



**Working Guidelines and
Procedures for Preparation
of
ORD Scientific and
Technical Assessment Reports (STAR)**



**Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460**

WORKING GUIDELINES AND PROCEDURES
FOR
PREPARATION OF ORD
SCIENTIFIC AND TECHNICAL ASSESSMENT REPORTS
(STAR)

OFFICE OF PROGRAM INTEGRATION
OFFICE OF RESEARCH AND DEVELOPMENT
ENVIRONMENTAL PROTECTION AGENCY

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1. INTRODUCTION AND OBJECTIVES

The assessment of known available data on major pollutants of concern to EPA is one of the major functions of the Office of Research and Development. Whether the data are generated by EPA through in-house efforts or through grants or contracts, or by other research institutions, ORD has a responsibility, as the Agency's technical arm, for assessing the information available to determine its validity and significance. The purpose of Scientific and Technical Assessment Reports (STAR) is to assist the Agency in complying with the statutory directives for which it is responsible, in accordance with the Assistant Administrator's memorandum of August 15, 1974 (see Appendix A). This is a two-fold requirement on the part of ORD, which involves the close interaction between our professional staff and: 1) the Program Offices in developing various standards, guidelines, regulations, and technical reports, and 2) the Office of General Counsel in defending, as a result of possible litigation, those same standards, guidelines, regulations and technical reports. The importance of the Reports, therefore, cannot be overestimated.

Although the key characteristics desired for STAR are explained in Appendix A, it may be useful to briefly summarize them here:

- o Assessment, not just summarization of knowledge on each pollutant.
- o Multi-media, not single media in scope.
- o Multi-disciplinary.
- o Objective assessment without recommendations.
- o Dose-response relationships, not effects thresholds.
- o Careful internal and external review.

The objectives of these Working Guidelines and Procedures are to establish a uniform set of procedures and a standardized outline, to the extent practical, for the preparation of ORD STAR. These guidelines and procedures supercede all previous ones and with the exceptions noted in the next paragraph will be used in the preparation of ORD assessment-type documents.

It is recognized that there are likely to be many cases where special circumstances will make the standardized outline impractical and where it will create more difficulties than it will resolve. In those cases where it

is possible to anticipate this, special detailed outlines will be prepared. This is likely to be the case when specific legislative requirements must be met (as in the case of criteria documents) or when the documents report on terminated research. In still other circumstances, the inappropriateness of the outline will become evident only during the actual preparation of a section of a document. In that case those responsible for the section should proceed with a more useful structure of their section and notify the OPI Coordinator if the change is sufficiently major so as to make the revised section incompatible with sections being prepared by other laboratories. It is hoped that in this way the outline will prove to be more of a guide, and hopefully an aid, to those preparing assessment documents rather than a set of restrictions on their activities.

In writing STAR, it is important to keep the English as simple and straightforward as possible consistent with maintaining the precision necessary. Professional jargon should be avoided whenever possible. Where possible, the English should be understandable to a decision maker in a program office who may not have technical training in the particular specialized field being discussed.

Suggestions for revision and changes in these guidelines and procedures will always be gratefully received by OPI and should be addressed to John Buckley (202-755-2611) or Alan Carlin (202-755-0650).

2. PROCEDURES

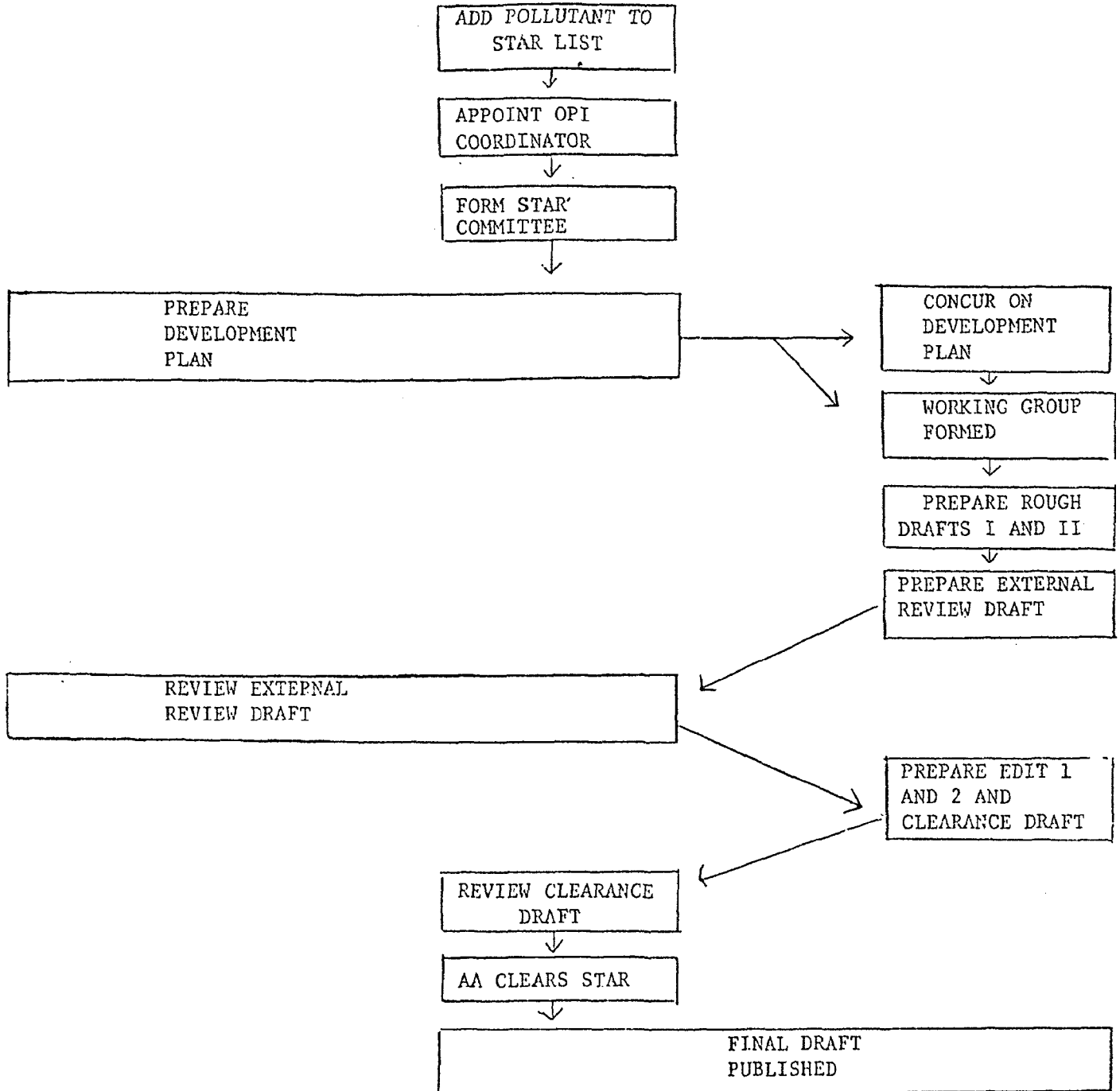
The procedures to be used in the preparation of STAR will be briefly summarized in this section. More detailed discussions of various aspects of the process can be found in Appendixes B, C, and D. Figure 2.1 provides a diagrammatic representation of the process as it will normally occur.

STAR LIST

As outlined in the Assistant Administrator's memorandum of August 15, 1974 (see Appendix A), OPI will prepare a periodically updated list of pollutants for which assessment documents are to be prepared, the dates by which they are to be issued after appropriate consultation with other ORD and Agency components, and OPI Coordinators who will have lead responsibility for coordinating the preparation of the document for OPI. This list will be made up on the basis of periodically solicited inputs from and discussions with interested program offices and DAAs. In addition, there will be an obvious need for coordination between these lists and ORD program plans. Every effort will be made to coordinate the list with the concerned program area managers so that there are no conflicts between the EROSS and the

Figure 2.1

STAR PREPARATION PROCESS



OTHER EPA
OFFICES
(INCLUDING
SAB)

ORD HEADQUARTERS

ORD FIELD

most recent STAR list. Any conflicts that cannot be otherwise resolved should be presented to the Assistant Administrator for resolution.

PREPARATION OF DEVELOPMENT PLANS BY STAR COMMITTEE

For each pollutant on these lists, the OPI Coordinator will request each DAA (and WERC Director, where appropriate) to appoint one staff member to a STAR Committee. He may also add additional members to the Committee, as from interested program offices. The Committee will be responsible for recommending a development plan for each proposed assessment document and will be chaired by the OPI Coordinator. He will prepare or arrange for the preparation of a draft development plan in time for the STAR Committee's first meeting using the format provided in Appendix B to the extent possible. The draft plan will detail the document development deadlines necessary to achieve the deadline for document issuance, the detailed outline of the document if different than the general guidelines contained in this document, and proposed contributors to be responsible for the development of each module or sub-module. When agreement is reached in the STAR Committee on this development plan, the OPI Coordinator will circulate the revised draft development plan to all relevant ORD DAAs and

NERC/WERC Directors as well as interested program offices for detailed comment. Formal concurrence will also be requested from the relevant ORD DAAs and NERC/WERC Directors who will be contributing resources to the development of the STAR. Copies will also be sent for comment to the Directors of those Laboratories named. Upon further revision and the resolution of any remaining issues by the Assistant Administrator, the development plan will be issued in final form by the Deputy Assistant Administrator for Program Integration. If as a result of subsequent information it becomes evident that revisions are required in the development plan, these will also be made by the OPI Coordinator with appropriate notification of and agreement by those concerned.

The development plan will usually designate one ORD organizational entity as the primary office responsible for the development and integration of each module and one individual in that office as the staff member primarily responsible. The plan may also designate one field laboratory as responsible for the development of each submodule identified, and name one individual in that laboratory as having primary responsibility. In many cases, the plan will designate additional contributors or sources

for various modules and sub-modules. The plan will establish milestones for receipt of various drafts by each organization and for the production of complete and revised drafts, and for editing by a designated report assembly organization.

WORKING GROUP

Those individuals from each laboratory or headquarters office named in the development plan as having primary responsibility for a module or sub-module will be members of a Working Group for that document. The Development Plan will also designate a Working Group Chairperson, often from the report assembly organization. The OPI Coordinator will usually serve as an ex-officio member who should receive copies of STAR drafts circulated to the Working Group and be informed of only planned Working Group meetings, but may be assigned additional duties by the Development Plan. The Chairperson may wish to call one or more meetings of the Group to insure better cooperation and coordination, and to appoint one or more additional members of the Working Group from the program offices most concerned.

REPORT REVIEW

Provided that the deadlines are met, any laboratory or Headquarters office responsible for developing a module or sub-module may seek outside (of ORD) review of its draft module or sub-module provided that the draft is clearly labeled as a preliminary draft that does not necessarily represent ORD or EPA views and that a copy of the external review is forwarded to the report assembly organization and the OPI Coordinator as soon as possible after receipt in ORD. Upon receipt and preliminary in-house review of all modules and the addition of suitable introductory material, the report assembly organization will prepare complete drafts in accordance with the detailed procedures outlined in Appendix C and the editorial guidelines and special instructions in Appendix D. As detailed there, after review by the individual responsible for the preparation of the modules and sub-modules in each office and laboratory and by the OPI Coordinator review copies will be sent by the report assembly organization or OPI to:

- o A list of external reviewers designated by the Science Advisory Board,
- o Program offices involved,
- o ORD personnel not involved in the preparation of the

draft who have special knowledge of the subjects discussed,

- o Relevant headquarters personnel, and
- o Other individuals deemed desirable.

Each organizational component involved in module or sub-module development is encouraged to send names and addresses for these lists with their completed draft to the report assembly organization or the OPI Coordinator, if appropriate.

FINAL EDITING, ISSUANCE, AND PUBLICATION

Upon the completion of the review process and subsequent draft revision, the report assembly office will arrange for the editing of the document and submit it to the OPI Coordinator. He will promptly send copies to all relevant DAAs and STAR Committee members. If he receives no adverse reaction in two weeks, he will recommend issuance to the Deputy Assistant Administrator for Program Integration, who will in turn review it and may recommend clearance by the Assistant Administrator for Research and Development. Upon such clearance, OPI, with the help of the report assembly

organization, will arrange for whatever publication and distribution may be appropriate.

3. STANDARDIZED REPORT OUTLINE

As discussed in the introduction, the standardized report outline to be presented in this section is intended to be more a guide and an aid to those preparing Assessment Reports than a set of restrictions on their activities. The outline has been annotated in an attempt to indicate the type of information or questions which should be considered in preparing each module. Additional sub-headings may be used as appropriate. The titles of each textual section and subsection are listed in Table 3.1 for easy reference.

DOCUMENT OUTLINE

ABSTRACT

Required by EPA regulations. 200 words or less. Will be prepared by the report assembly organization.

PREFACE

The preface should state the objective of the document and acknowledge contributions by the principal authors. It

should also explain why the report has been prepared and the relation of the document to other similar documents. The preface should be brief and prepared by the report assembly organization.

TABLE OF CONTENTS

Will be prepared by the report assembly organization and carry the heading CONTENTS. First order headings should be listed in upper case; second order headings should be listed using upper and lower case style with the first letter of the first word capitalized. Third order headings (also in upper and lower case style) may be included if done uniformly throughout the report and if they are numbered in the report. Section and subsection numbers should precede the title. The first line of all titles should have a uniform indentation from the left margin. Extra space should be left between sections.

LIST OF FIGURES

Should list all figures that appear in the report by figure number, title, and page number. The title should be in upper and lower case style, with the first letter capitalized. The first line of all titles should have a uniform indentation from the left margin. Will be prepared by report assembly organization.

LIST OF TABLES

Should list all tables that appear in the report by table number, title, and page number. The title should be upper and lower case style, with the first letter capitalized. The first line of all titles should have a uniform indentation from the left margin. Will be prepared by report assembly organization.

LIST OF ABBREVIATIONS AND SYMBOLS

Will be prepared by report assembly organization. All abbreviations used in the text should be listed

alphabetically and the full word(s) listed to the right using a uniform indentation.

LIST OF CHEMICAL FORMULAS

Will be prepared by report assembly organization. All chemical formulas mentioned in the text should be listed alphabetically with their full name listed to the right using a uniform indentation.

1. SUMMARY AND CONCLUSIONS

Each primary, module development organization will prepare a separate sub-section on summary and conclusions to the specific module of the outline for which it is responsible. The report assembly organization will use these contributions in preparing this section.

1.1 SUMMARY

An executive summary in which the most important points, from the standpoint of decision-making, included in each major section are presented in concise and simple language. The summary should contain no information which is not supported in the rest of the document.

1.2 CONCLUSIONS

The conclusions should concisely assess the degree of knowledge of various aspects of the problems posed by the pollutant, what critical data gaps may exist, the extent of the problem posed by the pollutant, and the range of possibilities available for doing something about it. There would be nothing in the conclusions that is not clearly based on data in the report. Although significant gaps in knowledge should be noted, no recommendations should be made as to whether future research should be carried out to fill them. There should also be no recommendations as to what action, if any, the Agency should take with respect to the pollutant.

2. POLLUTANT CHARACTERIZATION

2.1 CHEMICAL AND PHYSICAL PROPERTIES

A discussion of the chemical and physical properties of the pollutant to be discussed in the report that may be significant with regard to uses, sampling and analysis, transport and transformation, effects, and control technology. This section should discuss why these properties are important. Include the basic chemical formulae in the case of compounds as well as a diagram of compound structure. Emphasize compounds which may be of concern, whether or not they exist naturally in the environment, their associations, stability, solubility, etc.

2.2 MEASUREMENT TECHNIQUES

This sub-section should discuss two questions: can the pollutant be measured and how well? These questions should be addressed with respect to ambient levels in air, water, and land materials (soil, sediments, etc.), and concentrations in food receptors such as plants, animals, and man, in food consumed by animals and man, and in

effluent emissions from pollution sources. In each case, these two questions should be answered in terms of assessing the techniques available for sampling and the preparation and analysis of samples for the more promising techniques. Shortcomings of each technique should be discussed. It is also appropriate to assess the availability of instruments and of standard reference materials for instrument calibration and to assess the quality assurance status of the method described. Additionally, for the methods described, it is appropriate to indicate the working range and recommended technique, and equivalent techniques if no standard reference technique has been established. Particular attention should be paid to the relationship of what is measured by the analytical method to the form the pollutant takes in the various media and on those techniques used to obtain data presented in other modules of the same document. Where possible, quantitative values for precision, accuracy, etc., should be stated. Interference should be discussed specifically, as well as other problems related to obtaining reliable data. Discussion of procedures should not be repeated; simply reference previous paragraphs.

3. ENVIRONMENTAL OCCURRENCE AND TRANSPORT

Where possible it would be useful to include somewhere in this section a figure that conveys an idea as to the total cycle that the pollutant goes through from source to receptor including approximate ranges of concentrations in each medium and the exchange rates and mechanisms between media and sub-media, where important.

3.1 CONCENTRATIONS

An assessment of available data on observed concentrations in air, water, land materials, plants, animals, man, and food for animals and man should be presented. Characteristic patterns in space and time for both short- and long-term changes should be emphasized. Dates of data collection should be included, as well as confidence limits (quantitative or subjective), measurement methods, and averaging times. Significant gaps in the data and changes in measurement methods during the period of record should be noted. If the term "trace" is used it should be defined.

3.2 TRANSFORMATION AND TRANSPORT MECHANISMS

This sub-section should assess the state of knowledge of chemical, physical, and biological processes in both natural and man-made (such as those arising from disposal and recycling) systems including removal mechanisms and rates when known, transport within and between media, residence times, etc., in air, water (including running, standing, ground marine and estuarine), and soil environments. Knowledge of mechanisms that influence visibility and climate should be assessed. The biological discussion should include food chain transfer as well as biological magnification. To the extent possible, this section should be concerned with the total environmental cycle and the principal mechanisms that have an impact upon environmental loading, as well as the extent to which environmental observations confirm the implications of process information. Knowledge of the following biological processes in fresh surface and marine waters should be assessed where relevant: degradation by algae, bacteria, fungi, and other heterotrophic populations; microbial transformation (product formation); effects on growth; and incorporation and storage (bioaccumulation). In the case of biological processes in groundwater, degradation as a result of interaction with soil microorganisms and transformation

should be assessed. The following chemical processes should be discussed in surface waters: fast (equilibrium conditions) and slow (kinetics) reactions and transformations for both chemical and photochemical processes. The following physical processes should be assessed in the case of fresh surface waters: mass transport and dispersion, adsorption, sedimentation, solution, diffusion, and exchange (substrate-water-air-water). The same physical processes should be assessed in the case of marine environments except for the addition of density (salinity) gradients and currents. In the case of physical processes in groundwaters, infiltration and retention rates should be assessed. Chemical processes in air and on surfaces (such as photo-degradation) should be discussed. If relevant, assess the role that other pollutants may have in the transformation of the subject pollutant in the various media in which they come together.

4. ENVIRONMENTAL EXPOSURE AND UNDESIRABLE EFFECTS

Although this section is organized in such a way that each species or group of species would have to be discussed under four different headings, each STAR Committee should carefully consider whether it may prove more efficient and understandable to subdivide this section by groups of species, such as plants, animals, and man or non-human and human, and then to discuss consecutively each of the four subjects of the subsections shown below for each group. If this is done, non-human groups should, in general, be discussed prior to man, the ultimate receptor.

4.1 MECHANISMS OF EXPOSURE

This section is concerned with assessing the mechanisms operating at anatomical and physiological interfaces. The discussion of animals should include respiratory, body surface, and digestive tract routes. Plants should include epidermal, root, and stomatal systems. Materials should include mechanisms relating to undesirable effects, such as corrosion. Mechanisms may be chemical, physical, or biological.

4.2 MECHANISMS OF RESPONSE

In this sub-section, consider the receptor's normal handling of the constituent being reviewed. Include uptake, distribution, metabolism, and excretion. Include information on retention sites and times and on response to various retention levels. Background information necessary to make judgments concerning potential problems should be included along with nutritional requirements if applicable.

4.3 UNDESIRABLE EFFECTS

Identify and describe undesirable effects of the pollutant involved on plants, animals, materials, man, weather and climate, visibility in air, land materials, and water use (including aesthetic uses). Effects on ecosystems as well as effects on individuals and populations should be included when appropriate. This discussion should be structured in such a way that these undesirable effects can be scaled against the level of environmental contamination. In the case of the effects on plants, animals, materials, and man, the discussion should include the results of both laboratory and field studies. Detailed treatment of individual experiments or studies is not necessary; results should be

emphasized. Information regarding experimental design should be included if appropriate. A discussion of reversibility or irreversibility should specifically be included. Synergistic effects of the pollutant, if any, with other pollutants commonly found with it should be assessed. The discussion should include proved, suspected, and possible effects, but clearly distinguish among them. The major gaps and uncertainties in our ability to predict or measure the effects should be assessed.

4.4 ENVIRONMENTAL EXPOSURE

The purpose of the sub-section is to assess the possible exposure levels (i.e., the accessibility of the pollutant and the combined exposure) of various receptors and the probability that the receptors will actually be subjected to these levels. These exposures may come through a number of routes, all of which should be discussed where relevant. These routes include air, water, food (in the case of man and animals), land materials, occupational activities (in man) and special routes (man) such as smoking, cosmetics, and pharmaceuticals.

The assessment of receptor risks might be treated analogously to a time and motion concept, that is, by considering the buildup of body burden or effect from various environmental (and other) exposures and what proportion is presented by each exposure. Include population density aspect, location of source, receptor location and activities, and chance of contact.

If possible, the exposure estimates presented, summarized, or cited in this subsection should be sufficiently quantitative so as to make it possible to calculate the benefit estimates in Section 6.1. If insufficient data exist to present such calculations, then a qualitative estimate should be prepared. Exposure estimates should be determined for a range of potential control levels, ideally, the same ones considered in Section 5.2, and including the case of no further control. In some cases, it may be more convenient to put this discussion at the beginning of Section 6.

5. SOURCES AND CONTROLLABILITY

5.1 SOURCES

This sub-section should include a discussion of both current and projected sources of the pollutant from both natural and man-made sources. In the case of natural sources, the section should discuss what they are, how they are distributed geographically, and what their expected contribution is to the total emissions and to the ambient level. In the case of man-made sources, include in addition production, uses, and emission factors and distinguish between stationary and mobile sources. If available, process material balance studies should be cited. At this point in our discussion, we should be concerned with quantitative estimates of the man-made contribution to ambient levels of the pollutant in air, water, biological, and land materials. The discussion should include the processing of raw materials as a source of the pollutant. In discussing the current and projected sources of the pollutant, the impact of existing and planned reductions resulting from current environmental regulations should be identified.

5.2 CONTROL TECHNOLOGY AND CONTROLLABILITY

For each major source listed in Section 5.1 assess the potential for control by all methods; if it can be controlled, assess the availability and effectiveness of technology and/or administrative measures available to do so, the cost of achieving a range of reduced ambient levels, such as those considered in Section 4.4, their applicability, and whether their use generates other pollution problems in the same media. Distinguish between control measures already in use as a result of existing environmental regulations, those planned or expected to be used, and untried and unplanned measures.

5.3 UNDESIRABLE INTERMEDIA EFFECTS OF PRINCIPAL CONTROL MEASURES

Some or all of the control measures discussed in Section 5.2 may create other pollution problems in the same or other media. The existence, extent, and possible solutions to such problems should be discussed for a range of control alternatives.

6. OVERVIEW, BENEFITS, AND INSTITUTIONAL PROBLEMS OF CONTROL

6.1 ECONOMIC BENEFITS FROM CONTROL

To the extent possible, this sub-section should describe the total benefits to the nation, various regions, and income groups from a variety of potential control levels, in that order of importance. This information should be quantitative and expressed in dollars to the extent warranted by the reliability of the data, although quantitative statements expressed in other units (e.g., deaths avoided, hospital days not required, etc.) or even qualitative statements should be made if sufficiently reliable data are not available. Emphasis should be placed on national economic benefits over a range of potential control levels, such as those considered in Sections 4.4 and 5.2, and including the case of complete control.

6.2 SOCIETAL/INSTITUTIONAL CONSTRAINTS ON CONTROL

The intent of this section is to assess the major institutional and societal constraints on the implementation of the potential control measures discussed in Section 5 in order to reach the control levels discussed in Section 6.1.

Since the relative difficulty of applying various control measures should be discussed in Section 6.3, this sub-section should be devoted to an analysis of any difficulties likely to be encountered in implementing each of the various control measures discussed in Section 5. For each administrative or physical control measure described there, the analysis should ascertain whether there exists any Federal legislative authority for carrying out the measure, what the major difficulties of so doing would be, and whether there would be any other (non-legislative) implementation problems of carrying out the measure including administrative problems given current EPA, state, and local policies.

6.3 OVERVIEW

This sub-section should provide an overview assessment of how serious the health, ecological, and materials damage threats posed by the pollutant are and how serious the technological, economic, and institutional/societal problems of control may be. The discussion of how serious the problem is should include both the current situation and projections to the year 2000 if possible. The institutional discussion, unlike that in Section 6.2, should describe the

relative difficulty of a range of reasonable control measures, including that of the lowest cost measure. In making this overview assessment, particular attention should be given to the quality and certainty of key information and its relevance to regulatory decisions that the Agency may face.



APPENDIX A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, D.C. 20460

AUG 15 1974

OFFICE OF
RESEARCH AND DEVELOPMENT

SUBJECT: Scientific and Technical Assessment Documents

FROM: Acting Assistant Administrator for Research and Development
(RD-672)

TO: See Below

Introduction

This memorandum addresses the preparation and issuance by this Office of assessments of existing data and information to assist other components of the Agency in regulatory or standard setting activities. Although provision of such information is perhaps the most fundamental responsibility of ORD, confusion and misunderstanding about the development and issuance of summary assessment documents (which I will call Scientific and Technical Assessment Documents) has resulted in delays in review and clearance by this Office. It has also become increasingly evident that there is a need for a series of documents on major pollutants that will summarize for easy reference by the program offices, the Administrator, and others both inside and outside the Agency such available information. I hope by this memorandum to clarify the appropriate objectives and content of such documents, the means by which the need for such materials can be identified and the roles of the various organizational components of this Office in developing these documents.

Overall Objectives

Broadly, the objectives of such documents should be to provide a scientific basis for proposed/anticipated Agency actions, or an assessment of the state of knowledge of a major area of completed study that we do not currently plan to pursue further at this time. The material presented should cover all aspects of organized knowledge that will be helpful in regulatory decision-making regarding a specific pollutant or class of pollutants. This coverage should include an objective assessment of existing knowledge pointing out the extent to which it is definitive, the validity of the data on which it is based, and further identifying uncertainties and gaps that may exist. Most such documents should be multi-media in scope, focusing on single media only to the extent warranted

by the distribution of environmental insult. Documents of this type should avoid advocacy and present all sides of unresolved scientific issues. They should be objective in nature so as not to take positions on issues currently facing the Agency or otherwise foreclose regulatory options. Recommendations as to the need for future research programs should be avoided. Further, they should avoid any assessment of current Agency policies in the light of information presented. The documents should not, however, be purely expository in nature as would be project reports. They should have an element of assessment so that, when published, they can be said to represent the considered position of the scientific and technical arm of the Agency regarding organized knowledge bearing on a given subject. Finally, they should report available effects information either in the form of a dose-effect function or where this is not possible provide as much information as exists to help the user estimate what the relationship is.

Content

The format of these documents should be modular in character, containing either all or some subset of a group of generic topics on which ORD plays the central advisory role for the Agency. Ordinarily these documents will contain all of the modules listed below; however, in special situations as, for example, when the document assesses an area of research being terminated or when the document is being prepared to meet a specific legislative requirement with a smaller scope, such as those prepared pursuant to Sec. 108 of the Clean Air Act, fewer modules may be needed. I would suggest that the set of modules should include the following:

- o A discussion of pollutant characterization that would cover how the pollutant is measured in various media, capabilities of different measuring techniques, forms which the pollutant may take, etc.
- o A discussion of environmental occurrence that should cover known information on the presence of the pollutant in various media and should address the movement and chemical transformation of the pollutant in all media and defining, to the extent possible, routes of exposure to receptors.
- o A discussion of the ecological, materials, and health effects associated with the pollutant, after it leaves the media and enters the receptor structured in such a way that these effects can be scaled against the level of environmental contamination.
- o A discussion of current and projected sources of the pollutant, available control technologies, their costs and applicability, and the general controllability of the pollutant.

- o Finally, an overview/environmental appraisal that would consider societal/economic factors associated with the pollutant, including available information on the benefits of and known institutional constraints on control.

Origination, Preparation and Clearance

The need for these documents may be identified either from within ORD or elsewhere in the Agency. We have already received numerous requests for materials of this type from several of the program offices. Similarly, both the DAAs and the NERC/WERC Directors are in positions to be sensitive to needs for specific background documents.

In order to bring into being this scientific background series, I feel it is essential to be able to look across all ORD Program Areas in order to put the contribution of each in proper perspective. Further, it is crucial that ORD coordinate these outputs with the potential users, particularly in the program offices. For those reasons, I am assigning overall responsibility for the appropriate development and clearance of such documents to the Office of Program Integration. Specifically, it will be their responsibility in close cooperation with DAAs, NERCs, and program offices to:


- o Prepare and periodically update a list of major pollutants for which documents are to be prepared, and the dates by which they are to be issued,
- o Develop detailed substantive and editorial guidelines for the development of such documents,
- o Prepare and obtain the concurrence of relevant DAAs and WERC/NERC Directors on a detailed plan for the development of each document that: specifies the modules required, identifies responsible contributors, and specifies the date for the completion of each major task,
- o Follow the preparation of each module in enough detail to anticipate delays or major problems so that the necessity of remedial action can be brought to the attention of the relevant DAA or NERC Director or the schedule adjusted,
- o Arrange for appropriate internal and external review of the full documents, and

- o Arrange for editing of the final document to ensure necessary uniformity of style and consistency of content, and prepare any additional overview section that may be useful.

I should like to emphasize that it is not my intent that OPI should prepare any major portion of the material in each document or alter the scientific content thereof except as necessary to obtain uniformity of style and maintain consistency with overall ORD policy with regard to such materials, as stated earlier in this memorandum.

Implementation of New Procedures

The Office of Program Integration should proceed as rapidly as possible to implement the new procedures outlined in this memorandum. In order not to delay assessments now under development, however, existing plans, deadlines, procedures and organizational relationships will continue in effect until changed by follow-up memoranda from the Deputy Assistant Administrator for Program Integration except that an information copy of all such assessment documents not yet cleared by me, and regardless of whether fragmentary or comprehensive in nature, will be sent to the Deputy Assistant Administrator for Program Integration prior to any review external to ORD of the full document (or in the case of those already under external review, immediately) by the person coordinating such review. The Deputy Assistant Administrator will also approve the completed package after the review and prior to clearance by me. He will at that time edit the documents now being prepared to conform to the overall objectives section of this memorandum to the extent possible without causing major delays. Obviously, independent action by those now responsible for the development of such documents to make them better conform with this memorandum will speed the review process.



A. C. Trakowski

Addressees:

Acting Deputy Assistant Administrator for Program Integration (RD-675)
Acting Deputy Assistant Administrator for Environmental Engineering (RD-676)
Deputy Assistant Administrator for Environmental Sciences (RD-682)
Deputy Assistant Administrator for Monitoring Systems (RD-685)
Director, Office of Program Management (RD-674)
Director, Washington Environmental Research Center (RD-690)

Director, National Environmental Research Center, Cincinnati
Director, National Environmental Research Center, Corvallis
Director, National Environmental Research Center, RTP
Director, National Environmental Research Center, Las Vegas
Director, Control Systems Laboratory, RTP
Director, Chemistry and Physics Laboratory, RTP
Director, Meteorology Laboratory, RTP
Director, Quality Assurance and Environmental Monitoring Laboratory, RTP
Director, Pesticides and Toxic Substances Effects Laboratory, RTP
Director, Experimental Biology Laboratory, RTP
Director, Special Studies Staff, RTP
Director, Human Studies Laboratory, RTP
Director, National Marine Water Quality Laboratory, Corvallis
Director, National Water Quality Laboratory, Corvallis
Director, Arctic Environmental Research Laboratory, Corvallis
Director, Pacific Northwest Environmental Research Laboratory, Corvallis
Director, Grosse Ile Laboratory, Corvallis
Director, Robert S. Kerr Environmental Research Laboratory, Corvallis
Director, Gulf Breeze Environmental Research Laboratory, Corvallis
Director, Southeast Environmental Research Laboratory, Corvallis
Director, National Ecological Research Laboratory, Corvallis
Director, Advanced Waste Treatment Research Laboratory, Cincinnati
Director, Environmental Toxicology Research Laboratory, Cincinnati
Director, Industrial Waste Treatment Research Laboratory, Cincinnati
Director, Methods Development and Quality Assurance Research Laboratory,
Cincinnati
Director, Solid and Hazardous Waste Research Laboratory, Cincinnati
Director, Water Supply Research Laboratory, Cincinnati
Director, Monitoring Operations Laboratory, Las Vegas
Director, Monitoring Systems Research and Development Laboratory, Las Vegas
Director, Technical Support Laboratory, Las Vegas

APPENDIX B

STAR DEVELOPMENT PLANS AND THEIR PREPARATION

This Appendix contains a format for STAR Development Plans together with notes on most items. These notes follow:

1. Pollutant on which STAR is to be prepared. Be precise yet brief.
2. Reasons for producing STAR and use that will made of it.
 - 2.1 Reasons why ORD regards the STAR as high priority.
 - 2.2 User(s): Principal expected EPA using office(s) -- detail to at least DAA level.
 - 2.3 Use(s): Principal expected EPA using office(s) -- detail to at least DAA level.
3. Milestones: Include month and year for all significant milestones, including both those already achieved (show actual date) and those not yet reached (show current best estimate).
 - 3.2 Target date for approval by all relevant DAAs, WERC, NERCs, and requesting offices outside ORD.
 - 3.3 Besides date, specify nature of input.
 - 3.4 Besides date, specify nature of input.
4. Outline: Specify precisely what document outline is now planned to be used if other than that in Section 3 of these guidelines. (Example: Special Studies Staff outline, sections 1 through 12). Attach copy if OPI does not already have one.
5. Section development plan: Sections refer to any specified by item 4 or in attached outline. If individual not known, specify organization if possible. Indicate whether preparer believes informal approval has been obtained from all responsible ORD officials that individual/organization shown has agreed to prepare section.
7. Report assembly organization: ORD organization respon-

sible for assembling Rough Draft and subsequent STAR drafts.

9. Concurrences required: Check those ORD organizations whose concurrence is required pursuant to Section 2 of the Working Guidelines and Procedures.
10. Prepared by: Name of individual primarily responsible for preparing this development plan. Telephone number would be helpful.
11. Date prepared: Date on which preparer finished the plan.
12. Date approved by STAF Committee: To be filled in when this actually occurs.
13. Date all concurrences obtained: To be filled in when concurrences have been obtained from the Directors/DAAs of all organizations indicated in item 9.
14. Other comments: List any respect not indicated elsewhere in the plan in which this STAR or the preparation of it will differ from the OPI working guidelines and Procedures for Preparation of ORD STARS.

STAR DEVELOPMENT PLAN

1. Pollutant:
- 2.1 Reasons:
- 2.2 User(s):
- 2.3 Use(s):
3. Milestones: See separate page.
4. Outline:
5. Section development plan: See separate page.
6. OPI Coordinator:
7. Report assembly organization:
8. Working Group Chairperson:
9. Concurrences required: OPI ___ OEE ___ OES ___ OMS ___
WERC ___ NERC-Cin ___ NERC-Cor ___ NERC-RTP ___
NERC-LV ___
10. Prepared by:
11. Date prepared:
12. Date approved by STAR Committee:
13. Date all concurrences obtained:
14. Other comments:

3. MILESTONES

- 3.1 Request (if any) first received from program office:
- 3.2 Development plan approved:
- 3.3 Major required input (specify) received other than contractor report:
- 3.4 Contract signed to develop inputs (specify) for report:
- 3.5 Final contractor report received:
- 3.6 All EPA drafts received by report assembly organization:
- 3.7 Rough Draft 1 sent to Working Group:
- 3.8 External Review Draft available:
- 3.9 Edit 2 sent to Working Group:
- 3.10 Clearance draft sent to Office of Program Integration:
- 3.11 Clearance draft approved by AA for Research and Development:
- 3.12 Final draft published:

5. SECTION DEVELOPMENT PLAN

<u>To be Prepared by</u>					
<u>Sec-</u>	<u>Organi-</u>	<u>Indivi-</u>	<u>Informal</u>	<u>Due</u>	
<u>tion</u>	<u>zation</u>	<u>dual</u>	<u>Approval</u>	<u>Date</u>	<u>Comments</u>

APPENDIX C

PROCEDURES FOR DEVELOPMENT AND SUCCESSION OF DRAFTS

Since numerous assessment documents are being prepared, it is useful to formalize the procedures for handling the drafts as they progress to the final document. This will assist in identifying the most up-to-date draft, the purpose of each draft, and the availability of drafts for circulation.

GENERAL REQUIREMENTS

Each laboratory should ensure that each author's submission is identified as to document, date submitted, and author. These submissions should, if possible, be made using the Word/One System of Bowne Time Sharing, Inc. If not available, IBM magnetic cards or hard copy should be submitted to the report assembly organization, in that order of preference.

Special care should be taken by typists to ensure that numbers and symbols are accurately typed from one draft to another. Errors in these are hardest to catch.

One copy of each draft should be filed for office reference purposes and kept for 6 months after the document is published.

DRAFT SEQUENCE AND DESIGNATION

Experience has indicated that a sequence of drafts, as described below, is necessary. In individual cases, additional drafts at one stage or another might be required. Where action by an individual is indicated in the draft sequence below, this indicates responsibility of that person for the action being carried out but does not mean that the duty may not be delegated.

Rough Drafts

The report assembly organization should assemble a rough draft document from the module submissions using the standard outline. This will be identified as ROUGH DRAFT 1.

Rough Draft 1 will be sent to the Working Group for review, which may meet as a group to discuss the draft and propose

revisions. New writing and/or rewriting assignments may be necessary. When comments and new material are incorporated into a new draft, this will be identified as ROUGH DRAFT 2. This draft may be omitted at the discretion of the Working Group Chairman if there are only minor changes suggested in Rough Draft 1 provided that the pre-editing described in the next paragraph is carried out on Rough Draft 1.

Rough Draft 2 will be submitted to the Working Group for comment and revision. The report assembly organization may address specific questions to section authors where clarification or further information is required. While Rough Draft 2 is being reviewed by the Working Group, it should undergo a rough editing process to make certain that the next draft will be reasonably comprehensible. This pre-editing should ensure that at least the meaning of the text is clear, the units are metric, the tables comprehensible, and the numbers in the text and the tables are consistent.

External Review Draft

Author comments and other material identified as necessary or desirable by the report assembly organization or the OPI Coordinator will be incorporated into a new draft along with the results of the pre-editing. This draft will be identified as EXTERNAL REVIEW DRAFT. When completed, a copy will be transmitted to the OPI Coordinator for a one week review to determine consistency with the Development Plan and these working guidelines and procedures. If no objection has been raised by the OPI Coordinator seven days after he receives the draft, the report assembly organization should proceed with the formal internal and external review.

This and the Clearance Draft are the only drafts in the sequence intended for review purposes and are to be the only ones formally distributed as a draft of that respective Working Group. Other drafts should not be represented as reflecting the views of the Working Group; they may, however, be circulated to a limited number of persons other than those engaged in drafting that document provided that a copy of any resulting reviews are sent to the report assembly organization and the OPI Coordinator as soon as received in ORD.

The report assembly organization will be responsible for sending or arranging for sending copies with manuscript review forms to:

- o Suitable individuals in the program offices concerned.
- o Non-Headquarters ORD personnel not on the Working Group who are believed to have special knowledge of the subjects discussed.
- o Those reviewers external to ORD designated by the Science Advisory Board pursuant to a prior request by the report assembly organization through the OPI Coordinator for SAB to arrange for scientific review.
- o Any other individuals they deem desirable.

The OPI will be responsible for sending or arranging for sending review copies with manuscript review forms to the following Headquarters personnel:

- o Appropriate OPI staff members and consultants,
- o Members of the STAR Committee.
- o Relevant DAAs.
- o Any other individuals OPI deems desirable.

Both OPI and the report assembly organization will ensure that the other receives a copy of all reviews as soon as possible after receipt.

Two months after the initial release of the external review draft by the OPI Coordinator, the report assembly organization should proceed with revising the draft report in response to the comments received whether or not all reviews have been received back unless requested to delay by the OPI Coordinator.

Edit_1

When the document is complete in respect to its substantive content, a draft will be prepared by the report assembly office and identified as EDIT 1.

The report assembly organization will next arrange to have Edit 1 edited. The edited draft will be reviewed by the report assembly organization to determine whether editorial changes are acceptable or not. They will also consider EPA

required style and general technical aspects of the document and add required forms.

Edit_2

When the report assembly organization is satisfied with the edited Edit 1, a draft will be prepared and identified as EDIT 2. This draft will be distributed to members of the Working Group for comment.

Clearance Draft

When the comments on Edit 2 have been received, the revised draft as finally agreed upon by the Working Group will be typed and identified as CLEARANCE DRAFT. The report assembly organization should ensure that all final elements are included, such as the table of contents, and proofread by at least one other person.

The report assembly organization will send the draft to the OPI Coordinator for final Headquarters review together with a signed printing requisition and proposed distribution list. The OPI Coordinator will send a copy of the Clearance Draft to all members of the STAR Committee and all relevant DAAs with a maximum of two weeks for review. If no objections that cannot be readily resolved are received in two weeks after receipt by these individuals, the OPI Coordinator will submit the draft to the Deputy Assistant Administrator for Program Integration and the Assistant Administrator for Research and Development for final clearance. If objections arise, the OPI Coordinator will attempt to resolve them if they are minor in nature, or request the report assembly organization to revise the Clearance Draft if any substantial effort is required.

Final Draft

When the Assistant Administrator for Research and Development has cleared the document for publication, that draft will be designated as FINAL DRAFT.

Publication

The OPI Coordinator will arrange for inputting necessary codes using Word/One for final photo composition and for delivery of the finished camera ready copy to the Office of Program Management or other appropriate organization for printing and distribution.

APPENDIX D

EDITORIAL GUIDELINES AND SPECIAL INSTRUCTIONS FOR PREPARATION OF ASSESSMENT REPORTS

D.1 PURPOSE AND SCOPE

These editorial guidelines and special instructions have been prepared to ensure material consistency within each document and to ensure that all documents are consistent with each other with respect to format. These guidelines and special instructions should be carefully read by all those typing any portion of a Scientific and Technical Assessment Report. The following elements will be discussed:

Section

D.2	STAR Series
D.3	Use of Word/One
D.4	File of Reference Material
D.5	Cover and Title Page Format
D.6	EPA Review Notice and Other Disclaimers
D.7	Inside Front Cover Page Format
D.8	Paper Size
D.9	Margins
D.10	Type Face
D.11	Units
D.12	Line Spacing
D.13	Indentation
D.14	Lists
D.15	Headings
D.16	References
D.17	Footnotes
D.18	Illustrations
D.19	Table Style
D.20	Page Numbering
D.21	Conformance with CRD Report Specifications

D.2 STAR SERIES

All STAR will be in a new ORD report series number 6 called the STAR Series. All STAR will accordingly carry an identification number EPA-600/6-7X-0YZ where X is the last digit of the year and YZ is the sequential number in the STAR series issued by Cynthia Holley (202) 426-2175. The number will be assigned when the final draft is prepared.

D.3 USE OF WORD/ONE

All drafts should be typed and photo-composed using the Word/One system of Bowne Time Sharing, Inc. Where possible, drafts should be transmitted to other EPA offices by messaging the draft report over the Bowne System to the recipient. A supplementary telephone call will insure prompt receipt.

If it is not possible to prepare all drafts on Word/One, every effort should be made to prepare at least the External Review and later Drafts on it. Information on obtaining access to Word/One can be found in Appendix E. In order for clerical personnel to become proficient in the use of the Word/One system, it is strongly advisable that they take a one week course provided by Bowne Time Sharing, Inc. If a sufficient number of these requests have accumulated, ORD can arrange a special course oriented towards the STAR documents. Requests for the course in connection with STAR should accordingly be sent to Dr. Alan Carlin, RD-675, Headquarters on form DI-510A, Request, Authorization and Record of Employee Training, for forwarding to Mr. Harvey Weiner in Personnel after negotiations for any special course are completed.

Questions by ORD field personnel as to the use of Word/One can be answered by the following NERC employees:

NERC-Cincinnati -- Ed Nime (513) 684-4442
NERC-Corvallis -- Ken Pyram (503) 752-4385
NERC-RTP -- Mel Myers (919) 549-2613

If they are unable to help, the following Washington based people may be able to do so:

Ms. Denise Swink -- ORD ADP Consultant -- (202) 426-4180
Mr. Ronald A. Webb -- Bowne Account Representative,
1025 Connecticut Avenue
Washington, D.C. 20036
(202) 785-8800
Ms. Mary Janet Casserly -- Bowne Customer Service
Representative --
(202) 785-8800

D.4 FILE OF REFERENCE MATERIAL

Copies of all references or sources cited in any STAR should be obtained by the report assembly organization and retained in an easily referenced form in the files until such time as

the report may be revised and updated. Each report assembly organization may, with OPI approval, arrange for not more than one other EPA organization to carry out this responsibility provided that that organization can quickly respond to inquiries concerning the reference or source.

D.5 COVER AND TITLE PAGE FORMAT

The original for the printed cover (camera ready) will be prepared by the publications staff at ORD Headquarters. The title which should be centered in capital letters in the upper half of the cover and title page should read as follows:

SCIENTIFIC AND TECHNICAL ASSESSMENT REPORT
CN
(POLLUTANT)

The originating organization should be shown as follows in a single centered block near the bottom of the title page:

Assembled by
(name and location of report assembly organization)
for
Office of Program Integration
Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

On the cover page, this should be abbreviated by including only the last three lines in the lower right-hand corner.

The cover should be printed on 100 pound buff stock using dark blue GP-248-B ink and reverse printing.

D.6 EPA REVIEW NOTICE

All drafts except the Final Draft should also include the following wording on the title page:

NOTICE

This draft report has not been reviewed by the Office of Research and Development, EPA, and has not as yet been approved for publication. Accordingly, the contents do not necessarily reflect the views and policies of the Environmental Protection Agency. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

In addition, all hard copy drafts except the final draft should carry the following statement in capital letters on each page:

DRAFT

DO NOT QUOTE OR CITE

The Final Draft should carry the following wording on the second page (to be included on the inside front cover of the printed report):

EPA REVIEW NOTICE

This report has been reviewed by the Office of Research and Development, EPA, and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

D.7 INSIDE FRONT COVER PAGE FORMAT

The inside front cover page of the printed report should read as follows:

RESEARCH REPORTING SERIES

Research reports of the Office of Research and Development, U.S. Environmental Protection Agency, have been grouped into series. These broad categories were established to facilitate further development and application of environmental technology. Elimination of traditional grouping was consciously planned to foster technology transfer and a maximum interface in related fields. These series are:

1. Environmental Health Effects Research
2. Environmental Protection Technology
3. Ecological Research
4. Environmental Monitoring
5. Socioeconomic Environmental Studies
6. Scientific and Technical Assessment Reports
(STAR)

This report has been assigned to the SCIENTIFIC AND TECHNICAL ASSESSMENT REPORTS (STAR) series. This series assesses the available scientific and technical knowledge on major pollutants that would be helpful in possible EPA regulatory decision-making regarding the pollutant or assesses the state of knowledge of a major area of completed study. The series endeavors to

present an objective assessment of existing knowledge, pointing out the extent to which it is definitive, the validity of the data on which it is based, and uncertainties and gaps that may exist. Most of the reports will be multi-media in scope, focusing on single media only to the extent warranted by the distribution of environmental insult.

EPA REVIEW NOTICE

This report has been reviewed by the Office of Research and Development, EPA, and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

DISTRIBUTION STATEMENT

This report is available to the public from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

D.8 PAPER SIZE

The paper size should be 8 x 10-1/2 inch paper; where this is not available use 8-1/2 x 11 inch paper and adjust margins as noted below.

D.9 MARGINS

Margins should be as follows on all drafts as well as the printed report:

- o For 8 x 10-1/2 inch paper, use left margin of 1-1/4 inches, type text six inches wide with upper and lower margins of one inch; on Word/One, determine margins by entering as w60;50.
- o For 8-1/2 x 11 inch paper, use left margin of 1-1/2 inches, type text six inches wide with upper and lower margins of 1-1/4 inches.

D.10 TYPE FACE

The printed Report should be set in Times Roman, or if Word/One is not used for photo composition for some reason, a type face as similar to it as possible.

D.11 UNITS

All measurements shall be expressed in terms of the modernized metric system. Equivalent units may be given in parentheses following the metric expression. The following references may be helpful:

- o Page, Chester, and Paul Vigoureux, The International System of Units, NBS Special Publication 330, US GPO, Washington, D.C., 20402, price 30 cents.
- o American National Standard E 380-72 (Metric Practice Guide), American Society for Testing and Materials, 916 Race Street, Philadelphia, Pennsylvania 19103.

D.12 LINE SPACING

Spacing should be as follows:

- o For review drafts, spacing between lines and between paragraphs should be two (2) spaces, including subsection headings;
- o Section titles shall be centered three (3) spaces above the text, but within the margins.

D.13 INDENTATION

Indentation should be as follows:

- o All text except lists should begin at left margin, i.e., no indentation;
- o Lists: See below.

D.14 LISTS

Lists of items in a paragraph should be preceded by small circles (o) except where there is a reason for them to be preceded by Arabic numerals in parentheses. The circles should be indented five (5) spaces from the left margin. All text should be indented three (3) more spaces, or a total of eight (8) spaces where small circles are used. The text of each item should be followed by a period at the end of the item..

D.15 HEADINGS

Sections and major subsections are to be numbered using the decimal system as in the standardized document outline. Headings are to follow the style presented below. The instructions are written using the appropriate numbering and heading format.

1. FIRST ORDER

Each section heading should start a new page, be in capital letters, and be underlined.

1.1 SECOND ORDER

Each subsection title should be in capital letters and be underlined, but need not start a new page. Start paragraph two spaces below heading with no indentation.

Third Order

Capital and lower-case letters are set flush with left margin and two spaces above paragraph. Underline third order headings. Third order subsections may be numbered at the discretion of the report assembly organization, but should be done consistently throughout the report if at all. Such subsections should be numbered by adding a period and a number to the second order number. In this case the number would be 1.1.1.

Fourth Order -- Capital and lower case letters are set flush with left underlined, and followed with two dashes. Text in this fourth order follows on same line.

Fifth Order -- Initial capital letter on first word only and on proper nouns, underlined, and followed with two dashes. Text follows on same line. (Note: Fifth order should be avoided whenever possible).

-----EXAMPLES OF NUMBERING AND HEADING STYLE-----

2. SULFUR OXIDES AND SUSPENDED PARTICULATES

Sulfur oxides and suspended particulates, here considered together, often have common origins in that both may be

produced by the burning of fossil fuels. Sulfur dioxide is produced by the combustion of sulfur compounds present as impurities in many coals and heavy oils.

2.1 EXPERIMENTAL STUDIES

The results of animal studies suggest that the addition of various particles to sulfur dioxide may potentiate or enhance its effect. There is no convincing evidence from experimental work on healthy human beings that particles added to inhaled sulfur dioxide potentiate its effects in short-term exposures.

2.2 EFFECTS ON MAN

There have been some reports of studies that can be used to establish dose-response relationships or associations for sulfur dioxide and suspended particulates. These studies are limited in number, however, and at present there is little information available concerning the effect of varying one of these pollutants while the other is kept constant.

Acute Effects

Epidemiological techniques have been used in attempts to evaluate the separate or combined effects of sulfur dioxide and particulates. In London, implementation of the Clean Air Act has greatly reduced pollution by particulate matter, and this reduction has been accompanied by a much smaller drop in sulfur dioxide concentrations. Lawther *et. al.* studied the association of daily levels of smoke and sulfur dioxide with the reported state of health of patients with respiratory disease.

Chronic Effects

In any discussion of the effects of air pollution on people a distinction must be made between acute, subacute, and chronic effects. With very high concentrations such as have occurred in London, England, the Meuse Valley (Belgium), Donora, Pa., New York, the Ruhr, Osaka, and Rotterdam, the immediate effects were clearly manifest in terms of mortality or increased morbidity, especially among those already ill, old, or otherwise enfeebled.

Chronic Effects on Adults -- Holland and co-workers studied outdoor postal and telephone workers in the United Kingdom

and the USA and found a graduation of respiratory disease symptoms across polluted levels, particularly in the 50-59 year old category.

Upper respiratory -- Colds and related infections provide a measurable effect. Much data has been collected.

Colds -- Study of this condition has been confusing. Large sums have been spent.

Related infections -- Those who ventured into collecting this data are to be praised. Their work has left a mark on the scientific community.

Lower respiratory -- These effects are difficult to separate from other causes. Many studies have been of poor design.

-----END OF EXAMPLE-----

D.16 REFERENCES

Scientific and Technical Assessment Reports should use as references only those that have been verified by the writer at the time these documents are prepared. Proper preparation of reference listings in the initial drafts results in a considerable saving of time and error in final editing.

Where unpublished data or personal communications are referenced, permission to cite the data or personal communication must be obtained from the source by the person citing that reference.

Bibliographic style and format should be consistent. References to published material in the text should be cited in the author's last name (or, in the cases where there are no individual authors, the name or recognized acronym of an institutional author without any preceding article), year (in parenthesis), and page number if relevant (also in parenthesis), e.g., Jones (1946, p. 136), and should be listed in full alphabetically at the end of the report. If an author has more than one referenced publication in a year, then these should be identified consecutively in the list of references using lower case letters following the year and should also appear following the year in the text. If there is more than one author, normally reference only the first in the text, followed by a comma, et al., another comma, and then the year. If the same first author has

different co-authors of referenced publications in the same year, include enough co-authors in the text reference to make clear which is which. If reference is made to an individual's work as discussed in a secondary source, the reference should be to the secondary source, e.g., see the work of A. J. Smith as discussed in NAS (1974b, p. 322).

All tables that have been extracted or are based on other materials should be acknowledged by reference, with the source shown by author and date under Source at the end of the table and listed in full at the end of the section. The sources for figures must also be shown, but may be in the text or on the figure.

Journal Articles

Journal article (and reprint) entries should be in the following order (unless an element is missing, in which case it should be omitted):

- o Author's last name, comma, initials, comma, names of additional authors, comma, year of publication, lower case letter (if more than one publication is listed for the same author in the same year), period. If there is more than one author, use regular initials and surname order for those other than the first author, and use comma before the and preceding the last author.
- o Title should be in quotes and in upper- and lower-case style. Follow with comma. If title is in a foreign language, follow with English title in brackets.
- o Name of journal -- City where journal is published should be listed in parentheses after journal name if the journal is foreign. Abbreviations of the names of periodicals should follow in the style as listed in the ACS Handbook for Authors. Follow with comma.
- o Volume number of journal should be cited and underscored. The issue number should be listed in parentheses after the volume number. Follow with a colon.
- o Page numbers -- Immediately after colon, inclusive page numbers are given. Separate them with hyphen.

Follow with a period.

Example --

Smith, E. A., R. A. Jones, and A. T. Brown, 1969. "Effects of Air Pollution on Painted Surfaces," Aust. Chem. Process (Sidney), 22:17-21.

Books

- o Author(s) and date -- Same treatment as for journal articles.
- o Title -- Same treatment as for journal article titles except that title should be underlined instead of in quotation marks. List edition, if relevant, and follow with comma.
- o Name of publisher -- Follow with comma.
- o Place of publication -- Use city name. Follow with comma.
- o Pages cited -- Whole book: 500 pp.
Chapter: pp. 321-347
Page: p. 336.
End with period.

Example --

Smith, A. R., 1973. Air Pollution in Urban America, 2nd Ed., U. of Chicago Press, Chicago, 316 pp.

Parts of Books or Proceedings

- o Author and date -- Same treatment as for journal article. Follow with period.
- o Title of article or chapter -- Put in quotation marks and follow with comma.
- o In: Book title -- Follow with comma.
- o Follow with editor's last name, initials, and (ed.) -- Follow with comma.
- o Name of publisher -- Follow with comma.
- o Place of publication -- Use city name. Follow with comma.

- o Pages -- pp. 321-327 or p. 333. End with period.

Example --

Doe, J. C., 1962. "Air Pollution form Stockyards,: in:
Air Pollution in United States, Kiercynski, Y.A.
(ed.), Livestock Publishers, Kansas City, pp. 312-316.

Reports

- o Author and date -- Same treatment as for journal articles. Follow with period.
- o Title -- Same as for book. If no author, start citation with title. Follow with comma.
- o Source -- Name of company, institution, or government agency. If a contractor-sponsor relation exists, identify the performing organization. Follow with comma.
- o Location of publisher -- Follow with comma.
- o Report number -- Follow with comma.
- o Issuing agency or (co)sponsoring organization which issued report -- Follow with a comma.
- o Pages cited or total pages -- Follow with period.

Example --

James, L. P., J. T. Frederick and P. J. Williams, 1971.
Air Pollution Measurements by Various Orthodox Methods
in Certain Urban and Non-urban Locations at Specific Times,
U.S. Environmental Protection Agency, Raleigh, N. C.,
Publication Number AP-485, 185 pp.

Preprints

- o Author and title -- same treatment as for journal articles. Follow with comma.
- o Source or author's affiliation -- Follow with comma.
- o Name of meeting -- Precede with parenthesis.

Preface name of meeting with statement of relation such as "Prepared for" or "Presented at". Follow meeting name with comma.

- o Place of meeting -- City only. Follow with comma.
- o Date of meeting -- Exact month and day. Close parenthesis, then follow with comma.
- o Number of pages -- Follow with period.

Example --

Smith, R. F., 1972. "Air Pollution in River Basins," Riverview University, (presented at Annual River Basin Preservation Society Meeting, Riverview Heights, June 5-9), 4 pp.

Laws or Regulations

- o Governmental legal code or series of regulations -- Follow with comma.
- o Title of act or law, if there is a name -- Follow with comma.
- o Associated title, act number, section number, or paragraph identification -- Follow with comma.
- o Publisher (if relevant) -- Follow with comma.
- o Place of publication (if relevant).
- o Date -- Place in parenthesis. Follow with comma.
- o Pages -- Follow with period.

Example --

5 USC, Freedom of Information Act, Sec 552(b) (1967).

Unpublished Data

- o Investigator or other individual who provided data and date collected, summarized or otherwise identified -- Follow with period.

- o Title of report, file, or project where data can be found -- Follow with comma.
- o Source -- Name of company, institution, or agency. Follow with comma.
- o Location -- City and state or foreign country. Follow with comma.
- o Unpublished. End with period.

Example

Smith, R. R., 1971. Car Count Project, State Department of Transportation, Baltimore, Maryland, unpublished.

Personal Communications

- o Name of individual and date -- Follow with period.
- o Affiliation -- Follow with comma.
- o Location -- Follow with comma.
- o Personal communication with -- Give name of EPA employee or other individual who received the communication. Follow with comma.
- o Exact date -- Specify month and day if known. End with period.

Example --

Jones, F. R., 1973. North Carolina Board of Lumber Control, Raleigh, North Carolina, personal communication with I. M. Epa of EPA, July 8.

D.17 FOOTNOTES

Footnotes are indicated in text by superscript arabic numerals. The footnotes for each section should be collected at the end of the section.

D.18 ILLUSTRATIONS

To assure good reproduction, illustrations should be black ink line drawings without large gray-shaded or solid-black

areas. Areas to be defined may be designated with cross hatching or dot patterns, which do reproduce well. Illustrations should be proportioned to correspond with the 6- by 8-1/2 inch page frame. Since illustrations cannot be stored in Word/One, xerox copies of illustrations should be sent to recipients of draft copies and adequate space left for them in the text.

Graphs

All callouts on graphs should be in capital letters except for chemical and mathematical terms and symbols, which cannot be changed as a matter of style. The ordinate and abscissa should be labeled with capital letters followed by a comma and units in lower case letters. Units should be broken out of the description: "CONCENTRATION (ug/m)" is preferable to "CONCENTRATION IN MICROGRAMS PER CUBIC METER." (See Figure B.1)

Titles

The style for figure titles is upper case. Example: Figure 1.1-MONTHLY VARIATION OF DUSTFALL IN PHOENIX, ARIZONA, IN 1962.

Figure titles should be as concise as possible. They should describe the figure without adding other explanatory material. Commentary on illustrations should be included in the text of the report; it should not be placed under the illustrations.

Arabic numerals are to be used for figure numbers. Figures are to be numbered first with the section number followed by a decimal then with the number of the table in sequence of appearance in the section.

Source(s)

The sources for the information in all figures should be indicated either in the text or in the figure. If it is not evident to a nonexpert how the data has been manipulated, this should be carefully explained in the text.

D.19 TABLE STYLE

See Table B.1 for example.

Size and Proportion

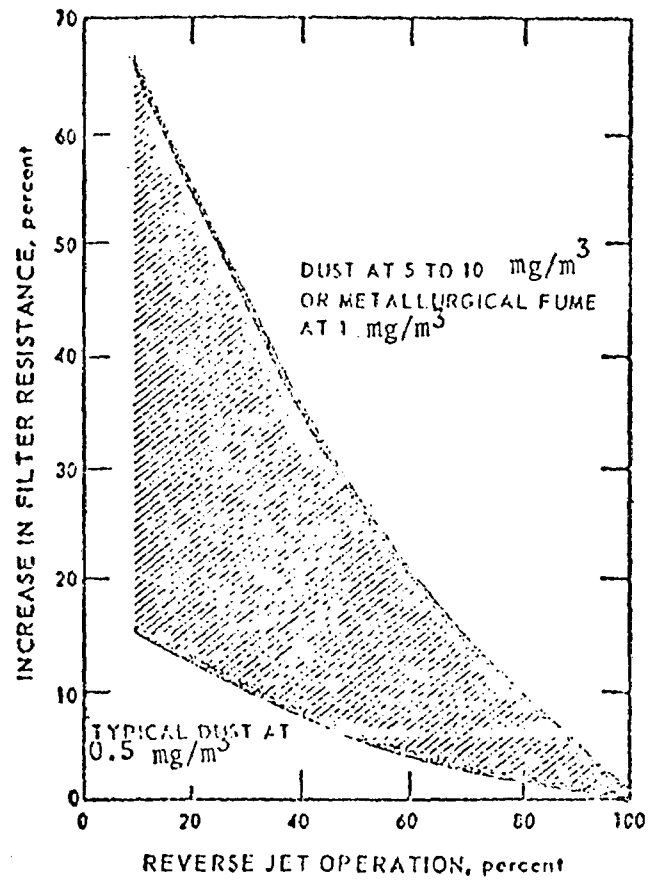


Figure B.1 — EFFECT OF CLEANING FREQUENCY
ON FILTER RESISTANCE IN
REVERSE-JET BAGHOUSE

Table B.1 EMISSION FACTORS FOR CALCIUM CARBIDE PLANT
(kg/MT)

Pollutant	Coke drier ¹	Electric furnace hood	Furnace room vents	Main stack ² (impingement scrubbers)
Acetylene	--	100	1.8	--
Sulfur trioxide	0.2	20	--	0.8
All other gases measured	0.2	17	--	1.9

Notes:

¹Equipped with cyclone and spray drier.

²Equipped with impingement scrubbers.

Source:

Based on Smith (1973, pp. 35-36). Numbers shown are average of his range.

Page frame proportion is roughly 6 by 8 1/2 inches. Tables appearing upright should be no more than 6 inches wide, and tables appearing on turn pages should be no more than 8 1/2 inches wide. If a table is larger than these dimensions, it should be kept in the 6- by 8 1/2-inch proportion so that when it is reduced, it will fit the page frame.

Title

The title is centered above the table. The word "Table" has an initial capital letter only. The table number is followed by two spaces. The table title is typed in all capital letters, except when alteration would change the meaning, e.g., chemical and mathematical terms.

Arabic numerals are to be used for table numbers. Tables are to be numbered first with the chapter number followed by a decimal, then with the number (within the section) of the Table. Table numbers are repeated in each section. Example: Tables 1.1, 1.2, 1.3, and 1.4. Tables 2.1, 2.2, 2.3, and 2.4.

If data in a table are all in the same units, the units should be designated in lower case letters in parentheses centered below the title for example:

Table 1.1 - COAL CONSUMPTION IN OHIO
(metric tons/year)

If an explanatory subtitle is needed, it should be typed in lower-case style under the main title.

Example -

Table 3.5 - COMBUSTION DATA FOR PATHOLOGICAL WASTE
(based on 1 kg dry ash-free combustible material)

Spacing

Double space between title and table. Separate title and table with a heavy line. Scan information in table to determine space needed for longest item, and plan column width accordingly.

Headings

Build headings from the baseline of the heading requiring the most vertical space.

Headings are to be initial capital letter on first word only. Units should be in parentheses centered under column heading.

Treatment of Data

Separate headings and data with a heavy line.

If the information in the table consists of words or phrases, use initial capital letter on first word only. Type flush left. The second line of a phrase in the left-hand column should be indented two spaces.

When the item description in the left-hand column is on two or more lines, type tabular data opposite first line.

Do not use vertical column rules unless absolutely necessary to make separations clear.

If the table contains columns of numbers, type whole numbers flush right with respect to each other, using longest number of center column. If numbers are whole numbers and decimals, line up the decimal points. Put zeros in front of decimal point for all numbers smaller than 1.

Separate data from footnotes or sources with a heavy line. If there are no footnotes or sources, still follow data with the heavy line.

Table Footnote(s)

Designate footnotes in tables with arabic numerals after and superior to data: Footnotes should be typed flush left and may extend the full width of the table under a heading Note(s). Double space between footnotes if space permits; otherwise single space. Single space within each footnote.

Source(s)

All tables should indicate the source(s) of the information in them, even if the same information is in the text. If it is not evident to a non-expert how the data has been manipulated, this should be carefully explained. Sources should be listed under a heading Source(s) following any footnotes.

D.20 PAGE NUMBERING

All preferatory material should be numbered except for the inside title page (which would be page i) using lower case Roman numerals. Regular text (beginning with Section 1) should be numbered consecutively using arabic numerals.

D.21 CONFORMANCE WITH CRD REPORT SPECIFICATIONS

In addition to the specifications listed in this Appendix, all STARS should conform with the Interim Specifications for OREM Grant, Contract and In-House Reports, March 1973, or later revised versions thereof as issued, including the requirement that the last page must be a completed EPA 2220-1 Technical Report Data form.

APPENDIX E

PROCEDURES FOR REQUESTING ACCESS TO TIME SHARING SERVICES THROUGH EPA CONTRACT WITH FOENE TIME SHARING (WORD/ONE)

In order to use Word/One, it is necessary for each user to obtain a user ID and account number. After filling out the necessary information on the attached form, it is very important, if you are part of one of the National Environmental Research Centers, to obtain approval for funds (under Concurrence - Funding) from the following people:

Robert Snelling, NERC-Las Vegas, (702) 736-2969
John Knight, NERC-RTP, (919) 549-2141
Kenneth Byram, NERC-Corvallis, (503) 752-4385
Robert Bridges, NERC-Cincinnati, (513) 871-6320

After approval for funding has been obtained through one of the above four persons, the form is then sent to Ms. Denise Swink, ADP Coordinator, Room 3817, RD-674, 401 M Street, S.W., Washington, D.C. 20460.

EDP SERVICES REGISTRATION

PLEASE PRINT OR TYPE						MIDSD USE ONLY		
SERVICE (Check one) <input type="checkbox"/> TIME SHARING <input type="checkbox"/> OTHER (Specify): _____ <input type="checkbox"/> TECHNICAL ASSISTANCE <input type="checkbox"/> DATA REDUCTION			SUPPLIER (Check one) <input type="checkbox"/> OSI <input type="checkbox"/> OTHER (Specify): _____ <input type="checkbox"/> NIH <input type="checkbox"/> WORD/ONE <input type="checkbox"/> ENVIRON			DATE RECEIVED		
						POSTED	UPDATED	PROOFED
PROJECT TITLE (Limit: 60 characters, including spaces)						PROJECT CODE		
ENVIRONMENTAL SYSTEM IDENTIFICATION NUMBER		ORGANIZATION SYMBOLS				ORGANIZATION CODE		
		PROGRAM ELEMENT TITLE				PROGRAM ELEMENT CODE		
PROJECT MANAGER		NAME (Last, first, middle initial)		PHONE (Include area code)			REFERENCE INITIALS	PROJECT INITIALS
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TO		ORIGINATED BY		DATE		MAILING LIST KEY:		
U.S. Environmental Protection Agency Director, Management Information and Data Systems Division (PM 218) Washington, D.C. 20460						M - MANAGEMENT PANEL		
		CONCURRENCE (Funding)		DATE		P - PROPERTY		
		CONCURRENCE (Other)		DATE		C - CONTRACTOR		
						F - FEDERAL NON-EPA		
						S - STATE OR LOCAL GOV'T		
						T - TERMINAL CONTACT		
						U - UNIVERSITY		