WORK PLAN

RTI PROJECT 44U-1736-13

EPA PROJECT 80/41

PHASE I

REVIEW OF ASBESTOS STANDARD

Prepared for

U.S. Environmental Protection Agency

Contract No. 68-02-3056

Mr. John Copeland

Lead Engineer

November 10, 1980

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FMSI 07064

REVIEW OF ASBESTOS STANDARD
PHASE I WORK PLAN

I. INTRODUCTION

This document presents a Work Plan prepared by Research Triangle Institute (RTI) for Phase I, Review of Asbestos Standard* as required by the U.S. Environmental Protection Agency (EPA) Contract Number 68-02-3056, "New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants."† The result of this review will be a recommendation to revise or not to revise the current standard. If the decision is made to revise the existing standard, a separate work plan will be developed. Thus, the work to be performed under this contract is as follows:

Phase I: Review of Asbestos Standard

Phase II: Revision of the Asbestos Standard (contingent upon Phase I results).

In the event that a revision of the current standard is found to be necessary, information collected in Phase I will provide much of the basis for Phase II. A Background Information Document (BID) will be prepared during Phase II and will provide background information to support the revision of the asbestos standard.

Because there are no published procedures for the review (and revision) of existing National Emission Standards for Hazardous Air Pollutants (NESHAP), this Work Plan was developed based on discussions with the EPA Lead Engineer and adaptation of the procedures outlined in the Contractor Procedures Manual for Development of National Emission Standards.

*The current asbestos standard was promulgated in 40 CFR 61, Subpart B.

†As a review of a National Emission Standard for Hazardous Air Pollutants, the proposed work and schedule for Phase I of this study differs from that normally performed during the Phase I work for New Source Performance Standards.

FMSI 07065

II. OBJECTIVES AND SCOPE OF WORK

The sources regulated by the current asbestos standard include asbestos mills, roadways, manufacturing, demolition and renovation, spraying, fabricating, insulating, and waste disposal. The purpose of Phase I is to review the standard regulating asbestos emissions from these sources, determine its adequacy, and gather information that will assist in revising the standard if a revision is recommended. A recommendation to revise or not to revise the standard will be based upon the following:

- Control Technology: Standards for air cleaning equipment and work practices now specified will be reviewed. Information will be collected on improvements in control equipment and work practices that have occurred since promulgation of the current standard, as well as the feasibility of substitutes and control technologies under development. Data collected on control technology during Phase I will serve as the basis for determining Best Available Control Technology (BACT) during the Phase II study if a revision of the standard is recommended.

- Emission Sampling and Analysis: Routine, standardized techniques for sampling and analyzing asbestos emissions were not available during promulgation of the current standard. Thus, numerical emission limitations are not included in the existing standard. Recent information on sampling and analysis will be collected and assessed for its applicability for monitoring asbestos emissions from sources identified in the existing standard. Advantages and disadvantages of the various measurement methods will be discussed from the viewpoint of establishing numerical emission standards.

- Health Risks: Recent data on health risks (including asbestosis, bronchogenic cancer, and mesothelioma) associated with exposure to airborne asbestos will be reviewed. Information relating asbestos-linked disease and asbestos concentrations commonly encountered in ambient air will be important in determining the need for numerical emission limits and the value at which limits should be set. EPA will supply RTI with any dose-response data or other quantitative data that may be required for the establishment of numerical emission limits.

- Enforcement of the Standard: Enforcement experience with the existing asbestos standard will be evaluated in order to identify problem areas. Lack of compliance or inability to enforce certain provisions may result in a recommendation to revise the standard.

FMSI 07066

- Emission Sources: Emission sources regulated by the current standard will be reviewed, and an attempt will be made to determine if there are additional important sources of asbestos emissions that should be included in the standard.

III. PLAN FOR PERFORMANCE

The approach that RTI will take in the Phase I review of the existing asbestos standard is presented here. Nine tasks (shown in Figure 1) are envisioned as necessary for an adequate review of the standard and are discussed below. Project participants and total hours of participation are shown in Figure 2, Project Organization Chart. Resumes of major project participants are in Appendix 1 of this work plan. The schedule and milestone are presented in Figure 1, while Table I shows dollar and manhour expenditures for the Phase I study.

It is expected that Phase I, Review of Asbestos Standard, will require 10.5 months to complete. The date of completion is set at August 28, 1981.

A. Task 1: Review Background Information for Existing Standard

In evaluating the need to revise the existing standard, RTI will assemble and establish a docket of the background information that provided the basis for the standard. This information will be reviewed to aid RTI in evaluating events occurring since promulgation of the standard. Furthermore, such an exercise will identify potential sources of information. Finally, a review of the background information will identify any areas of inadequacies in the current standard which may or may not be amenable to revision.

RTI will review published EPA documents, including the following:

- Background Information - Proposed National Emission Standards for Hazardous Air Pollutants: Asbestos, Beryllium, Mercury (APTD-0753), December 1971.

FMSI 07067

- Background Information Development of National Emission Standards for Hazardous Air Pollutants: Asbestos, Beryllium, and Mercury (APTD-1503), March 1973.
- Background Information on National Emission Standards for Hazardous Air Pollutants - Proposed Amendments to Standards for Asbestos and Mercury (EPA-450/2-74-009a), October 1974.
- Preambles to national emission standards and amendments for asbestos.

Key EPA personnel that participated in the development of the current standard will be identified and interviewed. RTI will ask to examine their files on asbestos in order to assemble pertinent data.

During the examination of EPA's earlier background material, information sources outside of EPA may be identified. These might include other government agencies, industry associations and unions, individual companies within the asbestos industry, and control equipment vendors. These sources will be contacted as it is deemed necessary.

B. Task 2. On-site Investigations

In order for RTI staff to evaluate processes, facilities, emission problems, and control techniques involved in asbestos-related industries, RTI plans to make several on-site investigations or plant trips. Information gathered during site visits will also assist in determining which sites are suitable for emission testing it if is determined later that emission testing is required. Because of the variety of sources, RTI plans to limit to a maximum of two, the number of visits made to each type of source. In the case of the asbestos manufacturing industry, the diversity of processes requires that at least twelve plant visits be made. The sites listed below, with anticipated dates of visits, will be contacted to schedule visits following

FMSI 07068

approval of this work plan.* If these visits cannot be scheduled, alternates will be selected in consultation with the Lead Engineer.

Week of Visit	Site of Visit	Source Category
Jan. 5, 1981	Asbestos Fabricators, Inc., Charlotte, NC	Fabricating
Jan. 5, 1981	Raybestos-Manhattan, Marshville, NC	Manufacturing - Textiles
Jan. 5, 1981	H.A. Haynie Co., Greenville, NC	Manufacturing - Fire-proofing and insulating materials
Jan 12, 1981	Bendix, Cleveland, TN	Manufacturing - Friction materials
Jan. 12, 1981	Sea Gulf Environmental Co., Louisville, KY†	Demolition and Renovation
Jan. 19, 1981	Asarco, Inc., Ragland, AL	Manufacturing - Asbestos/ Cement pipe
Jan. 19, 1981	Jaquays Asbestos Corp., Globe, AZ	Milling
Jan 26, 1981	Washington Asphalt Co., Seattle, WA	Manufacturing - Asphalt concrete
Feb. 2, 1981	(Left open for rescheduling of site visits as a result of cancellations)	
Feb. 9. 1981	Remington Arms Co., Bridgeport, CT	Manufacturing - Shotgun shells
Feb. 9, 1981	Raybestos-Manhattan, Stratford, CT	Manufacturing - Friction materials, packing and gaskets
Feb. 16, 1981	Rogers Corp., Manchester, CT	Manufacturing - Plastics

* The list of sites is subject to change based on the results of telephone contacts with these and other companies for information on products and pollution control methods. In addition, site visits will be coordinated with other research activities at EPA in order to avoid duplication of efforts and to avoid placing unreasonable demands on individual companies; this may necessitate modifying the list of proposed site visits.

† The location is that of the company office. Due to the temporary nature of the work, specific locations for site visits will be determined at a time closer to the dates given.

FMSI 07069

Week of Visit	Site of Visit	Source Category
Feb. 16, 1981	Allied Chemical Corp., Solvay, NY	Manufacturing - Chlorine
Feb. 23, 1981	H. B. Fuller Co., Philadelphia, PA*	Spraying
Feb. 23, 1981	GAF, Whitehall, PA	Manufacturing - Paper, plastics
March 2, 1981	Johns-Manville, Manville, NJ	Manufacturing - Asbestos/ Cement pipe, textiles, paper, coatings, packing and gaskets
March 2, 1981	Flintkote, Chicago Heights, IL	Manufacturing - Vinyl/ Asbestos, floor tile, coatings
March 9, 1981	Vermont Asbestos Group, Lowell, VT	Milling
	(To be visited during trips to manufacturing facilities)	Waste Disposal
March 16, 1981	(Left open for rescheduling of site visits as a result of cancellations)	

RTI also proposes that advantage be taken of site visits in order to visit several of the EPA Regional Officers. Information on enforcement of the current standard will be obtained during meetings with regional EPA personnel.

C. Task 3. Data Collection

In Task 3, data collection and analysis will begin. Data will be elicited from numerous areas. Initially, a literature search will be performed through the library facilities of EPA in the Research Triangle Park, North Carolina. Additionally, interviews and telephone contacts will be made

* The location is that of the company office. Due to the temporary nature of the work, specific locations for site visits will be determined at a time closer to the dates given.

FMSI 07070

with trade and worker associations, vendors of control equipment, companies within the asbestos industries, and government agencies.

The following is a list of sources of potentially useful information that RTI plans to investigate during this part of the study. Additional sources will be added to the list as they are identified.

Literature Sources

1. Asbestos: A Bibliography, EPA-600/3-78-066
2. Asbestos: An Information Resource, (NIH) 78-1681
3. U.S. EPA, Electron Microscopy Measurement of Airborne Asbestos Concentration: A Provisional Method Manual, EPA-600/2-77-178
4. U.S. EPA, Control Techniques for Asbestos Air Pollutants, AP-117
5. U.S. EPA, Chemical Market Input/Output Analysis of Selected Chemical Substances to Assess Sources of Environmental Contamination Task III. Asbestos, EPA-560/6-78-005
6. U.S. EPA, Evaluation of a Commercial Vacuum System for the Removal of Asbestos, EPA-600/2-80-88
7. U.S. EPA, Sprayed Asbestos-Containing Materials in Buildings: A Guidance Document, EPA-450/2-78-014
8. U.S. EPA, Field Testing of Emission Controls for Asbestos Maufacturing Waste Piles, EPA-600/2-77-098
9. U.S. EPA, Hazardous Wastes: A Risk-Benefit Framework Applied to Cadmium and Asbestos, EPA-600/5-77-002
10. Asbestos magazine
11. Asbestos Information Association, News and Notes newsletter
12. EPA files

Government Sources (other than EPA)

1. Pearl Harbor Naval Shipyard, U.S. Navy
2. U.S. Navy Environmental Health Center
3. OSHA

FMSI 07071

4. NIOSH

5. Consumer Product Safety Commission (CPSC)

6. Bureau of Mines

7. Mine Safety and Health Administration (MSHA)

8. State and Regional Agencies of EPA

9. Bureau of Land Management

10. U.S. Geological Survey

Trade and Worker Associations

1. Asbestos Information Association (AIA)

2. Oil, Chemical and Atomic Workers (OCAW)

3. International Association of Heat and Frost Insulators and Asbestos Workers

4. The International Brotherhood of Boilermakers Union

Vendors of Control Equipment

1. Nilfisk of American, Inc.

2. Hoffman Air Systems, Division of Clarkson Industries, Inc.

3. American Cleaning Equipment Corporation

4. Diversified Vacuum Systems, Inc.

5. American Air Filter

6. Wheelabrator-Frye

7. MikroPul, Inc.

8. Western Precipitation, Division of Joy

Major Mining and Manufacturing Companies in the Industry

1. Johns-Manville Canada Inc.

2. Asbestos Corp., Ltd.

3. Johns-Manville

FMSI 07072

4. Raybestos-Manhattan

5. GAF

As information is received, its contents will be reviewed specifically for current information on new control technology, feasibility of sampling and analysis, health risks, enforcement experience, and new emission sources. Relevant information will then be compiled and subject to analysis as discussed in Task 4.

D. Task 4. Data Analysis

Collected data will be analyzed by RTI in order to help assess the need to revise the current standard. The analysis will attempt to determine the following:

Control Technology

Available technology
Technology currently in use
Effectiveness of existing controls
Current asbestos emissions
Availability and feasibility of alternate control, including technology transfer
Feasibility of substitutes
Emission sources not amenable to controls
Control technology in the foreseeable future
Costs associated with control technology

Sampling and Analysis

Available methodology
Advantages and disadvantages of various methods
Availablity of routine, standardized method for compliance purposes
Costs of sampling and analysis

Health Risks

Human dose-response data (to be supplied by EPA)

Enforcement of the Standard

Federal experience with enforcement
Extent and approach of State enforcement

FMSI 07073

Emissions Sources

Sources not covered by the existing standard
Significance of emissions
Use of controls
Need for regulatory control

Industry Growth

Historical growth pattern
Expected growth pattern

E. Task 5. EPA Review

The results of the above analysis will be reviewed by EPA. RTI will meet with EPA to discuss its review and determine where there are additional data needs. The need to revise the standard will be discussed in light of the existing data.

If at this stage RTI and EPA agree that it is likely that a revision of the standard is necessary, RTI will initiate appropriate actions to revise the standard, including identification of emission sources, selection of sites to be visited, contact with selected companies, and preparation of Section 114 letters to be sent to selected companies. Initiation of these steps prior to completion of the Phase I review is important in view of the time usually required to arrange plant visits and obtain information from companies. The appropriate EPA Regional enforcement offices will be informed of the tentative plans to visit plants in their Region. All of these actions will be coordinated closely with the Lead Engineer.

F. Task 6. Final Data Analysis and Recommendation Regarding Standard

An attempt will be made to rectify any omissions of data identified during Task 5. A report will be prepared, which will include a discussion of the findings on control technology, sampling and analysis, health risks, enforcement experience, and emission sources. The report will include a

FMSI 07074

recommendation to support or forgo revision of the current standard. If a revision is recommended, the parts of the standard requiring modification will be identified, and the extent of the required revision will be determined.

G. Task 7. Incorporate EPA Comments

The Phase I report will be submitted to EPA for review and comments. RTI will incorporate these comments into the report.

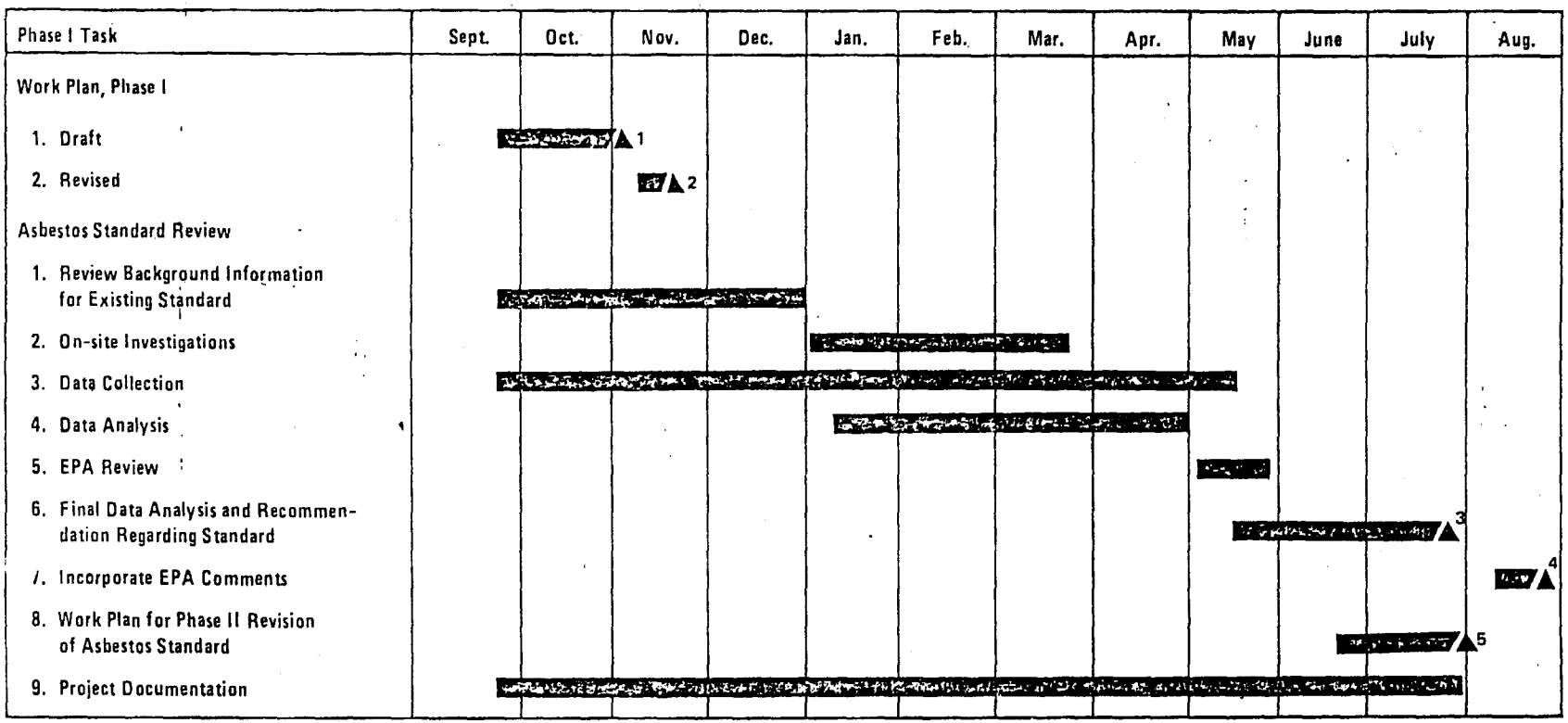
H. Task 8. WorK Plan for Phase II. Revision of the Asbestos Standard

If a revision of the standard is recommended, a work plan for Phase II will be developed. The Phase II Work Plan will detail the approach that RTI will take in revising the standard, including the level of effort required in developing a BID in support of the revision.

I. Task 9. Project Documentation

Throughout the review of the standard, RTI will maintain a project Docket. During development of the existing asbestos standard, a formal docket was not maintained due to the absence of regulations requiring a docket. Therefore, RTI will incorporate all of the available information that was collected during the development of the existing standard, in addition to more recent information, into the Docket for review of the standard. Information collected by RTI and data submitted by EPA will be included in the Docket in accordance with guidelines from the EPA Lead Engineer. Items to be entered into the Docket will be labeled, filed, and indexed identifying items included in the Docket. The index (to be current to within about 3 weeks) will be submitted monthly to the Lead Engineer. A copy will also be sent to Midwest Resarch Institute (MRI), Raleigh, North Carolina, which is currently performing an analysis for EPA on asbestos emissions from the surfacing of roadways. Similarly, MRI will provide RTI with a copy of its asbestos Docket index.

FMSI 07075



Milestones ▲

1. Submit Draft Phase I Work Plan.
2. Submit Revised Phase I Work Plan.
3. Submit Draft Phase I Report.
4. Submit Final Phase I Report.
5. Submit Phase II Work Plan.

Figure 1. Project Task Plan and Milestones for Phase I

FMSI 07076

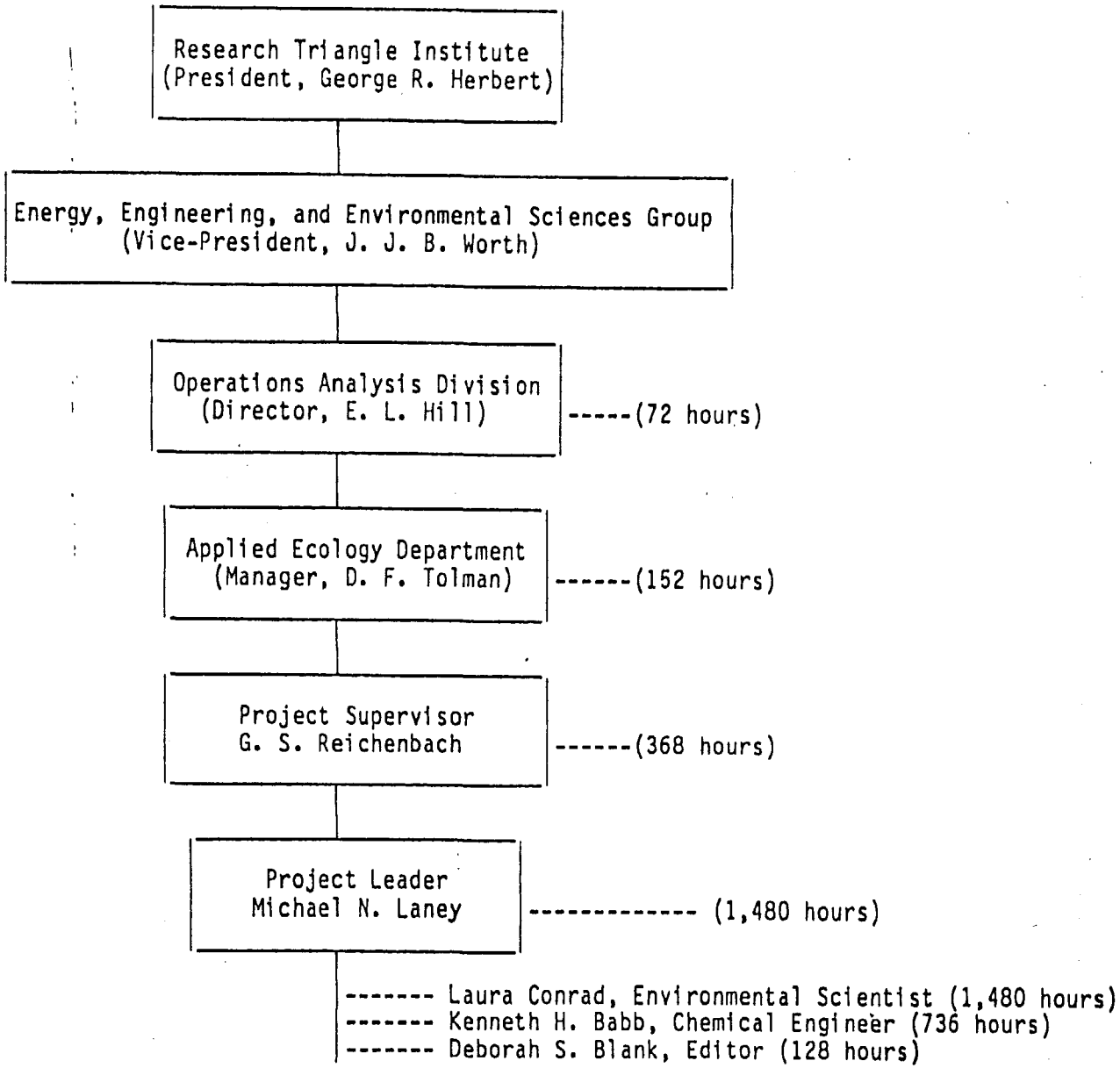


Figure 2. Project Organization Chart for Phase I

TABLE I. Cost/Schedule Baseline Information For Phase I

Contractor Research Triangle Institute — Prepared by Michael N. Laney

Project No. and Title EPA 80/41 Asbestos — Date November 1980

Phase I Tasks	Monthly Resource Allocations (dollars and hours)[a]												Total Budget/ Hours
	9/80	10/80	11/80	12/80	1/81	2/81	3/81	4/81	5/81	6/81	7/81	8/81	
Phase I Work Plan Asbestos Standard Review	$2.1 64	$3.8 115	$2.0 61										$7.9 240
1. Review Background Information for Existing Standard	$6.3 192	$1.3 40	$10.3 312	$5.5 168									$23.5 712
2. On-site Investigations					$9.2 280	$9.2 280	$9.2 280						$27.7 840
3. Data Collection	$1.3 40	$5.5 168	$6.1 184	$6.1 184	$3.4 104	$1.6 48	$1.3 40	$1.3 40	$0.8 24				$27.5 832
4. Data Analysis					$1.8 56	$3.2 96	$6.3 192	$11.1 336					$22.4 680
5. EPA Review									$1.6 48				$1.6 48
6. Final Data Analysis and Recommendation Regarding Standard									$2.6 80	$6.6 200	$4.5 136		$13.7 416
7. Incorporate EPA Comments												$2.9 88	$2.9 88
8. Work Plan for Phase II Revision of Asbestos Standard										$1.8 56	$3.2 96		$5.0 152
9. Project Documentation	$1.3 40	$4.5 136	$1.8 56	$1.1 32	$0.8 24	$0.5 16	$0.5 16	$0.5 16	$0.5 16	$0.5 16	$1.3 40		$13.5 408
TOTAL	$11.1 336	$15.1 459	$20.2 613	$12.7 384	$15.3 464	$14.5 440	$17.4 528	$12.9 392	$5.5 168	$9.0 272	$9.0 272	$2.9 88	$145.7 4,416

.11 costs are reported in thousands of dollars, exclusive of fee, and include support, travel and duplicating costs.
mission tests costs are not included; see Appendix 2.

FMSI 07078

APPENDIX 1

Resumes

KENNETH H. BABB

Education

B.S., Chemical Engineering, North Carolina State University, Raleigh, North Carolina, 1979.

Experience

1979 to date. Research Triangle Institute, Research Triangle Park, North Carolina. Chemical Engineer in the Applied Ecology Department. Member of project team developing National Emission Standards for Hazardous Air Pollutants (NESHAPS) for benzene emissions from maleic anhydride plants. Provides engineering analysis and evaluation of data relating to cost and design. Developing emissions, energy, and cost data for New Source Performance Standards (NSPS) for coating of beverage cans and large apliances. Also worked with team conducting survey on status of continuous emission monitoring and monitors for Environmental Protection Agency, Division of Stationary Source Enforcement.

Summer 1978. National Institute of Environmental Health Sciences, Research Triangle Park, N.C. Laboratory Technician. Maintained crab population for experiments, performed various chemical analyses, evaluated data gathered from analyses, and evaluated and altered experimental procedures.

Professional Memberships

American Institute of Chemical Engineers
Tau Beta Pi

June 1980

FMSI 07080

LAURA A. CONRAD

Education

B.A., Chemistry, State University College of New York, Buffalo, New York, 1973

M.S., Chemistry, State University of New York, Binghamton, New York, 1977

Experience

1980 to date. Research Triangle Institute, Research Triangle Park, North Carolina. Environmental Scientist in the Applied Ecology Department. One current project includes reviewing EPA's National Emission Standards for Hazardous Air Pollutants for Asbestos and determining whether there exists a need to revise the emission limitations of the existing standard. A second project includes the task of preparing an industry profile regarding occupational exposures to waste anesthetic gases and vapors for the Occupational Safety and Health Administration (OSHA).

1978 to 1980. Occupational Safety and Health Administration (OSHA), Washington, D.C. Industrial Hygienist. Managed a high-priority standard development project on grain handling facilities. Concentrated on the health effects associated with exposures to grain dust, pesticides, and toxic contaminants, such as aflatoxin. Prepared and published two Federal Register notices regarding rulemaking proceedings and wrote the initial draft proposal on Occupational Exposures to Hazardous Substances Found in Grain Handling Facilities. Participated both in public hearings presided by an administrative law judge and in informal public meetings presided by an OSHA panel. Conducted field trips to several U.S. grain elevators and mills and represented OSHA at several interregulatory agency and interest group meetings. Also, was a recipient of a cash award for work excellence for the Agency.

1977 to 1978. OSHA, Buffalo, New York. Industrial Hygienist. Enforced the Occupational Safety and Health Act. Conducted over 70 health inspections in various industrial establishments. Sampled for such substances as wood dust, grain dust, mercury, silica, lead, and several different solvents. Attended four formal industrial hygiene and safety courses at the OSHA Institute in Chicago. Attended a Los Alamos/NIOSH Respirator training course.

1975 to 1977. State University of New York, Binghamton. Teaching Assistant. Taught the freshman chemistry laboratory course in addition to chemistry problem-solving classes while attending graduate school.

1973 to 1974. Bishop Timon High School, Buffalo, New York. Chemistry Teacher. Taught general chemistry and music, and performed other assigned supervisory duties.

September 1980

APPENDIX 2

Asbestos Emissions Measurement Program

Appendix 2

Asbestos Emission Measurement Program

To help determine the protection afforded by the current requirement for ". . . no visible emission. . .," information is needed on asbestos emissions from the various sources. Data collected in Task 4. Data Collection will be examined for information on asbestos emissions, including atmospheric levels of asbestos. If data on asbestos emissions are considered to be inadequate, RTI proposes two alternatives for obtaining emission data.

Alternative one consists of utilizing ongoing or proposed EPA research, which includes asbestos sampling in the scope of research work. Specifically, RTI may be able to utilize data that are generated as part of a proposed multiagency (e.g., NIOSH, EPA) - asbestos industry research project, "The Environmental Research Program Plan for Asbestos." The Industrial Environmental Research Laboratory - Cincinnati (IERL-Ci) is responsible for organizing the asbestos research program which will encompass three areas of study, including an industrial survey, fugitive emissions, and use and disposal of commercial projects. The details of the program are being prepared in a proposal by IIT Research Institute. RTI will review the proposal and will determine, in consultation with the Lead Engineer, the feasibility of utilizing the proposed research to obtain the necessary data on asbestos emissions. This will be determined at the earliest feasible time.

If emissions data are not available through the asbestos research program described above, RTI will, as the second alternative, examine the feasibility of developing its own emission measurement program using the procedure given in EPA's Contractor Procedures Manual for Development of National Emission Standards, 3.2.6, Emission Measurement Program. Briefly, this entails the

preparation of a Source Test Plan by RTI to be reviewed by the Emission Measurement Branch (EMB) for technical feasiblity, time needed for method devlopment, resources, and other relevant items. EMB then submits its comments on the adequacy of the Source Test Plan to the Lead Engineer.

Presently there are no EPA reference methods for either emission sampling or atmospheric sampling of asbestos (a method for the sampling and measurement of airborne asbestos has been proposed*). Therefore, any asbestos sampling must be preceded by the development of test methods. This will require the efforts of and cooperation between EMB and the Office of Research and Development.

A limited number of emission tests will be performed in Phase I, the purpose being support for the feasibility assessment of emission testing as well as the establishment of a numerical emission limitation. RTI, in consultation with the Lead Engineer, will select three or four sites for testing.

Because emission testing by RTI is one alternative for obtaining emission data and may not be required, the additional costs of emission testing are estimated here and are not included in the costs in Table I. The costs shown here represent the cost of developing a Source Test Plan, the cost of arranging for the source tests, the cost of pretest survey trips, and the cost of trips to test sites for observation of emission sampling. Furthermore, the inclusion of emission testing in Phase I will likely require an extension of the Phase I schedule due to the time necessary to prepare a Source Test Plan, arrange and make pretest site surveys, sample (estimated at one week minimum

* Electron Microscope Measurement of Airborne Asbestos Concentrations: A Provisional Methodology Manual, EPA-600-2-77-178, Revised June 1978.

per site), and analyze emissions. It is probable that emission testing would not begin until after completion of the initial on-site investigations, which are tentatively scheduled to end in March.

It is estimated that for emission testing at four sites, a minimum of 8 man-weeks will be required to prepare a Source Test Plan, arrange for and participate in each pretest survey, and arrange for and observe the actual sampling. Thus, the estimated hours and minimum cost for emission testing are as follows:

Man-Weeks	Man-Hours	Estimated Cost
8	320	$10,560