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Handbook for Preparing Office of Research and Development Reports

Third Edition

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Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, OH 45268

Notice

This document replaces the *"Handbook for Preparing Office of Research and Development Reports,"* EPA/600/9-83/006, revised October 1989. The Technology Transfer and Support Division (TTSD) has produced this *Handbook* to provide guidelines that should be followed in preparing technical and scientific reports for the Office of Research and Development (ORD). Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Abstract

This *Handbook* is intended to assist authors and editors when preparing documents that report the results and conclusions of ORD's research, development, and demonstration programs.

The *Handbook* contains a listing of reference documents to be used in writing a report, a discussion of copyright requirements, and notices that may be used in various types of reports. The *Handbook* also discusses requirements for software, the general form of the report, style guidelines, and restrictions of which writers must be aware.

Required items in reports are described: the cover, front matter, body of text, and back matter and their individual parts. Also described are various types of documents: research and project reports, project summaries, applications guides, proceedings, journal articles, book chapters, published papers, environmental research briefs, seminar announcements, and internal reports.

Several sample pages of a report are shown.

The appendices consist of the following:

- an expanded list of sources—style manuals, guides to naming and presenting data, and texts on technical writing; and
- specifications for reports, project summaries, environmental research briefs, and brochures.

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Chapter One
Introduction

Purpose

This *Handbook* is addressed to those who prepare documents for the Office of Research and Development (ORD) of the U.S. Environmental Protection Agency (EPA). It contains guidance, notices, and format specifications that will ensure consistently high-quality documents and associated diskette copies at reasonable costs.

Applicability

These specifications and guidelines apply to the final documents and associated computer diskettes prepared as a result of research sponsored or conducted by ORD. Such documents include reports that

- result from in-house, interagency, grant, cooperative agreement, and contract research activities performed by or for ORD;
- document the findings of research required to produce a specific output; and
- are tailored to meet the needs of defined user groups.

Examples of reports include, but are not limited to, project reports and summaries, research reports, conference proceedings, environmental research briefs, criteria documents, manuals, handbooks, user's guides, seminar announcements, and internal reports.

Exclusions

These specifications and guidelines do not apply to nontechnical reports and studies, administrative or fiscal reports, or catalogs. If you are responsible for preparing such reports, ask the project officer to contact the Office of Communication, Education, and Media Relations, Washington, DC, for additional guidance and assistance.

Chapter Two
Source and Legal Information

This chapter provides information that is generally applicable to all ORD scientific and technical documents. It identifies important reference documents and discusses copyright and notices.

Sources of Information

You may find the following references useful as supplemental sources in preparing ORD scientific and technical reports. You may also want to use other guides from engineering and scientific societies and journals. A list of additional sources is given in Appendix A.

Office of Communication, Education, and Media Relations. *Publication Management: A Guide to Processes, Standards and Style,* EPA/175/K-93/011. Washington, DC: U.S. Environmental Protection Agency, 1992. (This booklet describes the regulations and standards governing the management and production of other than scientific or technical publications produced for EPA.)

Office of Communication, Education, and Media Relations. *Terms of Environment: Glossary, Abbreviations, and Acronyms,* EPA/175/B-93/001. Washington, DC: U.S. Environmental Protection Agency, 1993.

Office of Communication, Education, and Media Relations. *Developing Products for the Public: A Handbook for EPA Communicators,* EPA/176/B-91/001. Washington, DC: U.S. Environmental Protection Agency, 1991. (This handbook describes the Agency's process for developing a product intended for a nontechnical audience.)

ASTM (American Society for Testing and Materials). *Standard Practice for Use of the International System of Units (SI) (The Modernized Metric System),* PCN 03-543-093-34. Philadelphia, PA: ASTM, 1992. (ASTM, 1916 Race St., Philadelphia, PA 19103-1187; 215-299-5585).

U.S. Government Printing Office. *Government Printing Office Style Manual.* Washington, DC: USGPO, 1984. (This manual contains editorial advice and the federal government's recommended style for capitalization, punctuation, use of numerals, hyphenation, etc. You may purchase a copy from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Ask for Stock Number 021-000-00120-1.)

Legal Considerations

The government may be subject to liability for misuse of the literary or intellectual property (patents, trademarks, proprietary information) of others. Report writers and editors should observe the guidelines given in this section.

Copyright [1]

What Rights Copyright Gives

The Copyright Act gives the owner of a copyright the exclusive right to reproduce the copyrighted work, to prepare derivative works based on the copyrighted work, and to distribute copies of the copyrighted work to the public. It is illegal for anyone to violate any of the rights provided by the Act to the owner of the copyright.

Who Can Claim Copyright

The copyright in a work of authorship *immediately* becomes the property of the author who created it. In the case of works made for hire, the employer and not the employee is considered the author. The authors of a joint work are co-owners of the copyright in the work.

Works That Are Not Protected

Several categories of material are not eligible for copyright protection. These include, among others,

- Titles, names, short phrases, and slogans; familiar symbols or designs; mere variations of typographic ornamentation, lettering, or coloring; mere listings of ingredients or contents.

[1] This section, except for the part on EPA's use of copyrighted materials, is taken from *Copyright Basics.* The full citation is as follows:

Copyright Office. *Circular 1: Copyright Basics.* Washington, DC: Library of Congress, 1992.

- Ideas, procedures, methods, systems, processes, concepts, principles, discoveries, or devices, as distinguished from a description, explanation, or illustration.

- Works consisting *entirely* of information that is common property and containing no original authorship. Examples are standard calendars, height and weight charts, tape measures and rulers, and lists or tables taken from public documents or other common sources.

Copyright Secured Automatically Upon Creation
Copyright is secured *automatically* when the work is created. No publication or registration or other action in the Copyright Office is required to secure copyright. Before 1978, copyright was secured by the act of publication with notice of copyright. Works in the public domain on January 1, 1978, remain in the public domain under the current Act.

How Long Copyright Protection Endures
Works Originally Created on or after January 1, 1978
A work that was created on or after January 1, 1978, is automatically protected from the moment of its creation and is ordinarily given a term enduring for the author's life plus 50 years after the author's death. For works made for hire, and for anonymous and pseudonymous works, the duration of copyright will ordinarily be 75 years from publication or 100 years from creation, whichever is shorter.

EPA's Use of Copyrighted Materials
Copyright Does Not Cover Government Works
- No U.S. copyright exists in work prepared by a U.S. government employee.

- You must give a copy of such work to any who ask for it or refer them to whoever is distributing it.

You Should Answer Assignment Requests with a Statement from EPA's Patent Counsel
- Answer requests for assignment of U.S. or worldwide copyright rights in works of EPA employees with a letter that includes the following statement:

> **"This assignment cannot be executed because the referenced work was authored by a United States Government employee as part of that person's official duties. In view of Section 105 of the Copyright Act (17 U.S.C. §105) the work is not subject to U.S. copyright protection."**

- Copyright protection for a *specific foreign country* may be possible. Ask EPA's Patent Counsel to review the document.

Be Careful When Using Copyrighted Material
Copyrighted material may not be copied or displayed by EPA or incorporated in EPA documents unless written permission of the copyright owner has been obtained. Prior use of copyrighted material in another government publication does not constitute permission for EPA to use the same material. The absence of a copyright notice or the unpublished status of a work does not establish that the work has not been copyrighted. When permission to use copyrighted material has been obtained and the material is used in an EPA document, the copyrighted material should be identified by the following statement:

> ***Reprinted from (title of publication, year of first publication) by (name of author) with permission of (name of copyright owner).***

Many EPA documents are submitted to the National Technical Information Service (NTIS) for distribution. NTIS requires that copyright release letters accompany publications. The following is an example of a letter giving EPA and NTIS permission to use copyrighted material:

> ***Dear :***
> ***Permission is given to the U.S. Environmental Protection Agency (EPA) and to the National Technical Information Service to reproduce and sell the document identified below containing the following copyrighted material: (Describe the material; include the title, page number, number of the table(s) or figure(s), and any other identifying information.) The following copyright acknowledgment will be included: "Reprinted from (title of publication, year of first publication) by (name of author) with permission of (name of copyright owner)."***
>
> ***EPA Document:***
> ***[Identification of the EPA Document]***

The author should, within reason, follow any special acknowledgment wording requested by the copyright owner. Put such wording on the acknowledgment page of the front matter.

The data rights provisions applicable to both assistance agreements and contracts limit the right of the recipient or contractor to incorporate copyrighted materials in the product delivered to EPA. Prior to inclusion of copyrighted material in a work product delivered under an EPA assistance agreement or contract, the recipient or contractor must first

- Get the copyright owner's written permission for the government's use of such material

- Complete all necessary paperwork and forward permission with the report for processing.

- Pay any fees.

Copyright Notice

In addition to the copyright information that you put on the acknowledgment page, include on the notice page (page ii of the front matter) one of the three following notices:

> ***This document contains copyrighted material on pages (list pages).***

or

> ***This document is copyrighted in its entirety by the author.***

or

> ***This document is copyrighted in its entirety by the author. In addition, it contains copyrighted material from sources other than the author on pages (list pages).***

Assistance Agreement Recipients and Contractors Usually Copyright Their Data

Works of assistance agreement recipients and contractors can have copyright. In these instances, however, *the government is granted a license to all such data.*

- Assistance agreement recipients, following the Rights-in-Data and Copyright Clause in their agreement (40 CFR Part 30 Appendix C), usually can establish copyright without approval from EPA.

- Contractors follow the Federal Acquisition Regulation (FAR) Clause that is written into their contract:

  – most research and development contracts permit the contractor to establish copyright in scientific and technical articles without approval from EPA (FAR Clause 48 CFR Section 52.227-14, Rights in Data—General)

  – for other data produced under contract, the contractor must get written consent from the contracting officer before copyrighting data (FAR Clauses 48 CFR Section 52.227-14, Rights in Data—General and 48 CFR Section 52.227-17, Rights in Data—Special Works)

Announcement of Copyright

If assistance agreement recipients or contractors copyright their work, they should use the copyright announcement so that the project officer knows that permission is required if someone outside the government wants to use the document. Although use of the announcement is optional, it is highly recommended. The announcement should contain the symbol ©, or the word "Copyright," or the abbreviation "Copr.," and the year of first publication of the work, and the name of the owner of copyright in the work.

Example: © 1995 John Doe

Put the copyright announcement on page ii of the front matter.

Fair Use Doctrine Is a Murky Field

"Fair use" doctrine limits a copyright owner's absolute ownership rights.

- Purposes for which a reasonable portion of a copyrighted work can be used without permission:

  – criticism
  – comment
  – news reporting
  – teaching (including multiple copies for classroom use)
  – scholarship
  – research

  When copyrighted works are being used in this way, you should provide a citation as to source.

- Four factors used by courts in determining fair use:

  – the purpose and character of the use
  – the nature of the copyrighted work
  – the amount and substantiality of the portion used in relation to the copyrighted work as a whole
  – the effect of the use upon the potential market for or value of the copyrighted work (courts consider this one the most important)

  The weight courts assign to each factor varies with the particular circumstances.

Two Instances of Fair Use for EPA Employees, Contractors, and Assistance Agreement Recipients

- Making one copy of an article for personal use.

- Giving a contractor, assistance agreement recipient, or EPA employee individual copies of articles in connection with EPA-sponsored research.

Fair use is a vague doctrine and a potential trap for the unwary. Ask your project officer to request from the EPA Patent Counsel advice on a situation in which you are relying on fair use and about which you are not sure.

Computer Software

Commercial computer software is almost always copyrighted.

- Obtain consent of the copyright owner before copying software or using it in EPA work.

- You may find consent for limited use and copying in the software license agreement.

- **Putting a copyrighted work on a computer network, the Internet, or a bulletin board without written consent from the copyright owner could subject the government to copyright infringement liability.**

Do You Have Questions?
If you have further copyright questions, ask your project officer to contact the EPA Patent Counsel at 202-260-7510 (Mailcode 2379) in the Office of General Counsel or the Technology Transfer and Support Division (TTSD) at 513-569-7371.

Confidential Information

You may not include in a document released to the public information of a type that might be claimed as confidential by a business unless the business has informed EPA that it does not claim the information as confidential. If you have any questions, ask the Office of General Counsel.

Notices

Notices in this section pertain to draft and final documents and trade names. If you do not know if the document you are working on is a draft or the final version, check with the project officer. Put the copyright notice (see page 4) and the announcement of copyright (see page 4) after the notices described in this section. Put these notices on page ii of the front matter. In addition to the notices given in this chapter, page 9 in chapter 4 contains two notices under "Abstracts," and page 13 in chapter 5 contains one notice under "Proceedings."

Notices for Draft Documents

1. Draft copies of ORD reports are sometimes distributed outside the Agency for review. Mark the top of each page "DRAFT." Do not cite EPA documents at the draft stage as references in reports prepared by or for ORD. Put the following notice in all draft scientific and technical reports:

> ***Notice***
> ***This document is a preliminary draft. It has not been formally released by the U.S. Environmental Protection Agency and should not at this stage be construed to represent Agency policy. It is being circulated for comments on its technical merit and policy implications.***

2. Final draft documents that may become part of a regulatory docket file but are not submitted for a formal public comment period contain the following notice:

> ***Notice***
> ***This report is an external draft for review purposes only and does not constitute Agency policy.***

Notices for Final Documents

3. If agreement is reached that a peer-reviewed draft of a technical information product is appropriate for release as an EPA publication, the following statement must be used:

> ***Notice*** [2]
> ***The U.S. Environmental Protection Agency through its Office of Research and Development (funded and managed or partially funded and collaborated in) the research described here under (contract or assistance agreement number) to (name). It has been subjected to the Agency's peer and administrative review and has been approved for publication as an EPA document.***

4. EPA encourages independent publication of research results in refereed journals at any time. Submit one copy of the article to the project officer when it is sent for publication. Following publication, submit three reprints of the article to the project officer. The article must include the following statement:

> ***Notice*** [2]
> ***The U.S. Environmental Protection Agency through its Office of Research and Development (funded and managed or partially funded and collaborated in) the research described here under (contract or assistance agreement number) to (name). It has not been subjected to Agency review and therefore does not necessarily reflect the views of the Agency, and no official endorsement should be inferred.***

5. Final documents for internal use by the requesting program office contain the following notice:

> ***This document is intended for internal Agency use only.***

6. For research products that have been peer-reviewed and approved by the Agency but will be published elsewhere (e.g., in book chapters), include the following statement:

> ***Notice*** [2]
> ***The U.S. Environmental Protection Agency through its Office of Research and Development (funded and managed or partially funded and collaborated in) the research described here under (contract or assistance agreement number) to (name). It has been subjected to Agency review and approved for publication.***

[2] Include appropriate wording, which for contracts is *funded and managed* and for assistance agreements is usually *partially funded and collaborated in.* Also include notice statement no. 8 for documents containing proprietary information.

7. For proceedings that include both EPA and non-EPA authors, use the following notice:

> ***Notice***
>
> ***The views expressed in these Proceedings are those of the individual authors and do not necessarily reflect the views and policies of the U.S. Environmental Protection Agency (EPA). Scientists in EPA's Office of Research and Development have prepared the EPA sections, and those sections have been reviewed in accordance with EPA's peer and administrative review policies and approved for presentation and publication.***

Disclaimer for Trade and Manufacturer's Names

8. In addition to other notices that you put on page ii, if your document contains any information unique to a company, laboratory, or individual, you should put a disclaimer statement similar to the following:

> ***Mention of trade names or commercial products does not constitute endorsement or recommendation for use.***

Capitalize trade and manufacturers' names in a report. Before clearing the report for publication, notify the project officer and approving official of the use of trade and manufacturers' names.

Chapter Three
Guidelines

Overview

This chapter identifies the guidelines you should follow when preparing ORD scientific and technical reports and information products for publication. It is not intended to replace methods for handling abbreviations, units of measure, references, and other text annotations that are recommended practice within the many scientific and technical disciplines in the research community. A common sense, consistent approach will usually produce a readable and accurate document.

Requirements

Desktop-Published Copy vs. Word-Processed Copy

The contract may require you to provide final output of camera-ready copy in one of two ways: copy produced from desktop-publishing software or from word processing software. Either way is suitable for sending a document to printing or to NTIS.

- *Outputs from desktop-publishing software,* such as PageMaker®, give your document a more professional appearance. Often, because type is smaller, spacing is closer, and multiple columns are used, desktop-published copy requires fewer pages than output from word processing software; therefore, desktop-published copy is less expensive to print. All specifications in Appendix B and all figures in this document describe desktop-published copy.

- *Outputs from word processing software,* such as WordPerfect® or Microsoft® Word, are sometimes quicker and less expensive for writers to produce. Layout specifications for outputs from word processing software are as follows:

  Paper Size—8.5" x 11"

  Margins
  Top, left side, right side: all 1"
  Bottom: 1.25"

  Font—Twelve point sans serif (e.g., Univers)

  Levels of Headings
  Font: Same as text.
  Case: Initial Caps
  Subhead 1: Flush left, bold
  Subhead 2: Flush left, bold, italics
  Subhead 3: Flush left, normal
  Subhead 4: Flush left, italics, same line as text

  Layout—One column: image area 6.5" x 8.75"

  Spacing: Single

Software

If the contract requires you to produce a report in desktop-published format, follow the guidelines presented in Appendix B, pages 26 through 33. You may produce graphics using a program such as Freehand®, Illustrator®, or Canvas®. Send the hard copy of the report **and** diskettes (3 1/2-in. or SyQuest) to TTSD. ***TTSD plans to store all documents on diskette***, so you are requested to send diskettes with every document.

If you prepare a report that TTSD will desktop publish, furnish a paper copy and diskettes of the document prepared in WordPerfect® (which is the "Agency standard"), PageMaker®, or Microsoft® Word.[1] WordPerfect® has been identified as . You may submit a 3 1/2-in. diskette for smaller projects or a SyQuest diskette for larger projects. Graphics should be submitted as (1) a high resolution (600 dpi or higher) or high quality original paper copy or (2) a TIFF or EPS file and the original paper copy. Label all diskettes containing text and graphics with the application name and version of the program used and the system on which it was done. If you use a program or file other than what is suggested, ask your project officer to contact TTSD at 513-569-7292 (text) or 513-569-7558 (graphics) ***before*** you begin to make sure it can be converted.

Paste-Up

Use a product such as "DryTac Adhesives" for mounting all copy, tables, charts, figures, photos, etc. Do not use scotch tape, glue, or staples to mount camera-ready art or copy. Tape, glue, or staples create a distortion on the camera-ready material that will show up on the printer's negatives and plates.

1 TTSD sends documents to NTIS on disk. NTIS requires that the format be the current version of WordPerfect.

Style

Page Numbering

Number the front matter consecutively with lower case roman numerals. Count the title page as page i but do not put the number on the page. Number pages in the body of the report and back matter consecutively with arabic numerals. Start the first page of the body of the report on a right-hand page and number it 1; thereafter, begin each new chapter or section on the next available page. Allow no blank pages.

Equations

Define mathematical symbols at their first use. When mathematical formulas and equations are numerous, furnish a separate listing of symbols used.

Treat short, simple, and unnumbered equations as part of the text. When possible, type simple fractions on one line using a diagonal line and parentheses to avoid ambiguity:

$$[1/(a + b)] \text{ not } [1/a + b \text{ or } \frac{1}{a + b}].$$

If an equation requires special symbols, positioning, or brackets, display the equation on a line by itself, centered on the width of the page, with spacing above and below.

Break equations before an operational sign (e.g., +, -, =, x). Align a group of separate but related equations by their equal signs and indent or center the group as a whole. Number equations consecutively, using the chapter number or appendix letter as a prefix and starting equations in each chapter or appendix with 1 (e.g., 1-5 is the fifth equation in Chapter 1; B-1 is the first equation in Appendix B). Place these numbers flush right in parentheses as shown below:

$$SCA = \frac{-2\left(1 - \frac{CE}{100}\right)}{W_e} \qquad (6\text{-}3)$$

Other instructions concerning mathematical and chemical equations are in the *Government Printing Office Style Manual* and in other style manuals, such as those issued by the American Chemical Society (1155 Sixteenth St., NW, Washington, DC 20036) or the American Society of Civil Engineers (345 East 47th St., New York, NY 10017).

Footnotes

Keep footnotes to a minimum; incorporate all brief and relevant explanatory comments in the copy. Indicate footnotes in the text by superscript numerals and number consecutively beginning with 1 throughout each chapter. This is more practical than numbering footnotes beginning with 1 on each page, which often requires correcting numbers when text changes.

Abbreviations

Use abbreviations from standard dictionaries, in the *Government Printing Office Style Manual*, and in EPA's glossary (EPA/175/B-93/001). Technical abbreviations may be found in the appropriate reference documents for the subject area involved.

Metric Units of Measure

Use metric measurements, unless otherwise justified by the project officer; express equivalent units parenthetically, if desired. If you use other than metric measures, state the reason for such use in a footnote at the first nonmetric measure, and include a conversion table in the report.

Restrictions

Foldouts and Divider Pages

Do not use divider pages—those that merely serve to separate the report into parts—or foldouts. The cost of foldouts can usually be saved with planning: reduce wide tables, have tables fall on successive pages, separate maps into several parts, etc.

Errata and Addenda

You may choose to handle errata and addenda in one of two ways:

1 If a report already printed and listed with NTIS has changes and you want to include an errata sheet with the remaining copies of the document, send TTSD the errata sheet and a memo telling TTSD to send the errata sheet to NTIS with instructions that NTIS include it with future copies of the document to be distributed. In the memo, include the EPA number, the NTIS accession number, and the title of the document.

2 If a report already printed and listed with NTIS has changes and you want to produce a revised document, put the *same* EPA number, but use a *new* issuance date on the revised document (e.g., Revised August 1995). For additional information and procedures for processing and distributing modifications to existing reports, ask your project officer to call TTSD.

Paper Saving

Because of the costs of paper, shipping, mailing, and printing, consider appropriate paper-saving techniques. Combine tables and figures with text on one page and reduce and crop figures and photographs to a smaller size consistent with clarity and a professional appearance.

Attribution

Sources of information need to be attributed, even when obtained from another government agency and free of copyright restrictions; otherwise readers assume the materials originated with EPA.

Peer Review

The Joint Committee on Printing of the United States Congress requires that federal agencies have initial publication rights. Only after peer and administrative review can EPA decide whether to publish a report or waive its initial publication rights.

Chapter Four
General Organization of Standard Reports

Cover

Cover specifications are given on page 27 of Appendix B. An example of a cover is given in Figure 4-1 on page 15. You may wish to use the space below the subtitle for an illustration instead of the chevron shown. For questions about covers, ask your project officer to call TTSD at 513-569-7558.

Front Matter

Title Page

Center everything on the title page using initial caps only (e.g., Handbook, not HANDBOOK). See Figure 4-2 on page 16 for a sample title page and information on each item.

Notice

Put a peer-review notice, a disclaimer statement if needed, and a copyright notice on page ii of the front matter of a report. Copyright notices are discussed on page 4. Peer-review and disclaimer notices are discussed on pages 5 and 6.

Abstract

Two types of abstracts are used in EPA documents:

- The indicative (descriptive) abstract tells readers what the report is about. Use it to introduce a project summary.
- An informative abstract reports the hypothesis, methods, results, and conclusions of research detailed in the text.

Limit the abstract to 200 words.

In extramural reports, include the following information as part of the abstract in a prominent location:

> ***This report was submitted in fulfillment of (grant or contract number) by (contractor or grantee) under the (partial) sponsorship of the United States Environmental Protection Agency. This report covers a period from (date) to (date), and work was completed as of (date).***

On in-house project reports, include the following information as part of the abstract in a prominent location:

> ***This report covers a period from (date) to (date) and work was completed as of (date).***

Preface (Optional)

The author's own statement about the work is called a preface. A preface may include such information as the reasons for undertaking the work, the research method (if it might bear on the reader's understanding of the text), or the limitations within which the subject was studied.

Foreword

The foreword is often of a scope similar to that of the author's preface but is provided by the sponsoring laboratory.

Contents

Begin the contents on a right-hand, odd-numbered page. Include preliminary pages (front matter), main headings of the document, appendices, and the pages on which they appear. You may use dotted leaders to aid readability of the contents. If you use subheads, indent and subordinate them. Avoid extra spacing between major sections when it would cause contents to have a short overrun onto the following page. Figure 4-3 on page 17 shows a sample contents page.

Lists

Include a list of figures (figures, maps, charts, plates, illustrations) and a list of tables only if considered helpful or essential. For each figure or table, give its number, the caption as it appears in the report, and the page number. Avoid extra spacing when it would cause a list to have a short overrun onto the following page. If lists of figures and tables are short, combine on one page or combine with contents page. See Figure 4-4 on page 18 for a sample list.

Acronyms and Abbreviations

Assemble and define acronyms, symbols, and abbreviations if doing so will aid the reader. Abbreviations or symbols for the less common or specialized terms should also be given in parentheses following their first use in the text. Thereafter, use only the abbreviation or symbol. Consider using two columns

when the list exceeds one page. A sample list of acronyms and abbreviations is shown in Figure 4-5 on page 19.

Acknowledgments

Limit acknowledgments to peer reviewers and organizations that aided in a major way.

Body of Report

Text

Start each chapter with a dropped heading. Do not include any blank pages. Often, Chapter 1 is an introduction, but if your report is short, it may not require a separate introduction. Figure 4-6 on page 20 is a sample page of text.

Figures and Tables

Reference all figures and tables in the text. Put figures and tables as close as possible to their mention in the text (but not *before* they are mentioned). When a report contains only a few pages of text and many figures or tables, place the figures or tables in numerical sequence after the text. Spell out the words "Figure" and "Table" in the text and captions. Put captions in boldface type. Do not put a box around figures or tables. (The "boxes" around figures in this document represent the edges of the page. They are there to give you an idea of how examples would appear on a page.) Do not use foldouts.

If you find it necessary to place figures or tables in a horizontal or landscape orientation on the page, center them on the page so that the top is to the left margin and the bottom to the right margin.

Figures

Treat figures consistently throughout the document, and use them only if they relate directly to the subject matter and are necessary to explain the text.

Make sure that line weights and shading are consistent throughout the report. Use white paper and black ink. Do not use light copies or blueprints for camera-ready art or copy. These do not reproduce well when photographed for printing. Do not use small details, such as tiny circles, that will fill in or bleed during printing.

Reduce figures too big to fit within the margins given in the specifications in Appendix B. (Need help with reductions? Ask your project officer to call TTSD at 513-569-7558.) Make lines heavy enough to remain legible after you reduce them.

If you do not want a visible grid, do not use grid paper for graphs. Instead, use "tic" marks along the edges of the graph at the major divisions of the graph. If you want a visible grid, make sure that the grid background is red. Blue and green grids do not photograph well.

Make callouts within the figure clearly legible. Do not submit hand lettered graphics. Crop or mask photographs to eliminate insignificant details. Eliminate unnecessary border frames. As far as practical, place callouts in a figure horizontally, unboxed, and near the item identified. To ensure easy readability, maintain high contrast.

Number figures consecutively, using the chapter number or appendix letter as a prefix and starting figures in each chapter or appendix with 1 (e.g., 1-5 is the fifth figure in Chapter 1; B-1 is the first figure in Appendix B).

Put a caption under each figure flush left following the figure number. Capitalize only the first letter of the first word and any proper nouns or chemical or mathematical symbols, and close with a period.

If photographs are required, submit glossy black and white photo prints with good contrast. Satin finish prints conflict with the screens used by the printer when preparing the finished plates and cause shadowing and variations in the texture. Size and crop photographs to fit within the margins.

Do not use footnotes in a figure; make this material part of the caption or text.

A sample figure is shown in Figure 4-7 on page 21.

Tables

Organize tables as simply as possible for easy reading. Make the format of tables consistent throughout the publication. If the tables require stacking more than two rows of headings (vertically) and several columns (horizontally) the table is probably too complicated for the reader; split it into two or more tables, reorganize, or eliminate some of the data. Center columns under headings, and align on decimal. Leave space between horizontal entries, and do not use vertical lines. Computer printout sheets must show clear contrast between black and white and must not contain any gray or broken type.

Number tables consecutively, using the chapter number or appendix letter as a prefix and starting tables in each chapter or appendix with 1 (e.g., 1-5 is the fifth table in Chapter 1; B-1 is the first table in Appendix B). Place a caption flush left above each table after the table number. Capitalize the first letter of each word except articles, coordinating conjunctions, and prepositions. Do not use a closing period.

When a long table is continued on two or more pages, repeat the table number and "Continued," but not the table caption, on all the following pages (e.g., Table 3-6. Continued). Repeat the column headings with rules on each page.

Footnotes in tables are an efficient way to present peripheral information. Use superscript, lowercase letters, starting from the top of the table and proceeding from left to right. For a table that includes mathematical or chemical equations, use symbols instead of letters for footnotes because of the risk of mistaking

letters for exponents in the equation. Use symbols in the following order:

* (asterisk or star)

† (dagger)

‡ (double dagger)

§ (section mark)

(number sign).

The *Chicago Manual of Style*, chapter 12, may be helpful for preparing tables.

See Figure 4-7 on page 21 for a sample table.

References

In the text, reference the following kinds of material:

- The source of a significant and original statement.
- The source of information not sufficiently familiar so that most readers would know it or be able to find it readily.
- The sources of controversial matter and opposing views.

Present references in an accurate, uniform manner at the end of each chapter or together as the last chapter of your document. Cite references using either the number system (putting numbers in superscript or parentheses) or the "author-year" system (e.g., Blinksworth 1987). Use a style consistent with that of any scientific or technical journal or society. Include all essential elements of a reference: author(s) (or organization), title, source, identifying numbers, publisher, place of publication, date, pages.

Since personal communications are not usually available to the public, there is little point in using them in a list of references; if they are used, however, include them in parentheses within the text; for example, "(Cavanagh, Jeanne. Letter to author, 1990.)" In citing personal communications, obtain permission from the person to be quoted.

Figure 4-8 on page 22 shows a sample reference page.

Back Matter

Appendices

Appendices contain supplementary, illustrative material, original data, and quoted matter too long for incorporation in the body of the report or generally relevant but not immediately essential to an understanding of the subject.

Start all appendices on the next available page. (If the report ends on page 47, start appendices on page 48.) Treat each appendix title as a dropped chapter head.

Divide the appendices into Appendix A, Appendix B, etc., depending on the kinds and amounts of material used. These divisions should not be arbitrary. A close relationship must exist among materials compiled within any given appendix.

List all appendices in "Contents."

Glossary

If a glossary is included, list technical terms or those that might not be readily known. Need for a glossary depends on the intended audience for the report.

Bibliography

Bibliographic entries provide supplementary sources for information on the subject of the document. Present this literature, which has not been cited in the text, in a manner consistent with the references. See Figure 4-9 on page 23 for a sample bibliography page.

Index

An index lists in alphabetical sequence names, titles, and subjects appearing in the text. The value of any nonfiction book is enhanced by a well-prepared index. You can find instructions on indexing in most style books. Two of note are the *CBE Style Manual*, Council of Biology Editors, (available from Council of Biology Editors, Inc., 11 South LaSalle St., Suite 1400, Chicago, IL 60603; telephone 312-201-0101, fax 312-201-0214) and *The Chicago Manual of Style*, University of Chicago Press, Chicago, IL 60637; fourteenth edition (ISBN 0-226-10389-7) published in 1993.

Chapter Five
Types of Reports

Research Reports

The research report is a book-length presentation of the best of EPA/ORD's research findings. These reports are normally the most authoritative results of a research project on a critical area of interest in which the Agency is involved.

Presentation

Present research reports in classic textbook style—clear, concise prose. Follow "Report Specifications" in Appendix B.

Content

A research report will fit into one of two broad categories: investigative or expository.

In a standard *investigative report*, results and conclusions, the evidence to support them, and the interpretation of that evidence are the most important inclusions. The background of the project and the methods used should support the results and recommendations. Structure the body of an investigative report as follows:

1. Introduction
2. Conclusions
3. Recommendations
4. Methods and materials
5. Results and discussion
6. References

In the introduction, focus on the hypothesis or problem that the study tests. Place the conclusions and recommendations before other matter in the body of an investigative report because this allows the reader ready access to the full scope of the project. Methods, results, and discussion may be interwoven or addressed separately, as logic dictates.

An *expository report* sheds additional light on a topic or an area of high interest about which information is lacking. It is more informal and discursive in nature than an investigative report in the sense that its structure is not bound by the scientific method. Its organization is therefore looser than that of the investigative report; however, where possible, use the same format elements as the investigative report.

Weight the text of a research report in favor of explanatory copy, and do not include large volumes of backup and unedited data, repeatedly used figures of government or other organizational forms, or verbatim reprints from or transcripts of other printed information sources (e.g., the *Federal Register).* These inclusions would detract from the classic format of the book, run up the cost excessively, and are more appropriately referenced as secondary sources than printed. Footnote or reference all background materials where appropriate to enable the reader to locate them in the library, through NTIS, or through the appropriate information databases.

The effective use of appropriate referencing and footnoting techniques is absolutely necessary to increase the credibility of the document and fulfill the purpose of the presentation. Careful documentation shows that a research project has been thoroughly investigated. Referencing systems vary among scientific disciplines. Whatever system you use, be consistent and make each reference complete.

Project Reports

Most EPA research is documented and made available to the research community in a project report. Project reports are required when (1) neither a journal article nor an EPA research report is produced or (2) the journal article or EPA research report published is incomplete in terms of fully documenting the project or would require additional background data to survive rigorous scientific challenge. NTIS is the major distributor of project reports. Therefore, when preparing project reports, in addition to following "Report Specifications" found in Appendix B, use the following NTIS guidelines for all camera copy:

- Submit original camera copy on 8.5" x 11" white paper with black ink.
- Ensure that all computer printouts are highly legible originals.
- Number and account for all pages.
- Send the size you want reproduced; NTIS makes no reductions.
- If your report includes only one photo, clip the photo to the camera copy. If your report includes two or more photos, number the photos on the back and put a corresponding

number in the place in the text where you want the photo to go.

Project Summaries

The project summary is a condensed version of the project report. The length is usually two to eight pages of desktop-published copy (up to 21 double-spaced, draft word-processed pages). The project summary announces to the scientific and technical community the availability of the project report from NTIS. It is similar to a short journal article and contains enough information for the readers to determine if they are sufficiently interested in the project to purchase the complete report from NTIS. Therefore, the summary should present a concise synopsis of the key findings of the research project.

In the final draft of the summary, put principal findings, conclusions, tables, and figures that summarize significant results. In order of appearance, include the following:

- Title, identical to the title of the project report it summarizes. In the case of one project summary describing several closely related project reports, the title should be as closely linked as possible to the project report titles.
- Abstract—200 words
- Introduction
- Procedure
- Results and discussion
- Conclusions and recommendations

Use as few figures and tables as possible. If orientation of a photograph is questionable, indicate top of photograph on back side with soft-tip marker. Organize tables for maximum clarity and ease of interpretation. Use captions for all tables and figures and reference them in the text.

Even though a complete list of references is included in the project report, do not use references in a project summary unless you feel their inclusion is *essential* to the presentation. To prepare your document, follow "Project Summary Specifications" in Appendix B.

When the project summary final is completed, give the diskette copy *and* the camera copy or word-processed copy to the project officer.

Applications Guides

When many people need to apply a technology or method and when the only available information on the topic is dispersed over many sources, applications guides are cost-effective information products. They give directions to solve an environmental problem. In preparing them, use straightforward and precise language. To ensure that concepts or procedures are clear, use tabular material and graphic illustration as needed.

Three types of application guides are described:

- *A manual* is a comprehensive description of a new technology meant to solve an environmental problem. It guides the user through the creation, construction, and maintenance of a technology or technique.
- *A handbook* is a collection of information, statistics, data, and techniques that are accurate and relevant to a particular subject area.
- *A user's guide* explains and describes, step by step, how to employ an ORD-developed procedure, piece of equipment, model, or program.

Limit the contents of the work to that information required to inform the reader. Eliminate unnecessary details, appendices, and pages to reduce primary and secondary reproduction costs and to expedite review, approval, printing, and distribution.

Proceedings

A proceedings report is usually derived from the presentation of a paper and from the questions, answers, and general discussion at conference sessions.

If the paper has resulted from an EPA-funded project, include the following in a prominent location:

> ***This paper has been reviewed in accordance with the U.S. Environmental Protection Agency's peer and administrative review policies and approved for presentation and publication.***

To prepare a proceedings report, follow "Report Specifications" in Appendix B

Journal Articles

ORD encourages the publication of research results in the open scientific literature. In academia, government, and the private sector, the independent peer review achieved through the journal article publication process enhances scientific credibility and contributes to the establishment of scientific excellence. Each journal has its own style and requirements that must be observed when articles are prepared and submitted.

Book Chapters and Published Papers

Publication of research as a chapter in a volume addressing an area of environmental protection usually offers an author space not available in a journal article for the inclusion of additional data or information. Chapters also are used frequently to provide a review of the state of knowledge in a scientific or technical area of environmental importance.

Published papers or articles allow researchers to communicate at the peer level and attain visibility and credibility for EPA. A

paper is the written text of a presentation delivered before a scientific peer group. It becomes a published paper subject to EPA/ORD peer review if it will appear as one of the following:

- a preprint (a handout given before proceedings starts)
- a paper in another organization's proceedings
- an article in a non-peer-reviewed journal or book published outside of the Agency.

The book editor or the organization sponsoring the proceedings may provide instructions for chapter or paper preparation. If not, the section on "Report Specifications" in Appendix B provides useful instructions.

Environmental Research Briefs

The environmental research brief is a published product designed to keep the research and technical community abreast of current research status based on information resulting from EPA activities. To prepare your document, follow "Environmental Research Brief Specifications" in Appendix B.

Keep briefs as short as possible, four to eight pages of desktop-published copy (8-21 double-spaced, draft word-processed pages). Include tables and figures only if essential to the clarification of the text. Include only those references that focus on the topic of the brief.

Seminar Announcements

Brochures announcing a seminar are usually printed in landscape (horizontal) orientation on one of two paper sizes:

- 8.5- by 11-in., folded twice to provide three panels, or
- 8.5- by 14-in., folded three times to provide four panels.

Their preparation is described under "Brochures" in Appendix B.

Internal Reports

The internal report provides research information in response to a request from an EPA office. Format and layout may vary greatly—from a memo, to a set of aerial photographs, to a typical project report—depending on the request and urgency of the need.

United States
Environmental Protection
Agency

Office of Research and
Development
Washington DC 20460

EPA/600/R-93/011
October 1993

EPA

Radon Reduction Techniques for Existing Detached Houses

Technical Guidance

Figure 4-1. Sample cover.

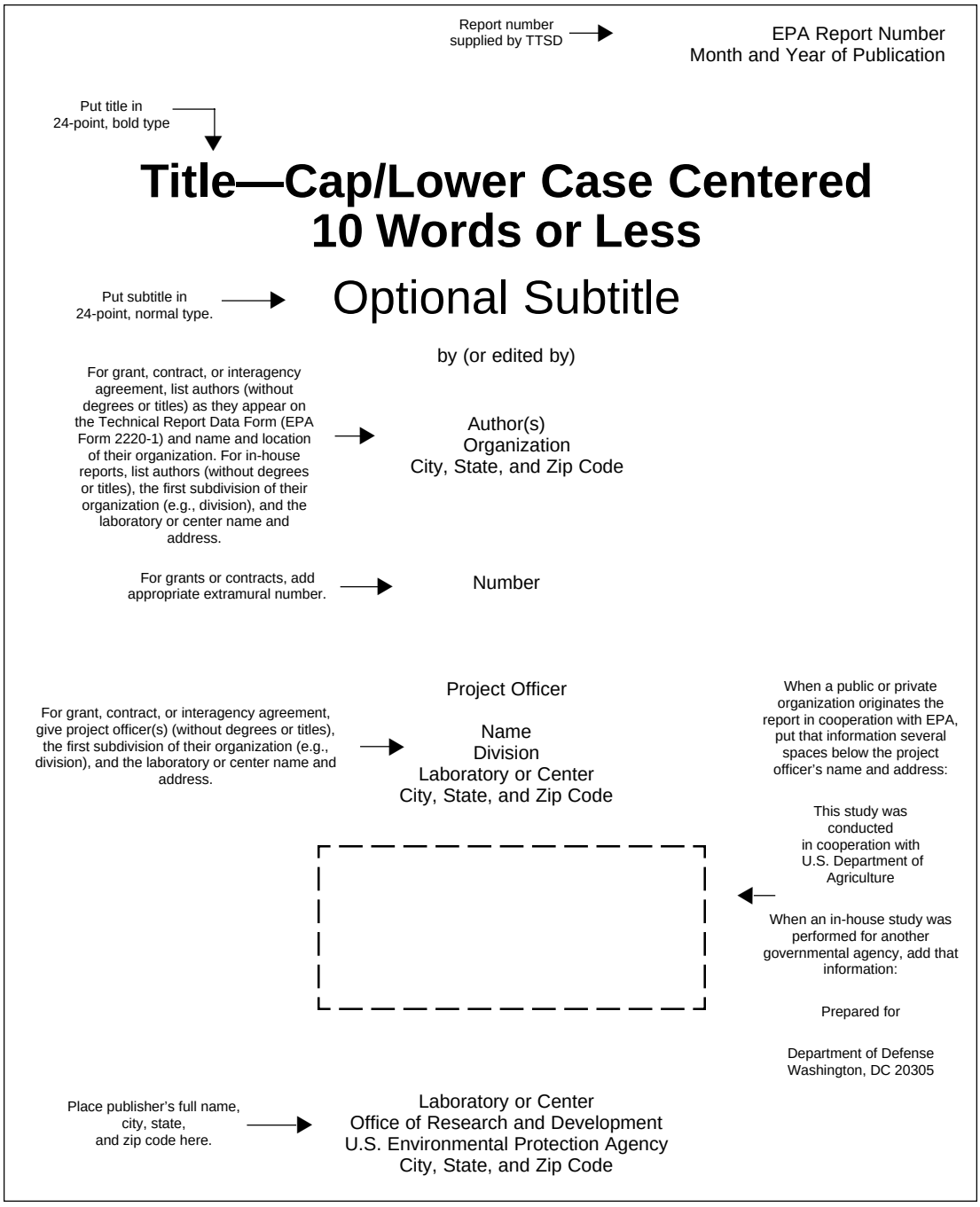

Figure 4-2. Sample title page.

Contents

Figure 4-3. Sample contents.

Figures

Figure 4-4. Sample list.

Acronyms and Abbreviations

A/C	Air-to-cloth (ratio)
acfh	Actual cubic feet per hour
acfm	Actual cubic feet per minute
acmh	Actual cubic meters per hour
APA	Air pathway analysis (or assessment)
APC	Air pollution control
APCD	Air pollution control device
ARAR	Applicable or relevant and appropriate requirements
BTEX	Benzene, toluene, ethylbenzene, and xylenes
Btu	British thermal units
BP	Boiling point
CAAA	Clean Air Act Amendments
CAS	Carbon adsorption system
CE	Control efficiency
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act

Figure 4-5. Sample acronyms and abbreviations.

Chapter 2
Display Head

Subhead 1
With regard to a frequently mentioned limitation, slowness, the reported coating removal rate for manual CO_2 pellet blasting ranges from 1.5 ft^2/min to 0.1 ft^2/min, depending on the substrate being stripped and the coating color (Ivey, 1990; Cundiff and Matalis, 1990). The net average strip rate on an F-16 aircraft was 0.189 ft^2/min per minute of nozzle time (0.13 ft^2/min with worker effectiveness factored in) (Ivey, 1990). The strip rate increased as the nozzle was widened. The Alclad™ surfaces pulled the net average down. The tested F-16 has 20% Alclad™ surfaces; other U.S. Air Force aircraft have up to 80% Alclad™ surfaces. Thus, strip rates will slow considerably on equipment with a higher percentage of Alclad™ surfaces.

Subhead 2
In fact, the process as tested cannot remove all the coating from Alclad™ surfaces. The Alclad™ surface left by CO_2 pellet blasting must be removed by another process to provide an adequate surface for recoating.

Held at chest level, the blast nozzle and hose weigh about 20 lb. When blasting underneath the aircraft, another 10 lb of thrust is added. In tests, workers traded off the duty to other workers every 15 min. The newer automated systems are easier to work with, strip faster, and are safer on sensitive materials because the optimal pressure and impingement angle can be maintained.

Subhead 3
Because of the simplicity of the equipment and the decreased cleaning time, there is a savings in labor costs when using ultrasonics. This savings along with that from decreased solvent purchase and disposal costs, offsets the capital cost of the equipment in a short time. Although costs vary for specific equipment, the cost for an ultrasonic cleaner console with a 25"x18"x15" chamber is approximately $10,000. A rinse console and dryer console would add about $4,000 each. Of course, smaller units can be obtained and existing tanks often can be used if a transducer is added.

The function of an inert atmosphere in the no-clean process is to create a solder wave upon which no permanent oxide film can form. The inert atmosphere thus eliminates the need for flux to clean the surface of the wave. There are two no-flux machine concepts on the market: open and closed. The open-concept machine, which employs flaps leading into a tunnel, will not reach the desired oxygen rate of under 10 ppm by continuous nitrogen flow alone. This system uses formic acid to reduce the oxygen level. Although this system has the advantage of mechanical simplicity, formic acid is potentially hazardous, and therefore is undesirable or, in some companies, prohibited. A closed system can prevent oxidation without the use of aggressive chemicals.

Figure 4 shows a typical configuration of the automated washer. Not all users require the multitude of compartments shown in the figure, and simpler versions of this unit can be manufactured. The process unit shown in the figure consists of a series of five compartments through which the soiled metal parts are transported. The parts are transported from one compartment to the next by a helical screw conveyor. The parts are sprayed successively with solutions from five holding tanks (one for each compartment).

Figure 4-6. Sample page of text.

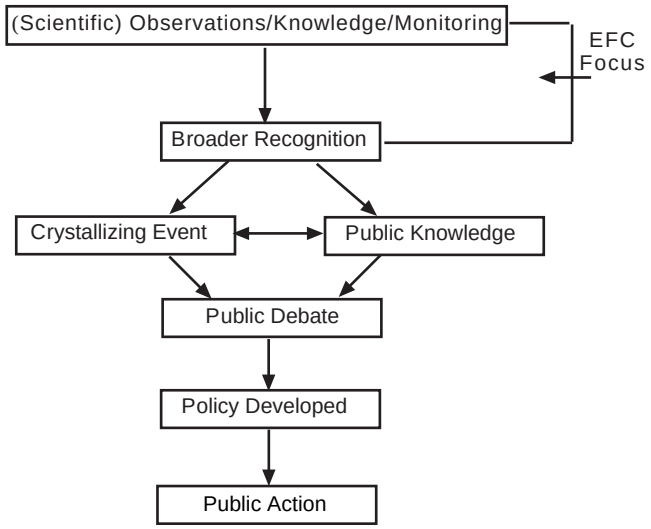

Figure C-1. Evolution of health and environmental issues.

Table 5-1. Reported Operating Capacities for Selected Organic Compounds (Source: Marzone and Oakes, 1973.)

Compound	Capacity [a]	VOCs	Carbon
Acetone	—	1,000	8
Benzene	—	10	6
n-Butyl acetate	—	150	8
n-Butyl alcohol	—	100	8
Carbon tetrachloride	10	10	—
Cyclohexane	—	300	6
Ethyl acetate	—	400	8
Isopropyl alcohol	400	8	—
Methyl acetate	—	200	7
Methyl alcohol	—	200	7
Methylene chloride	500	10	—
Methyl ethyl ketone	200	8	—
Methyl isobutyl ketone	100	7	—
Perchloroethylene	100	20	—
Toluene	—	200	7
Trichloroethylene	100	15	—
Trichlorotrifluoroethane	1,000	—	—
Xylene	—	100	10

[a] Adsorption capacities are based on 200 scfm of solvent-laden air at 100° F (per hour).

Figure 4-7. Samples of figure and table.

References

Journal

1. Binkley, Dan, and Thomas C. Brown. Forest practices as nonpoint sources of pollution in North America. *Water Resources Bulletin* 29 (5): 729-740 (1993).

2. Weihs, D., and R. D. Small. An approximate model of atmospheric plumes produced by large area fires. *Atmospheric Environment* 27A (1): 73-82 (1993).

Report

3. Richter, B. C., and C. W. Kreitler. *Identification of sources of ground-water salinization using geochemical techniques,* EPA/600/2-91/064. Cincinnati, OH: U.S. Environmental Protection Agency, 1991.

4. Vigon, B. W., D. A. Tolle, B. W. Cornaby, H. C. Latham, C. L. Harrison, T. L. Boguski, R. G. Hunt, and J. D. Sellers. *Life-Cycle Assessment: Inventory Guidelines and Principles,* EPA/600/R-92/245. Cincinnati, OH: U.S. Environmental Protection Agency, 1993.

Presentation

5. Abele, H. A. "Toward implementation of environmental policies." Paper presented at the *Environmental Challenge of the 1990s, International Conference on Pollution Prevention: Clean Technologies and Clean Products,* Washington, DC, June 10-13, 1990.

Book Chapter

6. Cohen, J. M., and Hannah, S. A. "Coagulation and flocculation." In *Water Quality and Treatment,* by American Water Works Association, Inc., New York: McGraw-Hill Book Co., 1971, 66-122.

Proceedings

7. Pauli, R. "Dry media paint stripping—eight years later." In *Proceedings of the 1993 DOD/Industry Advanced Coatings Removal Conference,* Phoenix, AZ, 1993.

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Figure 4-8. Sample references.

Bibliography

Baker, R. W., I. Blume, V. Helm, A. Kahn, J. Maguire, and N. Yoshioka. *Membrane research in energy and solvent recovery from industrial effluent streams.* DOE Report DE84016819. Idaho Falls, ID: DOE-INEL, 1984.

Chandrasekharan, M. P., and R. Rajagopalan. A multidimensional scaling algorithm for group layout in cellular manufacturing. *International Journal of Production Economics* 32 (1): 65-76 (1990).

Danielson, J. A., ed. *Air pollution engineering manual.* Cincinnati, OH: National Center for Air Pollution Control, U.S. Department of Health, Education and Welfare, 1967.

Lenssen, N. A new energy path for the third world. *Technology Review* 96: 43-51 (1993).

Marzone, R. R., and D. W. Oakes. Profitably recycling solvents from process systems. *Pollution Eng.* 5 (10): 23-24 (1973).

Monrozier, L. J., P. Guez, A Chalamet, R. Bardin, J. Martins, and J. P. Gaudet. Distribution of microorganisms and fate of xenobiotic molecules in unsaturated soil environments. *The Science of the Total Environment* 136: 121-133 (1993).

Pedersen, T., and J. Curtis. *Soil vapor extraction technology: Reference handbook*, EPA/540/2-91/003 (NTIS PB91168476). Cincinnati OH: U.S. Environmental Protection Agency, 1991.

Figure 4-9. Sample bibliography.

Appendices

Appendix A
Other Professional Sources

Style Manuals

American Mathematical Society. *AMS Author Handbook.* Providence, RI: AMS, 1995. (Call 401-455-4000 to order)

American National Standards Institute, Inc. *American National Standards for Writing Abstracts.* ANSI Z39.14-1979. New York, NY: ANSI, 1979. (This book is under revision. To order it or the next book, call 212-642-4900 or 212-764-3274.)

—*American National Standards for the Preparation of Scientific Papers for Written or Oral Presentation.* ANSI Z39.16-1979. New York, NY: ANSI, 1979.

American Society for Microbiology. *ASM Style Manual for Journals and Books.* Washington, DC: ASM, 1991. (To order this or the next book, call 202-737-3600.)

—*Manual of Clinical Laboratory Immunology*, 4th ed. Washington, DC: ASM, 1992.

The Chicago Manual of Style. 14th ed. Chicago, IL: University of Chicago Press, 1993. (Most widely used style and printing manual for commercial publishers. Contains most numbers and variety of examples and explanations of layout and format for content of publications, notes, bibliographies, setup of illustrations, figures, tables, and mathematical equations. To order call 312-201-0101.)

Council of Biology Editors, Inc. *Illustrating Science: Standards for Publication*. Bethesda, MD: CBE, 1984. (The address of CBE is 111 E. Wacker Dr. Suite 200, Chicago, IL 60601-4298. Phone: 312-201-0101.)

Council of Biology Editors. *Scientific Styles and Format: The CBE Style Manual for Authors, Editors, and Publishers*, 6th ed. Cambridge, U.K.: Cambridge University Press, 1994. (General scientific style and guidelines for the plant sciences, microbiology, animal sciences, chemistry and biochemistry, and geography and geology.)

Dodd, J. S. *The American Chemical Society Style Guide: A Manual for Authors and Editors.* Washington, DC: ACS, 1986. (Contains eleven references to handbooks on different kinds of chemical nomenclature; excellent source of information on ethical guidelines for publishing and on journals that publish about chemistry. Also includes information on electronic databases maintained by ACS for public access to the chemical literature.)

Garner, D., D. H. Smith, D. Cheney, and H. Sheehy. *The Complete Guide to Citing Government Information: A Manual for Writers and Librarians.* Bethesda, MD: Congressional Information Services, Inc., 1993. (Handbook used primarily by libraries to catalog government documents. To order call 301-654-1550.)

Hathwell. *Style Manual* . 4th ed. New York, NY: American Institute of Physics, 1990. (To order call 301-209-3100 or 1-800-809-2247.)

Michaelson, H. B. *How To Write & Publish Engineering Papers and Reports*. 4th ed. Phoenix, AZ: Oryx Press, 1990. (To order call 602-265-2651.)

Swanson, E. *Mathematics into Type*. Providence, RI: American Mathematical Society, 1979. (To order call 401-455-4000.)

Guides to Nomenclature and Presentation of Data

The Biochemical Society. *Biochemical Nomenclature and Related Documents*. London, UK: BS, 1978.

Buchanan, R. E., and N. E. Gibbons, eds. *Bergey's Manual of Determinative Bacteriology*. 9th ed. Baltimore, MD: Williams & Wilkins. 1993

Committee on Common Names of Insects. *Common Names of Insects and Related Organisms Approved by the Entomological Society of America*. College Park, MD: Entomological Society of America, 1982.

Committee on Names of Fishes. *A List of Common and Scientific Names of Fishes from the United States and Canada*. Bethesda, MD: American Fisheries Society, 1980.

Fasman, G. D., ed. *Handbook of Biochemistry and Molecular Biology*. 3rd ed. Vol 2. Cleveland, OH: CRC, 1976.

IUPAC Nomenclature of Inorganic Chemistry. 2nd ed. London, UK: Butterworths. 1971. (Distributor in the United States is Crane, Russak, New York, NY. The ISBN number is 008-021-999-3. A new edition is coming out.)

IUPAC Nomenclature of Organic Chemistry, Sections A, B, C, D, E, F, and H. Elmsford, NY: Pergamon, 1979.

IUPAC. Manual of symbols and terminology for physicochemical quantities and units. *Pure and Applied Chemistry* (1979) 51:1-41.

Jeffrey, C. *Biological Nomenclature*. 2nd ed. New York, NY: Crane, Russak, 1977.

Lapage, S. P., P. H. A. Sneath, E. F. Lessel, V. B. D. Skerman, H. P. R. Seeliger, W. A. Clark, eds. *International Code of Nomenclature of Bacteria. Bacteriological Code*. Washington, DC: American Society for Microbiology.

UNISIST Working Group on Bibliographic Data Interchange. *UNISIST Guide to Standards for Information Handling*. Paris, France: UNESCO, 1980. (Guide to international sources on preparation, production, editing, publication, reproduction, and exchange of documents, bibliographic data, document collections, and numerical data.)

Classic Texts on Writing in Technology and the Sciences

Day, R. A. *How to Write & Publish a Scientific Paper*. 4rd ed. Phoenix, AZ: Oryx Press, 1988. (Explanation of the IMRAD style of scientific writing as well as how to efficiently achieve it; written with excellent humorous examples. Handy references to commonly misused words and abbreviations in the appendices.)

Miller, C., and K. Smith. *The Handbook of Nonsexist Writing For Writers, Editors, and Speakers*. 2nd ed. New York, NY: HarperCollins, 1988. (Excellent lists of gender-neutral terms.)

Strunk, W., Jr., and E. B. White. *Elements of Style*. 3rd ed. New York, NY: The Macmillan Co., 1979. (Classic text explaining plain style, the basis of most scientific writing.)

Weston, A. *A Rulebook for Arguments*. 2nd ed. Indianapolis, IN: Hackett Publishing Co., 1992. (The ISBN number is 087-220-156-2.)

Appendix B
Specifications

Use These Specifications	For These Reports	Page
Report	Research Report Project Report Proceedings	27
Project Summary	Project Summary	29
Environmental Research Brief	Environmental Research Brief	31
Brochure	Seminar Announcement	33

Report Specifications

Measurements Are in Inches Unless Noted
Headings—Initial Caps
Margins—Left 0.625, Right 0.625, Top 0.875, Bottom 1
(Excluding Rule Header and Page Number)
Image Area—7.25 Wide X 10 Long

Cover 1—1 Column

Styles	Font: Univers or Helvetica	Size/Leading in Points	Position
Organizational Identification		9/10	
United			0.25 from top of page, 2.375 from flush left
Office of			0.25 from top of page, 4.625 from flush left
Report No.			0.25 from top of page, 6.825 from flush left
Title		30/31 Bold	1 from top of page, 2.375 from flush left
Subtitle		30	0.75 between title and subtitle 2.375 from flush left
EPA Logo		30	1 from top of page, 0.425 from flush left
ORD Identifier (Chevron)			2 above bottom of page
Line Art/Photo			Use available space as needed
EPA No. and Title on Spine		14/15 Bold	EPA No. and title should not exceed 10 horizontally; if so, use periods to indicate that there is more to the title

Title Page—1 Column

EPA Report No. and Date		10/11	l down from top of page, 0.75 from flush right, right justified
Title		24/25 Bold	Centered, 2.625 from top of page
Subtitle		24/25	Centered; 0.75 between title and subtitle
The word "By"		10/11	Centered, 0.625 from subtitle
Authors (if applicable)		10/11	Centered, 0.5 from By
Contract No. (if applicable)		10/11	Centered, 0.625 from last line of author ID
P.O. Name and Affiliation (if applicable)		10/11	Centered, 0.625 from contract no.
Organizational Identification		10/11	Centered, last line is 1.5 from bottom of page

Preliminary Pages—1 Column

Rule Header	Times or Helv.	1	Centered, 0.5 from top of page
Display Heads	Times or Helv.	14/15 Bold	Centered, 1.75 from rule
Text	Times or Helvetica	10/11	Left 1.25, right 1.25 First line of text 0.75 from last line of display head Justified Indent first line of paragraph 0.25

Report Specifications (continued)

Measurements Are in Inches Unless Noted

Text Pages

(2 Columns, Each 3.5; 0.25 Between Columns)

Styles	Font	Size/Leading in Points	Position
Rule Header		1	Centered, 0.5 from top of page
Page Number	Times or Helvetica	10/11	Centered below columns
Display Heads	Times or Helvetica	14/15 Bold	Centered, 1.75 from rule
Subhead 1	Times or Helvetica	12/13 Bold	Flush left
Subhead 2	Times or Helvetica	12/13 Bold, Italic	Flush left
Subhead 3	Times or Helvetica	10/11 Bold	Flush left
Subhead 4	Times or Helvetica	10/11 Bold Italic	Flush left
Body Text	Times or Helvetica	10/11	Justified, 0.375 from rule header to 0.5 above page number
Equations	Helvetica	10/11	Centered or aligned by equal signs; (equation number in parens, flush right)
References	Times or Helvetica	10/11	*Hanging indent* First line: flush left Other lines: indent 0.125 *With Number* Number: flush left Name: indent 0.25 Other lines: indent 0.25
Text Footnotes	Times or Helvetica	7/8	Superscript number flush left Other lines: indent 0.125 and justify 1.5-in. line above footnote

Figures and Tables

Figure Caption	Helvetica **(Figure No. Bold)**	8/9	Bottom of illustration, flush left
Figure Callouts	Helvetica	8/9	
Figure Notes and Credits	Helvetica	8/9	Following caption
Table Caption	Helvetica **(Table No. Bold)**	8/9	Top of table, flush left
Table	Helvetica	8/9	(One hairline rule below column heads and one at end of table)
Table Footnotes	Helvetica	8/9	Below rule line at end of table
Table Notes and Credits	Helvetica at end of table (before footnotes)	8/9	Flush left, immediately below rule

Project Summary Specifications

Measurements Are in Inches Unless Noted

Page Size—8.5 x 11
Font—Helvetica
Headings—Initial Caps
Page Number—Centered

Page Dimensions

First Page Margins

Left	3	Right	0.5
Top	0.5	Bottom	1

Additional Page Margins

Left	0.5	Right	0.5
Top	1	Bottom	1

Columns (3-Column Layout)

Column Width	2.312
Between Columns	0.25
First Page	No text in first column
Additional Pages	Text in 3 columns

Organizational Identification

	From Left Edge	*From Top Edge*
United States	3.125	0.5
Environmental Protection Agency	3.125	next line
Research and Development	3.125	1
Rule line above “Research and Development”	3	0.875
Rule line below “Research and Development”	3	0.0625
Laboratory Heading	5.625	0.5
Laboratory Location	5.625	next line
EPA Number and Date	5.625	1

Main Title

EPA Logo	1.625	1.375
Project Summary	3.125	1.375

Subtitle

Title	3.125	2
Authors	3.125	3.375
Text	3.125	4.375

Project Summary Specifications (continued)

Measurements Are in Inches Unless Noted

Styles	Size/Leading in Points	Position
Rule Header	1	Top of second and subsequent pages
Laboratory Heading	9/10	Flush left
Title	24/25 Bold	Flush left
Subtitle	24/25	Flush left
Authors	10/11	Flush left
Abstract	9/10 Bold	Justified, indent first line of paragraph 1 em space
EPA Blurb	9/10 Bold, Italic	Justified, indent first line of paragraph 1 em space
Body Text	9/10	Justified, indent first line of paragraph 1 em space
Subhead 1	11/12 Bold	Flush left
Subhead 2	11/12 Bold, Italic	Flush left
Subhead 3	11/12	Flush left
Subhead 4	11/12 Italic	Flush left
Bullet Paragraph (•)	9/10	Bullet: Indent 0.125 Paragraph: Indent 0.25
Hyphen Indent (-)	9/10	Hyphen: Indent 0.25 Paragraph: Indent .375
Reference	9/10	Reference: flush left Second line: Indent 0.25
Footnote	7/8	Superscript number flush left Other lines: indent 0.125 and justify 1.5-in. rule above footnote
NTIS Box	9/10 Italic	
Figure Head	8/9 Bold, Italic	Flush left below figure
Figure Callouts	8/9 Italic	
Table Head	8/9 Bold, Italic	Flush left above table
Tables	8/9 Italic (including footnotes)	One hairline rule below column heads and at end of table (above footnotes)
Equations	9/10	Flush left; (equation number in parens, flush right)

Environmental Research Brief Specifications

Measurements Are in Inches Unless Noted

Page Size—8.5 x 11
Font—Helvetica
Headings—Initial Caps Except for Main Title, Which Is All Caps
Page Number—Centered

Page Dimensions

First Page Margins

	Left	0.625	Right	0.625
	Top	0.5	Bottom	2.25

Additional Page Margins

	Left	0.625	Right	0.625
	Top	0.5	Bottom	1

Columns (2-Column Layout)

	Column Width	3.5
	Between Columns	0.25

Organizational Identification

		From Left Edge	*From Top Edge*
	Laboratory Heading	2.5	0.5
	Research and Development	2.5	1
	Rule line above “Research and Development”	3	0.875
	Rule line below “Research and Development”	3	0.0625
Title	EPA Logo	0.625	1.5
	Environmental Research Brief	2.5	1.5
	Rule line below “Environmental Research Brief”	2.5	2.125
Subtitle	Title	Centered on page	2.75
	Authors	Centered on page	3.5
	Text	0.625	3.825

Environmental Research Brief Specifications (continued)

Measurements Are in Inches Unless Noted

Styles	Size/Leading in Points	Position
Rule Header	1	Top of second and subsequent pages
Laboratory Heading	9/10	Flush left
Title	36/38 Bold	Flush left, ALL CAPS
Subtitle	14/16	Centered
Authors	11/12	Centered
Body Text	9/10	Justified,
Subhead 1	11/12 Bold	Flush left
Subhead 2	11/12 Bold, Italic	Flush left
Subhead 3	11/12	Flush left
Subhead 4	11/12 Italic	Flush left
Bullet Paragraph (•)	9/10	Bullet: Indent 0.125 Paragraph: Indent 0.25
Hyphen Indent (-)	9/10	Hyphen: Indent 0.25 Paragraph: Indent .375
Reference	9/10	Reference: flush left Second line: Indent 0.25
Footnote	7/8	Superscript number flush left Other lines: indent 0.125 and justify 1.5-in. line above footnote
Figure Head	8/9 Bold, Italic	Flush left below figure
Figure Callouts	8/9 Italic	
Table Head	8/9 Bold, Italic	Flush left above table
Tables	8/9 Italic (including footnotes)	One hairline rule below column heads and at end of table (above footnotes)
Equations	9/10	Flush left; (equation number in parens, flush right)

Brochure Specifications

Measurements Are in Inches Unless Noted
Headings—Initial Caps
Page Dimensions—8.5 x 11 (3 Panels) or 8.5 x 14 (4 Panels)
Panel Margins—Left 0.25, Right 0.25, Top 0.75, Bottom 0.875
Column Width—Not to exceed 3
Font—Helvetica

Cover Panel

Styles	Size/Leading in Points	Position
Organizational Identification	8/9	
United		0.25 from top of panel, 1 from flush left
Office or Laboratory		1 from top of panel, 1 from flush left
First Rule	1	1.25 from top of panel, 1 from flush left
Technology Transfer		1.25 from top of panel, 1 from flush left
Second Rule	1	1.375 from top of panel, 1 from flush left
Title	18/19 Bold	1.625 from top of panel, 1 from flush left 2.375 from flush left
EPA Logo	18	1.625 from top of panel, 0.25 from flush left
ORD Identifier		2 above bottom of panel

Text Panels

Heading	10/11 Bold	Flush left
Text	8/9	