ph.D. dissertation at the University of California was on the elemental characterization of indoor and outdoor aerosols. Multivariate statistical analyses were used to identify source contributions to aerosols and to model the relationship between indoor and outdoor aerosols. While completing her Ph.D. she took several courses in physiology and environmental toxicology.

At TRC, Dr. McCarthy is involved in a variety of projects relating to risk assessment, indoor air quality, and statistical analyses of environmental quality data. A recent project involved the evaluation of the literature on various indoor air pollutants for use in risk assessment models. This work involved the review of toxicological, epidemiological, and monitoring data to determine if sufficient health effects and exposure data were available to perform a quantitative risk assessment. Dr. McCarthy has also completed a risk assessment for a hazardous waste site. This included a review of the health effects of over a dozen compounds related to coal gasification processes, exposure estimation through inhalation and ingestion, and associated risks posed by the site to the surrounding population.

While at ERT her responsibilities included supervision of the analytical laboratory with client interaction for specialized analyses and project reports. At EPA, Dr. McCarthy worked as analytical chemist and supervised major field studies in the Virgin Islands, Puerto Rico, and New York.

Dr. McCarthy is a member of several technical societies and has published several technical articles on indoor air quality.

EDUCATION

1986, Ph.D.	University of California (Irvine), Environmental Analysis - Air Pollution
1982, M.S.	Harvard School of Public Health, Environmental Health
1975, M.S.	Rutgers, The State University of New Jersey, Environmental Science
1974, B.A.	Newton College of the Sacred Heart, Environmental Chemistry



DR5901042

RICHARD T. DECESAR
SENIOR CONSULTING SCIENTIST

EXPERTISE: Air Quality Source Apportionment, Atmospheric Chemistry,
Statistical Methodology

SUMMARY OF EXPERIENCE

Mr. DeCesar is a Senior Consulting Scientist at TRC and has over seven years experience in the development, application and validation of receptor oriented methods of air quality source apportionment. He was the primary contributor in a project which resulted in the development of statistical tools for designing receptor modeling studies to apportion the sources of urban air pollution to a specified level of precision.

Mr. DeCesar has managed several urban aerosol source apportionment research projects including: the "Medford Aerosol Characterization Study" (MACS) and an "Evaluation of Chemical Receptor Models for Air Particulate Source Impact Assessment using the PACS Data Set". His responsibilities included report preparation, multivariate statistical analysis, data base management, software development, and chemical analysis of aerosol samples.

Mr. DeCesar has been a major contributor in aerosol characterization studies carried out in numerous airsheds including: Kellog and Lewiston, Idaho; Missoula and East Helena, Montana; Portland, Oregon; South Bend, Indiana; and Labrador City, Newfoundland. He successfully quantified the impacts of sources and source types for the airsheds by using data collected in the studies and applying receptor model methodology. Through these studies he gained extensive experience in multivariate statistical analysis, study design, and the management and interpretation of large data sets.

Mr. DeCesar is the primary developer of the "Quantitative Source Apportionment System III" (QSAS III) software package. The QSAS III package, distributed by NEA, Inc. of Beaverton, Oregon, is an interactive command-driven system for data management and CMB source apportionment calculations as well as tabular and graphical representation of air quality data in report-ready formats.

EDUCATION

1984, M.S. Oregon Graduate Center, Beaverton, Oregon
Environmental Science

1978, B.S. Shippensburg University, Shippensburg, Pennsylvania
Chemistry

PROFESSIONAL AFFILIATIONS

Air Pollution Control Association
Member, Receptor Modeling Committee
American Chemical Society, Division of Environmental Chemistry



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RICHARD T. DECESAR (Continued)
SENIOR CONSULTING SCIENTIST

PUBLICATIONS

DeCesar R.T.; Cooper J.A., 1981: "The Quantitative Impact of Residential Wood Combustion and Other Vegetative Burning Sources on the Air Quality in Meford, Oregon." in Proceedings of 1981 International Conference on Residential Solid Fuels, edited by J. Cooper and D. Malek, Oregon Graduate Center, Beaverton, Oregon.

DeCesar, R.T.; Cooper, J.A., 1982: "Evaluation of Multivariate and Chemical Mass Balance Approaches to Aerosol Source Apportionment, Using Synthetic Data and an Expanded PACS Data Set." in Receptor Models Applied to Contemporary Air Pollution Problems, Air Pollution Control Association, Pittsburgh, PA.

Currie, L.A.; Gerlach, R.W.; Lewis, C.W.; Balfour, W.D.; Cooper, J.A.; Dattner, S.L.; DeCesar R.T.; Gordon, G.E.; Heisler, S.L.; Hopke, P.K.; Shah, J.J.; Thurston, G.D.; Williamson, H.J., 1984: "Interlaboratory Comparison of Source Apportionment Procedure: Results for Simulated Data Sets." Atmospheric Environment, 18; 1517-1537.

Dzubay, T.G.; Stevens, R.K.; Balfour, W.D.; Williamson, H.J.; Cooper, J.A.; Core, J.E.; DeCesar, R.T.; Crutcher, E.R.; Dattner, S.L.; Davis, B.L.; Heisler, S.L.; Shah, J.J.; Hopke, P.K.; Johnson, D.L., 1984: "Interlaboratory Comparison of Receptor Model Results for Houston Aerosol." Atmospheric Environment, 18; 1555-1556.

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BRADLEY W. REYNOLDS

EDUCATION

1979, M.S. Oregon State University, Atmospheric Science

1974, B.A. University of Nebraska, Chemistry

SUMMARY OF EXPERIENCE

Mr. Reynolds is a Principal Scientist working in the areas of modeling, permitting and atmospheric studies in the Denver office of TRC. He is currently responsible for all technical inputs and analysis in the projects he is involved with.

Mr. Reynolds has conducted and reviewed numerous dispersion and receptor modeling studies for a large variety of sources as well as basic atmospheric research. Some of these studies include such complex sources types as nonferrous smelters, rock quarries, surface mines, petroleum refineries, industrial/utility boilers, lime plants, chemical plants and urbanized regional source interactions. These studies routinely included the development of innovative emission inventory and modeling techniques on a case by case basis. He also has extensive experience in applied meteorology and air pollution field work, using a large array of standard and exotic meteorological and contaminant measuring equipment and tracers.

Aside from these major work areas, Mr. Reynolds has extensive experience in computer usage and programming. This includes the application of numerous data and statistical manipulation techniques and dispersion model modification and development. Besides the frequent application of most of EPA's UNAMAP models, he has also applied receptor models and photochemical models to various problems.

Prior to joining TRC, Mr. Reynolds worked for the State of Missouri as their meteorologist. There he performed, approved, archived and verified all dispersion modeling, monitoring and meteorology for permits, episodes and air quality planning. He was involved in all regulation and State Implementation Plan technical developments, documentation and expert testimony. Before this he worked for the Air Resource Center at Oregon State University where he was involved with experimental and theoretical solutions to air contaminant deposition and resuspension problems.

PROFESSIONAL AFFILIATIONS

American Meteorological Society

Air Pollution Control Association, TS-5 Fugitive Emissions Committee



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J. INKA PECZERSKI

EDUCATION

1978, M.L.S. Southern Connecticut State University, Library Science

1976, B.A. Central Connecticut State University, German

Additional course work in computer science, organic chemistry, management, and Russian.

SUMMARY OF EXPERIENCE

As Librarian at TRC, Mrs. Peczerski is responsible for maintaining and upgrading TRC's extensive collection of technical reports, periodicals, maps, and reference works. In support of the research staff, Mrs. Peczerski performs literature searches for a wide variety of environmental projects. These searches include computerized data retrieval on such systems as Lockheed's DIALOG and SDC's ORBIT. In addition to this retrieval activity, Mrs. Peczerski has access to numerous out-of-house sources of information through participation in local information networks.

Mrs. Peczerski has more than 20 years of experience as a librarian. She worked for many years in the field of environmental research as well as for industry in the area of chemistry and electronics. She has served as a library consultant on abstracting and indexing projects. She has made technical and legal translations.

KNOWLEDGE OF LANGUAGES

Polish and German

PROFESSIONAL AFFILIATIONS

American Chemical Society, Connecticut Valley Section; Division of Chemical Information

Connecticut Library Association

Special Libraries Association, Connecticut Valley Chapter; Recording Secretary, Membership Committee, Bulletin Editor

