

DOCUMENT RESUME

ED 165 737

IR 006 574

AUTHOR Tenopir, Carol; Cibbarelli, Pamela  
 TITLE An Environmental Library System.  
 PUB DATE 78  
 NOTE 23p.; Paper presented at the annual meeting of the  
 Special Libraries Association (Kansas City, Missouri,  
 June 1978); Some figures are of minimal legibility

EDRS PRICE MF-\$0.83 HC-\$1.67 Plus Postage.  
 DESCRIPTORS \*Environment; Federal Government; \*Government  
 Libraries; \*Information Systems; \*Library Planning;  
 Manuals; Research Libraries; Special Libraries

ABSTRACT

An environmental library system (ELS) for the United States Department of Housing and Urban Development has been developed and installed in six HUD offices to bring together all nationwide and local environmental source materials in an information system with comprehensive cataloging and computer-assisted access. The accompanying manuals indicating how to use the various sources needed to answer environmental questions comprise one of the basic elements of the system, which also includes question guides, the collection itself, and a card catalog. (Author/JVP)

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AN ENVIRONMENTAL LIBRARY SYSTEM

by

Carol Tenopir

and

Pamela Cibbarelli

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# AN ENVIRONMENTAL LIBRARY SYSTEM

BY

CAROL TENOPIR AND PAMELA CIBBARELLI  
CIBBARELLI AND ASSOCIATES

## Introduction

To comply with the National Environmental Policy Act of 1969, in the early 1970's the Department of Housing and Urban Development instituted environmental review procedures for all proposed HUD projects. HUD field offices that had been traditionally geared toward building and development were suddenly required to form environmental assessment divisions and to provide a staff to perform environmental surveys of every proposed project. The ECO 2/3 form, *NORMAL AND SPECIAL ENVIRONMENTAL CLEARANCE FOR SUBDIVISION AND MULTI-FAMILY PROJECTS*, (See Figure 1) was designed to rate the environmental suitability of each project site and to determine if an Environmental Impact Statement was required. An Environmental Clearance Officer (ECO) was appointed in every HUD field office to coordinate local environmental surveys and EIS writing, and to oversee the appointed review staff.

Unfortunately, field office budgets and personnel allocations did not expand with these increased responsibilities. The ECO and his staff generally had these environmental duties added on to their old responsibilities of processing and appraising proposed projects. The principal background of the HUD staff members who were charged with the responsibility of doing the environmental review usually

consisted of experience in real estate appraisal and did not include either education or experience in environmental impact assessment. The staff thus lacked the knowledge, training and enthusiasm for their new environmental duties.

These review personnel were also hampered by a lack of a knowledge of source works that could answer many of their questions and provide the documentation necessary for an adequate environmental review of each project area.

Improperly rated ECO 2/3 forms or a lack of verifiable source documentation on the forms soon became a serious problem. A review of ECO 2/3 forms submitted in 1974 revealed a majority of "A" ratings on all environmental issues, with "site analysis" overwhelmingly given as the source/documentation justification for this rating.

"A" ratings of a site's geologic suitability or a project's impact on all aspects of the environment would be hard to justify in a lawsuit when these ratings were totally based on a site visit by a non-specialist reviewer. The Department of Housing and Urban Development feared that many of the environmental ratings for new building projects were not properly documented, could not be legally verified, or were perhaps even in error. The quality and completeness of Environmental Impact Statements prepared at HUD offices was also an area of concern. No standard procedures or guidelines existed for the preparation of an EIS.

To improve the quality of all environmental documentation and review procedures in HUD field offices across the nation, and to examine HUD's circular 1390.1, *HANDBOOK OF DEPARTMENTAL POLICIES, RESPONSIBILITIES AND PROCEDURES FOR PROTECTION AND ENHANCEMENT OF ENVIRONMENTAL*

QUALITY, a series of contracts were awarded. These contracts served to assess and clarify HUD's environmental policies, to develop standardized review procedures, and to design a training program with documentation support for HUD's environmental personnel.

Under the first of these contracts, Alan M. Voorhees and Associates, Inc. issued the *INTERIM GUIDANCE MANUAL FOR ENVIRONMENTAL ASSESSMENT* in December 1974. This manual serves:

"to provide assistance in the environmental review of all proposed projects, as required under the National Environmental Policy Act of 1969" and "to facilitate environmental clearance in accordance with HUD's environmental policies in general, and in support of HUD Environmental Handbook 1390.1. The manual also has the flexibility to be used in a technical environmental assessment under various administrative procedures."\*

The Voorhees report identified the major areas of environmental concern--the components of an environmental review or EIS. These components were then further subdivided into subcomponents that addressed all ramifications of the various environmental issues that need to be considered in a project analysis. (See Figure 2) The Components and Subcomponents of the Environment provided a comprehensive orderly breakdown of the areas to be covered in an EIS or environmental review. Additionally, guidelines for and definitions of A+ through C- review grades for each component were provided in the *INTERIM GUIDANCE MANUAL*.

The problem of adequate source/documentation was not solved by the Voorhees report, however. Untrained HUD field office personnel still needed to be made aware of the numerous resources available to them to

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\*HUD memorandum from the HUD working group on Environmental Guidelines Research. January, 1975.

FIGURE 2

VOORHEES - HUD SUBCOMPONENTS OF THE ENVIRONMENT

Subcomponent No. - Classification (shelf) No.

1. GEOLOGY

- 1.1 Unique Features
- 1.2 Mineral Resources
- 1.3 Slope Stability/Rockfall
- 1.4 Depth to Impermeable Layers
- 1.5 Subsidence
- 1.6 Consolidation
- 1.7 Weathering/Chemical Release
- 1.8 Earthquakes/Vulcanism

2. SOILS

- 2.1 Slope Stability
- 2.2 Foundation Support
- 2.3 Shrink-Swell
- 2.4 Frost Susceptibility
- 2.5 Liquefaction
- 2.6 Erodibility
- 2.7 Permeability

3. SPECIAL LAND FEATURES

- 3.1 Sanitary Landfill
- 3.2 Wetlands
- 3.3 Coastal Zones/Shorelines
- 3.4 Mine Dumps/Spoil Areas
- 3.5 Prime Agricultural Land

4. WATER

- 4.1 Hydrologic Balance
- 4.2 Ground Water
- 4.3 Ground Water Flow Direction
- 4.4 Depth to Water Table
- 4.5 Drainage/Channel Form
- 4.6 Sedimentation
- 4.7 Impoundment Leakage and Slope Failure
- 4.8 Flooding
- 4.9 Water Quality

5. BIOTA

- 5.1 Plant and Animal Species
- 5.2 Vegetative Community
- 5.3 Diversity
- 5.4 Productivity
- 5.5 Nutrient Cycling

6. CLIMATE AND AIR

- 6.1 Macro-Climate Hazards
- 6.2 Forest and Range Fires
- 6.3 Heat Balance
- 6.4 Wind Alteration
- 6.5 Humidity and Precipitation
- 6.6 Generation and Dispersion of Contaminants
- 6.7 Shadow Effects

7. ENERGY

- 7.1 Energy Requirements
- 7.2 Conservation Measures
- 7.3 Environmental Significance

8. SERVICES

- 8.1 Education Facilities
- 8.2 Employment
- 8.3 Commercial Facilities
- 8.4 Health Care/Social Services
- 8.5 Liquid Waste Disposal
- 8.6 Solid Waste Disposal
- 8.7 Water Supply
- 8.8 Storm Water Drainage
- 8.9 Police
- 8.10 Fire
- 8.11 Recreation
- 8.12 Transportation
- 8.13 Cultural Facilities

9. SAFETY

- 9.1 Structures
- 9.2 Materials
- 9.3 Site Hazards
- 9.4 Circulation Conflicts
- 9.5 Road Safety and Design
- 9.6 Ionizing Radiation

10. PHYSIOLOGICAL WELL-BEING

- 10.1 Noise
- 10.2 Vibration
- 10.3 Odor
- 10.4 Light
- 10.5 Temperature
- 10.6 Disease

11. SENSE OF COMMUNITY

- 11.1 Community and Organization
- 11.2 Homogeneity and Diversity
- 11.3 Community Stability and Physical Characteristics

12. PSYCHOLOGICAL WELL-BEING

- 12.1 Physical Threat
- 12.2 Crowding
- 12.3 Nuisance

13. VISUAL QUALITY

- 13.1 Visual Content
- 13.2 Area and Structure Coherence
- 13.3 Apparent Access

14. HISTORIC AND CULTURAL RESOURCES

- 14.1 Historic Structures
- 14.2 Archaeological Sites and Structures

15.0 Publication Lists/Bibliographies

16.0 Laws/Standards

17.0 Directories

18.0 General Reference Works

facilitate accurate environmental assessment, and a coordinated training effort was needed. Determination of the best of these resources and provision of them to HUD field offices with instructions on their use was also necessary to ensure improved quality of HUD's environmental assessments.

In 1975, Environmental Systems Research Institute of Redlands, California, contracted with the Department of Housing and Urban Development to design an environmental information system for HUD field offices. Six prototypes of this system were to be set up around the country. Cibbarelli and Associates, library consultants, served as subcontractors to ESRI in the design and implementation of this system. A later contract called for training of HUD personnel in the establishment and use of the environmental information system.

The Environmental Library System designed by ESRI and Cibbarelli and Associates consists of four basic elements. These elements are:

- (1) Questions Guides
- (2) Environmental Library Collection
- (3) Card Catalog
- (4) Information Use Guide

Together these elements form a comprehensive environmental information and use system.

#### Question Guides

The *QUESTION GUIDES* identify specific pieces of information that are required for environmental impact assessment and point the user to the existing source or sources that will best provide that information.

One *QUESTION GUIDE* follows the exact organization of the ECO 2/3 form. (See Figure 3) The *ECO 2/3 QUESTION GUIDE* addresses in turn each issue raised in the ECO 2/3 form and analyzes in depth what type of information is necessary to sufficiently cover each issue. The *QUESTION GUIDE* anticipates the questions that must be answered in the course of a normal or special environmental clearance. The reviewer is led to the answer of the anticipated questions by the identification of information requirements necessary for a full answer. Information sources (i.e. agencies or persons where these information requirements can best be met) are given for each breakdown. Finally, the generic type of information item that will answer the detailed questions, supply the information requirements, and is available from the stated information source is listed. These generic information items or General Names, are also listed in the library card catalog. In each office's library card catalog the specific items in that collection or the local phone number of the pertinent agency that pertains to each General Name are given. The *ECO 2/3 QUESTION GUIDE* is thus applicable to all HUD offices nationwide, while the General Name drawer in each unique library makes it geographically specific.

The *EIS QUESTION GUIDE* is arranged to follow the Voorhees Components and Subcomponents of the Environment. Similar to the *ECO 2/3 QUESTION GUIDE*, the *EIS QUESTION GUIDE* anticipates the questions that must be answered in the course of an environmental review, this time for an Environmental Impact Statement. (See Figure 4) The reviewer is led to the answer of each detailed anticipated question by the

# ECO 2/3 QUESTION GUIDE

## ECO 2/3 Section: SITE SUITABILITY ANALYSIS

Subject: Groundwater (C-5)

### Primary Concerns:

Is the site subject to rapid water withdrawal problems which change the depth or character of the water table, affect water supply, and affect "water table fluctuation"?  
 Does a high seasonal water table limit the function of septic tank systems?

Questions	Information Requirements	Primary Sources	General Names (Data Items)	Notes
<p><b>Initial Screening</b></p> <p>1) Will the water supply for the proposed project come from groundwater sources on or near the site?</p>	<p>1. Source of water supply for project</p>	<p>Applicant</p> <p>Local Water Supply Agency</p>	<p>Application Forms</p> <p>Water Supply Studies/Plans</p>	
<p>2) Is the area in which the project is located subject to a shortage of groundwater supplies due to overdraft of the aquifer?</p>	<p>1. Current and projected number of wells and rates of groundwater withdrawal; safe annual and sustained yield of aquifer</p>	<p>U.S. Geological Survey</p> <p>State Geological Survey</p> <p>Local Water Supply Agency</p>	<p>Hydrologic Reports/Maps (USGS)</p> <p>Hydrologic Reports/Maps (State)</p> <p>Groundwater Studies</p> <p>Water Supply Studies/Plans</p>	

# QUESTION GUIDE



Environmental Component: 50115

Subject: Slope Stability

Primary Concern:

Will there be a risk of losses due to slope instability caused by the project?  
 Will the project be exposed to dangers from slope instability?

Questions	Information Requirements	Primary Sources	General Names (Data Items)	Notes
<p><u>Initial Screening</u></p> <p>1) What is the general nature of the soils in the area in which the site is located?</p>	<p>1. Location of site</p> <p>2. Soil types and uniform soil classification system designations</p>	<p>Applicant</p> <p>U.S. Soil Conservation Service</p>	<p>Application Forms</p> <p>Preliminary Site Plans</p> <p>Preliminary Sub-division Plans</p> <p>Soil Surveys (Published)</p> <p>Soil Surveys (Unpublished)</p> <p>Site Evaluations</p>	
<p>2) What is the nature of the slopes included on the site?</p>	<p>1. Nature of the existing slopes; identification of slope heights and angles</p>	<p>U.S. Geological Survey</p> <p>Applicant</p>	<p>Topographic Quadrangle Maps (USCS)</p> <p>Preliminary Site Plans</p>	

identification of information requirements necessary for a full answer. Principal sources of the information requirements are given, and the General Names for the types of information items that will best answer the stated breakdown are also given. The EIS preparer then goes to the General Name drawer in his office library collection to find which geographically specific items are available to meet his needs. All environmental review issues are covered in depth in the *EIS QUESTION GUIDE*, providing a format and complete source book for the preparation of an EIS.

Both the *EIS QUESTION GUIDE* and the *EIS QUESTION GUIDE* have been written to provide a detailed structure for information collection for environmental assessment. They can both be used by themselves, but are most fully used in conjunction with the other elements of the Environmental Library System that are more specific to each geographic area.

#### Environmental Library Collection

The Environmental Library Collection consists of books, maps, reports, etc. which are of demonstrated application to environmental assessment in the geographic area covered by each Environmental Library.

The choice of the best, most specific, and least complex information to be included in each library was a monumental task. Much available information is not prepared specifically for use in an environmental assessment process. It is usually prepared by a specialist for use by another specialist, and is not commonly interpreted for use by persons unfamiliar with the subject area covered.

This is beginning to change, however, and interpreted reports designed for use by planners and others involved in the land use regulation process are becoming more common. Identification of the best materials that can be used by non-environmental specialists for every environmental concern was accomplished for this project.

Some materials provide needed information that is not and does not need to be location specific (i.e., standards, procedures, primers, etc.). These non-geographic materials are usable, consistent, and specifically identifiable in all areas of the country. These nationwide sources are to be included in every environmental library. The Data Bank Acquisition Notes in the *INSTALLATION AND MAINTENANCE MANUALS* provide detailed and specific ordering, updating, and storage information for each of the important, non-geographic sources. (See Figure 5)

A majority of the needed information is location specific. Though the same general type of information is often available for many areas, the specific titles and authors of the item containing that information, the format in which the information is presented, the technical level, and the completeness of the descriptions is highly variable. The Data Bank Acquisition Notes for these variable sources are keyed to the General Name for each type of necessary information. (See Figure 6) The best source to obtain each geographically specific item, the acquisition priority, and time required for acquisition are also given. Every general type of

DATA BANK ACQUISITION NOTES  

General Name: AIR POLLUTION EMISSION FACTORS

Specific Citation: U.S. Environmental Protection Agency, Compilation of Air Pollution Emission Factors (Revised), Washington, D.C., U.S. Government Printing Office, 1975.

Format: Report

Suggested Storage Method: Shelf

Update Requirements: Basic volume will not change. Supplements with emission factors for additional industrial processes are published on an irregular basis.

Acquisition:

Acquisition Priority: Essential

Time Required For Acquisition: More than one month.

Cost: \$4.85 (USGPO); \$1.25 (NTIS).

Source:

Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20402  
(See Appendix L, Pg. L-V-1)

Alternative Source:

National Technical Information Service  
5285 Port Royal Road  
Springfield, Va. 22161  
(703) 321-8543

Procedures: The most rapid method of acquisition is to obtain the item from a U.S. Government Bookstore. If a U.S. Government Bookstore is located in local area, item may be available for purchase in person at the bookstore. If a deposit account has been established with the U.S. Government Printing Office, item may be ordered from the bookstore over the phone and billed to the account number. Mail order of item can also be made from bookstore by enclosing check (to "U.S. Government Printing Office") or deposit account number. USGPO Stock No. and/or Catalog No. and full title of book should be included in all mail orders.

Item is available for purchase from U.S. Government Printing Office, Washington, D.C. If a deposit account has been established, item may be ordered by mail and billed to the account number. If no account has been established, item can be ordered by enclosing check (to: "U.S. Government Printing Office"). Include full title of item and USGPO Stock No. or Catalog No. with all mail orders.

Item is available for purchase from National Technical Information Service. Item can be ordered by enclosing check (to: "National Technical Information Service") and including full title and NTIS Stock No. NTIS deposit account can be established to allow telephone order of item.

USGPO Catalog No. EP4.9:42/2REP

NTIS Stock No. PB223996

DATA BANK ACQUISITION NOTES  

General Name: CLIMATOLOGICAL DATA (LOCAL)

Specific Citation: (Locally Variable)

Format: Text

Suggested Storage Method: Shelf

Update Requirements: Annual

Acquisition:

Acquisition Priority: Essential

Time Required For Acquisition: Two weeks or less.

Cost: \$0.20/each.

Source:

Alternative Source:

National Climatic Center  
Federal Building  
Asheville, N.C. 28801  
(704) 258-2850

Procedures: Telephone National Climatic Center to determine names of weather stations in area which have annual summary reports. Reports can be ordered during this call and billed to requestor. Summaries are prepared annually and must be reordered each year.

information that does not rapidly get out-of-date and that is necessary to form a complete environmental assessment library is covered in the Data Acquisition Notes.

The only items not covered in the notes and not in the Environmental Library Collection are those items too rapidly outdated or too voluminous to be included in the in-house collection. These information items are most efficiently retrieved or cited by a telephone call to the appropriate agency. A *LOCAL CONTACT DIRECTORY*, providing phone numbers of the local agencies that can best answer environmental source needs for information not shelved in-house is included in each library. This directory provides the phone numbers of the agencies that have been identified in a Master List of Out-of-House Items (See Figure 7) as the best sources for each General Name information not covered in the Data Bank Acquisition Notes. Either specific items in the library collection or phone numbers of source people are thus included in the environmental library for every General Name cited in the *QUESTION GUIDES*.

#### Card Catalog

The key to the library collection and guide to the proper specific document or source person to answer each information need is, of course, the card catalog.

The Environmental Library System catalog is unique in that it combines a traditional subject, author-title indexing of in-house materials with a General Name reference file of all in and out-of-house items necessary to complete an environmental assessment.

FIGURE 7  
MASTER LIST (OUT OF HOUSE ITEMS)

General Name: PUPIL GENERATION RATES  
Call Number: OUT OF HOUSE  
Primary Source: Local School District  
Alternate Source: Local Planning Department  
Subjects: Educational facilities, Population studies

Use Guide Page: 2-96

General Name: RECREATIONAL PROGRAMS AND FACILITIES INFORMATION  
Call Number: OUT OF HOUSE  
Primary Source: Local Parks and Recreation Department  
Alternate Source: Individual Park or Recreational Facility  
Subjects: Recreational facilities

Use Guide Page: 2-97

General Name: RESPONSE TIME DATA - FIRE  
Call Number: OUT OF HOUSE  
Primary Source: Local Fire Department  
Alternate Source:  
Subjects: Fire protection

Use Guide Page: 2-98

General Name: RESPONSE TIME DATA - LAW ENFORCEMENT AGENCIES  
Call Number: OUT OF HOUSE  
Primary Source: Local Law Enforcement Agency  
Alternate Source:  
Subjects: Police services

Use Guide Page: 2-99

General Name: REVENUE DATA FOR HUNTING AND FISHING  
Call Number: OUT OF HOUSE  
Primary Source: State Fish and Game Department  
Alternate Source:  
Subjects: Revenue, Recreational facilities

Use Guide Page: 2-100

The catalog consists of:

- (1) Subject file that offers retrieval of both in and out-of-house materials through a variety of assigned subject headings. The subject headings were developed to use language requiring no expertise in the field, and with numerous see references to direct the user to the appropriate term and material.
- (2) Author-title file including government agencies, corporations, and individuals responsible for each item. Titles, subtitles and series titles are all included. Because so many of these publications have the same, similar, or hard-to-determine authors and because author is not a critical factor in this complete system, title was chosen as main entry.
- (3) General name file intended for use with *QUESTION GUIDES*. They describe the broad type of material each item represents. As a whole, they represent all the types of information necessary to complete a comprehensive environmental assessment.
- (4) Shelf list, the standard call number order librarian's file.

Each card in the catalog lists title, multiple authors, imprint information, subjects, general names, geographic area covered in this specific work, corresponding *USE GUIDE* page number, and call number.

(See Figure 8)

United States. Department of Agriculture. Soil Conservation Service

1.4 Soil Survey: Western Riverside Area,  
002 California.

United States. Department of Agriculture. Soil Conservation Service; United States. Department of the Interior. Bureau of Indian Affairs, et.al  
USDA, USDI, UC, Agriculture Experiment Station, 1971.

SUBJECTS: Soils, Land use.  
GEN. TITLE: Soil Surveys (Published).  
AREA: Riverside County.  
USE GUIDE PAGE: 1-54

LAND USE

8.11 Outdoor Recreation Space Standards.  
001 United States. Department of the Interior.  
Bureau of Outdoor Recreation.  
Washington, D.C.: USGPO, 1967.

SUBJECTS: Recreational facilities, Land use.  
GEN. TITLE: Outdoor Recreation Space Standards.  
AREA: Total Coverage.  
USE GUIDE PAGE: 1-47.

SOIL SURVEYS (PUBLISHED) - RIVERSIDE COUNTY

1.4 Soil Survey: Western Riverside Area,  
002 California.

United States. Department of Agriculture. Soil Conservation Service; United States. Department of the Interior. Bureau of Indian Affairs, et.al  
USDA, USDI, UC, Agriculture Experiment Station, 1971.

SUBJECTS: Soils, Land use.  
GEN. TITLE: Soil Surveys (Published).  
AREA: Riverside County.  
USE GUIDE PAGE: 1-54

The first line of the call number corresponds to the Subcomponents of the Environment. The shelf arrangement and *EIS QUESTION GUIDE* arrangement thus coincide. An accession number forms the second line and a series identifier third line is added if necessary.

Specific procedures and directions for cataloging, classifying and maintaining each Environmental Library are included in the *INSTALLATION AND MAINTENANCE MANUAL*. An author-authority list and subject thesaurus are also given. Clerical instructions for the creation of catalog cards are included, although the catalog cards for the six prototype libraries were generated with computer software designed for this project. This software is available to other agencies wishing to set up an Environmental Library System, but the HUD contract specifically called for a system that could be created and maintained manually.

The card catalog can be used by anyone in each HUD office-- knowledge and use of the *QUESTION GUIDES* are not required. Numerous traditional subjects and author-titles provide library access to anyone interested in any aspect of the environment.

#### Information Use Guide

The final element of the Environmental Library System is the *INFORMATION USE GUIDE*. A reviewer may not always know how to use the item he has retrieved to answer his environmental concern. Catalog cards for each in and out-of-house item carry the corresponding *USE GUIDE* page number to lead the reviewer to help. The *INFORMATION USE GUIDE* provides instructions on the use of every general type of information

in the system. (See Figure 9) These instructions include a general description of the source and terms or tools that will help when using it. Use notes, specific applications, directions for finding the needed information, and technical assistance available to ease use of the item are all included. Instructions are included for all specifically cited documents, as well as the geographically varying broad types of information.

The *INFORMATION-USE GUIDE* thus bridges the gap between subject specific information sources and users not trained in the subjects.

### Conclusion

Together the four elements of the Environmental Library System form a comprehensive and localized environmental documentation center that:

- Breaks down each subcomponent of the environment and ECO 2/3 reference into the questions that must be answered to create a satisfactory environmental review
- Inventories the information necessary to be gathered to answer each question
- Identifies information source people or agencies where such information can best be found
- Cites specific source documents that best answer each identified information need at the national level
- Determines general types of documents available locally that will best answer all specific local level questions
- Provides instructions on how to use all sources
- Designs an Environmental Library System (ELS) that can be installed in any office concerned with environmental assessment

# INFORMATION ITEM USE NOTES

Item Name: AIR POLLUTION EMISSION FACTORS

**Specific Citation:**

U.S. Environmental Protection Agency, Compilation of Air Pollution Emission Factors (Revised), Washington, D.C., U.S. Government Printing Office, 1975.

**General Description:**

This report provides typical emission rates for various types of pollution producing industry and land uses. The emission data were obtained from source tests, material balance studies, engineering estimates, etc. Emission factors cover most of the common emission categories. When no source-test data are available, these factors can be used to estimate the quantities of primary pollutants (particulates, CO, SO<sub>2</sub>, NO<sub>x</sub> and hydrocarbons) being released from a source or source group. As new data become available they will be issued as chapters or sections for inclusion in this report. To facilitate these additions, the report is in a punched, loose-leaf format. The lower left or right hand corner of each page of the report bears a notation that indicates the date the information on the page was issued.

**Useful Terms:**

Most important terms are defined in the chapters and sections where they are discussed. Some chapters (e.g., Chapter 3) have special introductory sections in which key terms are defined.

**Useful Tools:**

- Calculator for quantitative work.
- Set of conversion tables (English to metric, units to units).
- Specification of pollution sources important in project evaluation.

**Use Notes:**

This document is designed for ready use in estimating the quantities of pollutants emitted by a source which has not been actually tested.

Before using any of these data, READ THE INTRODUCTION, pages 1 and 2. This introduction explains the idea behind this report and points out some precautions to observe in using the emission factors.

One can identify the activity of interest most easily by scanning the table of contents, pages v to xiii. Having identified the activity, the appropriate chapter and section can be identified.

Each chapter usually begins with a brief account of the nature of the process or activity for which emission factors are to be presented. Then a section on emissions and controls often follows. And finally, in almost every case, a table or several tables are presented with the emission factors for the process (i.e., particulates in pounds per ton of raw material used). In a few cases very precise formulae for calculation are also given.

Sections generally conclude with references to literature sources which document the emission factors presented.

# INFORMATION ITEM USE NOTES



Item Name: SOLID WASTE STANDARDS (STATE)

## General Description:

These standards are typically found in the State Government Code. They deal with a wide variety of topics covering all aspects of solid waste management. Standards are formulated for type and size of containers, size and location of storage areas, minimum frequency of collection. Criteria for design, construction and operation of sanitary landfills is also included.

## Useful Terms:

Specialized terms will be defined in the standards, usually grouped together under the heading, "Definitions".

## Useful Tools:

## Use Notes:

It may be helpful to review the standards and underline or note the sections dealing with residential developments. This will assist in easy reference to the pertinent sections.

## Specific Applications:

1. Compliance with State Standards: Where State standards for residential solid waste disposal have been formulated, compare the state standards with the proposed project design. These will likely focus on types of containers, and size and location of storage areas. Also, compare State standards for solid waste collection and disposal with service levels and facilities of the solid waste disposal agency serving the project. (i.e., frequency of collection, size and operation of disposal site, etc.)

## Technical Assistance:

The local Solid Waste Disposal Agency (public or private) is the prime source of technical assistance with regard to local levels of service. The State Pollution Control Agency (Solid Waste) can provide assistance on standards.

- Provides detailed instruction on local establishment of the ELS
- Explains how to use all components of the ELS
- Establishes maintenance procedures for the continuation of the system

Although designed for the Department of Housing and Urban Development, the ELS can be specifically applied to many environmental agencies and situations. It combines the detailed analysis of environmental concerns and the specific identification of the best source works with a non-technical approach and instructions on the use of all sources. It has been designed to help many agencies in the continued improvement of environmental quality and documentation.