S O L I D W A S T E M A N A G E M E N T

Abstracts from the Literature, 1974--1978

HAZARDOUS WASTE

This bibliography (SW-756) from the SWIRS data base was compiled by Ronald E. Ware and Dorothy P. Mitchell.

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U.S. Environmental Protection Agency

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INTRODUCTION

This document makes available in printed form one of the eleven major subject categories of the solid waste management literature abstracted and stored on computer by the U.S. Environmental Protection Agency. A decision to close the computerized abstracting activities of the Solid Waste Information Retrieval System (SWIRS) in 1979 was influenced by rising costs and moderate growth of requests from users. However, EPA's Office of Solid Waste has undertaken to publish the 1975 through 1978 data; abstracts from earlier years may appear in some sections. The SWIRS monthly abstracts series formerly published are no longer available.

User Requests

The basic documents listed in the abstracts as "Retained in SWIRS library" may be requested via interlibrary loan through recognized libraries.

This abstracts series will not cover publications of EPA's Office of Solid Waste. Instead, users may request the catalog *Solid Waste Management: Available Information Materials*, which covers the years 1966 to present. Address the request to: Solid Waste Information, U.S. Environmental Protection Agency, 26 West Saint Clair Street, Cincinnati, Ohio 45268. The above catalog includes indexes by subject, author, and title, with order blanks.

Format, Abbreviations, and Typographic Errors

In the interest of making the data available expeditiously, the computer printout is being reproduced without change of minor typographic errors. Main abbreviations and acronyms are listed in the appendixes.

Section 1
GENERAL

(1) SWIRS ACC.NO.: 048165
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Report.
(4) AUTHOR: Kempa ES
(5) CORPORATE AUTHOR: Inter Solid Wastes/Public Cleansing Assoc
(6) BOOK TITLE: In Solid Waste Management 2nd International Proceedings-ISWA Italia 76, Fiera di Padova 21-25 Giugno 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2PL (10) PUB. YEAR: 1976
(11) ABSTRACT: The generation of hazardous waste in Poland is the topic of this report. It is pointed out that hazardous or toxic waste cannot be disposed of jointly with household refuse. Disposal methods for hazardous or toxic waste include reuse and/or recycling; pretreatment by physical, chemical, or combined methods (neutralization, precipitation, decantation, and detoxification); controlled tipping; and incineration. A hazardous waste screening model is described and illustrated. Legislative aspects of hazardous waste generation and disposal in Poland are considered. In 1972, about 25% of all industrial and municipal waste were classified as at least partially noxious, and 0.5% were categorized as strongly toxic. Partially noxious waste was recycled 24% of the time, while strongly toxic waste was recycled only 3% of the time. Sources of hazardous waste and methods employed in forecasting the amount of hazardous or toxic waste are described. Technological solutions to the problem of hazardous waste are examined. (Retained in SWIRS library).
(12) KEYWORDS: CONFERENCE; DISPOSAL; HAZARDOUS; INTERNATIONAL; POLAND
(14) HIERARCH TERMS: 1HC/2DP
(15) STIMS ACC.NO.: 00S47236
(16) CITATION: Padova, Italy, Associazione Nazionale di Ingegneria Sanitaria, 1976. p.897-911.

(1) SWIRS ACC.NO.: 048164
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Report.
(4) AUTHOR: Affholder M
(5) CORPORATE AUTHOR: Inter Solid Wastes/Public Cleansing Assoc
(6) BOOK TITLE: In Solid Waste Management 2nd International Proceedings-ISWA Italia 76, Fiera di Padova 21-25 Giugno 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2FR (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution problems and risks associated with the disposal of certain types of waste in France are described. Methods for disposing of noxious waste include the prevention of waste output by convenient technology and internal recycling, treatment removing or decreasing waste toxicity and allocating its return to the natural environment without any danger or its salvage for further use, and dumping on land or in subsoil under minimum risk conditions. Legislation enacted in France that is applicable to noxious waste is detailed. Enforcement of a law enacted in 1975 and the activities of bodies responsible for water conservation have led to the creation of stations for the treatment of industrial noxious waste. These stations include mixed plants involving incineration, chemical/physical treatment, and disposal for special waste and plants involving just one type of treatment or receiving only given types of waste. (Retained in SWIRS library).
(12) KEYWORDS: CONFERENCE; FRANCE; HAZARDOUS; INTERNATIONAL; LAW; POLLUTION; PROBLEMS
(14) HIERARCH TERMS: 1HC/2DP; 1LF/21B
(15) STIMS ACC.NO.: 00S47237
(16) CITATION: Padova, Italy, Associazione Nazionale di Ingegneria Sanitaria, 1976. p.876-896.

(1) SWIRS ACC.NO.: 048183
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Report
(4) AUTHOR: Van Veen P
(5) CORPORATE AUTHOR: Inter Solid Wastes/Public Cleansing Assoc
(6) BOOK TITLE: In Solid Waste Management 2nd International Proceedings-ISWA Italia 76, Fiera di Padova 21-25 Giugno 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2NF (10) PUB. YEAR: 1976
(11) ABSTRACT: Legislation dealing with the disposal of chemical waste in the Netherlands is reported. Three acts have been passed: Chemical Waste Act, Waste Disposal Act, and Soil Protection Act. An investigation initiated by the Institute for Waste Disposal in 1971, at the request of the government, to focus on the collection of data about chemical waste and treatment methods and on the application of this data to planning disposal facilities and processing equipment capacities is cited. Provisions of the three acts are detailed. Treatment methods are identified as incineration; detoxification, neutralization, and dewatering; the treatment of emulsions; biological purification; and special methods. Chemical waste is related to corresponding disposal methods in tabular form, and data on estimated amounts of chemical waste per treatment/disposal method are provided. (Retained in SWIRS library).
(12) KEYWORDS: CHEMICAL; CONFERENCE; DISPOSAL; HAZARDOUS; INTERNATIONAL; LAW; NETHERLANDS
(14) HIERARCH TERMS: 1HC/2DP; 1LF/2IB
(15) STIMS ACC.NO.: 00S47236
(16) CITATION: Padova, Italy, Associazione Nazionale di Ingegneria Sanitaria, 1976. p.866-875.

(1) SWIRS ACC.NO.: 048182
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Report.
(4) AUTHOR: Coleman AK
(5) CORPORATE AUTHOR: Inter Solid Wastes/Public Cleansing Assoc
(6) BOOK TITLE: In Solid Waste Management 2nd International Proceedings-ISWA Italia 76, Fiera di Padova 21-25 Giugno 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1976
(11) ABSTRACT: Waste disposal practices in the United Kingdom, with particular reference to hazardous waste, are reviewed. Provisions of the Control of Pollution Act of 1974 are outlined as they pertain to hazardous or toxic waste. Typical conditions attached to consent for the discharge of trade effluent to municipal sewers are listed in tabular form. Main features of the Deposit of Poisonous Wastes Act are noted, as this is the first legislation to embrace the disposal of hazardous or toxic waste on land. Environmental pollution aspects associated with the disposal of specific types of industrial waste are identified, along with other legislation reflecting worldwide responses to environmental protection. Four techniques are commonly employed in the United Kingdom for the disposal of hazardous waste: chemical treatment, incineration, polymerization, and recovery/recycling. The incineration of organic waste, incinerator operation controls, the control of odor, and site drainage and spillage control are discussed. (Retained in SWIRS library).
(12) KEYWORDS: CONFERENCE; DISPOSAL; ENVIRONMENT; GREAT BRITAIN; HAZARDOUS; INTERNATIONAL; POLLUTION; REGULATIONS
(14) HIERARCH TERMS: 1EP; 1HC/2DP; 1LF/2IB
(15) STIMS ACC.NO.: 00S47235
(16) CITATION: Padova, Italy, Associazione Nazionale di Ingegneria Sanitaria, 1976. p.835-865.

(1) SWIRS ACC.NO.: 048181
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: General report.
(4) AUTHOR: Vogl J
(5) CORPORATE AUTHOR: Inter Solid Wastes/Public Cleansing Assoc
(6) BOOK TITLE: In Solid Waste Management 2nd International Proceedings-ISWA Italia 76, Fiera di Padova 21-25 Giugno 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2GN (10) PUB. YEAR: 1976
(11) ABSTRACT: Difficulties encountered in the disposal of hazardous waste in Bavaria are examined. Three groups of hazardous waste are delineated: (1) chemical products that are toxic or present a risk of air, water, or soil pollution and that appear in solid, pasty, or liquid form; (2) waste that may considerably disfigure or impair nature, such as bulky scrap iron, junk cars, and old tires; and (3) waste that is pathogenic and that may be a menace to public health. The composition and amount of hazardous waste generated by industries are considered. Main producers of hazardous waste are the chemical, mineral oil, steel, electrical, wood processing, plastic, rubber, asbestos, glass, and leather industries. Difficulties in the disposal of hazardous waste relate to the distribution of hazardous waste, collection, treatment in central plants, recycling, costs, and organizational and technical aspects of disposal. (Retained in SWIRS library).
(12) KEYWORDS: CONFERENCE; DISPOSAL; GERMANY; HAZARDOUS; INTERNATIONAL; PROBLEMS
(14) HIERARCH TERMS: 1HC/2DP
(15) STIMS ACC.NO.: 00S47234
(16) CITATION: Padova, Italy, Associazione Nazionale di Ingegneria Sanitaria, 1976. p.781-834.

(1) SWIRS ACC.NO.: 046404
(2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Current research on land disposal of municipal solid wastes.
(4) AUTHOR: Schomaker NB
(6) BOOK TITLE: In Banerji, S. K., ed. Management of Gas and Leachate in Landfills. Proceedings of the Third Annual Municipal Solid Waste Research Symposium. (8) REPORT NO.: EPA-600/9-77-026
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2OH (10) PUB. YEAR: 1977
(11) ABSTRACT: Investigation of the disposal and processing of municipal solid and hazardous wastes is the primary responsibility of the Solid and Hazardous Waste Research Division (SHWRD). The Cincinnati, Ohio, office is directing research towards new and improved systems of municipal and hazardous waste management, development of technology, determination of environmental effects, and collection of data necessary for the establishment of processing and disposal guidelines. The current research program is divided into three areas: (1) pollutant predictions for current landfill techniques; (2) alternatives to current landfill disposal techniques; and (3) remedial action for minimizing pollutants from unacceptable sites. Recent focus on a waste-as-fuels program is discussed. Funding procedures are delineated. (Retained in SWIRS library).
(12) KEYWORDS: DATA; DISPOSAL; ECONOMICS; ENERGY; ENVIRONMENT; HAZARDOUS; MANAGEMENT; OHIO; RESEARCH; SANITARY LANDFILL
(14) HIERARCH TERMS: 1DP/2RP; 1MA/2PP; 1RP
(15) STIMS ACC.NO.: 00S45455
(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, Sep. 1977. p.1-12.

(1) SWIRS ACC.NO.: 046083
(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Considerations for in-plant solid waste control.
(4) AUTHOR: Eldredge RW
(6) JOURNAL TITLE: Waste Age
(10) LANGUAGE: EN (10) PUB. YEAR: 1975
(11) ABSTRACT: Thorough study of solid waste control procedures can help industries improve their profits. If material is not wasted, it does not require collection, storage, processing, or disposal as waste.

Some waste products have value as raw materials for other manufacturers, representing an income to offset waste control expenses. Establishment of good waste control practices within the plant can be achieved by: proper receptacle placement; proper sizing of receptacles; establishing a collection route; using control equipment to reduce theft; reevaluating management procedures; considering subsequent actions when choosing container locations; considering horizontal and vertical clearance, and cost saving movements; investigating labor costs; and selecting compatible equipment. Management responsibility in identifying hazardous wastes and their appropriate disposal requirements is discussed.

(12) KEYWORDS: COLLECTION; CONTAINER; COST REDUCTION; DISPOSAL; ECONOMICS; EQUIPMENT; HAZARDOUS; INDUSTRY; MANAGEMENT; MARKET; RECLAMATION; REFUSE; SOLID; STORAGE

(14) HIERARCH TERMS: 1IN/2CC; 1IN/2UT; 1MA/2TQ

(15) STIMS ACC.NO.: 00545133

(16) CITATION: 6(6):98-101, Jun. 1975.

(1) SWIRS ACC.NO.: 045849

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Evaluation of results.

(6) BOOK TITLE: In Disposal of Hazardous Wastes: Organization.

(10) LANGUAGE: EN (10) GEO. AREA: 1EU; 1US (10) PUB. YEAR: 1977

(11) ABSTRACT: Organizational schemes for the management and disposal of hazardous waste in North Atlantic Treaty Organization (NATO) countries are examined. Information was obtained primarily by questionnaire from the following NATO countries: Belgium, Denmark, the Federal Republic of Germany, France, the Netherlands, the United Kingdom, and the United States. It was determined that organizational issues in hazardous waste disposal should be considered in relation to other aspects of management and not in isolation. Issues of particular importance are the cost of transportation, the need for defining and classifying hazardous waste, the management of disposal facilities, control of the generation and transfer of hazardous waste, planning, waste exchange systems, liability, insurance, financing, and special regulations for certain waste types. (Retained in SWIRS library).

(12) KEYWORDS: DISPOSAL; ECONOMICS; EUROPE; HAZARDOUS; MANAGEMENT; PLANNING; REGULATIONS; SURVEY; US

(14) HIERARCH TERMS: 1DD/2DW; 1MA/2HF; 1MA/2MC; 1SO

(15) STIMS ACC.NO.: 00544398

(16) CITATION: North Atlantic Treaty Organization, Jun. 1977. p.73-100.

(1) SWIRS ACC.NO.: 045846

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(6) BOOK TITLE: Disposal of Hazardous Wastes: Organization.

(10) LANGUAGE: EN (10) GEO. AREA: 1EU; 1US (10) PUB. YEAR: 1977

(11) ABSTRACT: The findings of a study conducted to assess organizational problems encountered in the management and disposal of hazardous waste are presented. Emphasis is placed on the following aspects of hazardous waste disposal, as practiced in North Atlantic Treaty Organization (NATO) countries: legislative basis of the organization of hazardous waste disposal (regulations on the control of waste flows and on the licensing of facilities, planning regulations, and regulations on liability and financing and insurance), the practical execution of existing regulations, and the evaluation of advantages and disadvantages pertaining to different organizational schemes. Hazardous waste management in NATO countries is considered. Attention is given to management principles and the state of the art, regulations on waste stream control and practices of control, planning and limitation aspects of disposal districts, waste exchange systems, and special regulations or management systems for special types of waste. (Retained in SWIRS library).

(12) KEYWORDS: CONTROL; DISPOSAL; EUROPE; HAZARDOUS; MANAGEMENT; REGULATIONS; US

(14) HIERARCH TERMS: 1DD/2DW; 1MA/2HF; 1MA/2MC

(15) STIMS ACC.NO.: 00544895

(16) CITATION: North Atlantic Treaty Organization, Jun. 1977. 108 p.

(1) SWIRS ACC.NO.: 045785
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(6) BOOK TITLE: Alternatives for Hazardous Waste Management in the Inorganic Chemicals Industry. (8) REPORT NO.: SW-149c (9) CONTRACT NO.: EPA 68-01-4190
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Technically feasible treatment techniques for potentially hazardous wastes are identified that accomplish resource recovery, waste detoxification, or volume reduction of waste for ultimate disposal. Potentially hazardous waste streams are identified as mercury, chlorinated hydrocarbons, asbestos, lead, metallic sodium and calcium, waste water sludges, fluoride, arsenic, antimony, chromate, nickel, and phosphorus. Industries that generate these wastes are characterized in terms of number, location, size, and production capacity. Technologies for treating inorganic waste streams are identified as calcination, dissolution, distillation, electrolysis, evaporation, filteration, high gradient magnetic separation, neutralization and pH control, and precipitation. Processes selected for treatment of specific waste streams are identified, analyzed, and given costs. In addition, land disposal options and costs are discussed. A comparison of the cost of the proposed treatment processes with sanitary or chemical land disposal for each waste stream found that sanitary landfill operations would be significantly lower in capital outlays for 13 of the 15 waste streams identified. Consideration was also given to energy requirements for the respective treatments. The appendixes contain known occupational and health effects of potentially hazardous compounds, cost bases for cost analyses tasks, and sample calculation of costs. (Retained in SWIRS library).
(12) KEYWORDS: CHEMICAL; ECONOMICS; HAZARDOUS; INORGANIC; MANAGEMENT; PROCESS; TREATMENT
(14) HIERARCH TERMS: 1CB/2CA; 1EA/2EA; 1HA/2HG; 1MA/2MH; 1TG
(15) STIMS ACC.NO.: 00S44834
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 301 p.

(1) SWIRS ACC.NO.: 045520
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Programas de control de contaminacion de suelos en la Republica Argentina. (Programs of soil contamination control in the Republic of Argentina).
(4) AUTHOR: Levy N
(5) CORPORATE AUTHOR: Pan American Health Organization
(6) BOOK TITLE: In Symposio Sobre Ambiente, Salud y Desarrollo en las Americas. (Symposium on Environment, Health and Development in the Americas).
(10) LANGUAGE: SP (10) GEO. AREA: 1SA (10) PUB. YEAR: 1976
(11) ABSTRACT: Contamination of the soil in the Republic of Argentina, and programs to combat it, are discussed. Farmland, the base of the Argentine economy, is threatened by poor disposal techniqeus in particular. The contaminants, both organic and inorganic, include: radioactive materials, pathogenic wastes, metals, chemicals in industrial wastes and herbicides. Previously, each contamination problem had been dealt with individually and on a provincial basis. In recent years, the need for a comprehensive program has become evident. A ten-part national effort, to be administered by the Secretary of Natural Resources, is detailed. Maps of the regions involved are included. (Original text in Spanish).
(12) KEYWORDS: HAZARDOUS; LAND; PATHOGEN; PLANNING; RADIOACTIVE
(14) HIERARCH TERMS: 1DD/2DW; 1EA/2HF; 1PH; 1SJ
(15) STIMS ACC.NO.: 00S44568
(16) CITATION: Lima, Peru, Centro Panamerico de Ingenieria Sanitaria y Ciencias del Ambiente, 29 Jul.-2 Aug. 1974. p.245-258.

(1) SWIRS ACC.NO.: 044591
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Le traitement des dechets speciaux (The treatment of special wastes).
(4) AUTHOR: Vogl J
(6) JOURNAL TITLE: Techniques et Sciences Municipales
(10) LANGUAGE: FR (10) GEO. AREA: 1EU (10) PUB. YEAR: 1977
(11) ABSTRACT: Industrialization has heavily increased wastes which because of their chemical and physical characteristics present special problems and cannot be treated in the same manner as other domestic wastes. Vogl summarizes the discussions and presentations at the 1976 Padua Solid Waste Congress in this general report. Wastes which are toxic or dangerous for air, water, or soil pose specific problems in planning techniques and organization of treatment, recycling, and elimination. This article covers general information on 1) legislative and administrative measures for organizing the treatment of special wastes; 2) measures for reducing the production of special wastes; 3) measures for extracting special wastes; and 4) measures for organizing collection, treatment, and elimination of special wastes.
(12) KEYWORDS: COLLECTION; CONFERENCE; RECLAMATION; REGULATIONS; TOXIC; TREATMENT
(14) HIERARCH TERMS: ITD; 1CE/2CA/3CB; 1CC/2CJ; 1DD/2DL; 1DD/2DW; 1HA/2HG; 1LB; 1SE/2SP
(15) STIMS ACC.NO.: 00S43636
(16) CITATION: 72(4):179-172, Apr. 1977.

(1) SWIRS ACC.NO.: 044313
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(6) BOOK TITLE: Proceedings: 1976 National Conference on Control of Hazardous Material Spills, New Orleans, LA, Apr. 25-28, 1976.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: A conference was convened in April, 1976 to address problems related to the management and control of hazardous material spills. Approximately 80 presentations dealt with a variety of topics under the following headings: prevention, risk and impact analysis, detection, air pollution, cleanup, information and data retrieval, response, personnel safety, and ultimate disposal. A report was made by the U.S. Coast Guard, the U.S. Environmental Protection Agency, the Manufacturing Chemists Association, Environment Canada, and the United Kingdom of their respective information retrieval systems for hazardous material spills. (Retained in SWIRS library).
(12) KEYWORDS: ANALYSIS; CONFERENCE; CONTROL; DISPOSAL; FEDERAL; GOVERNMENT; HAZARDOUS; INDUSTRY; INFORMATION; MANAGEMENT; PERSONNEL; SPILLAGE
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1HA/2HH; 1MA/2MB
(15) STIMS ACC.NO.: 00S43357
(16) CITATION: Rockville, MD, Information Transfer, Inc., 1976. 443 p.

(1) SWIRS ACC.NO.: 044235
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(4) AUTHOR: Levin J
(5) CORPORATE AUTHOR: WAPORA, Inc
(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Practices-Special Machinery Manufacturing Industries.
(8) NTIS NO.: PB-265 981 (8) REPORT NO.: SW-141c (9) CONTRACT NO.: 68-01-3193
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Hazardous waste generation and management in industrial establishdments which manuracture special industry machinery, office, computing, and accounting machines are described. The results of 33 plant surveys show that land disposed process waste from the industries falls into five categories: machine shop, heat treating, electroplating, materials coating, and foundry waste. Specific process waste types are characterized according to their chemical constitutents and physical properties. Treatment and disposal techniques and attendant costs for each type of process waste at three levels of technology are examined: (1) the most prevalent technology in

use; (2) the best technology employed; and (3) the technology required for adequate health and environmental protection. Total process waste and hazardous constituent quantities are estimated for the tive categories on a national level and are broken down by Environmental Protection Agency regions and States. (Retained in SWIRS library).
(12) KEYWORDS: CHEMICAL; DATA; DISPOSAL; ECONOMICS; FEDERAL; GOVERNMENT; HAZARDOUS; INDUSTRY; MANAGEMENT; PHYSICAL; PLANT-INDUSTRIAL; STATE; SURVEY; TREATMENT
(14) HIERARCH TERMS: 1EA/2EA; 1EE; 1HA/2HF; 1HA/2HG; 1HA/2HH
(15) STIMS ACC.NO.: 00S43279 (15) SECONDARY AUTHORS: Beeland G; Greenberg J
(16) CITATION: Washington, DC, U. S. Environmental Protection Agency, Mar. 1977. 309 p. (Solid Waste Management Service.)

(1) SWIRS ACC.NO.: 044196
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(4) AUTHOR: Peters GO
(5) CORPORATE AUTHOR: WAPORA, Inc
(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Practices-Electronic Components Manufacturing Industry. (8) REPORT NO.: SW-140c (9) CONTRACT NO.: 68-01-3193
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Hazardous waste generation and management in the electronic components manufacturing industry are described. The results of surveys of 23 plants show that product and manufacturing process diversity within the industry precludes the satisfactory correlation of these factors with waste types. Survey data indicated that land disposed waste from the industry falls into 10 waste categories, five categories of which contain such hazardous materials as halogenated solvents, nonhalogenated solvents, waste water treatment sludge, painting waste, and hydraulic and lubricating oils. The remaining five categories include unquantifiable amounts of hazardous materials, no hazardous materials, or waste that is not typically landfilled. Hazardous properties of the industry's land disposed waste involve flammability, corrosivity and dermal irritation, oral toxicity, and bioconcentration. The estimated total quantity of potentially hazardous waste land disposed by the industry in 1975 was 54,500 tons on a wet weight ton basis. More than half of this total constituted waste water treatment sludge. The best technology applied and the technology required to provide enviornmentally adequate treatment for waste and associated costs are discussed. (Retained in SWIRS library).
(12) KEYWORDS: DATA; DISPOSAL; ECONOMICS; GENERATION; HAZARDOUS; INDUSTRY; MANAGEMENT; OIL; PAINT; SLUDGE; SOLVENT; SURVEY; TREATMENT; WASTE WATER
(14) HIERARCH TERMS: 1EA/2EA; 1HA/2HH; 1HA/2MH; 1SO
(15) STIMS ACC.NO.: 00S43239 (15) SECONDARY AUTHORS: Levin J; Thomas P
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Jan. 1977. 197 p. (Solid Waste Management Series.)

(1) SWIRS ACC.NO.: 044114
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Problems concerning hazardous materials disposal discussed for Wisconsin PCA.
(6) JOURNAL TITLE: American Paint and Coatings J
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2WI (10) PUB. YEAR: 1976
(11) ABSTRACT: Government and commercial views on the disposal of hazardous and toxic raw materials and waste were presented at a meeting of the Wisconsin Paint and Coatings Association. Waste discarded by manufactureres were estimated as follows for paint containers: 60 million pints; 160 million quarts; 320 million gallons; and for containers of raw materials, paint and finished products, 16 million five gallon cans and 3.7 million 55 gallon drums. Various disposal options are noted. Chem Waste provides an approved, nonpolluting disposal service for the industry. The Wisconsin department of Natural Resources and the Bureau of Air Pollution see a need for control of

waste product disposal. There are no regulations for the safe disposal of toxic and hazardous materials. Guidelines for pollution control will be presented to the state by the Environmental Protection Agency.
(12) KEYWORDS: CONTAINER; DISPOSAL; ENVIRONMENT; HAZARDOUS; PAINT; SANITARY LANDFILL; WISCONSIN
(14) HIERARCH TERMS: 1DD/2DG; 1DD/2DW; 1PA/2PA; 1TD
(15) STIMS ACC.NO.: 00S43157
(16) CITATION: 60(50):52, May 24, 1976.

(1) SWIRS ACC.NO.: 043992
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Management; Petroleum Re-Refining Industry. (8) REPORT NO.: SW-144C
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2DC (10) PUB. YEAR: 1977
(11) ABSTRACT: Resource recovery has become a matter of great importance in worldwide public awareness. Wastes from manufacturing sources generated in tremendous quantities are often a threat to our environment and, when not recycled, irretrievably deplete our finite resources. This study report attempts to qualify and quantify the potentially hazardous wastes generated by the petroleum rerefining industry in the United States. It further surveys the industry characteristics as well as the treatment and disposal technology and costs for its wastes. Projected production of rerefined oil and generation of wastes, using the best data available, have been made for 1977 and 1983. (Retained in SWIRS library).
(12) KEYWORDS: DISPOSAL; ECONOMICS; HAZARDOUS; INDUSTRY; MANAGEMENT; OIL; RECLAMATION; REFINERY; TREATMENT
(14) HIERARCH TERMS: 1EA/2EA; 1HA/2HF; 1PF/2PG/3PH
(15) STIMS ACC.NO.: 00S43035
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 148 p.

(1) SWIRS ACC.NO.: 043902
(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Overview of residuals management in Pennsylvania.
(4) AUTHOR: Merritt GL
(6) BOOK TITLE: In Land Application of Residuals. Proceedings: Engineering Foundation Conference, Easton, MD, Sep. 26-Oct. 1, 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2PA (10) PUB. YEAR: 1976
(11) ABSTRACT: The State plan for the management of residuals in Pennsylvania is described. A three-phase effort has been initiated, encompassing standards development, permit coordination, and planning. This effort is in response to stricter environmental control requirements for air and water pollution. Data on the quantities of solid waste generation in Pennsylvania are tabulated. Types of waste generated by certain industries in the State are listed. Also provided is a listing of estimated quantities of industrial process and nonprocess waste. Pennsylvania's Solid Waste Management Act requires that selected municipalities must plan for the disposal of all solid waste generated within their boundaries. Objectives of the State hazardous waste management plan are identified. Elements of comprehensive water quality management planning that affect solid waste management are noted. Institutional, financial, and legal aspects of residual waste control are addressed. The importance of permit coordination and the development of adequate disposal criteria and standards is discussed.
(12) KEYWORDS: CONTROL; CRITERIA; DATA; DISPOSAL; ECONOMICS; HAZARDOUS; INDUSTRY; INSTITUTION; LAW; LEGAL; MANAGEMENT; MUNICIPALITY; PENNSYLVANIA; PLANNING; REGULATIONS; RESIDUE; STATE
(14) HIERARCH TERMS: 1DD/2DP; 1HA/2HF; 1IC/2IY; 1MA/2MG
(15) STIMS ACC.NO.: 00S42945 (15) SECONDARY AUTHORS: Galida GR
(16) CITATION: New York, NY, American Society of Civil Engineers, 1976. p.124-134.

(1) SWIRS ACC.NO.: 043754
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Environmental considerations for hazardous waste management facilities.
(4) AUTHOR: Metry AA
(6) BOOK TITLE: In Proceedings: 23rd Annual Technical Meeting of the Institute of Environmental Sciences, Environmental Technology '77, Los Angeles, CA, Apr. 25-27, 1977.
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Criteria for use in planning for the construction and design of hazardous waste management facilities are presented. The impact of hazardous waste from the following industries is considered: mining and metallurgy, paint and dye, pesticide, electrical and electronic, printing and duplicating, electroplating and metal finishing, chemical manufacturing, explosives, rubber and plastics, battery, pharmaceutical, textile, petroleum and coal, pulp and paper, and leather. The role of the Federal Government and State governments in hazardous waste management is discussed. Recommended criteria for hazardous waste management facilities deal with facility location, the identification of hazardous waste, storage facilities, transfer stations, transport and handling, treatment, land disposal facilities, the preparation of hazardous waste for disposal and thermal processing facilities. The preparation of hazardous waste for disposal involves chemical fixation, volume reduction, segregation, detoxification, degradation, and encapsulation.
(12) KEYWORDS: CHEMICAL; CONSTRUCTION; CRITERIA; DESIGN; DISPOSAL; ELECTRICAL; FACILITY; FEDERAL; GOVERNMENT; HAZARDOUS; INDUSTRY; MANAGEMENT; METAL; MINE; PAINT; PESTICIDE; PLANNING; STATE
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HP; 1NA/2MH
(15) STIMS ACC.NO.: 00S42797
(16) CITATION: Mt. Prospect, IL, Institute of Environmental Sciences, 1977. p.101-106.

(1) SWIRS ACC.NO.: 043382
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(6) BOOK TITLE: A Survey of Hazardous Waste Generation and Disposal Practices in Kansas. v.2.
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2KS (10) PUB. YEAR: 1977
(11) ABSTRACT: Data are tabulated on the generation of hazardous waste in the State of Kansas during 1974. The Standard Industrial Classification (SIC) Code is used to organize and identify the 396 industries included in the survey. The data tabulations provide information on the generation of hazardous waste: gallons per year for liquid waste and percent gallons, and tons per year for solid waste and percent tons. Hazardous waste generation data for 14 major SIC groups are reported: (1) food and kindred products; (2) printing, publishing, and allied industries; (3) chemical and allied products; (4) petroleum refining and related industries; (5) rubber and miscellaneous plastic products; (6) leather and leather products; (7) stone, clay, glass, and concrete products; (8) primary metal industries; (9) fabricated metal products, except machinery and transportation equipment; (10) machinery, except electrical; (11) electrical and electronic machinery, equipment, and supplies; (12) transportation equipment; (13) railroad transportation; and (14) electric, gas, and sanitary services. (Retained in SWIRS library).
(12) KEYWORDS: CHEMICAL; CLAY; CONCRETE; DATA; ELECTRICAL; EQUIPMENT; FOOD PROCESSING; GLASS; HAZARDOUS; INDUSTRY; KANSAS; LIQUID; METAL; PLASTIC; RAIL HAUL; REFINERY; RUBBER; SANITARY; SOLID; TRANSPORT
(14) HIERARCH TERMS: 1HA/2HH; 11C/21Y
(15) STIMS ACC.NO.: 00S42425
(16) CITATION: Topeka, KS, Kansas Department of Health and Environment, Mar. 1977. 184 p.

(1) SWIRS ACC.NO.: 043356
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(5) CORPORATE AUTHOR: Kansas Dept. of Health and Environment
(6) BOOK TITLE: A Survey of Hazardous Waste Generation and Disposal Practices in Kansas.
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2KS (10) PUB. YEAR: 1977
(11) ABSTRACT: A study was initiated in 1975 by the Kansas Department of Health and Environment to determine the quantity of hazardous waste generated and disposal practices in the State. Objectives of the study were to identify the sources of hazardous waste, estimate the total quantity and characteristics of hazardous waste generated in Kansas during 1974, identify treatment and disposal techniques, establish a readily retrievable bank of information on hazardous waste sources, and conduct a review of legislation and administrative policies. 396 manufacturing industries were studied due to their high potential for producing hazardous waste and 31 pesticide applicators and 24 hospitals or institutions were also included in the study. Industries studied during 1974 generated 5.4 million gallons of liquids and 27,000 tons of solid sludge containing hazardous materials. Caustic solutions, waste oil, acids, and heavy metals in solution accounted for 92 percent of the total quantity of liquid waste. Sludge containing heavy metals, miscellaneous types of waste, halogenated organics, and paint sludge accounted for 97 percent of the solid sludge containing hazardous waste. The petroleum refining industry generated the largest volume of hazardous waste, followed by the chemical and allied products industry, the transportation equipment industry, and the fabricated metal products industry. Priorities for the improved management of hazardous waste are listed. (Retained in SWIRS library).
(12) KEYWORDS: ADMINISTRATION; DISPOSAL; EQUIPMENT; HAZARDOUS; HOSPITAL; INDUSTRY; INFORMATION; INSTITUTION; KANSAS; LIQUID; MANAGEMENT; METAL; ORGANIC; PAINT; PESTICIDE; REFINERY; SLUDGE; TRANSPORT; TREATMENT
(14) HIERARCH TERMS: 1HA/2HF; 1MA/2MG
(15) STIMS ACC.NO.: 00S42399
(16) CITATION: Topeka, KS, Kansas Department of Health and Environment, Mar. 1977. 9 p.

(1) SWIRS ACC.NO.: 043114
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Garbage and regionalism.
(4) AUTHOR: Banks S
(6) JOURNAL TITLE: Nation's Cities
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Regionalism, already well under way in solid waste disposal, was given a major boost with the passage of the Resource Conservation and Recovery Act of 1976 (RCRA). The act, among other things, calls for creation of a nationwide system of substate regional solid waste planning districts. The act establishes a comprehensive framework for identifying and regulating solid and hazardous waste and also for upgrading local waste management practices. RCRA is more likely to achieve its objectives than previous federal environmental legislation because of its emphasis on state and local responsibility. The most important section of the act is the section on "State and Regional Solid Waste Plans," in which governors in consultation with local officials are instructed to use previously issued Environmental Protection Agency guidelines to identify regional solid waste management units and designate a state agency responsible for implementing the state plan. Regional planning agencies are to begin putting their plans into action by March 1978. Municipal officials are urged to take an active role in planning to assure that State consultation with local officials takes full account of the advantages of existing municipal disposal arrangements. Although funding has

improved under the Carter administration, it is still insufficient and many states may choose not to cooperate in enacting the various provisions of the Act.

(12) KEYWORDS: DISPOSAL; ECONOMICS; ENVIRONMENT; EPA; FEDERAL; HAZARDOUS; LAW; LOCAL; MANAGEMENT; MUNICIPAL; RECLAMATION; REFUSE; REGIONAL; SOLID; STATE

(14) HIERARCH TERMS: 1DD/2DP; 1ED; 1LB/2LD; 1MA/2ME

(15) STIMS ACC.NO.: 00S42157

(16) CITATION: 15(5):22-23, May 1977.

(1) SWIRS ACC.NO.: 042592

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(6) BOOK TITLE: A Survey of Hazardous Waste Generation and Disposal Practices in Kansas. v.1.

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2KS (10) PUB. YEAR: 1977

(11) ABSTRACT: A study was initiated in 1975 by the Kansas Department of Health and Environment to determine the quantities of hazardous waste generated and disposal practices in the State. Five specific objectives of the study were to identify sources of hazardous waste, estimate the total quantity and characteristics of hazardous waste generated in Kansas during 1974, identify treatment and disposal techniques, establish a readily retrievable bank of information on hazardous waste sources, and conduct a review of legislation and administrative policies. Selected for the study were 396 manufacturing industries. In addition, 31 pesticide applicators and 24 hospitals or institutions were included in the study. Manufacturing industries generated 5,450,000 gallons of liquid hazardous waste and 27,200 tons of solid sludge containing hazardous waste. Caustic solutions, waste oil, acids, and heavy metals in solution accounted for about 92 percent of the total quantity of liquid waste. Sludge containing heavy metals, miscellaneous waste, halogenated organics, and paint sludge accounted for approximately 97 percent of solid sludge containing hazardous waste. Four industry groups accounted for roughly 93 percent of all hazardous waste generated: petroleum refining, chemical and allied products, transportation equipment, and fabricated metal products industries. The exportation of hazaruous waste was found to be the primary disposal technique used by Kansas industries. (Retained in SWIRS library)

(12) KEYWORDS: CLASSIFICATION; DISPOSAL; HAZARDOUS; HOSPITAL; INDUSTRY; INSTITUTION; KANSAS; PESTICIDE; SURVEY

(14) HIERARCH TERMS: 1HA/2HP; 1MA/2MG; 1SO

(15) STIMS ACC.NO.: 00S41635

(16) CITATION: Topeka, Kansas Department of Health and Environment, Mar. 1977. 158 p.

(1) SWIRS ACC.NO.: 042155

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Considerations in planning the management of hazardous waste materials.

(4) AUTHOR: Price DB

(6) JOURNAL TITLE: Pollution Engineering

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Considerations in planning the management of hazardous waste materials are reviewed. A number of questions should be answered whether the generator opts for internal handling of wastes or the engagement of an outside service: (1) What exactly are the wastes to be handled? (2) Are the wastes in a form for final disposal or must they be processed into a manageable condition? (3) What kind of hauling equipment is necessary to transport the materials? (4) Does the generator have the proper permits to haul the materials? (5) What facilities are available at the disposal site? and (6) Given the preceding answers, would a decision to handle wastes internally produce an economically sould result and are there possibilities for resource recovery? An ideal program is outlined which would include complete laboratory analysies of wastes and waste waters; acquisition of permits; collection and transportation; treatment and disposal; resource recovery; and consultation. The general economic climate is another aspect to be kept in mind since a good economy might spur the

release of government funds. The pollution engineer who recommends an outside service and follows up regularly will find his workload freed of many of the lesser problems in handling hazardous wastes.

(12) KEYWORDS: CONTRACT; DISPOSAL; HAZARDOUS; MANAGEMENT; MANUAL; PLANNING; POLLUTION

(14) HIERARCH TERMS: 1HA/2HF; 1HA/2HG; 1HA/2HH

(15) STIMS ACC.NO.: 00S41199

(16) CITATION: 9(2):31, Feb. 1977.

(1) SWIRS ACC.NO.: 040562

(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: G (10) GEO. AREA: 1ED (10) PUB. YEAR: 1976

(11) ABSTRACT: The Office of Research and Development work on the Public Sector Activities Program is reviewed. There are three research subprograms and waste management is organized in five areas; wastewater treatment technology, soil treatment systems, runoff pollution control, community wastewater system management, and solid and hazardous waste management. The general area of research in each of these subjects is reviewed. In 1976 emphasis will be on technological problems associated with the Construction Grants Program, principally the processing and disposal of sludges from wastewater treatment systems. Upgrading existing treatment works and alternative wastewater disinfection technologies will also receive attention. The Five Year Plan has the same objectives, with increased attention to improving existing treatment facilities with instrumentation, automation, and improved operation and maintenance procedures, integrated dry and wet weather management systems for urban wastewaters, treatment technologies to achieve the goals of P. L. 92-500, other treatment technologies for specific discharge conditions, and development of non structural approaches to urban and suburban runoff control. Major goals of the water supply subprogram include researching improved methods of identifying and measuring contaminants in drinking water and finding their source and effects, and improved treatment methods of raw water. Environmental management goals involve investigation of linkages among various residuals generated and discharged by community activities, design of integrated environmental management systems, evaluation of impacts on all media of single media pollution control strategies, and development of technical guidance methods.

(12) KEYWORDS: ECONOMICS; ENVIRONMENT; EPA; FACILITY; GRANT; HAZARDOUS; HEALTH; MANAGEMENT; PLANNING; PROGRAM; PUBLIC; RESEARCH; RESIDUE; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1AE

(15) STIMS ACC.NO.: 00S39606

(16) DOC.CIT.: Public sector activities. In U. S. Environmental Protection Agency Environmental Research Outlook, FY 1976 through 1980. Report to Congress, Feb. 1976. Environmental Protection Publication EPA-600/9-76-003. Washington, U. S. Environmental Protection Agency, 1976. p. 85-101.

(1) SWIRS ACC.NO.: 040272

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(4) AUTHOR: Train RE (10) GEO. AREA: 1CB; 1LB/2LD (10) PUB. YEAR: 1976

(11) ABSTRACT: A speech by the U. S. Environmental Protection Agency (EPA) Administrator as delivered to the Drug, Chemical and Allied Trades Association is presented. The need for cooperation between the Chemical Manufacturing Industry and the EPA in relation to development, testing and regulation of potentially hazardous chemicals is stressed. (Retained in SWIRS library)

(12) KEYWORDS: CHEMICAL; CONTROL; CRITERIA; EPA; LAW; TOXIC

(14) HIERARCH TERMS: 1HA

(15) STIMS ACC.NO.: 00S39316

(16) DOC.CIT.: Train, R. E. Controlling the risks we create: the need for toxic substances control legislation. Presented at the Spring Luncheon of the Drug, Chemical and Allied Trades Association, New York, NY, June 17, 1976. 13 p.

(1) SWIRS ACC.NO.: 040058
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) GEO. AREA: 1HA (10) PUB. YEAR: 1976
(11) ABSTRACT: The progress, problems, and growth of the hazardous waste management industry is discussed by the Chemical Waste Committee of the National Solid Wastes Management Association. The historical background to this Committee is examined with its relationship with the government. The creation of the chemical waste industry and various attitudes of organizations are outlined. The status of the industry and its future are discussed, with reference to the industry's dependence on legislation and its enforcement. A discussion of the Committee's definition of hazardous waste is given, as is a discussion on disposal versus pretreatment. The problems of the waste exchange concept are mentioned and the views of the Committee on transportation and storage are presented. A discussion on waste sheds and the exportation of waste over regional boundaries is given. The purpose of a trip ticket or manifest to accompany waste in transportation is explained and States using the system are mentioned. The Federal role in waste disposal is seen as inadequate and an outline of its position and the role of the EPA is given and discussed. The responsibility of the States and the action that they have taken legislatively is reported. State training programs are developing and the progress of State regulatory programs is presented and discussed.
(12) KEYWORDS: ASSOC; CHEMICAL; DEFINITION; DISCUSSION; EPA; GOVERNMENT; HAZARDOUS; HISTORY; INDUSTRY; LAW; MANAGEMENT; MATERIALS HANDLING; TRAINING
(14) HIERARCH TERMS: 1MA/2MB
(15) STIMS ACC.NO.: 00S39102
(18) DOC.CIT.: New thrust for hazardous waste management. Waste Age, 7(11):40, 42, 44, 46, 49-50, 52, 54, 56-58, 60, 62, 68, Nov. 1976.

(1) SWIRS ACC.NO.: 039906
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The proceedings of 1975 public meetings on hazardous waste management are reported. The meetings were convened by the Environmental Protection Agency's Office of Solid Waste Management Programs. They were held on December 2 in Newark, New Jersey; on December 4 in Rosemont, Illinois; on December 9 in Houston, Texas; and on December 11 in San Francisco, California. The meetings were attended by members of the public, representatives of industrial firms that generate hazardous waste, and environmentalists. The objective of the meetings was to obtain and disseminate information and recommendations on hazardous waste management issues. Sixteen major discussion topics were addressed during the four meetings: (1) definition of hazardous waste; (2) responsibilities and liabilities of hazardous waste generators; (3) hazardous waste disposal methods; (4) practices for rendering waste harmless; (5) cost data on processes and techniques for the treatment and disposal of hazardous waste; (6) safety; (7) provisions for site monitoring and recordkeeping; (8) availability of insurance and other mechanisms to reduce the risk to operators of private hazardous waste facilities; (9) hazardous waste storage and disposal sites; (10) feasibility methodologies for establishing limits on the amount of hazardous waste generated; (11) transportation safety regulations; (12) labeling; (13) damage costs of improper hazardous waste management; (14) mechanisms for soliciting citizen acceptance of hazardous waste management facilities; (15) hazardous waste generated by Federal facilites; (16) involvement of the private sector in the treatment and disposal of hazardous waste. (Retained in SWIRS library)
(12) KEYWORDS: CONFERENCE; DISPOSAL; ECONOMICS; ENVIRONMENT; EPA; HAZARDOUS; INDUSTRY; INFORMATION; MANAGEMENT; MATERIALS HANDLING; OSWMP; PUBLIC; RESPONSIBILITY; SAFETY; SITES; TRANSPORT; TREATMENT
(15) STIMS ACC.NO.: 00S38950
(18) DOC.CIT.: Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, Ill, Houston, TX, and San Francisco, CA, Dec. 1975. 2 V. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. 1736 p.

(1) SWIRS ACC.NO.: 038472
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: The results of a General Accounting Office (GAO) report on needed improvements in waste disposal are presented. The study by GAO concerned the disposal of commercial and military nuclear waste, excluding high level radioactive waste. Three broad areas were addressed in the study: suitability of disposal sites, improvements needed in program management and regulatory efforts, and longterm care of disposal sites. The following commercial sites are discussed in the GAO report: Beaty, Nevada; Morehead, Kentucky; West Valley, New York; Richland, Washington; Sheffield, Illinois; and Barnwell, South Carolina. Also covered in the report are sites operated by contractors of the Energy Research and Development Administration. GAO states that some disposal sites are releasing radioactivity to the environment. Recommendations are made with regard to studies on the effectiveness of sites in retaining waste, evaluation of the adequacy of monitoring programs at disposal sites, improvements in the regulation of disposal sites, need for ways to improve recordkeeping practices at disposal sites, and the responsibility for costs involved in long term care of disposal sites. Program policies and coordination are addressed in terms of Federal technical and financial assistance at commercial waste disposal sites.
(12) KEYWORDS: COMMERCIAL; DISPOSAL; GOVERNMENT; ILLINOIS; KENTUCKY; MILITARY; NEVADA; NEW YORK; RADIOACTIVE; RESEARCH; SITES; SOUTH CAROLINA; WASHINGTON
(15) STIMS ACC.NO.: 00S37516
(18) DOC.CIT.: Non-high-level wastes: improvements are needed in disposal GAO report. Nuclear News, 19(4):80-81, Mar. 1976.

(1) SWIRS ACC.NO.: 038073
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: This document presents the current state of knowledge about the production, usage, and distribution of polychlorinated biphenyls (PCB) in the United States. The information presented is derived from detailed studies on the production and first tier user industries, the past and present generation and disposition of PCB containing wastes, environmental PCB usage, inadvertent losses to and potential formation in the environment, and current regulatory authorities for PCB control. These results indicated that, although PCB content of industrial wastes can be reduced through various approaches such as treatment and substitution, there exists a potentially severe future hazard in the form of large amounts of PCB currently contained in land disposal sites. Further definition of this and other aspects of the PCB problem, and determination of ways to minimize the hazard, are recommended.
(12) KEYWORDS: CONTROL; DEFINITION; DISPOSAL; ENVIRONMENT; HAZARDOUS; INDUSTRY; LAND; POLLUTION; POLYCHLORINATED; PRODUCE; REDUCTION; REGULATIONS; TRANSPORT; US; UTILIZE; WASTE WATER
(15) STIMS ACC.NO.: 00S37117
(18) DOC.CIT.: Durfee, R. L. , G. Contos, and F. C. Whitmore. PCB in the United States: industrial use and environmental distributions. Environmental Protection Publication EPA 560/6-76-005. Washington, DC, U. S. Environmental Protection Agency, Feb. 25, 1976. 464 p. (Distributed by National Technical Information Service, Springfield, VA, as PB252012.)

(1) SWIRS ACC.NO.: 038072
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: Nine industrial plants were sampled to determine hexachlorobenzene (HCB) levels in air, water, soil and sediment. The plants represent six major industries: (1) perchloroethylene, (2) trichloroethylene, (3) carbon tetrachloride, (4) chlorine, (5) triazine herbicides, (6) pentachloronitrobenzene. In general, higher levels of HCB were associated with the production of lower chlorinated hydrocarbons than with the production of other chemicals. HCB levels in

soil and air at the pentachloronitrobenzene plant were relatively high. The levels of HCB associated with plants producting chlorine and triazine herbicides were very low. Several different waste disposal methods were used at the perchloroethylene and trichloroethylene plants that were sampled. The highest level of HCB was detected in air and soil at the plant using on site landfill and open pit storage. High HCB levels were detected in loading and transfer areas at plants using off site disposal methods. The highest level in an open waste treatment pond was 306 micrograms per liter. The level of HCB in soil within the plant area was over 1,000 micrograms per gram at three plants. The maximum concentration of HCB in air sampled off plant property was 0. 36 micrograms per cubic meter. A level of 3 micrograms per cubic meter was detected at the boundary of another plant. Soil taken from a cornfield adjacent to one plant contained 1. 1 micrograms per gram, and over 3,000 micrograms per gram were detected along the boundary road of another. HCB levels in water sampled beyond the plant exceeded 1 microgram per liter at two plants. Samples were collected from two sewage treatment plants; negligible quantities of HCB were detected.

(12) KEYWORDS: AIR; CHEMICAL; CHLORINE; EARTH; HYDROCARBON; MEASUREMENTS; MONITOR; ORGANIC; PLANT-INDUSTRIAL; POLLUTION; SAMPLING METHODS; SANITARY LANDFILL; SURVEY; TOXIC; WATER

(15) STIMS ACC.NO.: 00537116

(18) DOC.CIT.: Li, R. T. , J. L. Spigarelli, and J. E. Going. Sampling and analysis of selected toxic substances: task 1A hexachlorobenzene. Environmental Protection Publication EPA 560/6-76-001. Washington, DC, U. S. Environmental Protection Agency, June 1976, 151 p. (Distributed by the National Technical Information Service, Springfield, VA, as PB253794.)

(1) SWIRS ACC.NO.: 037508

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This study was intended to provide the U. S. Environmental Protecion Agency (EPA) with detailed and pertinent information on the generation, management, treatment, disposal and costs related to potentially hazardous wastes. The information will be used by the EPA to develop guidelines and standards for the management of hazardous wastes. The objectives of this study were to determine, for the manufacturers of industrial organic chemicals, pesticide preparations and explosives: (1) the quantities and geographic distributions of land-destined hazardous waste; (2) present practices for treatment and disposal of land-destined hazardous wastes; (3) commercial control technology for reducing the hazards presented by disposal of such wastes; and (4) the cost of present practices.

(12) KEYWORDS: CHEMICAL; DISPOSAL; ECONOMICS; HAZARDOUS; INCINERATION; INDUSTRY; ORGANIC; PESTICIDE; PROCESS; STANDARD; TECHNOLOGY; TREATMENT; WOOD

(15) STIMS ACC.NO.: 00536552

(18) DOC.CIT.: Gruber, G. I. Assessment of industrial hazardous waste practices, organic chemicals, pesticides, and explosives industries. Environmental Protection Publication 530/SW-118c. Washington, DC, Office of Solid Waste Management Programs, U. S. Environmental Protection Agency, 325 p. (Document available from National Technical Information Service as PB251307).

(1) SWIRS ACC.NO.: 037281

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: The generation and management of hazardous waste in the United States are addressed.

It is pointed out that the improper land disposal of hazardous waste can result in damage by ground water contamination, surface water contamination, air pollution, direct poisoning, food chain poisoning, and fire and explosion. Hazardous waste management activities at the Federal and State level are reviewed. Two Federal authorities deal with certain aspects of the hazardous waste management problem: (1) Federal Insecticide, Fungicide, and Rodenticide Act which provides for EPA (Environmental Protection Agency) regulation of the

storage and disposal of waste pesticides and containers; and (2) Atomic Energy Act which provides for the regulation of radioactive waste by the Nuclear Regulatory Commission. Proposed Federal legislation on hazardous waste is noted. Six States are identified as having comprehensive hazardous waste management legislation (California, Illinois, Minnesota, New York, Oregon, and Washington). Each State's legislation is detailed, and Federal guidelines pertaining to the conduct of hazardous waste studies are examined. Federal assistance programs in the area of hazardous waste are discussed, along with damage assessment, industry, technology assessment, and research programs. (Document retained in SWIRS library)

(12) KEYWORDS: AIR; CONFERENCE; CONTAMINATE; CONTROL; DUMP; EFFECT; EXPLOSION; FEDERAL; FOOD; GROUND WATER; HAZARDOUS; LAW; MANAGEMENT; PESTICIDE; POLLUTION; REGULATIONS; STATE; TOXIC; US

(15) STIMS ACC.NO.: 00536326

(18) DOC.CIT.: Sanjour, W. Hazardous waste management in the United States. In: Hickman, H. L. , Jr. ed. Proceedings; Third Japan-United States Governmental Conference on Solid Waste Management, Tokyo, May 10-17, 1976. Washington, DC, U. S. Environmental Protection Agency], June 1976, 753 p. (p. 4. 2. 1 - 4. 2. 34).

(1) SWIRS ACC.NO.: 037279

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: The hazardous nature of industrial waste is investigated in a paper presented at the Third Japan-United States Governmental Conference on Solid Waste Management in May 1976. In 1974, the problem of industrial waste containing 6 valance chromium was unexpectedly highlighted in Japan. The cause of this problem was investigated and the management of hazardous substances including chromium was considered. Production and consumption data on chromium are presented, and the increasing degree of environmental pollution caused by various hazardous elements is examined. The origin of hazardous industrial waste is addressed according to four categories: (1) manufacture or processing plants; (2) places where products containing hazardous substances are used; (3) places where hazardous industrial waste is produced during refining; and (4) injurious waste generated from the environmental sanitation facilities of cities. Treatment technologies for industrial waste containing hazardous substances are discussed, with emphasis on reuse and proper storage. Waste water treatment technologies are also discussed. The status of technology for heavy metal sludge treatment is reviewed, along with scattering waste disposal techniques and recycle and reuse concepts. (Document retained in SWIRS library)

(12) KEYWORDS: CHROMIUM; CONFERENCE; DATA; HAZARDOUS; INDUSTRY; MANAGEMENT; SAFETY; STORAGE; TECHNOLOGY; TREATMENT; UTILIZE

(15) STIMS ACC.NO.: 00536324

(18) DOC.CIT.: Murata, T. Countermeasure for disposal of industrial waste containing hazardous substances. In: Hickman, H. L. , Jr. , ed. Proceedings; Third Japan-United States Governmental Conference on Solid Waste Management, Tokyo, May 10-17, 1976. Washington, DC, U. S. Environmental Protection Agency, June 1976, 753 p. (p. 4. 1. 1. 1 - 4. 1. 1. 40).

(1) SWIRS ACC.NO.: 037256

(2) DOMESTIC: P (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Significant aspects of industrial waste control and disposal are examined. Hazardous industrial waste disposal techniques in the United Kingdom are reviewed in relation to legislative controls introduced by the 1972 Deposit of Poisonous Waste Act. Methods utilized by the private sector in disposing of hazardous waste are also noted. It is felt that the Deposit of Poisonous Waste Act has the effect of concentrating wastes on a few specific sites, thereby reducing the possibility for natural biodegradation of chemical wastes. This concentration effect has resulted in two adverse side effects: (1) transportation of waste over long distances to acceptable sites; and (2) significant increase in disposal costs. It is suggested that a

realistic approach to the problem of industrial waste be adopted which involves maximizing the use of natural biodegradation in landfill sites and the use of existing high capital cost treatment and incineration facilities for certain categories of waste. Tipping and leachate problems are discussed, and the following methods of waste disposal are examined: formation of lagoons from inert media for aqueous wastes, direct discharge of aqueous waste into the face of a tip using the absorbent capacity of fresh refuse, creation of drying beds from inert media, and direct discharge of sludge into the base of a tip's face which can then be quickly covered with other refuse.

(12) KEYWORDS: DISPOSAL; ECONOMICS; GREAT BRITAIN; HAZARDOUS; INDUSTRY; LAW; LEACH; PRIVATE; PROBLEMS; SANITARY LANDFILL; TRANSPORT

(15) STIMS ACC.NO.: 00S36301

(18) DOC.CIT.: Massey, D. R. Some views on industrial waste control. Solid Wastes, 66(3):111-116, Mar. 1976.

(1) SWIRS ACC.NO.: 037112

(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Federal Government involvement in solid waste management is reviewed. Waste management was initiated at the Federal level in 1965, with emphasis on four aspects: collection and storage, recycling and transformation, disposal, and reduction. The nature and scope of solid waste generation in the United States are discussed, and it is noted that major consideration has been given to municipal wastes in urban areas and to industrial wastes. Between 1966 and 1970, Federal research and development focused on municipal wastes. From 1970 to 1973, resource recovery was the single most important item of consideration. At the same time, efforts were made to explore hazardous waste management. Waste production in 1980 is forecasted in relation to economics, resource recovery, and reduction techniques. It is pointed out that the Federal Government will most likely emphasize the control of hazardous wastes in the future, along with resource recovery, land disposal criteria for all solid wastes, waste reduction options, and the redesign of products to make them last longer.

(12) KEYWORDS: COLLECTION; CONFERENCE; DISPOSAL; ECONOMICS; FEDERAL; HAZARDOUS; INDUSTRY; LAND; MANAGEMENT; MUNICIPALITY; RECLAMATION; REDUCTION; STORAGE; TECHNOLOGY; US

(15) STIMS ACC.NO.: 00S36157

(18) DOC.CIT.: Darnay, A. Defining the solid waste problem - an overview: the Federal view point after a decade of involvement. In: Proceedings; Fifth Annual Symposium of the Los Angeles Regional Forum on Solid Waste Management, University of California, Los Angeles, May 21, 1975. Torrance, CA, Los Angeles Regional Forum on Solid Waste Management, 1975, 160 p. (p. 2-7).

(1) SWIRS ACC.NO.: 036458

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Hazardous aspects of waste generation, treatment, and disposal in the pharmaceutical industry are examined. Four basic study objectives were identified: (1) determine the nature and quantities of hazardous waste originating in the pharmaceutical industry in 1973 and project these quantities to 1977 and 1983; (2) determine treatment and disposal practices within the industry; (3) examine improved control technologies which can be applied to reduce waste hazards; and (4) calculate the cost of implementing three levels of control technology in a typical hypothetical plant. Three levels of technology were considered: technology applied by typical facilities, best technology employed, and technology necessary to provide adequate health and environmental protection. Study results are presented in regard to characteristics of the pharmaceutical industry and its waste products, treatment and disposal technologies, and cost analyses.

Appendices provide information on hazard grades and properties of hazardous constituents.

(12) KEYWORDS: COMPARISON; COMPOSITION; CONTROL; DISPOSAL; DRUGS; ECONOMICS; EPA; HAZARDOUS; INDUSTRY; PROJECTION; QUANTITY; SURVEY; SYSTEMS ANALYSIS; TECHNOLOGY; TREATMENT

(15) STIMS ACC.NO.: 00535503

(18) DOC.CIT.: Environmental Protection Agency. Pharmaceutical industry: hazardous waste generation, treatment, and disposal. Environmental Protection Publication SW-508. Washington, U. S. Government Printing Office, 1976, 178 p. (Solid Waste Management Series.)

(1) SWIRS ACC.NO.: 035632

(2) DOMESTIC: F (2) CATEGORY: 07 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Mining operators near the Peak National Park have increased their operation to such an extent that waste disposal has become a major problem. They want to dispose of tailings on 70 acres of the parkland. A similar proposal was submitted in 1969. The Health and Safety Commission intends to put forward proposals requiring the labelling of road tankers carrying hazardous materials. The Health Safety Commission would also like to see tanker design included in any coding. The Hong Kong government has announced that funds are available to begin design work on the 29 million dollar Chaiwan composting plant. It is hoped that it will start operation in 1979 with an initial capacity of 200 tons per day. In South Yorkshire volunteer groups are competing to cleanup the environment. The competition is sponsored by the County Council and the Sheffield Morining Telegraph. About 370,000 tons of oils and greases are available for recovery. According to a recently published report only 80,000 tons are actually reclaimed. Planters division of Entwisle & Gass claim that their three stage baler has been specifically designed for the reclamation of metals from refuse. Land erosion has caused asbestos waste to come to the surface at two old dumps near Calderdale, South Yorkshire, and the county is having difficulty in tracing the owner of one of them. If the owners can not be traced the county will have to take action to prevent more erosion. Biraegradable plastic bags will be introduced by Spar, a grocery chain with 4,000 shops. The bags will decompose in 5 years, losing half their strength in the first year underground. The bags cost Spar less than existing bags. The United Kingdom chemical information service has expanded its scope to its current awareness bulletins. New additions include environmental pollution, liquid waste treatment, pollution on monitoring, recovery and recycling of waste, and solid and radioactive waste.

(12) KEYWORDS: ASBESTOS; CHEMICAL; COMPOSTING; DISPOSAL; ENVIRONMENT; HAZARDOUS; METAL; MINE; OIL; PACKAGING; PLASTIC; RECLAMATION; SANITARY LANDFILL; TAILINGS; TRANSPORT

(15) STIMS ACC.NO.: 00534677

(18) DOC.CIT.: Waste notes. Surveyor Public Authority Technology, 146(4339):24, Aug. 8, 1975.

(1) SWIRS ACC.NO.: 035466

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Waste disposal almost pays for itself at the Eastman Kodak Company's Rochester, New York plant. Silver is recovered by the combustible waste disposal unit. The market for vinyl chloride looks good despite recent health scares involving workers developing liver cancer. Frustration over the inability to cope with polychlorinated biphenyl (PCB) pollution was a major theme of a national conference on PCBs held in Chicago, Illinois. The U. S. Environmental Protection Agency (EPA) sponsored the Nov. 19 to 21, 1975 meeting. The number of small sources of PCBs make effluent regulation ineffective. What is needed is substitutes for PCB. EPA is investigating the possibility that a refuse fueled power plant might be hazardous to its workers' health. The problem would be due to increased exposure to bacteria and viruses. The Union Electric plant that is being investigated does not

think there is a real problem; new construction is being planned. EPA has approved ocean incineration as an environmentally sound method for disposing of toxic industrial wastes. EPA will issue permits and will monitor the ocean disposal. The decision on whether to permit the wide scale use of plutonium in nuclear fuel could come as early as 1977 according to announcements made by the U. S. Nuclear Regulatory Commission. A key step in the decision making process will be the preparation of a cost benefit analysis. Plutonium can be recovered from spent nuclear fuel.

(12) KEYWORDS: BACTERIA; DISPOSAL; ECONOMICS; EPA; FUEL; HEALTH; MARKET; MONITOR; OCEAN; PUBLIC UTILITY; RADIOACTIVE; RECLAMATION; REGULATIONS; TOXIC; VIRUS

(15) STIMS ACC.NO.: 00S34511

(18) DOC.CIT.: Chementator. Chemical Engineering, 82(26):79-82, Dec. 8, 1975.

(1) SWIRS ACC.NO.: 033954

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This paper presents on overview of hazardous wastes management in the States. Although a few States have taken action on the control of hazardous wastes, most are waiting for the passage of Federal legislation defining their responsibilities and giving direction for State activities in this area. California, Minnesota, and Oregon are the only States which have passed comprehensive hazardous wastes management legislation, including State authority to designate wastes as hazardous, to regulate the treatment and disposal of such wastes, and to require records and inspections of waste management facilities. Some States have approached the control of hazardous wastes through restrictions on the types of wastes which can be accepted at a landfill or other disposal site. Other States have strict regulations regarding the collection and hauling of hazardous wastes. However, only some regulation of the generation of hazardous wastes will permit real control over hazardous waste management practices. If States require a report on the generation of hazardous wastes they can then determine the extent to which these wastes reach approved disposal sites. Problems involved in the regulation of hazardous waste management by States include: administrative and political obstacles to new legislation and regulations; the restriction on the free movement of hazardous wastes across State boundaries; and the lack of an adequate data base on generation and composition of these wastes. With or without Federal legislation, States are expected to be the primary force in controlling the management of hazardous wastes. (This document is retained in the SWIRS library.)

(12) KEYWORDS: CONTROL; DISPOSAL; FEDERAL; GENERATION; HAZARDOUS; INDUSTRY; LAW; MANAGEMENT; PLANNING; PROBLEMS; REGULATIONS; STATE; TRANSPORT; TREATMENT

(15) STIMS ACC.NO.: 00S32998

(18) DOC.CIT.: Newton, M. Hazardous waste management in the States. In Proceedings; National Conference on Management and Disposal of Residues from the Treatment of Industrial Wastewaters, Washington, D. C. , Feb. 3-5, 1975. Rockville, Maryland, Information Transfer, Inc. p. 13-16.

(1) SWIRS ACC.NO.: 032273

(2) DOMESTIC: D (2) CATEGORY: 26 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Street cleaning methods have a low efficiency according to the EPA. They are primarily aimed at aesthetic purposes and even under well-operated programs don't reach the places where the greatest concentrations of contaminants lie. William D. Hurst, consulting engineer and senior research associate for the American Public Works Association agrees with this view but feels that there are ways of making the system more efficient. The problem as he sees it is

that the street sweepers only remove about 50 percent of the dust and dirt fraction that contain the majority of the contaminants. Therefore, a second sweep is needed. But sue to the economics of the situation, most cities are reluctant to authorize additional funds to buy the expensive equipment such as vacuum sweepers. The most efficient method would be to use a conventional street sweeper followed by a vacuum sweeper that can pick up the finer dust and dirt. City administrations need to design more effective programs for street cleaning.

(12) KEYWORDS: ADMINISTRATION; CURB; DUST; ECONOMICS; EPA; EQUIPMENT; HAZARDOUS; MAINTENANCE; MANAGEMENT; MUNICIPALITY; PARTICULATE MATTER; POLLUTION; PROBLEMS; PUBLIC WORKS; STREET CLEANING

(15) STIMS ACC.NO.: 00S31317

(18) DOC.CIT.: They don't remove enough dirt. The American City, 90(3):45, Mar. 1975.

Section 2
ECONOMICS

(1) SWIRS ACC.NO.: 048491
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: The costs of landfill criteria and hazardous waste regs will be high.
(6) JOURNAL TITLE: Solid wastes Mgmt/RRJ
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: Solid waste disposal criteria promulgated by the Environmental Protection Agency (EPA) for landfills and hazardous waste are analyzed. Sanitary landfill criteria have been extended to include every land disposal practice for all types of waste generated. Estimated combined annual costs to government, industry, and the taxpayer to meet requirements of the Resource Conservation and Recovery Act as they pertain to land disposal and hazardous waste are about $2.5 billion above the costs of existing practices. Major contributors to cost increases are safety, closure, groundwater protection, and environmentally sensitive areas. Compliance with hazardous waste criteria is expected to cost from two to 27% of the annual value of production for industries (petroleum rerefining, wool scouring, hydrofluoric acid, boric acid, aluminum smelting, and petroleum refining). Plans of the EPA to streamline its rulemaking process are reported. Data on the impact of the criteria are provided.
(12) KEYWORDS: CRITERIA; DISPOSAL; ECONOMICS; EPA; HAZARDOUS; LAND; MANAGEMENT; REGULATIONS; SANITARY LANDFILL; SOLID
(14) HIERARCH TERMS: 1HC; 1LF/2FF; 1MA/2PF; 1SG/2RL
(15) STIMS ACC.NO.: 00S47545
(16) CITATION: 21(7):16, 18, 54D, Jul. 1978.

(1) SWIRS ACC.NO.: 046709
(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Allocation formula development.
(4) AUTHOR: Gushue JJ
(6) BOOK TITLE: In Analysis of State Solid Waste Management Data.
(9) CONTRACT NO.: 68-01-3583
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Factors affecting the development of an allocation formula for federal solid waste management program funds are explored. State program needs are defined as the extent of federal monetary assistance required to develop an effective and comprehensive state solid waste management program. The extent of the solid waste management problem is conceptualized, considering land disposal, hazardous waste, and resource recover. Alternative formulas for examining the extent of impact that solid waste management problems at the state level have on the distribution of federal funds are presented. Computational procedures involved in the application of the formulas are detailed, and the results of implementing the computational procedures are given. (Retained in SWIRS library).
(12) KEYWORDS: DISPOSAL; ECONOMICS; FEDERAL; HAZARDOUS; LAND; MANAGEMENT; PROBLEMS; RECLAMATION; RESOURCE; SOLID; STATE
(14) HIERARCH TERMS: 1EC; 1MA/2PF
(15) STIMS ACC.NO.: 00S45761 (15) SECONDARY AUTHORS: Chatterjee S
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Oct. 1976. p.71-91.

(1) SWIRS ACC.NO.: 046536
(2) DOMESTIC: D (2) CATEGORY: 22 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: After what? After imposition of a 'perpetual care' system, that's what.
(4) AUTHOR: Kunes T
(6) JOURNAL TITLE: Waste Age
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2WW (10) PUB. YEAR: 1978
(11) ABSTRACT: In Wisconsin, proposed legislation would require landfill operators to provide routine care after their sites close and insurance against environmental disasters. Long term care provisions are included in a legislative package covering hazardous waste management and refinements of existing solid waste laws. In the proposed legislation, long term care (30 years) is defined as the routine care, maintenance, and monitoring of a solid waste or hazardous waste treatment, storage, or disposal facility following closing of the site. Routine long term care consists of: monitoring (sampling and analysis of gas, water quality and movement); land surface care; leachate management; and gas management. After 30 years, costs of additional care will be provided by a state run waste management fund to be created by user tipping fees charged at operating landfills. Emphasis of the proposed Wisconsin legislation is to couple siting and licensing procedures with planning for routine long term care to reduce the chance of environmental destruction.
(12) KEYWORDS: ANALYSIS; ECONOMICS; ENVIRONMENT; FEE; GAS; HAZARDOUS; LAW; LEACH; MAINTENANCE; MANAGEMENT; MONITOR; PLANNING; SANITARY LANDFILL; STATE; WATER; WISCONSIN
(14) HIERARCH TERMS: 1EP; 1LF/2SW; 1LH; 1MA/2SW; 1MV; 1SG/2SO
(15) STIMS ACC.NO.: 00S45587 (15) SECONDARY AUTHORS: Morgan J
(16) CITATION: 9(1):14, 16, 18, 20, Jan. 1978.

(1) SWIRS ACC.NO.: 046404
(2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Current research on land disposal of municipal solid wastes.
(4) AUTHOR: Schomaker NB
(6) BOOK TITLE: In Banerji, S. K., ed. Management of Gas and Leachate in Landfills. Proceedings of the Third Annual Municipal Solid Waste Research Symposium. (8) REPORT NO.: EPA-600/9-77-026
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2OH (10) PUB. YEAR: 1977
(11) ABSTRACT: Investigation of the disposal and processing of municipal solid and hazardous wastes is the primary responsibility of the Solid and Hazardous Waste Research Division (SHWRD). The Cincinnati, Ohio, office is directing research towards new and improved systems of municipal and hazardous waste management, development of technology, determination of environmental effects, and collection of data necessary for the establishment of processing and disposal guidelines. The current research program is divided into three areas: (1) pollutant predictions for current landfill techniques; (2) alternatives to current landfill disposal techniques; and (3) remedial action for minimizing pollutants from unacceptable sites. Recent focus on a waste-as-fuels program is discussed. Funding procedures are delineated. (Retained in SWIRS library).
(12) KEYWORDS: DATA; DISPOSAL; ECONOMICS; ENERGY; ENVIRONMENT; HAZARDOUS; MANAGEMENT; OHIO; RESEARCH; SANITARY LANDFILL
(14) HIERARCH TERMS: 1DP/2RP; 1MA/2IF; 1RE
(15) STIMS ACC.NO.: 00S45455
(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, Sep. 1977. p.1-12.

(1) SWIRS ACC.NO.: 046234
(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Southern New England water supply lands changing values and policies.
(4) AUTHOR: Irland LC
(6) JOURNAL TITLE: J New England Water Works Assoc
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CT; 1US/2MH; 1US/2RI (10) PUB. YEAR: 1977
(11) ABSTRACT: Conflicts over land and water use in Southern New England are reviewed. Major sources of conflict have been rising demands for access to reservoirs and adjacent land for recreation, and moves by two water companies to sell large acreages of land. Several threats to water quality result from different land use alternatives, such as timber harvesting, residential and commercial development, and recreational uses. For each use, potential impacts on water quality are summarized, and means of reducing those impacts are suggested. The arguments for and against disposal of the two water utilities' lands are noted. The State Assembly concerned has passed a two year moratorium on water company land sales while an independent Council studies the matter. Water use projections are reviewed, the economics of municipal and industrial water demand are discussed, and supply costs are summarized. It is concluded that, given the goal of providing the public with low cost, high quality water, extreme conservatism should be practiced. Management practices, such as permitting contact recreation, should be allowed only under the most carefully controlled conditions. Recreational use of water supply reservoirs and lands will raise complex financing, cost recovery, cost sharing, and liability problems.
(12) KEYWORDS: COMMERCIAL; CONNECTICUT; CONSTRUCTION; ECONOMICS; FORESTRY; HAZARDOUS; HEALTH; MANAGEMENT; MASSACHUSETTS; PUBLIC UTILITY; PUBLIC WORKS; QUALITY; REGIONAL; RESIDENTIAL; RHODE ISLAND; TREATMENT; WATER
(14) HIERARCH TERMS: 1EC/2C6; 1HL; 1MA/2RI
(15) STIMS ACC.NO.: 00S45285 (15) SECONDARY AUTHORS: Levy SM
(16) CITATION: 91(1):12-39, Mar. 1977.

(1) SWIRS ACC.NO.: 046114
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Industrial wastes assigned pigeonhole in federal regulatory program.
(6) JOURNAL TITLE: Solid Wastes Mngt/RRJ
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The 1976 Resource Conservation and Recovery Act (RCRA) is critical of the refuse industry. Consequently, the way in which the U.S. Environmental Protection Agency (EPA) implements the Act is being closely watched by that industry. So far, RCRA implementation has concentrated on hazardous wastes regulations and improved land disposal. Later, emphasis should shift to the more complex and long range objectives of resource conservation. The Resource Conservation Committee was set up by RCRA to eliminate economic and legal barriers which prevent resource conservation from being a feasible alternative for solid waste management. There are indications that the Committee is being accorded the priority it deserves by participating agencies and by Congress.
(12) KEYWORDS: AUTHORITY; DISPOSAL; ECONOMICS; EPA; FEDERAL; GOVERNMENT; HAZARDOUS; INDUSTRY; LAND; LAW; LEGAL; MANAGEMENT; PROBLEMS; RECLAMATION; REFUSE; REGULATIONS; SOLID; SPECIAL
(14) HIERARCH TERMS: 1LF/2ER; 1LF/2FF; 1MA; 1RR
(15) STIMS ACC.NO.: 00S45164
(16) CITATION: 20(10):30, 86, Oct. 1977.

(1) SWIRS ACC.NO.: 046083
(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Considerations for in-plant solid waste control.
(4) AUTHOR: Eldredge RW
(6) JOURNAL TITLE: Waste Age
(10) LANGUAGE: EN (10) PUB. YEAR: 1975
(11) ABSTRACT: Thorough study of solid waste control procedures can help industries improve their profits. If material is not wasted, it

does not require collection, storage, processing, or disposal as waste. Some waste products have value as raw materials for other manufacturers, representing an income to offset waste control expenses. Establishment of good waste control practices within the plant can be achieved by: proper receptacle placement; proper sizing of receptacles; establishing a collection route; using control equipment to reduce theft; reevaluating management procedures; considering subsequent actions when choosing container locations; considering horizontal and vertical clearance, and cost saving movements; investigating labor costs; and selecting compatible equipment. Management responsibility in identifying hazardous wastes and their appropriate disposal requirements is discussed.

(12) KEYWORDS: COLLECTION; CONTAINER; COST REDUCTION; DISPOSAL; ECONOMICS; EQUIPMENT; HAZARDOUS; INDUSTRY; MANAGEMENT; MARKET; RECLAMATION; REFUSE; SOLID; STORAGE

(14) HIERARCH TERMS: 1IN/2C6; 1IN/2UT; 1MA/2TQ

(15) STIMS ACC.NO.: 00S45133

(16) CITATION: 6(6):98-101, Jun. 1975.

(1) SWIRS ACC.NO.: 045911

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Practices in the Metal Smelting and Refining Industry. Volume I - Executive Summary. (8) REPORT NO.: SW-145c.1 (9) CONTRACT NO.: 68-01-2604

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Investigations of on-land disposal of process and pollution control residuals from the United States metal smelting and refining industry were conducted. Characteristics of each industry sector, including plant locations, production capacities, and smelting and refining processes, have been identified and described. Land-disposed or stored residuals, including slags, dusts, and sludges have been identified and characterized for physical and chemical properties. State, regional, and national estimates have been made of the total quantities of land-disposed or stored residuals and potentially hazardous constituents thereof. Current methods employed by the primary metals industry for the disposal or storage of process and pollution control residuals on land are described. Principal methods include lagoon storage of sludges and open dumping of slags. Methods of residual treatment and disposal considered suitable for adequate health and environmental protection have been provided. The costs incurred by typical plants in each primary smelting and refining category for current and environmentally sound potentially hazardous residual disposal or storage on land have been estimated. (Retained in SWIRS library).

(12) KEYWORDS: DISPOSAL; DUMPING; DUST; ECONOMICS; HAZARDOUS; INDUSTRY; LAGOONS; MANAGEMENT; METAL; OPEN; REFINERY; RESIDUE; SLAG; SLUDGE; STORAGE; TREATMENT

(14) HIERARCH TERMS: 1EC/2C6; 1HC/2DP; 1MA/2TQ; 1MK; 1SW/2MX

(15) STIMS ACC.NO.: 00S44961

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 51 p.

(1) SWIRS ACC.NO.: 045864

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Reeder LR

(6) BOOK TITLE: Review and Assessment of Deep-Well Injection of Hazardous Waste. Volume I.

(8) NTIS NO.: PB-269001 (8) REPORT NO.: EPA-600/2-77-029a (9) CONTRACT NO.: 68-03-2013

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2LA; 1US/2TX (10) PUB. YEAR: 1977

(11) ABSTRACT: A review and assessment is made of the adequacy of deep-well waste injection systems to receive hazardous wastes. The effects these wastes have upon the environment when injected into subsurface reservoirs are defined. A comprehansive bibliography, chemical waste profiles, deep-well inventory, case histories, microbiological research, deep-well and hazardous waste research, legal

aspects, and an inventory of statutes and regulations governing waste injection are discussed. More than 1,000 papers related to deep-well injection of industrial waste were reviewed, identifying 105 deep-well related and 186 hazardous waste treatment research projects. Problems stemmed from a failure to use available geologic information and accepted and proven engineering practices in location, design, and operation of deep-well systems. It is suggested that standard regulations among states are needed to alleviate problems arising from use of interstate aquifers for injection and for more effective management and control of deep-well systems. It was concluded that additional information is needed on aquifer chemistry, chemical and microbiological reactions of waste within a receiving aquifer, and monitoring of deep-well systems as a predictive tool. (Retained in SWIRS library).

(12) KEYWORDS: DEEP WELL; DISPOSAL; ECONOMICS; ENVIRONMENT; HAZARDOUS; INDUSTRY; LAW; LICENSE; LOUISIANA; MANAGEMENT; MONITOR; REGULATIONS; RESEARCH; TEXAS; UNDERGROUND

(14) HIERARCH TERMS: 1DD; 1DD/2DW; 1HA/2HF

(15) STIMS ACC.NO.: 00544913 (15) SECONDARY AUTHORS: Cobbs JH; Field JW JR

(16) CITATION: Cincinnati, Oh, U.S. Environmental Protection Agency, Jun. 1977. 196 p.

(1) SWIRS ACC.NO.: 045849

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Evaluation of results.

(6) BOOK TITLE: In Disposal of Hazardous Wastes: Organization.

(10) LANGUAGE: EN (10) GEO. AREA: 1EU; 1US (10) PUB. YEAR: 1977

(11) ABSTRACT: Organizational schemes for the management and disposal of hazardous waste in North Atlantic Treaty Organization (NATO) countries are examined. Information was obtained primarily by questionnaire from the following NATO countries: Belgium, Denmark, the Federal Republic of Germany, France, the Netherlands, the United Kingdom, and the United States. It was determined that organizational issues in hazardous waste disposal should be considered in relation to other aspects of management and not in isolation. Issues of particular importance are the cost of transportation, the need for defining and classifying hazardous waste, the management of disposal facilities, control of the generation and transfer of hazardous waste, planning, waste exchange systems, liability, insurance, financing, and special regulations for certain waste types. (Retained in SWIRS library).

(12) KEYWORDS: DISPOSAL; ECONOMICS; EUROPE; HAZARDOUS; MANAGEMENT; PLANNING; REGULATIONS; SURVEY; US

(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1MA/2MC; 1S0

(15) STIMS ACC.NO.: 00544898

(16) CITATION: North Atlantic Treaty Organization, Jun. 1977. p.73-100.

(1) SWIRS ACC.NO.: 045790

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Comparison studies.

(6) BOOK TITLE: In Alternatives for Hazardous Waste Management in the Inorganic Chemicals Industry. (8) REPORT NO.: SW-149c (9) CONTRACT NO.: EPA 68-01-4190

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A comparison was made of capital investment and operating costs and energy requirements of alternate methods of treating potentially hazardous wastes from the inorganic chemicals industry and between two land disposal options (sanitary or chemical landfill). For 13 of the 15 waste streams involved in the study, sanitary landfill operations proved to be significantly lower in capital outlays than either the chemical landfill or alternate treatment processes. For one of the waste streams, the capital outlays are approximately equal for sanitary landfill and the treatment process. One waste stream treatment process shows a significant advantage in the amount of capital outlay over both sanitary and chemical landfill options, and for five other streams the selected treatment processes show an advantage in the amount of capital outlay

over the respective chemical landfill option. However, high annual operating costs estimated for the treatment processes negate the capital outlay cost advantages for these six waste streams. Most treatment processes selected have higher energy requirements than the two land disposal options. Comparisons by industrial category made with respect to annual operating cost per kkg of product and total annual energy consumption show that product price effects of capital outlay, operating costs, and energy requirements are significant, indicating that only one resource recovery process (for phosphorus) appears practical. It is concluded that the other treatment processes may only be justified with potentially hazardous waste detoxification as a prime objective and resource recovery as secondary. (Retained in SWIRS library).

(12) KEYWORDS: CHEMICAL; DISPOSAL; ECONOMICS; HAZARDOUS; INORGANIC; LAND; MANAGEMENT; PROCESS; SANITARY LANDFILL; TREATMENT

(14) HIERARCH TERMS: 1HA/2HG

(15) STIMS ACC.NO.: 00S44839

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. p.7-1--7-25.

(1) SWIRS ACC.NO.: 045789

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Land disposal option costs.

(6) BOOK TITLE: In Alternatives for hazardous Waste Management in the Inorganic Chemicals Industry. (8) REPORT NO.: SW-149c (9) CONTRACT NO.: EPA 68-01-4190

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Sanitary landfill disposal options and costs for treating potentially hazardous wastes from the inorganic chemicals industry are reviewed and compared with similar parameters and costs for chemical landfill processes. Design bases used for sanitary landfills included disposing of solid wastes on land, spreading them in thin layers, compacting them to the smallest practical volume, and covering them with soil each day. Design bases used for chemical landfilling of wastes include lining excavated areas with compacted clay and synthetic membrane, collection and monitoring of leachate, and drumming of wastes. Cost bases included land cost, area grading and preparation, liner costs, liner cover costs, leachate collection and riser system, buildings and utilities, landfill equipment, and operating expenses. Results of analyses showed that sanitary landfill operations were significantly less expensive in terms of capital outlays and operating costs than chemical processes for 13 of the 15 waste streams identified. (Retained in SWIRS library).

(12) KEYWORDS: CHEMICAL; DISPOSAL; ECONOMICS; HAZARDOUS; INORGANIC; LAND; MANAGEMENT; PROCESS; SANITARY LANDFILL; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1CB/2CA; 1DD/2DW; 1EA/2EA; 1HA/2HG; 1SD/2SC

(15) STIMS ACC.NO.: 00S44838

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. p.6-1--6-35.

(1) SWIRS ACC.NO.: 045785

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(6) BOOK TITLE: Alternatives for Hazardous Waste Management in the Inorganic Chemicals Industry. (8) REPORT NO.: SW-149c (9) CONTRACT NO.: EPA 68-01-4190

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Technically feasible treatment techniques for potentially hazardous wastes are identified that accomplish resource recovery, waste detoxification, or volume reduction of waste for ultimate disposal. Potentially hazardous waste streams are identified as mercury, chlorinated hydrocarbons, asbestos, lead, metallic sodium and calcium, waste water sludges, fluoride, arsenic, antimony, chromate, nickel, and phosphorus. Industries that generate these wastes are characterized in terms of number, location, size, and production capacity. Technologies for treating inorganic waste streams are identified as calcination, dissolution, distillation, electrolysis,

evaporation, filteration, high gradient magnetic separation, neutralization and pH control, and precipitation. Processes selected for treatment of specific waste streams are identified, analyzed, and given costs. In addition, land disposal options and costs are discussed. A comparison of the cost of the proposed treatment processes with sanitary or chemical land disposal for each waste stream found that sanitary landfill operations would be significantly lower in capital outlays for 13 of the 15 waste streams identified. Consideration was also given to energy requirements for the respective treatments. The appendixes contain known occupational and health effects of potentially hazardous compounds, cost bases for cost analyses tasks, and sample calculation of costs. (Retained in SWIRS library).

(12) KEYWORDS: CHEMICAL; ECONOMICS; HAZARDOUS; INORGANIC; MANAGEMENT; PROCESS; TREATMENT

(14) HIERARCH TERMS: 1CB/2CA; 1EA/2EA; 1HA/2HG; 1MA/2MH; 1TG

(15) STIMS ACC.NO.: 00S44834

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 301 p.

(1) SWIRS ACC.NO.: 044235

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Levin J

(5) CORPORATE AUTHOR: WAPORA, Inc

(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Practices-Special Machinery Manufacturing Industries.

(8) NTIS NO.: PB-265 981 (8) REPORT NO.: SW-141c (9) CONTRACT NO.: 68-01-3193

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Hazardous waste generation and management in industrial establishdments which manufacture special industry machinery, office, computing, and accounting machines are described. The results of 33 plant surveys show that land disposed process waste from the industries falls into five categories: machine shop, heat treating, electroplating, materials coating, and foundry waste. Specific process waste types are characterized according to their chemical constitutents and physical properties. Treatment and disposal techniques and attendant costs for each type of process waste at three levels of technology are examined: (1) the most prevalent technology in use; (2) the best technology employed; and (3) the technology required for adequate health and environmental protection. Total process waste and hazardous constituent quantities are estimated for the five categories on a national level and are broken down by Environmental Protection Agency regions and States. (Retained in SWIRS library).

(12) KEYWORDS: CHEMICAL; DATA; DISPOSAL; ECONOMICS; FEDERAL; GOVERNMENT; HAZARDOUS; INDUSTRY; MANAGEMENT; PHYSICAL; PLANT-INDUSTRIAL; STATE; SURVEY; TREATMENT

(14) HIERARCH TERMS: 1EA/2EA; 1EE; 1HA/2HF; 1HA/2HG; 1MA/2MH

(15) STIMS ACC.NO.: 00S43279 (15) SECONDARY AUTHORS: Beeland G; Greenberg J

(16) CITATION: Washington, DC, U. S. Environmental Protection Agency, Mar. 1977. 309 p. (Solid Waste Management Service.)

(1) SWIRS ACC.NO.: 044196

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(4) AUTHOR: Peters GO

(5) CORPORATE AUTHOR: WAPORA, Inc

(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Practices-Electronic Components Manufacturing Industry. (8) REPORT NO.: SW-140c (9) CONTRACT NO.: 68-01-3193

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Hazardous waste generation and management in the electronic components manufacturing industry are described. The results of surveys of 23 plants show that product and manufacturing process diversity within the industry precludes the satisfactory correlation of these factors with waste types. Survey data indicated that land

disposed waste from the industry falls into 10 waste categories, five categories of which contain such hazardous materials as halogenated solvents, nonhalogenated solvents, waste water treatment sludge, painting waste, and hydraulic and lubricating oils. The remaining five categories include unquantifiable amounts of hazardous materials, no hazardous materials, or waste that is not typically landfilled. Hazardous properties of the industry's land disposed waste involve flammability, corrosivity and dermal irritation, oral toxicity, and bioconcentration. The estimated total quantity of potentially hazardous waste land disposed by the industry in 1975 was 54,500 tons on a wet weight ton basis. More than half of this total constituted waste water treatment sludge. The best technology applied and the technology required to provide enviornmentally adequate treatment for waste and associated costs are discussed. (Retained in SWIRS library).

(12) KEYWORDS: DATA; DISPOSAL; ECONOMICS; GENERATION; HAZARDOUS; INDUSTRY; MANAGEMENT; OIL; PAINT; SLUDGE; SOLVENT; SURVEY; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1EA/2EA; 1HA/2HH; 1MA/2MH; 1SO

(15) STIMS ACC.NO.: 00S43239 (15) SECONDARY AUTHORS: Levin J; Thomas P

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Jan. 1977. 197 p. (Solid Waste Management Series.)

(1) SWIRS ACC.NO.: 043992

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Management Petroleum Re-Refining Industry. (8) REPORT NO.: SW-144C

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2DC (10) PUB. YEAR: 1977

(11) ABSTRACT: Resource recovery has become a matter of great importance in worldwide public awareness. Wastes from manufacturing sources generated in tremendous quantities are often a threat to our environment and, when not recycled, irretrievably deplete our finite resources. This study report attempts to qualify and quantify the potentially hazardous wastes generated by the petroleum rerefining industry in the United States. It further surveys the industry characteristics as well as the treatment and disposal technology and costs for its wastes. Projected production of rerefined oil and generation of wastes, using the best data available, have been made for 1977 and 1983. (Retained in SWIRS library).

(12) KEYWORDS: DISPOSAL; ECONOMICS; HAZARDOUS; INDUSTRY; MANAGEMENT; OIL; RECLAMATION; REFINERY; TREATMENT

(14) HIERARCH TERMS: 1EA/2EA; 1HA/2HF; 1PF/2PG/3PH

(15) STIMS ACC.NO.: 00S43035

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 148 p.

(1) SWIRS ACC.NO.: 043976

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: R and D for the nuclear waste management concept of the Federal Republic of Germany.

(4) AUTHOR: Bohm H

(6) JOURNAL TITLE: Atomwirtschaft

(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2GE (10) PUB. YEAR: 1977

(11) ABSTRACT: Research and development work in nuclear waste management is described in Germany where reprocessing of radioactive nuclear wastes is favored. The advantages and disadvantages of the alternatives: reprocessing or direct ultimate disposal of spent fuels are discussed. An overview of the amounts of fuel and radioactive waste accumulating annually is presented together with an examination of the costs of nuclear waste management. The role of the big science research centers in the development of a waste management system is examined. Changing attitudes have resulted in an expansion of research an development work at these centers in reprocessing, waste treatement, and ultimate storage areas. Centers are concentrating on short and medium term objectives in cooperation with industry. And, centers are increasing their work on nuclear safety and the development of a

concept for safeguarding nuclear materials in a waste management center. Examples are given which illustrate unresolved problems of waste management of nuclear fuels.

(12) KEYWORDS: DISPOSAL; ECONOMICS; EUROPE; FUEL; GERMANY; HAZARDOUS; MANAGEMENT; RADIOACTIVE; RESEARCH; SAFETY; STORAGE

(14) HIERARCH TERMS: 1EA/2EA; 1HA/2HF; 1HA/2HG; 1HB; 1MA/2MH

(15) STIMS ACC.NO.: 00543018

(16) CITATION: 22(4):209-213, Apr. 1977.

(1) SWIRS ACC.NO.: 043902

(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Overview of residuals management in Pennsylvania.

(4) AUTHOR: Merritt GL

(6) BOOK TITLE: In Land Application of Residuals. Proceedings: Engineering Foundation Conference, Easton, MD, Sep. 26-Oct. 1, 1976.

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2PA (10) PUB. YEAR: 1976

(11) ABSTRACT: The State plan for the management of residuals in Pennsylvania is described. A three-phase effort has been initiated, encompassing standards development, permit coordination, and planning. This effort is in response to stricter environmental control requirements for air and water pollution. Data on the quantities of solid waste generation in Pennsylvania are tabulated. Types of waste generated by certain industries in the State are listed. Also provided is a listing of estimated quantities of industrial process and nonprocess waste. Pennsylvania's Solid Waste Management Act requires that selected municipalities must plan for the disposal of all solid waste generated within their boundaries. Objectives of the State hazardous waste management plan are identified. Elements of comprehensive water quality management planning that affect solid waste management are noted. Institutional, financial, and legal aspects of residual waste control are addressed. The importance of permit coordination and the development of adequate disposal criteria and standards is discussed.

(12) KEYWORDS: CONTROL; CRITERIA; DATA; DISPOSAL; ECONOMICS; HAZARDOUS; INDUSTRY; INSTITUTION; LAW; LEGAL; MANAGEMENT; MUNICIPALITY; PENNSYLVANIA; PLANNING; REGULATIONS; RESIDUE; STATE

(14) HIERARCH TERMS: 1DD/2DP; 1HA/2HF; 1IC/2IY; 1MA/2MG

(15) STIMS ACC.NO.: 00542945 (15) SECONDARY AUTHORS: Galida GR

(16) CITATION: New York, NY, American Society of Civil Engineers, 1976. p.124-134.

(1) SWIRS ACC.NO.: 043895

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Hazardous waste management and disposal-industrial.

(4) AUTHOR: Curry NA

(6) BOOK TITLE: In Land Application of Residuals. Proceedings: Engineering Foundation Conference, Easton, MD, Sep. 26-Oct. 1, 1976.

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: The treatment and disposal of toxic components of waste are considered. Toxic residuals include radioactive waste, pathogens, carcinogens, explosives, toxic elements and compounds, incinerator waste, flammable or exothermic materials, waste degradation products affecting the stability of toxic materials, complexing agents, and pH affecting products. The ability of the following disposal methods to handle toxic waste is assessed: spray irrigation, land farming, sanitary landfilling, chemical landfilling, deep well disposal, salt beds, and perpetual secure burial. Economic and practical aspects of treatment are explored, with particular emphasis

on leachate treatment and segregation versus treatment. Additional information on the characteristics and disposal of toxic waste is appended.

(12) KEYWORDS: CHEMICAL; DISPOSAL; ECONOMICS; FARM; HAZARDOUS; INDUSTRY; IRRIGATION; LAND; LEACH; MANAGEMENT; PATHOGEN; RADIOACTIVE; RESIDUE; SANITARY LANDFILL; TOXIC; TREATMENT

(14) HIERARCH TERMS: 1HA/2HF; 1HA/2MH; 1PM; 1TD

(15) STIMS ACC.NO.: 00S42938

(16) CITATION: New York, NY, American Society of Civil Engineers, 1976. p.17-38.

(1) SWIRS ACC.NO.: 043709

(2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Waste incineration cost.

(5) CORPORATE AUTHOR: TRW

(6) BOOK TITLE: In Destroying Chemical Wastes in Commercial-Scale Incinerators (Facility Report 6). (8) REPORT NO.: SW-122c.5 (9) CONTRACT NO.: 68-01-2966

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2TX (10) PUB. YEAR: 1977

(11) ABSTRACT: Capital and operating costs involved in the incineration of polychlorinated biphenyl (PCB) containing capacitor waste and nitrochlorobenzene (NCB) processing waste are examined. Individual economic analyses were performed to determine the commercial and industrial costs of incinerating chemical waste at the Rollins incineration facility in Deer Park, Texas. For commercial disposal facilities, estimates of equipment prices, fuel consumption, and manpower requirements were based on data obtained from Rollins Environmental Services, Inc. For the onsite industrial facility involving the disposal of NCB processing waste, estimates of equipment prices, fuel consumption, and manpower requirements were based on engineering scaling of data obtained for the Chemolite plant incinerator system of the 3M Company. The total capital investment for a 5,000 metric ton per year PCB capacitor waste incineration plant is estimated at $3.6 million. The total capital investment for an onsite 4,540 metric $2.8 million. Annual operating costs for the PCB plant and the NCB plant are estimated at $3.7 and $1.2 million, respectively.

(12) KEYWORDS: ECONOMICS; INCINERATION; POLYCHLORINATED

(14) HIERARCH TERMS: 1IA/21D; 1IA/21E

(15) STIMS ACC.NO.: 00S42752

(16) CITATION: Washington, DC, U. S. Environmental Protection Agency, 1977. p.69-77. (Solid Waste Management Series).

(1) SWIRS ACC.NO.: 043542

(2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: G

(4) AUTHOR: Williams R

(5) CORPORATE AUTHOR: Arthur D. Little, Inc

(6) BOOK TITLE: Economic Assessment of Potential Hazardous Waste Control Guidelines for the Inorganic Chemicals Industry. (8) REPORT NO.: EPA/530/SW-134c (9) CONTRACT NO.: EPA No. 68-01-3269

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: An analysis of the economic impact of potential hazardous waste management regulations upon inorganic chemicals was performed based on hazardous waste management cost data supplied by the EPA. The inorganic chemicals included chlorine and caustic soda, hydrofluoric acid, elemental phosphorus sodium dichromate, titanium dioxide, aluminum fluoride, chrome pigments, nickel sulfate, phosphorus pentasulfide, phosphorus trichloride, and sodium silicofluoride. A methodology was developed to systematically judge the broader economic effects on these chemicals, resulting from applications of hazardous waste management control, first by assessing the likelihood that management costs would be defrayed through price increases, and secondly, if price increases were not likely, the likelihood that plant closures would occur. Based on this approach, it was concluded that

only hydrofluoric acid appears to be susceptible to plant shutdowns as a result of hazardous waste management control costs. (Retained in SWIRS library).
(12) KEYWORDS: ANALYSIS; CHEMICAL; CONTROL; ECONOMICS; HAZARDOUS; INDUSTRY; INORGANIC; MANAGEMENT
(14) HIERARCH TERMS: 1A; 1CB/2CA; 1EA/2EA; 1HA; 1MA/2MH
(15) STIMS ACC.NO.: 00S42585 (15) SECONDARY AUTHORS: Shamel R; Hallock K
(16) CITATION: Washington, DC, EPA Hazardous Waste Management Division, Oct. 1976. 320 p.

(1) SWIRS ACC.NO.: 043114
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Garbage and regionalism.
(4) AUTHOR: Banks S
(6) JOURNAL TITLE: Nation's Cities
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Regionalism, already well under way in solid waste disposal, was given a major boost with the passage of the Resource Conservation and Recovery Act of 1976 (RCRA). The act, among other things, calls for creation of a nationwide system of substate regional solid waste planning districts. The act establishes a comprehensive framework for identifying and regulating solid and hazardous waste and also for upgrading local waste management practices. RCRA is more likely to achieve its objectives than previous federal environmental legislation because of its emphasis on state and local responsibility. The most important section of the act is the section on "State and Regional Solid Waste Plans," in which governors in consultation with local officials are instructed to use previously issued Environmental Protection Agency guidelines to identify regional solid waste management units and designate a state agency responsible for implementing the state plan. Regional planning agencies are to begin putting their plans into action by March 1978. Municipal officials are urged to take an active role in planning to assure that State consultation with local officials takes full account of the advantages of existing municipal disposal arrangements. Although funding has improved under the Carter administration, it is still insufficient and many states may choose not to cooperate in enacting the various provisions of the Act.
(12) KEYWORDS: DISPOSAL; ECONOMICS; ENVIRONMENT; EPA; FEDERAL; HAZARDOUS; LAW; LOCAL; MANAGEMENT; MUNICIPAL; RECLAMATION; REFUSE; REGIONAL; SOLID; STATE
(14) HIERARCH TERMS: 1DD/2DP; 1ED; 1LB/2LD; 1MA/2ME
(15) STIMS ACC.NO.: 00S42157
(16) CITATION: 15(5):22-23, May 1977.

(1) SWIRS ACC.NO.: 042333
(2) DOMESTIC: D (2) CATEGORY: 07 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Land application of waste materials: unresolved problems and future outlook.
(4) AUTHOR: Martin WP
(6) BOOK TITLE: In Land Application of Waste Materials.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: A review of the land application of waste materials is presented, and unresolved problem areas where additional research is needed are identified. A distinction is made between disposal versus the use of waste materials. Specific waste materials of concern are noted as heavy metals, pathogens, nutrient elements, persistent organics, organic loadings, waste water and heat, radioactive waste, salinity, and aesthetic values. A soil quality index is proposed to relate the environmental impact of continuing or sustained use of soil amendments on crop production or other land uses. The statement is made that the land application of waste can only be acceptable if it is

consistent with good crop, silvicultural, and land management practices. Such practices must be consistent with protecting the soil as a resource and, at the same time, protect against the degradation of surface and ground water and possible conflict with food and fiber production. The following areas are recommended for further research: prediction of the long term fate of potentially toxic heavy metals; survival, movement, and possible deactivation of viruses; the capacity of soil to accept waste; the development of cropping systems to optimize the use of nutrients while maximizing the amount of waste organics that can be accommodated; the use of waste heat and water; and the economic impact of waste management systems on agricultural production.

(12) KEYWORDS: BENEFIT; CRITERIA; DISPOSAL; EARTH; ECONOMICS; EFFECT; HAZARDOUS; LAND; MANAGEMENT; PROBLEMS; PROJECTION; RESEARCH; SLUDGE; UTILIZE; WASTE WATER

(14) HIERARCH TERMS: 1DD/2DQ; 1MA; 1SJ

(15) STIMS ACC.NO.: 00S41377 (15) SECONDARY AUTHORS: Gast RG; Meyer GW

(16) CITATION: Ankeny, IA, Soil Conservation Society of America, 1976. p. 300-309.

(1) SWIRS ACC.NO.: 042048

(2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Management of used chemicals.

(6) JOURNAL TITLE: Materials Reclamation Weekly

(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1977

(11) ABSTRACT: A one day conference on the management of used chemicals was held in Strathford on Avon in England. A sampling of technological potential began with domestic refuse. After separation, the cellulose element could be used for the production of ethanol. About 90 percent of the plastics now made from oil could be made from ethanol. Acid from pickling solutions could be revitalized by a system employing ion exchange membranes. Tin in a plating solution was saved by the same method. Metals in low concentrations can be recovered in a continuous electrolytic system. In the field of agriculture, grasslands were fertilized with a liquor generated in the production of gas (for nitrogen) and with coke oven byproducts (for phosphate and potash). Recovery process of solvents in Europe is discussed, and the problems of disposing of polychlorinated biphenyls are also discussed.

(12) KEYWORDS: ALCOHOL; CHEMICAL; CONFERENCE; DISPOSAL; ECONOMICS; EUROPE; GREAT BRITAIN; HAZARDOUS; LAND; MANAGEMENT; POLYCHLORINATED; RECLAMATION; UTILIZE

(14) HIERARCH TERMS: 1CB/2CA/3CC; 1CB/2CB/3CF; 1RB

(15) STIMS ACC.NO.: 00S41092

(16) CITATION: 129(1):20-21, 24, Jan. 1, 1977.

(1) SWIRS ACC.NO.: 041336

(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Rosenberg DG (10) GEO. AREA: 1PF/2PG/3PG; 1PF/2PG/3PH (10) PUB. YEAR: 1976

(11) ABSTRACT: A comprehensive review of hazardous waste generation and management practices within the petroleum refining industry is presented. Nearly 625,000 metric tons (dry weight) of wastes were generated in 1974 by 247 refineries with processing capacity of 14. 2 million barrels per day. Waste streams emanating from individual refining process are characterized and described in detail. Following site visits and waste stream sampling at a representative group of sixteen refineries, a laboratory program of chemical analysis was carried out to identify potentially hazardous constituents of refinery wastes. Concentration levels of these constituents were measured, and

hazardous wastes defined as those with any constituent with a concentration exceeding the average level in the natural soil environment. Oil is the principal hazardous substance in refinery wastes, representing approximately 110,000 metric tons per year. Metal constituents amount to 250 metric tons, fluoride to 812 metric tons, and phenol, cyanide, and benz-A-pyrene collectively to 6 metric tons. More than half of refinery wastes are removed by private contractors to ultimate disposal in offsite landfills or lagoons, however projections indicate a dramatic shift toward onsite disposal, particularly by landspreading and filling. (Retained in SWIRS library)

(12) KEYWORDS: DISPOSAL; ECONOMICS; HAZARDOUS; INDUSTRY; LAND; MANAGEMENT; OIL; REFINERY; SURVEY; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1HA/2HH

(15) STIMS ACC.NO.: 00540380 (15) SECONDARY AUTHORS: Cruse H; Lofy RJ

(18) DOC.CIT.: Rosenberg, D. G. , R. J. Lofy, and H. Cruse. Assessment of hazardous waste practices in the petroleum refining inudstry. Washington, DC, U. S. Environmental Protection Agency, June 1976. 353 p. (Distributed by the National Technical Information Service, Springfield, VA, as PB 259 097.)

(1) SWIRS ACC.NO.: 040562

(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: G (10) GEO. AREA: 1ED (10) PUB. YEAR: 1976

(11) ABSTRACT: The Office of Research and Development work on the Public Sector Activities Program is reviewed. There are three research subprograms and waste management is organized in five areas; wastewater treatment technology, soil treatment systems, runoff pollution control, community wastewater system management, and solid and hazardous waste management. The general area of research in each of these subjects is reviewed. In 1976 emphasis will be on technological problems associated with the Construction Grants Program, principally the processing and disposal of sludges from wastewater treatment systems. Upgrading existing treatment works and alternative wastewater disinfection technologies will also receive attention. The Five Year Plan has the same objectives, with increased attention to improving existing treatment facilities with instrumentation, automation, and improved operation and maintenance procedures, integrated dry and wet weather management systems for urban wastewaters, treatment technologies to achieve the goals of P. L. 92-500, other treatment technologies for specific discharge conditions, and development of non structural approaches to urban and suburban runoff control. Major goals of the water supply subprogram include researching improved methods of identifying and measuring contaminants in drinking water and finding their source and effects, and improved treatment methods of raw water. Environmental management goals involve investigation of linkages among various residuals generated and discharged by community activities, design of integrated environmental management systems, evaluation of impacts on all media of single media pollution control strategies, and development of technical guidance methods.

(12) KEYWORDS: ECONOMICS; ENVIRONMENT; EPA; FACILITY; GRANT; HAZARDOUS; HEALTH; MANAGEMENT; PLANNING; PROGRAM; PUBLIC; RESEARCH; RESIDUE; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1AE

(15) STIMS ACC.NO.: 00539606

(18) DOC.CIT.: Public sector activities. In U. S. Environmental Protection Agency Environmental Research Outlook, FY 1976 through 1980. Report to Congress, Feb. 1976. Environmental Protection Publication EPA-600/9-76-003. Washington, U. S. Environmental Protection Agency, 1976. p. 85-101.

(1) SWIRS ACC.NO.: 040186
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: T
(4) AUTHOR: Hickman H Jr (10) GEO. AREA: 1DD/2DN; 1LB/2LB; 1LB/2LD (10) PUB. YEAR: 1976
(11) ABSTRACT: A summary of the new amendments to the Solid Wastes Disposal Act is presented. The first part of the legislation deals with general provisions of the act, including findings and objectives and definitions to be used to interpret the act. The findings break down into four major areas of Congressional concern, solid wastes, environment and health, materials and energy. A total of 35 terms are defined in Subtitle A, the most important of which are disposal; hazardous wastes; hazardous wastes management; resource conservation; resource recovery; solid wastes; and solid waste management. Subtitle B establishes an Office of Solid Wastes in EPA. Subtitle C establishes a regulatory program for hazardous wastes management. Subtitle D provides for financial assistance to develop and implement solid wastes management plans in the states. Subtitle E provides for the Department of Commerce to stimulate recovery and recycling of materials. Subtitle F requires total government involvement while Subtitle G provides for administration procedures. Subtitle H lists authorities to conduct studies, demonstrations, training and evaluation of all aspects of solid wastes management.
(12) KEYWORDS: ECONOMICS; ENERGY; ENVIRONMENT; EPA; FEDERAL; GOVERNMENT; HAZARDOUS; HEALTH; LAW; MANAGEMENT; RECLAMATION; REFUSE; SOLID WASTE DISPOSAL ACT
(14) HIERARCH TERMS: 1MA
(15) STIMS ACC.NO.: 00S39230
(18) DOC.CIT.: Hickman, H. , Jr. President Ford signs new solid wastes bill. Solid Wastes Management, 19(11):52, 72, 74, Nov. 1976.

(1) SWIRS ACC.NO.: 039906
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The proceedings of 1975 public meetings on hazardous waste management are reported. The meetings were convened by the Environmental Protection Agency's Office of Solid Waste Management Programs. They were held on December 2 in Newark, New Jersey; on December 4 in Rosemont, Illinois; on December 9 in Houston, Texas; and on December 11 in San Francisco, California. The meetings were attended by members of the public, representatives of industrial firms that generate hazardous waste, and environmentalists. The objective of the meetings was to obtain and disseminate information and recommendations on hazardous waste management issues. Sixteen major discussion topics were addressed during the four meetings: (1) definition of hazardous waste; (2) responsibilities and liabilities of hazardous waste generators; (3) hazardous waste disposal methods; (4) practices for rendering waste harmless; (5) cost data on processes and techniques for the treatment and disposal of hazardous waste; (6) safety; (7) provisions for site monitoring and recordkeeping; (8) availability of insurance and other mechanisms to reduce the risk to operators of private hazardous waste facilities; (9) hazardous waste storage and disposal sites; (10) feasibility methodologies for establishing limits on the amount of hazardous waste generated; (11) transportation safety regulations; (12) labeling; (13) damage costs of improper hazardous waste management; (14) mechanisms for soliciting citizen acceptance of hazardous waste management facilities; (15) hazardous waste generated by Federal facilites; (16) involvement of the private sector in the treatment and disposal of hazardous waste. (Retained in SWIRS library)
(12) KEYWORDS: CONFERENCE; DISPOSAL; ECONOMICS; ENVIRONMENT; EPA; HAZARDOUS; INDUSTRY; INFORMATION; MANAGEMENT; MATERIALS HANDLING; CSWMP; PUBLIC; RESPONSIBILITY; SAFETY; SITES; TRANSPORT; TREATMENT
(15) STIMS ACC.NO.: 00S38050
(18) DOC.CIT.: Corson, W. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, Ill, Houston, TX, and San Francisco, CA, Dec. 1975. 2 V. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. 1736 p.

(1) SWIRS ACC.NO.: 039748
(2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: The economic and financial structure of the hazardous waste management service industry and its potential for creating new capacity under regulatory and nonregulatory assumptions are examined. Hazardous waste management facilities store, treat and dispose of wastes in facilities not associated with the industries that generate the waste. An analysis of the industry structure and organization including data on types of firms and plants, employment, pricing and costing, and markets was performed. An assessment was made of the industry's financial indicators. In 1975, there were approximately 95 firms in the industry operating 110 facilities; total industry revenues were about $100 million. The report projects that there will be capacity shortfalls of hazardous waste management facilities in 1983 for organic chemical and metal/metal finishing potentially hazardous wastes. (Retained in SWIRS library)
(12) KEYWORDS: ANALYSIS; CHEMICAL; ECONOMICS; FACILITY; HAZARDOUS; MANAGEMENT; MARKET; MATERIALS HANDLING; METAL; ORGANIC; PLANT-INDUSTRIAL; STORAGE
(15) STIMS ACC.NO.: 00538792
(18) DOC.CIT.: Foster D. Snell, Inc. Potential for capacity creation in the hazardous waste management service industry. Washington, U. S. Environmental Protection Agency, Aug. 1976. 123 p. (Distributed by the National Technical Information Service, Springfield, VA, as PB 257 187.)

(1) SWIRS ACC.NO.: 038745
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The third in a series of reports on the improper land disposal of hazardous waste is discussed. The report was prepared by the Environmental Protection Agency's Office of Solid Waste Management Programs. Criteria used in the selection of incidents for the hazardous waste reports are severity of damage, availability of supporting information, and availability of Environmental Protection Agency personnel for investigation. This report is concerned with petrochemical contamination of the Cohansey aquifer in in New Jersey, hexachlorobenzene contamination of cattle in Louisiana, and workers exposed to poisonous fumes at a Maryland landfill. Each damage incident is described in terms of personal damage, environmental damage, economic damage, cause of problem, type and quantity of hazardous waste, source of waste, date of incident, location, status, remedial action, legal action, and costs involved. (Document retained in SWIRS library)
(12) KEYWORDS: ACCIDENT; CONTAMINATE; DISPOSAL; ECONOMICS; HAZARDOUS; INVESTIGATION; LOUISIANA; MANAGEMENT; MARYLAND; NEW JERSEY; CSWMP
(15) STIMS ACC.NO.: 00537789
(18) DOC.CIT.: Hazardous waste disposal damage reports. Environmental Protection Publication EPA-530/SW-151. 3. Cincinnati, OH, U. S. Environmental Protection Agency, June 1976, 13 p. (Solid Waste Management Series.)

(1) SWIRS ACC.NO.: 038277
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Senate debate on the Solid Waste Utilization Act of 1976 (S. 2150) is discussed. The proposed Solid Waste Utilization Act is a bill to amend the Solid Waste Disposal Act to authorize State program and implementation grants, provide incentives for the recovery of resources from waste, and control the disposal of hazardous waste. The following aspects of the proposed bill are considered in the Senate debate: program and implementation grants, prohibitation of open dumping, hazardous waste disposal control, enforcement, citizens suits, judicial review, loan guarantees, rural community assistance, Federal procurement, employee protection, Federal land disposal sites, State authority, Federal facilities, resource conservation, solid waste on

Federal lands in Alaska, public relations and economic aspects of solid waste control, litter and solid waste, source reduction, energy, impact of the bill on consumers, solid waste activities in the State of Oreggon, employment prospects under a proposed Massachusetts bill on container deposits, waste disposal methods, areawide planning, and the responsibility of State and local government authorities in solid waste management.

(12) KEYWORDS: CONTROL; DISPOSAL; DUMPING; ECONOMICS; FEDERAL; GRANT; HAZARDOUS; INCENTIVE; LAW; MANAGEMENT; OPEN; PROGRAM; RESPONSIBILITY; SITES; SOLID; STATE; US; UTILIZE

(15) STIMS ACC.NO.: 00537321

(18) DOC.CIT.: U. S. Congress. Senate. Solid Waste Utilization Act of 1976. S. 2150, 94th Cong. , 2nd sess. Congressional Record, 122(104):June 30, 1976. Washington, U. S. National Archives, 1976. 44 p.

(1) SWIRS ACC.NO.: 038059

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Economic aspects of waste disposal from nuclear power plants are surveyed. Recovery of materials from wastes and their disposal is estimated at over 500 DM/kg uranium (U). The costs of uranium have been mounting proportionally with the costs for standard fuels: by 1. 1 Pf/kWh for nuclear fuel and by 33 DM/ton for bituminous coal. The cost of disposal alone amounts to about 12 percent of the cost for nuclear fuel. Recycling of uranium and plutimium could save 20 percent of costs for primary uranium. It is considered important, from an economical as well as from an environmental point of view, to recover (in the reprocessing plants) tritium and krypton 85 to 90 to 99 percent and iodine to 99 to 99. 8. Methods and processes of storing liquid nuclear wastes, high and medium active, are surveyed; Krypton 85 is stored in 50 l pressure bottles (200 kg/sq cm); iodine loaded barrel filters are stored in the barrels themselves; and tritium water is pumped into deep porous layers. Several processes are employed in storing liquid highly active wastes, usually in double wall steel tanks; after 5 years they must be further strengthened by some stable materials. Medium active liquid waste is concentrated in evaporators and then embedded in bitumen or cement. (Original text in German)

(12) KEYWORDS: BURY; CONCRETE; DISPOSAL; ECONOMICS; FOSSIL FUEL; FUEL; GERMANY; LIQUID; PROCESS; RADIOACTIVE; RECLAMATION; STABILIZATION; STORAGE

(15) STIMS ACC.NO.: 00537103

(18) DOC.CIT.: Schmieder, H. Entsorgung der Kerntechnik--Energiewirtschaftliche und technische Aspekte. (Waste removal in nuclear engineering and its economical and technical aspects.) Brennstoff-Waerme-Kraft, 28(5):212-215, May 1976.

(1) SWIRS ACC.NO.: 037508

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This study was intended to provide the U. S. Environmental Protecion Agency (EPA) with detailed and pertinent information on the generation, management, treatment, disposal and costs related to potentially hazardous wastes. The information will be used by the EPA to develop guidelines and standards for the management of hazardous wastes. The objectives of this study were to determine, for the manufacturers of industrial organic chemicals, pesticide preparations and explosives: (1) the quantities and geographic distributions of land-destined hazaruous waste; (2) present practices

for treatment and disposal of land-destined hazardous wastes; (3) commercial control technology for reducing the hazards presented by disposal of such wastes; and (4) the cost of present practices.

(12) KEYWORDS: CHEMICAL; DISPOSAL; ECONOMICS; HAZARDOUS; INCINERATION; INDUSTRY; ORGANIC; PESTICIDE; PROCESS; STANDARD; TECHNOLOGY; TREATMENT; WOOD

(15) STIMS ACC.NO.: 00536552

(18) DOC.CIT.: Gruber, G. 1. Assessment of industrial hazardous waste practices, organic chemicals, pesticides, and explosives industries. Environmental Protection Publication 530/SW-11bc. Washington, DC, Office of Solid Waste Management Programs, U. S. Environmental Protection Agency, 325 p. (Document available from National Technical Information Service as PB251307).

(1) SWIRS ACC.NO.: 037112

(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Federal Government involvement in solid waste management is reviewed. Waste management was initiated at the Federal level in 1965, with emphasis on four aspects: collection and storage, recycling and transformation, disposal, and reduction. The nature and scope of solid waste generation in the United States are discussed, and it is noted that major consideration has been given to municipal wastes in urban areas and to industrial wastes. Between 1966 and 1970, Federal research and development focused on municipal wastes. From 1970 to 1973, resource recovery was the single most important item of consideration. At the same time, efforts were made to explore hazardous waste management. Waste production in 1980 is forecasted in relation to economics, resource recovery, and reduction techniques. It is pointed out that the Federal Government will most likely emphasize the control of hazardous wastes in the future, along with resource recovery, land disposal criteria for all solid wastes, waste reduction options, and the redesign of products to make them last longer.

(12) KEYWORDS: COLLECTION; CONFERENCE; DISPOSAL; ECONOMICS; FEDERAL; HAZARDOUS; INDUSTRY; LAND; MANAGEMENT; MUNICIPALITY; RECLAMATION; REDUCTION; STORAGE; TECHNOLOGY; US

(15) STIMS ACC.NO.: 00536157

(18) DOC.CIT.: Darnay, A. Defining the solid waste problem - an overview: the federal view point after a decade of involvement. In: Proceedings; Fifth Annual Symposium of the Los Angeles Regional Forum on Solid Waste Management, University of California, Los Angeles, May 21, 1975. Torrance, CA, Los Angeles Regional Forum on Solid Waste Management, 1975, 160 p. (p. 2-7).

(1) SWIRS ACC.NO.: 037061

(2) DOMESTIC: D (2) CATEGORY: 05 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Chemical aspects of hazardous waste management are noted. The chemical viewpoint of hazardous waste management is summarized in terms of three major steps: (1) segregate hazardous waste from all other waste; (2) keep various types of hazardous waste separated from each other; and (3) process hazardous materials to produce environmentally acceptable and products when there is no opportunity for recycling. Conventional concepts in solid waste management are considered, including a large and relatively constant volume of waste, constant composition of waste, containment of waste in a specific location, and control of waste to prevent adverse environmental effects. The chemical viewpoint is contrasted with conventional concepts in that it emphasizes a relatively small volume of hazardous waste which must be kept segregated from the bulk of nonhazardous waste and special handling of residues from processed hazardous waste to prevent the regeneration of toxic characteristics. It is concluded that the cost of proper hazardous waste management will

be higher than that of nonhazardous waste management. However, the potential cost associated with inadequate disposal of hazardous waste is much higher in terms of economics and environmental damage.

(12) KEYWORDS: CHEMICAL; COMPOSITION; CONFERENCE; CONTROL; DISPOSAL; ECONOMICS; ENVIRONMENT; HAZARDOUS; MANAGEMENT; SEPARATING; TOXIC; VOLUME

(15) STIMS ACC.NO.: 00S36126

(18) DOC.CIT.: Brown, W. E. The chemical viewpoint of hazardous wastes management. In: National Solid Wastes Management Association. Proceedings; Fourth National Congress on Waste Management Technology and Resource and Energy Recovery, Atlanta, November 12-14, 1975. Washington, DC, U. S. Environmental Protection Agency, 1976, 382 p. (p. 37-45).

(1) SWIRS ACC.NO.: 037079

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: An approach to the management of hazardous waste is detailed. Hazardous waste materials generated in Alaska, Idaho, Oregon, and Washington were surveyed to estimate types and quantities of waste, determine waste management and disposal practices, identify existing and potential hazardous waste disposal sites, project future waste generation patterns, and develop cooperative concepts to enhance hazardous waste management within the study region. Four potential sources of hazardous waste were identified: (1) industrial operations which produce a hazardous residual as part of their process or handle hazardous materials; (2) State and Federal activities which handle hazardous materials; (3) agricultural operations which handle large quantities of pesticides; and (4) hazardous waste management industry. Surveys of these sources were conducted to obtain detailed information. The effectiveness of a regional survey approach to the evaluation of hazardous waste management is discussed in relation to the expected benefits of obtaining detailed information and whether such benefits exceed the cost of direct contact with all potential hazardous waste sources.

(12) KEYWORDS: ALASKA; COLLECTION; CONFERENCE; DISPOSAL; ECONOMICS; HAZARDOUS; IDAHO; INFORMATION; MANAGEMENT; OREGON; QUANTITY; REGIONAL; SURVEY; WASHINGTON

(15) STIMS ACC.NO.: 00S36124

(18) DOC.CIT.: Dawson, G. W. , and M. W. Stradley. Regional approach to chemical waste management: how do you derive your data base? In: National Solid Wastes Management Association. Proceedings; Fourth National Congress on Waste Management Technology and Resource and Energy Recovery, Atlanta, November 12-14, 1975. Washington, DC, U. S. Environmental Protection Agency, 1976, 382 p. (p. 10-21).

(1) SWIRS ACC.NO.: 036458

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Hazardous aspects of waste generation, treatment, and disposal in the pharmaceutical industry are examined. Four basic study objectives were identified: (1) determine the nature and quantities of hazardous waste originating in the pharmaceutical industry in 1973 and project these quantities to 1977 and 1983; (2) determine treatment and disposal practices within the industry; (3) examine improved control technologies which can be applied to reduce waste hazards; and (4) calculate the cost of implementing three levels of control technology in a typical hypothetical plant. Three levels of technology were considered: technology applied by typical facilities, best technology employed, and technology necessary to provide adequate health and environmental protection. Study results are presented in regard to characteristics of the pharmaceutical industry and its waste products, treatment and disposal technologies, and cost analyses.

Appendices provide information on hazard grades and properties of hazardous constituents.

(12) KEYWORDS: COMPARISON; COMPOSITION; CONTROL; DISPOSAL; DRUGS; ECONOMICS; EPA; HAZARDOUS; INDUSTRY; PROJECTION; QUANTITY; SURVEY; SYSTEMS ANALYSIS; TECHNOLOGY; TREATMENT

(15) STIMS ACC.NO.: 00S35503

(18) DOC.CIT.: Environmental Protection Agency. Pharmaceutical industry: hazardous waste generation, treatment, and disposal. Environmental Protection Publication SW-508. Washington, U. S. Government Printing Office, 1976, 176 p. (Solid Waste Management Series.)

(1) SWIRS ACC.NO.: 036361

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975

(11) ABSTRACT: Cyanide wastes arise in three main forms: spent case hardening salts containing 10 to 15 percent cyanide; spent plating baths, dips, stripping solutions etc, which contains several percent cyanide; and reuse waters which generally contain cyanide at less than 1,000 milligrams per liter. Experiments are described for the electro-chlorination of cyanide reuse waters using planar electrode cells; this method utilizes sodium chloride and though the cyanide is destroyed, metal is precipitated and must be filtered out. A letter alternative electrolytic method uses the Chemelec cell in which metals are recovered as a high purity deposity on the cathode as the cyanide is destroyed. The chemistry and comparative costs of chlorination versus electrolytic treatments are tabulated. Batch and continuous processes are described. The experimental method using a simulated copper cyanide rinse water should be equally applicable to all cyanide plating solution. If the recovered metal has a value of 250 to 350 pounds per ton, the cyanide can be destroyed at zero cost.

(12) KEYWORDS: CHEMICAL; COMPARISON; ECONOMICS; ELECTROLYSIS; ENERGY; FILTER; GREAT BRITAIN; HAZARDOUS; METAL; PRECIPITATE; SALT; SEPARATING; SIMULATION; TOXIC

(15) STIMS ACC.NO.: 00S35406

(18) DOC.CIT.: Hillis, M. R. Treatment of cyanide wastes by electrolysis. Transactions of the Institute of Metal Finishing, 53(2):65-73, 1975.

(1) SWIRS ACC.NO.: 035530

(2) DOMESTIC: D (2) CATEGORY: 05 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: A major contributor to the high cost of solid waste management is the cost of injuries that result in medical treatment and workman's compensation payments. Refuse collection and disposal have compiled the worst injury record of any industry in America. The Bureau of Sanitation in Milwaukee, Wisconsin planned a complete safety program with the goal of cutting down on accidents. The Bureau purchased Operation Responsible, a training program developed by the U. S. Environmental Protection Agency (EPA). The program included a movie, a series of slides complete with narrative, and instructions for training supervisors, truck drivers, and sanitation workers. Safe working procedures include such things as avoidance of slips and falls, careful handling of hazardous materials, proper lifting methods, and how to drive and guide vehicles. The package from EPA was used with only two changes. A few slides from each series were replaced with slides of Milwaukee sanitation workers. The narrative that accompanied the slides was taped so that the supervisor did not read it. Discussions and helpful suggestions were prompted by the presentations. It is estimated that the program saved the city approximately 200 thousand dollars in 1973, its first year of operation. Due to a severe winter in 1974, the accident rate did increase over the 1973 figures. A complete safety program includes the proper attitude, an employee's orientation to the job's safety equipment, a method of raising public interest, a cooperative effort between labor and management, and an information

system. A good reporting system for injuries helps determine the factors which influence injury rates.

(12) KEYWORDS: ACCIDENT; COLLECTION; DISPOSAL; ECONOMICS; EPA; EQUIPMENT; HAZARDOUS; INJURY; LIFT; MANAGEMENT; MILWAUKEE; PERSONNEL; SAFETY; TRAINING; TRUCK

(15) STIMS ACC.NO.: 00S34575

(18) DOC.CIT.: Caplan, R. E. Milwaukee battles back against refuse collection injuries. Public Works, 106(12):55-57, Dec. 1975.

(1) SWIRS ACC.NO.: 033987

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This paper discusses the development of a data base for the exchange and recycling of hazardous wastes. The Office of Solid Waste Management Programs (OSWMP) of the U. S. Environmental Protection Agency (EPA) believes that the implementation of the industrial waste exchange concept provides a viable method for alleviating the hazardous industrial wastes disposal problems in this country. The literature indicates that industrial waste exchange clearinghouses have been established in at least six European countries in recent years. These waste exchange clearinghouses are generally operated by a national industrial association. Advertisements are used to make the availability of wastes known, although the source of the waste remains confidential. At least one private firm in the United States has been established as brokerage to expedite the exchange of wastes for its customers. Although OSWMP does not intend to organize or manage an industrial waste utilization clearinghouse at this time, it is funding a study of the European waste clearinghouse and other institutional arrangements through which a viable industrial waste utilization exchange, and recycling program could be implemented in the United States. It is suggested that the first American exchanges will probably operate in specific regions rather than nationally as a result of the high cost of transporting wastes long distances. A systematic methodology will be developed to assess the potential uses for industrial and waste streams and will be demonstrated for at least 50 industrial waste streams. A clearinghouse implementation program will be also developed. (This document is retained in the SWIRS library.)

(12) KEYWORDS: DATA; ECONOMICS; EUROPE; HAZARDOUS; INDUSTRY; MANAGEMENT; OSWMP; PLANNING; PROBLEMS; RECLAMATION; RESEARCH; SYSTEM; UTILIZE

(15) STIMS ACC.NO.: 00S33031

(18) DOC.CIT.: Porter, C. H. Development of a data base for the exchange and recycling hazardous wastes. In Proceedings; National Conference on Management and Disposal of Residues from the treatment of Industrial Wastewaters, Washington, D. C. , Feb. 3-5, 1975. Rockville, Maryland, Information Transfer, Inc. p. 261-263.

(1) SWIRS ACC.NO.: 033959

(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This paper presents an assessment of the generation of hazardous wastes and of hazardous wastes management practices in the organic chemicals industry. This industry, Standard Industrial Classification Code 281, includes the following industries: alkalies and chlorine; industrial gasses; inorganic pigments; and other industrial inorganic chemicals. Data are provided on the generation of the following hazardous waste constituents by the various segments of this industry: asbestos, arsenic, beryllium, cadimum, chromium, copper, cyanides, lead, mercury, halogenated hydrocarbons, pesticides, selenium, and zinc. About 55 percent of the production in SIC 281 is by plants in the other industrial inorganic chemicals sub-category, but

this section produces about 90 percent of the potentially hazardous wastes. Wastes from the inorganic chemicals industry are generally subjected to some combination of the following treatment and disposal processes: chemical detoxification; high temperature processing, open dumping; municipal discharge to municipal sewers; deep well injection; and ocean dumping. most of the potentially hazardous wastes from this industry are disposed of by ponding, lagooning, landfilling, or dumping, generally in the absence of adequate containment, monitoring, or leachate control programs. It is suggested that appropriate safeguards to upgrade land disposal operations could be implemented in some cases with only moderate increases in cost. (This document is retained in the SWIFS library.)

(12) KEYWORDS: ANALYSIS; CHEMICAL; DATA; DISPOSAL; ECONOMICS; GENERATION; HAZARDOUS; INDUSTRY; INORGANIC; MANAGEMENT; PROBLEMS; PROJECTION; SURVEY; TREATMENT

(15) STIMS ACC.NO.: 0053003

(18) DOC.CIT.: Morekas, S. Waste volumes and characteristics from inorganic chemicals industry. In Proceedings; National Conference on Management and Disposal of Residues from the Treatment of Industrial Wastewaters, Washington, D. C. , Feb. 3-5, 1975. Rockville, Maryland, Information Transfer, Inc. p. 41-47.

Section 3
LAWS AND REGULATIONS

(6) BOOK TITLE: Resource Conservation and Recovery Act of 1976.
(10) LANGUAGE: EN PUB YEAR: 1976
(11) ABSTRACT: This Act amends the Solid Waste Disposal Act, Title II of Public Law 89-272--89th Congress, S. 306--October 20, 1965; as amended by the Resource Recovery Act of 1970, Public Law 91-512--91st Congress, H.R. 11833--October 26, 1970; by Public Law 93-14--93rd Congress, H.R. 5446--April 9, 1973 and by Public Law 93-611--93rd Congress, H.R. 16045--January 2, 1975. Provides for a hazardous waste regulatory program; financial and technical assistance for planning enhanced solid waste management programs; grants to improve solid waste management systems; and authority for research, demonstrations, and studies.
(16) CITATION: Public Law 94-580, 94th Congress, S. 2150, October 21, 1976.

(6) BOOK TITLE: Preliminary Notification of Hazardous Waste Activities; Proposed Procedures.
(10) LANGUAGE: EN PUB YEAR: 1978
(11) ABSTRACT: These proposed rules set forth the procedures for preliminary notification of hazardous waste activities. They define administrative procedures under which States may be granted the authority to receive notifications of hazardous waste activities, and they specify the procedures for filing such notifications by persons conducting hazardous waste activities. The Environmental Protection Agency (EPA) is proposing rules in order to facilitate notification of hazardous waste activities for both those persons who must file notifications and those who will receive them. The statutory intent of these proposed rules is to assure that all persons who at the time these regulations are promulgated are generating, transporting, treating, storing, or disposing of hazardous wastes identified or listed under regulations, shall notify EPA or an authorized State of these activities. These proposed rules specify who must file notification of hazardous waste activity, when and where notification must be filed and what such notification must contain.
(16) CITATION: Federal Register, 43(133):29908-29916, July 11, 1978.

(6) BOOK TITLE: Transportation of Hazardous Waste Materials; Proposed Provisions; Hearing.
(10) LANGUAGE: EN PUB YEAR: 1978
(11) ABSTRACT: This notice proposes to amend the Hazardous Materials Regulations of the U.S. Department of Transportation, 49 Code of Federal Regulations, Parts 171 through 177. The proposed amendment: (1) Would apply to the offering, transportation and delivery, both interstate and intrastate, of hazardous waste materials. (2) Would amend the DOT Hazardous Materials Regulations but not the Federal Motor Carrier Safety Regulations (49 CFR Parts 390-397). (3) Would define "hazardous waste" to include presently recognized hazardous materials when shipped as waste, The definition would result in the designation of all hazardous wastes as hazardous materials. Hazardous wastes would become a subset of hazardous materials. (4) Would prohibit the offering, transportation or delivery of hazardous wastes to sites not sanctioned. (5) Would require additional information on shipping papers. Additional information required to complete a manifest would have to be entered on hazardous materials shipping papers, or the manifest itself could be used as the shipping paper, provided it meets DOT requirements. (6) Would allow a greater latitide for use of nonrefillable and reconditionable containers for some hazardous waste shipments. (7) Would establish a stringent definition of when

a container (under 110 gallons) is "empty" for purposes of the DOT Hazardous Materials Regulations generally. (8) Would require a telephone report for any improper hazardous waste discharge, and to submit additoonal details on the written hazardous materials incident report. (9) Would require carriers to retain for three years a copy of each manifest. (10) Would preempt inconsistent State and local requirements. (11) Would not result in a major national economic impact, nor in a major increase in costs or prices for carriers generally.

(16) CITATION: Federal Register, 43(102): 22626-22634, May 25, 1978.

(6) BOOK TITLE: Standards Applicable to Transporters of Hazardous Wastes; and Public Hearing; Proposed Rules.

(10) LANGUAGE: EN PUB YEAR: 1978

(11) ABSTRACT: Proposed standards under Section 3003 of the Solid Waste Disposal Act (the Act) prescribing procedures for record-keeping, acceptance of hazardous waste for transport, compliance with the manifest system, delivery of the hazardous waste to a designated facility, spills, and placarding/marking of vehicles. In addition, EPA proposes that all hazardous wastes which meet the Department of Transportation's (DOT'S) definition of a hazardous material be subject to the Federal DOT Hazardous Material Regulations for both interstate and intrastate shipments. DOT is in the process of developing regulations which will include coverage of hazardous wastes. If DOT develops standards similar to those proposed by EPA, the EPA hazardous waste transportation standards will be modified to reflect the DOT Hazardous Materials Regulations or will reference the DOT Hazardous Materials Regulations.

(16) CITATION: Federal Register, 43(83): 18506-18512, April 28, 1978.

(6) BOOK TITLE: State Hazardous Waste Programs; Proposed Guidelines.

(10) LANGUAGE: EN PUB YEAR: 1978

(11) ABSTRACT: This rule sets out Guidelines for State hazardous waste management programs, including the substantive and procedural requirements for authorization of such State programs under the authority of Section 3006 of the Solid Waste Disposal Act (42 USC 6901 et seq.), as amended by the Resource Conservation and Recovery Act of 1976 (Pub.L. 94-580). These Guidelines also prescribe the procedures by which States may apply for authorization, the procedures by which such authorization may be withdrawn, and the procedures by which EPA proposes to exercise oversight of such State programs as may be authorized under Section 3006. Section 3005 of the act requires anyone who owns or operates a facility which stores, treats, or disposes of hazardous wastes to have a permit. The Agency considers this requirement to be central to the administration and enforcement of the Act. Section 3002(5) of the Act requires the use of a manifest to ensure that hazardous wastes which leave the site of generation are taken only to storage, treatment, or disposal facilities to which a permit has been issued.

(16) CITATION: Federal Register, 43(22): 4366-4373, February 1, 1978.

(6) BOOK TITLE: Toxic Substances Control and Solid Waste Disposal; Public Information; General Provisions; Confidential Business Information Under Toxic Substances Control Act and Solid Waste Disposal Act; Proposed Rule.

(10) LANGUAGE: EN PUB YEAR: 1978

(11) ABSTRACT: This rule makes changes in the Environmental Protection Agency (EPA) procedures for dealing with requests for information under the Freedom of Information Act and adds two new sections to Subpart B to implement modifications in the basic pro-

cedures for handling business information obtained under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, and the Toxic Substances Control Act. This rule makes no changes in EPA's policy concerning disclosure of business information that is confidential.
(16) CITATION: Federal Register, 43(12): 2638-2644, January 18, 1978.

(6) BOOK TITLE: Public Participation in Solid Waste Management; Interim Guidelines.
(10) LANGUAGE: EN PUB YEAR: 1978
(11) ABSTRACT: This rule sets forth guidelines for involving the public in the development, revision, implementation and enforcement of any regulation, guideline, information or program under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (Pub.L. 94-580). These guidelines apply to all EPA Offices concerned with the Act, other Federal agencies carrying out activities mandated by the Act, and to State and substate entities receiving financial assistance under the Act. Federal, State and substate entities shall provide, encourage, and assist participation of the public in solid and hazardous waste management activities to the fullest extent practicable consistent with other requirements of the Act. The major objectives of such participation include increased responsiveness of government to public concerns and priorities and improved public understanding of official programs and actions. EPA considers public participation to include public meetings, conferences and workshops; development of and distribution of reference materials understandable by the public; and the opportunity for public involvement and comment prior to promulgation of regulations and guidelines. EPA will make special efforts to insure that the public and the media understand the complex technical information produced. This will be accomplished through the use of a broad range of communication tools as described in the guidelines. The intent of the guidelines is to foster a spirit of openness and mutual trust between the public and the Federal, State and substate entities in efforts to promote the protection of the public health and the environment, and to conserve valuable material and energy resources.
(16) CITATION: Federal Register, 43(8): 1902-1906, January 12, 1978.

(6) BOOK TITLE: Effective Hazardous Waste Management (Non-Radioactive); Position Statement.
(10) LANGUAGE: EN PUB YEAR: 1976
(11) ABSTRACT: The purpose of this position statement is to describe a preferred waste management strategy or set of priority pathways for hazardous waste control that adequately protects the public health and environment. The Agency believes that reuse, energy recovery and material recovery as well as treatment are desirable prior to ultimate disposal, especially land disposal. Thus, the desired waste management options are (in order of priority):

Waste Reduction
Waste Separation and Concentration
Waste Exchange
Energy/Material Recovery
Waste Incineration/Treatment Secure Ultimate Disposal
(16) CITATION: Federal Register, 41(161): 35050-35051, August 18, 1976.

(6) BOOK TITLE: Vinyl Chloride; Recommended Procedures for Disposal of Aerosol Cans.
(10) LANGUAGE: EN PUB YEAR: 1976
(11) ABSTRACT: The purpose of this publication is to provide guidance for the disposal of vinyl chloride-containing aerosol cans that became obsolete when the Environmental Protection Agency, on January 22, 1975, cancelled certain products for indoor use that contained vinyl chloride as a propellant. An estimated 3.3 million cans of vinyl chloride aerosols were in existence. Of these, approxi-

mately one million were in the hands of manufacturers, wholesalers, and retailers. The remaining 2.3 million cans were in the possession of the consumer. This guidance was addressed primarily to holders of large quantities of vinyl chloride-containing aerosol cans, although the recommended procedures are appropriate to disposal of any such wastes. These recommended procedures represent the best information available on preferable disposal options for vinyl chloride-containing aerosol cans. VCM made up about 20 percent by volume (equivalent to about 16 percent of the net weight) of the propellant in most of the canceled pesticide aerosols. The pesticides involved were mainly pyrethrins, lindane, and malathion. In hair sprays, deodrants, paints, etc., however, VCM was as much as 40 to 45 percent by volume of the contents. Other propellants are chlorofluorocarbons 11 and 12 (e.g., Freon). Although EPA has no data on the ingredients of non-pesticide aerosols, hairsprays, for example, would be expected to consist mainly of organics, while paints may contain heavy metals such as cadmium, lead, chromium, or mercury.

Disposal of VCM-containing aerosol cans. Final disposal of VCM-containing aerosol cans was undertaken using methods listed in order of preferred priority:

1. High temperature incineration (except for products containing heavy metals)
2. Burial in a State-approved chemical (or hazardous) waste landfill
3. Burial in a separate area of a State-approved sanitary landfill.

(16) CITATION: Federal Register, 41(112) 23226-23227, June 9, 1976.

(6) BOOK TITLE: Polychlorinated Biphenyl-Containing Wastes; Disposal Procedures.

(10) LANGUAGE: EN PUB YEAR: 1976

(11) ABSTRACT: These recommended procedures do not have standard-setting or regulatory status, but represent the best information available on preferable disposal operations for PCB-containing waste materials. Refers to American National Standards Institute Standard ANSI C107.1-1974 which was in process of revision. This guidance is addressed primarily to industrial users of PCB's particularly those manufacturing or using capacitors and transformers containing PCB's although the recommended disposal procedures are appropriate to all PCB-containing wastes. PCB's are toxic, pervasive and persistent in the environment, and tend to accumulate in the food chain. Past uses have included impregnation of braided insulation of electric wiring, plasticizers in cable coatings, and as hydraulic system fluid. Safeguards are outlined for handling, transporting and disposing.

(16) CITATION: Federal Register, 41(64): 14134-14136, April 1, 1976.

(1) SWIRS ACC.NO.: 04684d

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Yugai Busshitsu ni kakawaru suishitsu soryo kisei. (Control of the total amount of the hazardous substances contained in the industrial wastewater).

(4) AUTHOR: Mizorogi M

(6) JOURNAL TITLE: Yosui To Haisui

(10) LANGUAGE: JA (10) PUB. YEAR: 1976

(11) ABSTRACT: A report entitled "The Implementation of Hazardous Substance Treatment Facilities Corresponding to the Needs of Individual Industrial Processes" is summarized after an investigation and a discussion were held at the Tokyo Water Quality Council Inquiry on November 10, 1975. This was due to a decision made by the council on the necessity of enforcing water quality control in May 1973. The plants which will be subjected under the new water quality control laws are those which either use hazardous substances as raw materials or those which include a process where hazardous substances are produced, and at the same time, discharge more than 100m (3) of wastewater/day into the public waters. The paper discusses the varieties of industrial processes that discharge hazardous substances, standards for the implementation of the treatment facilities, and the maintenance and

control of the treatment facilities. The new control system intends to place a water quality checking point within the plant grounds, which is expected to curtail the contamination of the water environment by the discharge of hazardous substances in considerable amounts. (Original text in Japanese).

(12) KEYWORDS: CONTROL; FACILITY; HAZARDOUS; INDUSTRY; LAW; QUALITY; SYSTEM; WATER
(14) HIERARCH TERMS: 1HC/2PT; 1WE/2C2
(15) STIMS ACC.NO.: 00S45900
(16) CITATION: 118(5):5-9, 1976.

(1) SWIRS ACC.NO.: 046270
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Waste disposal: it's a dirty business.
(4) AUTHOR: Dunphy JH
(6) JOURNAL TITLE: Chemical Week
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2NJ (10) PUB. YEAR: 1978
(11) ABSTRACT: Illegal disposal of hazardous wastes by illicit haulers is examined. Illegal dumping occurs in nearly every industrial state. Less than 1/2 the states have hazardous wastes laws and less than 1/4 regulate disposal. Nationwide, law enforcement officials are cracking down on illegal dumpers and companies who deal with them. There are indications that illegal traffic in hazardous wastes is big business and that organized crime is involved. Illegal haulers are able to charge disposal prices which are a fraction of those of legitimate firms. Examples are given of illicit dumpers who have been apprehended, prosecuted, and, in some cases, jailed. New Jersey's efforts to halt illegal traffic in hazardous wastes are described. The U.S. Environmental Protection Agency is formulating implementation plans for the Resource Conservation and Recovery Act of 1976, aiming at assuring environmentally safe disposal of these wastes.
(12) KEYWORDS: DISPOSAL; DUMPING; ECONOMICS; EPA; FEDERAL; HAZARDOUS; ILLEGAL; LAW; NEW JERSEY; REFUSE; STATE
(14) HIERARCH TERMS: 1DU/2LF; 1HC/2DP; 1LF/2DP; 1LF/2ER
(15) STIMS ACC.NO.: 00S45321 (15) SECONDARY AUTHORS: Hall A
(16) CITATION: 122(9):25-28, Mar. 1, 1978.

(1) SWIRS ACC.NO.: 046090
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Overview of hazardous waste management program.
(4) AUTHOR: Lehman JP
(6) BOOK TITLE: In Pilcher, K., ed. Talking Trash: Proceedings of the Meeting of the National Coalition on Solid Waste, Mar. 4-6, 1977.
(9) GRANT NO.: T90551-01-0
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: An overview is presented of the hazardous waste management program being developed by EPA under provisions of the Resource Conservation and Recovery Act of 1976. Elements of the program include: development of a data base on hazardous waste characteristics, damage assessment, and control technology options; translation of data into advisory guidances; assistance to states in program development; and provision of technical assistance to states in program development; and provision of technical assistance. Present emphasis is on developing standards to define and manage hazardous waste that will mandate the practices of hazardous waste management and disposal, including transportation, storage, treatment, notification, and permits. The present status of regulation development consists primarily of planning and rulemaking, with completion scheduled for April 1978. Resource recovery options and public participation in rulemaking and implementation are also discussed. (Retained in SWIRS library).
(12) KEYWORDS: CONSERVATION; ENVIRONMENT; FEDERAL; HAZARDOUS; LAW; MANAGEMENT; PUBLIC; RECLAMATION; REGULATIONS; RESOURCE
(14) HIERARCH TERMS: 1HC/2AN; 1LF/2FF; 1MA/2FF; 1RR
(15) STIMS ACC.NO.: 00S45140
(16) CITATION: Washington, DC, Environmental Action Foundation, 1977. p.15-19.

(1) SWIRS ACC.NO.: 045862
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Permit processes, labeling, and facility safety.
(6) BOOK TITLE: In Disposal of Hazardous Wastes: Recommended Procedures for Hazardous Waste Management.
(10) LANGUAGE: EN (10) GEO. AREA: 1CD; 1US/2CA (10) PUB. YEAR: 1977
(11) ABSTRACT: Permit processes and facility considerations associated with the management of hazardous waste by North Atlantic Treaty Organization countries are discussed. Elements of the hazardous waste disposal decision process are identified as the preproduction decision, generation, transportation, treatment and disposal. Two types of permit processes are described: (1) permits for a particular operation; and (2) control documents to maintain the identity of waste. Trip tickets are defined as a form of documentation designed to follow waste from generator to transporter to disposer. Examples of waste management forms used in California and Ontario, Canada, are provided. The important role of labeling in the proper disposal of hazardous materials is emphasized. Sample hazardous waste information labels used in Canada are included. Safety precautions and procedures at hazardous waste disposal facilities are addressed. (Retained in SWIRS library).
(12) KEYWORDS: CALIFORNIA; CANADA; DISPOSAL; HAZARDOUS; LICENSE; MANAGEMENT; REGULATIONS; SAFETY; TRANSPORT; TREATMENT
(14) HIERARCH TERMS: 1DD/2DK; 1DD/2DW; 1HA/2HF
(15) STIMS ACC.NO.: 00S44911
(16) CITATION: North Atlantic Treaty Organization, Jun. 1977. p.79-95.

(1) SWIRS ACC.NO.: 045261
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Toxic waste dumping incident demonstrates surveillance needs.
(6) JOURNAL TITLE: Public Works
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2KY; 1US/2TN (10) PUB. YEAR: 1977
(11) ABSTRACT: A toxic waste dumping incident is described to illustrate the need for regulatory surveillance. Disposal of wastes originating in Memphis, Tennessee, had been subcontracted to an out of state firm which trucked the toxic wastes to the sewage collection system of Louisville, Kentucky. Employees at a waste water treatment plant became ill, and local and Federal officials traced the irritants to their source. Various precautionary measures were taken to protect public health and the public water supply from the effects of the wastes, and solutions were sought to remove or deactivate the contaminants. The incident resulted in a threat to public health and actual illness of some involved employees, inconvenience to the municipalities involved in cleanup and decontamination procedures, and considerable expenses incurred in tracing and treating the wastes. After this incident it was determined that ambient water quality monitoring was insufficient to detect such incidents due to weaknesses in both organics detection and analysis efforts and in interagency communications. It was concluded that a fail safe detection system was not feasible or affordable, but that an effectively administered and adequately staffed permitting type regulatory program could serve as the primary safeguard against such incidents in the future.
(12) KEYWORDS: CONTAMINATE; DUMPING; EPA; HAZARDOUS; HEALTH; KENTUCKY; MONITOR; PUBLIC; PUBLIC WORKS; REGULATIONS; SEWAGE; TENNESSEE; TOXIC; WATER
(14) HIERARCH TERMS: 1HA/2HF; 1SF/2SU; 1TD
(15) STIMS ACC.NO.: 00S44326
(16) CITATION: 108(11):58-60, 82, Dec. 1977.

(1) SWIRS ACC.NO.: 044636
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Managing hazardous waste.
(4) AUTHOR: Andres DR
(6) JOURNAL TITLE: Waste Age
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2TX (10) PUB. YEAR: 1977
(11) ABSTRACT: A review of a Texas manifest system is presented. The Texas system is an example of a shipping manifest, or "trip ticket" regulatory system which is designed to identify the quantity, composition and origin of hazardous waste during its transportation from the point of generation to the point of storage, treatment and/or disposal. It was developed and implemented by the Texas Water Quality Board (TWQB) in 1976, and may provide a model for other states to follow. The advantages of the manifest are detailed. No authorization is necessary, there by minimizing procedural problems for both the waste generator and TWQB. The generator controls the off site disposal of waste. Potential problems associated with improper disposal can be detected, investigated and resolved. In developing the regulatory mechanism for controlling solid waste, the TWQB relied on criteria relating waste classification to waste quantity and the size of the generating facility (determined by the number of employees). The article defines the classes of waste. In an effort to restrict the number of active participants in the manifest system while at the same time implementing controls for the most potentially hazardous wastes, the TWQB developed a classbased reporting system. The design of the shipping control and reporting system is detailed.
(12) KEYWORDS: CLASSIFICATION; CONTROL; HAZARDOUS; MANAGEMENT; REFUSE; SHIP; TEXAS; TRANSPORT
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1HA/2HH; 1HA/2MH
(15) STIMS ACC.NO.: 00S43681
(16) CITATION: 8(10):38, 40-41, Oct. 1977.

(1) SWIRS ACC.NO.: 044506
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: State programs must be "equivalent, consistent and provide adequate enforcement" to win EPA approval.
(4) AUTHOR: Collins HF
(6) JOURNAL TITLE: Solid Waste Systems
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: This article discusses issues that might encourage waste managers to participate in the development of federal standards. The 1976 Federal Resource Conservation and Recovery Act empowers EPA to establish compulsory minimum standards for state hazardous waste management programs. EPA is now investigating issues that must be resolved before federal regulations can be developed. The unclear areas of the law, and EPA criteria for approval of state programs are discussed. Suggestions are made for states to reduce the hazardous waste management. Practical applications of existing resources must be utilized to achieve this. This discussion points out some uncertainties about the impact that the new law may have on waste managers. The law requires EPA and States to seek public participation. Interested persons are encouraged to express their views.
(12) KEYWORDS: CRITERIA; FEDERAL; HAZARDOUS; LAW; MANAGEMENT; REFUSE; STANDARD; STATE
(14) HIERARCH TERMS: 1HA/2HF; 1LB/2LB; 1LB/2LC; 1LB/2LD; 1MA/2MG
(15) STIMS ACC.NO.: 00S43551
(16) CITATION: 6(2):22-23, March-April 1977.

(1) SWIRS ACC.NO.: 044052
(2) DOMESTIC: F (2) CATEGORY: 14 (2) SUBJ.TYPE: G
(5) CORPORATE AUTHOR: Japanese Prime Minister
(6) BOOK TITLE: Order of the Prime Minister's Office on the Stipulation of Criteria to determine Hazardous Industrial Wastes.
(10) LANGUAGE: EN (10) GEO. AREA: 1AI/2JA (10) PUB. YEAR: 1976
(11) ABSTRACT: A summary of the Japanese Prime Minister's Office Order #5 issues on Feb. 17, 1973. this order, "Standard criteria for Determination of Hazardous Industrial Wastes" is based on item 1 and 3

of article 6 of the Waste Disposal and Public Cleaning Law of 1971, and was revised twice, first in Sept. of 1974 and second in Feb. of 1976. This order contains standard criteria related to landfill and reclamation, spent acids and alkalis, and earth and sand deposits in water. There are two additional tables listed which relate to article 1 and 3, and article 2 respectively, describe a standard criteria for determination of each hazardous substance such as alkyl mercury compounds, mercury and its compounds, cadmium and its compounds, lead and its compounds, organic phospher compounds, sexivalent chromium compounds, arsenic and its compounds, cyanide and polychlorinated biphenyls(PCB). (Original Text in Japanese) (Retained in SWIRS library).

(12) KEYWORDS: AIR; CHEMICAL; CRITERIA; ENVIRONMENT; HAZARDOUS; INDUSTRY; JAPAN; LAW; MERCURY; METAL; ORGANIC; POLLUTION; POLYCHLORINATED; SLAG; TOXIC; WATER

(14) HIERARCH TERMS: 1HA/2HH; 1LB/2LD; 1TD

(15) STIMS ACC.NO.: 00S43095

(16) CITATION: Japan, Feb. 1976. 39 p.

(1) SWIRS ACC.NO.: 043784

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: States to have major role in new hazardous wastes programs.

(6) JOURNAL TITLE: Solid Waste Systems

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: The question of what constitutes a hazardous waste is addressed. The Federal Resource Conservation and Recovery Act of 1976 defines major responsibilities for states in designating and implementing hazardous waste programs. Through this law, more than $50 million could be available to states for development of hazardous waste management programs. Congress, the U.S. Environmental Protection Agency (EPA), the National Solid Waste Management Association, and many states have designated terms for, and have defined hazardous wastes in, proposed or enacted laws and regulations. However, few agencies agree on the definition. Objective criteria are needed to alleviate problems of terminology and should be scientifically valid, practical, and legally defensible. Three general criteria should be used: physical or chemical properties, concentration limits, and listed constituents deemed hazardous in any concentration. Standardized methods should be developed for determining if a waste meets such criteria. A simplified decision tree for determining whether a waste is hazardous is suggested.

(12) KEYWORDS: CHEMICAL; CRITERIA; DISPOSAL; EPA; FEDERAL; GOVERNMENT; HAZARDOUS; LAW; MANAGEMENT; PHYSICAL; PROGRAM; STANDARD; STATE

(14) HIERARCH TERMS: 1HA/2HP; 1MA/2MG

(15) STIMS ACC.NO.: 00S42827

(16) CITATION: 6(1):6-7, Jan.-Feb. 1977.

(1) SWIRS ACC.NO.: 043249

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Solid waste disposal -- a long-standing public health problem comes of age.

(4) AUTHOR: Wands RC

(6) JOURNAL TITLE: American Journal of Public Health

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A laudable goal of the Resource Conservation and Recovery Act of 1976 is to encourage recycling of natural resources. An additional purpose of the Act is to provide for the safe disposal of discarded materials and to regulate the management of hazardous wastes. With respect to the latter goal, three reports are noted. One report describes the fortuitous recovery and removal of 70 kg of sodium monofluoroacetate from a sanitary landfill which drained into a stream bordering on wells and flowed into a reservoir. The second report commented on a study of leachates from solid waste land disposal sites across the U.S. which showed significant amounts of water and food

chain contaminants. And a third report on shallow land burial of low level radioactively contaminated solid waste found that although these materials pose no immediate threat to human health, long term shallow burial is not recommended. The public unknowingly contributes to the hazardous waste problem, but by far the greatest source is industry, especially the metallurgical and chemical industries. Examples are given of companies which are showing responsible attitudes towards hazardous disposal.

(12) KEYWORDS: BURY; CHEMICAL; DISPOSAL; HAZARDOUS; HEALTH; LAND; LAW; LEACH; MANAGEMENT; POLLUTION; RADIOACTIVE; RECLAMATION; SAFETY; SANITARY LANDFILL

(14) HIERARCH TERMS: 1HA/2HF; 1HB; 1IC; 1LB/2LB; 1LC; 1RA/2RG; 1SD

(15) STIMS ACC.NO.: 00S42292

(16) CITATION: 67(5):419-420, May 1977.

(1) SWIRS ACC.NO.: 043102

(2) DOMESTIC: F (2) CATEGORY: 05 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: The disposal of non-biodegradable hazardous wastes.

(4) AUTHOR: Street E

(6) JOURNAL TITLE: The Chemical Engineer

(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1977

(11) ABSTRACT: The disposal of nonbiodegradable hazardous wastes in Great Britain proceeded, until 1972, with little controlling legislation. Under the Poisonous Waste Act (1972) it became an offense to deposit waste on land, or cause or permit it to be deposited on land where the waste was poisonous, noxious, or polluting, and its presence was liable to cause an environmental hazard. It also became an offense to remove or deposit waste that was not exempt from the Act without giving prior notice. The Act still permitted full use of all tips. In 1974, the Control of Pollution Act, Part 1, introduced provisions to effectively control the use of tipping sites. Local disposal authorities carried out surveys which identified the wide variety of materials and noted disposal options. Authorities also recommended disposal systems most appropriate for their areas. ReChem's central waste treatment plants, established prior to control legislation, were modified in accord with local needs. The main categories of wastes covered by controlling legislation are noted as are methods currently available for dealing with the groups. Current prices for disposal methods are also shown. The possibility of the recovering of acids is discussed. In the United Kingdom acid recovery is not yet viable except on a very large scale.

(12) KEYWORDS: ACID; CONTROL; DISPOSAL; DUMPING; ECONOMICS; ENVIRONMENT; EUROPE; GREAT BRITAIN; HAZARDOUS; LAND; LAW; POLLUTION; RECLAMATION; TOXIC

(14) HIERARCH TERMS: 1DD/2DL; 1EA/2EA; 1HA; 1LB/2LB

(15) STIMS ACC.NO.: 00S42145

(16) CITATION: (319):249-250, Apr. 1977.

(1) SWIRS ACC.NO.: 042531

(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Recent progress in environmental quality in Japan: revisions of environmental and effluent standards on mercury and setting of environmental and effluent standards on PCB.

(5) CORPORATE AUTHOR: Japan Ministry of Construction

(6) BOOK TITLE: In Proceedings: Fourth United States/Japan Conference on Sewage Treatment Technology, Cincinnati, OH, and Washington, DC, Oct. 23-24 and Oct. 28-29, 1975. (8) REPORT NO.: EPA-600/9-76-023

(10) LANGUAGE: EN (10) GEO. AREA: 1AI/2JA (10) PUB. YEAR: 1976

(11) ABSTRACT: Changes made to Japanese environmental and effluent standards for mercury and polychlorinated biphenyls (PCB's) are noted. The changes made to wastewater discharge standards and to relevant measuring methods were enforced on September 30, 1974. Reasons for the changes are cited. With the incorporation of the changes, advances in analysis technology and the use of more sophisticated analyzing devices

make it possible to analyze low densities of mercury. Provisional tolerance levels of mercury have been established for fish and shellfish, and more data on environmental pollution and shellfish contamination have become available to permit studies of the interrelationship between them. Mercury standards are listed in tabular form. Relevant factors taken into account in the revision of PCB standards are identified as the concentration ratio in fish and shellfish and measurement methods for PCB's. Calculations for determining environmental quality limits on PCB's are presented.

(12) KEYWORDS: CONCENTRATION; DISCHARGE; EFFLUENT; EQUIPMENT; FISH; JAPAN; MANAGEMENT; MEASUREMENTS; MERCURY; POLLUTION; POLYCHLORINATED; QUALITY; REGULATIONS; STANDARD; WATER

(14) HIERARCH TERMS: 1HA; 11C; 1WA/2WD; 1WA/2WB; 1WA/2WB

(15) STIMS ACC.NO.: 00541574

(16) CITATION: Cincinnati, Oh, U.S. Environmental Protection Agency, Oct. 1976. p.105-112.

(1) SWIRS ACC.NO.: 040800

(2) DOMESTIC: F (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) GEO. AREA: 1AI/2JA (10) PUB. YEAR: 1976

(11) ABSTRACT: A summary of the Prime Minister's Office Order no. 6 issued February 17, 1973 is presented. This order, "Standard Criteria for Determination of Hazardous Industrial Wastes to be Discharged to the Reclamation Sites. . . " is based on clause 1:3 of article 5 of the enforcement ordinance to the Marine Pollution Prevention Law, and was revised in September of 1974 and in February of 1976. The order contains standard criteria related to sludge, ocean disposal, and methods for determination of hazardous substances. The eight listed tables describe standard criteria for determination of substances such as alkyl mercury compounds, mercury and its compounds, cadmium and its compounds, lead and its compounds, arsenic and its compounds, cyanide and polychlorinated biphenyls (PCb) contained in organic and inorganic sludge from various industrial sources. (Original text in Japanese) (Retained in SWIRS library)

(12) KEYWORDS: AIR; CHEMICAL; CRITERIA; ENVIRONMENT; HAZARDOUS; INDUSTRY; JAPAN; LAW; MERCURY; METAL; ORGANIC; POLLUTION; POLYCHLORINATED; SANITARY LANDFILL; SLAG; TOXIC; WATER

(14) HIERARCH TERMS: 1HA/2HF; 11C/217; 1LB/2LB

(15) STIMS ACC.NO.: 00539844

(18) DOC.CIT.: Order of the Prime Minister's office on the stipulation of criteria to determine hazardous waste to be discharged to sites such as the landfill sites provided for in clause 1, article 5 of ordinance to the Marine Pollution Prevention Law. Japan. Office of the Prime Minister, 1976. 11 p.

(1) SWIRS ACC.NO.: 040711

(2) DOMESTIC: F (2) CATEGORY: 14 (2) SUBJ.TYPE: T (10) GEO. AREA: 1AI/2JA (10) PUB. YEAR: 1976

(11) ABSTRACT: A summary of notification 14 of the Japan Environment Agency issued on February 17, 1973 and applied on March 1, 1973 is presented. The notification, related to detection technique for hazardous materials, is based on a provision of article 4 of the 1973 Prime Minister's Office Order 6 concerning stipulation of criteria for determination of hazardous wastes to be discharged to reclamation sites provided for in clause 1 article 5 of an ordinance to the Marine Pollution Prevention Law, and was revised in February and September of 1974 and in February of 1976. The detection technique established by the Director General of the Environment Agency expressed in the notification consists of preparation of a test solution, detection technique, and calculation of the concentration of the hazardous materials for each classified industrial waste. The hazardous materials to be detected are as follows: alkyl mercury compounds, mercury and its

compounds, organic phosphorus compounds, sexivalent chromium compounds, arsenic and its compounds, cyanide and polychlorinated biphenyls (PCB). (Text in Japanese) (Retained in SWIRS library)

(12) KEYWORDS: CHEMICAL; CONTROL; ENVIRONMENT; HAZARDOUS; INDUSTRY; INORGANIC; JAPAN; LAW; MERCURY; METAL; MONITOR; ORGANIC; POLYCHLORINATED; SANITARY LANDFILL; SLAG

(14) HIERARCH TERMS: 1CB/2CA/3CB; 11C/2IY

(15) STIMS ACC.NO.: 00S39755

(18) DOC.CIT.: Kaiyo oshen boshi no shiko rei dai go jo ikko ni kiteisuru umetate basho nado ni haishutsu shiyo to suru haikibutsu ni fukumareru yugai busshitsu no kentei hoho. (Detection technique of hazardous materials contained in industrial waste to be discharged to sites such as the landfill sites provided for in article 5, clause 1 of ordinance to the Marine Pollution Prevention Law.) Japan, Office of the Prime Minister, Feb. 27, 1976. 11 p.

(1) SWIRS ACC.NO.: 040637

(2) DOMESTIC: F (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) GEO. AREA: 1AI/2JA (10) PUB. YEAR: 1976

(11) ABSTRACT: Reference no. 5 is a summary of notification no. 13 of the Environment Agency issued on February 17, 1973, and relates to the detection technique for hazardous materials contained in industrial wastes. The notification is based on a provision of article 3 of the 1973 Prime Minister's Office Order No. 5 on the stipulation of criteria to determine hazardous industrial waste, and was revised in February and September of 1974 and in February of 1976. The detection technique established by the Director General of Environment Agency expressed in the notification consists of preparation of a test solution for detection of hazardous materials, detection technique, and calculation of the concentration of the hazardous materials for each classified industrial waste. The hazardous materials to be detected are as follows: alkyl mercury compounds, mercury and its compounds, cadmium and its compounds, lead and its compounds, organic phosphor compounds, sexivalent chromium compounds, arsenic and its compounds, cyanide and polychlorinated biphenyles (PCB). (Retained in SWIRS library)

(12) KEYWORDS: CHEMICAL; CONTROL; ENVIRONMENT; GOVERNMENT; INDUSTRY; JAPAN; LAW; POLLUTION; REFUSE; TOXIC; WASTE WATER

(14) HIERARCH TERMS: 1CB/2CA/3CB; 1HA/2HH; 1TD

(15) STIMS ACC.NO.: 00S39681

(18) DOC.CIT.: Japan Prime Minister. Detection technique of hazardous materials contained in industrial wastes. Japan, 1976. 13 p.

(1) SWIRS ACC.NO.: 040136

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: T

(4) AUTHOR: Hickman H Jr (10) GEO. AREA: 1DD/2DS; 1LB/2Lb; 1LB/2LD (10) PUB. YEAR: 1976

(11) ABSTRACT: A summary of the new amendments to the Solid Wastes Disposal Act is presented. The first part of the legislation deals with general provisions of the act, including findings and objectives and definitions to be used to interpret the act. The findings break down into four major areas of Congressional concern, solid wastes, environment and health, materials and energy. A total of 35 terms are defined in Subtitle A, the most important of which are disposal; hazardous wastes; hazardous wastes management; resource conservation; resource recovery; solid wastes; and solid waste management. Subtitle B establishes an Office of Solid Wastes in EPA. Subtitle C establishes a regulatory program for hazardous wastes management. Subtitle D provides for financial assistance to develop and implement solid wastes management plans in the states. Subtitle E provides for the Department of Commerce to stimulate recovery and recycling of materials. Subtitle F requires total government involvement while Subtitle G provides for administration procedures. Subtitle H lists authorities to conduct

studies, demonstrations, training and evaluation of all aspects of solid wastes management.

(12) KEYWORDS: ECONOMICS; ENERGY; ENVIRONMENT; EPA; FEDERAL; GOVERNMENT; HAZARDOUS; HEALTH; LAW; MANAGEMENT; RECLAMATION; REFUSE; SOLID WASTE DISPOSAL ACT

(14) HIERARCH TERMS: IMA

(15) STIMS ACC.NO.: 00S39230

(18) DOC.CIT.: Hickman, H. , Jr. President Ford signs new solid wastes bill. Solid Wastes Management, 19(11):52, 72, 74, Nov. 1976.

(1) SWIRS ACC.NO.: 038574

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Hazardous materials are defined in relation to criteria and regulations for their control. Hazardous materials are considered to be raw materials or finished products. The designation of a product as hazardous for transportation purposes is based on the product having characteristics which, in the event of an unintentional release from its container, would pose a minor to major danger to persons or property. Hazardous material regulations developed by the Department of Transportaion are noted, with emphasis on passage of the Transportaion Safety Act of 1974 (P. L. 93-633). The need for developing an improved hazard information system is discussed. Problems involved in the implementation of hazardous material regulations are examined. Activities of the Manufacturing Chemists Association with regard to hazardous materials are reviewed, and the development of a hazard information system by that association is addressed.

(12) KEYWORDS: CONTROL; HAZARDOUS; LAW; PROBLEMS; REGULATIONS; TRANSPORT

(15) STIMS ACC.NO.: 00S37618

(18) DOC.CIT.: Hazardous materials - what are they? Traffic World, 165(13):38-40, Mar. 29, 1976.

(1) SWIRS ACC.NO.: 038277

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Senate debate on the Solid Waste Utilization Act of 1976 (S. 2150) is discussed. The proposed Solid Waste Utilization Act is a bill to amend the Solid Waste Disposal Act to authorize State program and implementation grants, provide incentives for the recovery of resources from waste, and control the disposal of hazardous waste. The following aspects of the proposed bill are considered in the Senate debate: program and implementation grants, prohibitation of open dumping, hazardous waste disposal control, enforcement, citizens suits, judicial review, loan guarantees, rural community assistance, Federal procurement, employee protection, Federal land disposal sites, State authority, Federal facilities, resource conservation, solid waste on Federal lands in Alaska, public relations and economic aspects of solid waste control, litter and solid waste, source reduction, energy, impact of the bill on consumers, solid waste activities in the State of Oreggon, employment prospects under a proposed Massachusetts bill on container deposits, waste disposal methods, areawide planning, and the responsibility of State and local government authorities in solid waste management.

(12) KEYWORDS: CONTROL; DISPOSAL; DUMPING; ECONOMICS; FEDERAL; GRANT; HAZARDOUS; INCENTIVE; LAW; MANAGEMENT; OPEN; PROGRAM; RESPONSIBILITY; SITES; SOLID; STATE; US; UTILIZE

(15) STIMS ACC.NO.: 00S37321

(18) DOC.CIT.: U. S. Congress. Senate. Solid Waste Utilization Act of 1976. S. 2150, 94th Cong. , 2nd sess. Congressional Record, 122(104):June 30, 1976. Washington, U. S. National Archives, 1976. 44 p.

(1) SWIRS ACC.NO.: 036198
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: The disposal of hazardous industrial waste water sludge is discussed, based on activities of the Office of Solid Waste Management Programs within the Environmental Protection Agency (EPA). The status of solid waste management is discussed, along with Federal legislation on solid waste disposal. It is estimated that an estimated 10 million tons of potentially hazardous waste are generated in the United States annually. This includes toxic industrial sludge, pesticides, acids, caustics, flammables, explosives, and biological and radioactive residuals. It is concluded that the effective management of hazardous waste requires a regulatory program. A program is being conducted by EPA that is directed toward three main areas: (1) public health and environmental damage, study of the toxic effects of hazardous waste and document damage incidents; (2) hazardous waste assessment, identify waste sources, develop data on waste characteristics, and obtain data on waste generation rates; (3) technology assessment, study and evaluate disposal technology. The technology assessment program of the Office of Solid Waste Management Programs is described, with emphasis on source concentration, alternative waste uses, resource recovery, incineration, chemical and biological treatment methods, and land disposal.
(12) KEYWORDS: DATA; DISPOSAL; FEDERAL; HAZARDOUS; INDUSTRY; LAW; OSWMP; PUBLIC; SAFETY; SLUDGE; TECHNOLOGY; TREATMENT; WASTE WATER
(15) STIMS ACC.NO.: 00537242
(16) DOC.CIT.: Schaum, J. Disposal of industrial wastewater treatment sludges. In Langworthy, V. A. , ed. Proceedings; Third Annual Pollution Control Conference of the Water and Wastewater Equipment Manufacturers Association, Apr. 1-4, 1975. Ann Arbor, MI, Ann Arbor Publishers, Inc. , 1975. p. 745-752.

(1) SWIRS ACC.NO.: 037973
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: In 1974, as determined by the German Federal Government, the existing nuclear power plants do not pollute the air or waste water with radioactive waste. This is due to the strict enforcement of protective legislation. Radioactivity of exhaust air and water waters is routinely measured. Regular measurements are taken in the vicinity of nuclear power plants, to prevent any occasional contamination. Up to date measuring apparatus and methods are described. The maximum values of radiation exposure in direct vicinity to nuclear power plants are within the fractions of one millirem/year. As of July 1975, a table is given showing the average genetic radiation exposures, from both natural and man made sources, in the German Federal Republic for natural sources the figure is about 10 mrem/a. For man made sources the table (abridged) reads as follows: nuclear power plants, less than 1 mrem/a; use of radioactive materials and ionizing radiation in research and technology, less than 2 mrem/a; use of ionizing radiation and radioactive substances in medicine, about 50 mrem/a (xray 50 mrem/a; radiation therapy about 0. 5 mrem/a; nuclear medicine about 0. 5 mrem/a); fallout due to nuclear weapon testing, less than 8 mrem/a. The following apparatus is described and diagrammed: electronic multichannel computation and analysis system automatic FHT770E sample changer; anticoincidence measuring system with counter tubes for analyzing filters and specimens (that emit radiation); dose meter of the FHT190b with an ionization chamber for continuous measurement of gamma radiation; Minigor RE 501 xy-recorder to operate jointly with the FHT128A multichannel analyzer of pulses. (Original text in German)
(12) KEYWORDS: AIR; CONTAMINATE; CONTROL; EQUIPMENT; EXPOSURE; GERMANY; MEASUREMENTS; MONITOR; POLLUTION; RADIATION; RADIOACTIVE; REGULATIONS; SAFETY; WASTE WATER
(15) STIMS ACC.NO.: 00537017
(16) DOC.CIT.: Kosmowski, A. Moderne Strahlenschutzmessgeraete zur Anlagen und Umgebungsueberwachung (Modern radiation measuring device for monitoring plants and their vicinities). Wasser, Luft und Betrieb, 6:291-293, 1976.

(1) SWIRS ACC.NO.: 037826
(2) DOMESTIC: F (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1973
(11) ABSTRACT: A summary is present of the Prime Minister's Office Order No. 6, issued Feb. 17, 1973. This order, "Standard Criteria for Determination of Hazardous Industrial Wastes to be Discharged to the Reclamation Sites. . . . " is based on clause 1 to 3 of article 5 of the enforcement ordinance to the Marine Pollution Prevention Law, and was revised in Sept. of 1974 and in Feb. of 1976. The order contains standard criteria related to sludge, ocean disposal, and methods for determination of hazardous substances. The eight listed tables describe standard criteria for determination of substances such as alkyl mercury compounds, mercury and its compounds, cadmium and its compounds, lead and its compounds, arsenic and its compounds, cyanide and polychlorinated biphenyls (PCB) contained in organic and inorganic sludge from various industrial sources. (Original text in Japanese)
(12) KEYWORDS: CHEMICAL; CRITERIA; DISCHARGE; DISPOSAL; HAZARDOUS; INDUSTRY; JAPAN; LAW; RECLAMATION; SAMPLING METHODS; SITES; SLUDGE; WATER
(15) STIMS ACC.NO.: 00536870
(16) DOC.CIT.: Japan Office of the Prime Minister. Kaiyo osen boshi ho shikorei dai gojo ikko ni kitei suru umetate basho nado ni haishutsu suru yugai na haikibutsu ni kakaru hantei kijun o sadameru seirifu rei (Order of the Prime Minister's office on the stipulation of criteria to determine hazardous waste to be discharged to sites such as the landfill sites provided for in clause 1, article 5 of ordinance to the marine pollution prevention law). Prime Minister's Office Order 6. Feb. 7, 1973. 35 p.

(1) SWIRS ACC.NO.: 037624
(2) DOMESTIC: F (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1973
(11) ABSTRACT: A summary of notification No. 13 of the Environment Agency issued on Feb. 17, 1973, which relates to the detection technique for hazardous materials contained in industrial wastes is presented. The notification is based on a provision of article 3 of the 1973 Prime Minister's Office Order No. 5 on the stipulation of criteria to determine hazardous industrial waste, and was revised in Feb. and Sept. of 1974 and in Feb. of 1976. The detection technique established by the Director General of Environment Agency expressed in the notification consists of preparation of a test solution for detection of hazardous materials, detection technique, and calculation of the concentration of the hazardous materials for each classified industrial waste. The hazardous materials to be detected are as follows: alkyl mercury compounds, mercury and its compounds, cadmium and its compounds, lead and its compounds, organic phospher compounds, sexivalent chromium compounds, arsenic and its compounds, cyanide and polychlorinated biphenyls (PCB). (Original text in Japanese)
(12) KEYWORDS: CHEMICAL; CONCENTRATION; HAZARDOUS; INDUSTRY; JAPAN; LAW; SAMPLING METHODS
(15) STIMS ACC.NO.: 00536868
(16) DOC.CIT.: Japan Environment Agency. Sangyo haikibutsu ni fukumareru yugai busshitsu no kentei hoho (Detection technique of hazardous materials contained in industrial wastes). Environment Agency Notification 13. February 17, 1973. 15 p.

(1) SWIRS ACC.NO.: 037825
(2) DOMESTIC: F (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1973
(11) ABSTRACT: A summary is presented of notification No. 14 of the Environment Agency issued on Feb. 17, 1973 and applied on March 1, 1973. The notification, related to detection technique for hazardous materials, is based on a provision of article 4 of the 1973 Prime Minister's Office Order No. 6 concerning stipulation of criteria for determination of hazardous wastes to be discharged to reclamation sites provided for in clause 1 of article 5 of an ordinance to the Marine Pollution Prevention Law, and was revised in Feb. and Sept. 1974 and in

Feb. of 1976. The detection technique established by the Director General of the Environment Agency expressed in the notification consists of preparation of a test solution, detection technique, and calculation of the concentration of the hazardous materials for each classified industrial waste. The hazardous materials to be detected are as follows: alkyl mercury compounds, mercury and its compounds, organic phospher compounds, sexivalent chromium compounds, arsenic and its compounds, cyanide and polychlorinated biphenyls (PCB). (Original text in Japanese)

(12) KEYWORDS: CHEMICAL; DISCHARGE; HAZARDOUS; JAPAN; LAW; RECLAMATION; SAMPLING METHODS; SITES

(15) STIMS ACC.NO.: 00S36869

(18) DOC.CIT.: Japan Environment Agency. Kaiyo osen boshi ho shiko rei dai go jo ikko ni kiteisuru umetate basho nado ni haishutsu shiyo to suru haikibutsu ni fukumareru yugai busshitsu no kentei hoho (Detection technique of hazardous materials contained in industrial waste to be discharged to sites such as the landfill sites provided for article 5 clause 1 of ordinance to the marine pollution prevention law). Environment Agency Notification 14. February 17, 1973. 12 p.

(1) SWIRS ACC.NO.: 037821

(2) DOMESTIC: F (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1973

(11) ABSTRACT: Is a summary of the Prime Minister's Office Order No. 5 issued on Feb. 17, 1973 is presented. This order, "Standard Criteria for Determination of Hazardous Industrial Wastes" is based on items 1 and 3 of article 6 of the Waste Disposal and Public Cleaning Law of 1971, and was revised twice, first in Sept. of 1974 and second in Feb. of 1976. This order contains standard criteria related to landfill and reclamation, spent acids and alkalis, and earth and sand deposits in water. There are two additional tables listed which relate to articles 1 and 3, and article 2 respectively, and describe a standard criteria for determination of each hazardous substance such as alkyl mercury compounds, mercury and its compounds, cadmium and its compounds, lead and its compounds, organic phospher compounds, sexivalent chromium compounds, arsenic and its compounds, cyanide and polychlorinated biphenyls (PCB). (Original text in Japanese).

(12) KEYWORDS: ACID; ALKALINE; CRITERIA; EARTH; HAZARDOUS; INDUSTRY; JAPAN; LAW; RECLAMATION; SAND; SANITARY LANDFILL

(15) STIMS ACC.NO.: 00S36865

(18) DOC.CIT.: Japan Office of the Prime Minister. Yugai na sangyo haikibutsu ni kakaru hantei kijun o sadameru seifu rei (Order of the prime minister's office on the stipulation of criteria to determine hazardous industrial waste). Prime Minister's Office Order No. 5. Feb. 17, 1973. 10 p.

(1) SWIRS ACC.NO.: 037689

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The increasing volume of hazardous waste is addressed in relation to the responsibilities of local officials for disposal. It is estimated that about 10 million tons of nonradioactive hazardous waste are discarded annually and that this volume is increaing at the rate of 5 to 10 percnt per year. Stricter Federal and State air and water pollution regulations are increasing the volume of industrial sludge, slurry, and liquids that are considered toxic. Efforts made in California to deal with hazardous waste ae noted, with emphasis on their system for classifying for classifying hazardous waste landfill sites. Criteria that facilities in California must meet to classify as a hazardous waste site are outlined. Leachate treatment methods at landfill sites are discussed in relation to neutralization, biological treatment, evaporation, and predcipitation. A demonstration project in Minneapolis-St. Paul, Minnesota is cited which involves a hazardous waste control facility for a seven-county area. Operational data gathered during the demonstration will include making chemical waste safe for burial, encapsulation and burial of chemical waste,

collection and treatment of leachate, production of leachate under a variety of environmental conditions, methods of monitoring f

(12) KEYWORDS: BURY; CALIFORNIA; CLASSIFICATION; CLAY; DISPOSAL; HAZARDOUS; LEACH; MANAGEMENT; NORTH CAROLINA; PITS; REGULATIONS; SANITARY LANDFILL; SITES; UNDERGROUND; VOLUME

(15) STIMS ACC.NO.: 00S36733

(18) DOC.CIT.: Anon. Get ready! Hazardous wastes are coming your way. American City and County, 91(8):57-58, Aug. 1976.

(1) SWIRS ACC.NO.: 037084

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The management of hazardous waste in Tennessee is discussed. The Tennessee Solid Waste Disposal Act, implemented in July, 1972, contains two basic sections which deal with hazardous waste disposal. One section is concerned with the registration of hazardous waste processing and disposal facilities. The other section deals with special waste and is aimed basically at controlling the disposal of this waste in sanitary landfills. The nature of the hazardous waste problem in Tennessee is reviewed. Attempts of the State to deal with hazardous waste are noted, including enforcement of regulations in the Tennessee Solid Waste Disposal Act which relate to hazardous waste disposal and restrictions on the disposal of hazardous materials in sanitary landfills. An industrial waste survey was conducted to determine the magnitude of industrial and hazardous waste disposal problems in Tennessee. Other hazardous waste management activities in the State are also discussed, including solid waste training courses for municipal and industrial sanitary landfill operators, sponsorship of an annual solid waste conference, elimination of liquids from sanitary landfills to minimize possible leachate production and ultimate ground water pollution problems, efforts to pass a hazardous waste control law, and the development of adequate manpower for monitoring hazardous waste industries.

(12) KEYWORDS: CONFERENCE; CONTROL; DISPOSAL; GRANT; HAZARDOUS; LEACH; MANAGEMENT; PERSONNEL; PROBLEMS; REGULATIONS; SANITARY LANDFILL; STATE; SURVEY; TENNESSEE; TRAINING

(15) STIMS ACC.NO.: 00S36129

(18) DOC.CIT.: Tiesler, T. State hazardous waste program. In: National Solid Wastes Management Association. Proceedings; Fourth National Congress on Waste Management Technology and Resource and Energy Recovery, Atlanta, November 12-14, 1975. Washington, DC, U. S. Environmental Protection Agency, 1976, 382 p. (p. 76-79).

(1) SWIRS ACC.NO.: 037083

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The operational phase of California's hazardous waste management program is described. In accordance with the Hazardous Waste Act, the State Department of Health developed and adopted regulations governing hazardous waste in California. Emphasis is being placed on five aspects of hazardous waste management: (1) policy regarding land disposal; (2) monitoring hazardous waste producers, haulers, processors, and disposal site operators; (3) enforcing minimum standards for the collection, processing, and disposal of hazardous waste; (4) surveying production of hazardous waste on a statewide basis; and (5) participating in a State plan for managing hazardous material spills. Problems encountered in administering California's hazardous waste management program are noted, along with recent activities in the State which affect hazardous waste management. It is felt that the foremost challenge in developing an equitable hazardous waste management system throughout the State involves the implementation of mandates contained in Assembly Concurrent Resolution 79 regarding hazardous waste disposal sites and the implementation of

recommendations made by the Industrial Liquid Waste Committee on hazardous waste planning; and disposal and public education.

(12) KEYWORDS: CALIFORNIA; CONFERENCE; DISPOSAL; HAZARDOUS; LAND; MANAGEMENT; MONITOR; PERSONNEL; PROBLEMS; PROGRAM; REGULATIONS; STATE

(15) STIMS ACC.NO.: 00536125

(18) DOC.CIT.: Collins, H. California's hazardous waste management program. In: National Solid Wastes Management Association. Proceedings; Fourth National Congress on Waste Management Technology and Resource and Energy Recovery, Atlanta, November 12-14, 1975. Washington, DC, U. S. Environmental Protection Agency, 1976, 38. p. (p. 67-75).

(1) SWIRS ACC.NO.: 037075

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Hazardous wastes coming under the new version of the Waste Disposal Law drafted by the Federal Environmental Protection Agency, West Germany, are listed according to the type of waste with reference to origin, interfering substances, and properties. Wastes that are listed include: tannery wastes, metallurgical slag and dross, mineral sludge, nonferrous tailings, galvanic sludge, salts, acids, leach, concentrate, waste from plant protection and pesticide agents, waste from drug production, mineral oils, refinery mineral waste, solvents and solvent mixtures, explosives, waste from laboratories, and detergent wastes. (Original text in German)

(12) KEYWORDS: ACID; DISPOSAL; GERMANY; HAZARDOUS; INDUSTRY; LAW; LEACH; MINERAL; SALT; SLUDGE; TAILINGS

(15) STIMS ACC.NO.: 00536120

(18) DOC.CIT.: Federal Environmental Protection Agency, West Germany. List of hazardous wastes for the legislation in paragraph 1, section 1a, waste disposal law, new version. Draft. (Liste der sonderabfaelle fuer die rechtsverordnung nach labs, 1a abfg n. f.) May 12, 1976, 19 p.

(1) SWIRS ACC.NO.: 035711

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: New Jersey's Department of Environmental Protection (DEP) is proposing a revision of the rules regulating chemical and hazardous wastes. They want to prohibit the disposal of hazardous wastes at landfills without special permission from the Department. The list of hazardous wastes includes 100 substances that are highly toxic or corrosive, cause cancer, or are explosive. The DEP says that the list will be revised from time to time as more information on chemical wastes becomes available. Anyone wishing to dispose of these wastes in a landfill must show that there are no alternative disposal methods, and that the potential impacts will be minimized. The DEP has delayed until further notice a regulation requiring all disposal facilities that take chemical or hazardous wastes to have a collection and treatment system for water that leaks out of the landfills. The reason for the delay is the lack of facilities in New Jersey which can treat and dispose of hazardous wastes.

(12) KEYWORDS: CHEMICAL; COLLECTION; CORROSION; DISEASE; DISPOSAL; EXPLOSION; HAZARDOUS; NEW JERSEY; POLLUTION; REGULATIONS; SANITARY LANDFILL; TOXIC; TREATMENT; WATER

(15) STIMS ACC.NO.: 00534756

(18) DOC.CIT.: New Jersey proposes change in regulations for hazardous waste. Chemical Marketing Reporter, 208(13):7, 25, Sept. 29, 1975.

(1) SWIRS ACC.NO.: 035748

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: Union Carbide Corporation has prepared a "Hazard Information in Transportation" report in order to gain support for its

comprehensive hazardous materials transit plan. According to the report, the plan replaces numbers with words and symbols for the identification of primary, secondary, and tertiary risks of materials in transit. The symbols would be in accord with upcoming international hazard identification systems. The plan provides outlines for the revision of container labels and shipping documents. Hazards will be identifiable without a manual, but a manual will be provided to complement symbolic data. This should increase the safety of those who deal with hazardous shipments and reduce the administrative load for shippers and carriers. The plan also identifies all hazards involved in "mixed shipments" of multiple products which can be flammable, corrosive, poisonous, or have similar dangerous properties.

(12) KEYWORDS: HAZARDOUS; INDUSTRY; MANAGEMENT; PLANNING; SAFETY; SYSTEM; TRAINING; TRANSPORT

(15) STIMS ACC.NO.: 00534793

(18) DOC.CIT.: Union Carbide seeks industry support for its hazardous materials transit plan. American Paint and Coatings Journal, 60(23):16, 18, Nov. 17, 1975.

(1) SWIRS ACC.NO.: 035746

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: In trying to solve the problem of ultimate disposal of spilled hazardous wastes, the necessity for environmentally safe and practical disposal must be balanced against such impediments as transportation availability, costs, suitability of temporary storage facilities, citizen reaction, and local, state, and federal regulations. Two alternatives for disposal are on-site disposal or utilization of existing facilities. On-site disposal may include land disposal, chemical treatment, and/or long-term storage. Existing facilities include municipal waste facilities, commercial treatment and disposal sites which deal with industrial wastes, and industrially owned and operated facilities. The use of existing facilities is preferable to on-site disposal if they are appropriate and available. Advantages include quicker disposal, since construction is unnecessary, unlikely opposition from the local inhabitants, and the need only to know what type of wastes can be disposed of by what means and not how to build the facilities. Even though it might be impossible at times, to make use of the more favorable approach as far as long-term environmental hazards are concerned, an estimate of alternatives and their effects on the environment will lead to more stable solutions.

(12) KEYWORDS: ACCIDENT; BIBLIOGRAPHY; CHEMICAL; DISPOSAL; ENVIRONMENT; FACILITY; HAZARDOUS; HEALTH; INDUSTRY; MANAGEMENT; PLANNING; SAFETY

(15) STIMS ACC.NO.: 00534791

(18) DOC.CIT.: Lindsey, A. W. Ultimate disposal of spilled hazardous materials. Chemical Engineering, 82(23):107-114, Oct. 27, 1975.

(1) SWIRS ACC.NO.: 035641

(2) DOMESTIC: D (2) CATEGORY: 17 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: The Third United Nations Conference on the Law of the Sea reconvened in March 1975. A set of draft articles for further negotiations was agreed upon. The marine pollution provisions, however, are insufficient to combat the widespread problem. Mercury, lead, chlorinated hydrocarbons, petroleum, and radionuclides are accumulating in the environment on a global scale. Emission sources are found almost entirely within the boundaries of sovereign states. Such sources represent almost every facet of human activity. Land based pollution is transported to the oceans by the atmosphere and rivers. Strict regulations of land based pollution will not be approved by diplomats at the Law of the Sea Conference because such measures are too costly; both economically and politically. A supranational organization with comprehensive powers to publish and enforce regulations would be needed. International regulations would limit the range of options open

tc a policy maker who is attempting to balance the risks and benefits. Some developing countries are claiming an intrinsic right to pollute in crder to develop economically. A rund to subsidize the cost of pollution control for developing nations might be favorable. The provisions agreed upon are weak but they will have some effect. Tney will provide the basis for arbitration, the establishment of precedents, and increase the likelihood that stronger regulations will develop.

(12) KEYWORDS: CONTROL; ECONOMICS; EMISSION; ENVIRONMENT; HAZARDOUS; INTERNATIONAL; LAW; MERCURY; OCEAN; POLLUTION; REGULATIONS; SHIP; TRANSPORT; WATER; WATERWAY

(15) STIMS ACC.NO.: 00S34686

(18) DOC.CIT.: Paterson, A. E. III, Marine pollution and the Law of the Sea. Bulletin of the Atomic Scientists, 31(10):49-50, Dec. 1975.

(1) SWIRS ACC.NO.: 033956

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This paper describes the role of the State Government in hazardous industrial sludge management in Minnesota. The Minnesota Pollution Control Agency has the responsibility for regulation of pollution in the State. An informal steering committee composed of representatives or various State and local governmental agencies and private industry was used to develop a working definition cf hazardous wastes and to identify potential administrative alternatives fcr implementation or a Metropolitan Hazardous Waste Management Program in the Twin Cities area. The decision model developed for identifying hazardous wastes consisted of a series of questions tc which a yes answer would place the waste in one or two categories of hazardous wastes. The work of the Committee laid the basis for the Minnesota Hazardous Waste Management Act of 1974, which outlined the administrative framework and delegated specific authority to various governmental levels for hazardous waste planning, and waste identification, generation, transportation, and processing. Generators cf hazardous wastes are to be licensed by local agencies, while State agencies have responsibility for regulating hazardous waste transportation. (This document is retained in the SWIRS library.)

(12) KEYWORDS: CLASSIFICATION; GENERATION; GOVERNMENT; HAZARDOUS; INDUSTRY; LAW; LOCAL; MANAGEMENT; MINNESOTA; PLANNING; PROBLEMS; REGULATIONS; SLUDGE; STATE; TRANSPORT

(15) STIMS ACC.NO.: 00S33000

(18) DOC.CIT.: Kramer, L. D. , and P. P. Born. Minnesota's role in hazardous industrial sludge management. In Proceedings; National Conference on Management and Disposal of Residues from the Treatment of Industrial Wastewaters, Washington, D. C. , Feb. 3-5, 1975. Rockville, Maryland, Information Transfer, Inc. p. 25-29.

(1) SWIRS ACC.NO.: 035302

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: The Department of Environmental Quality (DEQ) has developed administrative regulations for hazardous waste management in Oregon comprising criteria for classification of wastes as hazardous, basic requirements for hazardous waste management from the point of waste generation to the point of ultimate disposition, and a list of wastes classified as hazardous. The DEQ is working to establish a statewide system for hazardous waste collection and disposal, with a number of regional collection facilities and one or two hazardous waste disposal sites. Such a program would ensure that hazardous waste management practices will improve and that the problem of hazardous waste disposal will not grow worse with the quickly expanding technologies that generate them.

(12) KEYWORDS: CLASSIFICATION; COLLECTION; DATA; DISPOSAL; HAZARDOUS; HEALTH; INDUSTRY; MANAGEMENT; OREGON; PLANNING; REGULATIONS; SAFETY; STORAGE; TRANSPORT

(15) STIMS ACC.NO.: 00S34347

(18) DOC.CIT.: Synak, M. , P. H. Wicks, and K. H. Spies. Development of Oregon's hazardous waste program. Journal of the Environmental Engineering Division--ASCE, 101(3):301-308, June 1975.

Section 4
HEALTH AND SAFETY

(1) SWIRS ACC.NO.: 047780
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Concentration of enteroviruses from large volumes of tap water, treated sewage, and seawater.
(4) AUTHOR: Gerba CP
(6) JOURNAL TITLE: Appl Environ Micro
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: An improved portable virus concentrator and reconcentrator procedure is described. This system offers many advantages over previous methods and can be used in the field to monitor large volumes of secondarily treated sewage, tapwater, and seawater for enteroviruses. Viruses in acidified water (pH 3.5) with aluminum chloride were adsorbed to a ten inch (ca. 25.4 cm) fiberglass depth cartridge and a ten inch pleated epoxy fiberglass filter in a series at flow rates of up to 37.8 l (ten gals)/min. Adsorbed viruses were then eluted from the filters with glycine buffer (pH 10.5 to 11.5), and the eluate was reconcentrated by using a combination of aluminum flocculation followed by hydroextraction. It was demonstrated that this method could detect surface solid associated viruses originating from sewage treatment plants. No difference was found in virus recovery between laboratory batch studies and a setup with acid salt injections. The many advantages of this unified scheme for the concentration of viruses include: high operating flow rates; low weight and small size; effectiveness with a variety of waters with widely varying qualities; and filters with a high resistance to clogging.
(12) KEYWORDS: ANALYSIS; CONCENTRATION; HAZARDOUS; MONITOR; SEWAGE; SYSTEM; VIRUS; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1MM
(15) STIMS ACC.NO.: 00S46834 (15) SECONDARY AUTHORS: Farrah SR; Goyal SM
(16) CITATION: 35(3):540-548, Mar. 1978.

(1) SWIRS ACC.NO.: 045485
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Experimental carcinogenesis of pyrolysis fuel oil.
(4) AUTHOR: Weil CS
(6) JOURNAL TITLE: Amer Indus Hygiene Assoc J
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Skin applications of two samples of pyrolysis fuel oil (residue from ethylene manufacture from hydrocarbons) to mice were made to test the carcinogenicity of the material. Experimental mice received three applications per week of chemical applied to shaved skin, and observations were made for papillomas and carcinomas for the lifetime of the mice. Control mice were painted with benzene or water. Results were that two samples of pyrolysis fuel oil residues produced skin carcinomas in the mice. Similar results have been reported from other carbonaceous materials subjected to high temperatures and pressures. Although these tests exposed mice to conditions different from those of working humans, their results should serve as warning of a possibe health risk.
(12) KEYWORDS: FUEL; HAZARDOUS; HEALTH; HYDROCARBON; OIL; PATHOGEN; PROCESS; PYROLYSIS; RESEARCH
(14) HIERARCH TERMS: 1HA/2HH; 1HB
(15) STIMS ACC.NO.: 00S44533 (15) SECONDARY AUTHORS: Condra NI
(16) CITATION: 38(12):730-733, Dec. 1977.

(1) SWIRS ACC.NO.: 045355
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Bacterial and viral pathogens associated with land application of organic wastes.
(4) AUTHOR: Elliott LF
(6) JOURNAL TITLE: J Environ Quality
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: There is a possibility that bacterial and viral pathogens may be present in animal, and municipal, wastes. Caution should be exercised when using these materials for crop production and these wastes should not be applied to root crops during the current growing season, or to above-ground crops 1 month before harvest. Animals should not be allowed to graze areas for 2 to 3 weeks after waste application. Waste should be applied on the basis of crop fertility requirements based on optimum nutrient utilization, thereby minimizing pathogen-loading rates. Disease outbreaks have occurred when crops grown on soils receiving raw sewage were eaten raw, or when an area was grazed shortly after waste application. No incidence of disease has been reported from land application of treated wastes. Thus, treatment of municipal waste before application is important. A zero-tolerance for pathogens in wastes land-applied for crop growth would seem unnecessary when proper management is used.
(12) KEYWORDS: AEROSOLS; BACTERIA; CROP; EARTH; HAZARDOUS; LAND; ORGANIC; PATHOGEN; TREATMENT; UTILIZE; VIRUS
(14) HIERARCH TERMS: 1HA/2HH; 1PC
(15) STIMS ACC.NO.: 00S44402 (15) SECONDARY AUTHORS: Ellis JR
(16) CITATION: 6(3):245-250, Jul-Sept. 1977.

(1) SWIRS ACC.NO.: 044102
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Mutagenicity of waste products from vinyl chloride industries.
(4) AUTHOR: Rannug U
(6) JOURNAL TITLE: J Toxicology and Environmental Health
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A test on EDC-tar, a vinyl chloride by-product possessing short chained chlorinated aliphatic hydrocarbons, was used to determine mutagenicity via the Ames Salmonella/mammalian microsome method. Since most of the components in the tar are poorly soluble in water, three agents were used as solvents or emulsifier: ethanol, DMSO, and Tween 80. The results with all these agents showed that EDC-tar contains direct as well as indirect mutagenic constitutents. It could be concluded that the mutagenic effect observed in the test could not be due to one of the main components, ethylene dichloride (1,2-dichloroethane). This substance showed a weak mutagenic effect, but only at higher concentrations than could be available in the highest concentration tests of the tar. Although the microsomal system enhanced the mutagenicity both of the EDC-tar and of 1,2-dichloroethane, this enhancement was dependent on NADPH in the case of EDC-tar but independent of NADPH with 1,2-dichloroethane. The Salmonella/mammalian microsome method seems to be a suitable tool for both mutagenicity screening of complex chemical mixtures and identification of mutagenic constitutents in such mixtures.
(12) KEYWORDS: ANALYSIS; BY-PRODUCT; CHEMICAL; CHLORIDE; HAZARDOUS; INDUSTRY; ORGANIC
(14) HIERARCH TERMS: 1CB/2CA; 1HA/2HH; 1IC/2IY
(15) STIMS ACC.NO.: 00S43145 (15) SECONDARY AUTHORS: Kamel C
(16) CITATION: 2(5):1019-1029, 1977.

(1) SWIRS ACC.NO.: 044072
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Mercury concentrations in soil, grass, earthworms and small mammals near an industrial emission source.
(4) AUTHOR: Bull KR
(6) JOURNAL TITLE: Environmental Pollution
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A study, around a chloralkali works, which examined mercury concentrations in soils, grass, earthworms, moles and woodmice is described. Atomic absorption spectrometric analysis of top-soils,

grass (Festuca rubra L.), earthworms (Lumbricus terrestris L.), and atmospheric fallout, within 0 to 5 km and 10 to 30 km of the works, showed that mercury levels were significantly higher near the works. Wood mice (Apodemus sylvaticus L.) and bank voles (Clethrionomys glareolus Schr.) collected near the works had significantly greater concentrations of total mercury in brain, kidney, liver and hair than control animals. Mercury concentrations in soils and tissues are tablulated. Differences between mercury concentrations in the mammals are not as marked as those for vegetation and soil. The half life retention of mercury by small animals is a few days and may not reflect concentrations in other species with slower excretion rates. The presence of methyl mercury in the mammals and L. terrestis is evidence of methylation of the inorganic mercury fallout.

(12) KEYWORDS: ANIMAL; EMISSION; ENVIRONMENT; HAZARDOUS; INVESTIGATION; MERCURY; POLLUTION; SOIL

(14) HIERARCH TERMS: 1ED; 1HA/2HH; 1ME

(15) STIMS ACC.NO.: 00S43115 (15) SECONDARY AUTHORS: Roberts RD; Inskip MJ

(16) CITATION: 12(2):135-140, Feb. 1977.

(1) SWIRS ACC.NO.: 044470

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Solomon KA

(6) BOOK TITLE: On Risks from the Storage of Hazardous Chemicals.

(8) REPORT NO.: NSF/RA-760464

(9) GRANT NO.: GI 39416 OEP7520318

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA/3LA (10) PUB. YEAR: 1976

(11) ABSTRACT: The following approach was used to obtain information on storage of hazardous chemicals: the governors of all fifty states were asked for information concerning the means used by the state in regulating and evaluating risks from storage of potentially hazardous chemicals; a brief survey was made of the measures employed in the cities of Los Angeles and El Segundo, California, in regulating the construction and use of facilities to store hazardous chemicals; and parametric hazard calculations were performed for postulated accidents having assumed population distributions to provide a rough assessment of the potential hazard. A description of the method of surveying the states and the results obtained are given as well as the results obtained in the survey of Los Angeles and El Segundo. The methodology and results of the limited parametric study of potential hazards are reported. Also included are the computational model used for postulated accidents caused by different chemicals. (Retained in SWIRS library).

(12) KEYWORDS: AIR; ANALYSIS; CALIFORNIA; CHEMICAL; CHLORINE; COMPUTER; DATA; EXPLOSION; HAZARDOUS; POPULATION; REGULATIONS; SAFETY; STATE; STORAGE; TOXIC

(14) HIERARCH TERMS: 1CG; 1HA/2HH; 1MA/2MG; 1SM/2TB; 1SM/2TC; 1SM/2TD

(15) STIMS ACC.NO.: 00S43514 (15) SECONDARY AUTHORS: Rubin M; Okrent D

(16) CITATION: Washington, DC, National Science Foundation, Dec. 1976. 161 p.

(1) SWIRS ACC.NO.: 044056

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Klusman RW

(5) CORPORATE AUTHOR: Colorado School of Mines

(6) BOOK TITLE: Toxic Heavy Metals in Ground Water of a Portion of the Front Range Mineral Belt. Final Completion Report.

(8) NTIS NO.: Pb 256 212 (8) REPORT NO.: A-023-COLO

(9) GRANT NO.: 14-31-0001-4006/5006

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CO (10) PUB. YEAR: 1976

(11) ABSTRACT: A study of toxic trace metal distribution in ground waters of the Front Range mineral belt, Colorado and adjacent areas was completed in order to determine the relationship of water quality to mineralization and the magnitude of potential health effects. A total

of 149 samples were collected and analyzed for arsenic, cadmium, copper, iron, lead, manganese, mercury, silver, and zinc. Field determinations of pH, Eh, and specific conductance were also made. The trace element data exhibited a log normal distribution and are described utilizing the geometric mean and geometric deviation. Four populations were recognized in the samples; 1) samples in the mineral belt with plumbing contamination, 2) samples in the mineral belt without plumbing contamination, 3) samples outside the mineral belt with plumbing contamination, and 4) samples outside the mineral belt without plumbing contamination. Differences in these populations for several elements are observed utilizing the t test. Utilizing the observed data distributions, geochemical abundance estimates are made for the four recognized populations. Ground waters in the mineral belt are estimated to exceed the U. S. Public Health Service limit in 14 percent of the samples for Cd, 1 percent for Cu, 51 percent for Fe, 74 percent for Mn, 2 percent for Hg, and 9 percent for Zn. (Retained in SWIRS library).

(12) KEYWORDS: COLORADO; GROUND WATER; HEALTH; METAL; TOXIC
(14) HIERARCH TERMS: 1GD; 1HA/2HH; 1HB; 1ME/2MB; 1TD
(15) STIMS ACC.NO.: 00S43099 (15) SECONDARY AUTHORS: Edwards KW
(16) CITATION: Washington, DC, U. S. Department of the Interior, June 1976. 61 p.

(1) SWIRS ACC.NO.: 044036
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Sledovani vyvoje radioaktivity vody v tocich a jeho hodnoceni. (Investigation of radioactivity development in water).
(4) AUTHOR: Jaroslav R
(6) JOURNAL TITLE: Vodni Hospodarstvi
(10) LANGUAGE: CZ (10) GEO. AREA: 1EU/2CZ (10) PUB. YEAR: 1976
(11) ABSTRACT: This article outlines the trend of water radioactivity studies in Czechoslovakia and the analysis of the concept of these studies to meet the requirements of uranium mining effluent treatment. Practical experience in evaluating the permissible levels of radioactive contamination shows that the effect on public health need not be decisive in the presence of other aspects. The presented priniciple of complex evaluations is also based on new governmental decree No. 25/75 Sb., on permissible water pollution. Two tables, 2 maps, and bibliography are included. (Originial text in Czechoslovakian).
(12) KEYWORDS: CZECHOSLOVAKIA; HEALTH; PUBLIC; RADIOACTIVE; WATER
(14) HIERARCH TERMS: 1HA/2HH; 1RA
(15) STIMS ACC.NO.: 00S43079
(16) CITATION: 26(4):107-111, 1976.

(1) SWIRS ACC.NO.: 043178
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Progress on radioactive waste disposal should ease public anxiety.
(6) JOURNAL TITLE: Nuclear Engineering International
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2GE; 1EU/2UK; 1US (10) PUB. YEAR: 1976
(11) ABSTRACT: A report on the International Symposium of the Management of Wastes from the LWR Fuel Cycle held in Denver in July 1976 concludes that progress on radioactive waste disposal should ease public anxiety. The meeting attracted 600 participants from the U.S. and other countries. It was announced that the U.S. budget allocation for solution to the problem would be increased from $4 million in 1976 to over $40 million in 1977. Statements of national policy were made by the United Kingdom (which defended the "go slow" policy); and the Federal Republic of Germany (which explained the concept of a Fuel Reprocessing Centre capable of handling 1,500 tons LWR fuel per year located over a salt dome so that most of the waste could be disposed of on the spot). The sessions left the impression that techniques of waste management have been developed to a point at which, if applied

vigorously, would result in risk to the public substantially smaller than that from accidents to the reactors which produce them. They are infinitesimally life.

(12) KEYWORDS: ACCIDENT; COLORADO; CONFERENCE; DENVER; DISPOSAL; GERMANY; GREAT BRITAIN; HAZARDOUS; INTERNATIONAL; MANAGEMENT; RADIOACTIVE; SAFETY; US

(14) HIERARCH TERMS: 1HA/2HF; 1HB

(15) STIMS ACC.NO.: 00S42221

(16) CITATION: 21(247):16, Aug. 1976.

(1) SWIRS ACC.NO.: 042943

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Hazardous waste management control requires laws, records, equipment...and education.

(6) JOURNAL TITLE: Solid Waste Systems

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA (10) PUB. YEAR: 1977

(11) ABSTRACT: Several accidents due to inadequate hazardous waste management are described and the methods and equipment used in California to control and monitor hazardous waste collection, transport, and disposal are detailed. The Resource Conservation and Recovery Act of 1976 requires the use of a manifest system to ensure that all hazardous wastes are designated for treatment, storage, or disposal at a facility authorized to accept such wastes. California's manifest is depicted. Data entered must include: the complete address of the waste producer, the hauler, and the processor or disposer; waste type; and method of treatment or disposal. A well equipped laboratory is mandatory for identification of hazardous wastes and their safe management at the disposal site. Typical case histories of accidents resulting from mixing incompatible wastes are summarized. Field equipment to collect representative samples and to provide rough screening of those samples is also required. The California Department of Health has developed mobile laboratories so that waste samples can be safely screened for hazardous properties immediately after collection.

(12) KEYWORDS: ACCIDENT; CALIFORNIA; CONTROL; DISPOSAL; EQUIPMENT; FACILITY; HAZARDOUS; LABORATORY; LAW; MANAGEMENT; MONITOR; SAMPLING METHODS; STORAGE; TRANSPORT; TREATMENT

(14) HIERARCH TERMS: 1HA; 1HB; 1LB

(15) STIMS ACC.NO.: 00S41986

(16) CITATION: 6(3):8-10, May/June 1977.

(1) SWIRS ACC.NO.: 042395

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Concepts in health evaluation of commercial and industrial chemicals.

(4) AUTHOR: McNamara BP

(6) BOOK TITLE: In Mehlman, M. A., R. E. Shapiro, and H. Blumenthal, eds. New Concepts in Safety Evaluation.

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: Toxicity evaluation of commercial and industrial chemicals and the effects (short term or longterm) of these on humans are discussed. Chemicals considered include food additives, drugs, cosmetics, agricultural chemicals, household chemicals, and industrial chemicals. A brief history of the laws pertinent to chemicals control and human exposure is cited and include legislation such as the Federal Food, Drug, and Cosmetic Act, Consumer Product Safety Act, the Occupational Safety and Health Act, and the Toxic Substance Control Act. Technical information on chemicals testing as relates to short term and longterm effects is provided, and data specific to human reproduction and carcinogenicity and chemicals exposure are stressed.

(12) KEYWORDS: ANALYSIS; CHEMICAL; COMMERCIAL; DISEASE; EFFECT; EXPOSURE; HEALTH; HUMAN; INDUSTRY; LAW; SAFETY; TOXIC

(14) HIERARCH TERMS: 1CB; 1HA/2BF; 1HB; 1IC/2IY

(15) STIMS ACC.NO.: 00S41438

(16) CITATION: Washington, DC, Hemisphere Publishing Corporation, 1976. p.61-140.

(1) SWIRS ACC.NO.: 041349
(2) DOMESTIC: D (2) CATEGORY: 09 (3) SUBJ.TYPE: S
(4) AUTHOR: Fishbein L (10) GEO. AREA: NAM; USA (10) PUB. YEAR: 1976
(11) ABSTRACT: Fumigants and their degradation products in foodstuffs and soil are examined to determine the potential mutagenicity of their residues. The fumigants primarily include ethylene dibromide, 1,2-dibromo-3-chloropropane, ethylene oxide, symdibromotetrachloroethane, 1,3-dichloropropene, dichlorovos, carbon tetrachloride, and methyl bromide. Fumigants are defined as gaseous pesticides that are widely used for the control of insects, mites, nematodes, wireworms, rodents, bacteria, yeasts, and molds. Twenty seven of the most commonly used fumigants are listed, including a number of alkylating, carcinogenic, and mutagenic agents; potential carcinogens and mutagens; and hepatotoxins. Factors influencing the distribution and persistence of a specific fumigant and its degradation are noted. The toxicological nature of fumigants, as well as their principal metabolic and degradation products which may reach humans via direct exposure or ingestion as residues in food, are detailed.
(12) KEYWORDS: CLASSIFICATION; DISEASE; EXPOSURE; FOOD; HAZARDOUS; HEALTH; HUMAN; PESTICIDE; RESIDUE; SAFETY; TOXIC
(14) HIERARCH TERMS: TPL
(15) STIMS ACC.NO.: 00S40393
(16) DOC.CIT.: Fishbein, L. Potential hazards of fumigant residues. Environmental Health Perspectives, 14:39-45, Apr. 1976.

(1) SWIRS ACC.NO.: 041330
(2) DOMESTIC: D (2) CATEGORY: 09 (3) SUBJ.TYPE: S (10) GEO. AREA: NAB; NPE (10) PUB. YEAR: 1975
(11) ABSTRACT: The use of agricultural chemicals is discussed as a health hazard to the inhabitants of rural areas. A project was conducted to evaluate the hazard to farm workers exposed to organophosphate residues. Parameters governing the relationship between organophosphates introduced into the agricultural environment and their subsequent effects on workers who entered that environment in the course of normal work activities were ascertained. Physiological effects of exposure to organophosphate pesticides were examined during 1975. It was determined that established preharvest intervals for phosdrin ad methomyl use on lettuce and methyl parathion use on artichokes provided adequate protection for workers harvesting the crops. The relationship between guthion pesticide application and climatology was assessed. It was found that there did not appear to be any movement of guthion from trees into the air. Studies involving field sampling and residue analysis were carried out on the application of lannate, phosdrin, and guthion, to agricultural products. The results of these studies are reported. (Retained in SWIRS Library)
(12) KEYWORDS: AGRICULTURE; ANALYSIS; CHEMICAL; EFFECT; ORGANIC; PESTICIDE; PHOSPHATE; PHYSIOLOGICAL; RESIDUE; RURAL; TRANSPORT; VEGETATION
(14) HIERARCH TERMS: THB
(15) STIMS ACC.NO.: 00S40374
(16) DOC.CIT.: Effects of the use of agricultural chemicals on the health of inhabitants of rural communities. In Summary Report 1975. University of California at Davis, 1975. p. 65-67.

(1) SWIRS ACC.NO.: 041325
(2) DOMESTIC: D (2) CATEGORY: 09 (3) SUBJ.TYPE: S
(4) AUTHOR: Hsieh DI (10) GEO. AREA: USA; THB (10) PUB. YEAR: 1975
(11) ABSTRACT: The metabolism and disposition of aflatoxin B1 in Rhesus monkeys are investigated. The objective of the investigation was to examine the similarities between monkeys and humans with regard to aflatoxin B1 responses. In vivo animal data were used to estimate human susceptibility to aflatoxicosis and to develop diagnostic methods for human exposure to aflatoxin B1. A fluorescence assay technique was developed for determining monooxygenase activity in liver microsomal preparations. Liver samples were homogenized in buffered sucrose, and aflatoxin B1 was

located by fluorescence and scraped into vials for scintillation counting. There were remarkable similarities in the metabolic patterns and relative activities between human and monkey livers. One week after exposure to a single 0.4 milligram per kilogram dose of aflatoxin B1, monkey livers showed severe centrilobular necrosis and mild diffuse fatty change. Some parenchymal cells showed damage to the endoplastic reticulum, swelling of the mitochondria, and proliferation of Kupffer cells. Six months after exposure, livers appeared to return to normal. The mutagenic activity of various aflatoxins and their animal metabolites is discussed. (Retained in SWIRS library)

(12) KEYWORDS: ANIMAL; CHEMICAL; COMPARISON; EFFECT; EXPOSURE; HUMAN; ORGANIC; PHYSIOLOGICAL; TOXIC

(14) HIERARCH TERMS: 1HA/2HB

(15) STIMS ACC.NO.: 00S40372

(18) DOC.CIT.: Hsieh, D. P. Metabolism of aflatoxin B1. In Summary Report 1975. University of California at Davis, 1975. p. 41-44.

(1) SWIRS ACC.NO.: 041327

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) GEO. AREA: 1ED; 1PE (10) PUB. YEAR: 1975

(11) ABSTRACT: Information is provided on the effect of pesticides and other industrial toxicants in the environment. Studies are reported on the environmental impact of chlorinated hydrocarbons. These studies are concerned with an analytical methodology for chlorinated hydrocarbons that emphasizes toxaphene and chlordane, comparative detoxication of pesticides, biological effects of chlorinated hydrocarbons on birds and rodents, and chemicobiological interactions of chlorinated hydrocarbons in Rhesus monkeys. The toxicological characteristics of organophosphates are examined in relation to the recovery of muscle and nerve cells. The mammalian metabolism of chlorinated hydrocarbons is explored. A study on the uptake and excretion of hexachlorobenzene by growing lambs is reported. The competitive inhibition of nitrosamine formation is examined. (Retained in SWIRS library)

(12) KEYWORDS: ANALYSIS; CHLORINE; DATA; EFFECT; ENVIRONMENT; HYDROCARBON; INDUSTRY; INVESTIGATION; PESTICIDE; TOXIC

(14) HIERARCH TERMS: 1HB

(15) STIMS ACC.NO.: 00S40371

(18) DOC.CIT.: Pesticides and other industrial toxicants in the environment. In Summary Report 1975. University of California at Davis, 1975. p. 1-38.

(1) SWIRS ACC.NO.: 040804

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) GEO. AREA: 1US/2NY/3N1 (10) PUB. YEAR: 1977

(11) ABSTRACT: In Niagara Falls, New York, an elementary school, a baseball diamond, and 50 new homes are sitting on or adjoin a field that is leaking toxic chemicals. The Hooker Chemical and Plastics Corporation has previously used the field as a dump for chemical residues and had then donated it to the city school board. The board dumped topsoil on the area and built an elementary school. For several years there were no problems. Then residents noticed lawns turning red, red seepage in their basements, and their children came home with burned feet after playing football. Samples from a basement sump pump which were analyzed contained 40 percent chlorinated hydrocarbons. Three accounted for the majority of the sample and all three were toxic. They are standard "intermediates" used in the manufacture of herbicides and pesticides. Hooker has denied liability pointing out that in deeding the property it had specifically disclaimed responsibility for injuries resulting from chemicals in the soil and had even cautioned against putting a basement in the school.

(12) KEYWORDS: CHEMICAL; CHLORINE; DISPOSAL; HAZARDOUS; HEALTH; HYDROCARBON; INDUSTRY; LAND; MUNICIPALITY; NEW YORK; PESTICIDE; RESIDUE; RESPONSIBILITY; TOXIC; WASTE

(14) HIERARCH TERMS: [illegible]

(15) STIMS ACC.NO.: [illegible]

(18) DOC.CIT.: The letter is actual. Mother Jones, 2(1):5, Jan. 1977.

(1) SWIRS ACC.NO.: 040781
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Heidermanns G (10) PUB. YEAR: 1975
(11) ABSTRACT: Extensive measurements of the concentration of asbestos dusts, carried out at working places in the friction lining industry and in car factories, led to the result that in the mechanical processing of brake lining, the values obtained for fine chrysotile dust are not permissible any more. It is a fact that during the removal by blowing of abrasion dust from brake drum lining containing asbestos, high dust concentrations occurred, but there was practically no chrysotile asbestos in this dust. The transformation of asbestos which obviously occurred here, was confirmed by laboratory experiments.
(12) KEYWORDS: AIR; ASBESTOS; AUTOMOBILE; DUST; EUROPE; GERMANY; INDUSTRY; LABORATORY; LINER; MEASUREMENTS; MINERAL; OCCUPATION; PARTICULATE MATTER; PLANT-INDUSTRIAL; QUALITY
(14) HIERARCH TERMS: 1AC/2AJ
(15) STIMS ACC.NO.: 00S39825 (15) SECONDARY AUTHORS: Koehnen G; Schoetz A
(18) DOC.CIT.: Heidermanns, G. , G. Koehnen, and A. Schoetz. Dust concentrations in fabrication of friction coating containing asbestos and their handling in car repair shops. Staub Reinhaltung der Luft, 35(12):433-436, Dec. 1975.

(1) SWIRS ACC.NO.: 040663
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Laaksovirta K (10) GEO. AREA: 1EU/2FN (10) PUB. YEAR: 1976
(11) ABSTRACT: The lead contents of lichen (Hypogymnia physodes) and its substrate (bark of Pinus sylvestris) were studied along a busy four lane highway on the coast of southern Finland. The lead determinations of the samples were performed by an isotope/excited xray fluorescence analysis. The decrease in the lead content of the lichens was statistically significant between 20 and 100 m from the road, but not between 100 and 200 m. There appeared to be no correlation between the lead content of lichens and traffic density. The lead content of bark changed significantly both between the distances of 20 and 100 m and 100 and 200 m, and correlated highly significantly with the traffic density. In this study pine bark was a better indicator than lichens of lead emission from motor vehicles. This could be caused by effective lead accumulation in lichens even where there was moderate traffic flow.
(12) KEYWORDS: AGRICULTURE; ALGAE; ANALYSIS; AUTOMOBILE; BARK; CROP; EMISSION; FUNGUS; HIGHWAY; METAL; NON-FERROUS; PHOSPHORUS; POLLUTION; RESIDUE; SAMPLING METHODS; SCANDINAVIA; SULFUR; VEGETATION
(14) HIERARCH TERMS: 1AC/2AE
(15) STIMS ACC.NO.: 00S39707 (15) SECONDARY AUTHORS: Alakuijala P; Olkkonen H
(18) DOC.CIT.: Laaksovirta, K. , H. Olkkonen, and P. Alakuijala. Observations on the lead content of lichen and bark adjacent to a highway in southern Finland. Environmental Pollution, 11(4):247-255, Dec. 1976.

(1) SWIRS ACC.NO.: 040533
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Wood JM (10) GEO. AREA: 1AI/2JA (10) PUB. YEAR: 1976
(11) ABSTRACT: In 1956, a mysterious epidemic spread in Minimata, a small fishing village in Japan. This illness was characterized by sensory as well as motor disturbances of the central nervous system. It especially struck families of fishermen whose food is essentially based on products from the sea. Research was immediately undertaken to discover the origin of this sickness. Soon after, a factory manufacturing acetaldehyde was suspected of ejecting effluents containg organic mercury. Its responsibility was objectively established after a long judiciary battle. After setting up a treatment

facility in 1960, the poisonings stopped. But there were 121 cases of the illness, 22 congenital and 54 fatal. (Text in French)

(12) KEYWORDS: CHEMICAL; DISCHARGE; EFFECT; ENVIRONMENT; EPIDEMIOLOGY; FOOD; HEALTH; HUMAN; INDUSTRY; JAPAN; MERCURY; METAL; OCEAN; POLLUTION; RESPONSIBILITY; TOXIC

(14) HIERARCH TERMS: 1TD; 1WA/2WG

(15) STIMS ACC.NO.: 00539577

(18) DOC.CIT.: Wood, J. M. Les metaux toxiques dans l'environnement. (Toxic metals in the environment.) La Recherche, 7(70):711-720, Sept. 1976.

(1) SWIRS ACC.NO.: 040254

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(4) AUTHOR: Goldstein E (10) GEO. AREA: 1AC/2AE (10) PUB. YEAR: 1976

(11) ABSTRACT: Methods used to assess different microbial defense parameters, their sensitivity in detecting abnormality, the importance of the abnormality as regards susceptibility to infection, and the extent to which the method has been applied in toxicology are discussed. Because the above studies can be performed with any inhaled contaminant, the hazard of presently unstudied agents such as pesticides, metallic vapors, and hydrocarbon containing industrial effluents is assessable by the methods indicated in the test. The development and use of animal models that mimic human diseases should significantly enhance our ability to assess the hazard from exposure to manmade airborne contaminants.

(12) KEYWORDS: AIR; BIOLOGICAL; CHEMICAL; CONTAMINATE; EFFECT; EFFLUENT; GASSES; POLLUTION; RESEARCH; TOXIC

(14) HIERARCH TERMS: 1MF

(15) STIMS ACC.NO.: 00539298 (15) SECONDARY AUTHORS: Jordan GW; MacKenzie MR

(18) DOC.CIT.: Goldstein, E., G. W. Jordan, and M. R. MacKenzie. Methods for evaluating the toxicological effects of gaseous and particulate contaminants on pulmonary microbial defense systems. Annual Review of Pharmacology and Toxicology, 16, 447-463, 1976.

(1) SWIRS ACC.NO.: 039857

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Effluents from sewage treatment plants were tested for the presence of Salmonella, a type of bacteria pathogenic to humans. Although the treatment plants discharged waste water that conformed to regulations on amounts of oxidizable matter and suspended solids, Salmonella was found in effluents from the 66 purification plants studied. It was shown that the bacterial population is not totally destroyed by the primary and secondary process actually meant to insure sewage purification, even when the plants discharge to the receiving waters an effluent which conforms to the regulations relating to purification of oxidizable and settlable matter. A correlation as found between high levels of Salmonella and high levels of fecal coliforms, which can be used as an indicator for Salmonella contamination. More studies are needed on the potential hazards to human health of the presence of Salmonella in sewage plant effluents. A modification in current types of primary and secondary sewage treatment processes may be needed. (Text in French)

(12) KEYWORDS: ACTIVATED SLUDGE; BACTERIA; COLIFORM; DATA; EFFLUENT; EUROPE; FRANCE; HAZARDOUS; MICROBIOLOGY; PATHOGEN; PURIFICATION; SALMONELLA; SEWAGE; TREATMENT

(15) STIMS ACC.NO.: 00538901

(18) DOC.CIT.: Baylett, R., P. Sinegre, and R. Chapat. Systemes d'epuration biologique et Salmonella. (Biological purification systems and Salmonella.) Techniques et Sciences Municipales, 71(7):339-342, July 1976.

(1) SWIRS ACC.NO.: 039656
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: In the frame of the "Walcheren-project" in which the epidemiology of salmonellosis is studied in a certain area, effluent from sewage treatment plants, wastepipes of butcher shops and surface waters, which receive the effluent were studied for the presence of salmonellae. From 100 samples of effluent 150 (94 percent) contained salmonellae. The most common serotype was S. typhi murium (35 percent) followed by S. panama and S. infantis. Fourteen butcher shop wastepipes were sampled 54 times: 14 (26 percent) times salmonellae were found, but only twice was the type isolated from the butcher shop the same as found in the effluent on the same day. With regard to the presence of salmonellae in surface waters receiving effluent it was shown that from the immediate vicinity of the plant to 250 meters downstream from the site of drainage of effluent the number of salmonellae per 100 milliters remains almost constant. After 1. 5 to 4 kilometers, salmonella could not be isolated from any of the samples examined. The results underline the hypothesis that salmonellae multiply in the sewage system and/or plant. The spread of salmonellae by effluent seems to be limited to the plant itself and the nearest vicinity. Proposals are brought forward to interupt contamination cycles by decontamination measures.
(12) KEYWORDS: BACTERIA; COMMERCIAL; CONCENTRATION; CONTAMINATE; EFFLUENT; EPIDEMIOLOGY; HAZARDOUS; MEASUREMENTS; MICROBIOLOGY; NETHERLANDS; POLLUTION; SALMONELLA; SEWAGE; SLAUGHTERHOUSE; WASTE WATER
(15) STIMS ACC.NO.: 00538702
(18) DOC.CIT.: Kampelmacher, E. H. , and L. M. van Noorle Jansen. Salmonella in effluent from sewage treatment plants, wastepipe of butcher's shops and surface water in Walcheren. Zentralblatt fuer Bacteriologic, Parasitenkunde, Infektionskrankheiten, and Hygiene 162(3-4):307-319, July 1976.

(1) SWIRS ACC.NO.: 039372
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Organophosphate toxicity results from anticholinesterase activity at the neuromuscular junction and the central cholinergic synapse. This activity is accompanied by changes in the electroencephalogram consisting of desynchronization and increased fast activity (beta) at lower doses and spike wave discharges at higher levels. Rapid treatment of exposure with an anticholinergic compound (atropine) and a cholinesterase activator are usually effective. EEG (electroencephalographic) activity was studied in experimental Rhesus monkeys and in industrial workers with histories of exposure to organophosphates. EEG activity increased through Delta, Theta, Alpha and Beta waves measured during periods of waking, drowsy, sleep, hyperventilation and posthyperventilation.
(12) KEYWORDS: ANIMAL; BIOLOGICAL; EFFECT; EXPOSURE; HEALTH; HUMAN; INDUSTRY; MEASUREMENTS; PERSONNEL; PESTICIDE; PHOSPHATE; RESEARCH; TECHNOLOGY; TOXIC; UTILIZE
(15) STIMS ACC.NO.: 00538416
(18) DOC.CIT.: Duffy, F. H. , J. H. Burchfiel, and W. M. Sim. Persistant effects of organophosphate exposure as evidenced by electroencephalographic measurements. In Baron, R. L. , ed. Proceedings; the Pesticide Induced Delayed Neurotoxicity Conference Proceedings, Washington, DC, Feb. 19-20, 1976. Environmental Protection Publication EPA-600/1-76-025. Research Triangle Park, NC, U. S. Environmental Protection Agency, July 1976. p. 102-152. (Environmental Health Effects Research Series.)

(1) SWIRS ACC.NO.: 039371
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: A description of the neuropathology of delayed neurotoxicity due to organophosphates is given. Chemical and physiological descriptions of symptomatic abnormalities are provided

along with histological photomicrographs of degenerative lesions evidenced in the funiculus of the hen. Methods of sampling and examining experimental hens are provided.

(12) KEYWORDS: BIOLOGICAL; CHEMICAL; EFFECT; HEALTH; PESTICIDE; PHOSPHATE; PHYSIOLOGICAL; POULTRY; RESEARCH; SAMPLING METHODS; TECHNOLOGY; TOXIC

(15) STIMS ACC.NO.: 00S38415

(18) DOC.CIT.: Bradley, W. A. The pathology of delayed neurotoxicity due to organophosphates. In Baron, R. L. , ed. Proceedings; the Pesticide Induced Delayed Neurotoxicity Conference Proceedings, Washington, DC, Feb. 19-20, 1976 Environmental Protection Publication EPA-600/1-76-025. Research Triangle Park, NC, U. S. Environmental Protection Agency, July 1976. p. 84-102. (Environmental Health Effects Research Series.)

(1) SWIRS ACC.NO.: 039237

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975

(11) ABSTRACT: Tawny owls (Strix aluco) and Barn owls (Tyto alba) killed by traffic have been collected throughout Great Britain as part of a pollution monitoring program. Specimens suitable for monitoring purposes have been analysed for total mercury residue by a flameless atomic absorption technique. The mean total mercury residue in the pertoral muscle of the Tawny owl and Barn owl was 0. 25 plus or minus 0. 02 and 0. 18 plus or minus 0. 02 ppm respectively. A constant relationship was found between the mercury residues in the petoral muscle, liver, heart, kidney and brain of specimens. The results are discussed in relation to the published results of experimental feeding studies and surveys of mercury residues in wildlife. The study indicates that the use of mercurial seed dressings in Britain has not led to significant contamination of the Tawny owl and Barn owl. Three figures and four tables are presented showing the geographical distribution of the 102 Tawny owl and 87 Barn Owl specimens analyzed, and mercury residues in the tissues studied.

(12) KEYWORDS: ANIMAL; CONTAMINATE; ENVIRONMENT; GREAT BRITAIN; HAZARDOUS; MERCURY; MONITOR; NON-FERROUS; POLLUTION; PROGRAM

(15) STIMS ACC.NO.: 00S38281

(18) DOC.CIT.: Stanley, P. I. , and G. R. Elliott. An assessment based on residues in owls of environmetal contamination arising from the use of mercury compounds in British agriculture. Agro-Ecosystems, 2(3):223-234, 1975.

(1) SWIRS ACC.NO.: 038565

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: The interrelation of many chronic diseases, particularly cancer, to environmental pollutants is discussed. The exponential increases in exposure of the general population to currently used and new synthetic chemicals, and their degradation products in air, water and soil, are inadequately characterized toxicologically and ecologically. Considerations are given to relatively uncontrolled occupational exposure to a wide range of known chemical carcinogens, in addition to the fact that thousands of other pollutants are toxicologically uncharacterized or inadequately characterized. In addition to scientific considerations, critical deficiencies in legislative and regulatory approaches to environmental pollutants, including conflicts of interest in the generation and evaluation of data, restrictions on open access to data, and lack of qualified representation of a wide range of concerned viewpoints and interest in decision making processes are cited.

(12) KEYWORDS: CHEMICAL; CLASSIFICATION; DISEASE; EFFECT; ENVIRONMENT; EPIDEMIOLOGY; HEALTH; OCCUPATION; POLLUTION; SYNTHETIC; TOXIC

(15) STIMS ACC.NO.: 00S37609

(18) DOC.CIT.: Epstein, S. S. Assessment of the influences of environmental pollutants on cancer and other chronic diseases. In Proceedings; International Symposium on the Recent Advances in the Assessment of the Health Effects of Environmental Pollution, Paris, June 24-28, 1974. v. 4. Luxembourg, Commission of the European Communities, 1975. p. 2367-2381.

(1) SWIRS ACC.NO.: 038151
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975
(11) ABSTRACT: This textbook, designed for courses in toxicology, can also serve as a source of concepts and modes of thought for those concerned with community health, agriculture, food technology, pharmacy, veterinary medicine, solid waste and related fields. For persons further removed from the field ft toxicology, the book presents a selectively representative view of the many facets of the subject. This text is organized to facilitate its use by these different types of users. The elements of method and approach that identify the science are described. Included are those principles most frequently invoked in a full understanding of toxicologic events, such as dose response, and is primarily mechanistically oriented. Also discussed is the systemic site of action of toxins. Answers to two questions are provided; what kinds of injury are produced in specific organs or systems by toxic agents and what are the agents that produce these effects? Toxic agents are grouped by chemical or use characteristics and an attempt has been made to illustrte the ramifications of toxicology into all areas of the health sciences.
(12) KEYWORDS: AIR; CHEMICAL; INORGANIC; ORGANIC; PESTICIDE; PLASTIC; TOXIC
(15) STIMS ACC.NO.: 00S37195
(18) DOC.CIT.: Casarett, L. J. , and J. Doull, eds. Toxicology: the basic science of poisons. New York, Macmillan Publishing Co. , Inc. , 1975. 758 p.

(1) SWIRS ACC.NO.: 037878
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The risk of fires in dust collection systems of baghouses is explored. Particulate emissions from industrial processes including baghouses often contain combustible materials. Fire prevention and protection depend on three factors: (1) reducing causes of combustion; (2) detecting the fire; (3) extinguishing the fire. Methods normally used to reduce causes of combustion involve lowering the combustible content of a system and minimizing the possibility of introducing sparks. The combustion tendency of a dust control system can be reduced by decreasing the amount of unoxidized or partially oxidized material that enters the baghouse. Preventing sparks may be accomplished by the following techniques: reduce gas stream velocities at ductwork pickup point, install screens in exhaust hoods over equipment, and install a spark arrester. Heat and light detection methods can be used to spot fires in baghouses. In heat detection systems, thermocouples strategically placed throughout the baghouse serve as detectors. Light detection systems sense the light radiated from a flame. The removal of fuel, oxygen, and heat, which are required to sustain combustion, will extinguish a fire. However, because it is essentially impossible to remove fuel or dust laden bags from baghouses, fire extinguishing methods are limited to those that smother or cool bags. The most simple fire extinguishing method is to isolate the baghouse system by closing dampers, shutting off the fan, and allowing the blaze to consume available oxygen. Other extinguishing methods involve water spray extinguishing systems, high pressure carbon dioxide systems, and dry chemical injection systems.
(12) KEYWORDS: COLLECTION; COMBUSTIBLE; COMPOSITION; DUST; EMISSION; FIRE; FIREPROOF; INDUSTRY; PARTICULATE MATTER; SYSTEM
(15) STIMS ACC.NO.: 00S36922
(18) DOC.CIT.: Massey, D. Reducing risk of baghouse fires. Plant Engineering, 30(4):129-131, Feb. 19, 1976.

(1) SWIRS ACC.NO.: 037804
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: Waste materials generated by hospitals can be divided into several types: general rubbish; food residues; pathological wastes; radioactive wastes; drug residues and solvents;

and disposable syringes, needles, test tubes, etc. The amount of hospital waste has increased from approximately 4 pounds per patient per day in 1955 to a current figure of 19 pounds per day. The usual methods utilized to dispose of this waste are incineration, compacting and sanitary landfill. Pathological wastes are usually incinerated. Microbiological wastes are autoclaved. Liquid wastes (unused drugs) are in some cases autoclaved, diluted and poured down the drain. Radioactive wastes are disposed of by service contract or returned to manufacturer. Some hospitals sterilize food residues and make them available for animal feed.

(12) KEYWORDS: DISPOSABLES; DISPOSAL; DRUGS; HAZARDOUS; HOSPITAL; INCINERATOR; MICROBIOLOGY; PATHOGEN

(15) STIMS ACC.NO.: 00S36848

(18) DOC.CIT.: Powers, P. W. Hospital wastes. In: How to Dispose of Toxic Substances and Industrial Wastes, Noyes Data Corporation, 1976, 497 p. (p. 223-226).

(1) SWIRS ACC.NO.: 037252

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Movement of poliovirus I (Chat) through nonsterile core samples of a sandy forest soil was monitored, using several regimens of loading with either dechlorinated final effluent from an operating activated sludge treatment plant or distilled water. Simulated cycles of rainfall and effluent applications, resulting in ionic gradients, were shown to affect virus movement. Such studies indicate that poliovirus applied in effluents may move considerable distances through this soil after rainfall. Survial of poliovirus in the soil at 4 and 20 degrees C has been monitored for 84 days. During this period, the capacity of the virus to migrate is unchanged. (Author Abstract)

(12) KEYWORDS: ACTIVATED SLUDGE; DISCHARGE; EARTH; EFFLUENT; FACILITY; FORESTRY; HAZARDOUS; MONITOR; PATHOGEN; SAMPLING METHODS; SAND; SIMULATION; TRANSPORT; TREATMENT; VIRUS

(15) STIMS ACC.NO.: 00S36297

(18) DOC.CIT.: Duboise, S. M. , B. E. Moore, and B. P. Sagik. Poliovirus survival and movement in a sandy forest soil. Applied and Environmental Mirobiology, 31(4):536-543, Apr. 1976.

(1) SWIRS ACC.NO.: 036801

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Explosion hazards in municipal solid waste shredding facilities are addressed. The Environmental Protection Agency has recommended that provisions for separate outdoor placement of shredders and special pressure relief devices be explored to minimize explosion potentials. However, such measure must be coupled with rules and operational guidelines for safe operating procedures. The Waste Equipment Manufacturers Institute believes that information regarding explosion hazards and methods to minimize the effects of explosions should be widely circulated. Systems are noted for suppression explosions, including pressure venting of shredders and ancillary equipment. It is felt that screening of input material, consideration to structure design and shredder placement within a structure, and the installation of a suppression system or pressure relief system are the most feasible options available to provide explosion protection.

(12) KEYWORDS: EPA; EQUIPMENT; EXPLOSION; FACILITY; HAZARDOUS; INFORMATION; MUNICIPALITY; SAFETY; SHREDDING; SYSTEM

(15) STIMS ACC.NO.: 00S35846

(18) DOC.CIT.: Sandoval, M. A. The potential for explosions in municipal solid waste shredding facilities: the need for awareness. Waste Age, 7(2):32, 34, Feb. 1976.

(1) SWIRS ACC.NO.: 036792
(2) DOMESTIC: F (2) CATEGORY: 05 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: The storage of chemical waste products from raw material industries requires the use of on-site deposits due to the large volumes obtained. Because of high levels of ground water and the relatively thick alluvial soil, deposits should remain above ground. Special problems arise when the wastes contain water soluble hazardous materials which can be transported in a liquid medium. The choice of waterproofing for impervious diked tanks entails the additional consideration of settlements, attacks by chemical action and the construction of a weatherproof installation corresponding to the requirements of the building site. (Original text in German.)
(12) KEYWORDS: CHEMICAL; DUMP; DUMPING; ENVIRONMENT; FACILITY; GERMANY; GROUND WATER; HAZARDOUS; PLANNING; SPECIAL; STORAGE; TRANSPORT; WATER
(15) STIMS ACC.NO.: 00535837
(16) DOC.CIT.: Woebken, K., and H. Kunz. Planning and experiences with dumps of special wastes in the country around Nordenham. (Sonderdeponien im Raum Nordenham-Planungen und Erfahrungen.) Wasser und Boden, 27(5):103-105, May 1975.

(1) SWIRS ACC.NO.: 036797
(2) DOMESTIC: D (2) CATEGORY: 04 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: An experimental study is reported that was conducted with cows to examine the digestibility, N-metabolism, and milk production of concentrate diets supplemented isonitrogenously with crude protein from conventional sources or from dehydrated poultry excreta (DPE) and to examine the presence of polychlorinated biphenyl (PCB) residues in milk after cattle were fed excreta contaminated with PCB's. The conventional concentrate mixture and one containing dehydrated poultry excreta (32 percent) were fed to two groups of 12 cows each to provide 36 percent of total dietary nitrogen and 15 percent of total dry matter intake for 90 days. Cows fed the concentrate containing poultry excreta consumed 17 percent less corn silage and 5 percent less concentrate dry matter and produced 10 percent less milk. Ratios of dry matter intake from feed to fluid milk were equal for the two groups of cows, and milk production declined at the same rate for both groups. Poultry excreta used in diets for 6 to 12 cows and fed for 50 days was from hens fed diets containing 40 ppm of PCB mixtures with 21 to 68 percent chlorine. For the other 40 days, all 12 cows were fed uncontaminated poultry excreta. Monochlorobiphenyls and tetrachlorobiphenyls were not detected in milk, but pentachlorobiphenyls and dichlorobiphenyls were detected. With intakes normalized to 1 ppm in the concentrate, total residues in milk fat at 35 days were less than 0.5 ppm for 21, 32, and 42 percent chlorine and 1.2, 2.9, and 4.1 ppm for 48, 54, and 60 percent chlorine. Fifty days after the last feeding, residues dropped to 0.5, 1.2, and 0.7 ppm for 48, 54, and 60 percent biphenyls. Although milk output was reduced, it was concluded that the economics of feeding dehydrated poultry excreta compare favorably with those of conventional crude protein.
(12) KEYWORDS: ANALYSIS; CATTLE; COMPARISON; DAIRY; ECONOMICS; EFFECT; FEED; MANURE; NITROGEN; POLYCHLORINATED; POLYMER; PROTEIN; RESIDUE
(15) STIMS ACC.NO.: 00535832
(16) DOC.CIT.: Smith, L. W., G. F. Fries, and M. F. Weinland. Poultry excreta containing polychlorinated biphenyls as a protein supplement for lactating cows. Journal of Dairy Science, 59(3):465-474, 1976.

(1) SWIRS ACC.NO.: 036844
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S, I (10) PUB. YEAR: 1975
(11) ABSTRACT: A collection of papers is presented that was prepared for the conference on Early Warning for Toxic Substances, held in Seattle Washington during July 30 to February 2, 1975. It

purpose of the seminar was to examine some of the tools that currently exist which may be applicable to the early identification, assessment, and prioritization of chemical substances adversely impacting the environment. The need for early warning tools is evident when consideration is given to the large number of chemicals to which people are exposed in their daily lives and the well publicized incidences involving such chemical substances as mercury, thalidomide, polychlorinated biphenuyls, and vinyl chlorides. While no solutions to the problem of identifying toxic substances were derived at the seminar, a number of issues regarding the need for, workability, and practicality of early warning were raised. The seminar was organized in three major sections; (1) effects, legislation, and incidents relating to toxic substances; (2) early warning system elements; and (3) early warning systems and subsystems.

(12) KEYWORDS: CANADA; CHEMICAL; CONFERENCE; HEALTH; MONITOR; REGULATIONS; SAFETY; SEATTLE; SYSTEM; TOXIC; US

(15) STIMS ACC.NO.: 00S35693

(18) DOC.CIT.: Battelle Memorial Institute. Papers presented at a seminar on early warning systems for toxic substances, Seattle, Jan. 30 - Feb. 2, 1974. Springfield, VA, NTIS, PB-244412, July 1975, 201 p.

(1) SWIRS ACC.NO.: 036589

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: The need for improved technical and other information for meeting emergencies related to the transporation of hazardous materials is examined. The Chemical Hazards Response Information System (CHRIS) under development by the Coast Guard is evaluated as a prototype system for all modes of transportation. CRRIS is composed of three reference guides or data bases and a central headquarters organization for developing, implementing, supporting, and maintaining the system for evaluating multimodal accidents in the transportation of hazardous materials. Basic system concepts are discussed for extending CHRIS to all modes of transportation. It is concluded that CHRIS expansion would be beneficial in reducing hazards associated with the transport of chemicals. Such an expanded information system would be composed of a decentralized organization providing response guidance on request to local emergency services personnel, computerized hazard assessment system operated at headquarters, and reference manuals furnished to all response organizations. (Author Abstract Modified)

(12) KEYWORDS: ACCIDENT; CHEMICAL; COMPUTER; DATA; HAZARDOUS; INFORMATION; MANUAL; RESEARCH; SYSTEM; TRANSPORT

(15) STIMS ACC.NO.: 00S35613

(18) DOC.CIT.: Allan, D. S. , and G. H. Harris. Chemical hazards response information system for multimodal accidents (CHRISMA): a reevaluation of CHRIS for all modes of transportation. Report No. CG-D-148-75. Washington, Department of Transportation, Apr. 1975, 123 p.

(1) SWIRS ACC.NO.: 036238

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975

(11) ABSTRACT: The joint effect of phenol and formaldehyde in concentrations of 0. 023 plus-minus 0. 005 mg/cu m and 0. 024 plus-minus 0. 002d mg/cu m, respectively, in combination with high air temperature (30 plus-minus 2 degrees C), has a higher degree of toxicity: changes in erythropoiesis, phagocytic activity of neutrophils, lysozyme activity, protein spectrum of blood serum, neuromuscular system, activity of testicular epithelium, mitotic activity of corneal epithelium, etc, including histopathological shifts. Data on the effect of other concentrations of phenol and formaldehyde are available. The investigations were carried with the purpose of assessing the effect of synthetic polymer emissions on personnel employed in the shipbuilding industries, especially in regard to the permissible levels of emissions from polymer materials. It is recommended that the concentrations of phenol and formaldehyde,

whenever their combined effects are involved should not exceed 0. 005 and 0. 006 mg/cu m, respectively.

(12) KEYWORDS: CHEMICAL; CONCENTRATION; CONSTRUCTION; DATA; EMISSION; INDUSTRY; PERSONNEL; PHENOL; POLYMER; PROTEIN; SHIP; STANDARD; SYNTHETIC; TEMPERATURE; TOXIC

(15) STIMS ACC.NO.: 00S35283

(18) DOC.CIT.: Dvoskin Ya. G. , S. E. Sandratskaya, and N. A. Rakhmanina. Study of joint effect of phenol and formaldehyde in combination with temperature of about 30 degrees C. (Izucheniye sovmestnogo deystviya fenola i formaldegida v kombinatsii s povyshennoy temperaturoy vo2dukha.) Gigiyena i Sanitariya, 12:17-20, 1975.

(1) SWIRS ACC.NO.: 036169

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: A handling guide for potentially hazardous materials is presented which is considered to represent the most complete assembly of available information on materials safety. The handbook contains a synonym directory, including more than 2,300 chemical names that are cross-indexed to eliminate the confusion of brand names, organic chemical designations, and common names. Condition under which each chemical may be hazardous to individuals and/or the environment, and the potential or degree of hazard to be anticipated, are organized and described on individual sheets or data forms. A handbook section on risk classification identifies risk by type, using an abbreviated classification or identification developed by the Department of Transportation. In addition to a written description of risk, the degree of risk is indicated in relation to potential fire and health hazards. Other sections of the handbook are concerned with the following: precautions necessary to protect personnel and the environment from potentially hazardous materials, hazard to life, first aid procedures, fire hazards and their control, stability of chemicals, cleanup procedures in the disposition of materials, and priority risk ratings. Data forms are supplemented with specialized information in support sections of the handbook, and sample listings for parathion are included to illustrate the handbook's layout and information recording procedures.

(12) KEYWORDS: CHEMICAL; CLASSIFICATION; CLEANUP; CONTROL; DIRECTORY; FIRE; HAZARDOUS; HEALTH; MANUAL; SAFETY; TOXIC

(15) STIMS ACC.NO.: 00S35214

(18) DOC.CIT.: Baskin, A. D. , ed. Handling guide for potentially hazardous materials. Niles, IL, Material Management and Safety Inc. , 1975, 1158 p.

(1) SWIRS ACC.NO.: 036110

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The interrelationship between hepatitis viral replication and pesticide toxicity is investigated. In evaluating the effect of viral replication in hepatic endoplasmic reticulum on activities of microsomal drug-metabolizing enzymes of the liver, two viruses were used which replicate in hepatic endoplasmic reticulum without producing hepatic disease: Newcastle vaccinal virus in chickens, and duck hepatitis virus inadult ducks. The microsomal enzymes assayed were ethylorphine N-dimethlase, aryl hydrocarbon hydroxylase, and aniline hydroxylase. The soluble enzyme, nitroreductase, was also assayed in chickens. Pesticide residue analysis was used to evaluate indirectly the microsomal enzymatic conversion of DDT to DDD and the soluble enzymatic conversion of DDT to DDE in ducks. Viral replication did not increase the activities of microsomal enzymes and may have decreased such activities slightly. Viral replication prior to chemical induction of enzymes in chickens by phenobarbital and in ducks by DDT resulted in greater activities of microsomal enzymes but not soluble enzymes than was obtained by chemical induction without prior viral replication. Although microsomal

enzymes were induced to greater levels by viral replication, pesticide residue analysis failed to demonstrate any increased clearance of residues from body tissues.

(12) KEYWORDS: ANALYSIS; BIOLOGICAL; CATALYST; CHEMICAL; EFFECT; HAZARDOUS; ORGANIC; PESTICIDE; POULTRY; PRODUCE; VIRUS

(15) STIMS ACC.NO.: 00S35155

(18) DOC.CIT.: Hagland, W. L. Effect of duck hepatitis virus on pesticide toxicity. Research Triangle Park, NC, U. S. Environmental Protection Agency, Jan. 1976, 70 p.

(1) SWIRS ACC.NO.: 036101

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1975

(11) ABSTRACT: Available material on the metabolism and toxicology of molybdenum is evaluated, with emphasis on those aspects relevant to human beings. The toxicological appraisal of molybdenum is organized as follows: (1) analytical methods used in evaluation (colorimetry, emission spectrography, neutron activation, and atomic absorption); (2) production, uses, and occurrence; (3) metabolism (uptake and absorption, excretion, and tissue distribution); (4) molybdenum as an essential element in animal nutrition; (5) toxicity; and (6) interaction of molybdenum with copper, sulfate, purines, and proteins. Conclusions concerning the possible health effects of molybdenum on human beings are presented. A bibliography is provided in which special efforts were made to include recent publications on molybdenum in Russia and to coordinate this work with similar effort underway in the Environmental Health Criteria Program of the World Health Organization.

(12) KEYWORDS: ANALYSIS; BIBLIOGRAPHY; BIOLOGICAL; CHEMICAL; EPA; FOOD; HEALTH; METAL; PROCESS; PRODUCE; PROTEIN; TOXIC; USSR; WHO

(15) STIMS ACC.NO.: 00S35140

(18) DOC.CIT.: Friberg, L. , P. Boston, and G. Nordberg. Molybdenum - a toxicological appraisal. Research Triangle Park, NC, U. S. Environmental Protection Agency, Nov. 1975, 142 p. (Environmental Health Effects Research Series.)

(1) SWIRS ACC.NO.: 036061

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Methane gas, seeping from old Richmond, Virginia sanitary landfills, has endangered about 1000 homes, forced closing of several elementary schools, and caused at least one explosion which injured one person and faced condemnation of an apartment building. A million-dollar project is under way to drill wells into the major landfills and to pump the meltane out. The gas will either be burned at the wellhead, or if collected in sufficient quantity, could be sold commercially. In the meantime, the hazard continues to exist and other areas with significant sanitary landfills may be similarly affected.

(12) KEYWORDS: HAZARDOUS; INCINERATION; LAND; METHANE; MUNICIPALITY; PUMP; RECLAMATION; SANITARY LANDFILL; UTILIZE

(15) STIMS ACC.NO.: 00S35100

(18) DOC.CIT.: McAllister, B. Washington Post. Methane: Richmond's Washinnton Post, Apr. 4, 1976, p. A1, A8.

(1) SWIRS ACC.NO.: 035885

(2) DOMESTIC: F (2) CATEGORY: 09 (4) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: In recent years a number of potential emergency situations have arisen following traffic accidents or fires involving chemicals. In an attempt to minimize the danger from such incidents, an emergency advice scheme has been established by the Chemical Industries Association of Great Britain in collaboration with the British Central Government. As part of the scheme, chemical companies are providing information to facilitate the identification of products and their hazards and advice for their safe treatment in an emergency. The information is being organized so that it can easily be searched using

a computer-based information retrieval system. The data being collected initially are related to the requirements of the public emergency services, but they can be extended to meet the needs of other organizations.

(12) KEYWORDS: ACCIDENT; ANALYSIS; CHEMICAL; GOVERNMENT; GREAT BRITAIN; HAZARDOUS; INDUSTRY; MANAGEMENT; PROBLEMS; SAFETY; TRANSPORT

(15) STIMS ACC.NO.: 00S34930

(18) DOC.CIT.: Cumberland, R. F. , and M. D. Hepden. A scheme for recognizing chemicals and their hazards in an emergency. Journal of Hazardous Materials, 1(1):35-43, Sept. 1975.

(1) SWIRS ACC.NO.: 035861

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Present and future problems in the management of nuclear wastes are considered. Safe operation of a nuclear reactor should encompass the entire nuclear fuel cycle, including fuel supply, reprocessing, and disposal of wastes. The residue from mill tailings is a minor but persistent hazard. Steps should be taken for proper location and disposal of these wastes. Fuel storage space is becoming a pressing problem requiring immediate attention. Decommissioning of facilities will become a problem in another 20 or 30 years. Three stages are required: lock up with surveillance; conversion and restricted site release; and unrestricted site release. Gas recovery processes should be developed and used so that dangerous materials such as krypton 85 and tritium don't escape into the atmosphere and biosphere. The costs versus the benefits must be ascertained for separating alpha bearing wastes from fuels. Two methods of disposal that can be utilized in this century are disposal in the earth surface and in geological formations. Small countries should cooperate in regional centers for fuel reprocessing and waste handling to cut handling and operating costs, to reduce the numbers and sources of radioactivity, and to reduce the risks of accidents. Maturity of nuclear energy is the ability to manage it wisely, safely and in cooperation.

(12) KEYWORDS: ACCIDENT; DISPOSAL; ECONOMICS; FUEL; GASSES; GEOLOGIC; HAZARDOUS; INTERNATIONAL; MANAGEMENT; PLANNING; PROBLEMS; RADIATION; RADIOACTIVE; REGIONAL; STORAGE

(15) STIMS ACC.NO.: 00S34906

(18) DOC.CIT.: Lennemann, W. L. , H. E. Parker, and P. J. West. Management of radioactive wastes. International Atomic Energy Bulletin, 17(4):2-13, Aug. 1975.

(1) SWIRS ACC.NO.: 035733

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: Experimental methods of minimizing the flow and spread of hazardous spills are described. A combination of four powdered polymers and a universal gelling agent that renders the spilled material into a form which is easily recoverable is discussed. This four component blend consists of agents that will collect water soluble, polar, non-polar, and alcoholic types of hazardous materials. A fluidizing agent is also required which has the secondary effect of providing a gel that is more resistant to hydrolysis. This agent is inexpensive, costing about 0. 50 dollars per lb, and it has been found after field testing that about 50 percent of the agent, by weight, based on the weight of the spilled liquid, is needed to bring the spill under control. Laboratory experiments and field tests were conducted on typical materials that might be found in real spills. The agents were tested on spills on both land and water with good results. Quick mechanical retrieval of the gelled particles proved necessary, since some tended to sink in water or percolate into the land and some were mistaken for food by fish. Applicators were required to disperse the agents evenly in small and large areas. Of the different methods tried,

it was found that sprinklers were effective in small areas and sand blasters were effective in larger areas.

(12) KEYWORDS: ACCIDENT; COLLECTION; COST REDUCTION; ECONOMICS; HAZARDOUS; LAND; LIQUID; POLLUTION; POLYMER; PROCESS; RESEARCH; TOXIC; WATER

(15) STIMS ACC.NO.: 00S34778

(18) DOC.CIT.: Baier, R. E. , J. G. Michalovic, V. A. Depalma, and R. J. Pilie. Universal gelling agent for the control of hazardous liquid spills. Journal of Hazardous Materials, 1(1):21-33, Sept. 1975.

(1) SWIRS ACC.NO.: 035530

(2) DOMESTIC: D (2) CATEGORY: 05 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: A major contributor to the high cost of solid waste management is the cost of injuries that result in medical treatment and workman's compensation payments. Refuse collection and disposal have compiled the worst injury record of any industry in America. The Bureau of Sanitation in Milwaukee, Wisconsin planned a complete safety program with the goal of cutting down on accidents. The Bureau purchased Operation Responsible, a training program developed by the U. S. Environmental Protection Agency (EPA). The program included a movie, a series of slides complete with narrative, and instructions for training supervisors, truck drivers, and sanitation workers. Safe working procedures include such things as avoidance of slips and falls, careful handling of hazardous materials, proper lifting methods, and how to drive and guide vehicles. The package from EPA was used with only two changes. A few slides from each series were replaced with slides of Milwaukee sanitation workers. The narrative that accompanied the slides was taped so that the supervisor did not read it. Discussions and helpful suggestions were prompted by the presentations. It is estimated that the program saved the city approximately 200 thousand dollars in 1973, its first year of operation. Due to a severe winter in 1974, the accident rate did increase over the 1973 figures. A complete safety program includes the proper attitude, an employee's orientation to the job's safety equipment, a method of raising public interest, a cooperative effort between labor and management, and an information system. A good reporting system for injuries helps determine the factors which influence injury rates.

(12) KEYWORDS: ACCIDENT; COLLECTION; DISPOSAL; ECONOMICS; EPA; EQUIPMENT; HAZARDOUS; INJURY; LIFT; MANAGEMENT; MILWAUKEE; PERSONNEL; SAFETY; TRAINING; TRUCK

(15) STIMS ACC.NO.: 00S34575

(18) DOC.CIT.: Caplan, R. E. Milwaukee battles back against refuse collection injuries. Public Works, 106(12):55-57, Dec. 1975.

(1) SWIRS ACC.NO.: 034460

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: New standards in safe working conditions and more stringent requirements for the protection of employees, and even those remotely concerned with the activities of a company, are laid down by the Health and Safety at Work Act of Great Britain. A health hazard exists in the handling of old batteries. Lead, which can be leaked due to spillage which occurs during off-loading carelessness, can find its way to gutters, and eventually enter the sewage system, the acid destroying bacteria necessary for the processing of organic matter, and fouling the waterways to the sea. It can also be picked up on the soles of worker's footwear, where it can be carried to auto or home carpets. Here, it becomes dried and the dust is blown into the air by the heating and cooling systems. Children, playing on contaminated floor coverings, can also be affected by lead. By way of solution, then, batteries should be collected in containers such as plastic coated units which can be easily decontaminated, and will contain acid which might otherwise be leaked in a spill. At storage points, all yard surfaces should be of acid-resisting alumina sloping to an adequate blue brick and alumina cement sump. Spillage should be be hosed into the sump for regular removal by an effluent disposal service. Workers

should be instructed to realize potential sources of contamination to their families, and a working industrial safety clothing room should be provided. Also, eating or handling of food in the area is out, and even smoking of cigarettes should be prohibited unless the worker thoroughly washes his hands with hot, soapy water, as lead on his finger tips will be transferred through the cigarette paper.

(12) KEYWORDS: CONTROL; DISPOSAL; GREAT BRITAIN; HAZARDOUS; INDUSTRY; REGULATIONS; SAFETY; STANDARD

(15) STIMS ACC.NO.: 00S33504

(18) DOC.CIT.: Hazards of handling batteries. Materials Reclamation Weekly, 126(25):25-26, June 21, 1975.

(1) SWIRS ACC.NO.: 033607

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: Analysis of representative samples of spackling, patching, and jointly compounds, purchased at retail stores in the New York City area, has shown that some contain asbestos minerals as well as other biologically active substances. Measurements suggest that home repair work involving the use of such materials may result in exposure to dust at concentrations sufficient to produce disease.

(12) KEYWORDS: ANALYSIS; ASBESTOS; CHEMICAL; DUST; HAZARDOUS; HEALTH

(15) STIMS ACC.NO.: 00S32651

(18) DOC.CIT.: Exposure to asbestos in the use of consumer spackling, patching, and taping compounds. Science, 189(4202):551-553, Aug. 1975.

(1) SWIRS ACC.NO.: 032173

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: The consumption of hexachlorobenzene (HCB)-treated seed wheat in Turkey during the 1950's has been indentified as the cause of many cases of cutaneous porphyria. In December of 1972 HCB-contaminated cattle were detected in Louisiana. Thus a survey of the plasma hexachlorobenzene levels of the exposed population was undertaken. HCB residue levels ranged from 0 to 7.9 ppb. The highest level for a chemical waste disposal facility worker was 345 ppb, and the highest level found in the general population was 23 ppb. Males had significantly higher levels but there was no age difference. There was no evidence of cutaneous porphyria by history or by skin examination. A possible association between HCB residues and corprophyrin and lactic dehydrogenase was found. Only 2 meals out of the 48 sampled were positive for HCB. There was a correlation between the HCB levels in household dust and plasma levels. Workers in plants producing perchloroethylene and carbon tetrachloride had HCB plasma levels of up to 233 ppb.

(12) KEYWORDS: ANALYSIS; CHEMICAL; DATA; DISEASE; DISPOSAL; DUST; HAZARDOUS; HISTORY; HUMAN; INDUSTRY; LOUISIANA; POPULATION; RESEARCH; SURVEY; TOXIC

(15) STIMS ACC.NO.: 00S31217

(18) DOC.CIT.: Burns, J. E. , and F. M. Miller. Hexachlorobenzene contamination: its effects on a Louisiana population. Archives of Environmental Health, 30(1):44-48, Jan. 1975.

Section 5
TRANSPORTATION

(1) SWIRS ACC.NO.: 048509
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: EPA, DOT, Senate plot courses for hazardous waste handlers.
(4) AUTHOR: Dombrowski C
(6) JOURNAL TITLE: Solid Wastes Mgmt/RRJ
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: Hazardous waste generators are to be the initial focus of enforcement efforts by the Environmental Protection Agency's hazardous waste program. Emphasis will also be given to the processing of permit applications from disposal facilities that threaten the environment. It is estimated that the cost of hazardous waste disposal will rise from $155 million per year to $530 million per year under the program. The Department of Transportation and the Senate are also promulgating or amending rules pertaining to hazardous waste. Department of Transportation proposals establish minor recordkeeping requirements and prohibit the shipment of hazardous waste to improper treatment, storage, or disposal sites. The Senate has increased the authorization for the Department of Transportation's hazardous materials program for fiscal year 1979. Plans of the Environmental Protection Agency to streamline its rulemaking process are noted.
(12) KEYWORDS: DISPOSAL; EPA; FEDERAL; GOVERNMENT; HAZARDOUS; PERMIT; REGULATIONS
(14) HIERARCH TERMS: 1HC/2DP; 1LF/2FF
(15) STIMS ACC.NO.: 00S47563
(16) CITATION: 21(7):54A-54D, Jul. 1978.

(1) SWIRS ACC.NO.: 048342
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Draft of 3003 outlines procedures for handling of hazardous wastes.
(4) AUTHOR: Stern L
(6) JOURNAL TITLE: Solid Wastes Mgmt/RRJ
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: An outline of the procedures required by draft regulations under the Resource Conservation and REcovery Act (RCRA) in Section 3003, is presented. The "cradle to grave" manifest system will track hazardous wastes from generator to permitted disposal or treatment facility, with all intermediate transporters also required to sign off on the manifest. Transporters will be responsible for notifying immediately the closest regional office of the Environmental Protection Agency in event of a spill. The agency will provide a 24 hour emergy telephone service for these calls. In addition, a written report, in duplicate, must be filed with the director of the Office of Hazardous Materials Operations, in the Department of Transportation. Information required to be provided is detailed. Responsibility for cleaning up the spill rests with the transporter. Vehicle marking and placarding will be required, in addition to existing DOT regulations which may apply.
(12) KEYWORDS: ACCIDENT; DISPOSAL; DOT; ENVIRONMENT; EPA; HAZARDOUS; LAW; REGULATIONS; TRANSPORT
(14) HIERARCH TERMS: 1HC/2DP; 1LF/2ER; 1LF/2FF; 1TT
(15) STIMS ACC.NO.: 00S47396
(16) CITATION: 21(6):56, Jun. 1978.

(1) SWIRS ACC.NO.: 046869
(2) DOMESTIC: D (2) CATEGORY: 14 (3) SUBJ.TYPE: J
(5) CORPORATE AUTHOR: U.S. Environmental Protection Agency
(6) BOOK TITLE: Provisions for Hazardous Waste Regulation and Land Disposal Controls under the Resource Conservation and Recovery Act of 1976. (8) REPORT NO.: SW-944
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: The enactment of the Resource Conservation and Recovery Act in October, 1976 to deal with the environmental problems posed by solid waste and to promote resource recovery is discussed. To achieve its goals, the act seeks to bring about the development of comprehensive state and local solid waste programs that include the regulation of hazardous waste from the point of generation through disposal, environmental controls on the land disposal of all other solid waste, and resource conservation activities. Subtitle C of the act contains hazardous waste authorities, which include the development of criteria for determining what types of waste are hazardous, the institution of a manifest system to track this waste from the point of generation to the point of the disposal, and the organization of a permit system for hazardous waste management and storage and disposal facilities. Key aspects of the regulatory program under the act are discussed as follows: defining hazardous waste, developing standards for generators and transporters of hazardous waste, establishing regulations for treatment and disposal, developing a permit system, notification, state implementation, land disposal provisions, providing financial and technical assistance to state and local governments, conducting research and development activities, and encouraging public participation. Problems associated with the establishment of solid waste management facilities are noted. (Retained in SWIRS library).
(12) KEYWORDS: CONTROL; DISPOSAL; FEDERAL; HAZARDOUS; LAND; LAW; MANAGEMENT; REGULATIONS; STATE
(14) HIERARCH TERMS: 1HC; 1LF/2CF; 1MA/2FF
(15) STIMS ACC.NO.: 00546142
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Mar. 1978. 10 p.

(1) SWIRS ACC.NO.: 046854
(2) DOMESTIC: F (2) CATEGORY: 09 (3) SUBJ.TYPE: G
(3) ARTICLE TITLE: Storing and transporting of barrels under observation of anti-pollution control.
(4) AUTHOR: Vogel C
(6) JOURNAL TITLE: Roerderei und Kehrw
(10) LANGUAGE: GM (10) GEO. AREA: 1E0/2SU (10) PUB. YEAR: 1976
(11) ABSTRACT: Measures are outlined for regulating the handling and storage of barrels with harmful liquids in a Swiss industrial enterprise. Recently developed auxiliary means for transport, tilting, and storage are delineated. Regulations in Switzerland require barrel sites to have a trap basin for preventing leakage in designated groundwater regions. The cylindrical barrels have a capacity of 200 l and a weight of 200-300 kg. Handling and transporting a full barrel annually necessitates considerable expenditure and presents certain injury risks. Indoor transportation of barrels is handled by fork lift trucks using barrel pallets for laying barrels, or wooden pallets (type 1 800 x 1200 mm) for upright barrels. This method is unsatisfactory and to overcome this shortcoming in a large Swiss plant, a new storage and transporting method was introduced which meets groundwater conservation regulations. "Barrel-boys" have been designed which are capable of picking up a 300 kg barrel from a laying to an upright position safely and without effort. (Original text in German).
(12) KEYWORDS: HAZARDOUS; INDUSTRY; PROCESS; STORAGE; SWITZERLAND; TRANSPORT
(14) HIERARCH TERMS: 1HC; 1SW/2C2; 1TT/2MX
(15) STIMS ACC.NO.: 00545906
(16) CITATION: 26(9):974-975, Jul. 1976.

(1) SWIRS ACC.NO.: 046664
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: EPA guidelines are shaping up on RCRA's first anniversary.
(6) JOURNAL TITLE: Solid Wastes Mgmt/RRJ
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: One year after passage of the Resource Conservation and Recovery Act of 1976 (RCRA), the U.S. Environmental Protection Agency (EPA) has announced some of the contents of its hazardous wastes regulations. Contents reviewed relate to issuance of criteria defining hazardous wastes to be regulated under RCRA. Hospital wastes, municipal sludges, and leachates will be included with wastes which are corrosive, flammable, or toxic. Proposed manifest regulations are very complex and will serve to increase the accountability of waste generators and transporters. Proposed regulations and requirements relate to hazardous wastes storage, treatment, and disposal facilities. States which ban importation of wastes into or across state borders will be ineligible for EPA financial assistance and not authorized to assume the RCRA hazardous wastes program.
(12) KEYWORDS: CONSERVATION; CRITERIA; DISPOSAL; EPA; FEDERAL; GRANT; HAZARDOUS; HOSPITAL; LAW; LEACH; RECLAMATION; REFUSE; REGULATIONS; SLUDGE; STATE; STORAGE; TOXIC; TRANSPORT; TREATMENT
(14) HIERARCH TERMS: 1DP/2LF; 1LF/2FF; 1MA/2SW
(15) STIMS ACC.NO.: 00S45716
(16) CITATION: 20(12):46, 48, Dec. 1977.

(1) SWIRS ACC.NO.: 045862
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Permit processes, labeling, and facility safety.
(6) BOOK TITLE: In Disposal of Hazardous Wastes: Recommended Procedures for Hazardous Waste Management.
(10) LANGUAGE: EN (10) GEO. AREA: 1CD; 1US/2CA (10) PUB. YEAR: 1977
(11) ABSTRACT: Permit processes and facility considerations associated with the management of hazardous waste by North Atlantic Treaty Organization countries are discussed. Elements of the hazardous waste disposal decision process are identified as the preproduction decision, generation, transportation, treatment and disposal. Two types of permit processes are described: (1) permits for a particular operation; and (2) control documents to maintain the identity of waste. Trip tickets are defined as a form of documentation designed to follow waste from generator to transporter to disposer. Examples of waste management forms used in California and Ontario, Canada, are provided. The important role of labeling in the proper disposal of hazardous materials is emphasized. Sample hazardous waste information labels used in Canada are included. Safety precautions and procedures at hazardous waste disposal facilities are addressed. (Retained in SWIRS library).
(12) KEYWORDS: CALIFORNIA; CANADA; DISPOSAL; HAZARDOUS; LICENSE; MANAGEMENT; REGULATIONS; SAFETY; TRANSPORT; TREATMENT
(14) HIERARCH TERMS: 1DD/2DK; 1DD/2DW; 1HA/2HF
(15) STIMS ACC.NO.: 00S44911
(16) CITATION: North Atlantic Treaty Organization, Jun. 1977. p.79-95.

(1) SWIRS ACC.NO.: 045847
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Hazardous waste management in the participating countries.
(6) BOOK TITLE: In Disposal of Hazardous Wastes: Organization.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU; 1US (10) PUB. YEAR: 1977
(11) ABSTRACT: Hazardous waste management principles and the regulation and control of waste streams are considered. Management principles and the state of the art in Belgium, Denmark, the Federal Republic of Germany, France, the Netherlands, the United Kingdom, and the United States are detailed. Regulations on waste stream control and practices of control in these same NATO countries are also described. In the various countries, there are public authorities and private

enterprises which deal with: waste disposal; conditions for disposal; organizational schemes for management and disposal under public and private law; and regulations pertaining to the transport, treatment, storage, and disposal of hazardous waste. Legislative and environmental aspects of waste stream control practices are addressed. (Retained in SWIRS library).

(12) KEYWORDS: CONTROL; DISPOSAL; ENVIRONMENT; EUROPE; HAZARDOUS; MANAGEMENT; REGULATIONS; STORAGE; TRANSPORT; TREATMENT; US

(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1HA/2MC

(15) STIMS ACC.NO.: 00S44896

(16) CITATION: North Atlantic Treaty Organization, Jun. 1977. p.12-50.

(1) SWIRS ACC.NO.: 045843

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(6) BOOK TITLE: Disposal of Hazardous Wastes: Transportation.

(10) LANGUAGE: EN (10) GEO. AREA: 1EU; 1US (10) PUB. YEAR: 1977

(11) ABSTRACT: The transport of hazardous waste is examined in this report prepared for the North Atlantic Treaty Organization. Compounds having potential environmental effects are listed in tabular form, and comments on their hazardous properties are provided in terms of labeling requirements for transport. In another table, the same compounds are cataloged in terms or waste types in England, Germany, and France which might contain the compounds. Additional data on the transport of hazardous waste in the United Kingdom and the United States are provided. A format for classifying hazardous waste, along with definitions of classes and divisions of such waste, are included. (Retained in SWIRS library).

(12) KEYWORDS: CLASSIFICATION; DISPOSAL; ENVIRONMENT; FRANCE; GERMANY; GREAT BRITAIN; HAZARDOUS; TRANSPORT; US

(14) HIERARCH TERMS: 1DD/2DW; 1ED; 1HA/2HF; 1HA/2HH

(15) STIMS ACC.NO.: 00S44892

(16) CITATION: North Atlantic Treaty Organization, Jul. 1977. 56 p.

(1) SWIRS ACC.NO.: 045491

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Trace metals in scallops from within and around two ocean disposal sites.

(4) AUTHOR: Pesch G

(6) JOURNAL TITLE: Marine Pollution Bull

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: The areal distributions of the concentrations of 13 metals in sea scallop tissues were examined in the vicinity of two ocean disposal sites located off the U.S. mid Atlantic coast. Metal contaminants determined included iron, copper, chromium, aluminum, manganese, lead, cobalt, nickel, vanadium, cadmium, zinc, silver, and titanium. Patterns of metals distribution showed that five specific metals (silver, copper, nickel, cadmium, and vanadium) may be used as identification tags for individual wastes disposed at the two sites. Disposed materials tended to be transported by currents south and southwest from the disposal sites. It was concluded that biological availability and potential toxicity of the metals pose a threat to marine biota.

(12) KEYWORDS: ANALYSIS; BIOLOGICAL; HAZARDOUS; HEALTH; METAL; OCEAN; TOXIC; TRANSPORT

(14) HIERARCH TERMS: 1DD/2DK; 1DD/2DQ; 1HA/2HF

(15) STIMS ACC.NO.: 00S44539 (15) SECONDARY AUTHORS: Reynolds B; Bcgerson P

(16) CITATION: 8(10):224-228, Oct. 1977.

(1) SWIRS ACC.NO.: 045244
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Closing loop on hazardous materials.
(6) JOURNAL TITLE: Chemical Week
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The Resource Conservation and Recovery Act of 1976 will ban open dumping and will place restrictions and controls on disposal of hazardous wastes. The U. S. Environmental Protection Agency (EPA) must publish a comprehensive list of hazardous wastes, publish standards for generators, transporters, and treaters of such wastes and issue permit regulations. As a result of this legislation, the chemical industry will be completely regulated from manufacture to disposal. EPA anticipates that definition of hazardous wastes will go beyond treatment, storage, and disposal to encompass wastes which have damage potential if they do not reach such facilities. EPA expects to apply definitional criteria to the waste mixtures and not to the suspected hazardous components. Within 90 days of promulgation of regulations identifying and listing hazardous wastes, all generators, treaters, storers, or transporters of the waste must notify EPA of its activity, location, and the nature of the waste. Failure to comply will be punishable by civil and criminal penalties.
(12) KEYWORDS: DISPOSAL; DUMPING; EPA; HAZARDOUS; LAW; OPEN; REFUSE; REGULATIONS; STORAGE; TRANSPORT; TREATMENT
(14) HIERARCH TERMS: 1HA/2HF; 1LB/2LD
(15) STIMS ACC.NO.: 00S44291
(16) CITATION: 120(3):44-45, Jan. 19, 1977.

(1) SWIRS ACC.NO.: 045235
(2) DOMESTIC: D (2) CATEGORY: 22 (2) SUBJ.TYPE: T
(5) CORPORATE AUTHOR: Land Quality Management Div
(6) BOOK TITLE: In Sanitary Landfill Operator's Manual.
(10) LANGUAGE: EN (10) GEO. AREA: 1US/21A (10) PUB. YEAR: 1977
(11) ABSTRACT: Procedures for the disposal of hazardous wastes set forth by the Iowa Department of Environmental Quality (DEQ) are discussed. The Solid Waste Disposal Rules state that "no industrial sludge or toxic and hazardous waste shall be delivered nor disposed by a sanitary disposal project unless explicit instructions are first obtained from the department". Landfills will not accept radioactive materials for disposal. Disposal instructions for hazardous wastes will be issued by the DEQ after receipt of the following information: quantity of waste; chemical composition and physical form; toxicity or other known hazards; proposed packaging and transport; suggested handling at disposal site; potential for recycle; and previous method of disposal. Disposal instruction forms are included. The disposal of hazardous waste containers is discussed and pictures of the U.S. Dept. of Transportation hazardous materials warning labels are included.
(12) KEYWORDS: AUTHORITY; CHEMICAL; CONTAINER; DISPOSAL; HAZARDOUS; IOWA; PACKAGING; RECLAMATION; SANITARY LANDFILL; TOXIC; TRANSPORT
(14) HIERARCH TERMS: 1DD/2DJ; 1HA/2HF; 1SD/2SH
(15) STIMS ACC.NO.: 00S44282
(16) CITATION: Des Moines, Iowa, Iowa Dept. of Environ. Quality, May 1977. p.63-67.

(1) SWIRS ACC.NO.: 045231
(2) DOMESTIC: D (2) CATEGORY: 22 (2) SUBJ.TYPE: T
(5) CORPORATE AUTHOR: Land Quality Management Div
(6) BOOK TITLE: Sanitary Landfill Operator's Manual.
(10) LANGUAGE: EN (10) GEO. AREA: 1US/21A (10) PUB. YEAR: 1977
(11) ABSTRACT: A manual with specific requirements and suggested procedures for operating a sanitary landfill is presented by the Iowa Department of Environmental Quality. The following topics are individually discussed: sanitary landfills; the landfill operation; cell construction; roads and traffic control; inclement weather operations; vector and litter control; leachate monitoring; procedures for hazardous waste disposal; sewage sludge disposal; sanitary landfill equipment; map reading; OSHA and safety; records; inspections; and sources of assistance. Solid waste rules from the state of Iowa and

from the Iowa Department of Environmental Quality are included as are surveying techniques. The techniques include the determination of elevations and the calculation of earthwork quantities. Pictures, diagrams and tables are included. (Retained in SWIRS library).

(12) KEYWORDS: AUTHORITY; CLIMATE; CONSTRUCTION; DATA; ENVIRONMENT; EQUIPMENT; HAZARDOUS; IOWA; OSHA; REGULATIONS; SAFETY; SANITARY LANDFILL; TRANSPORT

(14) HIERARCH TERMS: 1DD/2DJ; 1EE/2EM; 1SD/2SG

(15) STIMS ACC.NO.: 00S44278

(16) CITATION: Des Moines, Iowa, Iowa Dept. of Environ. Quality, May 1977. 138 p.

(1) SWIRS ACC.NO.: 044957

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Seminar statement on solid waste management.

(6) JOURNAL TITLE: APWA Reporter

(10) LANGUAGE: EN (10) PUB. YEAR: 1975

(11) ABSTRACT: APWA, its Institute for Solid Wastes, and other persons involved in solid waste management discussed proposed federal solid waste legislation and problems stemming from implementation. The statement resulted from a meeting on April 14, 1975 in Washington, D.C. and concerns a proposed bill to extend and expand the Solid Waste Act of 1965. Topics discussed include resource conservation and recovery, hazardous waste disposal programs, funding of research and development, transportation rates of solid waste, regulations for open dumping and burning, public suits, and governmental use of recycled materials.

(12) KEYWORDS: CONFERENCE; FEDERAL; GOVERNMENT; HAZARDOUS; LAW; MANAGEMENT; RECLAMATION; REFUSE; REGULATIONS; RESOURCE; SOLID; TRANSPORT

(14) HIERARCH TERMS: 1DD/2LD; 1MA/2MH

(15) STIMS ACC.NO.: 00S44003

(16) CITATION: 42(5):9, May 1975.

(1) SWIRS ACC.NO.: 044636

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Managing hazardous waste.

(4) AUTHOR: Andres DK

(6) JOURNAL TITLE: Waste Age

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2TX (10) PUB. YEAR: 1977

(11) ABSTRACT: A review of a Texas manifest system is presented. The Texas system is an example of a shipping manifest, or "trip ticket" regulatory system which is designed to identify the quantity, composition and origin of hazardous waste during its transportation from the point of generation to the point of storage, treatment and/or disposal. It was developed and implemented by the Texas Water Quality Board (TWQB) in 1976, and may provide a model for other states to follow. The advantages of the manifest are detailed. No authorization is necessary, thereby minimizing procedural problems for both the waste generator and TWQB. The generator controls the off site disposal of waste. Potential problems associated with improper disposal can be detected, investigated and resolved. In developing the regulatory mechanism for controlling solid waste, the TWQB relied on criteria relating waste classification to waste quantity and the size of the generating facility (determined by the number of employees). The article defines the classes of waste. In an effort to restrict the number of active participants in the manifest system while at the same time implementing controls for the most potentially hazardous wastes, the TWQB developed a classbased reporting system. The design of the shipping control and reporting system is detailed.

(12) KEYWORDS: CLASSIFICATION; CONTROL; HAZARDOUS; MANAGEMENT; REFUSE; SHIP; TEXAS; TRANSPORT

(14) HIERARCH TERMS: 1DD/2DW; 1MA/2HF; 1MA/2HH; 1MA/2MH

(15) STIMS ACC.NO.: 00S43681

(16) CITATION: 8(10):38, 40-41, Oct. 1977.

(1) SWIRS ACC.NO.: 044434
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Fuller WH
(5) CORPORATE AUTHOR: Univ of Arizona
(6) BOOK TITLE: Movement of Selected Metals, Asbestos, and Cyanide in Soil: Applications to Waste Disposal Problems. (8) REPORT NO.: EPA-600/2-77-020 (9) CONTRACT NO.: 68-03-0208
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: This report presents information on movement of selected hazardous substances in soil which can be applied to problems of selecting and operating land disposal sites for wastes containing arsenic, asbestos, beryllium, cadmium, chromium, copper, cyanide, iron, lead, mercury, selenium, and zinc. The information is based on a literature review, laboratory studies of movement of hazardous substances through soil in municipal landfill leachate, and the author's experience in soil science and waste disposal. The report also presents general information on soils and geological materials and specific information on the chemistry of the selected hazardous substances which is relevant to an understanding of their migration in soil. Critical information gaps are identified, particularly as regards the chemistry and soil adsorption behavior of mixtures of several hazardous substances in the presence of high concentrations of other organic and inorganic solutes, a situation commonly encountered in leachates from municipal and hazardous solid wastes. In spite of these information gaps, it is concluded that waste disposal practice can be improved by application of present information. The report contains a bibliography of 81 related citations. (Retained in SWIRS library).
(12) KEYWORDS: ASBESTOS; BIBLIOGRAPHY; CHEMICAL; CONTAMINATE; DATA; DISPOSAL; GEOLOGIC; GROUND WATER; HAZARDOUS; INDUSTRY; LEACH; METAL; MUNICIPALITY; POLLUTION; SOIL; TRANSPORT
(14) HIERARCH TERMS: 1GD; 1HA/2HF; 1LC; 1ME; 1SJ
(15) STIMS ACC.NO.: 00S43478
(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, April 1977. 242 p.

(1) SWIRS ACC.NO.: 044318
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Summary of damage incidents from improper land disposal.
(4) AUTHOR: Lazar EC
(6) BOOK TITLE: In Proceedings: 1976 National Conference on Control of Hazardous Material Spills, New Orleans, LA, Apr. 25-28, 1976.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Potential damages resulting from hazardous waste disposal on land are explored. There are six major routes of environmental transport by which the improper disposal of hazardous waste on land can result in damages: ground water contamination via leachate; surface water contamination via runoff; air pollution via open burning, evaporation, sublimation, and wind erosion; poisoning via direct contact; poisoning via the food chain; and fire and explosion. Each of these forms of damage is considered in relation to the significance of hazardous waste disposal. It is envisioned that improved cooperation between government and industry will minimize the incidence of damages.
(12) KEYWORDS: AIR; CONTAMINATE; DISPOSAL; EXPLOSION; FIRE; GROUND WATER; HAZARDOUS; LAND; LEACH; POLLUTION; TRANSPORT
(14) HIERARCH TERMS: 1HA/2HF
(15) STIMS ACC.NO.: 00S43362
(16) CITATION: Rockville, MD, Information Transfer, Inc., 1976. p.437-440.

(1) SWIRS ACC.NO.: 044295
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Hazardous material road spills: training keeps Colcrado prepared.
(4) AUTHOR: Patton R
(6) JOURNAL TITLE: Rural and Urban Roads
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CO (10) PUB. YEAR: 1977
(11) ABSTRACT: The state of Colorado is currently conducting seminars in the area of hazardous materials handling with emphasis on emergency spills. These seminars were started only after it was discovered that no other state had training procedures of any kind. The seminars have had great success, with many out of state emergency personnel attending.
(12) KEYWORDS: HAZARDOUS; MATERIALS HANDLING; SAFETY; SPILLAGE; TRANSPORT
(14) HIERARCH TERMS: 1EB/2EB; 1HA/2HF; 1TF/2TM
(15) STIMS ACC.NO.: 00S43339
(16) CITATION: 15(5):43-44, May 1977.

(1) SWIRS ACC.NO.: 044208
(2) DOMESTIC: F (2) CATEGORY: 07 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Waste disposal controls.
(4) AUTHOR: Laughlin RGW
(5) CCRPORATE AUTHOR: Ontario Research Foundation
(6) BOOK TITLE: In The Methodology for the Operation of a Waste Materials Exchange in Canada. (8) REPORT NO.: EPS 3-EC-77-8 (9) CCNTRACT NO.: 06SS KE 204-6-EP13
(10) LANGUAGE: EN (10) GEO. AREA: 1EU; 1US; 1CD (10) PUB. YEAR: 1977
(11) ABSTRACT: Controls being introduced over the disposal of waste materials in Europe and North America are discussed. The controls cover the transportation and disposal of waste, with primary emphasis on hazardous or toxic waste. It is felt that the effect of implementing stringent controls over the disposal of hazardous waste on the establishment of a waste materials exchange will be to increase the utilization of the exchange by industry. Two reasons for this are cited: (1) the cost for disposal in an environmentally acceptable manner is usually more expensive than landfill or lagooning; and (2) the reporting aspect of most existing or proposed waste disposal control legislation should also encourage the use of a waste exchange. Data on hazardous waste treatment and disposal practices in the United States are tabulated.
(12) KEYWORDS: CANADA; CONTROL; DATA; DISPOSAL; EUROPE; HAZARDOUS; INDUSTRY; INFORMATION; SYSTEM; TOXIC; TRANSPORT; TREATMENT; US
(14) HIERARCH TERMS: 1DD/2DW; 1EB/2EP; 1HA; 1TD
(15) STIMS ACC.NO.: 00S43251 (15) SECONDARY AUTHORS: Golomb A
(16) CITATION: Ottawa, Ontario, Environment Canada, Mar. 1977. p.25-27.

(1) SWIRS ACC.NO.: 043569
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: The county perspective: a major improvement.
(4) AUTHOR: Shaskan C
(6) JOURNAL TITLE: Environmental Comment
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The county role in the new solid waste law, the Resource Conservation and Recovery Act (RCRA) of 1976, is described. The new law does not emphasize source reduction measures to the extent counties believe necessary to support programs for reducing solid waste, but it does show significant improvement over earlier legislative proposals. Rural assistance in solid waste management is a critical element in the new law. The $25 million provided per year (for 1978 and 1979) to help rural communities upgrade their solid waste management facilities is insufficient. Counties are increasingly concerned with catastrophes and pollution that may result from the transportation and disposal of hazardous waste so they welcome the strong hazardous waste management program contained in the new law. Counties aprove of RCRA's call for the creation of statewide solid

waste plans supplemented by subregional plans whose functions must be jointly determined by state and local officials. The new law does not providean adequate level of funding so local governments will have to return to their strained budgets or charge local taxpayers increased user fees. If the Environmental Protection Agency encourages flexibility in the implementation of the program and insists on full funding, county solid waste programs may benefit.

(12) KEYWORDS: COUNTY; DISPOSAL; ECONOMICS; GOVERNMENT; HAZARDOUS; LAW; LOCAL; RECLAMATION; RURAL; SOLID; TRANSPORT

(14) HIERARCH TERMS: 1HA/2HF; 1LB/2LD; 1MA/2MA; 1MA/2MF; 1MA/2MG; 1RG

(15) STIMS ACC.NO.: 00S42612

(16) CITATION: 18-20, Feb. 1977.

(1) SWIRS ACC.NO.: 043563

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Illinois' solid waste management program: monitoring, permitting, and enforcement.

(4) AUTHOR: Rein JH

(6) JOURNAL TITLE: Environmental Comment

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2IL (10) PUB. YEAR: 1977

(11) ABSTRACT: The Illinois solid waste management program can be divided into three general areas: monitoring, permitting, and enforcement. The monitoring of solid waste management sites involves the inspection of landfill sites, the compiling and gathering of material which could be used as evidence, and the testing of water. Inspectors are equipped with photographic equipment, surveying instruments, well monitoring equipment, and stream sampling apparatus. A unique three tiered permit system for sanitary landfills involves development, operating, and supplemental permits. Eighty percent of the landfill sites have permits due to rigorous envorcement of the program and standard operating requirements have been enforced. Under a voluntary compliance program, violators of regulations are called to a compliance conference in an attempt to establish a corrective program. Guidelines are being developed to allow greater public participation in the permitting process. Proposed regulations relating to hazardous waste generation, transportation, and disposal are noted.

(12) KEYWORDS: DISPOSAL; HAZARDOUS; ILLINOIS; LEGAL; LICENSE; MANAGEMENT; MONITOR; REGULATIONS; SANITARY LANDFILL; SOLID; TRANSPORT

(14) HIERARCH TERMS: 1DD/2DP; 1HA/2HF; 1LB/2LG

(15) STIMS ACC.NO.: 00S42606

(16) CITATION: 16-17, Feb. 1977.

(1) SWIRS ACC.NO.: 043382

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(6) BOOK TITLE: A Survey of Hazardous Waste Generation and Disposal Practices in Kansas. v.2.

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2KS (10) PUB. YEAR: 1977

(11) ABSTRACT: Data are tabulated on the generation of hazardous waste in the State of Kansas during 1974. The Standard Industrial Classification (SIC) Code is used to organize and identify the 396 industries included in the survey. The data tabulations provide information on the generation of hazardous waste: gallons per year for liquid waste and percent gallons, and tons per year for solid waste and percent tons. Hazardous waste generation data for 14 major SIC groups are reported: (1) food and kindred products; (2) printing, publishing, and allied industries; (3) chemical and allied products; (4) petroleum refining and related industries; (5) rubber and miscellaneous plastic products; (6) leather and leather products; (7) stone, clay, glass, and concrete products; (8) primary metal industries; (9) fabricated metal products, except machinery and transportation equipment; (10) machinery, except electrical; (11) electrical and electronic machinery, equipment, and supplies; (12) transportation equipment; (13) railroad

transportation; and (14) electric, gas, and sanitary services. (Retained in SWIRS library).

(12) KEYWORDS: CHEMICAL; CLAY; CONCRETE; DATA; ELECTRICAL; EQUIPMENT; FOOD PROCESSING; GLASS; HAZARDOUS; INDUSTRY; KANSAS; LIQUID; METAL; PLASTIC; RAIL HAUL; REFINERY; RUBBER; SANITARY; SOLID; TRANSPORT

(14) HIERARCH TERMS: 1HA/2HH; 11C/2IY

(15) STIMS ACC.NO.: 00S42425

(16) CITATION: Topeka, KS, Kansas Department of Health and Environment, Mar. 1977. 184 p.

(1) SWIRS ACC.NO.: 043356

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(5) CORPORATE AUTHOR: Kansas Dept. of Health and Environment

(6) BOOK TITLE: A Survey of Hazardous Waste Generation and Disposal Practices in Kansas.

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2KS (10) PUB. YEAR: 1977

(11) ABSTRACT: A study was initiated in 1975 by the Kansas Department of Health and Environment to determine the quantity of hazardous waste generated and disposal practices in the State. Objectives of the study were to identify the sources of hazardous waste, estimate the total quantity and characteristics of hazardous waste generated in Kansas during 1974, identify treatment and disposal techniques, establish a readily retrievable bank of information on hazardous waste sources, and conduct a review of legislation and administrative policies. 396 manufacturing industries were studied due to their high potential for producing hazardous waste and 31 pesticide applicators and 24 hospitals or institutions were also included in the study. Industries studied during 1974 generated 5.4 million gallons of liquids and 27,000 tons of solid sludge containing hazardous materials. Caustic solutions, waste oil, acids, and heavy metals in solution accounted for 92 percent of the total quantity of liquid waste. Sludge containing heavy metals, miscellaneous types of waste, halogenated organics, and paint sludge accounted for 97 percent of the solid sludge containing hazardous waste. The petroleum refining industry generated the largest volume of hazardous waste, followed by the chemical and allied products industry, the transportation equipment industry, and the fabricated metal products industry. Priorities for the improved management of hazardous waste are listed. (Retained in SWIRS library).

(12) KEYWORDS: ADMINISTRATION; DISPOSAL; EQUIPMENT; HAZARDOUS; HOSPITAL; INDUSTRY; INFORMATION; INSTITUTION; KANSAS; LIQUID; MANAGEMENT; METAL; ORGANIC; PAINT; PESTICIDE; REFINERY; SLUDGE; TRANSPORT; TREATMENT

(14) HIERARCH TERMS: 1HA/2HF; 1MA/2MG

(15) STIMS ACC.NO.: 00S42399

(16) CITATION: Topeka, KS, Kansas Department of Health and Environment, Mar. 1977. 9 p.

(1) SWIRS ACC.NO.: 043166

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Summary: Laws and regulations concerning the disposal of hazardous wastes -- Washington.

(4) AUTHOR: Waldrop P

(6) BOOK TITLE: In State Hazardous Waste Regulations and Legislation: A Synopsis of Information on Seven Selected States.

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2WA (10) PUB. YEAR: 1976

(11) ABSTRACT: Laws and regulations concerning the handling and disposal of hazardous wastes in Washington are presented. At present, direct control of the disposal of environmentally hazardous wastes is tenuous without a specific law, although a few parts of existing law and regulations concern hazardous wastes. Hazardous waste haulers are regulated by the Utilities and Transportation Commission. Regulations about solid waste storage include mention of hazardous and problem wastes. Hazardous wastes must be properly labelled, stored, and inaccessible to the public. Problem wastes, and those unsuitable for storing in containers, must be stored in a nuisance free manner. No specific mention is made concerning secure landfills, but there are general regulations which are pertinent and there are regulations

concerning solid waste handling standards which would also apply. There are no laws or regulations concerning hazardous waste generator or disposer reporting. Information about hazardous wastes is given voluntarily by the waste producer. Legislation relating to hazardous wastes is in progress. An index of current laws and regulations for hazardous waste handling and disposal is included.

(12) KEYWORDS: CONTAINER; DISPOSAL; GOVERNMENT; HAZARDOUS; LAW; REGULATIONS; SANITARY LANDFILL; STATE; STORAGE; TRANSPORT; WASHINGTON

(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1LB/2LG

(15) STIMS ACC.NO.: 00S42209

(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, 1976, p.42-47, Solid Waste Management Series SW 530.

(1) SWIRS ACC.NO.: 043165

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Summary: Laws and regulations concerning the disposal of hazardous wastes -- Oregon.

(4) AUTHOR: Waldrop P

(6) BOOK TITLE: In State Hazardous Waste Regulations and Legislation: A Synopsis of Information on Seven Selected States.

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2OR (10) PUB. YEAR: 1976

(11) ABSTRACT: Laws and regulations concerning the handling and disposal of hazardous wastes in Oregon are presented. Environmentally hazardous wastes fall into four categories: (1) substances for defoliation, or control of insects, fungi, weeds, etc.; (2) discarded radioactive material; (3) hazardous industrial, manufacturing, trade or business residues classified as hazardous by the State Environmental Quality Commission; and (4) containers and receptacles used in the transport, storage or use of the substances. Disposal of these wastes is prohibited in or upon any property other than that designated as a disposal site. The operator of an environmentally hazardous waste disposal site must be licensed and his responsibilities for site management are listed. License fees are based on the volume or material accepted. State regulations to provide a detailed classification system for identifying environmentally hazardous waste are being developed. Requirements for reuse, recovery, or treatment, rinsing of containers, warning signs, container labeling, record keeping, accident reporting, and general transport regulations are discussed. An index of laws and regulations on hazardous waste handling and disposal is included.

(12) KEYWORDS: CONTAINER; DISPOSAL; FEE; GOVERNMENT; HAZARDOUS; LAW; LICENSE; MANAGEMENT; OREGON; PESTICIDE; RADIOACTIVITY; RECLAMATION; REGULATIONS; SITES; STATE; TRANSPORT

(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1LB/2LG

(15) STIMS ACC.NO.: 00S42208

(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, 1976, p.36-41, Solid Waste Management Series SW 530.

(1) SWIRS ACC.NO.: 043162

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Summary: laws and regulations concerning the disposal of hazardous wastes -- Massachusetts.

(4) AUTHOR: Waldrop P

(6) BOOK TITLE: In State Hazardous Waste Regulations and Legislation: A Synopsis of Information on Seven Selected States.

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2MA (10) PUB. YEAR: 1976

(11) ABSTRACT: Laws and regulations concerning the disposal of hazardous wastes in Massachusetts are presented. The Massachusetts Solid Waste Disposal Law of 1969 empowers the Department of Public Health to promulgate regulations relating to the storage, collection, transportation, transfer, and disposal of solid waste. The 1970 laws refer to handling and disposal and licensing of chemical and other hazardous wastes. Sanitary Landfill Regulations define special wastes. Special wastes disposal must be conducted in a separate landfill area designated for that purpose and the operator must obtain a permit. Those operating or engaged in the collection, conveyance, or disposal of hazardous wastes must be licensed. Hazardous Waste Regulations

prohibit dumping of nine kinds of waste substances. A five part classification scheme for hazardous wastes has been established which specifies disposal of the five classes of wastes. Offshore disposal of hazardous wastes is permitted if authorized. Hazardous waste transport vehicles require marking. Transport of the wastes through waters of the State for the purpose of offshore disposal is prohibited. An index of laws and regulations for hazardous waste handling and disposal is included.

(12) KEYWORDS: CHEMICAL; DISPOSAL; DUMPING; GOVERNMENT; HAZARDOUS; LAW; LICENSE; MASSACHUSETTS; OCEAN; REGULATIONS; SANITARY LANDFILL; STATE; STORAGE; TRANSPORT

(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HE; 1LB/2LG

(15) STIMS ACC.NO.: 00S42205

(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, 1976, p.15-21, Solid Waste Management Series SW 530.

(1) SWIRS ACC.NO.: 043160

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Summary: laws and regulations concerning the disposal of hazardous wastes -- California.

(4) AUTHOR: Waldrop P

(6) BOOK TITLE: In State Hazardous Waste Regulations and Legislation: A Synopsis of Information on Seven Selected States.

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA (10) PUB. YEAR: 1976

(11) ABSTRACT: Law and regulations concerning the disposal of hazardous wastes in California are presented. The California Department of Health governs the identification, handling, and transport of hazardous wastes; the State Water Resources Control Board governs the disposal sites, waste discharge requirements, and monitoring. Means of identifying hazardous wastes are noted. California has guidelines for the handling and disposal of potentially noncompatible wastes. The key to the State hazardous waste reporting system is the Liquid Waste Hauler (Manifest) Record. Site operators must make monthly hazardous waste reports which include copies of the Manifests. State fees are collected on a tonnage basis and are used by the state to cover administration costs of the law. The waste disposal system is governed by a site classification scheme coupled with a waste classification scheme. The Regional Water Quality Control Boards may require monitoring of local ground and surface water. Suspected violation of the minimum standards and regulations for the handling, processing, and disposal of hazardous wastes are subject to proceedings instigated by the California Attorney General. An index of laws and regulations on hazardous waste handling and disposal is attached.

(12) KEYWORDS: CALIFORNIA; DISPOSAL; FEE; GOVERNMENT; GROUND WATER; HAZARDOUS; LAW; MONITOR; REGULATIONS; SITES; STATE; TRANSPORT

(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1LB/2LG

(15) STIMS ACC.NO.: 00S42203

(16) CITATION: 1976, p.1-9, Solid Waste Management Series SW 530. Cincinnati, OH, U.S. Environmental Protection Agency,

(1) SWIRS ACC.NO.: 042943

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Hazardous waste management control requires laws, records, equipment...and education.

(6) JOURNAL TITLE: Solid Waste Systems

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA (10) PUB. YEAR: 1977

(11) ABSTRACT: Several accidents due to inadequate hazardous waste management are described and the methods and equipment used in California to control and monitor hazardous waste collection, transport, and disposal are detailed. The Resource Conservation and Recovery Act of 1976 requires the use of a manifest system to ensure that all hazardous wastes are designated for treatment, storage, or disposal at a facility authorized to accept such wastes. California's manifest is depicted. Data entered must include: the complete address of the waste producer, the hauler, and the processor or disposer; waste type; and method of treatment or disposal. A well equipped laboratory is mandatory for identification of hazardous wastes and their safe

management at the disposal site. Typical case histories of accidents resulting from mixing incompatible wastes are summarized. Field equipment to collect representative samples and to provide rough screening of those samples is also required. The California Department of Health has developed mobile laboratories so that waste samples can be safely screened for hazardous properties immediately after collection.

(12) KEYWORDS: ACCIDENT; CALIFORNIA; CONTROL; DISPOSAL; EQUIPMENT; FACILITY; HAZARDOUS; LABORATORY; LAW; MANAGEMENT; MONITOR; SAMPLING METHODS; STORAGE; TRANSPORT; TREATMENT

(14) HIERARCH TERMS: 1HA; 1HB; 1LB

(15) STIMS ACC.NO.: 00S41986

(16) CITATION: 6(3):8-10, May/June 1977.

(1) SWIRS ACC.NO.: 042726

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: The Resource Conservation and Recovery Act of 1976 public law 94-580.

(4) AUTHOR: Easton E

(6) JOURNAL TITLE: Waste Age

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A summary and analysis of the Resource Conservation and Recovery Act of 1976, Public Law 94 580, is presented. The law is described section by section, and the way in which it may affect those involved in solid waste managements is noted. Subtitle A includes definiations or terms used in the law which often do not conform to conventicanl usage; other general provisions permit interstate agencies to carry out any provisions which may be carried out by individual states as approved by Congress and the Environmental Protection Agency (EPA). Subtitle B outlines the authorities of the EPA Administrator. The hazardous waste management provisions of Subtitle C are the most important sections of the new law; they concern those who generate hazardous wastes, transport, stores, treat, process, or disposes of such wastes. Subtitle D is designed to assist in developing and encouraging methods for the disposal of solid waste. State participation in Subtitle D planning process is essential to the orderly phaseout of open dumping. Subtitle E directs the Secretary of Commerce to publish guidelines for developing specifications for classifications of recovered materials. Under Subtitle F, all procuring agencies are required to purchase items composed of the highest percentage of recovered materials. Subtitle G includes miscellaneous provisions which apply to all aspects of the law. Subtitle H contains EPA's authority to conduct research, development, demonstration, and information programs in aspects of solid waste management.

(12) KEYWORLS: DISPOSAL; DUMPING; EPA; FEDERAL; HAZARDOUS; LAW; MANAGEMENT; RECLAMATOIN; REFUSE; RESEARCH; SOLID; STATE

(14) HIERARCH TERMS: 1HA; 1LB/2LD; 1HA/2HB

(15) STIMS ACC.NO.: 00S41769

(16) CITATION: 8(1):2-4, 6, 8, 13-15, Jan. 1977.

(1) SWIRS ACC.NO.: 042722

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Sources, characteristics and treatment and disposal of industrial wastes containing hexachlorobenzene.

(4) AUTHOR: Quinlivan SC

(6) JOURNAL TITLE: J Hazardous Materials

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A study to identify the sources and characteristics of manufacturing wastes containing hexachlorobenzene (HCB) and to review and document methods currently used for treatment and disposal of HCB wastes, was made. The chlorinated solvents and pesticide industries were found to account for nearly all HCB wastes produced (4,305 tons per year) by the 14 industries reviewed as sources of HCB wastes. Waste sotrage methods which are used prior to ultimate disposal include storage of solid waste cubes under plastic cover and use of

water covered lagoons. Methods for transportation of HCB wastes include use of forklift, truck, pipeline, heated tank trucks and rail. Ultimate waste disposal methods include land disposal, incineration (with or without by product recovery), resource recovery, discharge to municipal sewage treatment plants, and emission to the atmosphere. The majority of the HCB waste handled by the industrial facilities reviewed is currently disposed of in two industrial landfills using a soil cover of 4 to 6 ft. with a polyethylene film placed at approximately the middepth of the soil cover. Incineration at a sufficiently elevated temperature can effectively destroy HCB; Hydrogen Chloride as a by-product.

(12) KEYWORDS: CHLORINE; DISPOSAL; HAZARDOUS; INCINERATION; LAND; ORGANIC; PLANT-INDUSTRIAL; STORAGE; TRANSPORT; TREATMENT

(14) HIERARCH TERMS: 1HA; 1PA/2PA; 1SA

(15) STIMS ACC.NO.: 00S41765 (15) SECONDARY AUTHORS: Ghassemi M

(16) CITATION: 1(4):343-359, Mar. 1977.

(1) SWIMS ACC.NO.: 042595

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Conclusions-discussion of results.

(6) BOOK TITLE: In A Survey of Hazardous Waste Generation and Disposal Practices in Kansas. v.1

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2KS (10) PUB. YEAR: 1977

(11) ABSTRACT: A survey was made of 396 Kansas industrial and manufacturing firms to determine the quantities of hazardous waste generated and evaluate disposal practices. During 1974, these firms generated 5,450,000 gallons of liquid hazardous waste, and 27,000 tons of solid sludge containing hazardous waste. Caustic solutions were the largest class of liquid hazardous waste generated in the State, while sludge containing heavy metals were the largest class of solid sludge containing hazardous waste. By industry classification, petroleum refining was the largest generator of hazardous waste. It was found that Kansas is a net exporter of hazardous waste, with approximately 57 percent of all liquids and 21 percent of solid sludge containing hazardous waste shipped out of the State. Of the pesticide applicators surveyed, approximately 94 percent of containers generated by their operations were disposed of in a sanitary landfill. Incineration was the primary disposal technique for pathological waste. It is pointed out that no hazardous waste treatment and/or disposal site existed in Kansas as of 1974. The implications of the hazardous waste problem are discussed.

(12) KEYWORDS: ACID; CONTAINER; DISPOSAL; HAZARDOUS; HOSPITAL; INCINERATION; KANSAS; METAL; SLUDGE; STATE; SURVEY; TRANSPORT; VOLUME

(14) HIERARCH TERMS: 1HA/2HF; 1MA/2MG; 1SO

(15) STIMS ACC.NO.: 00S41638

(16) CITATION: Topeka, Kansas Department of Health and Environment, Mar. 1977. p.95-108.

(1) SWIMS ACC.NO.: 042486

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(5) CORPORATE AUTHOR: United States Testing Company, Inc

(6) BOOK TITLE: Toxicological and skin corrosion testing of selected hazardous materials.

(8) NTIS NO.: PB 264 975 (8) REPORT NO.: DOT/MTB/OHMO-76/2 (9) CONTRACT NO.: DOT-OS-30077

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: Selected toxicological tests were undertaken on twelve organic chemicals in animals to determine if these qualified as hazardous materials according to the Department of Transportation Hazardous Materials Regulations. Overall toxicological and skin corrosion tests results are summarized. The twelve materials studied were benzene, benzene sulfonic acid, 1-chloro-nitrobenzene, chloropicrin, ethyl benzene, monochloroacetic acid, nitrobenzene, phenol, styrene, toluene-2, 4-diisocynate (TDI), trichloroacetic acid, and ortho-xylene. Parameters utilized in the tests were (1) toxicity by

inhalation, (2) toxicity by oral ingestion, (3) toxicity by skin absorption, and (4) skin corrosion. Procedures, descriptions and detailed results are given. (Retained in SWIRS library)
(12) KEYWORDS: ADMINISTRATION; ANIMAL; CHEMICAL; CHLORINE; DATA; EFFECT; FEDERAL; HAZARDOUS; INVESTIGATION; KERATIN; NITROGEN; ORGANIC; PHENOL; SULFUR; TOXIC; TRANSPORT
(14) HIERARCH TERMS: 1HA/2HH
(15) STIMS ACC.NO.: 00S41529
(16) CITATION: Washington, U.S. Department of Transportation, Apr. 1976. 28 p.

(1) SWIRS ACC.NO.: 042429
(2) DOMESTIC: D (2) CATEGORY: 28 (2) SUBJ.TYPE: T
(5) CORPORATE AUTHOR: UN Comm/Trans of Dangerous Goods
(6) BOOK TITLE: Transport of dangerous goods. (8) REPORT NO.: ST/ECA/43-E/CN.2/170
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Recommendations, which are based largely on existing regulations and on work undertaken by various organizations, are addressed to governments and to the international organizations concerned with the regulation of the transport of dangerous goods. Although the recommendations do not constitute an international code, these do represent a broad and flexible framework for current, or revised, or newly established regulations, with a maximum of uniformity. Principles underlying the regulation of dangerous goods transport are given, and the need for a certain uniformity at the world level for all modes of transport in regard to classification and definitions of the classes, listing of the principal dangerous goods, packing and labelling and shipping papers, is stressed. Special recommendations on explosive and pesticide transport are considered. (Retained in SWIRS library)
(12) KEYWORDS: CLASSIFICATION; CRITERIA; DEFINITION; EXPLOSION; HAZARDOUS; INTERNATIONAL; LICENSE; MANUAL; PESTICIDE; REGULATIONS; TRANSPORT
(14) HIERARCH TERMS: 1LB/2LE; 1MA/2MC; 1TF
(15) STIMS ACC.NO.: 00S41472
(16) CITATION: New York, United Nations Publication, 1976.

(1) SWIRS ACC.NO.: 042358
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Rail carrier hazardous materials requirements.
(4) AUTHOR: Feirlein LW
(6) BOOK TITLE: In Red Book on Transportation of Hazardous Materials.
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: U.S. Department of Transportation (DOT) regulations on the rail transport of hazardous materials, and a legislative history of these are given. Amendment and extensive revision to the regulations are cited. Federal criteria in regards to rail transport include shipping papers, special placarding, loading and unloading specifications, special events (fire leaks) specifications, and handling of cars during switching operations.
(12) KEYWORLS: FEDERAL; HAZARDOUS; RAIL HAUL; REGULATIONS; TRANSPORT
(14) HIERARCH TERMS: 1HA; 1TF/2TR
(15) STIMS ACC.NO.: 00S41401
(16) CITATION: Boston, Cahners Books International, Inc., 1977. p.153-159.

(1) SWIRS ACC.NO.: 042357
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Motor carrier hazardous requirements.
(4) AUTHOR: Feirlein LW
(6) BOOK TITLE: In Red Book on Transportation of Hazardous Materials.
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Motor carrier hazardous materials criteria are dealt with, and the U.S. Department of Transportation (DOT) regulations, Motor Carrier Safety Regulations (49 CFR Part 397), and the Hazardous

Materials Regulations (49 CFR Parts 172 and 177) are discussed. A legislative history of this aspect of hazardous materials transport is given. Binding on both common and private carriers, DOT safety regulations apply not only to classification, packaging, and labeling, but also driver qualification, driving of motor vehicles, parts and accessories, loading, reporting of accidents, hours of service (drivers), and inspection and maintenance. The Hazardous Materials Regulations are applicable to shippers, responsibility in motor transport of hazardous materials. Criteria, such as shipping papers and placarding are considered. Time limitations on transport and delivery are discussed, and regulation stipulations on special events, such as disabled vehicles, or leaking packages are cited.

(12) KEYWORDS: FEDERAL; HAZARDOUS; REGULATIONS; SAFETY; TRANSPORT; TRUCK

(14) HIERARCH TERMS: 1HA; 1TF/2TM

(15) STIMS ACC.NO.: 00S41400

(16) CITATION: Boston, Canners Books International, Inc., 1977. p.137-152.

(1) SWIRS ACC.NO.: 042356

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Shipment of hazardous materials by air.

(4) AUTHOR: Beirlein LW

(6) BOOK TITLE: In Red Book on Transportation of Hazardous Materials.

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Regulations dealing with the air transport of hazardous materials are discussed, and a brief legislative history concerning safety in air transportation is given. While a large portion of air regulations on hazardous materials handling are binding upon the air carrier, specific shipper requirements are detailed: these include special processing (duplication) of shipping papers, classification, and proper handling of hazardous materials for ''passenger carrying'' and ''cargo only'' aircraft, packaging, and labeling for air shipment. Restricted Articles Tariff No. 6-D is cited, and the basic principles of the International Air Transport Association restricted articles regulations are given.

(12) KEYWORDS: AIRCRAFT; FEDERAL; HAZARDOUS; INTERNATIONAL; REGULATIONS; TRANSPORT

(14) HIERARCH TERMS: 1HA; 1TF/2TH

(15) STIMS ACC.NO.: 00S41399

(16) CITATION: Boston, Canners Books International, Inc., 1977. p.129-136.

(1) SWIRS ACC.NO.: 042355

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Shipment of hazardous materials by water.

(4) AUTHOR: Beirlein LW

(6) BOOK TITLE: In Red Book on Transportation of Hazardous Materials.

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Regulations dealing with the transport of hazardous materials by water are discussed. Revisions of and amendments to the U.S. Department of Transportation (DOT) criteria code (49 CFR Part 176) are given. Although DOT regulations apply in general to most hazardous materials shipments, conflicting codes and criteria may exempt a shipper from meeting full DOT requirements. Exemptions are stressed and include those hazardous materials being imported, exported, or passing through the United States which (1) may be shipped under the requirements of the Intergovernmental Maritime Consultative Organization's International Maritime Dangerous Goods Code (IMCO IMDG Code); (2) may be shipped with specifications packaging markings not directly affixed (DOT, Part 178), but may be securely attached to package; (3) may meet the IMCO requirements when a single part area is

involved; and (4) may receive certification according to the IMCO IMDG Code in lieu of U.S. certification.
(12) KEYWORDS: FEDERAL; HAZARDOUS; INTERNATIONAL; REGULATIONS; SHIP; TRANSPORT; WATER
(14) HIERARCH TERMS: 1HA; 1TF/2TL
(15) STIMS ACC.NO.: 00S41398
(16) CITATION: Boston, Canners Books International, Inc., 1977. p.123-128.

(1) SWIRS ACC.NO.: 042354
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Hazardous materials packaging.
(4) AUTHOR: Beirlein LW
(6) BOOK TITLE: In Red Book on Transportation of Hazardous Materials.
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Packaging selection and recommendations for the safe transport of regulated hazardous materials are given. Public safety considerations and potential liabilities are stressed in regard to compliance with Federal regulations on packaging, and corporate (shipper) responsibility for packaging selection. Recommended procedures are hazardous material classification, shipping name categorization, and packaging selection in accordance with U.S. Department of Transportation (DOT) specification packaging regulations. A summary of DOT specification packaging, including specification number, type of container, and reference to the current section of DOT regulation where that specification may be found, is given. Containers covered include carboys, inside containers, inside liners, cylinders, drums, cases, wooden drums, wooden boxes, fiberboard boxes, bags, overpacks, portable tanks, and tank cars and trucks.
(12) KEYWORDS: CLASSIFICATION; CONTAINER; CRITERIA; FEDERAL; HAZARDOUS; PACKAGING; SPECIFICATION; TRANSPORT
(14) HIERARCH TERMS: 1CI; 1HA; 1TF
(15) STIMS ACC.NO.: 00S41397
(16) CITATION: Boston, Canners Books International, Inc., 1977. p.53-82.

(1) SWIRS ACC.NO.: 042353
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Identification and classification of materials.
(4) AUTHOR: Beirlein LW
(6) BOOK TITLE: In Red Book on Transportation of Hazardous Materials.
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The process of identification and classification of hazardous materials for transport as pertains to the shipper, carrier, and packaging manufacturer, and to the regulatory responsibility of the U.S. Department of Transportation (DOT) is delineated. Shipping criteria are identification of the chemistry and properties of the material; classification of that material according to the DOT regulations; selection of the proper DOT shipping name; selection of a packaging authorized for that shipping name; marking and labeling of that package for shipment; preparation of shipping documents to accompany the package; certification of the propriety of the shipment and tender the package and certified paperwork to the carrier; and determination of proper placarding and supply placards to the motor carrier. General classes of regulated hazardous materials which fall under DOT discretion are (1) explosives, liquid and solid; (2) flammables, liquid, solid, and gaseous, and combustible liquids; (3) poisons, liquid, solid, and gaseous; (4) corrosive materials, liquid and solid; (5) oxidizers, liquid and solid; (6) irritating materials, liquid, solid, and gaseous; (7) radioactive materials, liquid, solid, and gaseous; (8) etiologic agents, liquid and solid; (9) nonflammable

compressed gases; (10) organic peroxides; and (11) other regulated materials (ORM).

(12) KEYWORDS: ADMINISTRATION; CHEMICAL; CLASSIFICATION; CRITERIA; FEDERAL; HAZARDOUS; LAW; RADIOACTIVE; REGULATIONS; TRANSPORT

(14) HIERARCH TERMS: 1HA; 1TF

(15) STIMS ACC.NO.: 00S41396

(16) CITATION: Boston, Cahners Books International, Inc., 1977. p.33-46.

(1) SWIRS ACC.NO.: 042352

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: The what, who, where, when, why of hazardous materials transportation regulations.

(4) AUTHOR: Bierlein LW

(6) BOOK TITLE: In Red Book on Transportation of Hazardous Materials.

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: General regulatory aspects of hazardous materials transport are presented. Definition and authoritative bodies concerned with hazardous transport regulations are considered. Application of the transport regulations to shippers, carriers, and packaging manufacturers is specifically dealt with, as well as the rationale of the regulations themselves.

(12) KEYWORDS: ADMINISTRATION; DEFINITION; FEDERAL; HAZARDOUS; REGULATIONS; SAFETY; TRANSPORT

(14) HIERARCH TERMS: 1HA; 1LB/2LB; 1TF

(15) STIMS ACC.NO.: 00S41395

(16) CITATION: Boston, Cahners Books International, Inc., 1977. p.21-32.

(1) SWIRS ACC.NO.: 042351

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Bierlein LW

(6) BOOK TITLE: Red Book on Transportation of Hazardous Materials.

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Hazardous materials transport regulations, and explanations, applications, and rationale of these are presented. Authoritative government agencies responsible for regulation of hazardous materials handling are cited; however, since the focus is on transport, the primary regulatory body dealt with is the U.S. Department of Transportation (DOT). The role and legislative history of DOT are outlined, and its responsibilities in affirmative requirements, as well as prohibitions, affecting all aspects of the transport of hazardous materials, and the people related to that transport are delineated: these aspects include the identification, classification, description, packing, marking, labelling, and shipping documentation for the materials, as well as the handling of the materials in transit by carriers, such as carrier placarding, carrier loading and storage of the materials, vehicle safety standards, and driver qualifications. Accident and incident reporting requirements are dealt with for all carriers in the event of unintentional spillage or release of hazardous material from its packaging. Requirements and licensing procedures for all modes of hazardous materials transport, as well as monetary penalties for specific failures in shipment criteria, are given. The Hazardous Materials Transportation Act is presented, and the emergency response system CHEMTREC (Chemical Transportation Emergency Center) is reported on. (Retained in SWIRS Library)

(12) KEYWORDS: ADMINISTRATION; CLASSIFICATION; CRITERIA; FEDERAL; FINE; HAZARDOUS; LAW; LICENSE; MATERIALS HANDLING; MONITOR; PACKAGING; REGULATIONS; SAFETY; SPILLAGE; TRANSPORT

(14) HIERARCH TERMS: 1HA; 1LB/2LB; 1TF

(15) STIMS ACC.NO.: 00S41394

(16) CITATION: Boston, Cahners Books International, Inc., 1977. 680 p.

(1) SWIRS ACC.NO.: 042181
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: The hazardous waste manifest system.
(4) AUTHOR: Andres DR
(6) JOURNAL TITLE: Waste Age
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Features of the proposed standard manifest form required by the Resource Conservation and Recovery Act (1976) to identify the quantity, composition, and origin of hazardous waste during its transportation from point of generation to point of storage, treatment, and disposal are discussed and the use of this control document is reviewed. The intent of the manifest system is to provide a closed loop reporting method covering the total movement of hazardous wastes. Recent legislation places continuing liability for proper disposal with the generator. The procedures which must be followed for the reporting of generation, transportation, and receipt of such wastes are noted. Advantages of a single page, combination manifest/bill of lading are examined. The protection of proprietary information when using the manifest is a matter of concern and the need to restrict the dissemination of such information has been recognized by the Resource Conservation and Recovery Act.
(12) KEYWORDS: CONTROL; DISPOSAL; HAZARDOUS; LAW; MANAGEMENT; STORAGE; SYSTEM; TRANSPORT; TREATMENT
(14) HIERARCH TERMS: 1HA; 1LB/2LD; 1MA/2MB
(15) STIMS ACC.NO.: 00S41225
(16) CITATION: 8(2):24, 28, Feb. 1977.

(1) SWIRS ACC.NO.: 041643
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(4) AUTHOR: Melsted SW (10) GEO. AREA: 1SJ (10) PUB. YEAR: 1977
(11) ABSTRACT: An analysis of previously published data is presented as is an attempt to show that the transfer of cadmium from the soil to corn grain and from corn grain to pheasant tissue may be expressed, and predicted, through logarithmic relationships. Maximum loading rates for sewage sludges on land will be influenced by the degree to which crops will absorb hazardous elements from sludge amended soils and the degree to which animals will absorb these same elements from grain and forage; monitoring disposal sites similarly assumes the ability to predict metal movement through the food chain.
(12) KEYWORDS: ANALYSIS; ANIMAL; CROP; DISPOSAL; EARTH; EFFECT; FOOD; HAZARDOUS; LAND; MATHEMATICAL MODEL; METAL; MONITOR; PROJECTION; SLUDGE; SOIL CONDITIONER; TRANSPORT; UTILIZE
(14) HIERARCH TERMS: 1SI/2S9
(15) STIMS ACC.NO.: 00S40687 (15) SECONDARY AUTHORS: Hinesly TD; Tyler JJ
(18) DOC.CIT.: Melsted, S. W. , T. D. Hinesly, and J. J. Tyler. Cadmium transfer from sewage sludge-amended soil to corn grain to pheasant tissue. In Loehr, R. C. Land as a Waste Management Alternative: Proceedings of the 1976 Cornell Agricultural Waste Management Conference. Ann Arbor, MI, Ann Arbor Science Publishers Inc. , 1977. p. 199-208.

(1) SWIRS ACC.NO.: 041316
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) GEO. AREA: 1HA; 1LE/2LD (10) PUB. YEAR: 1976
(11) ABSTRACT: Hazardous material regulations promulgated by the Department of Transportation (DOT) are reported. DOT's Materials Transportation Bureau published a final consolidation of hazardous material regulations that became effective on July 1, 1975. Compliance with certain portions of the regulations do not become effective until 1977 and 1979. Proponents of the phased approach adopted in theregulations are discussed, as well as those who take issue with the effective dates. Provisions of the regulations are concerned with review and training, depletion of stock (packages and shipping paper), tariffs, placarding, and exemptions. Information on the effective dates

cf these provisions is detailed. Classes of hazardous material are listed. (Retained in SWIRS library)

(12) KEYWORDS: EPA; FEDERAL; HAZARDOUS; REGULATIONS; TRANSPORT

(14) HIERARCH TERMS: 1TP/2TH

(15) STIMS ACC.NO.: 00S40360

(18) DOC.CIT.: Department of Transportation. Consolidation of hazardous materials regulations. Federal Register, 41(123), June 24, 1976. Washington, U. S. National Archives, 1976. 2 p.

(1) SWIRS ACC.NO.: 041058

(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Wilson GR (10) GEO. AREA: 1LC; 1SI/2S2 (10) PUB. YEAR: 1975

(11) ABSTRACT: Problems involved in evaluating the impact of land disposal of sludge on ground water quality are assessed, with particular emphasis on hydrological aspects. The behavior and fate of contaminants are considered to be of major importance in evaluating the hydrological aspects of ground water contamination. Constituents of sludge percolate are identified. Hydrological studies on ground water contamination are reviewed. It is concluded that factors governing the chemical and transport behavior of contaminants through the zone of aeration and in the aquifer are significantly complex and that there appears to be little prospect of accurately predicting such behavior prior to the emplacement of sludge. This may be rectified by the continuation of theoretical and laboratory studies and, in particular, by the accumulation of data from field investigations.

(12) KEYWORDS: CONTAMINATE; CRITERIA; DISPOSAL; EFFECT; GROUND WATER; HAZARDOUS; HYDROLOGY; LAND; LEACH; PERCOLATE; RESEARCH; SLUDGE; TRANSPORT

(14) HIERARCH TERMS: 1SD/2SK

(15) STIMS ACC.NO.: 00S40102

(18) DOC.CIT.: Wilson, G. R. Impact of land disposal of sludges on groundwater. In U. S. Environmental Protection Agency. Proceedings; the 1975 National Conference on Municipal Sludge Management and Disposal, Anaheim, CA, Aug. 18-20, 1975. Rockville, MD, Information Transfer, Inc. , 1975. p. 193-199.

(1) SWIRS ACC.NO.: 041057

(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Weddle BK (10) GEO. AREA: 1LC; 1SD/2SK (10) PUB. YEAR: 1975

(11) ABSTRACT: The land disposition of sewage sludge and its environmental effects are addressed. Two projects of the Environmental Protection Agency are reported. One project was designed to determine the capacity of solid waste to assimilate the moisture in liquid sludge and septic tank pumpings and significant factors affecting that capacity; optimum means for nuisance free admixture of liquid sludge with solid waste in a landfill; effects of combined liquid sludge and solid waste disposal on the environment, landfill operating efficiencies, and personnel performance; effects of liquid sludge on landfill compaction; and the most economically feasible methods for transporting and disposing of liquid sludge. The other project was concerned with the environmental impact of mixed sludge and soil waste and sludge only disposal sites. The first project is complete, while the second project is ongoing. Supporting tabular data are provided on the predicted absorptive capacity of municipal refuse as received at oceanside landfills; average liquid sludge and soild waste generation rates for 1973 and 1985; and the results of a sludge, leachate, and ground water sample analysis.

(12) KEYWORDS: ANALYSIS; DISPOSAL; ECONOMICS; EFFECT; ENVIRONMENT; EPA; GROUND WATER; HAZARDOUS; LEACH; PROGRAM; RESEARCH; SANITARY LANDFILL; SLUDGE; TRANSPORT

(14) HIERARCH TERMS: 1SI/2S2

(15) STIMS ACC.NO.: 00S40101

(18) DOC.CIT.: Weddle, B. K. Environmental effects of sludge disposal in sanitary landfills. In U. S. Environmental Protection Agency. Proceedings; the 1975 National Conference on Municipal Sludge Management and Disposal, Anaheim, CA, Aug. 18-20, 1975. Rockville, MD, Information Transfer, Inc. , 1975. p. 188-192.

(1) SWIRS ACC.NO.: 040917
(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Rausa G (10) GEO. AREA: 1ED; 1PF (10) PUB. YEAR: 1976
(11) ABSTRACT: The environmental processes and effects related to advanced fossil fuels are addressed in a meeting report of the Advanced Fossil Fuels Sector Group. The meeting was held on August 25, 1976 in Las Vegas, Nevada. Components of the environmental processes and effects program include pollutant characterization, measurement and monitoring, environmental transport processes, health effects, ecological effects, and integrated assessment. The major problem of the program is the extremely difficult development of an index of toxicity for organics because of the large number of complex variables involved. Studies on the physical and chemical characterization of advanced fossil fuels residuals and products, directional modeling and shale oil adsorption, health effects, and ecological effects are cited. Studies on carcinogens are also noted, including the identification of hazardous agents, rapid biological screening systems, metabolism and fate, hazards analysis (dose and effect), and mechanisms of damage and repair.
(12) KEYWORDS: ANALYSIS; BURNING; CLASSIFICATION; CONFERENCE; EFFECT; EMISSION; ENVIRONMENT; FOSSIL FUEL; GASSES; HAZARDOUS; MEASUREMENTS; MONITOR; POLLUTION; TRANSPORT
(14) HIERARCH TERMS: 1AZ
(15) STIMS ACC.NO.: 00539961
(18) DOC.CIT.: Rausa, G. Environmental processes and effects. In Proceedings; Meeting Report Advanced Fossil Fuels Sector Group (AFFSG), Las Vegas, NV, Aug. 25, 1976. Environmental Protection Publication EPA-600/7-76-023. Washington, U. S. Environmental Protection Agency, Oct. 1976. p. 23-25, 97-107. (Interagency Energy-Environment Research and Development Series.)

(1) SWIRS ACC.NO.: 040847
(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S; T (10) GEO. AREA: 1US/2NJ; 1US/2NY/3NY (10) PUB. YEAR: 1976
(11) ABSTRACT: The adverse effects on air and water quality, resulting from the construction and operation of regional sludge processing facilities, are investigated. It is felt that adverse effects on air quality cannot be avoided. Suspended particulates from the pyrolysis of sludge will be emitted, even if high energy venturi scrubbers are used. It is estimated that particulate levels will increase by 500 tons per year in the New York City and New Jersey metropolitan region, an 0. 5 percent increase over existing ambient levels. Even with proper controls, vehicles transporting sludge, residues, and chemicals will emit particulates, carbon monoxide, and hydrocarbons. Construction activities will increase atmospheric dust and gas levels. Deterioration in water quality depends on such variables as existing levels of pollutants in receiving water, the volume of water passing through a discharge point, and quantities and kinds of pollutants released by a facility. Concentrations of BOD (biochemical oxygen demand) following sidestream treatment are expected to equal 30 mg/l the maximum permissible level by New York standards. Mercury will also be released to receiving waters in scrubber sidestreams, the exact amount depending on its form in sludge and the treatment scrubber water receives.
(12) KEYWORDS: AIR; CHEMICAL; EFFECT; ENVIRONMENT; FACILITY; HAZARDOUS; MANAGEMENT; NEW JERSEY; NEW YORK; PLANNING; POLLUTION; PROGRAM; PROJECTION; PYROLYSIS; REGIONAL; RESIDUE; SLUDGE; TRANSPORT; TREATMENT; WATER
(14) HIERARCH TERMS: 1AC; 1PR; 1WA
(15) STIMS ACC.NO.: 00539891
(18) DOC.CIT.: Adverse environmental effects of proposed (pyrolysis) plan. In Phase 2 Report of Technical Investigation of Alternatives for New York-New Jersey Metropolitan Area Sewage Sludge Disposal Management Program. Boston, Ma, Camp Dresser and McKee, June 1976. p. VII. 129-VII. 150.

(1) SWIRS ACC.NO.: 040798
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Davies Dm (10) GEO. AREA: 1TF (10) PUB. YEAR: 1976
(11) ABSTRACT: The national hazardous waste problem and the unavoidable need to transport liquid wastes for off site disposal are described. Practical measures for the avoidance of hazards during transportation are given, including: (1) accurate waste description; (2) correct vehicle design and selection; (3) vehicle marking; and (4) effective technical control and emergency procedures. Practical case studies are presented describing incidents that have arisen and the conclusions to be drawn from them. Three tables, one figure and three appendices are presented.
(12) KEYWORDS: CHEMICAL; CONTROL; EFFLUENT; ENVIRONMENT; HAZARDOUS; INCINERATION; LIQUID; MANAGEMENT; POLLUTION; SAFETY; SANITARY LANDFILL; SLUDGE; TECHNOLOGY; TRANSPORT; TREATMENT
(14) HIERARCH TERMS: 1HA
(15) STIMS ACC.NO.: 00S39642 (15) SECONDARY AUTHORS: Mackay GA
(18) DOC.CIT.: Davies, D. R. , and G. A. Mackay. Recent developments in the transport of liquid wastes. Journal of Hazardous Materials, 1(3):199-214, Nov. 1976.

(1) SWIRS ACC.NO.: 040504
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) GEO. AREA: 1RG (10) PUB. YEAR: 1976
(11) ABSTRACT: Provisions of the Resources Conservation and Recovery Act of 1976 are outlined. The act is designed to provide technical and financial assistance for the development of management plans and facilities, for the recovery and energy and other resources from discarded materials and for the safe disposal of discarded materials, and to regulate the management of hazardous waste. General provisions of the act are noted. Seven other components of the act are examined: (1) Office of Solid Waste and functions of its administrator and resource and conservation panels; (2) hazardous waste management (standards applicable to generators of hazardous waste, transporters of hazardous waste, and owners and operators of hazardous waste treatment, storage, and disposal facilities; permits for the treatment, storage, and disposal of hazardous waste; and authorized State hazardous waste programs); (3) State and regional solid waste plans; (4) duties of the Secretary of Commerce in resource and recovery; (5) Federal responsibilities; (6) miscellaneous provisions (employee protection, citizen suits, judicial review, grants or contracts for training projects, and labor standards); and (7) research, development, demonstration, and information. (Retained in SWIRS library)
(12) KEYWORDS: ANALYSIS; FEDERAL; GRANT; LAW; MANAGEMENT; PROGRAM; RECLAMATION; RESPONSIBILITY; STATE; TECHNOLOGY
(14) HIERARCH TERMS: 1LB/2LD
(15) STIMS ACC.NO.: 00S39548
(18) DOC.CIT.: U. S. Congress. Resource Conservation and Recovery Act of 1976 (Title II of Public Law 94-580). 94th Cong. , Oct. 21, 1976. (Washington, U. S. Government Printing Office, 1976.) 47 p.

(1) SWIRS ACC.NO.: 040487
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) GEO. AREA: 1RG (10) PUB. YEAR: 1976
(11) ABSTRACT: Provisions of the Resource Conservation and Recovery Act are identified. The act is designed to provide technical and financial assistance for the development of management plans and facilities, for the recovery of energy and other resources from discarded materials and for the safe disposal of discarded materials, and to regulate the management of hazardous waste. General provisions of the act are outlined, and seven other basic concerns of the act are delineated: (1) Office of Solid Waste and functions of its administrator and resource recovery and conservation panels; (2) hazardous waste management (standards applicable to transporters of hazardous waste and owners and operators of hazardous waste treatment, storage, and disposal facilities; permits for the treatment, storage, and disposal of hazardous waste; and authorized State hazardous waste

programs); (3) State or regional solid waste plans; (4) duties of the Secretary of Commerce in resource and recovery; (5) Federal responsibilities; (6) miscellaneous provisions (employee protection, citizen suits, imminent hazard, judicial review, grants or contracts for training projects, and labor standards); and (7) research, development, demonstration, and information. (Retained in SWIRS library)

(12) KEYWORDS: ANALYSIS; COLLECTION; DISPOSAL; FEDERAL; GRANT; LAW; LOCAL; MANAGEMENT; RECLAMATION; RESPONSIBILITY; STATE

(14) HIERARCH TERMS: 1LB/2LD

(15) STIMS ACC.NO.: 00S39531

(18) DOC.CIT.: U. S. Congress. Resource Conservation and Recovery Act of 1976; S. 2150. Washington, U. S. Government Printing Office, 1976. 47 p.

(1) SWIRS ACC.NO.: 040432

(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S; T (10) GEO. AREA: 1HA/2HF (10) PUB. YEAR: 1976

(11) ABSTRACT: Technological aspects in the treatment and disposal of tannery waste are examined. Essentially all solid waste streams generated by tanneries using chrome as their tanning medium and those operations limited to leather finishing are characterized as being potentially hazardous. Inplant management of solid waste is similar in most tanneries. Waste is collected at the point of generation and placed into fiber or steel drums. Periodically, the drums are moved to a central loading area where they are unloaded into a tannery or contractor owned truck for hauling to a disposal site. Waste water treatment sludge accumulated in sewer sumps is normally pumped out periodically into a contractor's truck for disposal. Of 41 tanneries visited in the study, 11 haul their own waste to a disposal site and 30 utilize contractor services. The treatment of potentially hazardous waste in the leather tanning and finishing industry is restricted to dewatering waste water treatment sludge. Potentially hazardous waste from tanneries is disposed of at three types of sites: dumps; landfills; and trenches, lagoons, pits, and ponds.

(12) KEYWORDS: CHROMIUM; DISPOSAL; DUMPING; EPA; HAZARDOUS; OSWMP; SANITARY LANDFILL; SURVEY; TANNERY WASTE; TECHNOLOGY; TRANSPORT; TREATMENT

(14) HIERARCH TERMS: 1TA

(15) STIMS ACC.NO.: 00S39476

(18) DOC.CIT.: Treatment and disposal technology. In SCS Engineers, Inc. Assessment of Industrial Hazardous Waste Practices--Leather Tanning and Finishing Industry. Washington, U. S. Environmental Protection Agency, Nov. 1976. p. 135-137.

(1) SWIRS ACC.NO.: 040187

(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: T

(4) AUTHOR: Meyers S (10) GEO. AREA: 1ED (10) PUB. YEAR: 1976

(11) ABSTRACT: A summation of the EPA solid wastes programs for the coming fiscal year is presented. By the end of fiscal 1977, studies of hazardous waste generation and management practices at 15 industries and the analyses of the data will be completed. A series of studies will be completed, covering all applications of commercial scale incinerators, the destruction of 14 different types of hazardous wastes, the assessment of chemical treatment methods for waste pesticides and a project in which composted sewage sludges and wood wastes were used to produce a soil conditioner. Studies of land disposal problems will be reported. The following publications will be issued: Hazardous Waste Management Decision Makers Guide; documents on hazardous waste transportation, use of public lands for disposal, management aspects of hazardous waste facilities and a model state hazardous waste statute; and a revised Sanitary Landfill Design and Operation Manual. Reports on the use of sludge for turf grass, for foodchain markets and management of sludge will be issued. Other information released will concern industrial waste management assistance, refuse collection, injury problems in solid waste

management, resource conservation and an eight volume Resource Recovery Implementation Guide will be completed.

(12) KEYWORDS: ENERGY; ENVIRONMENT; EPA; FEDERAL; GOVERNMENT; HAZARDOUS; INCINERATION; MANAGEMENT; RECLAMATION

(14) HIERARCH TERMS: 1MA

(15) STIMS ACC.NO.: 00S39231

(18) DOC.CIT.: Meyers, S. Federal agency charts solid wastes programs for coming fiscal year. Solid Wastes Management, 19(11):48, 76, Nov. 1976.

(1) SWIRS ACC.NO.: 040060

(2) DOMESTIC: D (2) CATEGORY: 11 (2) SUBJ.TYPE: T

(4) AUTHOR: Lewis CR (10) GEO. AREA: 1IA/2II; 1IC/2I9 (10) PUB. YEAR: 1976

(11) ABSTRACT: Incineration of industrial chemical waste is described. The 3M company uses a rotary kiln incinerator with air pollution control equipment. Incinerations was considered the best method of hazardous waste disposal because it is an excellent method of disposing of all types of solvent contaminated waste, it eliminates groundwater pollution potential from the scrap, and it meets anticipated pollution control regulations. Most incinration problems have been overcome in this successful facility but it is not recommended for large quantities of organometals. The seven steps of material handling are described. These are (1) chemical identification, (2) categorization, (3) segregation, (4) packaging, (5) labeling, (6) transportation, (7) handling and disposal. The incineration process is described, success being dependent on achieving the relatively consistent temperature required for proper oxidation, the complete mixing of combustion gases, adequate retention to permit the kinetics of the combustion reaction to occur, and a proper oxygen supply. The air pollution control process is described, as is the maintenance of the primary and secondary combustion chambers, with an outline of some of the problems that occur in them. The principle problem related to the air pol

(12) KEYWORDS: AIR; BENEFIT; CORROSION; DISPOSAL; HAZARDOUS; INCINERATION; INDUSTRY; OXIDATION; OXYGEN; POLLUTION; REGULATIONS; ROTARY KILN; TRANSPORT; UTILIZE

(14) HIERARCH TERMS: 1CB/2CA/3CA

(15) STIMS ACC.NO.: 00S39104 (15) SECONDARY AUTHORS: Edwards RE; Santoro MA

(18) DOC.CIT.: Lewis, C. R. , R. E. Edwards, and M. A. Santoro. Incineration of industrial wastes. Chemical Engineering, 83(22):115-121, Oct. 1976.

(1) SWIRS ACC.NO.: 040032

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A representative of the State of Virginia discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 11, 1975 in San Francisco, California. A paper on hazardous waste and its management is presented. Consideration is given in the paper to the storage and transport of hazardous waste, the use of toxic materials in manufacturing and in agriculture, and regulatory experiences in Virginia pertaining to water pollution control. Incidents in the State involving toxic materials are reported. It is concluded that minimizing the adverse effects of toxic materials can be enhanced by altering exposure to such materials. Information is therefore required on the biochemical mechanisms by which toxic materials affect living organisms, the impact of toxic materials to which there is environmental exposure, and characteristics of existing and evolving toxic materials and how these materials should

be safely manufactured and handled. Recommendations are made for improvements in and regulation of hazardous waste management programs.

(12) KEYWORDS: AGRICULTURE; CONFERENCE; CONTROL; EPA; HAZARDOUS; INDUSTRY; MANAGEMENT; MATERIALS HANDLING; POLLUTION; REGULATIONS; STORAGE; TRANSPORT; VIRGINIA; WATER

(15) STIMS ACC.NO.: 00539076

(18) DOC.CIT.: Jensen, E. G. Representing the Commonwealth of Virginia, on hazardous waste management. In Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, IL, Houston, TX, and San Francisco, CA, Dec. 1975. v. 2. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. p. 1713-1725.

(1) SWIRS ACC.NO.: 040030

(2) DOMESTIC: D (2) CATEGORY: 28 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: A representative of the Department of Transportation discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 11, 1975 in San Francisco, California. Two major issues are addressed: (1) extent to which existing transportation safety regulations and definitions are useful and sufficient for governing the transport (both interstate and intrastate) of hazardous waste, as distinguished from substances; (2) requirements for labeling and placarding of waste shipments and the most effective and accepted systems for such labeling and placarding. The classification of hazardous material transport regulations is explored. The establishment of proper shipping name descriptors for hazardous waste is considered.

(12) KEYWORDS: CLASSIFICATION; CONFERENCE; EPA; FEDERAL; HAZARDOUS; MANAGEMENT; REGULATIONS; RESPONSIBILITY; SAFETY; TRANSPORT

(15) STIMS ACC.NO.: 00539074

(18) DOC.CIT.: Roberts A. Representing the Department of Transportation, on hazardous waste management. In Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, IL, Houston, TX, and San Francisco, CA, Dec. 1975. v. 2. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. p. 1708-1710.

(1) SWIRS ACC.NO.: 040011

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A representative of the BKK Company discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 11, 1975 in San Francisco, California. The company is the only organization licensed by the State of California to both transport and dispose of all forms of nonradioactive solid and liquid hazardous waste. Among other operations, the company operates a 600 acre hazardous waste disposal site in Los Angeles County, California. The site is a fully contained site, meaning that any materials entering the site (liquids or leachates resulting from waste deposited) cannot leave the site. In addition to site barriers, provisions have been made for leachate collection, monitoring, and pumping. Operational details of the hazardous waste disposal site are presented. The need for enforcing existing procedures and regulations on hazardous waste disposal is stressed. Emphasis is also placed on the health effects of improper hazardous waste disposal. Legal liabilities of waste generators,

transporters, and disposers are examined. A question and answer session follows the presentation.

(12) KEYWORDS: CALIFORNIA; COMMERCIAL; CONFERENCE; COUNTY; DISPOSAL; EPA; HAZARDOUS; LICENSE; LOS ANGELES; MANAGEMENT; OPERATIONS RESEARCH; SITES; TRANSPORT

(15) STIMS ACC.NO.: 00539055

(18) DOC.CIT.: Tinnan, L. Representing the BKK Company, on hazardous waste management. In Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, IL, Houston, TX, and San Francisco, CA, Dec. 1975. v. 2. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. p. 1511-1532.

(1) SWIRS ACC.NO.: 040009

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A representative of the S. Rose Cooperage Company discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 11, 1975 in San Francisco, California. The company is engaged in a program of decontaminating and reconditioning used pesticide containers under a permit from the California Department of Agriculture. It is felt that problems associated with the transportation and storage of hazardous waste and employee safety in the reconditioning of containers can be dealt with and that hazardous materials can be recovered from the waste stream and reused. The magnitude of the pesticide container disposal problem is addressed. Two major recommendations are made: (1) review with the Office of Pesticide Programs modifications to its existing regulations to authorize the reconditioning of all used pesticide containers; (2) adopt guidelines relating to the land emplacement of pesticide containers. A question and answer session follows the presentation.

(12) KEYWORDS: CONFERENCE; CONTAINER; EFFECT; EPA; FEDERAL; HAZARDOUS; INDUSTRY; MANAGEMENT; PERSONNEL; PESTICIDE; PROGRAM; RECLAMATION; REGULATIONS; SAFETY; STORAGE; TRANSPORT

(15) STIMS ACC.NO.: 00539053

(18) DOC.CIT.: Fleisher, S. J. Representing the S. Rose Cooperage Company, on hazardous waste management. In Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, IL, Houston, TX, and San Francisco, CA, Dec. 1975. v. 2. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. p. 1499-1503.

(1) SWIRS ACC.NO.: 039978

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A representative of the Malone Company discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 9, 1975 in Houston, Texas. The Malone Company deals exclusively with waste transportation, treatment, and disposal. The reclamation of oil by the company is examined, along with the establishment of monitoring wells to prevent water contamination. The main problem of the company involves air rather than water pollution. Another significant problem is being careful not to accept any waste that has a high aromatic content. The transport of hazardous materials is considered in relation to Federal and State regulations. A question and answer session follows the presentation.

(12) KEYWORDS: AIR; COMMERCIAL; CONFERENCE; DISPOSAL; EPA; HAZARDOUS; MANAGEMENT; MONITOR; OIL; POLLUTION; PROBLEMS; RECLAMATION; TRANSPORT; TREATMENT

(15) STIMS ACC.NO.: 00539022

(18) DOC.CIT.: Montgomery, J. R. Representing the Malone Company, on hazardous waste management. In Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, IL, Houston, TX, and San Francisco, CA, Dec. 1975. v. 1. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. p. 905-919.

(1) SWIRS ACC.NO.: 039959
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: A representative of the Ohio Environmental Protection Agency discusses hazardous waste management at a public meeting held by the U. S. Environmental Protection Agency on December 4, 1975 in Rosemont, Illinois. Ohio opposes any cut in State programs on hazardous waste. The development of hazardous waste. The development of hazarous waste regulations by States is discussed, and it is recommended that the U. S. Environmental Protection Agency take action to support the States in assuring continuity of regulation development in parallel with Federal programs. Support is given to the concept of hazardous waste treatment centers, criteria for the design of model legislation for both hazardous waste management and enforcement purposes, provision by the Federal Government of a clearinghouse function to allow industry as well as States to know what other companies are doing in the field of hazardous waste handling, and the belief that generators of hazardous waste should be able to develop the necessary toxicity data. A survey being conducted in Ohio to evaluate the magnitude of the hazardous waste problem is cited. A question and answer session follows the presentation.
(12) KEYWORDS: CENTRALIZED; CONFERENCE; CRITERIA; DATA; EPA; FEDERAL; GRANT; HAZARDOUS; INFORMATION; INTER; MANAGEMENT; OHIO; PROBLEMS; REGULATIONS; STATE; SURVEY; TECHNOLOGY; TOXIC; TRANSPORT; TREATMENT
(15) STIMS ACC.NO.: 00S39003
(18) DOC.CIT.: Brown, D. Representing the Ohio Environmental Protection Agency, on hazardous waste management. In Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, IL, Houston, TX, and San Francisco, CA, Dec. 1975. v. 1. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. p. 661-669.

(1) SWIRS ACC.NO.: 039953
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: A representative of the Minnesota Pollution Control Agency discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 4, 1975 in Rosemont, Illinois. The Minnesota Pollution Control Agency, in coordination with county units of government, has been developing a program to manage the State's hazardous waste. One result from the promulgation of governmental regulations and technological advances regarding air and water discharges is that pollutants will become concentrated in solid or semisolid form. The disposal of these residues is considered to be a significant new dimension in the management of industrial hazardous waste. It is felt that Federal standards should be devised to address the development of a national identification and classification system for hazardous waste, expansion of private industry and the improvement and construction of q hazardous waste processing facilities, transportation of hazardous waste, and State implementation of hazardous waste control programs. Recommendations are made by the Minnesota Pollution Control Agency with respect to the preceding concerns of Federal standards. A question and answer session follows the presentation.
(12) KEYWORDS: AIR; ASSOC; CLASSIFICATION; CONFERENCE; CONTROL; COUNTY; CRITERIA; DISCHARGE; EPA; FEDERAL; HAZARDOUS; MANAGEMENT; MINNESOTA; POLLUTION; PROGRAM; SOLID; WATER
(15) STIMS ACC.NO.: 00S38997
(18) DOC.CIT.: Born, P. Representing the Minnesota Pollution Control Agency, on hazardous waste management. In Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, IL, Houston, TX, and San Francisco, CA, Dec. 1975. v. 1. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. p. 599-614.

(1) SWIRS ACC.NO.: 039942
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: A representative of the Illinois Environmental Protection Agency discusses hazardous waste management at public meeting held by the U. S. Environmental Protection Agency on December 4, 11975 in Rosemont, Illinois. It is pointed out that major emphasis has been placed in Illinois on the establishment of a supplemental permit system for the safe emplacement of liquid and certain hazardous waste into environmentally sound disposal sites, the development of guidelines for managing special and hazardous waste, disposed of on land by implementing the waste exchange concept. Several key problems and areas of consideration associated with any hazardous waste management program are addressed. A question and answer session follows the presentation.
(12) KEYWORDS: CONFERENCE; CONTROL; DISPOSAL; EPA; HAZARDOUS; ILLINOIS; LAND; LICENSE; LIQUID; MANAGEMENT; PROGRAM; REDUCTION; REGULATIONS; SITES; TRANSPORT; VOLUME
(15) STIMS ACC.NO.: 00S38986
(18) DOC.CIT.: Clark, T. Representing the Illinois Environmental Protection Agency, on hazardous waste management. In Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, IL, Houston, TX, and San Francisco, CA, Dec. 1975. v. 1. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. p. 455-470.

(1) SWIRS ACC.NO.: 039906
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The proceedings of 1975 public meetings on hazardous waste management are reported. The meetings were convened by the Environmental Protection Agency's Office of Solid Waste Management Programs. They were held on December 2 in Newark, New Jersey; on December 4 in Rosemont, Illinois; on December 9 in Houston, Texas; and on December 11 in San Francisco, California. The meetings were attended by members of the public, representatives of industrial firms that generate hazardous waste, and environmentalists. The objective of the meetings was to obtain and disseminate information and recommendations on hazardous waste management issues. Sixteen major discussion topics were addressed during the four meetings: (1) definition of hazardous waste; (2) responsibilities and liabilities of hazardous waste generators; (3) hazardous waste disposal methods; (4) practices for rendering waste harmless; (5) cost data on processes and techniques for the treatment and disposal of hazardous waste; (6) safety; (7) provisions for site monitoring and recordkeeping; (8) availability of insurance and other mechanisms to reduce the risk to operators of private hazardous waste facilities; (9) hazardous waste storage and disposal sites; (10) feasibility methodologies for establishing limits on the amount of hazardous waste generated; (11) transportation safety regulations; (12) labeling; (13) damage costs of improper hazardous waste management; (14) mechanisms for soliciting citizen acceptance of hazardous waste management facilities; (15) hazardous waste generated by Federal facilites; (16) involvement of the private sector in the treatment and disposal of hazardous waste. (Retained in SWIRS library)
(12) KEYWORDS: CONFERENCE; DISPOSAL; ECONOMICS; ENVIRONMENT; EPA; HAZARDOUS; INDUSTRY; INFORMATION; MANAGEMENT; MATERIALS HANDLING; CSWMP; PUBLIC; RESPONSIBILITY; SAFETY; SITES; TRANSPORT; TREATMENT
(15) STIMS ACC.NO.: 00S38950
(18) DOC.CIT.: Corson, A. S. , P. A. Savage, and C. A. Baggatts, eds. Proceedings; the 1975 Public Meetings on Hazardous Waste Management, Newark, NJ, Rosemont, Ill, Houston, TX, and San Francisco, CA, Dec. 1975. 2 V. Office of Solid Waste Management Programs Publication SW-9p. Washington, U. S. Environmental Protection Agency, 1976. 1736 p.

(1) SWIRS ACC.NO.: 039778
(2) DOMESTIC: F (2) CATEGORY: 12 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: A seminar entitled "Disposal of Chemical and Poisonous Waste Avoiding the Legal Pitfalls" was held in Great Britain recently. An initial inspection of legal aspects of waste disposal was followed by a discussion of practical considerations of some disposal options which avoid the legal pitfalls. Site appraisal, physical and chemical compatibility of wastes, engineering construction and operation of landfills and deep well disposal were discussed. Considerations to be made when determining whether to burn wastes were offered. Ocean disposal of industrial wastes was supported by one authority, particularly for odorous wastes, pharmaceuticals, cyanide, and arsenic. Dispersion from a boat was considered very satisfactory and it was pointed out that ocean dumping was a very small contribution to ocean pollution. Developments in the transportation of hazardous wastes were discussed.
(12) KEYWORDS: CHEMICAL; DISPOSAL; GREAT BRITAIN; HAZARDOUS; INDUSTRY; LAW; OCEAN; SAFETY; SANITARY LANDFILL; TRANSPORT
(15) STIMS ACC.NO.: 00538822
(18) DOC.CIT.: Industrial waste--how to lose it legally. Surveyor, 148(4389):29, July 23, 1976.

(1) SWIRS ACC.NO.: 039687
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: U. S. electrical equipment manufacturers are looking for substitutes for the 27 million pounds of polychlorinated biphenyls (PCBs) they use each year as dielectric fluids in capacitors and transformers. This research has been prompted by the controversy over the alleged environmental hazards of PCBs and the prospect of tightened federal controls over their use. Hydrocarbons, chlorobutylated diphenyl oxides, phthalic esters and silicones are now under investigation as possible substitutes for PCBs. Some of the companies and their processes discussed are: Monsanto's MCS 1238; Dow Chemical's XFS 4169L; Exxon Chemical's DINP; and Dow-Corning's DC 561. To date, however, it appears that researchers have found it less difficult to develop a fluid suitable for use in capacitors that for use in transformers.
(12) KEYWORDS: CHEMICAL; ELECTRICAL; ENVIRONMENT; HAZARDOUS; INORGANIC; ORGANIC; POLYCHLORINATED; TOXIC; TRANSPORT
(15) STIMS ACC.NO.: 00538731
(18) DOC.CIT.: The search is on for PCB substitutes. Chemical Week, 118(9):34-35, Feb. 25, 1976.

(1) SWIRS ACC.NO.: 039625
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Sediments in the Hayle estuary in a historical mining area of Cornwall have been found to contain exceptionally high concentrations of tin, arsenic, copper, lead, tungsten, and zinc. In this study, the distribution of these heavy metals is correlated with pollution from past mining activity through mine waste discharge into streams, and changes which took place at the time of the development and the Upton Towans, which are two blown sand deposits separated by the Hayle estuary. One table and three figures illustrate the report.
(12) KEYWORDS: CLAY; GREAT BRITAIN; HAZARDOUS; METAL; MINE; MINERAL; NON-FERROUS; POLLUTION; SAND; SEDIMENTATION; TRANSPORT; WATERWAY
(15) STIMS ACC.NO.: 00538669
(18) DOC.CIT.: Yim, W. W. Heavy metal accumulation in the estuarine sediments in a historical mining of Cornwall. Marine Pollution Bulletin, 7(8), Aug. 1976.

(1) SWIRS ACC.NO.: 039438
(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The carcinogenic potential of various chemicals in drinking water is addressed. Of the wide array of chemical contaminants identified in potable water, some have carcinogenic activity as determined by experimental animal studies. Some appear to be universally distributed both nationally and internationally. Some carcinogenic chemicals may be traced back to point source contamination, while others may be formed or magnified to levels above those in raw water supplies during chlorination processes. Some carcinogenic chemicals fall into use classes such as pesticides, industrial chemicals, and drugs. Not all chemicals classified as having carcinogenic potential, however, can be assessed with regard to their equivalent hazard. Differentiation is necessary to identify those chemicals that are well recognized as classical carcinogens and those that are of an equivocal nature when evaluated in animal studies. Some chemicals may be characterized as potential carcinogens on the basis of structural relationships or ancillary studies on mutagenicity. The integrated result from multiple carcinogens in water supplies may have additive or inhibitory properties.
(12) KEYWORDS: ANALYSIS; CHEMICAL; CLASSIFICATION; DISEASE; DRUGS; HAZARDOUS; HEALTH; PESTICIDE; TRANSPORT; WATER
(15) STIMS ACC.NO.: 00538482
(18) DOC.CIT.: Krayhill, H. F. Origin, classification and distribution of chemicals in drinking water with an assessment of their carcinogenic potential. In Jolley, R. L. , ed. Proceedings; the Conference on the Environmental Impact of Water Chlorination, Oak Ridge National Laboratory, Oct. 22-24, 1975. Oak Ridge, TN, Oak Ridge National Laboratory, 1976. p. 229-246.

(1) SWIRS ACC.NO.: 039142
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: This data sheet, revised by the Chemical Section of the National Safety Council, discusses the health hazards of using mercury and the precautions necessary to avoid these hazards. Emphasis is on reducing the ways mercury vapor may get into the workroom air. Also discussed are shipping and container problems, waste disposal, symtoms of mercury poisoning, threshold limit values, air sampling techniques, ventilation, personal protection and medical examinations for persons who might potentially be exposed to mercury.
(12) KEYWORDS: CONTAINER; CONTROL; HAZARDOUS; HEALTH; MERCURY; MONITOR; OCCUPATION; PROBLEMS; TRANSPORT
(15) STIMS ACC.NO.: 00538186
(18) DOC.CIT.: Mercury. National Safety News, 113(1):69-71, Jan. 1976.

(1) SWIRS ACC.NO.: 039003
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: The collection, transport, and disposal of toxic or hazardous liquid, semisolid, and industrial waste are addressed. It is felt that the producer of such waste and those who handle the waste are responsible for any pollution which may result in collection, transport, and disposal. Liquid industrial waste is defined to include residues, byproducts, and unsalable products from manufacturing for which there is no further economic use, including concentrated pollutants from air and water cleaning operations. The feasibility of centralized disposal plants for industrial waste is discussed, and centralized plants operating in Logan, New Jersey and Chicago, Illinois are noted. Three basic techniques are employed in these plants: thermal stabilization, chemical stabilization, and biochemical stabilization.

Operating problems associated with centralized disposal plants for industrial waste are considered.

(12) KEYWORDS: CENTRALIZED; CHICAGO; COLLECTION; DISPOSAL; FACILITY; HAZARDOUS; ILLINOIS; INDUSTRY; LIQUID; MANAGEMENT; MUNICIPALITY; NEW JERSEY; RESPONSIBILITY; TOXIC; TRANSPORT

(15) STIMS ACC.NO.: 00S38107

(18) DOC.CIT.: Mindler, A. B. The management of toxic or hazardous "liquid" semi-solid and industrial wastes. In Hampton, H. K. , E. R. , Kaiser, and C. O. Velzy, eds. Incinerator and Solid Waste Technology 1962-1975. New York City, The American Society of Mechanical Engineers, 1975. p. 293-297.

(1) SWIRS ACC.NO.: 038834

(2) DOMESTIC: D (2) CATEGORY: 28 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: An updated bibliography on the transport of explosives, rocket propellants, chemical warfare agents, industrial chemicals, chlorine, and other hazardous materials is presented. Transport of radioactive wastes and materials are excluded. All modes of transport are described, such as container types, thermal coated tank cars, and pipeline: accidents, economics, and data are included. This updated bibliography contains 190 abstract. (Document retained in SWIRS library.)

(12) KEYWORDS: ACCIDENT; BIBLIOGRAPHY; CHEMICAL; CHLORIDE; DATA; ECONOMICS; EXPLOSION; HAZARDOUS; INDUSTRY; TRANSPORT

(15) STIMS ACC.NO.: 00S37878

(18) DOC.CIT.: Smith, M. F. , ed. Hazardous materials transportation. p. 1. general studies: a bibliography with abstract. Springfield, VA, National Technical Information Service, May 1976. 190 p. (Distributed by the National Technical Information Service as NTIS/PS-76/0331.)

(1) SWIRS ACC.NO.: 038704

(2) DOMESTIC: D (2) CATEGORY: 02 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Factors effecting pesticide mobility from hazardous waste disposal sites containing high pesticide concentrations were examined. Major consideration was given to the influence of the shape of the adsorption isotherm on pesticide mobility. Equilibrium adsorption of dimethylamine salt of 2,4-D (2,4-Dichlorophenoxy acetic acid) on Webster silty clay loam was measured in the concentration range of 0 to 5000 micrograms/ml. The adsorption isotherm was nonlinear in shape with the exponent in the Freundlich equation equal to 0. 71. The adsorption sites for 2,4-D on the Webster soil were not saturated even in the presence of 5,000 micrograms/ml of 2,4-D (amine salt). The mobility of 2,4-D in the Webster soil at various 2,4-D concentrations was simulated with a numerical solution to the solute transport model. A procedure for estimating the arrival time of a selected pesticide concentration at various soil depths below a disposal site is presented and discussed, as well as simulation results in general.

(12) KEYWORDS: ADSORPTION; HAZARDOUS; MATHEMATICAL MODEL; PESTICIDE; SALT; SANITARY LANDFILL; SIMULATION; SITES; TRANSPORT

(15) STIMS ACC.NO.: 00S37748

(18) DOC.CIT.: Davidson, J. M. , L. T. Ou, and P. S. Rao. Behavior of high pesticide concentrations in soil water systems. In Fuller, W. H. ed. Proceedings; the Residual Management by Land Disposal Proceedings of the Hazardous Waste Research Symposium, University of Arizona, Tucson, Feb. 2-4, 1976. Environmental Protection Publication EPA-600/9-76-015. Cincinnati, OH, U. S. Environmental Protection Agency, July 1976. p. 206-212. (Distributed by the National Technical Information Service, Springfield, VA, as PB 256 768 AS.)

(1) SWIRS ACC.NO.: 038697
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The disposal of hazardous industrial waste sludges by landfilling has the potential for an undesirable environmental impact due to leachate production and concommitant pollutant migration. Chemical fixation of sludges is a viable treatment alternative which may reduce this undesirable environmental impact. The U. S. Army Engineer Waterways Experiment Station (WES), through an interagency agreement with the U. S. Environmental Protection Agency, is currently evaluating fixation technology to assess its role in sludge disposal operations. The current program is divided into three phases involving the characterization of the raw sludges, laboratory leaching and physical testing of raw and fixed sludges, and pilot scale leach testing of raw and fixed sludges. The results presented are confined to one of the five hazardous industrial waste sludges, namely the electroplating sludge. Results of the physical testing to be presented are confined to one of the five hazardous industrial waste sludges, namely the electroplating sludge. Results of the physical testing to be presented include bulk density, void ratio, porosity, specific gravity, and permeability. The results of the leaching tests show that all fixed materials are leaching pollutants to some degree; and comparison between the leaching data for the raw and fixed sludges demonstrates that leaching properties are dependent on the pollutant analyzed.
(12) KEYWORDS: CHEMICAL; DISPOSAL; HAZARDOUS; INDUSTRY; LEACH; PLATING; POLLUTION; SANITARY LANDFILL; SLUDGE; STABILIZATION; TECHNOLOGY; TRANSPORT; TREATMENT
(15) STIMS ACC.NO.: 00S37741
(18) DOC.CIT.: Mahloch, J. L. Leachability and physical properties of chemically stabilized hazardous wastes. In Fuller, W. H. , ed. Proceedings; the Residual Management by Land Disposal Proceedings of the Hazardous Wastes Research Symposium, University of Arizona, Tucson, Feb. 2-4, 1976. Environmental Protection Publication EPA-600/9-76-015. Cincinnati, OH, U. S. Environmental Protection Agency, July 1976. p. 127-139. (Distributed by the National Technical Information Service, Springfield, VA, as PB 256 768 AS.)

(1) SWIRS ACC.NO.: 038695
(2) DOMESTIC: D (2) CATEGORY: 22 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: Disposal or impoundment of hazardous wastes on land presents the potential of these wastes, or leachates of the wastes, seeping into the ground and polluting surface and ground water. The use of impervious barriers to intercept and control this seepage offers a means of reducing and possibly eliminating such pollution. An experimental research project is underway to assess the relative effectiveness and durability of a wide variety of liner materials when exposed to hazardous wastes. The materials under study include soils and clays, soil cements, asphaltic concretes and other asphaltic compositions, and a wide range of polymeric membranes. The polymeric materials used in the manufacture of these membranes include polyvinyl chloride, chlorinated polyethylene, chlorosulfonated polyethylene, ethylene proplene rubber, neoprene, butyl rubber, and elasticized polyolefin, a thermoplastic polyester, and polyurethanes. In this study the liner materials are exposed to such hazardous wastes as strong acids, strong bases, oil refinery tank bottom wastes, lead wastes from gasoline, saturated and unsaturated hydrocarbon wastes, and a pesticide. The experimental procedure followed is described and results of preliminary tests used in the selection of materials of extensive testing are presented.
(12) KEYWORDS: CONTROL; EARTH; EXPOSURE; HAZARDOUS; LEACH; LINER; POLLUTION; POLYMER; RESEARCH; SEEPAGE; TRANSPORT
(15) STIMS ACC.NO.: 00S37739
(18) DOC.CIT.: Haxo, H. E. , Jr. Evaluation of selected liners when exposed to hazardous wastes. In Fuller, W. H. , ed. Proceedings; the Residual Management by Land Disposal Proceedings of the Hazardous Waste

Research Symposium, University of Arizona, Tucson, Feb. 2-4, 1976. Environmental Protection Publication EPA-600/9-76-015. Cincinnati, OH, U. S. Environmental Protection Agency, July 1976. p. 102-111. (Distributed by the National Technical Information Service, Springfield, VA, as PB 256 768 AS.)

(1) SWIRS ACC.NO.: 038692
(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The migration of hazardous materials in soil is largely controlled by the physical and chemical composition of the soil upon which the waste is placed. However, differences in waste composition and leachability cause large differences in migration of specific elements or compounds through a soil. This is demonstrated by comparing the migration of cadmium, leached from four different industrial wastes, through one type of soil. The wastes were nickel/cadmium battery, electroplating, water base paint and inorganic pigment wastes. The soil used in these experiments was Davidson, N. Carolina clay soil which is classified as an Ultisol. Information as to difference in penetration and distribution of the cadmium in the soil is presented and related to difference in the wastes. Major consideration was given to the monitoring of leachate decomposition monitoring and ground water pollution prevention.
(12) KEYWORDS: CHEMICAL; COMPOSITION; DISPOSAL; EARTH; EFFECT; GROUND WATER; HAZARDOUS; INDUSTRY; INVESTIGATION; LEACH; METAL; NON-FERROUS; TRANSPORT
(15) STIMS ACC.NO.: 00537736
(18) DOC.CIT.: Houle, M. J. , R. E. Bell, and D. E. Long. Industrial hazardous waste migration potential. In Fuller, W. H. , ed. Proceedings; the Residual Management by Land Disposal Proceedings of the Hazardous Waste Research Symposium, University of Arizona, Tucson, Feb. 2-4, 1976. Environmental Protection Publication EPA-600/9-76-015. Cincinnati, OH, U. S. Environmental Protection Agency, July 1976. p. 76-85. (Distributed by the National Technical Information Service, Springfield, VA, as PB 256 768 AS.)

(1) SWIRS ACC.NO.: 038685
(2) DOMESTIC: D (2) CATEGORY: 22 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: The Solid and Hazardous Waste Research Division (SHWRD) of the U. S. Environmental Protection Agency, in Cincinnati, Ohio, has responsibility for research in the areas of solid and hazardous waste management, including both disposal and processing. This research is being directed towards (1) new and improved systems of solid and hazardous waste management, (2) development of technology, (3) determination of environmental effects, (4) collection of data necessary for the establishment of processing and disposal guidelines. The Division concentrates on hazardous waste management and disposal, alone and in combination with municipal wastes. SHWRD has divided its hazardous waste research program into two general areas: (1) disposal of hazardous residuals to the land, (2) hazardous waste materials treatment. The overall hazardous waste research program as conducted by SHWRD is currently classified into six categorical areas: (1) identification and characterization of hazardous waste; (2) hazardous waste decomposition; (3) pollutant migration through soils; (4) control technology; (5) specialized waste; (6) alternatives for hazardous waste landfills.
(12) KEYWORDS: CLASSIFICATION; DECOMPOSE; DISPOSAL; EPA; HAZARDOUS; LAND; MANAGEMENT; OHIO; PROGRAM; RESEARCH; SANITARY LANDFILL; TECHNOLOGY; TRANSPORT
(15) STIMS ACC.NO.: 00537729
(18) DOC.CIT.: Schomaker, N. B. Current research on land disposal of hazardous wastes. In Fuller, W. H. , ed. Proceedings; the Residual Management by Land Disposal Proceedings of the Hazardous Waste Research Symposium, Univerity of Arizona, Tucson, Feb. 2-4, 1976. Environmental Protection Publication EPA-600/9-76-015. Cincinnati, OH, U. S. Environmental Protection Agency, July 1976. p. 1-13. (Distributed by the National Technical Information Service Springfield, VA, as PB 256 768 AS.)

(1) SWIRS ACC.NO.: 038574
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Hazardous materials are defined in relation to criteria and regulations for their control. Hazardous materials are considered to be raw materials or finished products. The designation of a product as hazardous for transportation purposes is based on the product having characteristics which, in the event of an unintentional release from its container, would pose a minor to major danger to persons or property. Hazardous material regulations developed by the Department of Transportation are noted, with emphasis on passage of the Transportaion Safety Act of 1974 (P. L. 93-633). The need for developing an improved hazard information system is discussed. Problems involved in the implementation of hazardous material regulations are examined. Activities of the Manufacturing Chemists Association with regard to hazardous materials are reviewed, and the development of a hazard information system by that association is addressed.
(12) KEYWORDS: CONTROL; HAZARDOUS; LAW; PROBLEMS; REGULATIONS; TRANSPORT
(15) STIMS ACC.NO.: 00S37018
(18) DOC.CIT.: Hazardous materials - what are they? Traffic World, 165(13):38-40, Mar. 29, 1976.

(1) SWIRS ACC.NO.: 038306
(2) DOMESTIC: F (2) CATEGORY: 25 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: The possibility for use of Belgian mines for storage of hazardous materials is examined. The Belgian coal deposits form two distinct entities: (1) the south deposits extending along a narrow belt from Liege to Mons and into the north of France; (2) the north or Campine deposit which is an extension of the basins of Aik-la-Chapelle and Dutch Limburg. Geology and mining conditions are discussed for both deposits. An examination of various underground mining cavities in Belgium indicates that the open mines are not suitable for storage of hazardous or toxic wastes because of (1) groundwater contamination; (2) inaccessible passageways which limit transport; (3) gases; (4) still active operations.
(12) KEYWORDS: BELGIUM; FOSSIL FUEL; GEOLOGIC; HAZARDOUS; MINE; PITS; STORAGE; TOXIC; TRANSPORT; UNDERGROUND
(15) STIMS ACC.NO.: 00S37350
(18) DOC.CIT.: Stassen, P. NATO Committee on the Challenge of Modern Society pilot study on the elimination of hazardous wastes. Belgium, National Institute of Extractive Industries, Apr. 30, 1976. 7 p.

(1) SWIRS ACC.NO.: 038302
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: The extraction and analysis of heavy metals leachate at two urban waste landfill sites in Japan are discussed. Contaminated water, permeating from the landfill sites, contributes to soil and crop contamination in the rice fields. An analysis of hazardous wastes in groundwater indicates varying concentrations of heavy metals including iron, manganese, cadmium, chromium and lead. Sources for these unsoluble heavy metals in wastes include incineration ash, polyvinyl chloride products, inorganic pigments, home electric appliances, and manufacturers dumping plating sludge. As a result of anaerobic decomposition, sulfur substances are transformed to hydrogen sulfide. The significant effects of pH and oxidation reduction potential on the extraction of heavy metals are discussed. A considerable concentration of heavy metals is expected to accumulate in the bottom strata of sediment deposits.
(12) KEYWORDS: CONTAMINATE; DATA; FACILITY; GROUND WATER; HAZARDOUS; INDUSTRY; JAPAN; METAL; MUNICIPALITY; PROCESS; SANITARY LANDFILL; SEDIMENTATION; SITES; TRANSPORT
(15) STIMS ACC.NO.: 00S37346
(18) DOC.CIT.: Giken, K. K. Study on the process of generation of industrial wastes containing harmful substances; report of the fiscal year 1974. Japan, Ministry of Health and Welfare, Mar. 1975. 15 p.

(1) SWIRS ACC.NO.: 038249
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: An analysis of factors affecting the fate of mercury in aquatic systems is made using a mathematical model. Three forms of mercury (mercuric, elemental, and methyl) are represented. All forms are considered to be present in both the water and sediment portions of the system. Processes influencing the behavior of mercury forms are assumed to be oxidation, reduction, methylation, demethylation, sorption, sediment/water exchange, volatilization, and longitudinal transport. Environmental factors of importance are pH, concentration of suspended particulates, depth of water, and depth of sediment. Three dimensional graphs (concentration vs. time and distance) are used to portray the temporal behavior of the mercury forms along a stretch of slowly moving stream. Mercuric mercury flows through the reach, partitioning into the sediment as it flows. The spatio temporal pattern of methyl and elemental forms in both water and sediment is controlled largely by the mercuric mercury sorbed to the sediments. This effect and the sensitivity of all the forms to a range of values used for the sediment/water partition coefficient for mercuric ion, lead to the conclusion that sorption is the single most important factor influencing the behavior of mercury in aquatic systems.
(12) KEYWORDS: ANALYSIS; EFFECT; HAZARDOUS; MATHEMATICAL MODEL; MERCURY; OCEAN; TRANSPORT
(15) STIMS ACC.NO.: 00S37293
(18) DOC.CIT.: Lassiter, R. R. , J. L. Malanchuk, and G. L. Laughman. Comparison of processes determining the fate of mercury in aquatic systems. In Ott, W. R. , O. Albrecht, and R. Clark, eds. Proceedings; the Conference on Environmental Modeling and Simulation, Cincinnati, OH, Apr. 19-22, 1976. Environmental Protection Publication EPA-600/9-76-016. Washington, U. S. Environmental Protection Agency, July 1976. p. 619-623.

(1) SWIRS ACC.NO.: 038248
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: A simple mathematical model has been developed to aid in the management of hazardous chemical disposal in sanitary landfill sites. The model is based upon chemical mass balance and incorporates the important physical/chemical parameters: (1) hydrodynamic flow velocity based upon the porosity and hydrodynamic gradient of the porous medium (2) variable water table; (3) variable rainfall; (4) reversible adsorption/desorption phenomena; (5) first order irreversible sorption, if any; (6) first order chemical reaction; (7) first order microbial degradation kinetics. The chemical, which is deposited into the landfill in any time pattern desired, is routed vertically by rainfall infiltration to the water table where movement in the horizontal direction occurs. The simplicity of the model and the resulting computer simulation program permits a ten year run to be computed and plotted automatically for approximately $60. The application of the model for a typical sanitary landfill (Brown's Island Landfill, Salem, Oregon) is demonstrated.
(12) KEYWORDS: CHEMICAL; COMPUTER; DISPOSAL; HAZARDOUS; MANAGEMENT; MATHEMATICAL MODEL; OREGON; SANITARY LANDFILL; TRANSPORT
(15) STIMS ACC.NO.: 00S37292
(18) DOC.CIT.: Elzy, E. , and F. T. Lindstrom. Model of the movement of hazardous waste chemicals for sanitary landfill sites. In Ott, W. R. , O. Albrecht, and R. Clark, eds. Proceedings; The Conference on Environmental Modeling and Simulation, Cincinnati, OH, Apr. 19-22, 1976. Environmental Protection Publication EPA-600/9-76-016. Washington, U. S. Environmental Protection Agency, July 1976. p. 609-613.

(1) SWIRS ACC.NO.: 038141
(2) DOMESTIC: F (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Regulations concerning special and hazardous wastes are summarized, as applicable to the land of Baden-Wuerttemberg. There is only one landfill for special and hazardous waste at Malsch. In 1975

a list of other dumping grounds was compiled. On July 29, 1974, three ordinances were issued concerning the transport of such wastes: ordinance on inventories; ordinance on collection and transport; ordinance on receiving such wastes. Instructions on issuing permits on transport are cited in full. (Original text in German)

(12) KEYWORDS: DISPOSAL; DUMP; GERMANY; HAZARDOUS; INDUSTRY; LAND; LAW; LICENSE; REGULATIONS; SANITARY LANDFILL; TRANSPORT

(15) STIMS ACC.NO.: 00537185

(18) DOC.CIT.: Habel, H. J. Sonderabfaelle. (Special and hazardous waste.) Galvanotechnik, 67(5):357-359, May 15, 1976.

(1) SWIRS ACC.NO.: 038073

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: This document presents the current state of knowledge about the production, usage, and distribution of polychlorinated biphenyls (PCB) in the United States. The information presented is derived from detailed studies on the production and first tier user industries, the past and present generation and disposition of PCB containing wastes, environmental PCB usage, inadvertent losses to and potential formation in the environment, and current regulatory authorities for PCB control. These results indicated that, although PCB content of industrial wastes can be reduced through various approaches such as treatment and substitution, there exists a potentially severe future hazard in the form of large amounts of PCB currently contained in land disposal sites. Further definition of this and other aspects of the PCB problem, and determination of ways to minimize the hazard, are recommended.

(12) KEYWORDS: CONTROL; DEFINITION; DISPOSAL; ENVIRONMENT; HAZARDOUS; INDUSTRY; LAND; POLLUTION; POLYCHLORINATED; PRODUCE; REDUCTION; REGULATIONS; TRANSPORT; US; UTILIZE; WASTE WATER

(15) STIMS ACC.NO.: 00537117

(18) DOC.CIT.: Durfee, R. L. , G. Contos, and F. C. Whitmore. PCB in the United States: industrial use and environmental distributions. Environmental Protection Publication EPA 560/6-76-005. Washington, DC, U. S. Environmental Protection Agency, Feb. 25, 1976. 464 p. (Distributed by National Technical Information Service, Springfield, VA, as PB252012.)

(1) SWIRS ACC.NO.: 037911

(2) DOMESTIC: F (2) CATEGORY: 10 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The bacteriological hazard of open field latrines in northern areas has been assessed. Human enteric bacteria were demonstrated to persist, in rather high numbers, for at least nine months in open latrine sites. The bacteria penetrate the subsurface, but lateral migration is minimal except during spring thaw. During this period, virtually all water collected near winter bivouac areas was shown to be contaminated with enteric bacteria. Snow collected for the production of drinking water during winter exercises was shown to be free of contamination provided it is not collected too near latrine sites. Sampling methods and bacteriological analysis of fecal and soil material are discussed and shown in two tables.

(12) KEYWORDS: ALASKA; ANALYSIS; BACTERIA; CANADA; COLIFORM; CONTAMINATE; EARTH; FECES; HAZARDOUS; HUMAN; MEASUREMENTS; PATHOGEN; SAMPLING METHODS; SNOW; TRANSPORT

(15) STIMS ACC.NO.: 00536955

(18) DOC.CIT.: White, L. A. , and M. R. Spence. Persistence of human enteric bacteria in the Canadian North. Canadian Journal of Public Health, 67(1):25-29, Jan. /Feb. 1976.

(1) SWIRS ACC.NO.: 037891

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Hazardous waste problems are discussed in relation to ground water contamination via leachate, surface water contamination via runoff, air pollution via burning, evaporation, sublimation, wind

erosion, poisonings due to direct contact with and through the food chain, and fires and explosions at land disposal sites. Hazardous waste may involve chemical, biological, flammable, explosive, or radioactive substances. Physically, hazardous waste can be in the form of liquids, solids, sludges, and gases. Most hazardous or toxic waste can be categorized as inorganic toxic waste is discussed, with emphasis on the Hazardous Materials Transportation Act of 1974, Federal Water Pollution Control Act Amendments of 1972, regulations that apply to the disposal of hazardous waste, existing disposal practices, landfill disposal, chemical fixation, incineration, chemical and pretreatment methods, deep well disposal, ocean dumping, and microwave decomposition. International disposal techniques for other than high level solid radioactive waste are noted, including shallow land burial, disposal into mines and deep geological formations, deep sea disposal, deep well disposal, and packaging.

(12) KEYWORDS: BIOLOGICAL; BURY; CHEMICAL; DECOMPOSE; DEEP WELL; DISPOSAL; DUMPING; EPA; HAZARDOUS; INCINERATION; MANAGEMENT; MINE; OCEAN; PACKAGING; RADIOACTIVE; REGULATIONS; SANITARY LANDFILL; TOXIC; TREATMENT

(15) STIMS ACC.NO.: 00536935

(18) DOC.CIT.: Cheremisinoff, P. N. , and W. F. Holcomb. Management of hazardous and toxic wastes. Pollution Engineering, 8(4):24-32, Apr. 1976.

(1) SWIRS ACC.NO.: 037671

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Guidelines are presented for emergency personnel and/or shippers and carriers to protect themselves and the general public against hazardous materials, to identify hazardous materials, and to determine the proper agencies to contact to receive assistance in the cleanup and removal of hazardous materials. Classes of hazardous materials are delineated as follows: explosives, flammable liquids, combustibles, flammable solids, oxidizing materials, corrosive liquids, nonflammable compressed gases, flammable compressed gases, poisons (Class A, liquids and gases), poisons (Class B, liquids and solids), irritating materials, and radioactive materials. Labeling requirements for hazardous materials are examined, and Federal regulations governing the transportation of dangerous articles are described which require the use of placards on the outside of trucks and railroad cars. General loading requirements are detailed, along with shipping procedures, waybills, and manifests. Driving and parking rules in the transportation of hazardous materials are noted. Telephone numbers are listed that may be called in the event of an incident involving the transport of hazardous materials. A commodity list of dangerous articles is provided.

(12) KEYWORDS: CLASSIFICATION; FEDERAL; HAZARDOUS; REGULATIONS; TRANSPORT

(15) STIMS ACC.NO.: 00536715

(18) DOC.CIT.: Benrendsen, D. J. Guidelines to the handling of hazardous materials. Denver, Source of Safety, Inc. , 1976, 80 p.

(1) SWIRS ACC.NO.: 037597

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Treatment facilities in Switzerland that annually handle 10,000 and 30,000 tons are described. These facilities accept all types of industrial waste solutions, acid, alkaline, cyanide, metal containing and other special solutions. The materials or solutions are delivered to the plant in plastic containers. Larger quantities can be transported in a center-owned 15 ton suction tank semitrailer. The substances are segregated by type and analyzed before treatment is begun. Careful monitoring at each step assures an effluent which meets regulations. A specialized treatment center of this type is rapidly

becoming a necessity in order to protect public waters from non-decontaminated waste waters.

(12) KEYWORDS: CONTAINER; DESIGN; EUROPE; FACILITY; FILTER; HAZARDOUS; INDUSTRY; ION EXCHANGE; PLASTIC; PRECIPITATE; PROCESS; SLUDGE; STORAGE; SWITZERLAND; TOXIC; TRANSPORT; TREATMENT; WASTE WATER

(15) STIMS ACC.NO.: 00536641

(18) DOC.CIT.: Anon. Detoxifying industrial wastewaters. Environmental Science and Technology, 10(2):127-129, Feb. 1976.

(1) SWIRS ACC.NO.: 037567

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The decomposition of chemicals to environmentally innocuous substances is examined. Field and laboratory data are being collected by the Environmental Protection Agency (EPA) to assess and model sources and sinks of synthetic chemicals. EPA has established a 15-member pollutant and transformation advisory committee to investigate a pollutant's entrance and fate in the environment. The committee will evaluate existing data on pollutant translocation, pollutant transmutation after interaction with other systems, and the implications of these alterations on EPA rulemaking. In an effort to develop early warning systems, EPA will monitor the presence and activity of suspected carcinogens in environmental media, under a 5-yr assessment program that has received initial funding of $1.1 million. In addition to activities within EPA, many basic research and modeling efforts are being undertaken at universities and private companies. The fate of synthetic chemicals in aqueous media is discussed, as well as the effect of such chemicals on soils. Emphasis is placed on the effect of pesticides and pathways for chemical decomposition. It is pointed out that ultraviolet radiation from the sun is sufficiently energetic to bring about photochemical transformation of xenobiotics dispersed in natural environments. The use of mathematical models to describe the transport or transformation of pollutants is addressed.

(12) KEYWORDS: CHEMICAL; CONVERT; DECOMPOSE; EFFECT; ENVIRONMENT; EPA; HAZARDOUS; MONITOR; POLLUTION; PROGRAM; TRANSPORT

(15) STIMS ACC.NO.: 00536611

(18) DOC.CIT.: Anon. Tracking the elusive pollutant. Environmental Science and Technology, 10(7):640-641, July 1976.

(1) SWIRS ACC.NO.: 037507

(2) DOMESTIC: F (2) CATEGORY: 07 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Options for the reclamation, treatment, and disposal of waste are offered. The options are categorized as follows: (1) recycling, reuse, and reclamation; (2) disposal on land and land reclamation (shredding, high density baling, composting, untreated waste, and transport as an element of disposal by land), (3) thermal treatment and energy recovery (incineration and the use of waste as fuel in conventional boilers); (4) sea disposal; (5) treatment and disposal of hazardous waste; and (6) disposal of awkward or bulky household waste. Approximately 18 million tons of household and commercial waste are disposed of annually in Great Britain, along with 3 million tons of building waste, 23 million tons of general industrial waste, and 12 million tons of power station waste. In addition, about 60 million tons of mining waste and 50 million tons of quarrying waste are produced each year. Waste disposal options are detailed, and research projects on disposal techniques are noted which pertain to pyrolysis and the microbial and chemical conversion of waste. An economic evaluation of waste disposal plans is presented, with emphasis on how to measure the benefits, financial costs, and environmental effects of a plan. An example of a waste disposal strategy is provided.

The use of a transportation model in the allocation of waste is discussed.

(12) KEYWORDS: CHEMICAL; COMPOSTING; DISPOSAL; DOMESTIC; EARTH; ECONOMICS; ENERGY; FUEL; GREAT BRITAIN; HAZARDOUS; INCINERATION; MICROORGANISM; PYROLYSIS; RECLAMATION; RESEARCH; TRANSPORT; TREATMENT; VOLUME

(15) STIMS ACC.NO.: 00536551

(18) DOC.CIT.: Great Britain Department of the Environment. Reclamation, treatment and disposal of wastes: an evaluation of available options. Waste Management Paper No. 1. London, Her Majesty's Stationery Office, 1976, 42 p.

(1) SWIRS ACC.NO.: 037256

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Significant aspects of industrial waste control and disposal are examined. Hazardous industrial waste disposal techniques in the United Kingdom are reviewed in relation to legislative controls introduced by the 1972 Deposit of Poisonous Waste Act. Methods utilized by the private sector in disposing of hazardous waste are also noted. It is felt that the Deposit of Poisonous Waste Act has the effect of concentrating wastes on a few specific sites, thereby reducing the possibility for natural biodegradation of chemical wastes. This concentration effect has resulted in two adverse side effects: (1) transportation of waste over long distances to acceptable sites; and (2) significant increase in disposal costs. It is suggested that a realistic approach to the problem of industrial waste be adopted which involves maximizing the use of natural biodegradation in landfill sites and the use of existing high capital cost treatment and incineration facilities for certain categories of waste. Tipping and leachate problems are discussed, and the following methods of waste disposal are examined: formation of lagoons from inert media for aqueous wastes, direct discharge of aqueous waste into the face of a tip using the absorbent capacity of fresh refuse, creation of drying beds from inert media, and direct discharge of sludge into the base of a tip's face which can then be quickly covered with other refuse.

(12) KEYWORDS: DISPOSAL; ECONOMICS; GREAT BRITAIN; HAZARDOUS; INDUSTRY; LAW; LEACH; PRIVATE; PROBLEMS; SANITARY LANDFILL; TRANSPORT

(15) STIMS ACC.NO.: 00536301

(18) DOC.CIT.: Massey, D. K. Some views on industrial waste control. Solid Wastes, 66(3):111-116, Mar. 1976.

(1) SWIRS ACC.NO.: 037252

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Movement of poliovirus I (Chat) through nonsterile core samples of a sandy forest soil was monitored, using several regimens of loading with either dechlorinated final effluent from an operating activated sludge treatment plant or distilled water. Simulated cycles of rainfall and effluent applications, resulting in ionic gradients, were shown to affect virus movement. Such studies indicate that poliovirus applied in effluents may move considerable distances through this soil after rainfall. Survial of poliovirus in the soil at 4 and 20 degrees C has been monitored for 84 days. During this period, the capacity of the virus to migrate is unchanged. (Author Abstract)

(12) KEYWORDS: ACTIVATED SLUDGE; DISCHARGE; EARTH; EFFLUENT; FACILITY; FORESTRY; HAZARDOUS; MONITOR; PATHOGEN; SAMPLING METHODS; SAND; SIMULATION; TRANSPORT; TREATMENT; VIRUS

(15) STIMS ACC.NO.: 00536297

(18) DOC.CIT.: Duboise, S. M. , B. E. Moore, and B. P. Sagik. Poliovirus survival and movement in a sandy forest soil. Applied and Environmental Microbiology, 31(4):536-543, Apr. 1976.

(1) SWIRS ACC.NO.: 037121
(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: Solid waste management planning in Los Angeles County, California is reviewed. California's Solid Waste Management and Resource Recovery Act of 1972 establishes local government as being primarily responsible for providing adequate solid waste management and planning, with the State being responsible for the development and maintenance of State policy and a State solid waste resource recovery program. The organization of Los Angeles County's solid waste management plan is described, with emphasis on the restructuring of an existing county solid waste management committee to include an executive council, advisory council, staff support, and 11 working groups or task forces related to the following plan elements: goals and objectives, waste production, waste collection, waste storage, hazardous waste management, litter and indiscriminate dumping, resource recovery, waste transfer and haul, waste disposal, financing, and plan implementation. Salient features of the waste production element of the plan are detailed. Major issues in plan implementation are identified which relate to materials and energy recovery technology, landfill site locations, standards for the storage of wastes on premises at the source, and organizational structure.
(12) KEYWORDS: BOARD; COLLECTION; CONFERENCE; COUNTY; DUMPING; HAZARDOUS; LAW; LOCAL; LOS ANGELES; MANAGEMENT; PERSONNEL; PLANNING; RECLAMATION; STANDARD; STORAGE; TRANSPORT
(15) STIMS ACC.NO.: 00S36166
(18) DOC.CIT.: Brandt, H. T. Los Angeles County solid waste management plan. In: Proceedings; Fifth Annual Symposium of the Los Angeles Regional Forum on Solid Waste Management, University of California, Los Angeles, May 21, 1975. Torrance, CA, Los Angeles Regional Forum on Solid Waste Management, 1976, 160 p. (p. 117-126).

(1) SWIRS ACC.NO.: 037029
(2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: Consideration is given to the problems of air cargo handling of "Rental Articles" or hazardous materials which include about 2,200 different items ranging from newsprint ink to radioactive pharmaceuticals. Pan American World Airways program consists of training employees, particularly those handling cargoes, to recognize these restricted hazardous materials and to take appropriate measure to ensure safe handling. Twelve classroom sessions deal with subjects such as identification and proper shipping certification of restricted articles, processing, packaging or damage involving magnetized materials, poisons, radioactive materials, etc. Cargo manuals and rule-books are kept updated. Not only will quality control inspection of restricted articles be assigned to loading and receiving docks, but to the aircraft as well.
(12) KEYWORDS: AIRCRAFT; ANALYSIS; CONTROL; FAA; HAZARDOUS; INDUSTRY; MANAGEMENT; PERSONNEL; PROGRAM; RADIOACTIVE; TRAINING; TRANSPORT; TRANSPORTATION TERMINAL
(15) STIMS ACC.NO.: 00S36074
(18) DOC.CIT.: Townsend, T. J. Recognizing and handling restricted articles. International Civil Aviation Organization Bulletin, 31(1):21-22, Jan. 1976.

(1) SWIRS ACC.NO.: 036792
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: The storage of chemical waste products from raw material industries requires the use of on-site deposits due to the large volumes obtained. Because of high levels of ground water and the relatively thick alluvial soil, deposits should remain above ground. Special problems arise when the wastes contain water soluble hazardous materials which can be transported in a liquid medium. The choice of waterproofing for impervious diked tanks entails the additional consideration of settlements, attacks by chemical action and the

construction of a weatherproof installation corresponding to the requirements of the building site. (Original text in German.)

(12) KEYWORDS: CHEMICAL; DUMP; DUMPING; ENVIRONMENT; FACILITY; GERMANY; GROUND WATER; HAZARDOUS; PLANNING; SPECIAL; STORAGE; TRANSPORT; WATER

(15) STIMS ACC.NO.: 00535837

(18) DOC.CIT.: Woenken, K. , and H Kunz. Planning and experiences with dumps of special wastes in the country around Nordenham. (Sonderdeponien im Raum Nordenham-Planungen und Erfahrungen.) Wasser und Boden, 27(5):103-105, May 1975.

(1) SWIRS ACC.NO.: 036569

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: The need for improved technical and other information for meeting emergencies related to the transporation of hazardous materials is examined. The Chemical Hazards Response Information System (CHRIS) under development by the Coast Guard is evaluated as a prototype system for all modes of transportation. CHRIS is composed of three reference guides or data bases and a central headquarters organization for developing, implementing, supporting, and maintaining the system for evaluating multimodal accidents in the transportation of hazardous materials. Basic system concepts are discussed for extending CHRIS to all modes of transportation. It is concluded that CHRIS expansion would be beneficial in reducing hazards associated with the transport of chemicals. Such an expanded information system would be composed of a decentralized organization providing response guidance on request to local emergency services personnel, computerized hazard assessment system operated at headquarters, and reference manuals furnished to all response organizations. (Author Abstract Modified)

(12) KEYWORDS: ACCIDENT; CHEMICAL; COMPUTER; DATA; HAZARDOUS; INFORMATION; MANUAL; RESEARCH; SYSTEM; TRANSPORT

(15) STIMS ACC.NO.: 00535013

(18) DOC.CIT.: Allan, D. S. , and G. H. Harris. Chemical hazards response information system for multimodal accidents (CHRISMA): a reevaluation of CHRIS for all modes of transportation. Report No. CG-D-148-75. Washington, Department of Transportation, Apr. 1975, 123 p.

(1) SWIRS ACC.NO.: 036454

(2) DOMESTIC: D (2) CATEGORY: 28 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The development of a hazardous waste management program at the State level is discussed, with emphasis on hazardous waste transportation control. Elements of a comprehensive hazardous waste management program must include reporting by waste generators, regulation of temporary waste receptors (storage and transfer facilities), regulation of permanent waste receptors (reprocessing, treatment, and disposal facilities), and regulation of waste transportation. Elements of a hazardous waste transportation control program are discussed, along with techniques for implementing such a program. Consideration is given to the scope of regulation for a waste trasportation control system, recommended requirements and procedures for State programs (permit system, equipment identification, hazardous waste shipping papers, accident and incident reporting, equipment inspections, and recordkeeping), data handling (permit application, hazardous waste shipping papers, and accident and incident reporting), automatic data processing (coding systems and quality control), State agency roles, interstate cooperation, equipment operator training, program resources, and Federal programs. Appendices provide information on specific waste transportation applications and Federal and State transport regulations.

(12) KEYWORDS: COMPUTER; CONTROL; EQUIPMENT; FEDERAL; HAZARDOUS; INFORMATION; MANAGEMENT; MANUAL; PERSONNEL; REGULATIONS; STATE; TECHNOLOGY; TRANSPORT

(15) STIMS ACC.NO.: 00535499

(18) DOC.CIT.: Porter, C. H. State program implementation guide: hazardous waste transportation control. Environmental Protection Agency Publication EPA-530/SW-512. Washington, U. S. Environmental Protection Agency, 1976, 35 p. (Solid Waste Management Series.)

(1) SWIRS ACC.NO.: 036438
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Hazardous materials are addressed in the consolidation of Department of Transportation (DOT) regulations related to aeronautics and space, shipping, and transportation aspects of hazard control. Specific topics considered in the consolidation of DOT regulations include transportation of dangerous articles and magnetized materials (Federal Aviation Administration), transportation or storage of explosives and other dangerous articles or substances and combustible liquids on board vessels (Coast Guard), and transportation of hazardous materials (DOT). A hazardous materials table is provided which lists materials in alphabetical order along with their proper shipping name, hazard class, label(s) required, exceptions, and packaging and other requirements for transporting and shipping.
(12) KEYWORDS: CLASSIFICATION; COMBUSTIBLE; FEDERAL; HAZARDOUS; MAGNET; PACKAGING; REGULATIONS; SHIP; STORAGE; TRANSPORT
(15) STIMS ACC.NO.: 00S35483
(18) DOC.CIT.: Department of Transportation. Hazardous materials regulations. Federal Register, 41(74):15972-16131, Apr. 15, 1976.

(1) SWIRS ACC.NO.: 036424
(2) DOMESTIC: F (2) CATEGORY: 16 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975
(11) ABSTRACT: Several special waste burning plants, intended mainly for hazardous refuse, are either under construction or planned. Canton Zurick participates in the construction of anorganic solution burning plant at Turgi, to be put in commission in summer of 1975. Cantons Zurich and Aargau and the City of Zurich plan a facility for burning organic materials in the industrial region of Dietikon. The final tailings from these two plants would then be dumped in Aargau in a special dumping ground for hazardous wastes. Several designated dumping grounds would be used for oil-polluted wastes. The Dietikon project is described in detail. It is planned for 336 tons of hazardous wastes per week. The wastes would be transported in special 6-ton motor trucks. (Original text in German.)
(12) KEYWORDS: CONSTRUCTION; FACILITY; HAZARDOUS; INCINERATION; MANAGEMENT; MUNICIPALITY; OIL; SANITARY LANDFILL; SWITZERLAND; SYSTEM; TRANSPORT
(15) STIMS ACC.NO.: 00S35469
(18) DOC.CIT.: Anon. Cantonal incinerator for hazardous waste. (Kantonale verbrennungsanlage fuer sondermuell.) Schweizerische Bauzeitung, 93(16):235-236, 1975.

(1) SWIRS ACC.NO.: 036084
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: Criteria used by 23 hazardous substance classification systems to define a hazardous substance are described. The predominance of Federal classification systems is explained by the number of Federal statutes mandating the regulation of hazardous substances in food, in transport, in the work environment, and in the air and water environment. It is noted that the supply component of military services used hazard ratings to help determine precautions needed for the storage and shipment of materials. Only California's classification system has been developed for the purpose of comprehensively managing hazardous wastes, including their transport and disposal. Criteria used by each of the hazardous substance classification systems are presented in tabular form, with every system utilizing toxicological criteria in determining whether a substance should be classified as hazardous. Many systems utilize the toxicology criterion as the primary screen for identifying hazardous substances, although their focus is on acute rather than chronic toxicity data. The source of criteria for each hazardous substance classification system is noted, if available. A report appendix lists standards recommended

by NIOSH (National Institute for Occupational Safety and Health) for various hazardous substances.

(12) KEYWORDS: CLASSIFICATION; DATA; FEDERAL; FOOD; HAZARDOUS; PERSONNEL; REGULATIONS; STORAGE; SYSTEM; TOXIC; TRANSPORT

(15) STIMS ACC.NO.: 00S35129

(18) DOC.CIT.: Kohan, A. M. A summary of hazardous substance classification systems. Cincinnati, HO, U. S. Environmental Protection Agency, Dec. 1975, 55 p.

(1) SWIRS ACC.NO.: 036029

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: Some case histories of damage occasioned by improper land disposal of hazardous wastes are briefly described. Six major routes of environmental transport by which the damage is effected are noted: groundwater contamination via leachate; surface water contamination via runoff; air pollution via open burning, evaporation, sublimation, and wind erosion; poisoning via direct contact; poisoning via the food chain; and fire and explosion. A total of 14 cases is described.

(12) KEYWORDS: DISPOSAL; EVAPORATION; EXPLOSION; FOOD; GROUND WATER; HAZARDOUS; HISTORY; POLLUTION; SANITARY LANDFILL; TRANSPORT; WATER

(15) STIMS ACC.NO.: 00S35074

(18) DOC.CIT.: Lazar, E. C. Damage incidents from improper land disposal. Journal of Hazardous Materials, 1:157-164, 1975/76.

(1) SWIRS ACC.NO.: 035885

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: In recent years a number of potential emergency situations have arisen following traffic accidents or fires involving chemicals. In an attempt to minimize the danger from such incidents, an emergency advice scheme has been established by the Chemical Industries Association of Great Britain in collaboration with the British Central Government. As part of the scheme, chemical companies are providing information to facilitate the identification of products and their hazards and advice for their safe treatment in an emergency. The information is being organized so that it can easily be searched using a computer-based information retrieval system. The data being collected initially are related to the requirements of the public emergency services, but they can be extended to meet the needs of other organizations.

(12) KEYWORDS: ACCIDENT; ANALYSIS; CHEMICAL; GOVERNMENT; GREAT BRITAIN; HAZARDOUS; INDUSTRY; MANAGEMENT; PROBLEMS; SAFETY; TRANSPORT

(15) STIMS ACC.NO.: 00S34930

(18) DOC.CIT.: Cumberland, K. F. , and M. D. Hebden. A scheme for recognizing chemicals and their hazards in an emergency. Journal of Hazardous Materials, 1(1):35-43, Sept. 1975.

(1) SWIRS ACC.NO.: 035748

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: Union Carbide Corporation has prepared a "Hazard Information in Transportation" report in order to gain support for its comprehensive hazardous materials transit plan. According to the report, the plan replaces numbers with words and symbols for the identification of primary, secondary, and tertiary risks of materials in transit. The symbols would be in accord with upcoming international hazard identification systems. The plan provides outlines for the revision of container labels and shipping documents. Hazards will be identifiable without a manual, but a manual will be provided to complement symbolic data. This should increase the safety of those who deal with hazardous shipments and reduce the administrative load for

shippers and carriers. The plan also identifies all hazards involved in "mixed shipments" of multiple products which can be flammable, corrosive, poisonois, or have similar dangerous properties.

(12) KEYWORDS: HAZARDOUS; INDUSTRY; MANAGEMENT; PLANNING; SAFETY; SYSTEM; TRAINING; TRANSPORT

(15) STIMS ACC.NO.: 00534793

(18) DOC.CIT.: Union Carbide seeks industry support for its hazardous materials transit plan. American Paint and Coatings Journal, 60(23):16, 18, Nov. 17, 1975.

(1) SWIRS ACC.NO.: 034462

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Internationally, efforts have been going on in the last few years to improve the safety aspects of movement and handling of hazardous chemicals. The two areas of greatest concentration are the retention of the chemicals within their conveying units and the development of an operational system to deal quickly and properly with accidents or escapes that may occur. Safety aspects which have been developed so far include: (1) Packaging for conveyance by rail, truck (to withstand a fall from a truck) and sea (to withstand leakage for up to 3 months or until recovery). The aim is to ensure that package contents are retained despite relatively poor handling; (2)) General instructions which designate routing, marking for danger, product identification and codes of practice for loading and off-loading for hazardous materials; (3) Hazard coding, using an abbreviated coding system to identify the chemical and provide instructions for emergency advice and assistance. It is suggested that codes appear on the outside of the containers, and also the conveyance which will not only identify the chemical involved, but give instructions for emergency procedures to be followed until local fire authorities arrive. Segregation of hazardous products from food and clothing and from other chemicals likely to interact is already required for sea, air, and land transport. More and more warehouses are adopting the same standards.

(12) KEYWORDS: CHEMICAL; HAZARDOUS; INTERNATIONAL; PACKAGING; SAFETY; STANDARD; TRANSPORT

(15) STIMS ACC.NO.: 00533506

(18) DOC.CIT.: Meadowcroft, A. E. IV Environmental protection in the distribution of hazardous chemicals. Chemical Society Reviews, 4(1):99-106, 1975.

Section 6
PROCESSING, DISPOSAL, AND SITING

(1) SWIRS ACC.NO.: 048102
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Verfahren zur Verfestigung und Einkapselung von Sonderabfallen zum Zwecke der Ablagerung. (Solidification and encapsulation of special wastes for disposal).
(4) AUTHOR: Ronneburger J
(6) JOURNAL TITLE: Chemie-Ingenieur-Technik
(10) LANGUAGE: GM (10) PUB. YEAR: 1976
(11) ABSTRACT: Difficulties in treatment and disposal of liquids, slurries and sludges are increased by their nonsolid state. Problems are also caused by special wastes due to their generally high content of harmful substances as well as other hazardous properties. Transformation of such special wastes into solid and largely nonreactive products could offer a possibility of avoiding the difficulties at conventional disposal facilities. Solidification processes are also of interest because they open a way to dispose of wastes not only at special waste disposal facilities but also jointly with residential wastes at ordinary landfills. Recently solidification processes have been developed and are, in part, commercially applied in various countries. Utilization or landfill disposal of the solidification products demands the definition of certain minimum requirements. Requirements with regard to water pollution prevention (e.g. leachability) are more difficult to formulate than other requirements unrelated to water protection (e.g. strength).
(12) KEYWORDS: DISPOSAL; FACILITY; HAZARDOUS; LIQUID; REGULATIONS; SLUDGE; SLURRY; SOLID; TREATMENT
(14) HIERARCH TERMS: 1HC/2DP; 1AV
(15) STIMS ACC.NO.: 00547155
(16) CITATION: 50(5):329-331, May 1978.

(1) SWIRS ACC.NO.: 047465
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Field verification of hazardous waste migration from land disposal sites.
(4) AUTHOR: Gibb JP
(6) BOOK TITLE: In Disposal of Residues on Land Proceedings: National Conference on Disposal of Residues on Land, St. Louis, MO, Sep. 13-15, 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2II (10) PUB. YEAR: 1977
(11) ABSTRACT: Soil coring is noted as an effective tool for mapping migration patterns of chemical pollutants through earth materials. A field study was conducted in Illinois to verify the migration of hazardous waste from land disposal sites. An extensive drilling program to obtain unconsolidated sediment cores and groundwater samples was undertaken at each site. Chemical analyses of core and groundwater samples were performed to define vertical and horizontal migration patterns of chemical pollutants through shallow glacial deposits and aquifer profiles, seasonal variations of toxic chemical levels in groundwater, and residual toxic chemical buildup in unconsolidated materials in the vicinity of land disposal sites. In addition to being effective in mapping migration patterns of chemical pollutants, soil coring also provided field data to verify the

effectiveness of various soil types to absorb or retain different chemical pollutants. (Retained in SWIRS library).
(12) KEYWORDS: ANALYSIS; CHEMICAL; DISPOSAL; GROUND WATER; HAZARDOUS; ILLINOIS; INVESTIGATION; LAND; SITES
(14) HIERARCH TERMS: 1HC/2AN; 1ST
(15) STIMS ACC.NO.: 00S46519 (15) SECONDARY AUTHORS: Cartwright K
(16) CITATION: Rockville, MD, Information Transfer Inc., 1977. p.179-184.

(1) SWIRS ACC.NO.: 047047
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Profile report: gelatinized nitrocellulose (PNC) (523).
(4) AUTHOR: Blumenthal JL
(5) CORPORATE AUTHOR: TRW Systems Group
(6) BOOK TITLE: In Hazardous Waste Disposal Program, Eighth Monthly Report.
(8) NTIS NO.: PB-257 331 (8) REPORT NO.: TRW-21485-6008-TU-00 (9) CONTRACT NO.: EPA-68-03-0069
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The hazardous properties and management of plastisol nitrocellulose (PNC) waste are discussed. PNC is generally not considered toxic as such or reactive with the skin. In a wet condition, however, solvents used in its manufacture or for shipping may be dangerous and present the greatest toxicity hazard in handling. Dry PNC is an extreme fire hazard and proper care should be taken in its handling and storage. PNC is less dangerous when stored wet with solvents or water. Due to the flammability of many solvents, a fire hazard still exists. The sensitivity of PNC to fire and explosion, as with nitrocellulose, requires that all scrap and waste from preparation be maintained in a wet state for destruction. Waste PNC should be collected in drums or fiberboard containers lined with conductive polyethylene bags. Open burning and controlled incineration are described as two disposal processes. The treatment of PNC waste in national disposal sites is evaluated. (Retained in SWIRS library).
(12) KEYWORDS: CHEMICAL; DISPOSAL; HAZARDOUS; MANAGEMENT; PROCESS; SITES
(14) HIERARCH TERMS: 1HC/2DP; 1HC/2PT; 1MA/2TQ
(15) STIMS ACC.NO.: 00S46100 (15) SECONDARY AUTHORS: Clausen JF; Dal Porto DF
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sep. 1972. p.165-169.

(1) SWIRS ACC.NO.: 046894
(2) DOMESTIC: D (2) CATEGORY: 09
(4) AUTHOR: Reeder LR
(5) CORPORATE AUTHOR: Louis R. Reeder and Associates
(6) BOOK TITLE: Review and Assessment of Deep-Well Injection of Hazardous Waste. V. II.
(8) NTIS NO.: PB-269 002 (8) REPORT NO.: EPA-600/2-77-029b (9) CONTRACT NO.: 68-03-2013
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: This second volume of a four-volume report focusing on the adequacy of deep well injection systems to receive hazardous waste includes a bibliography, patents related to deep well systems, and waste characterization profiles. A total of 105 deep well research projects are identified, and more than 1,000 papers related to deep well injection of industrial waste have been reviewed. The effect of hazardous waste received by deep well injection systems on the environment is examined. Also considered and/or included are microbiological research, deep well and hazardous waste research, legal

aspects, statutes and regulations governing waste injection, case histories, and a deep well inventory. (Retained in SWIRS library).
(12) KEYWORDS: BIBLIOGRAPHY; DEEP WELL; DISPOSAL; HAZARDOUS; INDUSTRY; PATENT
(14) HIERARCH TERMS: 1DE; 1HC/2DP
(15) STIMS ACC.NO.: 00S45947 (15) SECONDARY AUTHORS: Cobbs JH; Field JW Jr
(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, Jun. 1977. 493 p. (Environmental Protection Technology Series).

(1) SWIRS ACC.NO.: 046854
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Storing and transporting of barrels under observation of anti-pollution control.
(4) AUTHOR: Vogel C
(6) JOURNAL TITLE: Foerdern und Heben
(10) LANGUAGE: GM (10) GEO. AREA: 1EU/2SU (10) PUB. YEAR: 1976
(11) ABSTRACT: Measures are outlined for regulating the handling and storage of barrels with harmful liquids in a Swiss industrial enterprise. Recently developed auxiliary means for transport, tilting, and storage are delineated. Regulations in Switzerland require barrel sites to have a trap basin for preventing leakage in designated groundwater regions. The cylindrical barrels have a capacity of 200 l and a weight of 200-300 kg. Handling and transporting a full barrel annually necessitates considerable expenditure and presents certain injury risks. Indoor transportation of barrels is handled by fork lift trucks using barrel pallets for laying barrels, or wooden pallets (type 1 800 x 1200 mm) for upright barrels. This method is unsatisfactory and to overcome this shortcoming in a large Swiss plant, a new storage and transporting method was introduced which meets groundwater conservation regulations. "Barrel-boys" have been designed which are capable of picking up a 300 kg barrel from a laying to an upright position safely and without effort. (Original text in German).
(12) KEYWORDS: HAZARDOUS; INDUSTRY; PROCESS; STORAGE; SWITZERLAND; TRANSPORT
(14) HIERARCH TERMS: 1HC; 1SW/2C2; 1TT/2MX
(15) STIMS ACC.NO.: 00S45906
(16) CITATION: 26(9):974-975, Jul. 1976.

(1) SWIRS ACC.NO.: 047491
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Twin Cities return $3,700,000 EPA grant.
(4) AUTHOR: Genis B
(6) JOURNAL TITLE: Environment Midwest
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2MN/3MP (10) PUB. YEAR: 1978
(11) ABSTRACT: An interview with B. Genis, a member of the Minnesota Pollution Control Board committee set up to facilitate the siting of a hazardous waste disposal facility, explains why attempts to find an acceptable site in the Minneapolis, Minnesota, area failed. The Twin Cities area has returned an EPA grant of $3.7 million for construction of such a facility after the committee failed to find a site. The committee first considered technical requirements for siting, and involved citizens groups and public reactions wherever feasible. The technical input to the siting evaluation project was considered useful and valid, but public opposition arose when geological factors revealed that four tentative sites were not really safe. Generally speaking, the public testimony reinforced the concept that the technical and geological problems were such that the sites could not possibly be utilized. It was concluded that the public was educated in the process of the hearings and site evaluation discussions to the fact that Minnesota needs a hazardous waste disposal facility, even though its siting there was opposed.
(12) KEYWORDS: DISPOSAL; HAZARDOUS; MINNESOTA; SITES
(14) HIERARCH TERMS: 1HC/2DP; 1HC/2PT
(15) STIMS ACC.NO.: 00S46545
(16) CITATION: P.5-6, May 1978.

(1) SWIRS ACC.NO.: 047709
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: The question of depositing solidified acidic resins.
(4) AUTHOR: Gerschler LJ
(6) BOOK TITLE: In Solidification and Encapsulation of Waste Products for Storage Purposes, Conference at Berlin on Sep. 23-24, 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2GN/3BR (10) PUB. YEAR: 1976
(11) ABSTRACT: The issue of depositing solidified acidic resins is explored. Acidic resins and waste products such as solution media, wastewater, and used bleached soil occur with the processing of oil. Possibilities for the elimination of acidic resins are noted, including incineration, lime water, potassium silicate, calcium, underground depots, and pyrolysis. Acidic resin solidification with various additive materials is viewed as promising. Neutralization and solidification are possible with the following materials: domestic refuse, potassium silicate, calcium, lime water, special calcium, clay, styropor, polyurethane waste, alkaline ash, and slag. The characteristics of solidified acidic resins are described, and processes involved in solidification are detailed. (Retained in SWIRS library).
(12) KEYWORDS: ACID; GERMANY; HAZARDOUS; OIL; PROCESS; RESIN
(14) HIERARCH TERMS: 1HC/2PT; 1OL
(15) STIMS ACC.NO.: 00S46762
(16) CITATION: Berlin, Germany, Berlin Technical University, 1976. p.101-113.

(1) SWIRS ACC.NO.: 047708
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Criteria for the solidification and encapsulation of special waste products with regard to such aspects as depot operations and the long term safety and screening in the case of surface depots.
(4) AUTHOR: Wassmann K
(6) BOOK TITLE: In Solidification and Encapsulation of Waste Products for Storage Purposes, Conference at Berlin on Sep. 23-24, 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2GN/3BR (10) PUB. YEAR: 1976
(11) ABSTRACT: Criteria to be met before the solidification process can be recommended for waste management operations are examined. In contrast to a domestic waste depot, a special waste depot represents a much greater hazard to the environment. The main requirement from the standpoint of water conservation is that the deposit mass in a special waste depot should be shielded as much as possible from the natural water system. Deep groundwater may not come in contact with the mass, and groundwater near the surface must be directed away with applicable technology. Additionally, condensed water must be kept away from the mass by covering and shielding. The issue of where solidification should take place is discussed. Criteria suggested for the deposition of special waste pertain to the following aspects: leachability of the end product, strength of special waste types, end products of solidification processes, structure of solidification processes, and solidification products with limited water permeability. (Retained in SWIRS library).
(12) KEYWORDS: CRITERIA; GERMANY; GROUND WATER; HAZARDOUS; MANAGEMENT; PROCESS; SAFETY
(14) HIERARCH TERMS: 1GW; 1HC/2PT; 1SB
(15) STIMS ACC.NO.: 00S46761
(16) CITATION: Berlin, Germany, Berlin Technical University, 1976. p.94-100.

(1) SWIRS ACC.NO.: 047704
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Encapsulation of toxic wastes in concrete rings.
(4) AUTHOR: Ruckel H
(6) BOOK TITLE: In Solidification and Encapsulation of Waste Products for Storage Purposes, Conference at Berlin on Sep. 23-24, 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2GN/3BR (10) PUB. YEAR: 1976
(11) ABSTRACT: A method for encapsulating toxic waste in concrete rings is described. In the construction of the special waste depot, loam soil which supported plant life was already present. A double layer of loam was laid on the earth, and a drainage layer in a sand bed was placed on top of this layer of loam. A top layer was added to protect drainage when the first layer of special refuse was applied. Three standard commercial concrete rings were placed on top of each other on a loam layer added to the protective top layer. Seams were sealed with mortar, and a base of concrete was laid. The inner and outer surface of the structure were covered with a layer of inert substances to prevent water from leaking into the structure. When the space was filled with toxic waste, the rings were closed with concrete and the surface of the structure was again painted with the inert substance. For additional safety, loam was stamped around the rings. (Retained in SWIRS library).
(12) KEYWORDS: CONCRETE; CONTAINER; EARTH; GERMANY; STORAGE; TOXIC
(14) HIERARCH TERMS: 1HC; 1ST; 1SW/2CZ; 1TM
(15) STIMS ACC.NO.: 00S46757
(16) CITATION: Berlin, Germany, Berlin Technical University, 1976. p.73-75.

(1) SWIRS ACC.NO.: 047703
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: The SEALOSAFE process and operating experiences with SEALOSAFE.
(4) AUTHOR: Cope CB
(6) BOOK TITLE: In Solidification and Encapsulation of Waste Products for Storage Purposes, Conference at Berlin on Sep. 23-24, 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2GN/3BR (10) PUB. YEAR: 1976
(11) ABSTRACT: A chemical treatment process known as SEALOSAFE is described that transforms liquid, solid, or semisolid waste products into a sludge like condition. The sludge solidifies within three days to a hard polymer. The process requires the construction of a regional treatment installation and the transportation of waste products from their production point to the installation. Harmful materials in waste products are bound in the hard polymer and cannot be released to the environment without complete decomposition of the polymer. Harmful materials of concern are acids, alkalines, cyanide, sulfide, compounds of arsenic, cadmium, zinc, lead, copper, tin, mercury, and many others. The SEALOSAFE polymer has six main characteristics that appear to be important: limited water permeability, not subject to leaching, strong mechanical solidity, odorless, noncombustible, and nonbiodegradable. (Retained in SWIRS library).
(12) KEYWORDS: CHEMICAL; GERMANY; HAZARDOUS; LIQUID; SLUDGE; SOLID; TREATMENT
(14) HIERARCH TERMS: 1HC/2PT
(15) STIMS ACC.NO.: 00S46756
(16) CITATION: Berlin, Germany, Berlin Technical University, 1976. p.58-72.

(1) SWIRS ACC.NO.: 047700
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Solidification and sealing procedures for highly poisonous or radioactive wastes.
(4) AUTHOR: Wagner G
(6) BOOK TITLE: In Solidification and Encapsulation of Waste Products for Storage Purposes, Conference at Berlin on Sep. 23-24, 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2GN/3GR (10) PUB. YEAR: 1976
(11) ABSTRACT: Guidelines for the solidification and sealing of radioactive waste are presented. Since the decomposition of radioactive elements cannot be effected by chemical reactions, there is not basic alternative to solidification and sealing for their treatment. Types of radioactive waste vary greatly: aqueous solutions, organic liquids, sludge from filter preconcentrates, vaporized concentrates, suspensions of power or bead resin ion exchangers, and in part combustible solid waste. The selection of the correct treatment process is determined by requirements for leaching stability, irradiation stability, pressure stability, and flammability that are placed on end products. Conditioning measures for radioactive waste are discussed, including bituminization, cementing, casting resins, and polymerization. (Retained in SWIRS library).
(12) KEYWORDS: GERMANY; HAZARDOUS; RADIOACTIVE; TREATMENT
(14) HIERARCH TERMS: 1HC/2PF; 1RD
(15) STIMS ACC.NO.: 00S46753
(16) CITATION: Berlin, Germany, Berlin Technical University, 1976. p.19-27.

(1) SWIRS ACC.NO.: 047534
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Capacity of soils for hazardous organic substances.
(4) AUTHOR: Martin JP
(6) BOOK TITLE: In Composting of Municipal Residues and Sludges, 1977 National Conference, Aug. 23-25, 1977.
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: The impact of hazardous organic substances on soil is evaluated, with particular emphasis on the biological degradation mechanism of soil for destroying or detoxifying hazardous organic substances. Phenolic substances, which enter the soil through plant lead and root litter, and the application of organic amendments to soil such as compost, animal manure, and sludge, and industrial waste, are discussed. Consideration is also given to pesticides and soil humus formation. The side effect of toxic chemicals on soil properties and plant growth are explored in terms of both biological and chemical parameters. The persistence of pathogenic organisms such as viruses, bacteria, protozoa, and parasitic worms in soil is addressed. (Retained in SWIRS library).
(12) KEYWORDS: EARTH; HAZARDOUS; MICROORGANISM; ORGANIC; PARASITE; TOXIC
(14) HIERARCH TERMS: 1HC/2AN; 1MM; 1ST
(15) STIMS ACC.NO.: 00S46587 (15) SECONDARY AUTHORS: Page AL
(16) CITATION: Rockville, MD, Information Transfer, Inc., 1978. p.101-105.

(1) SWIRS ACC.NO.: 046644
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Apparatus for opening and washing cans.
(4) AUTHOR: Knapp MC
(7) PATENT DATA: U.S. Patent No. 4,056,412
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A method and a means are presented for automatically opening and washing cans containing dangerous or hazardous materials. The method provides safety to the operator of the machine and speed of operation. The device supports the can on one of its lateral sides for a sliding movement from a prepunch position to a punch position. A knife is positioned adjacent to the support and has a cutting edge

presented toward the bottom of the can so that the knife will destructively pierce the bottom of the can whenever the can is manually forced against the knife. The knife is shaped to provide a channel for liquid contents of the can to drain whenever the can is pierced by the knife. A spray nozzle is mounted with respect to the knife so as to protrude within the interior of the can whenever the knife pierces the can. A timing device causes the spraying of the can interior throughout a 30-second cycle.

(12) KEYWORDS: AUTOMATIC; CLEANUP; CONTAINER; EQUIPMENT; HAZARDOUS; OPEN; PATENT

(14) HIERARCH TERMS: 1CZ; 1HC/2DP

(15) STIMS ACC.NO.: 00S45696 (15) SECONDARY AUTHORS: Galloway CR

(16) CITATION: filed Jan. 8, 1976 issued Nov. 15, 1977.

(1) SWIRS ACC.NO.: 046235

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(5) CORPORATE AUTHOR: North Atlantic Treaty Organization

(6) BOOK TITLE: N.A.T.O. Committee on the Waste Material of Modern Society Pilot Study on the Elimination of Dangerous Wastes. Report on the Sub-Project of Underground Depositions.

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: A pilot study on the elimination of dangerous wastes through underground deposition was carried out. The objective was to determine circumstances and conditions, both tectonic and economic, in which the dumping of dangerous solid, viscous, or liquid wastes into inactive or partially active mines can be realized safely while avoiding creating water pollution. Geological and geographic criteria were postulated as: dry and impermeable deposits, stable lode walls, lack of wall reaction, homogeneous conditions, zones not subjected to seismic shock, nonfaulted zone, deposit inclination, thick and widely spread layer, location in a low region with easy year-round access, and location in a region not subject to glaciation or ocean encroachment. Technical criteria for such deposition were established for: mines either exploited by chambers, or columns at one level; parallel ventilation of deposits between them; average depth mines; and sufficient manipulative and control provisions and equipment. Detection, surveillance, and control requirements are identified, and various mineralogic formations are considered for such deposition. It is concluded that, in order of preference, layered salt, potassium, domed salt, gypsum, granite, limestone rock, and clays are suitable depositories. It is recommended that specific characteristics of waste materials and their compatibility with the deposition location and qualities be considered in selecting a site. Safety and management measures are suggested. Underground elimination of hazardous wastes can be justified if it does not noxiously affect the biosphere or hamper extraction of minerals or subterranean water. (Original text in English; French translation retained in SWIRS library).

(12) KEYWORDS: CRITERIA; DISPOSAL; ECONOMICS; ENVIRONMENT; GEOLOGIC; HAZARDOUS; SITES; UNDERGROUND

(14) HIERARCH TERMS: 1DP/2HC; 1DP/2HP; 1HC/2DP

(15) STIMS ACC.NO.: 00S45286

(16) CITATION: Geneva, Switzerland, North Atlantic Treaty Organization, 1976. 48 p.

(1) SWIRS ACC.NO.: 046157

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Kover P

(6) BOOK TITLE: Considerations Relating to Toxic Substances in the Application of Municipal Sludge to Cropland and Pastureland (A Background Summary).

(8) NTIS NO.: PB-263 006 (8) REPORT NO.: EPA 560/8/76/004

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: Background information concerning the potential health hazards from toxic substances when disposing or utilizing municipal sludge on agricultural lands is presented. Particular note is made of croplands and pasturelands where the products enter the human food chain. Some of the toxic elements and synthetic organic chemical substances known to be present in municipal sludges are considered and

only readily available information is used. The range of concentration in municipal sludge, in unamended soil and the mean level in dry soil of 69 trace elements and eight organics (mostly pesticides) are tabulated. Applicable and available data concerning the potential hazards from toxic substances are scarce but the following topics were considered in detail: volume, types and composition of municipal sludge; elements and substances found in municipal sludge; plant uptake of chemical substances from municipal sludge amended soil; the aspects of health effects; and the literature cited. A sludge information summary is included in the appendix. (Retained in SWIRS library).

(12) KEYWORDS: CROP; ENVIRONMENT; FOOD; HAZARDOUS; HUMAN; INVESTIGATION; LAND; LITERATURE; METAL; MUNICIPALITY; PESTICIDE; SLUDGE

(14) HIERARCH TERMS: 1HC/2DP; 1MY/2DP; 1SP/2DP; 1SP/2HE

(15) STIMS ACC.NO.: 00S45208

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Nov. 1976. 24 p.

(1) SWIRS ACC.NO.: 046038

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Fighting leachates in the trenches.

(6) JOURNAL TITLE: Waste Age

(10) LANGUAGE: EN (10) PUB. YEAR: 1978

(11) ABSTRACT: A manufacturer of wet cell batteries, informed that the treatment process was causing environmental pollution, experimented with bentonite cut-off walls. Although they have great potential for use in waste control, these walls, or slurry trenches, have normally been used only in construction projects. The plants sulphuric wastes had been processed by dilution, lime, addition, and pumping into four settling ponds. It was found that contaminants could leak through pond soil banks into a nearby river via the water table. To solve the problem, slurry trenches were constructed which encircled all four ponds and penetrated one foot into an impervious subsurface shale layer. A total of 850 lineal ft of 30 in. wall to a depth of 20 ft was constructed at a cost of $65,000. Monitoring wells located outside the slurry walls have shown no trace of pond liquor since the installation.

(12) KEYWORDS: ACID; CONSTRUCTION; CONTROL; EFFLUENT; HAZARDOUS; LIME; MONITOR; POLLUTION; SETTLEMENT; SLURRY; SULFUR; TRENCH

(14) HIERARCH TERMS: 1HC; 1LH; 1WE/2C2; 1WE/2HE; 1WE/2IN

(15) STIMS ACC.NO.: 00S45088

(16) CITATION: 9(1):61-62, 76, Jan. 1978.

(1) SWIRS ACC.NO.: 045891

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Microwave plasma detoxification of hazardous and toxic materials.

(4) AUTHOR: Oberacker DA

(6) BOOK TITLE: News of Environmental Research in Cincinnati.

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Microwave plasma detoxification was studied as a process for the destruction of selected pesticides. The research project was initiated in 1970 and, in 1975, a feasibility study to test the microwave plasma detoxification process on several pesticides and toxic waste was conducted. A microwave reactor was modified to allow for the injection of liquids and solutions. Waste types selected for testing were malathion, methyl bromide, polychlorinated biphenyl, phenylmercuric acetate, and kepone. Analytical methods employed were mass spectroscopy which yielded information on the identification of gaseous products produced and infrared analysis which determined liquid and solid effluent materials deposited in product receiver traps. Gas chromatography and standard quantitative techniques for mass balance and heavy metals were adopted as required. Microwave plasma detoxification was demonstrated to be an effective and economically competitive process for pesticide destruction. (Retained in SWIRS library).

(12) KEYWORDS: ANALYSIS; ECONOMICS; EQUIPMENT; HAZARDOUS; PESTICIDE; PROCESS; RESEARCH; TOXIC

(14) HIERARCH TERMS: 1EA/2EA; 1HA/2HF; 1PE; 1RE; 1TD

(15) STIMS ACC.NO.: 00S44940 (15) SECONDARY AUTHORS: Lees S

(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, Oct. 1977. 4 p.

(1) SWIRS ACC.NO.: 045864
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Keeder LR
(6) BOOK TITLE: Review and Assessment of Deep-Well Injection of Hazardous Waste. Volume I.
(8) NTIS NO.: PB-269001 (8) REPORT NO.: EPA-600/2-77-029a (9) CONTRACT NO.: 68-03-2013
(10) LANGUAGE: EN (10) GEO. AREA: 1US/7LA; 1US/2TX (10) PUB. YEAR: 1977
(11) ABSTRACT: A review and assessment is made of the adequacy of deep-well waste injection systems to receive hazardous wastes. The effects these wastes have upon the environment when injected into subsurface reservoirs are defined. A comprehensive bibliography, chemical waste profiles, deep-well inventory, case histories, microbiological research, deep-well and hazardous waste research, legal aspects, and an inventory of statutes and regulations governing waste injection are discussed. More than 1,000 papers related to deep-well injection of industrial waste were reviewed, identifying 105 deep-well related and 186 hazardous waste treatment research projects. Problems stemmed from a failure to use available geologic information and accepted and proven engineering practices in location, design, and operation of deep-well systems. It is suggested that standard regulations among states are needed to alleviate problems arising from use of interstate aquifers for injection and for more effective management and control of deep-well systems. It was concluded that additional information is needed on salaquifer chemistry, chemical and microbiological reactions of waste within a receiving salaquifer, and monitoring of deep-well systems as a predictive tool. (Retained in SWIRS library).
(12) KEYWORDS: DEEP WELL; DISPOSAL; ECONOMICS; ENVIRONMENT; HAZARDOUS; INDUSTRY; LAW; LICENSE; LOUISIANA; MANAGEMENT; MONITOR; REGULATIONS; RESEARCH; TEXAS; UNDERGROUND
(14) HIERARCH TERMS: 1DW; 1DD/2DW; 1HA/2HF
(15) STIMS ACC.NO.: 00S44913 (15) SECONDARY AUTHORS: Cobbs JH; Field JW JR
(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, Jun. 1977. 186 p.

(1) SWIRS ACC.NO.: 045856
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(6) BOOK TITLE: Disposal of Hazardous Wastes: Recommended Procedures for Hazardous Waste Management.
(10) LANGUAGE: EN (10) GEO. AREA: 1EU; 1US (10) PUB. YEAR: 1977
(11) ABSTRACT: Procedures and criteria for the management of hazardous waste are discussed from an international standpoint. Fundamental concepts that countries participating in the North Atlantic Treaty Organization (NATO) may collectively encompass in their hazardous waste management schemes are portrayed. The issue of defining hazardous waste is discussed from two perspectives, existing statutory definitions and regulatory definitions. Waste sampling and waste analysis techniques employed by NATO countries are examined. It is pointed out that approaches to site selection for the disposal of hazardous waste are generally less well developed than approaches to the definition issue. Site selection criteria are compared, and soil characteristics and ground water conditions are noted as the physical factors of greatest concern. It is demonstrated that long-term care of hazardous waste is a relatively undeveloped area of consideration by NATO countries. Consideration is given to facility permits, container labeling, and facility safety. (Retained in SWIRS library).
(12) KEYWORDS: ANALYSIS; DEFINITION; EUROPE; HAZARDOUS; MANAGEMENT; PLANNING; REGULATIONS; SITES; US
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1HA/2HG; 1HA/2HC
(15) STIMS ACC.NO.: 00S44907
(16) CITATION: North Atlantic Treaty Organization, Jun. 1977. 95 p.

(1) SWIRS ACC.NO.: 045650
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(6) BOOK TITLE: Disposal of Hazardous Wastes: Landfill.
(10) LANGUAGE: EN (10) GEO. AREA: 1CD; 1EU; 1US (10) PUB. YEAR: 1977
(11) ABSTRACT: The extent to which landfills are employed to dispose of hazardous waste in North Atlantic Treaty Organization (NATO) countries is assessed. Landfill use in Canada, Denmark, France, the Federal Republic of Germany, the Netherlands, Norway, the United Kingdom, and the United States is described. The importance of preventing waste pollution is stressed, and some examples of water pollution problems and other possible hazards caused by landfills are cited. The selection and preparation of sites for landfills and site operation and disposal methods are taken into account. Landfill research in the various NATO countries and site investigation techniques are reported. Landfills in general and special chemical landfills represent an important method of hazardous waste disposal in almost all the countries studied. The leachate generating potential of waste in landfills is discussed. (Retained in SWIRS library).
(12) KEYWORDS: DISPOSAL; EUROPE; HAZARDOUS; LEACH; POLLUTION; RESEARCH; SANITARY LANDFILL; SURVEY; US
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1LC; 1SO
(15) STIMS ACC.NO.: 00S44699
(16) CITATION: North Atlantic Treaty Organization, May 1977. 90 p.

(1) SWIRS ACC.NO.: 045718
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Subramanian RV
(6) BOOK TITLE: Immobilization of Hazardous Residuals by Encapsulation.
(8) NTIS NO.: PB-271 410 (8) REPORT NO.: NSF/RA-770163
(9) GRANT NO.: ENV76 6563
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The objective of this research is to devise and evaluate methods for solidification in a polymer matrix of liquids containing hazardous substances. The report seeks to: (1) evaluate the true immobilization of wastes encapsulated in the polyester matrix by long range leaching studies; (2) evaluate the applicability of the process to a wide spectrum of actual hazardous wastes; (3) optimize the conditions for the emulsification and curing steps of the process; and (4) provide a sound basis for commercial exploitation of the process by detailed plant investigations. A wide variety of industrial wastes was obtained from chemical companies and waste treatment industries. These contained toxic components such as cyanide, arsenic, poisonous metal ions, PCB, Kepone, and pharmaceutical wastes. The process was found to be generally applicable to solidify these wastes. The detailed results of these studies form the basis of this report. (Retained in SWIRS library).
(12) KEYWORDS: HAZARDOUS; INDUSTRY; LEACH; LIQUID; MANAGEMENT; RADIOACTIVE; RESIDUE; TREATMENT
(14) HIERARCH TERMS: 1HA/2HH; 1LC; 1RA
(15) STIMS ACC.NO.: 00S44767 (15) SECONDARY AUTHORS: Mahalingam R
(16) CITATION: Washington, DC, National Science Foundation, Jul. 1977. 80 p.

(1) SWIRS ACC.NO.: 045491
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Trace metals in scallops from within and around two ocean disposal sites.
(4) AUTHOR: Pesch G
(6) JOURNAL TITLE: Marine Pollution Bull
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The areal distributions of the concentrations of 13 metals in sea scallop tissues were examined in the vicinity of two ocean disposal sites located off the U.S. Mid Atlantic coast. Metal contaminants determined included iron, copper, chromium, aluminum, manganese, lead, cobalt, nickel, vanadium, cadmium, zinc, silver, and

titanium. Patterns of metals distribution showed that five specific metals (silver, copper, nickel, cadmium, and vanadium) may be used as identification tags for individual wastes disposed at the two sites. Disposed materials tended to be transported by currents south and southwest from the disposal sites. It was concluded that biological availability and potential toxicity of the metals pose a threat to marine biota.

(12) KEYWORDS: ANALYSIS; BIOLOGICAL; HAZARDOUS; HEALTH; METAL; OCEAN; TOXIC; TRANSPORT

(14) HIERARCH TERMS: 1DD/2DK; 1DD/2DQ; 1HA/2HF

(15) STIMS ACC.NO.: 00544539 (15) SECONDARY AUTHORS: Reynolds B; Rogerson P

(16) CITATION: 8(10):224-226, Oct. 1977.

(1) SWIRS ACC.NO.: 045444

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Characteristics of percolate of solid and hazardous waste deposits.

(4) AUTHOR: Brunner DR

(6) JOURNAL TITLE: J Amer Wtr Works Assoc

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Large quantities of solid and hazardous wastes require land disposal. Though methods exist for controlling or eliminating the environmental damages caused by such wastes, the operating and design conditions must be refined. Percolates from landfilled municipal solid waste contain organics and metals in greater concentrations than domestic wastewater. The volume of percolate is highly dependent on disposal site hydrogeology, as influenced by climate, site design and operation. Properly operated sanitary landfills will not pollute groundwater when appropriate controls are provided as determined by a detailed hyrogeological survey. Disposal of hazardous wastes requires special evaluation of natural and artificial methods to prevent groundwater contamination. Ground and surface water incidents are abundant when solid and hazardous wastes have been disposed of improperly. The water industry needs to be aware of all waste disposal practices and should assess the impact these practices have on water quality.

(12) KEYWORDS: CONTROL; DISPOSAL; ENVIRONMENT; GROUND WATER; HAZARDOUS; LAND; LEACH; MANAGEMENT; METAL; MUNICIPALITY; ORGANIC; POLLUTION; QUALITY; REFUSE; SANITARY LANDFILL; SOLID

(14) HIERARCH TERMS: 1DD/2DW; 1GD; 1HA/2HF

(15) STIMS ACC.NO.: 00544492 (15) SECONDARY AUTHORS: Carnes RA

(16) CITATION: 69(8):453-456, Aug. 1977.

(1) SWIRS ACC.NO.: 045326

(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Leachate and gas monitoring and analysis.

(4) AUTHOR: Lofy R

(5) CORPORATE AUTHOR: SCS Engineers

(6) BOOK TITLE: In Environmental Assessment of Subsurface Disposal of Municipal Wastewater Treatment Sludge, Interim Report. (8) REPORT NO.: EPA/530/SW-547c (9) CONTRACT NO.: 68-01-3106

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Monitoring was performed at eight case study sites to assist in completing an assessment of the environmental impact of waste water treatment sludge disposal in landfills. Measurements were made of decomposition gas constituents, leachate quality immediately below disposal sites, and ground water quality at two depths in the presumed downstream direction from disposal sites. Three monitoring wells were drilled to the ground water table at each site. One well was situated within the landfill area to facilitate the sampling of leachate generated around the proximity of the well. Two additional wells were located approximately 100 ft outside the limits of the disposal area in the presumed direction of ground water migration. Leachate and ground water samples were examined for such constituents

as pH, total solids, ammonia nitrogen, nitrate nitrogen, total Kjeldahl nitrogen, chloride, sulfate, total organic carbon, chemical oxygen demand, calcium, cadmium, chromium, copper, iron, mercury, and lead.
(12) KEYWORDS: ANALYSIS; GASSES; LEACH; MEASUREMENTS; MONITOR; QUALITY; SITES; SLUDGE
(14) HIERARCH TERMS: 1LC; 1MK; 1S1/2SX
(15) STIMS ACC.NO.: 00S44373
(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, Sep. 1977. p.27-30.

(1) SWIRS ACC.NO.: 045263
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Land application guidelines for sludges contaminated with toxic elements.
(4) AUTHOR: Garrigan GA
(6) JOURNAL TITLE: J Wtr Poll Contr Federation
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Hazards encountered in the application of municipal sludges to soils, and inadvertent use of unsuited toxic sludges are discussed. Guidelines protecting against the hazards are reviewed briefly; however, strict adherance to the guidelines is not advised. Several limiting factors must be considered in each case. This applies to both conservative and liberal toxic element guidelines. Users are to begin with an "acceptable sludge" and address the issue of limiting factors. These include concentrations of toxic elements, nitrogen and other nutrients. Care must be taken to insure adequate nitrogen removal through the soil; the maximum load of nitrogen which a soil is to receive must be estimated in each case.
(12) KEYWORDS: ANALYSIS; HAZARDOUS; NITROGEN; QUANTITY; SLUDGE; SOIL; TOXIC
(14) HIERARCH TERMS: 1HA/2HF; 1SJ; 1TD
(15) STIMS ACC.NO.: 00S44310
(16) CITATION: 49(12):2380-2389, Dec. 1977.

(1) SWIRS ACC.NO.: 044781
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(4) AUTHOR: Taylor DA
(5) CORPORATE AUTHOR: Daedalean Associates, Inc
(6) BOOK TITLE: An Engineering Study on the Emulsification of Immiscible Noxious Liquids Discharged into the Marine Environment by Chemical Tankers. (8) REPORT NO.: CG-M-5-77 (9) CONTRACT NO.: DOT-CG-64919A
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Annex II of the 1973 IMCO Marine Pollution Convention limits the wake concentration of certain noxious substances discharged by chemical tankers. Emulsification prior to discharge was considered as a means of assuring the proper dispersion of immiscible noxious substances. This study includes a review of the theory of emulsification and an examination of specific types of commercially available mechanical emulsifiers. The various mechanical emulsifiers are evaluated on the basis of: 1) applicability to IMCO Category B and C products; 2) stability of the emulsions formed; 3) chemical concentration limitations; 4) capacity limitations; 5) feasibility for use in explosive environments; 6) reliability and maintainability; and 7) operating and capital costs. This evaluation indicates that cavitating jet emulsification equipment is best suited for this application. Recommended locations on a typical chemical tanker for the emulsifier, discharge lines, and necessary piping are given. Finally, recommendations concerning design data for implementation of the emulsification system are presented. (Retained in SWIRS Library).
(12) KEYWORDS: CHEMICAL; DATA; DISCHARGE; ENGINEERING; ENVIRONMENT; EQUIPMENT; LIQUID; OCEAN
(14) HIERARCH TERMS: 1EE/2EX; 10A/20C; 1WA/2WD
(15) STIMS ACC.NO.: 00S43626 (15) SECONDARY AUTHORS: Hochrein AA Jr; Thiruvengadam AP
(16) CITATION: Washington, DC, U.S. Coast Guard Office of Merchant Marine Safety, Jan. 1977. 56 p.

(1) SWIRS ACC.NO.: 043955
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Disposal methods for hazardous wastes.
(4) AUTHOR: Fish HA
(6) JOURNAL TITLE: J Oil and Colour Chemists Assoc
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1977
(11) ABSTRACT: Methods most commonly employed for the disposal of hazardous wastes are described, including 1) tipping on land, 2) disposal in deep mines, 3) disposal at sea, 4) chemical, electrochemical or biological processing to recover materials for reuse or to reduce hazard to land disposal, and 5) incineration. Land disposal is most common, but reasons are presented in support of other methods, with suggested system of treatment and type of disposal system for specific wastes not suitable to land disposal.
(12) KEYWORDS: DISPOSAL; HAZARDOUS; INCINERATION; LAND; OCEAN; PROCESS; TREATMENT
(14) HIERARCH TERMS: 1HA/2HF; 1HA/2HG
(15) STIMS ACC.NO.: 00S42997
(16) CITATION: 60(8):296-299, 1977.

(1) SWIRS ACC.NO.: 043928
(2) DOMESTIC: D (2) CATEGORY: 11 (2) SUBJ.TYPE: S; T
(5) CORPORATE AUTHOR: U.S. Environmental Protection Agency
(6) BOOK TITLE: Sampling survey related to possible emission of polychlorinated biphenyls (PCBs) from the incineration of domestic refuse.
(10) LANGUAGE: EN (10) GEO. AREA: 1US/21L/3CH (10) PUB. YEAR: 1975
(11) ABSTRACT: During the three week period October 20 to November 7, 1975, ambient and stack sampling for polychlorinated biphenyls (PCBs) were conducted at a domestic incinerator in an effort to quantify the levels of PCB emissions associated with the inceration of domestic refuse. The stack sampling was performed at an incinerator equipped with an electrostatic precipitator using a modified EPA Method 5 sampling train. Ambient sampling was conducted, upwind and downwind of the incinerator, using hexane as the solvent in duplicate sets of three impingers in series. It was concluded that the particulate emissions contain PCBs; however, the amount emitted does not results in a measurable increase in existing ambient levels of PCB; the presence of PCBs in the vapor state could not be established because of contamination in the xylene used as the solvent; and the use of hexane as the absorbing reagent is appropriate for ambient sampling. (Retained in SWIRS library).
(12) KEYWORDS: GASSES; INCINERATION; PARTICULATE MATTER; PLANT INDUSTRIAL; SMOKE
(14) HIERARCH TERMS: 1IA/1I6
(15) STIMS ACC.NO.: 00S42970
(16) CITATION: Chicago, IL, U.S. Environmental Protection Agency, November 1975. 47 p.

(1) SWIRS ACC.NO.: 043845
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Hazardous waste management and disposal-industrial.
(4) AUTHOR: Curry NA
(6) BOOK TITLE: In Land Application of Residuals. Proceedings: Engineering Foundation Conference, Easton, MD, Sep. 26-Oct. 1, 1976.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The treatment and disposal of toxic components of waste are considered. Toxic residuals include radioactive waste, pathogens, carcinogens, explosives, toxic elements and compounds, incinerator waste, flammable or exothermic materials, waste degradation products affecting the stability of toxic materials, complexing agents, and pH affecting products. The ability of the following disposal methods to handle toxic waste is assessed: spray irrigation, land farming, sanitary landfilling, chemical landfilling, deep well disposal, salt beds, and perpetual secure burial. Economic and

practical aspects of treatment are explored, with particular emphasis on leachate treatment and segregation versus treatment. Additional information on the characteristics and disposal of toxic waste is appended.

(12) KEYWORDS: CHEMICAL; DISPOSAL; ECONOMICS; FARM; HAZARDOUS; INDUSTRY; IRRIGATION; LAND; LEACH; MANAGEMENT; PATHOGEN; RADIOACTIVE; RESIDUE; SANITARY LANDFILL; TOXIC; TREATMENT

(14) HIERARCH TERMS: 1HA/2HF; 1HA/2HH; 1FM; 1FD

(15) STIMS ACC.NO.: 00S42938

(16) CITATION: New York, NY, American Society of Civil Engineers, 1976. p.17-38.

(1) SWIRS ACC.NO.: 043819

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Industrial dumps leaking deadly vinyl chloride gas.

(4) AUTHOR: Zeldin M

(6) JOURNAL TITLE: Audubon

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA/3LA; 1US/2NJ (10) PUB. YEAR: 1976

(11) ABSTRACT: According to a U.S. Environmental Protection Agency (EPA) study, vinyl chloride has been measured at potentially dangerous levels in the air above landfills in Los Angeles, California, and Edison, New Jersey, where wastes from vinyl plastic plants are deposited. Four of 17 air samples taken in a 5 month period in 1975 contained vinyl chloride concentrations equivalent to or slightly above the health standards established by the U. S. Occupational Safety and Health Administration. The Los Angeles landfill receives 4,000 gallons of polyvinyl chloride (PVC) sludge once a month. The Edison landfill receives 35,000 gallons a week. Vinyl chloride concentrations also were found at appreciable distances from the landfills. A monitoring program is recommended to determine vinyl chloride levels in groundwater at PVC landfills and in nearby lakes and rivers.

(12) KEYWORDS: AIR; CALIFORNIA; DISPOSAL; EPA; GASSES; GROUNDWATER; HAZARDOUS; HEALTH; MONITOR; NEW JERSEY; POLLUTION; POLYVINYL CHLORIDE; SANITARY LANDFILL; STANDARD; WATERWAY

(14) HIERARCH TERMS: 1HA/2HF; 1HB; 1MK; 1SD/2FE

(15) STIMS ACC.NO.: 00S42862

(16) CITATION: 78(2):120-121, Mar. 1976.

(1) SWIRS ACC.NO.: 043817

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Toxic soluble waste disposal in a sanitary landfill site draining to an urban water supply.

(4) AUTHOR: Johnson CJ

(6) JOURNAL TITLE: American Journal of Public Health

(10) LANGUAGE: E (10) PUB. YEAR: 1977

(11) ABSTRACT: An incident is reported which illustrates the need for better guidelines concerning the disposal of hazardous substances. 6,000 lbs of supposedly ineffective rat bait was buried at a sanitary landfill site. Because of the highly toxic nature of the agent in the bait, sodium monofluoracetate (MFA), the burial was investigated. Consultation with the regional poison control center disclosed that the substance would have full potency, was water soluble, and it was unlikely that it would be biodegradable when buried in a landfill. It was also discovered that an intermittent stream ran by the disposal site which drained into a reservoir for a large water district. A field visit to the landfill site confirmed that the site was not suitable for disposal of hazardous wastes. The material was removed. Another problem highlighted by the incident is the siting of sanitary landfills at recharging areas for aquifers. Geologists and hydrologists should be consulted when sites are selected to avoid contamination of water supplies by toxic substances buried at sanitary landfill sites.

(12) KEYWORDS: CHEMICAL; DISPOSAL; HAZARDOUS; HEALTH; SANITARY LANDFILL; TOXIC; WATERWAY

(14) HIERARCH TERMS: 1HA/2HF; 1HL; 1SD; 1TD

(15) STIMS ACC.NO.: 00S42860

(16) CITATION: 57(5):466-469, May 1977.

(1) SWIRS ACC.NO.: 043705
(2) DOMESTIC: D (2) CATEGORY: 11 (2) SUBJ.TYPE: T
(5) CORPORATE AUTHOR: TRW
(6) BOOK TITLE: Destroying chemical wastes in commercial-scale incinerators (facility report 6). (8) REPORT NO.: SW-122c.5 (9) CONTRACT NO.: No. 68-01-2966
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2TX (10) PUB. YEAR: 1977
(11) ABSTRACT: Incineration tests of selected types of chemical waste were conducted at a contract disposal facility operated by Rollins Environmental Services, Inc. in Deer Park, Texas. The incineration system consists of a rotary kiln and liquid injection burner feeding a common afterburner. Tests were performed to determine the effectiveness of thermal destruction of discarded electrical capacitors containing polychlorinated biphenyls (PCB's) and waste from the production of nitrochlorobenzene rotary kiln, as a hammermilled fluff and as whole capacitors. The PCB tests were performed at maximum incinerator temperatures and residence time to operate under conditions of maximum destructive effectiveness. NCB waste was destroyed in the liquid injection burner at two different waste feed conditions to determine the effect of operating variables. Particulate stack emissions were higher for the whole capacitor test than for the hammermilled capacitor test. Overall waste destruction efficiencies for PCB's and NCB were over 99.999 percent for every test except the incineration of whole capacitors, where waste residuals in ash reduced the overall destruction efficiency to approximately 99.5 percent. Data on the capital and operating costs of the incineration facility are provided. (Retained in SWIRS library).
(12) KEYWORDS: BURNER; CHEMICAL; COMMERCIAL; DATA; DISPOSAL; ECONOMICS; ELECTRICAL; INCINERATOR; LIQUID; POLYCHLORINATED; ROTARY KILN; TEXAS; THERMAL
(14) HIERARCH TERMS: 1AE; 1CB/2CA/3CA; 1EA/2EA; 1IA/2II; 1IB/2IV
(15) STIMS ACC.NO.: 00S42748
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 162 p. (Solid Waste Management Series).

(1) SWIRS ACC.NO.: 043442
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Roundhill could solve toxic disposal poser.
(6) JOURNAL TITLE: New Civil Engineer
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1977
(11) ABSTRACT: In Great Britain, use of an abandoned sewage sludge incinerator for toxic waste disposal is being considered. The new incinerator is adjacent to a sewage disposal works and was abandoned as too expensive to run. The area Water Authority does not support the proposal. The wastes would have to be transported out of the catchment area in which they are produced and the sewage disposal works discharges into a drinking water river. The Authority does not consider the incinerator suitable for burning liquid waste because there is concern that toxic wastes should not be treated in a conventional sewage works since serious contamination of rivers might result. The Water Authority solution to toxic waste disposal problems is based on segregating the waste into simple components for individual treatment. At least 60 percent of the liquid toxic waste is in abandoned mine workings. The whereabouts of an 8 year old toxic waste tip thought to contain dioxin is discussed.
(12) KEYWORDS: DISPOSAL; EUROPE; GREAT BRITAIN; HAZARDOUS; INCINERATION; LIQUID; POLLUTION; SEWAGE; SLUDGE; TOXIC; WATERWAY
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HP; 1IA/2IM
(15) STIMS ACC.NO.: 00S42485
(16) CITATION: (229):T-6, Feb. 3, 1977.

(1) SWIRS ACC.NO.: 043478
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Brooks M
(6) BOOK TITLE: Demilitarization of CS I. Chemical Disposal of CS by Hydrolysis. (8) REPORT NO.: EC-TR-76078
(10) LANGUAGE: EN (10) GEO. AREA: 1US (10) PUB. YEAR: 1976
(11) ABSTRACT: A simple, effective chemical disposal method for CS (O chlorobenzylidenemalononitrile), suitable for plant scale and yielding a salable product, has been developed. The recommended reaction is aqueous alkaline hydrolysis of CS to o chlorobenzaldehyde. In the system developed, the reaction goes rapidly to give easily separated, high purity o chlorobenzaldehyde, with yields of 70 percent to 75 percent. (Retained in SWIRS library).
(12) KEYWORDS: ALKALINE; BY-PRODUCT; CARBON; CHEMICAL; CHLORINE; DISPOSAL; HAZARDOUS; HYDROCARBON; HYDROGEN; HYDROLYSIS; MILITARY; NITROGEN
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HG; 1PM
(15) STIMS ACC.NO.: 00S42521 (15) SECONDARY AUTHORS: Davis PM; Sass S
(16) CITATION: Aberdeen Proving Ground, MD, Dec. 1976. 19 p.

(1) SWIRS ACC.NO.: 043388
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: MacDonald LP
(6) BOOK TITLE: Burning Waste Chlorinated Hydrocarbons in a Cement Kiln. (8) REPORT NO.: EPS-4-WP-77-2
(10) LANGUAGE: EN (10) GEO. AREA: 1CD (10) PUB. YEAR: 1977
(11) ABSTRACT: An experimental program was tested during 1975 to 1976 using waste chlorinated hydrocarbons, containing up to about 46 weight percent chlorine, as fuel in the manufacture of cement. Materials burned included mixtures of ethylene dichloride, chlorotoluene and up to approximately 50 percent polychlorinated biphenyls (PCB). These materials were destroyed in the cement kiln with at least 99.98 percent efficiency in all cases. Three light chlorinated hydrocarbons, dichloromethane, chloroform and carbon tetrachloride, were found in the emissions in the part per billion or lower range. The quantity of precipitator dust requiring disposal, as well as emissions of particulate matter, increased during the test. The chlorine input from the chlorinated hydrocarbon waste was up to about 0.8 weight percent relative to clinker and this effectively reduced the alkali concentration of the clinker. Burning chlorinated hydrocarbon waste is a valuable method of destroying hazardous pollutants and of conserving fossil fuel. (Retained in SWIRS library).
(12) KEYWORDS: BURNING; CHEMICAL; EMISSION; EQUIPMENT; FOSSIL FUEL; GASES; HAZARDOUS; HYDROCARBON; LIQUID; ORGANIC; PARTICULATE MATTER; RECLAMATION
(14) HIERARCH TERMS: 1CB/2CA/3CA; 1HA/2HF; 1SB
(15) STIMS ACC.NO.: 00S42431 (15) SECONDARY AUTHORS: Hopton PJ; Skinner DJ
(16) CITATION: Ottawa, Canada, Environmental Protection Service, March 1977. 223 p.

(1) SWIRS ACC.NO.: 043361
(2) DOMESTIC: D (2) CATEGORY: 11 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Whitmore FC
(5) CORPORATE AUTHOR: Versar, Inc
(6) BOOK TITLE: Destruction of Polychlorinated Biphenyls in Sewage Sludge During Incineration. (9) CONTRACT NO.: 68-01-1587
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: An experiment to determine the efficiency with which PCB's are destroyed in a municipal sewage sludge incinerator. A standard mixture of PCB's (Aroclor 1254) was injected into the sludge cake at the rate of 50 ppm (dry solids basis) under conditions whereby the various emergent streams from the furnace could be monitored. The experimental results indicate no PCB's present in either the scrubber

exhaust water or in the ash; the amount of PCB in the emergent stack gases were found to correspond to destruction ratios in excess of 0.94 under normal furnace operating conditions. (Retained in SWIRS library).

(12) KEYWORDS: AIR; ANALYSIS; ASH; CHLORINE; GASES; INCINERATOR; POLLUTION; POLYCHLORINATED; SAMPLING METHODS; SCRUBBER; SEWAGE; SLUDGE; TREATMENT

(14) HIERARCH TERMS: 1IB/2IW; 1S1/2S5

(15) STIMS ACC.NO.: 00S42424

(16) CITATION: Washington, DC, Environmental Protection Agency, 1976. 73 p.

(1) SWIRS ACC.NO.: 043372

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: 6

(3) ARTICLE TITLE: Deep well injection -- sweeping the problem under the carpet?

(4) AUTHOR: Kendrick PJ

(6) JOURNAL TITLE: Journal Water Pollution Control Federation

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Deep well injection is becoming increasingly popular as restrictions on the discharge of noxious fluids to surface waters become more stringent. The disposal technique is based on the concept of injecting liquid wastes into confining geologic strata that have no other actual or potential uses. The potential for environmental contamination exists. The possible consequences of high pressure injection include contamination of potable groundwater, the fracturing of geologic strata, migration of wastes along existing faults and fractures, rupture of rock formations and movement of wastes up the well casing, resulting in aquifer contamination and the triggering of seismic activity. The development of legislation and regulatory controls has paralleled the growth of well injection practices. The adoption of the Federal Water Pollution Control Act Amendments of 1972 marked the most significant legislative development in federal control over injection programs. Legal proceedings concerning well injection and inherent hazards associated with the operation are noted.

(12) KEYWORDS: DEEP WELL; DISPOSAL; ENVIRONMENT; GEOLOGIC; GROUNDWATER; HAZARDOUS; LAW; LIQUID; POLLUTION; PROBLEMS; RESPONSIBILITY

(14) HIERARCH TERMS: 1DD/2DO; 1ED; 1HA/2HF; 1LB/2LD

(15) STIMS ACC.NO.: 00S42415

(16) CITATION: 49(2):187-189, Feb. 1977.

(1) SWIRS ACC.NO.: 043349

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: 6

(4) AUTHOR: Moon DK

(6) BOOK TITLE: New England PCB Waste Management Study.

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: Polychlorinated biphenyl (PCB) waste management practices in the New England area of the United States are examined. The study focused on past and present (1976) PCB waste streams generated directly or indirectly by transformer and capacitor manufacturing plants located in New England. An investigation was made of the potential for PCB contamination of surface and subsurface water caused by drainage from land disposal sites. The types of sites were divided into three categories: (1) disposal sites receiving quantities of PCB liquid and/or solid waste; (2) disposal sites receiving volumes of industrial waste but not specifically PCB waste; and (3) disposal sites receiving residential and commercial waste. Information was obtained on PCB waste generated and PCB waste processing and disposal. A PCB land sampling program was conducted, and PCB emissions from municipal solid waste incineration were studied. The study results demonstrated that concentrations of PCB's entered the environment in surface and subsurface water samples from land disposal sites, sludge from municipal solid waste incinerator. Recommendations are made for

the improvement of PCB waste management, and information on PCB treatment and disposal is appended. (Retained in SWIRS library).
(12) KEYWORDS: DISPOSAL; EMISSION; INCINERATOR; INDUSTRY; LAND; MANAGEMENT; MUNICIPALITY; PROCESS; REGIONAL; SITES; SLUDGE; SOLID; TREATMENT; WASTE WATER
(14) HIERARCH TERMS: 1DB/2DL; 1IA/2IM; 1MA/2ME; 1M
(15) STIMS ACC.NO.: 00842392 (15) SECONDARY AUTHORS: Huebner DA; Leighton IW
(16) CITATION: Boston, MA, U. S. Environmental Protection Agency, Nov. 1976. 62 p.

(1) SWIRS ACC.NO.: 043153
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Process for converting sodium nitrate-containing, caustic liquid radioactive wastes to solid insoluble products.
(4) AUTHOR: Barney GS
(5) CORPORATE AUTHOR: U.S.A. by U.S.E.R.D.A.
(7) PATENT DATA: U.S. Patent 4,028,265
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A method for converting sodium nitrate containing, caustic, radioactive wastes to a solid, relatively insoluble, thermally stable form is provided. The powdered aluminum silicate clay (kaolin, bentonite, dickite, halloysite, pyrophyllite) is reacted with the sodium nitrate-containing radioactive wastes which have a caustic concentration of about 3 to 7 M at a temperature of 30 C to 100 C to entrap the dissolved radioactive salts in the aluminosilicate matrix. In one embodiment the sodium nitrate containing, caustic, radioactive liquid waste, or salts or oxide produced by evaporation or calcination of these liquid wastes is converted to the solid mineral form-cancrinite. In another embodiment the sodium nitrate containing, caustic, radioactive liquid is reacted with the powdered aluminum silicate clay, the resulting reaction product is air dried either as loose powder or molded shapes and then fired at a temperature of at least 600 C to form the solid mineral form nepheline which has the approximate chemical formula of NaAlSiO4. The leach rate of the entrapped radioactive salts with distilled water is reduced essentially to that of the aluminosilicate lattice which is very low.
(12) KEYWORDS: CONVERT; HAZARDOUS; LIQUID; NITROGEN; PATENT; PROCESS; SODIUM; SOLID
(14) HIERARCH TERMS: 1CB/2CA/3CB; 1HA/2HF; 1KA
(15) STIMS ACC.NO.: 00842196 (15) SECONDARY AUTHORS: Brownell LE
(16) CITATION: filed Aug. 25, 1975 issued June 7, 1977.

(1) SWIRS ACC.NO.: 043072
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Salts of the iodine oxyacids in the impregnation of adsorbent charcoal for trapping radioactive methyliodine.
(4) AUTHOR: Dietz VR
(5) CORPORATE AUTHOR: U.S.A. represented by U.S. E.R.D. Admin
(7) PATENT DATA: U.S. Patent NO. 4,016,242
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A method of removing more than 99.7% of the methyliodide 131 gas from the effluent of a reactor is described. The method comprises passing the effluent gas through a charcoal sorbent formed by first compacting charcoal with an aqueous mixture of a first component comprising a salt of the iodine oxyacids selected from the group consisting of periodate, iodate and hypoiodite and a second component selected from the groups consisting of iodine and iodine salt, the aqueous mixture being adjusted to a pH of about 10 and then contacting the resulting impregnated charcoal with a tertiary amine. The tertiary amine is selected from the group or compounds consisting of hexamethylenetetramine, triethanolamine, N-methylmorpholine, N, N, N', N'-tetramethylethylene-diamine, 1, dimethylamino-2-propanol, N-methylpiperazine, N, N, N', N'-tetramethyl-1,4-butanediamine, 1,2-bis(trialkylammonium)ethane, N, N, N', N'-tetramethylmethanediamine,

1,2-bis(morpalino)ethane, 1,2-bis(dialkamino)ethane and 1,3-bis(dialkylamino)propane.
(12) KEYWORDS: ACTIVATED CARBON; PATENT; PH; PURIFICATION; RADIOACTIVE; SEPARATING
(14) HIERARCH TERMS: 1HA/2H6; 11C/21Z; 1KA; 1SE/2SP
(15) STIMS ACC.NO.: 00S42115 (15) SECONDARY AUTHORS: Blachly CH
(16) CITATION: filed Feb. 26, 1976 issued Apr. 5, 1977.

(1) SWIRS ACC.NO.: 042983
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Accepting responsibility for hazardous waste management: a new direction for the solid waste industry.
(6) JOURNAL TITLE: Waste Age
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Full implementation of the provisions of the Federal Resource Conservation and Recovery Act (1976) is an opportunity for the solid waste disposal industry to expand into the hazardous waste area. The repsonsibilities and complexities of the job are many. The Browning Ferris Kansas City facility, a secure landfill, is cited for government and industry cooperation to ensure proper environmental control of hazardous wastes. The site has 60 feet of solid clay which can be compacted tightly to form a virtually impermeable barrier to prevent leachate pollution of area water. Samples of wastes to be disposed of are analyzed in the company's laboratory and the analysis submitted to the State's Department of Natural Resources for approval before wastes are accepted. After placement, drums are covered with clay; care is taken to place compatible materials next to one another; a master plan of the area notes where each waste is located. Marketing such a service is complicated. Sufficient volume must be available to warrant the expensive geological investigations that precede site use; disposal costs keep increasing; and customers are sometimes reluctant to reveal their wastes content, for proprietary reasons. Truckings can be a problem. A deep well disposal site, chemical fixation sites, and an acid neutralizaiotn and sludge landfill operation are discussed.
(12) KEYWORDS: CLAY; DISPOSAL; FEDERAL; HAZARDOUS; LAW; MARKET; MISSOURI; PROBLEMS; SITE; TRANSPORTATION
(14) HIERARCH TERMS: 1HA/2HF; 1SD/2SJ
(15) STIMS ACC.NO.: 00S42026
(16) CITATION: 8(4):6-9, Apr. 1977.

(1) SWIRS ACC.NO.: 042962
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Is land disposal of toxic wastes a hazard for future generations?
(4) AUTHOR: Hamence JH
(6) JOURNAL TITLE: J. Association of Public Analysts
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1977
(11) ABSTRACT: A discussion is presented concerning land disposal of toxic wastes in Great Britain. The theory is examined that soil purifies such wastes and converts them, in time, into fertile areas. Proponents of this theory argue that soil is composed of substances which have decayed over the centuries. Opponents argue that today's toxic wastes are not natural, organic substances and will not adapt to the soil in the same way. Specific examples are considered. Toxic metals applied to a soil, either in liquid or solid form, can only accumulate in the soil. The soil will neutralize a certain amount of acid or alkaline wastes, but saturation point is soon reached at which neutralization will not occur and acid and alkaline waste will begin to affect water and plants. Organic compounds can only be successfully broken down by soil if the compound is distributed at a very low concentration and the soil is given time to build up the necessary organisms which destroy the compounds. In tips in which household waste

forms an absorbent for large quantities of liquid waste, waterlogging of the bottom layers can occur which can give rise to other hazards.
(12) KEYWORDS: ACID; ALKALINE; DISPOSAL; EUROPE; GREAT BRITAIN; GROUND WATER; HAZARDOUS; HEALTH; LAND; METAL; ORGANIC; REFUSE; SOLID; TOXIC; VEGETATION
(14) HIERARCH TERMS: 1GD; 1HA; 1SJ
(15) STIMS ACC.NO.: 00S42005
(16) CITATION: 15(Part 1):1-4, Mar. 1977.

(1) SWIRS ACC.NO.: 042940
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: The Earthline facility: containing the commitment for sound hazardous wastes control.
(6) JOURNAL TITLE: Waste Age
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2IL (10) PUB. YEAR: 1977
(11) ABSTRACT: Earthline (a subsidiary of SCA Services, Boston) located in Illinois on the site of a former coal mine, is designed to receive solid, semisolid, and liquid hazardous wastes from industrial plants within a 300 mile radius of St. Louis. Facility and management procedures are specifically designed to meet and exceed the latest federal and state regulations imposed for handling hazardous wastes. Earthline works closely with the state on various research projects. The Earthline facility occupies 130 acres and is totally secure. Favorable site characteristics are generous deposits of highly impermeable clay and large amounts of mine slag. Potential customers must provide data on the chemical and physical characteristics of each waste prior to any commitment by Earthline to receive the waste. A well equipped laboratory, staffed by experienced chemists, is an integral part of the Earthline facility. Laboratory staff evaluate incoming waste to determine proper handling. Wastes are internally segregated in isolated cells within secure trenches. A three dimensional grid inventory is recorded daily, and trench vents are installed for monitoring of leachate and gas generation. Recovering value from waste is a part of Earthline's operation. Wastes with potential for immediate recovery are shipped for recycling. Other wastes are evaluated for their potential as alternate fuels.
(12) KEYWORDS: DISPOSAL; FACILITY; FEDERAL; GAS; HAZARDOUS; ILLINOIS; LABORATORY; LAW; LEACH; LIQUID; MONITOR; RECLAMATION; REFUSE; SOLID; STATE
(14) HIERARCH TERMS: 1HA/2HF; 1LB/2LC
(15) STIMS ACC.NO.: 00S41983
(16) CITATION: 8(5):111-114, May 1977.

(1) SWIRS ACC.NO.: 042937
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Michael Rapps, manager, hazardous waste sub-unit, Illinois, E.P.A.
(4) AUTHOR: Eldredge R
(6) JOURNAL TITLE: Waste Age
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2IL (10) PUB. YEAR: 1977
(11) ABSTRACT: An interview is presented with Michael Rapps, manager of the hazardous wastes sub unit of the Illinois Environmental Protection Agency. Illinois' increasing awareness of the dangers of indiscriminate disposal of hazardous wastes is reflected in more stringent laws. In 1976 only 700 out of 20,000 manufacturers of industrial waste were issued disposal permits. The balance have found other means of disposal, some illegal. As a zero discharge limit is approached, people in the waste disposal business will see more and more waste from new sources. It is incumbent on industry, with government leadership, to provide proper disposal facilites. The need for definition of "hazardous wastes" and "special wastes" is discussed. The impact of the new Illinois laws on haulers and sanitary landfill operators is discussed.
(12) KEYWORDS: ACID; CLASSIFICATION; DISPOSAL; EPA; HAUL; HAZARDOUS; ILLINOIS; INDUSTRY; LAW; MANAGEMENT; METAL; SANITARY LANDFILL; SLUDGE; STATE
(14) HIERARCH TERMS: 1ED; 1HA; 1LB/2LC
(15) STIMS ACC.NO.: 00S41980
(16) CITATION: 8(5):70,72-74,76,78,80,82,84,86,88,120, May 1977.

(1) SWIRS ACC.NO.: 042815
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Toxic waste disposal.
(4) AUTHOR: Gray R
(6) JOURNAL TITLE: Water Pollution Control
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/20K (10) PUB. YEAR: 1977
(11) ABSTRACT: Disposal methods available in Great Britain to the toxic waste producer are reviewed. Large quantities of acids, oils, solvents, and metals are being reclaimed from waste streams by the producer or by specialist companies. Certain wastes contain constituents which are uneconomic to recover and which must receive chemical treatment to render them suitable for discharge to sewer or river. Some commercial companies have patented a process for the fixation and solidification of wastes to ensure that when they are ultimately deposited on to land, leaching will not take place. As long as economics control the ultimate method of disposal, tipping on to land must be a favored method of disposal. The most important rule for success is suitable site selection, either total containment or controlled escape/purification. Suggestions for preventing stream pollution from disposal sites are made. The possible effects of site licensing are discussed. Waste disposal to underground strata has caused anxiety. Legislation pertaining to the disposal of toxic wastes in the ocean has been enacted. Under license, a disposer may dump certain classes of industrial waste in containers which are specifically designated in the license. Multipurpose, multichamber, incinerator designs are described.
(12) KEYWORDS: CONTAINER; DISPOSAL; EUROPE; GEOLOGIC; GREAT BRITAIN; HAZARDOUS; INCINERATION; LEACH; LEGISLATION; LICENSE; OCEAN; RECLAMATION; SANITARY LANDFILL; SITE; TOXIC; UNDERGROUND
(14) HIERARCH TERMS: 1DD/2DK; 1HA/2HF; 1TD
(15) STIMS ACC.NO.: 00S41858
(16) CITATION: 76(1):30-38, 1977.

(1) SWIRS ACC.NO.: 042811
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: The treatment of toxic effluents: investigations by the BCRA.
(4) AUTHOR: Cooper RL
(6) JOURNAL TITLE: Effluent and Water Treatment J
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/20K (10) PUB. YEAR: 1977
(11) ABSTRACT: Investigations by the British Carbonization Research Association (BCRA) of the treatment of strong toxic wastes, with particular reference to those arising from the carbonization of coal, have led to the conclusion that biological treatment using the activated sludge process is generally the most efficient and successful method from a cost/benefit point of view. Since many of the constituents of carbonization wastes are lethal to bacteria, the conditions for their successful purification are far more stringent than those for domestic sewage or nontoxic biodegradable wastes. It is not possible to assess the treatability of a carbonization liquor from an analysis of its known constituents. Other biological methods of purification of effluents are described, and include the use of towers packed with plastic filling and rotating disc contractors. Many methods of effluent treatment have been studied and some could have application to a wide range of industrial waste problems. Carbonization liquors are likely to be limited to post biological stages of treatment, although pretreatment of these effluents remains a distinct possibility.
(12) KEYWORDS: ACTIVATED SLUDGE; BACTERIA; BIOLOGICAL; EFFLUENT; EUROPE; FOSSIL FUEL; GREAT BRITAIN; INDUSTRY; PURIFICATION; TOXIC; TREATMENT
(14) HIERARCH TERMS: 1HA; 1IC/21G; 1SI/2SI
(15) STIMS ACC.NO.: 00S41854
(16) CITATION: 17(5):230-237, May 1977.

(1) SWIRS ACC.NO.: 042484
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Cyanide waste disposal site neutralization.
(4) AUTHOR: Kastman KL
(6) BOOK TITLE: In American Society of Civil Engineers/Geotechnical Engineering Division. Proceedings: the Conference on Geotechnical Practice for Disposal of Solid Waste Materials, Ann Arbor, University of Michigan, June 13-15, 1977.
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A case study describing the location, identification, and a series of remedial actions taken for an existing sodium cyanide waste disposal site in the Midwest is presented. Sodium cyanide, a common toxic industrial waste, was disposed of in this case in pellet form and solid waste materials at three pit locations. Sampling and monitoring programs, physical and chemical identification of the materials, and an evaluation of the relative effectiveness of in situ neutralization, and a removal method of neutralization are detailed. Monitoring data covering a period of three years is presented to evaluate the effectiveness of the neutralization techniques. A discussion of the large variations between the cyanide concentrations in the soils and groundwater is presented.
(12) KEYWORDS: CHEMICAL; DISPOSAL; EFFECT; ENVIRONMENT; INDUSTRY; MONITOR; PITS; PLANT-INDUSTRIAL; SAMPLING METHODS; SITES; TOXIC; TREATMENT
(14) HIERARCH TERMS: 1DD/2DL; 1HA/2HF
(15) STIMS ACC.NO.: 00S41527 (15) SECONDARY AUTHORS: Zimmerman RE
(16) CITATION: New York City, American Society of Civil Engineers, 1977. p.831-849.

(1) SWIRS ACC.NO.: 042423
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Land disposal of hazardous wastes: an example from Hopewell, Virginia.
(4) AUTHOR: Walz DH
(6) JOURNAL TITLE: Ground Water, Special Issue. V.2.
(6) BOOK TITLE: In Lehr, J. H., and M. Hoch, eds. Proceedings: the Third National Ground Water Quality Symposium, Las Vegas, NV, Sept. 15-17, 1976.
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2VA/3HW (10) PUB. YEAR: 1977
(11) ABSTRACT: Details of the special disposal pit designed for the disposal of the pesticide Kepone in Hopewell, Virginia, are given as an example of management of hazardous wastes for land disposal. Predisposal cleanup procedures at the plant manufacturing the pesticide, and the Kepone disposal pit design, evaluation, and operations are discussed. The disposal pit method, recommended by a specially created Technical Committee by the Virginia State Department of Health specifically to cleanup and close the Kepone manufacturer in Hopewell, incorporated encapsulation of the wastes in clay and plastic. Completed in early March, 1976, the disposal site is monitored by the Virginia State Water Control Board via an observation well and an underdrain system.
(12) KEYWORDS: CONTROL; DESIGN; DISPOSAL; HAZARDOUS; LAND; LEACH; LINER; MANAGEMENT; MONITOR; PESTICIDE; SAFETY; SANITARY LANDFILL; TRENCH; VIRGINIA
(14) HIERARCH TERMS: 1GD; 1HA/2HF; 1MA/2MG; 1TE
(15) STIMS ACC.NO.: 00S41466 (15) SECONDARY AUTHORS: Chestnut KT Jr
(16) CITATION: 15(1):75-80, Jan.-Feb. 1977.

(1) SWIRS ACC.NO.: 042333
(2) DOMESTIC: D (2) CATEGORY: 07 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Land application of waste materials: unresolved problems and future outlook.
(4) AUTHOR: Martin WP
(6) BOOK TITLE: In Land Application of Waste Materials.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: A review of the land application of waste materials is presented, and unresolved problem areas where additional research is

needed are identified. A distinction is made between disposal versus the use of waste materials. Specific waste materials of concern are noted as heavy metals, pathogens, nutrient elements, persistent organics, organic loadings, waste water and heat, radioactive waste, salinity, and aesthetic values. A soil quality index is proposed to relate the environmental impact of continuing or sustained use of soil amendments on crop production or other land uses. The statement is made that the land application of waste can only be acceptable if it is consistent with good crop, silvicultural, and land management practices. Such practices must be consistent with protecting the soil as a resource and, at the same time, protect against the degradation of surface and ground water and possible conflict with food and fiber production. The following areas are recommended for further research: prediction of the long term fate of potentially toxic heavy metals; survival, movement, and possible deactivation of viruses; the capacity of soil to accept waste; the development of cropping systems to optimize the use of nutrients while maximizing the amount of waste organics that can be accommodated; the use of waste heat and water; and the economic impact of waste management systems on agricultural production.

(12) KEYWORDS: BENEFIT; CRITERIA; DISPOSAL; EARTH; ECONOMICS; EFFECT; HAZARDOUS; LAND; MANAGEMENT; PROBLEMS; PROJECTION; RESEARCH; SLUDGE; UTILIZE; WASTE WATER

(14) HIERARCH TERMS: 1DD/2DQ; 1MA; 1SJ

(15) STIMS ACC.NO.: 00S41377 (15) SECONDARY AUTHORS: Gast RG; Meyer GW

(16) CITATION: Ankeny, IA, Soil Conservation Society of America, 1976. p. 300-309.

(1) SWIRS ACC.NO.: 042048

(2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Management of used chemicals.

(6) JOURNAL TITLE: Materials Reclamation Weekly

(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1977

(11) ABSTRACT: A one day conference on the management of used chemicals was held in Strathford on Avon in England. A sampling of technological potential began with domestic refuse. After separation, the cellulose element could be used for the production of ethanol. About 90 percent of the plastics now made from oil could be made from ethanol. Acid from pickling solutions could be revitalized by a system employing ion exchange membranes. Tin in a plating solution was saved by the same method. Metals in low concentrations can be recovered in a continuous electrolytic system. In the field of agriculture, grasslands were fertilized with a liquor generated in the production of gas (for nitrogen) and with coke oven byproducts (for phosphate and potash). Recovery process of solvents in Europe is discussed, and the problems of disposing of polychlorinated biphenyls are also discussed.

(12) KEYWORDS: ALCOHOL; CHEMICAL; CONFERENCE; DISPOSAL; ECONOMICS; EUROPE; GREAT BRITAIN; HAZARDOUS; LAND; MANAGEMENT; POLYCHLORINATED; RECLAMATION; UTILIZE

(14) HIERARCH TERMS: 1CB/2CA/3CC; 1CB/2CB/3CF; 1RB

(15) STIMS ACC.NO.: 00S41092

(16) CITATION: 129(1):20-21, 24, Jan. 1, 1977.

(1) SWIRS ACC.NO.: 042004

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Sewage sludges, garbage composts and the food chain.

(4) AUTHOR: Beeson KC

(6) JOURNAL TITLE: Interface

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: A literature review concerning the phytotoxicity of heavy metals in sludges and composts and their behavior in the food chain and uptake by plants is presented. Applications of inorganic zinc to the soil were several fold more effective in increasing uptake of zinc by crops than were applications of compost or sludge containing the same quantity of zinc. A method for reducing the phytotoxicity of cadmium by plants by controlled irrigation was investigated. Three

papers report an experiment with sewage sludge with and without added copper, chromium, zinc, and nickel salts added to the sludge or directly to the soils. The transfer of cadmium and lead from sewage sludge to several carriers of the food chain was investigated. That cadmium is readily taken up by the roots of immature corn plants and transported to the shoots was reported. The need for more information on the range of concentrations of the potentially phytotoxic elements in the edible portion of crops where normal yields are obtained from the application of contaminated waste materials to soils is delineated.

(12) KEYWORDS: CHROMIUM; COMPOST; CROP; EFFECT; FOOD; IRRIGATION; LITERATURE; METAL; SEWAGE; SLUDGE; SOIL CONDITIONER; TOXIC; VEGETATION

(14) HIERARCH TERMS: 1HA; 1MD; 1SA/2S2; 1VC

(15) STIMS ACC.NO.: 00S41048

(16) CITATION: 5(1):23, 1976.

(1) SWIRS ACC.NO.: 041336

(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Rosenberg DG (10) GEO. AREA: 1PF/2PG/3PG; 1PF/2PG/3PH (10) PUB. YEAR: 1976

(11) ABSTRACT: A comprehensive review of hazardous waste generation and management practices within the petroleum refining industry is presented. Nearly 625,000 metric tons (dry weight) of wastes were generated in 1974 by 247 refineries with processing capacity of 14. 2 million barrels per day. Waste streams emanating from individual refining process are characterized and described in detail. Following site visits and waste stream sampling at a representative group of sixteen refineries, a laboratory program of chemical analysis was carried out to identify potentially hazardous constituents of refinery wastes. Concentration levels of these constituents were measured, and hazardous wastes defined as those with any constituent with a concentration exceeding the average level in the natural soil environment. Oil is the principal hazardous substance in refinery wastes, representing approximately 110,000 metric tons per year. Metal constituents amount to 250 metric tons, fluoride to 812 metric tons, and phenol, cyanide, and benz-A-pyrene collectively to 6 metric tons. More than half of refinery wastes are removed by private contractors to ultimate disposal in offsite landfills or lagoons, however projections indicate a dramatic shift toward onsite disposal, particularly by landspreading and filling. (Retained in SWIRS library)

(12) KEYWORDS: DISPOSAL; ECONOMICS; HAZARDOUS; INDUSTRY; LAND; MANAGEMENT; OIL; REFINERY; SURVEY; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1HA/2HH

(15) STIMS ACC.NO.: 00S40380 (15) SECONDARY AUTHORS: Cruse H; Lofy RJ

(18) DOC.CIT.: Rosenberg, D. G. , R. J. Lofy, and H. Cruse. Assessment of hazardous waste practices in the petroleum refining inudstry. Washington, DC, U. S. Environmental Protection Agency, June 1976. 353 p. (Distributed by the National Technical Information Service, Springfield, VA, as PB 259 097.)

(1) SWIRS ACC.NO.: 040739

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) GEO. AREA: 1EU/2GE (10) PUB. YEAR: 1975

(11) ABSTRACT: A plan confirmation procedure for erecting and operating a special refuse dump in Ochtrup, Germany by the Gelsenberg-Mannesmann Environmental Company is presented. The landfill is proposed as a special waste receptor for hazardous solid industrial waste, and especially dangerous and toxic waste materials which were previously dumped in salt mines. Members of various government agencies and of industrial concerns express their misgivings at the hearings on the special landfill in the areas of operations and maintenance, air

and water pollution, economics, and health and environmental safety. (Original text in German) (Retained in SWIRS library)

(12) KEYWORDS: DISCUSSION; DISPOSAL; GERMANY; GOVERNMENT; HAZARDOUS; HEALTH; INDUSTRY; LOCAL; PLANNING; POLLUTION; SAFETY; SANITARY LANDFILL; TOXIC

(14) HIERARCH TERMS: 1DD/2DW; 1SD/2SG

(15) STIMS ACC.NO.: 00S39783

(18) DOC.CIT.: Planfestellungsverfahren zur errichtung und zum betrieb einer sondermuelldeponie in Ochtrup durch die Gelsenberg-Mannesmann-Umweltschutz-GmbH, Essen, (GMU). (Plan confirmation procedure for erecting and operating a special rubbish dump in Ochtrup by the Gelsenberg-Mannesmann Environmental Company, Essen (GMU).) Germany, Government of Muenster, Aug. 6, 1975. 19 p.

(1) SWIRS ACC.NO.: 040641

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Shiver JK (10) GEO. AREA: 1US/2LA/3NO (10) PUB. YEAR: 1976

(11) ABSTRACT: Results of an assessment of the magnitude of the waste chlorohydrocarbon problem in the United States, and a study of the applicability of the conversion of this waste by chlorolysis as a means of resolving the problem are presented. An estimated 86,400 metric tons per year of chlorohydrocarbon waste is generated in the United States and usual treatments are chlorolysis to solvents, and incineration. The balance is disposed of by deep well injection or burial. The identified waste is a suitable feedstock for a chlorolysis operation if it is pretreated to remove particulate materials and moisture. Geographically, the waste is generated primarily along the Gulf Coast, from Corpus Christi to New Orleans. The Gulf Coast concentration indicates that a regional waste disposal facility (including a chlorolysis unit, a waste pretreatment unit, and a conventional incineration unit) would be viable. Preparation of a design and firm capital estimate is recommended as the next step in an overall program leading to such a regional facility.

(12) KEYWORDS: BURY; CHLORINE; CONTROL; DISPOSAL; FACILITY; HYDROCARBON; INCINERATION; LOUISIANA; PESTICIDE; PLANNING; POLLUTION; PROCESS; REGIONAL; TEXAS; TREATMENT

(14) HIERARCH TERMS: 1CB/2CA/3CB; 1TD; 1WA/2WG

(15) STIMS ACC.NO.: 00S39685

(18) DOC.CIT.: Shiver, J. K. Converting chlorohydrocarbon wastes by chlorolysis. Environmental Protection Publication EPA-600/2-76-270. Washington, U. S. Environmental Protection Agency, Oct. 1976. 68 p. (Environmental Protection Technology Series.)

(1) SWIRS ACC.NO.: 040546

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Chin DT (10) GEO. AREA: 1UA/2HF; 1TD (10) PUB. YEAR: 1976

(11) ABSTRACT: A study has been made of the destruction of concentrated cyanide solutions with a steel packed bed electrochemical cell. The apparent current densities studied varied from 45 to 350 milliamperes per square centimeter based upon the cross sectional area of the packed column. It was found that cyanide was destroyed at a rate of 0. 1 to 10 moles per faraday of electricity. Chemical decomposition was found to take place at the beginning of the electrolysis due to the catalysis of the steel bed. The average power consumption ranged from 0. 0025 to 0. 05 kilowatts per hour per gram of cyanide destroyed, depending upon the magnitude of cell current.

(12) KEYWORDS: CHEMICAL; CHLORINE; DECOMPOSE; EFFLUENT; ELECTRICAL; ELECTROLYSIS; ION; PH; POWER; PUMP; TOXIC; WASTE WATER

(14) HIERARCH TERMS: 1CB/2CA/3CA

(15) STIMS ACC.NO.: 00S39590 (15) SECONDARY AUTHORS: Eckert B

(18) DOC.CIT.: Chin, D. T. , and B. Eckert. Destruction of cyanide wastes with a packed-bed electrode. Plating and Surface Finishing, 63(10):38-41, Oct. 1976.

(1) SWIRS ACC.NO.: 038745
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The third in a series of reports on the improper land disposal of hazardous waste is discussed. The report was prepared by the Environmental Protection Agency's Office of Solid Waste Management Programs. Criteria used in the selection of incidents for the hazardous waste reports are severity of damage, availability of supporting information, and availability of Environmental Protection Agency personnel for investigation. This report is concerned with petrochemical contamination of the Cohansey aquifer in New Jersey, hexachlorobenzene contamination of cattle in Louisiana, and workers exposed to poisonous fumes at a Maryland landfill. Each damage incident is described in terms of personal damage, environmental damage, economic damage, cause of problem, type and quantity of hazardous waste, source of waste, date of incident, location, status, remedial action, legal action, and costs involved. (Document retained in SWIRS library)
(12) KEYWORDS: ACCIDENT; CONTAMINATE; DISPOSAL; ECONOMICS; HAZARDOUS; INVESTIGATION; LOUISIANA; MANAGEMENT; MARYLAND; NEW JERSEY; OSWMP
(15) STIMS ACC.NO.: 00S37789
(18) DOC.CIT.: Hazardous waste disposal damage reports. Environmental Protection Publication EPA-530/SW-151. 3. Cincinnati, OH, U.S. Environmental Protection Agency, June 1976, 13 p. (Solid Waste Management Series.)

(1) SWIRS ACC.NO.: 038713
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: A process for the microbial degradation of dichlorodiphenyltrichloroethane (DDT) is presented. A process for the degradation of DDT where it appears as a pollutant or a contaminant is described for the following conditions: dirty closed or open waters; industrial effluent wastes; polluted marshlands and estuaries; marine environments; disposal lagoons; contaminated industrial areas; soils and farmlands; and other situations where DDT may accumulate. The procedure provides for degrading readily, efficiently and economically. The microorganisms provided are capable of degrading DDT, leaving a detoxified and beneficial cell mass. The microorganisms are nonpathogenic to marine fauna and flora, humans and animals. The process also provides a means of treating DDT without the need for the handling, transporting and storage of heavy, bulky equipment. The process can also be used to degrade various hydrocarbon oils and petrochemicals wherever their presence constitutes a deleterious pollutant.
(12) KEYWORDS: DECOMPOSE; MICROORGANISM; PATENT; PESTICIDE; PROCESS; TREATMENT
(15) STIMS ACC.NO.: 00S37757
(18) DOC.CIT.: Prudom, C. M. (Biotekbika International, Inc.). Microbial degradation of DDT. U. S. Patent No. 3,979,283; filed Sept. 25, 1974; issued Sept. 7, 1976.

(1) SWIRS ACC.NO.: 038630
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The disposal of aerosol cans is addressed, based on procedures recommended by the Environmental Protection Agency (EPA) with regard to vinyl chloride as an aerosol propellant. Historical aspects of regulations on the use of vinyl chloride are reviewed. Guidance is provided for the disposal of aerosol cans containing vinyl chloride. Technical information on vinyl chloride monomer (VCM) as a chlorinate alkene hydrocarbon is presented. VCM constitutes about 20 percent by volume of the propellant of most pesticide aerosols prohibited by EPA. The pesticides involved are primarily pyrethrins, lindane, and malathion. In hair sprays, deodorants, and paints, VCM may constitute as much as 40 to 45 percent by volume of the contents. The final disposal of aerosol cans containing VCM should be undertaken

using methods listed in the following order of preferred priority: (1) high temperature incineration (except for products containing heavy metals); (2) burial in a State approved chemical or hazardous waste landfill; (3) burial in a separate area of a State approved landfill.
(12) KEYWORDS: AEROSOLS; BURY; CONTAINER; DISPOSAL; EPA; INCINERATION; PESTICIDE; POLYVINYL CHLORIDE; REGULATIONS
(15) STIMS ACC.NO.: 00S37674
(18) DOC.CIT.: Environmental Protection Agency: vinyl chloride-recommended procedures for disposal of aerosol cans. Federal Register, 41(112):23226-23227, June 9, 1976.

(1) SWIRS ACC.NO.: 038602
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Problems associated with the disposal of dilute pesticide solutions are discussed, along with sources of dilute solutions, disposal practices, and factors which influence a choice among disposal practices. Three dilute solutions are generated in the study by container rinsing, equipment washing, water from pesticide fire fighting operations, spill cleanups, and drum reconditioning operations. The possible buildup of toxic levels of the dilute solutions in soil is discussed. Disposal methods in use for dilute pesticide solutions are identified and discussed. These methods and their characteristics are summarized in tabular form. Incineration and batch biodegradation of dilute pesticide solutions are considered to be limited by high cost, complexity, and low availablity. Photodecomposition and chemical degradation can be effective under correct conditions, although neither provides complete degradation for all pesticides and their degradation products. Lagooning is one method used principally by manufacturers to provide light for photodecomposition to occur. Soil injection and gravel filled pits are primarily biodegradation methods. Long term storage of dilute pesticide solutions in special land disposal sites is offered as a last resort. Whenever possible, it is concluded that the use of dilute solutions for spray mixtures is the most reliable and desirable method for disposal.
(12) KEYWORDS: BIOLOGICAL; DATA; DECOMPOSE; DILUTION; DISPOSAL; LAGOONS; PESTICIDE; PROBLEMS; STORAGE; TOXIC
(15) STIMS ACC.NO.: 00S37646
(18) DOC.CIT.: Day, H. R. Disposal of dilute pesticide solutions. Environmental Protection Publication EPA-530/SW-519. Washington, U. S. Environmental Protection Agency, June 1976, 18 p. (Solid Waste Management Series.)

(1) SWIRS ACC.NO.: 038434
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: The following techniques for the treatment and disposal of polluting and toxic wastes are discussed: recovery and reclamation; chemical fixation; chemical and biochemical treatment; land and sea disposal; incineration including pyrolysis; and physical treatment. Hydrogeological consideration, such as leaching under different geological situations, are described and illustrated by four figures. The legal requirements for toxic waste disposal are discussed under headings: Deposit of Poisonous Waste Act (1972), and the Control of Pollution Act (1974).
(12) KEYWORDS: BIOLOGICAL; CHEMICAL; CONTAMINATE; EUROPE; INCINERATION; LAW; LEACH; METAL; POLLUTION; PYROLYSIS; RECLAMATION; SITES; TOXIC
(15) STIMS ACC.NO.: 00S37476
(18) DOC.CIT.: Rumary, C. B. Toxic waste disposal technical, legal and hydrogeological aspects. Solid Wastes, 66(7):300-310, July 1976.

(1) SWIRS ACC.NO.: 037902
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Chemical solidification of waste and disposal by landfill are discussed as techniques that were adopted by a plant of E. I. DuPont in Belle, West Virginia. Chemfix Inc. of Pittsburgh, Pennsylvania and National Environmental Controls Inc. in Louisiana were responsible for development of the chemical techniques. The results of tests conducted to evaluate chemical solidification of waste and disposal by landfill have proven to be successful with regard to the deposition of waste materials in the Gulf of Mexico. Efforts directed toward the goal of properly handling toxic and hazardous waste are noted, not only for the Belle, West Virginia plant but also for industries in Louisiana. The potential effect of hazardous waste on Louisiana's water supply is discussed with regard to chemical products and carcinogens. The location of a new DuPont plant in Louisiana is evaluated.
(12) KEYWORDS: CHEMICAL; HAZARDOUS; LOUISIANA; MANAGEMENT; PENNSYLVANIA; PLANNING; PLANT-INDUSTRIAL; SANITARY LANDFILL; SOLID; STATE; WEST VIRGINIA
(15) STIMS ACC.NO.: 00S36946
(18) DOC.CIT.: Mackay, B. B. , Jr. Chemical wastes snafu spurs state planning. Solid Wastes Management, 19(7):40,68, July 1976.

(1) SWIRS ACC.NO.: 037891
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Hazardous waste problems are discussed in relation to ground water contamination via leachate, surface water contamination via runoff, air pollution via burning, evaporation, sublimation, wind erosion, poisonings due to direct contact with and through the food chain, and fires and explosions at land disposal sites. Hazardous waste may involve chemical, biological, flammable, explosive, or radioactive substances. Physically, hazardous waste can be in the form of liquids, solids, sludges, and gases. Most hazardous or toxic waste can be categorized as inorganic toxic waste is discussed, with emphasis on the Hazardous Materials Transportation Act of 1974, Federal Water Pollution Control Act Amendments of 1972, regulations that apply to the disposal of hazardous waste, existing disposal practices, landfill disposal, chemical fixation, incineration, chemical and pretreatment methods, deep well disposal, ocean dumping, and microwave decomposition. International disposal techniques for other than high level solid radioactive waste are noted, including shallow land burial, disposal into mines and deep geological formations, deep sea disposal, deep well disposal, and packaging.
(12) KEYWORDS: BIOLOGICAL; BURY; CHEMICAL; DECOMPOSE; DEEP WELL; DISPOSAL; DUMPING; EPA; HAZARDOUS; INCINERATION; MANAGEMENT; MINE; OCEAN; PACKAGING; RADIOACTIVE; REGULATIONS; SANITARY LANDFILL; TOXIC; TREATMENT
(15) STIMS ACC.NO.: 00S36935
(18) DOC.CIT.: Cheremisinoff, P. N. , and W. F. Holcomb. Management of hazardous and toxic wastes. Pollution Engineering, 8(4):24-32, Apr. 1976.

(1) SWIRS ACC.NO.: 037597
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: Treatment facilities in Switzerland that annually handle 10,000 and 30,000 tons are described. These facilities accept all types of industrial waste solutions, acid, alkaline, cyanide, metal containing and other special solutions. The materials or solutions are delivered to the plant in plastic containers. Larger quantities can be transported in a center-owned 15 ton suction tank semitrailer. The substances are segregated by type and analyzed before treatment is begun. Careful monitoring at each step assures an effluent which meets regulations. A specialized treatment center of this type is rapidly

becoming a necessity in order to protect public waters from non-decontaminated waste waters.
(12) KEYWORDS: CONTAINER; DESIGN; EUROPE; FACILITY; FILTER; HAZARDOUS; INDUSTRY; ION EXCHANGE; PLASTIC; PRECIPITATE; PROCESS; SLUDGE; STORAGE; SWITZERLAND; TOXIC; TRANSPORT; TREATMENT; WASTE WATER
(15) STIMS ACC.NO.: 00536641
(18) DOC.CIT.: Anon. Detoxifying industrial wastewaters. Environmental Science and Technology, 10(2):127-129, Feb. 1976.

(1) SWIRS ACC.NO.: 037372
(2) DOMESTIC: F (2) CATEGORY: 24 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The response of activated sludge to the polychlorinated biphenyl (PCB) Kanechlor 500 and its biodegradation by anaerobes is investigated. Kanechlor 500 was selected for study as a representative industrial toxicant. Its effect on biochemical characteristics of activated sludge and its behavior in the biological treatment process were observed. The efficiency of COD (chemical oxygen demand) removal by activated sludge was not affected by low water concentrations of PCB. PCB did, however, result in changes in microfilm and increased aldolase activity at these low concentrations. A characteristic effect of PCB on activated sludge was demonstrated in an increase in the oxygen uptake activity, suggesting that PCB might be an uncoupler of oxidative phosphorylation. PCB did not undergo degradation to any appreciable extent during the aeration process nor as the result of anaerobic digestion, although low concentrations did not exert an influence on COD and BOD (biochemical oxygen demand) in the process. In synthetic sewage, PCB underwent mobilization from the aqueous phase to activated sludge. It was concluded that PCB exerts some influence on activated sludge even if water concentrations are low and that PCB has the potential to accumulate in activated sludge while its degradation by activated sludge and anaerobic digestion is difficult.
(12) KEYWORDS: ACTIVATED SLUDGE; AIR; ANAEROBIC; BOD; COD; COLLECTION; CONCENTRATION; DECOMPOSE; DIGESTION; EFFECT; INVESTIGATION; POLYCHLORINATED; PROBLEMS; TOXIC; WATER
(15) STIMS ACC.NO.: 00536417
(18) DOC.CIT.: Kaneko, M. , K. Morimoto, and S. Nambu. The response of activated sludge to a polychlorinated biphenyl (KC-500). Water Research, 10(2):157-163, 1976.

(1) SWIRS ACC.NO.: 037280
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: A landfill disposal method for hazardous waste is reported that is particularly applicable to chromium ore residues. The method is described in a paper presented at the Third Japan-United States Governmental Conference on Solid Waste Management in May 1976. It is estimated that there are about 248 chromium ore residue burial sites in Japan, and the potential hazard of these sites is noted. The efforts of Tokyo's Metropolitan Government to investigate pollutional aspects of chromium storage are described in relation to the construction of a subway line which resulted in the discovery of chromium ore residues as deep as 5 meters below the ground surface. It was concluded that the control of hazardous substances, in this case chromium ore residues, would best be accomplished by isolating the landfill or land burial site away from the public and by placing the landfill or land burial area under the jurisdication of a public agency. Data is tabulated on the prevalence of metals in Japanese soil,

based on samples taken during 1973 and 1974. (Document retained in SWIRS library)

(12) KEYWORDS: BURY; CHROMIUM; CONFERENCE; CONTROL; HAZARDOUS; JAPAN; POLLUTION; PUBLIC; RESIDUE; SAFETY; SANITARY LANDFILL; SITES; STORAGE; TREATMENT

(15) STIMS ACC.NO.: 00S36325

(18) DOC.CIT.: Muton, N. Landfill disposal method for hazardous wastes, especially for chromium ore residues. In: Hickman, H. L. , Jr. , ed. Proceedings; Third Japan-United States Governmental Conference on Solid Waste Management, Tokyo, May 10-17, 1976. Washington, DC, Environmental Protection Agency, June 1976, 753 p. (p. 4. 1. 2. 1 - 4. 1. 2. 11).

(1) SWIRS ACC.NO.: 037202

(2) DOMESTIC: D (2) CATEGORY: 19 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A technique for minimizing the hazardous properties of polychlorinated biphenyls (PCBs) is noted. Canada's Department of the Environment states that the technique involves a newly developed strain of bacteria and a special procedure by which bacteria is given access to the previously almost indestructible PCB compounds. PCBs, used as a heat transfer fluid and in paints, inks, and copying papers and valued for their insulating qualities and insolubility, are considered to an environmental hazard in that they do not break down even over many decades. The Health Protection Branch of Health and Welfare in Canada, in consultation with the Fish Inspection Branch of Environment Canada, has established a temporary guideline of 2 ppm maximum for PCBs in the edible portion of fish. It is noted that the new technique for minimizing the hazardous properties of PCBs is most likely to be of value in the treatment of industrial wastes containing PCBs and in disposing of such objects as transformers which contain the chemical. The technique may not, however, be applicable to the problem of PCBs already in the environment or to diffuse sources in which the pollutant has already been mixed with other effluent.

(12) KEYWORDS: BACTERIA; BIOLOGICAL; BOARD; CANADA; CONTROL; DECOMPOSE; FISH; HAZARDOUS; POLYCHLORINATED; SPECIAL; TECHNOLOGY; TOXIC

(15) STIMS ACC.NO.: 00S36307

(18) DOC.CIT.: Anon. Poison PCBs made safe by bacteria. Fishing News International, 15(3):57, Mar. 1976.

(1) SWIRS ACC.NO.: 037146

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The removal of contaminants from water by using clay minerals is investigated. The ability of HVM, RVM, and LVM (high, regular, and low volatile matter) clays to remove organics, viruses, and heavy metals from water was studied. Attapulgite clay was an excellent adsorbent for various contaminants that are resistant to removal by conventional water treatment processes. Contacting with attapulgite, sepiolite and an amorphous zeolite resulted in virus adsorption to various degrees, with the highest degree of adsorption exhibited by HVM grades of attapulgite. Contacting with HVM attapulgite indicated that clay adsorbed substantial amounts of diazinon (an insecticide), diethylstilbestrol (a hormone), and aflatoxin (a mycotoxin), with probable total adsorption of the mycotoxin. Percolation of diazinon, diethylstilbestrol, and aflatoxin through granular LVM attapulgite resulted in good adsorptive capacities, with the best capacity for adsorptionn exhibited for the aflatoxin. Good capacities for heavy metal adsorption were obtained using percolation through a granular LVM attapulgite bed.

(12) KEYWORDS: ADSORPTION; CLAY; COLLECTION; INVESTIGATION; METAL; MINERAL; ORGANIC; PERCOLATE; POLLUTION; UTILIZE; VIRUS; WATER

(15) STIMS ACC.NO.: 00S36191

(18) DOC.CIT.: Morton, S. D. , and E. W. Sawyer. Clay minerals remove organics, viruses and heavy metals from water. Water and Sewage Works, Reference Issue:R-116, R-118, R-120, Apr. 30, 1976.

(1) SWIRS ACC.NO.: 037082
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: The development and installation of a chemical waste landfill at the Union Carbide plant in Institute, West Virginia is described. Investigations leading to the chemical landfill project pointed out the need for handling a large volume of waste, proximity of landfill to plant, protection against uncontrolled leachate and excessive rain, protection of personnel, and avoidance of fire and odor. Design and operating practices were developed for the landfill, and costs for landfill operations were initially based on an annual waste load of 12,000 cu yd per year. Disposal costs of chemical landfill were compared to those associated with incineration and sanitary landfill techniques. A form was specially designed for waste classification and control. Based on the experience at the Union Carbide plant, it is concluded that chemical landfill is a viable method for handling hazardous and refractory chemical waste. Problems in the chemical landfill project have included leachate collection and odor, although it is anticipated that these will be corrected during the final phase of landfill construction. It is felt that a highly experienced landfill operator familiar with chemicals and chemical process operations is essential to the successful control of a chemical landfill facility.
(12) KEYWORDS: CHEMICAL; CLASSIFICATION; COMPARISON; CONFERENCE; DISPOSAL; ECONOMICS; FIRE; INCINERATION; INVESTIGATION; LEACH; MANAGEMENT; ODOR; PERSONNEL; SANITARY LANDFILL; WEST VIRGINIA
(15) STIMS ACC.NO.: 00S36127
(18) DOC.CIT.: Slover, E. A case history: implementing a chemical waste landfill. In: National Solid Wastes Management Association. Proceedings; Fourth National Congress on Waste Management Technology and Resource and Energy Recovery, Atlanta, November 12-14, 1975. Washington, DC, U. S. Environmental Protection Agency, 1976, 382 p. (p. 46-66).

(1) SWIRS ACC.NO.: 037081
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Chemical aspects of hazardous waste management are noted. The chemical viewpoint of hazardous waste management is summarized in terms of three major steps: (1) segregate hazardous waste from all other waste; (2) keep various types of hazardous waste separated from each other; and (3) process hazardous materials to produce environmentally acceptable and products when there is no opportunity for recycling. Conventional concepts in solid waste management are considered, including a large and relatively constant volume of waste, constant composition of waste, containment or waste in a specific location, and control of waste to prevent adverse environmental effects. The chemical viewpoint is contrasted with conventional concepts in that it emphasizes a relatively small volume of hazardous waste which must be kept segregated from the bulk of nonhazardous waste and special handling of residues from processed hazardous waste to prevent the regeneration of toxic characteristics. It is concluded that the cost of proper hazardous waste management will be higher than that of nonhazardous waste management. However, the potential cost associated with inadequate disposal of hazardous waste is much higher in terms of economics and environmental damage.
(12) KEYWORDS: CHEMICAL; COMPOSITION; CONFERENCE; CONTROL; DISPOSAL; ECONOMICS; ENVIRONMENT; HAZARDOUS; MANAGEMENT; SEPARATING; TOXIC; VOLUME
(15) STIMS ACC.NO.: 00S36126
(18) DOC.CIT.: Brown, W. E. The chemical viewpoint of hazardous wastes management. In: National Solid Wastes Management Association. Proceedings; Fourth National Congress on Waste Management Technology and Resource and Energy Recovery, Atlanta, November 12-14, 1975. Washington, DC, U. S. Environmental Protection Agency, 1976, 382 p. (p. 37-45).

(1) SWIRS ACC.NO.: 037080
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: The regulation of hazardous waste facility siting within the context of an overall waste management program is discussed. Sociopolitical aspects of facility siting are examined, along with economic, institutional and jurisdictional, and technical aspects. It is felt that citizen acceptance of hazardous waste facilities is the most significant sociopolitical aspect of siting. An active, unbiased public education program is recommended to encourage citizen acceptance. The location of hazardous waste facilities on government owned land is another way to alleviate public concerns but this is recommended only as a last resort. The following other recommendations are made: (1) eliminate waste importation bans in a geographical area which are counterproductive; (2) build safeguards against the abandonment of hazardous waste facilities into facility permit processes; (3) provide private facilities with fiscal incentives or set up some form of public service facility; (4) address technical site selection criteria independently rather than with some weighted average scheme, since additive totals may mask basic defects in a proposed site; and (5) establish minimum training requirements for facility operators and a routine monitoring and surveillance program as basic components in regulatory criteria for hazardous waste treatment and disposal facilities.
(12) KEYWORDS: ABANDONED; CHEMICAL; CONFERENCE; GEOGRAPHY; HAZARDOUS; MANAGEMENT; MONITOR; PROGRAM; PUBLIC; PUBLIC RELATIONS; REGULATIONS; SAFETY; SITES; TRAINING
(15) STIMS ACC.NO.: 00S36125
(18) DOC.CIT.: Lehman, J. P. Regulatory aspects of siting hazardous waste treatment and disposal facilities. In: National Solid Wastes Management Association. Proceedings; Fourth National Congress on Waste Management Technology and Resource and Energy Recovery, Atlanta November 12-14, 1975. Washington, DC, U. S. Environmental Protection Agency, 1976, 382 p. (p. 22-36).

(1) SWIRS ACC.NO.: 036944
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Solid and/or liquid cyanide waste is destroyed under environmentally favorable conditions by adding water to the cyanide and heating the mixture at high temperature and with the use of pressure.
(12) KEYWORDS: CHEMICAL; COMBINED; CONTROL; DECOMPOSE; ENVIRONMENT; LIQUID; PATENT; PROCESS; SOLID; THERMAL; TOXIC; WATER
(15) STIMS ACC.NO.: 00S35989
(18) DOC.CIT.: Schindewolf, U. Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the environmentally favorable destruction of solid and/or liquid cyanide waste. U. S. Patent No. 3,945,919. Issued Mar. 23, 1976.

(1) SWIRS ACC.NO.: 036846
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: A study on the purification of cyanide-containing waste water by electrodialysis is reported. The study was conducted in a gold extraction plant using an electrodialysis assembly of the circulation type. It was found that electrodialysis of solutions after gold removal is a very promising process which insures both purification of waste water and utilization of valuable components. Obstacles to industrial adoption of the process are noted that are due primarily to the deposition of insoluble compounds on ion exchange membranes. Deposition interferes with normal operation of the electrodialyzer's hydraulic system, raises specific energy consumption, and lowers the output capacity of the electrodialysis assembly. Deposition prevention was investigated during electrodialysis of cyanide-containing solutions. The influence of various water-soluble complexing agents and surfactants on deposit formation was studied, along with the effort of softening the original cyanide-containing solutions. It was demonstrated that the best scheme for purifying

cyanide wastes by electrodialysis involves preliminary ion exchange softening of solutions and the use of electrodialysis concentrate for regenerating ion exchange columns.

(12) KEYWORDS: ENERGY; HYDRAULIC; ION; NON-FERROUS; PROCESS; PURIFICATION; RECLAMATION; TOXIC; UTILIZE; WASTE WATER

(15) STIMS ACC.NO.: 00S35691

(16) DOC.CIT.: Lyubman, N. Y. , A. I. Usov, and M. A. Bogomol. Purification of cyanide-containing waste waters by electrodialysis. Journal of Applied Chemistry, 48(10):2241-2243, 1975.

(1) SWIRS ACC.NO.: 036804

(2) DOMESTIC: F (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: The control of pollution in the pulp and paper industry is discussed. It is noted that Canada's $7. 5-million Cooperative Pollution Abatement Research program, initiated in 1970, has supported more than 100 research projects designed to provide knowledge and new technology directly applicable to pollution problems. Papers on pollution control are cited that were presented at the 1975 Environmental Improvement Conference held in Vancouver, Canada. With regard to the pulp and paper industry, topics considered at the conference included pilot plant studies for evaluating the performance of centrifugal cleaners and other types of equipment, diffuser design, economic considerations in the selection of a biological treatment system, cost comparisons of aerated lagoons, effluent toxicity, use and disposal of bark, economics and energy, reduction of heat consumption in pulp mills, detection methods, and various occupational protection measures. A panel discussion was held on secondary treatment systems, and an incubation system was reported in which effects due to color and toxic constituents can be separated.

(12) KEYWORDS: CANADA; COMPARISON; CONFERENCE; CONTROL; ECONOMICS; EQUIPMENT; GRANT; INDUSTRY; LAGOONS; PAPER; POLLUTION; PULP; RESEARCH; SEPARATING

(15) STIMS ACC.NO.: 00S35649

(16) DOC.CIT.: Overend, M. Pollution must be halted at the factory wall. Pulp and Paper, 77(1):83-87, Jan. 1976.

(1) SWIRS ACC.NO.: 036575

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Recommended procedures are discussed for the disposal of wastes from industrial facilities which contain polychlorinated biphenyls (PCB's). The procedures, developed as part of the Environmental Protection Agency's action plant to insure that PCB's do not pollute the environment, are addressed primarily to those manufacturing and/or using capacitors and transformers containing PCBs. Background information on the history of PCb use in the United States is presented. Two options are recommended for the disposal of PCB-containing wastes: (1) incineration; and (2) controlled land disposal. Proper incineration must involve a suitable balance among temperature in the incinerator, dwell time in the firing chamber, and oxygen availability. Wastes containing PCB's must not be disposed of with other mixed wastes in sanitary landfills; sites for PCb waste disposal must be located or engineered to avoid direct hydraulic continuity with surface and subsurface waters. Appendices contain a listing of names used for PCB's by various manufacturers and a description of Monsanto's incineration facility in Sauget, Illinois.

(12) KEYWORDS: CHEMICAL; DISPOSAL; ELECTRICAL; FEDERAL; HISTORY; INCINERATION; INDUSTRY; ORGANIC; POLLUTION; POLYMER; REGULATIONS; SANITARY LANDFILL; TOXIC; WATER

(15) STIMS ACC.NO.: 00S35619

(16) DOC.CIT.: Environmental Protection Agency. Polychlorinated biphenyl-containing wastes: disposal procedures. Federal Register, 41(64): 14134-14136, Apr. 1, 1976.

(1) SWIRS ACC.NO.: 036436
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975
(11) ABSTRACT: Experiments with migration of substances and soil percolation, carried out since 1973, have investigated soils contaminated with radioactive isotopes, undisturbed samples (used as control), and soil from sewage-treated fields. Substances that have contaminated soil are tabulated. It was determined that electrical conductivity of seepage water from sewage-treated soil was higher (2. 6 mmhos/cm) than of the control sample (0. 05). The contaminated soil was also found to contain a high percentage of nitrogen compounds such as NO3 and NO2, as well as a higher percentage of minerals (P, Cl, Na, Mg, K, Ca) and heavy metals (Zn, Cd). The migration of zinc (found to be 10. 8 cm/year) was studied separately in cooperation with the ITAL Institute in Wageningen, Holland. (Original text in German.)
(12) KEYWORDS: CHEMICAL; COMPARISON; EARTH; ELECTRICAL; LAND; METAL; MINERAL; NITROGEN; PERCOLATE; RADIOACTIVE; SAMPLING METHODS; SEWAGE; TREATMENT
(15) STIMS ACC.NO.: 00S35481
(18) DOC.CIT.: El-Bassam, N. Testing the load of substances on soil and determining the long-term effects of wastes on ground water. (Versuche zur feststellung der stoffbelastung im boden und zur ermittlung der spaetzeitwirkung von abfallstoffen auf das Grundwasser.) Landwirtschaftliche, Forschung, 3:175-182, 1975.

(1) SWIRS ACC.NO.: 036292
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The special refuse disposal network in Bavaria is described as providing the production industry with sufficient possibilities for inexpensive transfer of their partially hazardous manufacturing wastes. This is based on the economic structure and the size of the land. The construction and operation of the Gallenbach special refuse deposit is described in detail as to size and what special refuses may be stored at the deposit according to the official permit. These include combustion residues; oil-contaminated soil; and decontaminated, neutralized and puncture proof concentrated sludge. The investment costs on the deposit are about 4 million DM for the first stage of construction. For storage of one ton of special refuse at Gallenbach, the GSB (Corporation for Disposal of Special Refuse in Bavaria) charges the waste producer 40 DM. (Text in German with English translation attached.)
(12) KEYWORDS: DISPOSAL; ECONOMICS; FACILITY; GERMANY; HAZARDOUS; INDUSTRY; REFUSE; SPECIAL; STORAGE
(15) STIMS ACC.NO.: 00S35337
(18) DOC.CIT.: Nato Committee on challenges to Modern Society. Pilot study - disposal of hazardous wastes; the Gallenbach special refuse deposit. (Pilotstadie-beseitigung gefaehrlicher Abfaelle; die Sondermuelldeponie Gallenbach.) At: International Experts Conference, Bonn, May 10-13, 1976, 8 p.

(1) SWIRS ACC.NO.: 036170
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975
(11) ABSTRACT: The usage of the Herfa Neurode mine located near Bad Hersfeld, West Germany, for storing industrial hazardous wastes is discussed. The conditions in the mine are particularly favorable for storage. Thanks to the clay, the saline formation is well protected from all infiltration of water coming from upper formations. Procedures for the storage of hazardous wastes are described in detail as well as safety measures for all involved personnel under the direction of the Society for Action "Kali und Salz", certain regulations are imposed and carried out on surface transport conditions of dangerous wastes. (Text

in French. The original document and translation filed in SWIRS library.)

(12) KEYWORDS: CONFERENCE; DISPOSAL; EUROPE; GERMANY; HAZARDOUS; INDUSTRY; LAW; MINE

(15) STIMS ACC.NO.: 00S35215

(18) DOC.CIT.: NATO Committee on Challenges of Modern Society Pilot Study on the Elimination of Dangerous Wastes. Deposit of dangerous wastes into the underground open-cast workings of the Potash Mine of Herfaxleurode. (Depot de dechets dangereux dans les dzantier souterrains de la mine de potasse de Herfa Neurode). Report of the meeting of Technical Experts at Bad Hersfeld, West Germany, Dec. 16-17, 1975, 18 p.

(1) SWIRS ACC.NO.: 036155

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The nature of cation changes in windbreak soils resulting from feedlot runoff is investigated in relation to the premature death of trees. Three windbreaks located adjacent to livestock feedlots and containing segments with dead trees were studied in the Plate River Valley near Grand Island, Nebraska in 1969. At each investigation site, soil profiles were sampled in one-foot increments to a depth of 4 ft. Values for chemical properties were averaged for each soil sample depth, with a 1:1 ratio of soil in distilled water used for pH measurements. Electrical conductivity of soil samples was determined, along with cation exchange capacities. Soil profile samples showed that feedlot runoff, over a period of 2 to 3 yrs, increased soil pH and conductivity and altered the exchangeable cation status in dead tree areas. Changes in soil samples, however, were not considered to be sufficient to kill the trees, although sodium saturation was too high within feedlots to support normal plant growth. It was suggested that heavy metals and organic substances (or their decompositon products) leaching through soils could have been toxic to the trees. Grading was recommended to divert the flow of wastes away from established wind breaks or, alternatively, the selection of upslope locations for new plantings.

(12) KEYWORDS: CHEMICAL; DISTILLATION; EARTH; EFFECT; ELECTRICAL; FEED LOT; HAZARDOUS; LAND; LEACH; MEASUREMENTS; NEBRASKA; PH; TIME; TOXIC; VEGETATION

(15) STIMS ACC.NO.: 00S35200

(18) DOC.CIT.: Van Havenbeke, D. F. , L. Chesnin, and D. R. Miller. Feedlot Waste runoff and mortality of windbreak trees. Journal of Soil and Water Conservation, 31(1):14-17, Jan. -Feb. 1976.

(1) SWIRS ACC.NO.: 033951

(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This publication contains about 35 papers delivered to the National Conference on Management and Disposal of Residues from the Treatment of Industrial Wastewaters. The conference was divided into the following areas of concern: institutional sludge management considerations; inorganic residue systems; and disposal. Some specific areas of concern include: hazardous waste management; sludge dewatering; waste water reuse systems; the recovery of protein values from industrial wastes; land disposal problems and technology; and the stabilization of hazardous wastes. The papers were presented by personnel from various governmental agencies, private industries, and research or educational institutions. (This document is retained in the SWIRS library.)

(12) KEYWORDS: CONTROL; DISPOSAL; ECONOMICS; HAZARDOUS; INDUSTRY; MANAGEMENT; PLANNING; POLLUTION; PROBLEMS; PROCESS; RECLAMATION; RESIDUE; SLUDGE; TREATMENT

(15) STIMS ACC.NO.: 00S32995

(18) DOC.CIT.: Proceedings; National Conference on Management and Disposal of Residues form the Treatment of Industrial Wastewaters, Washington, D. C. , Feb. 3-5, 1975. Rockville, Maryland, Information Transfer, Inc. 274 p.

(1) SWIRS ACC.NO.: 033606
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: Data are presented on the acute toxicity of the thermal degradation products of polymers obtained by two methods of degradation. One system utilized a slowly increasing temperature and gradual degradation of the polymer with the rats being exposed to degradation products as they were evolved. In this system the more toxic polymers included wool, polypropylene, polyvinyl chloride, and urethane foam. The second system utilized conditions of rapid combustion and exposure of rats to the total products of combustion for a period of 4 hr. In this system, the more toxic materials included red oak, cotton, acrylonitrile-bu-tadiene-styrene, and styreneacrylonitrile. This report deals with acute toxicity on the basis of mortality data only and does not include other parameters of toxicity such as organ weights and histopathology. The two experimental techniques presented in the study closely represent the two extreme conditions of rapid combustion versus slow pyrolysis.
(12) KEYWORDS: ANALYSIS; CHEMICAL; COMBUSTIBLE; DATA; HAZARDOUS; HEALTH; POLYMER; PROCESS; PYROLYSIS; RESEARCH; TEXTILE; TOXIC
(15) STIMS ACC.NO.: 00S32650
(18) DOC.CIT.: Cornish, H. H. , K. J. Hann, and M. L. Barth. Experimental toxicology of pyrolysis and combustion hazards. Environmental Health Perspectives, 11:191-196, June 1975.

(1) SWIRS ACC.NO.: 033385
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: The first Hargreaves Clearwaste Treatment Centre is nearing completion where liquid waste, including toxic wastes, will be entirely disposed of by chemical treatment and incineration, under the strict control of Government regulations. Waste will come into the centre in sealed tankers and pumped into high security storage tanks. Analysis will then take place and the liquid will be chemically treated. Sludge will be disposed of through incineration. Estimated capacity will be 500,000 gal per week.
(12) KEYWORDS: ANALYSIS; CHEMICAL; DISPOSAL; GREAT BRITAIN; HAZARDOUS; INCINERATION; LIQUID; SLUDGE; STORAGE; TREATMENT
(15) STIMS ACC.NO.: 00S32429
(18) DOC.CIT.: Hargreaves toxic waste centre. Water and Waste Treatment, 18(6):12, May 1975.

(1) SWIRS ACC.NO.: 032999
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: A processing plant for the treatment of hazardous industrial waste has been constructed by Polymeric Treatments, Ltd. near their Brownhills, Staffordshire, works in Britain. The plant, known as the Sealosafe plant, will treat 50,000 tons of industrial waste per year. Using a polymerization unit which reacts the wastes with chemicals, a thick porridge-like slurry is formed. After pumping to a land reclamation site, the slurry converts into a hard solid within 3 days. The weight controlled polymerization is carried out at normal temperature and atmospheric pressure. All waste is treated. There are no gases produced and no liquid effluent is discharged during the process. Treated wastes have very low permeability, are non-leaching, are non-biodegradable, odorless, and have substantial strength. Thus, the polymerized wastes are not easily dispersed into the environment.
(12) KEYWORDS: CHEMICAL; EUROPE; GREAT BRITAIN; HAZARDOUS; INDUSTRY; LEACH; PLANT-INDUSTRIAL; POLYMER; PROCESS; RECLAMATION; TOXIC
(15) STIMS ACC.NO.: 00S32043
(18) DOC.CIT.: Britain's first waste polymerization plant. Surveyor, 35, Nov. 1, 1974.

(1) SWIRS ACC.NO.: 032997
(2) DOMESTIC: F (3) CATEGORY: 05 (4) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: A 750,000 pounds sterling automated hazardous industrial waste processing and recovery center has been constructed in Roughmute, Stirling by Re-Chem International of Scotland. Inorganic wastes will be processed chemically using advanced methods pioneered by the company and previously tested at a similar plant in Pontypool, South Wales. The treatment process will render poisonous waste substances innocuous and convert all toxic components either into harmless water soluble derivatives or into water insoluble inert derivatives. Many metals, including copper, nickel, cobalt, cadmium, tin, and lead, are covered for reuse by the process. Waste not suitable for chemical treatment will be processed through a high temperature incinerator.
(12) KEYWORDS: CHEMICAL; EUROPE; GREAT BRITAIN; HAZARDOUS; INCINERATION; INCINERATOR; INDUSTRY; INORGANIC; METAL; NON-FERROUS; RECLAMATION; SCOTLAND; TOXIC; TREATMENT
(15) STIMS ACC.NO.: 00S32041
(18) DOC.CIT.: Scotland gets hazardous waste processing plant. Surveyor, 145(4310):37, Jan. 17, 1975.

Section 7
ANALYSIS, RESEARCH AND DEVELOPMENT

(1) SWIRS ACC.NO.: 048128
(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Zinc and cadmium contents of agricultural soils and corn in northwestern Indiana.
(4) AUTHOR: Pietz RI
(6) JOURNAL TITLE: J Environ Quality
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: The broad scope of Cd, Pb, and Zn contamination from the northwestern Indiana industrial urban area on adjacent, rural, agricultural soils was studied and the changes in soil crop metal concentrations with distance from the industrial urban complex were evaluated. Sampling in the region revealed no widespread metal contamination. Some metal enrichment had occurred on agricultural soils in Gary and East Gary, Indiana. Corn lead concentration of Cd, Pb, and Zn fluctuated with sampling location, but grain Cd and Pb levels remained essentially constant at less than 0.05 and less than 0.4 micrograms/g, respectively. A comparison of Zn/Cd ratios in soils, and in corn leaves and grain, suggested that Cd was more actively accumulated in the corn plant but not the grain. Because of the limited acreage affected and the relatively low metal levels observed, no human or animal health problems are expected from harvested crops or silage. The use of lag distance versus log metal concentration in regression analysis showed that the limited metal contamination of agricultural soils was mainly in a southeasterly direction from the industrial urban area.
(12) KEYWORDS: AGRICULTURE; EARTH; HEALTH; INDUSTRY; METAL; VEGETABLE
(14) HIERARCH TERMS: 1IN/2AN; 1MK/2ZI; 1ST
(15) STIMS ACC.NO.: J0S47181 (15) SECONDARY AUTHORS: Masarik D; Vetter RJ
(16) CITATION: 7(3):361-364, Jul.-Sep. 1978.

(1) SWIRS ACC.NO.: 047911
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Treating sludges.
(6) JOURNAL TITLE: Environ Science Tech
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: The treatment of municipal and industrial wastewater sludge in a kiln with molten salt for the removal of toxic metals, organic compounds, gases, and particulates is explored. Salts used consist of alkali salts, sulfates, and oxides. Together with calcium oxide, these salts can, for example, reduce sulfur dioxide in a gas stream from 700 ppm to three ppm. Collected sulfur dioxide can be reacted with aluminum oxide to produce valuable aluminum sulfate. Toxic organics, including nitrogen containing organics in human waste, are decomposed. Aside from a somewhat involved distillation process needed to recover cadmium and mercury, it may be possible to recover up to 95% of antimony, chromium, manganese, nickel, and zinc. Problems with sewage sludge involve not only pathogens but also heavy metals and toxic elements that are hard to decompose. Metals and toxicants raise serious questions about land disposal. Alternative and innovative technology for wastewater treatment is detailed, based on the experience of a project in the Central Contra Costa Sanitation District in California. An additional furnace is planned to copyrolyze refuse derived fuel with sludge. The refuse derived fuel will be made from

municipal refuse. Technological aspects of recovery processes and land disposal are evaluated.
(12) KEYWORDS: CALIFORNIA; FUEL; INDUSTRY; METAL; MUNICIPALITY; PATHOGEN; RECLAMATION; REFUSE DERIVED; SALT; SLUDGE; TECHNOLOGY; TOXIC; WASTE WATER
(14) HIERARCH TERMS: 1ET/2WT; 1SP/2HP; 1TM
(15) STIMS ACC.NO.: 00S46963
(16) CITATION: 12(5):511-512, May 1978.

(1) SWIRS ACC.NO.: 047899
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Solid Waste Disposal
(4) AUTHOR: Lollar RM
(6) JOURNAL TITLE: Leather Manufacturer
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: Solid waste is classified as hazardous according to six criteria drafted by the Environmental Protection Agency (flammable, corrosive, infectious, reactive, radioactive, and toxic waste). Two specific criteria to control the classification of tannery solid waste are proposed: (1) solid waste whose pH is below three or over 12 when diluted one to one with water are corrosive; and (2) toxic by specific analytical definitions or selected bioassay procedures. The analysis test method for determining the hazardous nature of waste involves six parts: (1) has a concentration of any substance for which a drinking water standard exists greater than or equal to ten times the standard; (2) has a concentration of any substance greater than or equal to 0.5 times the lowest oral mammalian lethal median dose; (3) has a concentration of any substance equal to ten times the lowest 96 hour lethal median concentration for those substances; (4) phototoxicity criteria, not determined; (5) contains more than the amount of genetically active material established by as yet undetermined threhold limits; and (6) contains more than the indicated amount of any persistent/bioaccumulable material based on as yet undetermined threshold limits. It is recommended that special attention be given by the tanning industry to hexavalent chromium, benzene, and free benzidine from direct dyestuffs.
(12) KEYWORDS: CRITERIA; HAZARDOUS; LAW; REGULATIONS
(14) HIERARCH TERMS: 1HC; 1LF/2FF
(15) STIMS ACC.NO.: 00S46951
(16) CITATION: 95(2):23-26, Feb. 1978.

(1) SWIRS ACC.NO.: 047893
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: How hazardous are effluents from today's technologies?
(6) JOURNAL TITLE: Environ Science Tech
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: The use of conventional biological and chemical procedures in combination to analyze the hazardous nature of effluent is recommended to overcome deficiencies of whole sample testing. Chemical fractionation of the whole sample produces specific subfractions that can be analyzed further to identify active components. Bioassays of these subfractions can characterize biological effects. Both chemical and biological techniques can then be used to quantify the amount of toxicants present and the extent of biological damage. Subjects addressed at a symposium sponsored by the Environmental Protection Agency on short term bioassays in the fractionation and analysis of complex environmental mixtures included testing water samples from energy related activities and from municipal water utilities for mutagenicity, screening air samples for potential mutagenicity and possible atmospheric transformation of chemical mutagens, and characterizing and testing diesel engine emissions as well as coal fly ash and shale oil for mutagenicity. Various bioassay techniques and efforts of the Environmental Protection Agency in this area are described. The monitoring of industrialized sites is

discussed. Scientific factors to consider in testing environmental samples are examined.
(12) KEYWORDS: ANALYSIS; BIOLOGICAL; CHEMICAL; EFFLUENT; HAZARDOUS; INDUSTRY; MICROBIOLOGY; TOXIC
(14) HIERARCH TERMS: 1HC/2AN; 1IN/2EF; 1TM
(15) STIMS ACC.NO.: 00S46945
(16) CITATION: 12(5):508-510, May 1978.

(1) SWIRS ACC.NO.: 047751
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Hazardous wastes input into class I landfills.
(4) AUTHOR: Eichenberger B
(6) JOURNAL TITLE: J Environ Engring Div ASCE
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: Seventeen metal species discharged to Class I landfill sites are documented in this study. These sites receive a combined estimated daily volume of 2.3 x 10(6) l/d of hazardous wastes. The following metal species occurred (in order of predominance, sodium being the greatest) according to their estimated daily total deposition: sodium, iron, calcium, zinc, potassium, magnesium, copper, chromium, nickel, lead, barium, manganese, vanadium, arsenic, cadmium, beryllium, and gold. Approximately 50% of the total volume of hazardous wastes sampled were generated by the petroleum industry. About 35% of the volume was equally divided between the chemical industry and industrial cleaning. The metal, food, and miscellaneous/unknown industries each contributed less than 10% of the total volume. Approximately 70% of the total volume was in the aqueous phase and 8% consisted of an organic liquid phase. The weight percent of 17 metal species in the soluble phase ranged from less than 10% to a maximum of 90%. The volume flow and concentration of soluble toxic metals pose a potential water quality problem.
(12) KEYWORDS: DISPOSAL; HAZARDOUS; LIQUID; METAL; POLLUTION; SANITARY LANDFILL; SITES; WATER
(14) HIERARCH TERMS: 1HC/2DP; 1MI; 1MK; 1SG/2SO
(15) STIMS ACC.NO.: 00S46805 (15) SECONDARY AUTHORS: Chen KY; Edwards J
(16) CITATION: 104(EE3):385-399, Jun. 1978.

(1) SWIRS ACC.NO.: 047744
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Prispevok ku kontrole toxicity odpadovych vod pre biologicke cistenie aktivovanym kalom. (Contribution to the toxicity control of waste waters during biological purification with activated sludge).
(4) AUTHOR: Regula S
(6) JOURNAL TITLE: Chemicky Prumysl
(10) LANGUAGE: CZ (10) GEO. AREA: 1EU/2CZ (10) PUB. YEAR: 1976
(11) ABSTRACT: The method of activated sludge has proven to be the most effective method for the purification of wastewaters containing organic substances. The authors have devised a very sensitive method for determining the toxicity of activated sludge for protozoa. Activated sludge may contain thousands of individual protozoans per milliliter, and more than 200 species have been identified. The most suitable test objects are the Ciliata (about 130 species) and smaller forms visible at 100-150-fold magnification. The devised test has enabled the authors to determine the conditions for purification of wastewater from the manufacture of Ineumax BMT, Sulfenax CB and peptazins in the biological stage and to determine the toxicity ranking of the following organic substances: benthiazol, benthiazol-sulfonamide, benthiazol-sulphenamide; aniline benzthiazol, ammonium benzthiazylsulfonate. Ciliata is a suitable object for determining the maximum permissible salinity of wastewaters, e.g., for (NH4)2SO4, a toxic effect was observed at a concentration of seven to eight g/l. Using a similar procedure, differences could be found in the toxicity between NH4OH, NH4Cl, (NH4)2CO3, NH4NO3, etc. The use of protozoa for the toxicity rating of some types of wastewaters from the

chemical industry can be a valuable supplement to the other currently used microbiological and hydrobiological methods. (Original text in Czechoslovakian).

(12) KEYWORDS: ACTIVATED SLUDGE; CONTROL; CZECHOSLOVAKIA; HAZARDOUS; MICROORGANISM; TOXIC; WASTE WATER
(14) HIERARCH TERMS: 1HC/2AN; 1MM; 1SP/2BP
(15) STIMS ACC.NO.: 00S46798 (15) SECONDARY AUTHORS: Klucovsky P
(16) CITATION: 26(51):375-376, 1976.

(1) SWIRS ACC.NO.: 047716
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Soybean growth and composition as influenced by soil amendments of sewage sludge and heavy metals: Field studies.
(4) AUTHOR: Ham GE
(6) JOURNAL TITLE: Agronomy Journal
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: Field studies on soybean growth and composition as influenced by soil amendments of sewage sludge and heavy metals were conducted to determine the partitioning of these heavy metals into the various plant parts. Anaerobically digested sludge was applied at rates of 25, 50, and 100 and 200 metric t/ha to soil on which soybeans were grown. The addition of sewage sludge did not significantly influence soybean yield. The seed concentration of N, P, K, Zn, and Cd increased, whereas the Fe concentration decreased. When mature plants were separated into leaves, stems, husks, or pods and seed, analyses indicated that Zn was concentrated in the leaves, increasing up to 331 mg Zn/g leaf at the 200 metric t/ha sludge rate, while at the 100 metric t/ha level, the Zn concentration leveled off and Cadmium and Cu were more concentrated in the mature leaf tissue. It was concluded that sewage sludge of the type applied in the study could be used as a source of P without yield reductions, and results did not indicate large increases of sludge borne metals in the seed.
(12) KEYWORDS: CROP; EARTH; INVESTIGATION; METAL; SEWAGE; SLUDGE
(14) HIERARCH TERMS: 1MK/2HV; 1SP/2UT; 1ST
(15) STIMS ACC.NO.: 00S46770 (15) SECONDARY AUTHORS: Dowdy RH
(16) CITATION: 70(2):326-330, Mar.-Apr. 1978.

(1) SWIRS ACC.NO.: 047531
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Fate of Organics.
(4) AUTHOR: Weber JB
(6) BOOK TITLE: In Composting of Municipal Residues and Sludges, 1977 National Conference, Aug. 23-25, 1977.
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: The movement and degradation of organic pollutants in sludge are analyzed. Organic components of industrial waste effluent are listed according to source and composition. Organic waste and environmental toxins are categorized in terms of their degradability: (1) readily degradable (amino sugars, carbohydrates, fatty acids, nucleic acids, and proteins); and (2) slowly degradable (cellulose detergents, fats, humic compounds, hydrocarbons, lignin, pesticides, phenols, plant and bile pigments, tannin, and waxes). Key industries that generate potentially hazardous waste are identified. Reactions of organic compounds with the soil, degradation and transfer processes, volatilization, movement in runoff, and uptake by plants are discussed. (Retained in SWIRS library).
(12) KEYWORDS: ANALYSIS; HAZARDOUS; ORGANIC; POLLUTION; SLUDGE
(14) HIERARCH TERMS: 1HC/2AN; 1SP/2AN
(15) STIMS ACC.NO.: 00S46364 (15) SECONDARY AUTHORS: Sheets TJ
(16) CITATION: Rockville, MD, Information Transfer, Inc., 1978. p.81-85.

(1) SWIRS ACC.NO.: 047308
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Cadmium-enriched sewage sludge application to acid and calcareous soils: effect on yield and cadmium uptake by lettuce and chard.
(4) AUTHOR: Mahler RJ
(6) JOURNAL TITLE: J Environ Quality
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: Eight soils with pH values ranging from 4.8 to 7.8 were treated with 1% sewage sludge amended with variable amounts of CdSO4 to study the effect on yield and cadmium uptake by lettuce and chard. Results indicate that diagnostic levels for Cd in soil and in plant tissue are soil as well as crop specific. Swiss chard and lettuce grown in either acid or calcareous Cd contaminated soils absorb quantities of Cd considerably in excess of normal levels without substantial concomitant yield reductions. This demonstrates that Cd toxicity to plants grown in Cd contaminated soils, by itself, is not sufficient to control excess Cd in the food chain.
(12) KEYWORDS: EARTH; RESEARCH; SLUDGE; UTILIZE; VEGETABLE
(14) HIERARCH TERMS: 1RP; 1SP/2UT; 1ST; 1VG
(15) STIMS ACC.NO.: 00546362 (15) SECONDARY AUTHORS: Bingham FT; Page AL
(16) CITATION: 7(2):274-281, Apr.-Jun. 1978.

(1) SWIRS ACC.NO.: 047231
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Sittig M
(6) BOOK TITLE: Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The prevention of toxic metals poisoning in industries and in the general environment is considered in this 30th volume of the Noyes Data Corporation's Pollution Technology Review Series. Detailed consideration is given to the following metals: antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, indium, lead, manganese, mercury, molybdenum, nickel, selenium, tin, vanadium, and zinc. Each toxic metal is examined in terms of toxicity, extent of exposure, detection, environmental standards, handling procedures, removal from air, removal from water, solid waste disposal, and economic impact of controls. (Retained in SWIRS library).
(12) KEYWORDS: CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; MANAGEMENT; METAL; POLLUTION; TOXIC
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00546285
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. 350 p.

(1) SWIRS ACC.NO.: 046009
(2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Identification of PCB's in the presence of DDT-type compounds using low temperature luminescence.
(4) AUTHOR: Brownrigg JT
(6) JOURNAL TITLE: Arch Environ Contamination and Toxicol
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: An investigation to assess the applicability of low temperature luminescence spectroscopy to the problem of identifying polychlorinated biphenyls (PCB's) in the presence of DDT-type compounds is described. PCB and DDT concentrations at sub-part per billion levels in water can be rapidly estimated using an extraction procedure followed by luminescence measurement at 77 K. Detection limits in natural water samples having high levels of fluorescent materials and particulates may be more than an order of magnitude higher. These limitations could probably be overcome by the inclusion of a simple chromatographic step or the use of improved extraction techniques. The method utilized commercially available instrumentation and could be useful as a screening method in either a mobile laboratory or in a small field station. Although the procedure does not include coupling

with gas or liquid chromatography, low temperature luminescence analysis might be used profitably with either procedure for confirmatory measurements. The method may be extended to include a wider array of aromatics. Future work is suggested.
(12) KEYWORDS: ANALYSIS; RESEARCH; INVESTIGATION; POLYMER; SPECTROGRAPHIC; TEMPERATURE; TOXIC; WATER
(14) HIERARCH TERMS: 1AN; 1BC/2AN; 1BP; 1WE/2AN
(15) STIMS ACC.NO.: 00S45059 (15) SECONDARY AUTHORS: Hornig AW
(16) CITATION: 4(2):175-182, 1976.

(1) SWIRS ACC.NO.: 045806
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Effects of incubation and liming on yield and heavy metal uptake by rye from sewage-sludged soil.
(4) AUTHOR: Lagerwerff JV
(6) JOURNAL TITLE: J Environ Quality
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2DC; 1US/2MD/3BL (10) PUB. YEAR: 1977
(11) ABSTRACT: Soil management procedures which could effectively minimize the agronomic hazards of applied sludge are compared. Rye was grown under controlled conditions on Evesboro sandy loam amended with digested secondary sewage sludge. Plant yield and uptake of cadmium (Cd), copper (Cu), lead (Pb) and zinc (Zn) were measured as functions of sludge application rate (0 to 10% dry weight basis), sludge origin (Baltimore, Md., and Washington, D. C.), pH of soil-sludge mixture (two levels), incubation time between mixing and planting (0 to 7 weeks), and plant age (three clippings). Plant yields from successive clippings decreased as sludge application rates increased. Uptake of the four metals increased with sludge additions and with plant age, in the order (high to low) Zn, Cd, Pb, Cu. Metal uptake decreased in the order (high to low) Zn, Cu, Pb and Cu with the addition of lime. Incubation diminished Cu and Pb uptake. Test results suggest organic matter complex formation in the order Cu, Pb, Zn, Cd. The relative uptake of extractable Cd from soil was greater than that of Zn, especially upon liming, while the total uptake of these metals then decreased.
(12) KEYWORDS: DISTRICT OF COLUMBIA; EARTH; INVESTIGATION; LIME; MARYLAND; METAL; NON-FERROUS; SEWAGE; SLUDGE; TRANSPORT
(14) HIERARCH TERMS: 1ME/2NB; 1SP; 1SI/2S9; 1SJ
(15) STIMS ACC.NO.: 00S44855 (15) SECONDARY AUTHORS: Viersdorf GT; Milberg RP
(16) CITATION: 6(4):427-431, 1977.

(1) SWIRS ACC.NO.: 045805
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Transport of heavy metals in a sludge-treated forested area.
(4) AUTHOR: Sidle RC
(6) JOURNAL TITLE: J Environ Quality
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A study to determine the transport of heavy metals in a forested sludge disposal area is reported. Plots in a mixed hardwood forest received two separate applications of anaerobically digested sewage sludge (0.1 to 3.1% solids) in fall 1974 and spring 1975. Total solids loading in the low and high treatments were 12.71 and 26.96 metric tons/ha, respectively. Copper (Cu) zinc (Zn) and cadmium (Cd) loadings in the high treatment were 24.56, 28.49, and 0.253 kg/ha, respectively. Calculated amounts of percolate Cu, Zn, and Cd moving out of the 120-cm depth in the high treatment were 0.3, 3.2 and 6.6% of the total applied levels, respectively, indicating the order of relative mobility in soil as Cd, Zn and Cu (the lowest). It was determined that Cu applied in the sewage sludge was more extratable than the native soil Cu, Zn was only slightly more extractable, and Cd was less extractable. Of the other heavy metals chromium (Cr), lead (Pb), cobalt (Co) and nickel (Ni) analyzed in soil extracts, only Cr

and Ni increased in the 0 to 7.5-cm depth following sludge applications.
(12) KEYWORDS: EARTH; FORESTRY; INVESTIGATION; METAL; NON-FERROUS; SEWAGE; SLUDGE; TRANSPORT
(14) HIERARCH TERMS: 1FA/2EY; 1ME/2NB; 1S1/2S9
(15) STIMS ACC.NO.: 00S44854 (15) SECONDARY AUTHORS: Kardos LT
(16) CITATION: 6(4):431-437, 1977.

(1) SWIRS ACC.NO.: 045729
(2) DOMESTIC: D (2) CATEGORY: 01 (2) SUBJ.TYPE: S
(4) AUTHOR: Kover PD
(6) BOOK TITLE: Considerations Relating to Toxic Substances in the Application of Municipal Sludge to Cropland and Pastureland (A Background Summary).
(8) NTIS NO.: PB 263 006 (8) REPORT NO.: EPA 560/8-76-004
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Background information on potential health hazards from toxic substances from disposal and utilization of municipal sludge on agricultural lands, particularly croplands and pasturelands where products enter the human food chain, is presented. Toxic elements and synthetic organic chemical substances known to be present in such sludges are listed as mercury, motor oil additives, flow entrainment from water-carrying pipes (lead, copper, cadmium, zinc, and antimony), street runoff, detergents, laundry products, and consumer products such as pesticides and organics. Factors affecting plant uptake of toxic substances may include soil/sludge pH, organic content, cation exchange capacity, soil distribution and variables, plant age, species, rooting depth, and climatic (seasonal) effects. It is concluded that additional data on plant uptake and on chronic effects of low-level dietary exposure to trace elements and substances entering the food chain from sewage sludge are needed, with principal concern for contamination by heavy metals and pesticides. (Retained in SWIRS library).
(12) KEYWORDS: AGRICULTURE; DAIRY; DISPOSAL; HEALTH; LAND; MUNICIPALITY; SAFETY; SLUDGE; TOXIC
(14) HIERARCH TERMS: 1DD/2DK; 1DD/2DK; 1HB; 1TD
(15) STIMS ACC.NO.: 00S44778
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Nov. 1976. 24 p.

(1) SWIRS ACC.NO.: 045530
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Die Bestimmung von Cyaniden in Wasser und in festen Abfallen. (The determination of cyanide in water and solid wastes).
(4) AUTHOR: Mertens H
(6) JOURNAL TITLE: Zeit Wasser Abwasser Forschung
(10) LANGUAGE: GM (10) GEO. AREA: 1EU/2GE (10) PUB. YEAR: 1976
(11) ABSTRACT: Methods for differentiation and detection of cyanides are discussed. Total cyanides and easily liberated cyanides are defined; new techniques developed by the Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlammuntersuchung for their detection, as well as that of cyanogen chloride, are presented. Detection of cyanide ions in distillates, using turbidity titration of high sensitivity and formation of polymethine dye, is described. Included are critical comparisons of other published methods, in particular those dealing with separation and decomposition processes. (Original text in German).
(12) KEYWORDS: ANALYSIS; CHEMICAL; COMPARISON; HAZARDOUS; ION; TOXIC
(14) HIERARCH TERMS: 1AE; 1BA/2BB; 1TD
(15) STIMS ACC.NO.: 00S44578
(16) CITATION: 9(6):183-195, Nov.-Dec. 1976.

(1) SWIRS ACC.NO.: 045513
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Kawam A
(6) BOOK TITLE: Feasibility of Using Sewage Sludge in Highway Embankment Construction.
(8) NTIS NO.: PB 242 260 (8) REPORT NO.: FHWA-RD-75-38 (9) CONTRACT NO.: DOT-FH-11-8122
(10) LANGUAGE: EN (10) PUB. YEAR: 1975
(11) ABSTRACT: A laboratory evaluation of the feasibility of utilizing sewage sludge in construction of a highway embankment was conducted. Mixtures composed of lime, fly ash, waste calcium sulfate and up to 17 percent sewage sludge were evaluated. The effect of lime type, fly ash source and the relative proportions of lime, fly ash and waste calcium sulfate on compressive strength of compacted specimens was measured. Using the criterion that the 28 day compressive strength should be 50 p.s.i. (345 kN/square meters) greater than that of uncured specimens, over 75 percent of the formulations examined passed this test. Two soils, one sandy and the other clay, were used to replace 30, 50 and 70 percent of the fly ash in selected formulations. All samples with the soil replacement exceeded the minimum strength gain criterion. Selected formulations were further evaluated for volume change, durability, permeability and leachability. Both freeze-thaw resistance and wet-dry stability were measured and determined to be marginal. The permeability was found to be low, of the order of one millionth cm/sec. Analysis of the leachate from the permeability tests indicated that the heavy metals present in the sewage sludge (cadmium, chromium, mercury and zinc) were retained in the mixture. However, lime and gypsum did increase the pH and calcium and sulfate ion concentrations in the leachate. (Retained in SWIRS library).
(12) KEYWORDS: ANALYSIS; COMPACTION; EARTH; EMBANKMENT; ENGINEERING; FLY ASH; HIGHWAY; LEACH; LIME; SLUDGE; UTILIZE
(14) HIERARCH TERMS: 1PC/2PF; 1LC; 1S1/25Y
(15) STIMS ACC.NO.: 00S44561 (15) SECONDARY AUTHORS: Ross J; Smith LM
(16) CITATION: Washington, DC, U.S. Department of Transportation, Feb. 1975. 44 p.

(1) SWIRS ACC.NO.: 045432
(2) DOMESTIC: F (2) CATEGORY: 24 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Contributions to ecological chemistry. CXXXVIII. Fate of PCBs-14C in sewage treatment - laboratory experiments with activated sludge.
(4) AUTHOR: Herbst E
(6) JOURNAL TITLE: Chemosphere
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The fate of polychlorinated biphenyl (PCB) residues in water and sludge after activated sludge treatment was investigated using carbon-14 labeled PCBs applied to activated sludge supplied by a municipal sewage treatment plant. During treatment, samples of the sludge culture were taken hourly to determine radioactivity of the liquid and solid phases (liquid scintillation counting) and to determine conversion rates (analysis by thin layer chromatography). Results showed a relative decrease of radioactivity in the aqueous phase of the sludge culture and increase in the solid phase, differentiated slightly according to the PCB traced. It was concluded that activated sludge treatment is ineffective in removing PCBs from sludge and that treated sludge used as fertilizer may add soil contaminants in the form of PCBs.
(12) KEYWORDS: ACTIVATED SLUDGE; CONVERT; FERTILIZER; LABORATORY; MUNICIPALITY; POLLUTION; POLYCHLORINATED; RADIOACTIVE; RESIDUE; SEWAGE; TREATMENT; WATER
(14) HIERARCH TERMS: 1S1/25X; 1TG
(15) STIMS ACC.NO.: 00S44480 (15) SECONDARY AUTHORS: Klein W; Scheunert I
(16) CITATION: 6(11):725-730, 1977.

(1) SWIRS ACC.NO.: 045407
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Underground disposal of Canada's nuclear waste.
(4) AUTHOR: Tammemagi HY
(6) JOURNAL TITLE: Geoscience Canada
(10) LANGUAGE: EN (10) GEO. AREA: 1CD (10) PUB. YEAR: 1977
(11) ABSTRACT: Radioactive wastes in Canada and the scientific programs in progress or planned to ensure their long-term subsurface isolation are described. The Canadian program policy calls for reliance on state-of-the-art technology and provision for surveillance and possible retrieval of wastes after burial. It is estimated that the anticipated volume and heat levels of wastes will require a subsurface one-level repository of about one kilometer squared by the year 2000 and of about eight kilometers squared by the year 2050, with scheduled readiness on a full time basis by the year 2000. The main objective of the disposal programs at present is to determine the most suitable type of host rock for the disposal site. Specific sites will then be selected and investigated, ultimately yielding one site which will be developed into a demonstration facility. Three rock types are being considered: plutonic crystalline rocks, salt deposits, and serpentinized ultramafic rock. Factors being studied in addition to siting (geological, geotechnical, and environmental) are the legal and political influences and repercussions of site selection and use and ultimate disposal problems.
(12) KEYWORDS: CANADA; DISPOSAL; GEOLOGIC; HAZARDOUS; PLANNING; RADIOACTIVE; SITES; UNDERGROUND
(14) HIERARCH TERMS: 1DD/2DW; 1EA/2RG
(15) STIMS ACC.NO.: 00S44454 (15) SECONDARY AUTHORS: Gale JE; Sanford BV
(16) CITATION: 4(2):71-76, June 1977.

(1) SWIRS ACC.NO.: 045352
(2) DOMESTIC: F (2) CATEGORY: 02 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Distribution of polychlorinated biphenyls in a municipal wastewater treatment plant and environs.
(4) AUTHOR: Bergh AK
(6) JOURNAL TITLE: Science Total Environ
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Distribution of polychlorinated biphenyls (PCB) in sewage wastes at a municipal sewage treatment plant was examined, showing that the great bulk of PCBs entering such a treatment plant become adsorbed onto the grit chamber solids and the sludge that is passed for the anaerobic digesters. When appreciable quantities of PCBs are present in sewage, as was the case in this study, significant quantities can nevertheless pass with the effluents discharged from the treatment plant. The PCB concentrations in the treatment plant waters undergoing secondary and tertiary treatment tend to be consistent with the limited solubility properties of the PCBs. However, appreciably higher concentrations can be found in the sediments of waters receiving treatment plant discharges and bioaccumulation in fish is demonstrated readily. Also described are quantitative data on PCBs in soils fertilized with PCB-contaminated sludge.
(12) KEYWORDS: DATA; MUNICIPALITY; POLYCHLORINATED; RESEARCH; SEWAGE; TREATMENT; WASTE WATER
(14) HIERARCH TERMS: 1AE; 1BE; 1SF/2SR
(15) STIMS ACC.NO.: 00S44399 (15) SECONDARY AUTHORS: Peoples RS
(16) CITATION: 8(3):197-204, Nov. 1977.

(1) SWIRS ACC.NO.: 045209
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Chlorodibenzo-p-dioxins and chloridibenzofurans are trace components of fly ash and flue gas of some municipal incinerators in The Netherlands.
(4) AUTHOR: Olie K
(6) JOURNAL TITLE: Chemosphere
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2NE (10) PUB. YEAR: 1977
(11) ABSTRACT: The presence of chlorodibenzo-p-dioxins (CDD) and chlorodibenzofurans (CDF) as trace components of fly ash and flue gas of some municipal incinerators in The Netherlands is examined. Three

different incineration plants were investigated for environmental loading of organic pollutants by waste products. CDDs and CDFs identified by mass spectrometry in fly ash from the three incinerators are tabulated by formula. The results of the sampling on two different occasions of the flue gases of one incinerator is also tabulated. The most abundant compounds from the flue gas were chlorophenols. CDDs were also determined in small amounts. It was generally noted that: amounts of CDD and CDF entering the atmosphere are small but toxicity suggests that extensive monitoring of facilities in densely populated areas be carried out; the origins of the two toxic substances are unknown, so that fly ash and the flue gases of other industrial installations should be investigated; and municipal incinerators and other combustion processes may be a source of some of the organochlorine compounds in the environment.

(12) KEYWORDS: BIOLOGICAL; CHLORINE; EUROPE; FLY ASH; GASSES; HAZARDOUS; HUMAN; INCINERATION; INDUSTRIAL; INVESTIGATION; MUNICIPAL; NETHERLANDS; ORGANIC

(14) HIERARCH TERMS: 1AC/2AI; 1HA/2HH; 1MJ; 1RE; 1TD

(15) STIMS ACC.NO.: 00S44256 (15) SECONDARY AUTHORS: Hutzinger O; Verneulen PL

(16) CITATION: 6(8):455-459, 1977.

(1) SWIRS ACC.NO.: 045025

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Surveying Massachusetts' hazardous wastes.

(4) AUTHOR: Fennelly PF

(6) JOURNAL TITLE: Environmental Science and Technology

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2MA (10) PUB. YEAR: 1977

(11) ABSTRACT: A recent survey of Massachusetts' hazardous wastes estimated quantities of hazardous waste generated by categories, identified disposal and recycling options, and recommended disposal options. State legislation to control handling and disposal of hazardous wastes was adopted in 1970. Regulations define hazardous waste, specify methods for their handling and disposal, and require that firms engaged in their conveyance, handling, or disposal be licensed. Lack of personnel to enforce the rules and lack of suitable disposal options within the State have limited the effectiveness of the progras. A hazardous waste survey was performed to define the extent of the problem. Quantities of hazardous wastes were estimated by reviewing license applications and by a telephone survey of selected industries which enquired into amount, geographic distribution, and current disposal practices. In all, 37,750,000 gals of hazardous wastes are generated each year in the State. Disposal of hazardous sludges is the biggest problem since no landfills within the State are licensed to accept them. Recommendations for immediate and long range action are given.

(12) KEYWORDS: DISPOSAL; HAZARDOUS; INDUSTRY; LAW; LICENSE; MASSACHUSETTS; PERSONNEL; PROBLEMS; RECLAMATION; REFUSE; REGULATIONS; SANITARY LANDFILL; SLUDGE; SURVEY

(14) HIERARCH TERMS: 1HA/2HF; 1LB/2LG

(15) STIMS ACC.NO.: 00S44071 (15) SECONDARY AUTHORS: Chillingworth MA; Spawn PD

(16) CITATION: 11(8):762-766, Aug. 1977.

(1) SWIRS ACC.NO.: 044998

(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Hazard of heavy metals and other elements to plants and animals.

(5) CORPORATE AUTHOR: Council for Agri Science and Technology

(6) BOOK TITLE: In Application of Sewage Sludge to Cropland: Appraisal of Potential Hazards of Heavy Metals to Plants and Animals.

(8) NTIS NO.: PB 264 015 (8) REPORT NO.: EPA 430/9-76-013

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: The potential adverse effect of heavy metals and other elements presented in sludge applied to agricultural land on plants and animals is addressed Elements posing relatively little hazard are manganese, iron, aluminum, chromium, arsenic, selenium, antimony, lead, and mercury. Elements posing a potentially serious

hazard include cadmium, copper, molybdenum, nickel, and zinc. The characteristics of these elements and their action in sludge applied to agricultural land are discussed.
(12) KEYWORDS: AGRICULTURE; ANIMAL; CHEMICAL; HAZARDOUS; METAL; SLUDGE; VEGETATION
(14) HIERARCH TERMS: 1HA/2HH; 1ME/2MX; 1ME/2MY; 1ME/2MZ; 1ME/2M3; 1ME/2NB; 1SI/2SX
(15) STIMS ACC.NO.: 00S44044
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Nov. 1976. p.24-36.

(1) SWIRS ACC.NO.: 045257
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Evaluation of crystalline components in sewage sludge.
(4) AUTHOR: Silviera DJ
(6) JOURNAL TITLE: Comm Soil Sci Plant Analysis
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Crystalline minerals in anaerobically digested sewage sludges were determined by x-ray diffraction analysis to examine the potential hazards of land application of sewage sludge. Sludge samples were prepared for analyses by either washing with water to remove soluble salts or oxidizing organic matter with H2O2. A limited number of minerals were shown to be present as crystalline materials in sludge. Even though sludges contained appreciable concentrations of copper, zinc, cadmium, lead, and nickel, no crystalline metal sulfides, phosphates, hydroxides, oxides, or carbonates were found, except for a copper, zinc carbonate hydroxide whose presence indicates that precipitation of complex metal species might occur during sludge digestion. All other crystalline components detected are common minerals, such as quartz, feldspar, montmorillonite, chlorite, mica, dolomite, and calcite. In general, crystalline forms found in sludge samples after carbonate and organic matter removal represent stable minerals found in many soils; they are probably not formed during the sludge digestion process.
(12) KEYWORDS: ANAEROBIC; ANALYSIS; DIGESTION; HAZARDOUS; LAND; METAL; MINERAL; NON-FERROUS; RESEARCH; SEWAGE; SLUDGE; SOIL CONDITIONER; SPREADING
(14) HIERARCH TERMS: 1AE; 1SI/2SX; 1SI/2S4
(15) STIMS ACC.NO.: 00S44304 (15) SECONDARY AUTHORS: Nelson DW; Sommers LE
(16) CITATION: 8(6):509-518, 1977.

(1) SWIRS ACC.NO.: 045017
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Handling of special wastes.
(4) AUTHOR: Chatterjee S
(5) CORPORATE AUTHOR: Battelle Columbus Laboratories
(6) BOOK TITLE: In Predictive Criteria for Construction/Demolition Solid Waste Management.
(8) NTIS NO.: ADA 034 419 (8) REPORT NO.: CERL-TR-N-14 (9) CONTRACT NO.: DACA88-74-R-0025
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Special types of waste generated during construction and demolition activites are considered. They include paper sacks with cellophane lining, asbestos insulation, paints, and pesticides. Paper sacks can be disposed of in a landfill or incinerated. Asbestos insulation is seldom used in construction. Since paints are generally consumed contained from 5 gallon cans, they can be partially wasted if unused. Pesticides are usually stored in large mobile tanks and are taken back after use without any waste. Paints and paint cans, therefore, are the only special waste of a hazardous nature requring proper disposal. Paints can be transported to a hazardous waste disposal facility or be chemically fixed for disposal in a landfill. The disposal of special waste by environmentally safe methods costs about $0.11 to $0.50 per gallon. Environmentally safe methods generally

consist of chemical fixation and disposal in a landfill with ground water monitoring facilities.
(12) KEYWORDS: ASBESTOS; CHEMICAL; CONSTRUCTION; DEMOLITION; GROUND WATER; HAZARDOUS; MONITOR; PAINT; PAPER; PESTICIDE; SANITARY LANDFILL
(14) HIERARCH TERMS: 1CH/2DC/3CG; 1DC; 1HA/2HF
(15) STIMS ACC.NO.: 00S44063
(16) CITATION: Champaign, IL, Construction Engineering Research Laboratory, Dec. 1976. p.77.

(1) SWIRS ACC.NO.: 044905
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Model for fate of sludge constituents in soil.
(4) AUTHOR: Sommers LE
(5) CORPORATE AUTHOR: Purdue University
(6) BOOK TITLE: In Nitrogen and Metal Contamination of Natural Waters from Sewage Sludge Disposal on Land.
(8) NTIS NO.: PB 264 089 (8) REPORT NO.: 89
(9) GRANT NO.: 14-31-0001-4061
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A model is proposed that concerns the movement of nitrogen and metals into ground water following sludge disposal on land. It is pointed out that the form, amount, and mobility of nitrogen and metals in soil are influenced by the degradation of sludge and soil organic matter. Sludge organic nitrogen is subjected to microbial degradation upon addition to the soil system. Chemical and physical properties of soil are important in controlling nitrogen transformations since microorganisms mediate the cycling of nitrogen. The influence of soil properties on sludge nitrogen reactions in soil requires quantification before the fate of sludge nitrogen in soil can be predicted with certainty. Metals of primary concern in the land disposal of sludge are copper, zinc, nickel, lead, and cadmium. Metals may exist in sludge and soil in several forms: water soluble, exchangeable, precipitated, sorbed, and chelated. The presence of metals appears to have no effect on the rate of carbon dioxide release from sludge amended soil.
(12) KEYWORDS: CARBON DIOXIDE; DISPOSAL; GROUND WATER; LAND; METAL; NITROGEN; SLUDGE
(14) HIERARCH TERMS: 1GD; 1ME; 1SI/2SA; 1SJ
(15) STIMS ACC.NO.: 00S43950 (15) SECONDARY AUTHORS: Nelson DW; Terry RE
(16) CITATION: Washington, DC, U.S. Department of the Interior, Dec. 1976. p.98-100.

(1) SWIRS ACC.NO.: 044885
(2) DOMESTIC: D (2) CATEGORY: 02 (2) SUBJ.TYPE: S
(4) AUTHOR: Theis, TL
(5) CORPORATE AUTHOR: University of Notre Dame
(6) BOOK TITLE: The Contamination of Groundwater by Heavy Metals from the Land Disposal of Fly Ash. (9) CONTRACT NO.: E(11-1)-2727
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The surface concentration of trace metals on fly ash was determined in order to evaluate the potential for ground water contamination. The following metals were investigated: arsenic, cadmium, chromium, copper, lead, nickel, selenium and zinc. A comparison of release patterns in pH washings with the surface active "sink" of metals yielded useful information in defining the degree of release and subsequent contamination from fly ash to the aquatic environment. Release was favored by an acid pH. Even in the neutral range, a significant amount of arsenic, selenium, cadmium, nickel, and lead was released. There was general agreement between trace metal migations in laboratory and field studies. Arsenic, nickel, and selenium consistently appeared to be capable of migrating the longest distance. The application of chemical models to the study of trace metal surface concentrations is discussed. Recommendations for further

study are made. The results of the laboratory studies are presented in detail in a separate paper. (Retained in SWIRS library).
(12) KEYWORDS: ANALYSIS; CHEMICAL; CHROMIUM; CONTAMINATE; DISPOSAL; ENVIRONMENT; FLY ASH; GROUND WATER; LAND; METAL; PH; WATER
(14) HIERARCH TERMS: 1AE; 1FC/2FB; 1GD; 1ME/2NB
(15) STIMS ACC.NO.: 00S43930
(16) CITATION: Washington, DC, U.S. Energy Research and Development Administration, Oct. 1, 1976. 13 p.

(1) SWIRS ACC.NO.: 044720
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Effects of sewage sludge composition, application rate, and lime regime on plant availability of heavy metals.
(4) AUTHOR: John MK
(6) JOURNAL TITLE: Journal of Environmental Quality
(10) LANGUAGE: EN (10) GEO. AREA: 1CD (10) PUB. YEAR: 1976
(11) ABSTRACT: This paper reports on the application of primary digested sludge from a metropolitan sewage treatment plant and Milorganite, to limed (pH 6.4) and unlimed (pH 5.6) soils. The application rate was 0, 5, 10, 25, and 100 grams per kilogram. The test plants used were lettuce and beets. Concentrations of cadmium, zinc, lead, copper, nickel, manganese, and iron were analyzed. It was found that availability of the metals in the plants was influenced by the rate as well as the nature of the sludge applied, and soil acidity associated with the Milorganite. Data is given.
(12) KEYWORDS: ANALYSIS; DATA; INORGANIC; LIME; METAL; NON-FERROUS; SEWAGE; SLUDGE
(14) HIERARCH TERMS: 1AE; 1ME/2NB; 1SI/2SX
(15) STIMS ACC.NO.: 00S43765 (15) SECONDARY AUTHORS: Van Laerhoven CJ
(16) CITATION: 5(3):246-251, Jul.-Sept., 1976.

(1) SWIRS ACC.NO.: 044879
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Potentially harmful constituents in effluents or sludges.
(5) CORPORATE AUTHOR: Environmental Quality Systems, Inc
(6) BOOK TITLE: In Disposal of Wastewater Residuals. V.1.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Potentially harmful constituents in effluents or sludges is discussed with emphasis on biochemical cycling of nitrogen and phosphorus. With the addition of so many organic compounds to water ways, eutrophication has become a problem and is discussed briefly in this section. Heavy metals are analyzed in regard to land application of sludge. Reactions in the soil and the aquifier are studied. Organic compounds in sludges are a function of the process creating the wastewater, and must be dealt with on a individual basis.
(12) KEYWORDS: ANALYSIS; DATA; EFFLUENT; HAZARDOUS; METAL; NITROGEN; ORGANIC; PHOSPHORUS; SLUDGE
(14) HIERARCH TERMS: 1AE; 1HA/2HB; 1ME/2NB; 1SI/2SX
(15) STIMS ACC.NO.: 00S43924
(16) CITATION: Washington, DC, National Commission on Water Quality, March 1976. p.X-1 to X-33.

(1) SWIRS ACC.NO.: 044595
(2) DOMESTIC: F (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: The influence of sewage sludge on the content of heavy metals.
(4) AUTHOR: Baerug R
(6) JOURNAL TITLE: Plant and Soil
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2NE (10) PUB. YEAR: 1977
(11) ABSTRACT: In 1973 and 1974 a small plot field experiment was carried out with two types of sewage sludge, one rich and one poor in heavy metals, applied in different quantities and compared with NPK fertilizer. The test plant used was potatoes. The sludge increased the

soil content of cadmium, nickel, and lead along with readily soluble copper and zinc. NPK fertilizer did not influence the soil analytical values. Based on amounts of nutrients applied, the NPK fertilizer was determined more efficient than sludge although the sludge increased the yield of tubers significantly. Overall, less than 5 percent of the heavy metals applied were accumulated in the tubers. There was no toxic effects observed in the plants due to the application of the sludge.
(12) KEYWORDS: AGRICULTURE; DATA; FERTILIZER; METAL; SEWAGE; SLUDGE; VEGETATION
(14) HIERARCH TERMS: 1ME/2NB; 1SI/2S9; 1VC
(15) STIMS ACC.NO.: 00S43640 (15) SECONDARY AUTHORS: Martinsen JH
(16) CITATION: 47(2):407-418, June 1977.

(1) SWIRS ACC.NO.: 044570
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Process for the treatment of organic wastes.
(4) AUTHOR: Humblet LA
(5) CORPORATE AUTHOR: Soc Eur Traitement Chim Comb Irradies
(7) PATENT DATA: U.S. Patent No. 4,039,468
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A process for the treatment of organic wastes resulting from the extraction of metal elements by a solvent of the phosphoric acid ester type in the presence or not of an organic diluent is described. The organic wastes result from the extraction of metals in radiochemical separation plants, especially those reprocessing irradiated nuclear fuels. The process consists of the following three main steps: a. separation of the phosphoric acid ester from its organic dilutent so that the phosphate phase contains the degradation products and also the elements to be finally insolubilized; b. deesterification of the phosphate, (conversion of it into phosphoric acids on one side and organic compounds mainly consisting of hydrocarbons on the other side); and, c. solidification of the liquid radioactive phosphoric acids in the form of inorganic phosphates, which may later be incorporated into a suitable matrix material.
(12) KEYWORDS: ACID; CONTINUOUS; METAL; ORGANIC; RADIOACTIVE; SEPARATING; SOLVENT; TREATMENT
(14) HIERARCH TERMS: 1MD/2MS/3ME; 1SE/2SP; 1TG
(15) STIMS ACC.NO.: 00S43615 (15) SECONDARY AUTHORS: Eschrich HR; Salomon L
(16) CITATION: Mol, Belgium, filed Sept. 12, 1975 issued Aug. 2, 1977.

(1) SWIRS ACC.NO.: 044529
(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Analyses and their interpretation for sludge application to agricultural land.
(4) AUTHOR: Sommers LE
(6) JOURNAL TITLE: Ohio Agr E and D Center Research Bull
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Sewage sludge is a very heterogeneous material, varying in composition from city to city and from day to day in the same city. Therefore, considerable thought must be given to obtaining representative samples and to making arrangements for accurate chemical analysis of the sludge before an attempt is made to develop plans for sludge application to agricultural land. This article discusses how to collect samples of sludge for analysis and suggests methods to be used for each analysis. The most important elements to be considered are nitrogen, ammonium, nitrate, phosphorous, potassium, copper, zinc, nickel, lead, and cadmium. Other considerations for applying sewage sludge on agricultural land include soil pH, cation exchange capacity, lime requirement to adjust soil to pH 6.5, soil tests for available phosphorous and potassium, phosphorous and potassium fertilizer recommendation, and crops to be grown. Steps to be used for the calculation of the rate of sludge application are given. Tables include: the Total Amount of Sludge Metals Allowed on Agricultural Land; the Annual Nitrogen, Phosphorous, and Potassium Utilization by

Selected Crops; and the Release of Residual Nitrogen During Sludge Decomposition in Soil.

(12) KEYWORDS: AGRICULTURE; ANALYSIS; CHEMICAL; COMPOSITION; DISPOSAL; EARTH; FARM; FERTILIZER; LAND; RESEARCH; SLUDGE

(14) HIERARCH TERMS: 1SI/2S9; 1DD/2DO; 1FA/2EI; 1RE; 1SI/2S2; 1SJ

(15) STIMS ACC.NO.: 00S43574 (15) SECONDARY AUTHORS: Nelson DW

(16) CITATION: (1090):3.1-3.7, Oct. 1976.

(1) SWIRS ACC.NO.: 044434

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(4) AUTHOR: Fuller WH

(5) CORPORATE AUTHOR: Univ of Arizona

(6) BOOK TITLE: Movement of Selected Metals, Asbestos, and Cyanide in Soil: Applications to Waste Disposal Problems. (8) REPORT NO.: EPA-600/2-77-020 (9) CONTRACT NO.: 68-03-0208

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: This report presents information on movement of selected hazardous substances in soil which can be applied to problems of selecting and operating land disposal sites for wastes containing arsenic, asbestos, beryllium, cadmium, chromium, copper, cyanide, iron, lead, mercury, selenium, and zinc. The information is based on a literature review, laboratory studies of movement of hazardous substances through soil in municipal landfill leachate, and the author's experience in soil science and waste disposal. The report also presents general information on soils and geological materials and specific information on the chemistry of the selected hazardous substances which is relevant to an understanding of their migration in soil. Critical information gaps are identified, particularly as regards the chemistry and soil adsorption behavior of mixtures of several hazardous substances in the presence of high concentrations of other organic and inorganic solutes, a situation commonly encountered in leachates from municipal and hazardous solid wastes. In spite of these information gaps, it is concluded that waste disposal practice can be improved by application of present information. The report contains a bibliography of 81 related citations. (Retained in SWIRS library).

(12) KEYWORDS: ASBESTOS; BIBLIOGRAPHY; CHEMICAL; CONTAMINATE; DATA; DISPOSAL; GEOLOGIC; GROUND WATER; HAZARDOUS; INDUSTRY; LEACH; METAL; MUNICIPALITY; POLLUTION; SOIL; TRANSPORT

(14) HIERARCH TERMS: 1GD; 1HA/2HP; 1LC; 1ME; 1SJ

(15) STIMS ACC.NO.: 00S43478

(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, April 1977. 242 p.

(1) SWIRS ACC.NO.: 044431

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Pilie RJ

(6) BOOK TITLE: Methods to Treat, Control and Monitor Spilled Hazardous Materials. (8) REPORT NO.: EPA-670/2-75-042 (9) CONTRACT NO.: 68-01-0110

(10) LANGUAGE: EN (10) PUB. YEAR: 1975

(11) ABSTRACT: A program was instituted to study the feasibility of treating, controlling and monitoring spills of hazardous materials. Emphasis was placed on considering techniques and equipment which would be applicable to general classes of chemicals rather than to specific hazardous polluting substances. Several methods were investigated and found to be promising for removing or detoxifying spills of hazardous chemicals in situ. These included: the use of sodium sulfide as a precipitating agent for spills of heavy metal ion solutions; the use of activated carbon packaged in porous fiber bags (carbon tea bags) for adsorbing a wide variety of soluble organic chemicals; and the use of various acids or bases to neutralize spills. Methods were studied to control spills on land and prevent their contaminating nearby surface or ground water. To this end, a four-component universal gelling agent was developed to immobilize a spilled liquid. A cyclic colorimeter, a novel heavy metal ion detector, was perfected and laboratory tested, and a detection kit capable of sensing several chemicals was developed. A computer model was developed and refined to simulate the spread of a

spill when certain stream parameters and material characteristics are known. Bioassay studies were conducted for several chemicals using at least three species of biota. In addition, bioassays were conducted to estimate the environmental effect of each of the various treatment methods developed. (Retained in SWIRS library).
(12) KEYWORDS: ACID; ACTIVATED; CARBON; CHEMICAL; COMPUTER; CONTROL; EQUIPMENT; HAZARDOUS; ION; MATHEMATICAL MODEL; METAL; MONITOR; PRECIPITATE; TREATMENT
(14) HIERARCH TERMS: 1CB/2CA/3CB; 1CG; 1HA/2HG; 1ME/2NB; 1MK
(15) STIMS ACC.NO.: 00S43475 (15) SECONDARY AUTHORS: Baier RE; Ziegler RC
(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, June 1975. 137 p.

(1) SWIRS ACC.NO.: 044405
(2) DOMESTIC: F (2) CATEGORY: 02 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Rapid flameless atomic absorption analysis of the metallic content of sewage sludges. I. Lead, cadmium and copper.
(4) AUTHOR: Lester JN
(6) JOURNAL TITLE: The Science of the Total Environment
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2NE (10) PUB. YEAR: 1977
(11) ABSTRACT: Analysis of sewage sludge for the presence of heavy metals is a important factor to be considered before its disposal on land. Flameless atomic absorption is shown to be a quick and sensitive technique for the determination of lead, copper, and cadmium. By using this method the normal pretreatment of samples is eliminated. It is also shown possible that application of flameless atomic absorption can be extended to cover a wider range of metals in all types of sludges.
(12) KEYWORDS: ABSORPTION; ANALYSIS; ATOMIZED; EQUIPMENT; METAL; NON-FERROUS; SEWAGE; SLUDGE
(14) HIERARCH TERMS: 1AE; 1EE/2EX; 1SI/2SX
(15) STIMS ACC.NO.: 00S43449 (15) SECONDARY AUTHORS: Harrison RM; Perry R
(16) CITATION: 8(2):153-158, Sept. 1977.

(1) SWIRS ACC.NO.: 044310
(2) DOMESTIC: F (2) CATEGORY: 21 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Untersuchungen uber aufnahme und anreicherung von schwermettallen bei milchkuhen durch verfutterung von zink-, blei- und cadmiumhaltigem industriestaub (Investigations on intake and accumulation of heavy metals in dairy cows after feeding industrial dust containing zinc, lead and cadmium).
(4) AUTHOR: Rosenberger VG
(6) JOURNAL TITLE: Deutsche Tieraerztliche Wochenschrift
(10) LANGUAGE: GM (10) GEO. AREA: 1EU/2GE (10) PUB. YEAR: 1976
(11) ABSTRACT: A experiment was conducted with 12 dairy cows. Each was fed industrial dust containing 1000 to 1500 ppm zinc in dry feed matter. No effects were found in performance (body weight and milk production), health status or food hygiene regulations. An accumulation in liver, hairs, and kidney correlated with dosage given. Concentrations in other organs was less evident but traceable.
(12) KEYWORDS: CATTLE; DAIRY; DUST; INDUSTRY; METAL
(14) HIERARCH TERMS: 1ME/2MI; 1ME/2M3
(15) STIMS ACC.NO.: 00S43354 (15) SECONDARY AUTHORS: Grunder HD; Crobmann G
(16) CITATION: 83(11):478-481, 1976

(1) SWIRS ACC.NO.: 044260
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Mercury emissions from chlorine-production solid waste deposits.
(4) AUTHOR: Lindberg SE
(6) JOURNAL TITLE: Nature
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: In a 2 year study of mercury (Hg) emissions from waste disposal ponds of an inactive chlorine plant (located next to a river), air, water, and waste samples were collected from the ponds and

surrounding area. Solid and aqueous samples for Hg determination were handled and analyzed according to standard flameless AAS methods. Air samples for particulate and vapor Hg were collected using standard air filter and activated charcoal absorption techniques, and analyzed as before. Emission of elmental Hg vapor from waste material from the waste ponds' surfaces was found to be related to surface temperature. During high temperature periods, the concentration of atmospheric metallic Hg measured near the wastepond area approached the U.S. Environmental Protection Agency (EPA) suggested standard for total Hg in ambient air. Using simple regression analyses, estimated total annual flux of Hg from the inactive plant (by atmospheric and aquatic pathways) was calculated at 6 percent of the EPA standard for emission of Hg to water and air from active chlorine plants situated in riverine environs.

(12) KEYWORDS: ANALYSIS; ATMOSPHERE; CHLORINE; DISPOSAL; EMISSION; EPA; HAZARDOUS; MERCURY; METAL; POLLUTION; STANDARD; TEMPERATURE; WATER

(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HH

(15) STIMS ACC.NO.: 00S43304 (15) SECONDARY AUTHORS: Turner RR

(16) CITATION: 268(5616):133-135, July 14, 1977.

(1) SWIRS ACC.NO.: 044196

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(4) AUTHOR: Peters GO

(5) CORPORATE AUTHOR: WAPORA, Inc

(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Practices-Electronic Components Manufacturing Industry. (8) REPORT NO.: SW-140c (9) CONTRACT NO.: 68-01-3193

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Hazardous waste generation and management in the electronic components manufacturing industry are described. The results of surveys of 23 plants show that product and manufacturing process diversity within the industry precludes the satisfactory correlation of these factors with waste types. Survey data indicated that land disposed waste from the industry falls into 10 waste categories, five categories of which contain such hazardous materials as halogenated solvents, nonhalogenated solvents, waste water treatment sludge, painting waste, and hydraulic and lubricating oils. The remaining five categories include unquantifiable amounts of hazardous materials, no hazardous materials, or waste that is not typically landfilled. Hazardous properties of the industry's land disposed waste involve flammability, corrosivity and dermal irritation, oral toxicity, and bioconcentration. The estimated total quantity of potentially hazardous waste land disposed by the industry in 1975 was 54,500 tons on a wet weight ton basis. More than half of this total constituted waste water treatment sludge. The best technology applied and the technology required to provide enviornmentally adequate treatment for waste and associated costs are discussed. (Retained in SWIRS library).

(12) KEYWORDS: DATA; DISPOSAL; ECONOMICS; GENERATION; HAZARDOUS; INDUSTRY; MANAGEMENT; OIL; PAINT; SLUDGE; SOLVENT; SURVEY; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1EA/2EA; 1HA/2HH; 1MA/2MH; 1SO

(15) STIMS ACC.NO.: 00S43239 (15) SECONDARY AUTHORS: Levin J; Thomas P

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Jan. 1977. 197 p. (Solid Waste Management Series.)

(1) SWIRS ACC.NO.: 044076

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Method for the safe disposal of alkali metal.

(4) AUTHOR: Johnson TR

(5) CORPORATE AUTHOR: USA, USERDA

(7) PATENT DATA: U.S. Patent No. 4,032,615

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A safe disposal method for alkali metals employed in liquid metal coolant systems in which minimal hydrogen gas is evolved in which the exothermic heat of reaction can be released by incremental step and in which the final volume of waste materials is minimized, is described. The alkali metal is dissolved within a melt of a metal or

metals that are substantially inert to salts of the alkali metal. The melt is then contacted with a salt containing the alkali metal hydroxide and a gas containing oxygen. The alkali metal is converted to an oxide which is dissolved in the salt. The salt is separated from the melt and contacted with a gas containing water to convert the alkali metal oxide to its hydroxide. The excess salt produced can be withdrawn for storage and the remainder recycled to continue the process. The substantially inert, molten metals used for dissolving the alkali metal are those that will not react to replace the alkali metal within its hydroxide or oxidize appreciably in the presence of the alkali metal. The inert metals perferably include such low melting point metals as lead, bismuth, tin, antimony, cadmium, indium and alloys of these materials. The molten salt may include both hydroxide and carbonate. The use of carbonates can reduce corrosiveness to process vessels.

(12) KEYWORDS: ALKALINE; CORROSION; DISPOSAL; GAS; LIQUID; METAL; PROCESS; SAFETY; SODIUM; WATER

(14) HIERARCH TERMS: 1DD/2DK; 1DD/2DW; 1HA/2HG

(15) STIMS ACC.NO.: 00S43119

(16) CITATION: Filed Jan. 27, 1976 issued June 28, 1977.

(1) SWIRS ACC.NO.: 044071

(2) DOMESTIC: F (2) CATEGORY: 24 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Schwermetallgehalte im Kultursubstrat und Erntegut des Champignons, Agaricus bisporus (Lange) Singer. beim Einstz von Millklarschlammkompost. (Heavy metal contents in the culture substrate and in the mushroom, Agaricus bisporus, grown in composts mixed with municipal waste and sewage.)

(4) AUTHOR: Domsch KH

(6) JOURNAL TITLE: Z. Pflanzenernaehrung und Bodenkunde

(10) LANGUAGE: GM (10) GEO. AREA: 1EU/2GE (10) PUB. YEAR: 1976

(11) ABSTRACT: An examination of the transfer of heavy metals from sludge compost to vegetation is reported. The addition of increasing quantities of municipal waste compost to conventional horse manure compost resulted in a proportional increase in the heavy metal content of the mixture. The increases ranged between 250 percent (zinc) and 900 percent (mercury). Ninety-four to 99 percent of the heavy metals in municipal waste compost are bound in compounds from which they can not be extracted using calcium chloride solution. The amounts extractable from horse manure compost with calcium Chloride solution are from 1.5 (zinc) to 33 (mercury) times greater. The influences of the increasing quantities of heavy metals in municipal waste horse manure composts are demonstrable in the content of these metals in harvested mushrooms. This corresponds to the availability of the metals. The relative enrichement is greatest with mercury, and least with cadmium. The quantities found in mushrooms, with the exception of mercury, fall within the normal range detected in vegetable crops.

(12) KEYWORDS: ANIMAL; COMPOST; FUNGUS; MANURE; MERCURY; METAL; MUNICIPAL; SLUDGE

(14) HIERARCH TERMS: 1ME/2MB; 1MJ/2NA; 1SI/2S9

(15) STIMS ACC.NO.: 00S43114 (15) SECONDARY AUTHORS: Grabbe K; Fleckenstein J

(16) CITATION: (4):487-501, 1976.

(1) SWIRS ACC.NO.: 044013

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Haxo HE JR

(6) BOOK TITLE: Liner Materials Exposed to Hazardous and Toxic Sludges. First Interim Report. (8) REPORT NO.: EPA-600/2-77-081 (9) CONTRACT NO.: 68-03-2173

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: The storage and disposal of hazardous liquids and solid wastes on the land are increasing the potential for pollution of surface and ground waters by these wastes or their leachates. Intercepting and controlling the seepage of such fluids by the use of impervious barriers offers a promising means of reducing or eliminating such pollution. This engineering research project was undertaken to assess the relative effectiveness and durability of a wide variety of liner materials when exposed to hazardous wastes. The materials under

study include a native soil, modified bentonite a soil cement, a hydraulic asphalt concrete, an asphaltic membrane, and 8 polymeric membranes based upon polyvinyl chloride, chlorinated polyethylene, chlorosulfonated polyethylene, ethylene propylene rubber, neoprene, butyl rubber, an elasticized polyolefin, and a thermoplastic polyester elastomer, respectively. In this study the liner materials are exposed to such hazardous wastes as a strong acid, a strong base, an oil refinery tank bottom waste, a blend of lead wastes from gasoline production, a saturated and unsaturated hydrocarbon oil waste, and a pesticide. The experimental approach and methodology followed are described and results of preliminary tests used in the selection of materials for extensive testing are presented. (Retained in SWIRS library).

(12) KEYWORDS: ENGINEERING; EQUIPMENT; HAZARDOUS; LEACH; LINER; MANAGEMENT; POLLUTION; RESEARCH; SANITARY LANDFILL; SLUDGE

(14) HIERARCH TERMS: 1HA/2HF; 1LC; 1TD

(15) STIMS ACC.NO.: 00S43056 (15) SECONDARY AUTHORS: Haxo RS; White RM

(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, June 1977. 73 p.

(1) SWIRS ACC.NO.: 043992

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Management Petroleum Re-Refining Industry. (8) REPORT NO.: SW-144C

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2DC (10) PUB. YEAR: 1977

(11) ABSTRACT: Resource recovery has become a matter of great importance in worldwide public awareness. Wastes from manufacturing sources generated in tremendous quantities are often a threat to our environment and, when not recycled, irretrievably deplete our finite resources. This study report attempts to qualify and quantify the potentially hazardous wastes generated by the petroleum refining industry in the United States. It further surveys the industry characteristics as well as the treatment and disposal technology and costs for its wastes. Projected production of refined oil and generation of wastes, using the best data available, have been made for 1977 and 1983. (Retained in SWIRS library).

(12) KEYWORDS: DISPOSAL; ECONOMICS; HAZARDOUS; INDUSTRY; MANAGEMENT; OIL; RECLAMATION; REFINERY; TREATMENT

(14) HIERARCH TERMS: 1EA/2EA; 1HA/2HF; 1PF/2PG/3PH

(15) STIMS ACC.NO.: 00S43035

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 148 p.

(1) SWIRS ACC.NO.: 043770

(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Permissible levels of heavy metals in secondary effluent for use in a combined sewage treatment marine aquaculture system. II. Development of guidelines by method of additions.

(4) AUTHOR: Kerfoot WB

(6) BOOK TITLE: In Proceedings: Conference on Wastewater Use in the Production of Food and Fiber, Oklahoma City, OK, Mar. 5-7, 1974.

(8) REPORT NO.: EPA-660/2-74-041

(10) LANGUAGE: EN (10) PUB. YEAR: 1974

(11) ABSTRACT: Permissible concentrations of zinc, copper, lead, cadmium, chromium, and nickel in a combined sewage treatment/marine aquaculture system were investigated. Scale models of the combined system were constructed in a sea water laboratory, and the toxic effects of specific metals on phytoplankton were determined. The concentration of metals in effluent media had little influence on the number of algae. When metals were added individually at a concentration of 0.5 parts per million to effluent, copper, cadmium, and nickel had a pronounced depressing effect on algae growth. Other effects observed on the diatoms were certain morphological variations. The influence of cell density on toxicity was also apparent. The high density of cells in the aquaculture system suppressed toxicity until a drop in the number of cells occurred. This drop was then accentuated by elevated levels of metal introduced into effluent. Few oysters died during the

operation of the combined system and in no case could isolated deaths be attributed to metal concentrations. Data on permissible concentrations of metals in effluent are tabulated.
(12) KEYWORDS: ALGAE; ANIMAL; CHROMIUM; CONCENTRATION; EFFLUENT; HAZARDOUS; METAL; MICROORGANISM; MONITOR; NON-FERROUS; OCEAN; SEWAGE; STANDARD; TOXIC; TREATMENT
(14) HIERARCH TERMS: 1ME; 1MK; 1SF/2SU
(15) STIMS ACC.NO.: 00S42813 (15) SECONDARY AUTHORS: Redmann GA
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, June 1974. p.79-101.

(1) SWIRS ACC.NO.: 043757
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(5) CORPORATE AUTHOR: Garrity-Sandage Associates, Inc
(6) BOOK TITLE: Special Substances Report 1977. V.1. Industrial Special Wastes Generated in Iowa and Manpower Characteristics of Employee Handlers. (9) CONTRACT NO.: 76-4300-01
(10) LANGUAGE: EN (10) GEO. AREA: 1US/21A (10) PUB. YEAR: 1977
(11) ABSTRACT: A statewide survey of the hazardous waste stream in Iowa was conducted during the summer of 1976. The objectives of the survey were to determine the quantity of hazardous waste generated in Iowa and evaluate treatment and disposal practices and to estimate the number of persons who come in daily contact with hazardous substances as part of their employment. Interviews were carried out at the site of 244 industries, and an additional 239 interviews were conducted by telephone and/or mail. The survey focused on manufacturers in 17 standard industrial classifications. It was determined that Iowa generates and disposes an estimated 574 million kilograms of solid special waste and an estimated 132 million liters of nonsolid hazardous waste annually. Approximately 24,000 workers in the State handle special or hazardous materials daily. It is recommended that steps be taken to plan for proper disposal methods and sites and that a training program be initiated for persons who work with hazardous materials. Supporting tabular data are appended. (Retained in SWIRS library).
(12) KEYWORDS: DATA; DISPOSAL; GENERATION; HAZARDOUS; INDUSTRY; IOWA; PERSONNEL; QUANTITY; SITES; STATE; SURVEY; TRAINING; TREATMENT
(14) HIERARCH TERMS: 1EB/2EE; 1HA/2HP; 1SO
(15) STIMS ACC.NO.: 00S42800
(16) CITATION: Mason City, IA, Garrity-Sandage Associates, Inc., Apr. 1977. 156 p.

(1) SWIRS ACC.NO.: 043583
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Electrical industry self-polices PCB use.
(6) JOURNAL TITLE: Electrical World
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The Federal ban of polychlorinated biphenyls (PCBs), specifically from the viewpoint of the electrical industry is discussed. Of 209 possible PCB homologs, the electrical industry has used few since their introduction in 1929; those used include: Aroclor 1260, 1254, 1242, and 1016. The level of chlorination is the most significant factor in the relative biodegradability of PCBs. Westinghouse tests on the PCBs have indicated that Arochlor 1016 is sufficiently biodegradable to remain in use, Westinghouse believes that many agencies supervising PCB analyses are arriving at erroneous results. It is felt that PCB standards are based on data derived from a questionable analytical technique. Environmental Protection Agency studies to date have concerned Arochlor 1254, a material not used by Westinghouse for 10 years because of recognized nonbiodegradability and possible detrimental effects on the environment. In the absence of Federal standards manufacturers' associations developed their own standards to prevent the inadvertent pollution of the environment. The Food and Drug Administration is reviewing tolerance limits for PCBs set in 1973 and now considered to be too severe.
(12) KEYWORDS: ANALYSIS; BIOLOGICAL; CHLORINE; DECOMPOSE; DISCHARGE; ELECTRICAL; ENVIRONMENT; EPA; INDUSTRY; LAW; POLLUTION; RESEARCH; STANDARD
(14) HIERARCH TERMS: 1EL; 1HA/2HP; 11C/2I7
(15) STIMS ACC.NO.: 00S42626
(16) CITATION: 185(12):131,133,134, June 15, 1976.

(1) SWIRS ACC.NO.: 042922
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Hazardous waste sampling: an official overview.
(4) AUTHOR: Andres DR
(6) JOURNAL TITLE: Waste Age
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA (10) PUB. YEAR: 1977
(11) ABSTRACT: A discussion of hazardous waste sampling from the viewpoint of a California state regulatory agency official is presented. Parameters which must be considered in hazardous waste sampling programs include: phase complexity (solid, aqueous, organic liquid); access; chemical reactivity; and safety. The effect of a sampling program on the flow of wastes at a disposal site can be considerable. As word spreads about the presence of sampling personnel at a disposal site waste volume is considerably affected.) This problem of accurately representing waste flow has been made possible in California because of the waste hauler manifest and the automated data system which it now supplies. Analysis of these waste samples poses unique problems. In California, a classification system has been developed involving various levels of analysis according to indications obtained from preliminary data. Methods used in data analyses are usually classical wet chemical methods. California's current effort is directed toward development of well standardized procedures for waste sampling, and the incorporation of these procedures in a field manual suitable for use by regulatory agencies, waste generators, haulers, and at disposal sites.
(12) KEYWORDS: ANALYSIS; CALIFORNIA; CHEMICAL; DISPOSAL; HAZARDOUS; REFUSE; REGULATIONS; SAMPLING METHODS; SITE
(14) HIERARCH TERMS: 1HA/2HH; 1MA
(15) STIMS ACC.NO.: 00541965
(16) CITATION: 8(5):116-117, May 1977.

(1) SWIRS ACC.NO.: 042722
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Sources, characteristics and treatment and disposal of industrial wastes containing hexachlorobenzene.
(4) AUTHOR: Quinlivan SC
(6) JOURNAL TITLE: J Hazardous Materials
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A study to identify the sources and characteristics of manufacturing wastes containing hexachlorobenzene (HCB) and to review and document methods currently used for treatment and disposal of HCB wastes, was made. The chlorinated solvents and pesticide industries were found to account for nearly all HCB wastes produced (4,305 tons per year) by the 14 industries reviewed as sources of HCB wastes. Waste sotrage methods which are used prior to ultimate disposal include storage of solid waste cubes under plastic cover and use of water covered lagoons. Methods for transportation of HCB wastes include use of forklift, truck, pipeline, heated tank trucks and rail. Ultimate waste disposal methods include land disposal, incineration (with or without by product recovery), resource recovery, discharge to municipal sewage treatment plants, and emission to the atmosphere. The majority of the HCB waste handled by the industrial facilities reviewed is currently disposed of in two industrial landrills using a soil cover of 4 to 6 ft. with a polyethylene film placed at approximately the middepth of the soil cover. Incineration at a sufficiently elevated temperature can effectively destroy HCB; Hydrogen Chloride as a by-product.
(12) KEYWORDS: CHLORINE; DISPOSAL; HAZARDOUS; INCINERATION; LAND; ORGANIC; PLANT-INDUSTRIAL; STORAGE; TRANSPORT; TREATMENT
(14) HIERARCH TERMS: 1HA; 1PA/2PA; 1SA
(15) STIMS ACC.NO.: 00541765 (15) SECONDARY AUTHORS: Ghassemi M
(16) CITATION: 1(4):343-359, Mar. 1977.

(1) SWIRS ACC.NO.: 041803
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Freudenthal RI (10) GEO. AREA: 1AE; 1FD (10) PUB. YEAR: 1976
(11) ABSTRACT: Toxicity tolerances in rats were investigated. Ethylenebisisothiocynate sulfide (EBIS) was fed to groups of rats at 0,

1, 10, 100, and 1000 ppm for up to 90 days. Only those rats receiving EBIS at 1000 ppm demonstrated a toxic response to the test chemical reflected as a reversible paralysis of the hind legs noted within 8 to 14 days. Laboratory procedures and physiological effects are noted in detail. A no effect level for this 90 day dietary study for EBIS is 100 ppm in week 1 to 31 mg/kg body weight at week 12. (Retained in SWIRS library)

(12) KEYWORDS: CARBON; CHEMICAL; HYDROGEN; INVESTIGATION; LABORATORY; ORGANIC; RESEARCH; RODENT; SULFUR; TOXIC

(14) HIERARCH TERMS: 1CB

(15) STIMS ACC.NO.: 00S40847

(18) DOC.CIT.: Freudenthal, R. I. Dietary subacute toxicity of ethylenebisisothiocyanate sulfide in the laboratory rat. Environmental Protection Publication EPA-600/1-76-030. Research Triangle Park, NC, U. S. Environmental Protection Agency, Sept. 1976. 32 p. (Environmental Health Effects Research Series.)

(1) SWIRS ACC.NO.: 041777

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Cavender JV Jr (10) PUB. YEAR: 1977

(11) ABSTRACT: The treatment of aqueous waste systems containing minor amounts of cyanide (CN) to detoxify the streams is described. Aqueous streams containing cyanide in a concentration of up to 1,000 ppm are treated to reduce cyanide content by contacting the streams with formaldehyde and a compound which will generate the bisulfate ion at a temperature from about80 to 135 C while maintaining the pH of the mixture in the range from 8 to 12 for a period of time sufficient to reduce the cyanide content to less than 1 ppm using a formaldehyde/CN ion molar ratio of at least 1 and a bisulfite ion/CN ion molar ratio from about 1:1. 5. Operations may be carried out on a batch or on a continuous basis. Reaction time may vary from about three quarters of an hour to one hour.

(12) KEYWORDS: CARBON; CHEMICAL; ENVIRONMENT; HYDROGEN; NITROGEN; PATENT; PH; SULFUR; TOXIC; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1CB/2CA/3CB

(15) STIMS ACC.NO.: 00S40815

(18) DOC.CIT.: Cavender, J. V. , Jr. (Monsanto Company). Detoxification of aqueous waste streams containing cyanide. U. S. Patent No. 4,003,833; filed May 24, 1976; issued Jan. 18, 1977.

(1) SWIRS ACC.NO.: 041621

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Leoni V (10) PUB. YEAR: 1976

(11) ABSTRACT: The application of Tenax (a porous polymer developed in the Netherlands) to the extraction of organic micropollutants such as pesticides and polychlorobiphenyls from waters has been studied, and it has been observed that also in the presence of other pollutants (oil, surface active substances, etc.) the results obtained with an absorption column of Tenax-Celite are equivalent to those obtained with the continuous liquid/liquid extraction technique. For natural waters that contain solids in suspension that adsorb pesticides, it may be necessary to filter the water before extraction with Tenax and then to extract the suspended solids separately. Analyses of river and estuarine sea waters, filtered before extraction, showed the effectiveness of Tenax, and the extracts obtained for the pesticides analysis prove to be much less contaminated by interfering substances than the corresponding extracts obtained by the liquid/liquid technique.

(12) KEYWORDS: ADSORPTION; INVESTIGATION; PESTICIDE; POLLUTION; POLYCHLORINATED; POLYMER; PURIFICATION; TECHNOLOGY; TREATMENT; WATER

(14) HIERARCH TERMS: 1WA

(15) STIMS ACC.NO.: 00S40665 (15) SECONDARY AUTHORS: Colombo BJ; Puccetti G

(18) DOC.CIT.: Leoni, V. , G. Puccetti, and R. J. Colombo. The use of Tenax for the extraction of pesticides and polychlorinated biphenyls from water. 2. tests with artificially polluted and natural waters. Journal of Chromatography, 125(2):399-407, Oct. 1976.

(1) SWIRS ACC.NO.: 041629
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) GEO. AREA: 1ED; 1HA (10) PUB. YEAR: 1975
(11) ABSTRACT: Research projects sponsored by the Food Protection and Toxicology Center of the University of California at Davis are described. Emphasis is placed on three areas of environmental toxicology: (1) the fate and effect of pesticides and other toxicants in the environment; (2) the transport of toxicants through air, water, and soil; and (3) the effect of the use of agricultural chemicals on the health of farm employees. The following research projects in the three major areas are reported: environmental impact of chlorinated hydrocarbons, organophosphate toxicity, mammalian metabolism of chlorinated hydrocarbons, uptake and excretion of hexachlorobenzene by growing lambs, competitive inhibition of nitrosamine formation, metabolism of Aflatoxin B1 (a naturally occurring toxicant), monitoring of contaminants in the Monterey Basin and San Joaquin Valley areas of California, and a study of parathion as a public health hazard. (Retained in SWIRS library)
(12) KEYWORDS: AGRICULTURE; CALIFORNIA; CHEMICAL; CONTAMINATE; CONTROL; ENVIRONMENT; FARM; FOOD; INFORMATION; PERSONNEL; PESTICIDE; PROGRAM; RESEARCH; TOXIC; TRANSPORT; UNIVERSITY
(14) HIERARCH TERMS: 1AE
(15) STIMS ACC.NO.: 00S40673
(18) DOC.CIT.: Food Protection and Toxicology Center. Summary report 1975. University of California at Davis, 1975. 87 p.

(1) SWIRS ACC.NO.: 041596
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Sayler GS (10) GEO. AREA: 1WA (10) PUB. YEAR: 1976
(11) ABSTRACT: Freshwater and marine systems consisting of mixtures of suspended sediment and/or crude oil were tested for their interactions with mercury and HCB (hexachlorobiphenyl). Using additions of radioactively labeled mercury and HCB, a type of PCB (polychlorinated biphenyl), it was shown that both oil and suspended sediment could partition mercury and HCB. The relative percent partitioning by oil was three times greater than by suspended sediment. Suspended sediment was equally effective as a partitioning agent in terms of the net concentration of mercury or HCB. The data show that there can be significant accumulation of heavy metal and PCBs in oil and sediment, which can be highly toxic.
(12) KEYWORDS: HYDROCARBON; INVESTIGATION; LABORATORY; MERCURY; METAL; OCEAN; OIL; POLLUTION; POLYCHLORINATED; RESEARCH; SEDIMENTATION; SUSPENDED; TOXIC; WATERWAY
(14) HIERARCH TERMS: 10A
(15) STIMS ACC.NO.: 00S40640 (15) SECONDARY AUTHORS: Colwell RR
(18) DOC.CIT.: Sayler, G. S. , and R. R. Colwell. Partitioning of mercury and polychlorinated biphenyl by oil, water, and suspended sediment. Environmental Science and Technology, 10(12):1142-1145, Nov. 1976.

(1) SWIRS ACC.NO.: 041486
(2) DOMESTIC: D (2) CATEGORY: 02 (2) SUBJ.TYPE: S
(4) AUTHOR: Jensen S (10) GEO. AREA: 1SI/2SZ (10) PUB. YEAR: 1977
(11) ABSTRACT: Organochlorines, including PCB (polychlorinated biphenyl) and DDT in sediment and sludge are determined in the presence of elemental sulfur. The method can also be used for unprejudiced search for both volatile and/or polar pollutants. The sulfur interfering in the gas chromatographic determination is removed in a nondestructive treatment of the extract with tetrabutylammonium sulfite. This lipophilic ion pair rapidly converts the sulfur to thiosulfate in an organic phase. The recovery of added organochlorines

was above 80 percent and the detection limit in the range of 1 to 10 ppb from a 10 g sample.
(12) KEYWORDS: ANALYSIS; CHEMICAL; CHLORINE; ORGANIC; POLYCHLORINATED; PROCESS; RESIDUE; SEDIMENTATION; SLUDGE; SULFUR; TOXIC; UTILIZE
(14) HIERARCH TERMS: 1S1/2SX
(15) STIMS ACC.NO.: 00S40530 (16) SECONDARY AUTHORS: Renberg L; Reutergardh L
(18) DOC.CIT.: Jensen, S. , L. Renberg, and L. Reutergardh. Residue analysis of sediment and sewage sludge for organochlorines in the presence of elemental sulfur. Analytical Chemistry, 49(2):316-318, Feb. 1977.

(1) SWIRS ACC.NO.: 041338
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Narahashi T (10) GEO. AREA: 1HA/2HH; 1RE (10) PUB. YEAR: 1976
(11) ABSTRACT: Several skeletal muscle and smooth muscle preparations have been examined for their usefulness in evaluating the toxic effects of a variety of insecticides. The following preparations were found satisfactory for such test: guinea pig ileum for muscarinic receptors, frog rectus abdominis for nicotinic receptors of tonic muscle, and rat diaphragm for nicotinic receptors of phase muscle. Five carbamate insecticides, four organophosphate insecticides and chlordimeform were studied. None of the insecticides tested had any direct and potent effect on these receptors except the effect on cholinergic receptors via cholinesterase inhibition. Thus, it can be concluded that these insecticides exert no direct action on cholinergic and adrenergic receptors. (Retained in SWIRS library)
(12) KEYWORDS: ANALYSIS; ANIMAL; EFFECT; PESTICIDE; RESEARCH; TOXIC
(14) HIERARCH TERMS: 1PE
(15) STIMS ACC.NO.: 00S40362
(18) DOC.CIT.: Narahashi, T. In-vitro methods for evaluating side effects of pesticides and toxic substances. Environmental Protection Publication EPA-600/1-76-035. Research Triangle Park, NC, U. S. Environmental Protection Agency, Nov. 1976. 125 p. (Environmental Health Effects Research Series.)

(1) SWIRS ACC.NO.: 041335
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) GEO. AREA: 1AC/2AJ; 1IC/2I7 (10) PUB. YEAR: 1976
(11) ABSTRACT: A national emission standard for vinyl chloride emitted from ethylene dichloride-vinyl chloride and polyvinyl chloride plants is being promulgated under the authority of section 112 of the Clean Air Act. Vinyl chloride has been implicated as the causal agent of angiosarcoma and other serious disorders, both carcinogenic and noncarcinogenic, in people with occupational exposure and in animals with experimental exposure to vinyl chloride. Reasonable extrapolations from these findings cause concern that vinyl chloride may cause or contribute to the same or similar disorders at present ambient air levels. The purpose of the standard is to minimize vinyl chloride emissions from all known process and fugitive emission sources in ethylene dichloride-vinyl chloride and polyvinyl chloride plants to the level attainable with best available control technology. (Retained in SWIRS library)
(12) KEYWORDS: AIR; CONTROL; DISEASE; EMISSION; EXPOSURE; HEALTH; HUMAN; OCCUPATION; POLLUTION; POLYVINYL CHLORIDE; STANDARD
(14) HIERARCH TERMS: 1P1/2PJ/3PN
(15) STIMS ACC.NO.: 00S40379
(18) DOC.CIT.: Standard support and environmental impact statement, v. 2: promulgated emission standard for vinyl chloride. Environmental Protection Publication EPA-450/2-75-009b. Research Triangle Park, NC, U. S. Environmental Protection Agency, Sept. 1976. 134 p.

(1) SWIRS ACC.NO.: 041169
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Dyer RL (10) GEO. AREA: 1AE; 1PE (10) PUB. YEAR: 1976
(11) ABSTRACT: An isotope dilution methodology was developed for analysis of an insecticide, parathion, and a herbicide, trifluralin, isolated from rat tissues and excreta. Sample cleanup was facilitated by use of high pressure gel permeation chromatography in conjunction with thin layer chromatography and reversed phase high pressure liquid chromatography. Isotope ratio measurements were performed using multilabeled stable isotopic carriers and nonfragmenting field ionization mass spectrometry. Parathion and trifluralin were administrered intraperitoneally and/or orally at the sub mg/kg level, and the unchanged materials assayed in tissues and excreta at the ppb level. The technique was also applied to the determination of parathion and methyl parathion concentrations in aerosols. The biological implications of the results of the animal experiments are discussed. (Retained in SWIRS library)
(12) KEYWORDS: AEROSOLS; ANALYSIS; ANIMAL; CHEMICAL; DILUTION; EFFECT; INVESTIGATION; ISOTOPE; PESTICIDE; PROCESS; SPECTROGRAPHIC
(14) HIERARCH TERMS: 1MA
(15) STIMS ACC.NO.: 00S40213 (15) SECONDARY AUTHORS: Heck Hd'A; Scott AC
(18) DOC.CIT.: Dyer, R. L. , H. d'A. Heck, and A. C. Scott. Feasibility of applying field ionization mass spectrometry to pesticide research. Environmental Protection Publication EPA-600/1-76-037. Research Triangle Park, NC, U. S. Environmental Protection Agency, Nov. 1976. 86 p. (Environmental Health Effects Research Series.)

(1) SWIRS ACC.NO.: 041165
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Curby WA (10) GEO. AREA: 1HA/2HH; 1WA/2WB (10) PUB. YEAR: 1976
(11) ABSTRACT: A biological multichannel analyzer has been developed which, using a sensor that operates on the coulter Principle, measures and distributes mixed cell populations by cell size. It provides an analog distribution and digital printed readout for future analysis. Although primarily a pulse height analyzer (applied successfully to studying bacteria, mammalian blood and inert particles) it operates as a pulse shape analyzer if the instant at which each pulse height is read is varied. This technique, applied to the peripheral whole blood from freshly sacrificed Fundulus heteroclitus shows the alterations with time and the variations caused by trace amounts of cadmium and copper in the aquatic environment. The size frequency distribution patterns of each trace element environment differ from each other, and each, markedly from the norm. The response of F. heteroclitus whole blood cells from fishes living in several aquatic environments of fixed pH and dissolved oxygen and temperature has been investigated and recorded. Comparison of data with those obtained from fish subjected to dissolved traces of chemical pollutants was performed. (Retained in SWIRS library)
(12) KEYWORDS: ANALYSIS; BIOLOGICAL; COMPUTER; EQUIPMENT; FISH; MEASUREMENTS; METAL; NON-FERROUS; WATERWAY
(14) HIERARCH TERMS: 1AG
(15) STIMS ACC.NO.: 00S40209 (15) SECONDARY AUTHORS: Joy EC; Ulinick RD
(18) DOC.CIT.: Curby, W. A. , R. D. Ulinick, and E. C. Joy. Assays of toxic pollutants by fish blood. Environmental Protection Publication EPA-600/3-76-069. Narragansett, RI, U. S. Environmental Protection Agency, Sept. 1976. 77 p. (Ecological Research Series.)

(1) SWIRS ACC.NO.: 041155
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Rubinstein R (10) GEO. AREA: 1AE; 1WC (10) PUB. YEAR: 1975
(11) ABSTRACT: The result of a survey is given which was undertaken to develop a series of acceptable test protocols for assessing the

effects of chemicals on plants. Plant exposure to air, soil, and water contaminants were considered. Test species were selected on the basis of physiology, anatomy, importance as crops, and their susceptibility to chemicals. Bioassay methods were chosen because they are most representative of natural conditions. The recommended sequence of test procedures includes: growth chamber of laboratory testing, greenhouse testing, field plot testing, progeny testing and, finally, population studies in the ecosystem. It is suggested that the extent of testing should depend upon the quantity of the chemical to be manufactured and its potential hazard to the environment. (Retained in SWIRS library)

(12) KEYWORDS: AIR; CHEMICAL; CONTAMINATE; CROP; EARTH; EFFECT; EXPOSURE; SURVEY; TOXIC; VEGETATION; WATER

(14) HIERARCH TERMS: IPE

(15) STIMS ACC.NO.: 00S40199 (15) SECONDARY AUTHORS: Cole H; Cuirle E

(18) DOC.CIT.: Rubinstein, R. , E. Cuirle, and H. Cole. Test methods for assessing the effects of chemicals on plants. Environmental Protection Publication EPA-560/5-75-008. Washington, DC, U. S. Environmental Protection Agency, June 30, 1975. 233 p. (Distributed by the National Technical Service, Springfield, VA, as PB 248 198.)

(1) SWIRS ACC.NO.: 040784

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(4) AUTHOR: Chian ES (10) GEO. AREA: 1CB (10) PUB. YEAR: 1976

(11) ABSTRACT: A literary review of organics is presented. There are 14 reports reviewed that cover aspects of oxygen demand and organic carbon. Detergents and surfactants are covered by 18 reports, the majority of which are summarized in a table of toxic and biological effects of compounds on equatic organisms. Methods for analysis of petroleum and allied products on aquatic organisms, and attenuation of petroleum and allied products in the environment are the subjects of tables that include the majority of references to these materials. Organic analysis of organics in water are summarized in three major categories: methods of identification and quantification of trace organics in water, organic analysis of drinking and natural waters, and organic analysis of wastewater. The majority of reports on pesticides and related chlorinated hydrocarbons are listed in the following four tables; methods for analysis of compounds from environmental samples, toxic effects on aquatic organisms, accumulation in aquatic organisms, and attenuation of compounds in the environment. Humic, colored, and odorous substances are the subject of several reports and methods of analysis of nitrogenous compounds from environmental samples are summarized in a table. There are 337 references.

(12) KEYWORDS: CHEMICAL; CHLORINE; DETERGENT; EFFECT; FISH; HYDROCARBON; LITERATURE; NITROGEN; ORGANIC; PESTICIDE; QUALITY; TOXIC; WASTE WATER; WATER

(14) HIERARCH TERMS: ITD

(15) STIMS ACC.NO.: 00S39828 (15) SECONDARY AUTHORS: DeWalle FB

(18) DOC.CIT.: Chian, E. S. K. , and F. B. DeWalle. Organics. Journal Water Pollution Control Federation, 48(6):1042-1077, June 1976.

(1) SWIRS ACC.NO.: 040271

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Bretherick L (10) GEO. AREA: 1HB (10) PUB. YEAR: 1975

(11) ABSTRACT: Research students and practicing chemists will find a wide selection of documented information on likely reaction hazard potentials of existing or proposed chemical compounds included in this compilation. It is also useful in the important area of safety training in school, college and university laboratories. Information on toxic hazards is omitted because it is collectively available elsewhere; similarly, details of all flammable materials capable of burning explosively when mixed with air and ignited have been excluded. Elements and compounds are entered either as classes, groups and topics alphabetically ordered, or as arranged in formula order. All

information available to the author by June 1973 is contained in this handbook. (Retained in SWIRS library)
(12) KEYWORDS: CHEMICAL; EXPLOSION; HAZARDOUS; HEALTH; INDUSTRY; INSTITUTION; LABORATORY; MANUAL; PLANT-INDUSTRIAL; RESEARCH; SAFETY; TRAINING
(14) HIERARCH TERMS: 1HA
(15) STIMS ACC.NO.: 00S39315
(18) DOC.CIT.: Bretherick, L. Handbook of reactive chemical hazards. Cleveland, OH, CRC Press, Inc. , 1975. 976 p.

(1) SWIRS ACC.NO.: 040149
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Forstner U (10) GEO. AREA: 1US/2WI (10) PUB. YEAR: 1976
(11) ABSTRACT: A review of the literature on use of lake sediments as indicators of heavy metal pollution is presented. Referenced are 115 publications. Heavy metals are one of most toxic forms of environmental pollutants. By analyzing lake sediments, it is possible to determine provenance, distribution, extent, and possible hazards of metal contamination. Sedimentary cores provide the means for evaluating the different influences from natural and civilizational sources; they represent a historical record of metal accumulations as a result of population growth and industrial development. In Lake Constance, Lake Michigan, Wisconsin Lakes, Lake Washington, and Lake Erie the vertical distribution of a large number of elements in core profiles was measured simultaneously. Results of these studies are shown in a table according to (1) background levels of minor elements in deeper core, (2) maximum values in upper layers, (3) factors of enrichment as the quotient (2):(1). Mixed sewage inputs into Lakes Constance and Michigan moderately enhanced zinc, lead, mercury, and cadmium values. Metal pollution resulting from pesticide use is demonstrated by examples from lakes in Wisconsin. Examples of atmospheric influences on metal concentrations in lacustrine deposits are seen in sedimentary core studies of Lake Washington while industrial effluents were responsible for trace and minor element concentrations in sedimentary cores in Lake Erie studies. Mercury contamination from sediment and biota has been reported in aquatic systems far removed from characteristic industrial effluents. Other possible sources of mercury pollution are noted. Potential hazards for drinking water quality and aquatic life may arise from metal polluted lake disposits by changes of water chemistry. Three mechanisms seem most disadvantageous: an increasing input of chelating substances, the changes of pH values, and the consequences of advanced eutrophication.
(12) KEYWORDS: ANALYSIS; HAZARDOUS; HISTORY; LITERATURE; MEASUREMENTS; MERCURY; METAL; MICHIGAN; POLLUTION; QUALITY; SEDIMENTATION; SURVEY; TOXIC; WATER; WATERWAY; WISCONSIN
(14) HIERARCH TERMS: 1AF/2AM; 1ME; 1TD
(15) STIMS ACC.NO.: 00S39193
(18) DOC.CIT.: Forstner, U. Lake sediments as indicators of heavy-metal pollution. Naturwissenschaften, 63(10);465-470, Oct. 1976.

(1) SWIRS ACC.NO.: 040140
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(4) AUTHOR: Lawson ER (10) GEO. AREA: 1US/2AR (10) PUB. YEAR: 1976
(11) ABSTRACT: A study in Arkansas is reported in which the amount of 2,3,5 T residues appearing in storm runoff from small upland watersheds as a result of spraying for hardwood brush and sprout control were quantified. Methods and procedures are noted. Herbicide treatment and water sampling are described. Samples were collected at various flow volumes to determine whether the amount of herbicide removed varied with storm size. Sample analysis indicated that 2,4,5, T does not persist for extended periods in forest environments. Herbicides may be volatilized into the atmosphere, photodecomposed, degraded in the forest floor, or leached into the soil and subsequently decomposed. Analysis also showed that herbicides are rapidly degraded or diluted in streams. None of the concentrations found in any stream

were sufficiently high to be toxic to man or mammals or to fish and many aquatic organisms.
(12) KEYWORDS: ANALYSIS; ARKANSAS; CONCENTRATION; DRAINAGE; FORESTRY; MEASUREMENTS; PESTICIDE; QUALITY; RESEARCH; RESIDUE; SAMPLING METHODS; TOXIC; WATER; WATERWAY
(14) HIERARCH TERMS: 1PE; 1WA/2WA; 1WA/2WF
(15) STIMS ACC.NO.: 00S39192
(18) DOC.CIT.: Lawson, E. M. 2,4,5 T residues in storm runoff from small watersheds. Journal of Soil and Water Conservation, 31(5):217-219, Sept.-Oct. 1976.

(1) SWIRS ACC.NO.: 040131
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Alfredson PG (10) GEO. AREA: 1RA/2NG (10) PUB. YEAR: 1976
(11) ABSTRACT: Present and future methods of managing radioactive wastes in the nuclear industry are reviewed. In the stages from uranium mining to fuel fabrication, the main purpose of waste management is to limit and control dispersal into the environment of uranium and its decay products, particularly radium and radon. Nuclear reactors produce large amounts of radioactivity but release rates from commercial power reactors have been low and well within legal limits. The principal waste from reprocessing is a high activity liquid containing essentially all the fission products along with the transuranium elements. Most high activity wastes are currently stored as liquids in tanks but it is agreed that future wastes must be converted into solids. Processes to solidify wastes have been demonstrated in pilot plant facilities in the United States and Europe. After solidification, wastes may be stored for some time in manmade structures at or near the Earth's surface. The best method for ultimate disposal appears to be placing solid wastes in a suitable geological formation on land. Disposal in salt or hard rock presents no major engineering problem but requires confirmation that wastes will remain permanently out of man's environment.
(12) KEYWORDS: ENGINEERING; ENVIRONMENT; EUROPE; FUEL; LIQUID; MANAGEMENT; MINE; RADIOACTIVE; SAFETY; SALT; SOLID; STORAGE
(14) HIERARCH TERMS: 1MA
(15) STIMS ACC.NO.: 00S39175 (15) SECONDARY AUTHORS: Levins DM
(18) DOC.CIT.: Alfredson, P. G. , and D. M. Levins. Radioactive waste management. Atomic Energy in Australia, 19(3):18-31, July 1976.

(1) SWIRS ACC.NO.: 040064
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Mattsson PE (10) GEO. AREA: 1AE; 1HA (10) PUB. YEAR: 1976
(11) ABSTRACT: Gas chromatographic methods for the determination of polychlorinated biphenyls and DDT (with some of its metabolites) in sewage sludge samples and similar materials are described. The sample is extracted with a mixture of hexane, acetone and water. After separation, the hexane phase is reduced in volume and divided into two aliquots, one of which is first shaken with 7 percent fuming sulphuric acid to remove lipids, and then with potassium cyanide to eliminate interference by elemental sulphur. The other aliquot is evaporated to dryness and heated with ethanolic potassium hydroxide. The two aliquots are injected into a gas chromatograph fitted with a glass capillary column and an electron capture detector. Hexabromobenzene is used as an internal standard. Polychlorinated byphenyls are determined quantitatively by comparing the peaks of the sample with those of Clopen A 50 or A 60. The individual percentage composition of the chlorobiphenyls in the polychlorinated biphenyl oils is used. The capillary column is coated with silicone oil SF 96 according to a described procedure.
(12) KEYWORDS: ANALYSIS; CHEMICAL; CHLORINE; HAZARDOUS; HYDROCARBON; PESTICIDE; POLYCHLORINATED; SEWAGE; SLUDGE; TOXIC
(14) HIERARCH TERMS: 1SI/2SX
(15) STIMS ACC.NO.: 00S39108 (15) SECONDARY AUTHORS: Nygren S
(18) DOC.CIT.: Mattsson, J. E. , and S. Nygren. Gas chromatographic determination of polychlorinated biphenyls and some chlorinated pesticides in sewage sludge using a glass capillary column. Journal of Chromotography, 124(2):265-275, Sept. 15, 1976.

(1) SWIRS ACC.NO.: 039864
(2) DOMESTIC: F (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Thermal transformation of Na (sodium) Cs (cesium) and Sr (strontium) type zeolites were studied by means of differential thermal analysis (DTA), thermogravimetric analysis (TGA) and xray powder diffraction. Synthetic zeolites A, X and Y, synthetic mordenite (Zeolon) and natural mordenite were used in this study. Na type zeolites of A and X recrystallized to nepheline (sodium, aluminum, silicate) above 11,000 C, but the structures of zeolite Y and mordenite collapsed above about 900 C and did not recrystallize until 1,200 C. Cs type of zeolite Y recrystallized to it above 1,100 C, but the structure of mordenite collapsed above 1,100 C and zeolite Y recrystallized to it above 1,200 C, but the structure of mordenite collapsed above 1,000 C. The results described were supported by microscopic observation and the measurement of density. (Text in Japanese)
(12) KEYWORDS: INVESTIGATION; JAPAN; LIQUID; PROCESS; RADIOACTIVE; RESEARCH; SOLID; THERMAL
(15) STIMS ACC.NO.: 00S38908
(18) DOC.CIT.: Kanno, T., E. Mimura, and T. Kitamura. Zeoraito ni yoru hoshasei haieki no shori (1) Na kata,, Cs kata oyobi Sr kata Zeoraito no Kanetsu henka. (Processing of radioactive waste solution with Zeolites, (1) thermal transformation of Na, Cs, and Sr type zeolites.) Journal of the Atomic Energy Society of Japan, 18(8):518-524, 1976.

(1) SWIRS ACC.NO.: 039760
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The basic chemistry of arsenic (As) related to its dissolution and subsequent precipitation in gold mine waste waters is discussed. The lime addition methods provides the most economic treatment of arsenical slurries but requires a careful control of the oxidation of As+3 into As+5, of the pH and the filtration of the precipitate. Arsenic in gold mining waste waters, is almost always in the trivalent state. The artificial oxidation of arsenic must be performed prior to lime addition. Control of the pH consists in providing a sufficient amount of lime to obtain a saturated solution. Finally, the calcium arsenate formed in the reaction must be carefully filtered out. A modification of the method by phosphoric acid addition may be necessary to respect the safety norms. The cost of the method is about one fifth that of its nearest competitor. Brief mention of the problems of disposal of the filtered arseniferous wastes suggest the possibility of underground storage. Further study is suggested.
(12) KEYWORDS: CHEMICAL; INORGANIC; LIME; METAL; MINE; NON-FERROUS; PRECIPITATE; PROCESS; TOXIC; WASTE WATER
(15) STIMS ACC.NO.: 00S38804
(18) DOC.CIT.: Laguitton, D. Arsenic removal from gold mine waste waters: basic chemistry of the lime addition method. CIM Bulletin, 69(773):105-109, Sept. 1976.

(1) SWIRS ACC.NO.: 039489
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: A method for the direct determinatin of concentrations of molecular hydrogen sulfide (H_2S) is presented. The procedure involves bubbling compressed nitrogen through an aqueous sulfide solution to displace H_2S which is collected in a glass bead concentration column and measured colorimetrically. The H_2S concentration is calculated from the determined sulfide displacement rate and by reference to a log linear standard curve relating temperature with the H_2S displacement rate to the H_2S concentration in standard solutions. To permit accurate determination of H_2S from the determined dissolved sulfide concentration and fraction of dissolved sulfide as H_2S for specific conditions of temperature and pH, the apparent linear relationship between ionization constant for H_2S (aq) and temperature was defined. This procedure of calculating H_2S in

various waters and effluents was confirmed by the direct technique. This was used to define the relationship between test pH and sulfide toxicity to the fathead minnow. (Retained in SWIRS library)
(12) KEYWORDS: ANALYSIS; CHEMICAL; FISH; HYDROGEN; MATHEMATICAL MODEL; PH; POLLUTION; SULFUR; TOXIC; WATER
(15) STIMS ACC.NO.: 00S38533
(18) DOC.CIT.: Broderius, S. J. , and L. L. Smith. Effect of hydrogensulfide on fish and invertebrates. part 2. hydrogen sulfide determination and relationship between pH and sulfide toxicity. Environmental Protection Publication EPA-600/3-76-062. St. Paul, MN. , U. S. Environmental Protection Agency, July 1976. 109 p. (Ecological Research Series.)

(1) SWIRS ACC.NO.: 039678
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Information collected during a survey of mercury and pesticide residue content of biota collected from four coastal areas of Hawaii is presented. Two of the areas were affected by waste discharges from sugar plantations; one area was relatively pristine, remote from agricultural or urban developments; and the remainng area represented a domestic urban drainage point off Honolulu. Perodic samples of biota were taken during the period of 1971 through 1974. The 223 biological specimens collected represented 58 different animal species. About one fourth of the samples analyzed showed mercury concentration ranging from less than 0. 01 parts per million to a single sample of 1. 0 ppm. The mean value for all samplS was 0. 08 ppm. Two tables summarize the data.
(12) KEYWORDS: AGRICULTURE; ANALYSIS; ANIMAL; BIOLOGICAL; CHEMICAL; CONTAMINATE; DOMESTIC; HAWAII; HAZARDOUS; MERCURY; OCEAN; TOXIC
(15) STIMS ACC.NO.: 00S38722
(18) DOC.CIT.: Klemmer, H. W. , G. S. Unninayer, and M. I. Okubo. Mercury content of biota in coastal waters in Hawaii. Bulletin of Environmental Contamination and Toxicology, 15(4):454-457, Apr. 1976.

(1) SWIRS ACC.NO.: 039233
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: A method for the determination of mercury in effluent waters based on the electrolytic separation of the mercury, by thermal distillation and by atomic absorption spectrometry of the mercury vapor is described. Tabular results of analyses of standard solutions by several other methods are compared with the new method and the results by using the various methods in the determination of mercury in industrial effluent waters are also presented in tabular form.
(12) KEYWORDS: ABSORPTION; DISTILLATION; EFFLUENT; ELECTROLYSIS; HAZARDOUS; MERCURY; METAL; NON-FERROUS; PLANT-INDUSTRIAL; TOXIC; USSR
(15) STIMS ACC.NO.: 00S38277
(18) DOC.CIT.: Svistov, P. F. , and Y. I. Turkin. Determination of mercury in effluent waters by atomic absorption spectroscopy (exchange of experience). Industrial Laboratory, 42(2):205-206, Feb. 1976.

(1) SWIRS ACC.NO.: 039232
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: A method for the determination of turpentine and terpineol in effluents from flotation processes in the separation of nonferrous metal ores is described. A calibration curve is plotted, using benzene, chloriform, or toluene as solvents, and measuring

optical density by photocolorimetry. A typical result of the analysis of effluent samples is presented in tabular form.
(12) KEYWORDS: ANALYSIS; CHEMICAL; EFFLUENT; HAZARDOUS; HEALTH; MEASUREMENTS; METAL; MINE; NON-FERROUS; PLANT-INDUSTRIAL; SOLVENT; TOXIC; USSR
(15) STIMS ACC.NO.: 00S38276
(18) DOC.CIT.: Parkhomovskii, V. L. , V. P. Il'ina, and D. G. Petrunyak. Determination of terpineol and turpentine in effluent from ore concentration plant works (exchange of experience). Industrial Laboratory, 42(2):204, Feb. 1976.

(1) SWIRS ACC.NO.: 039162
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Analyses of cadmium, zinc, copper, and nickel in the tissues of fish and crustaceans from inshore waters off the northeast coast of Great Britain reveal surprisingly high values. The area is heavily polluted with coal wastes. Heavy industry includes aluminum smelting and pharmaceutical manufacture. Heavy metal input from these sources is slight and the high metal levels reported for some specimens remain unexplained. The high tissue zinc levels are of particular interest. As many of the fish analyzed are bottom dwellers, further research regarding sediment zinc levels is indicated. The physiology of heavy metal accumulation and their general biogeochemical cycling also merit more detailed study. Tables show the concentration of the various metals and the part of the fish anatomy in which they were found.
(12) KEYWORDS: ALUMINUM; CONCENTRATION; DRUGS; FISH; FOSSIL FUEL; GREAT BRITAIN; METAL; NON-FERROUS; POLLUTION; RESEARCH; WATERWAY
(15) STIMS ACC.NO.: 00S38206
(18) DOC.CIT.: Wright, D. A. Heavy metals in animals from the northeast coast. Marine Pollution Bulletin, 7(2):36-38, Feb. 1976.

(1) SWIRS ACC.NO.: 039155
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The Orion model 94-06 cyanide electrode was evaluated to determine its applicability to water and wastewaters. The calibration curve was Nernstian over the concentration range of 0. 26 and 26 ppm, and the slope of the curve was 59 mv per decade change. This work consisted in studying the response of the cyanide selective electrode to cyanide when this ion was present in solution in both free and complex forms. The results show conclusively that the electrode responds only to free cyanide in solution and not at all to that complexed to metals.
(12) KEYWORDS: ANALYSIS; CHEMICAL; ION; MATHEMATICAL MODEL; MEASUREMENTS; MONITOR; TOXIC; WASTE WATER; WATER
(15) STIMS ACC.NO.: 00S38199
(18) DOC.CIT.: Schlueter, A. The applicability of the cyanide electrode for measuring free and total cyanide. Environmental Protection Publication EPA-600/4-76-020. Cincinnati, U. S. Environmental Protection Agency, June 1976. 29 p. (Environmental Monitoring Series.)

(1) SWIRS ACC.NO.: 038705
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: Three solutions of cyanide, KCN in deionized water (simple form), K3Fe(CN)6 in deionized water (complex form) and KCN in natural landfill leachate (mixed form) were each leached through five soils of varying physical and chemical properties to evaluate which soil characteristics govern the movement of the various cyanide forms in soils. The effluent from each column was collected and analyzed for total cyanide each day. In general, KCN and K3Fe(CN)6 in water were

both found to be very mobile in soils, while KCN in landfill leachate was found to be less mobile. Soil properties such as low pH, presence of free iron oxide and kaolin, chlorite and gibbsite type clay (high positive charges) tended to increase attenuation of cyanide in the three forms. High pH, presence of free CaCO3, (calcium carbonate), high negative charges, low clay content and montmorillonite clay tended to increase the mobility of the three cyanide forms.

(12) KEYWORDS: CHEMICAL; CLAY; CONTROL; EARTH; INVESTIGATION; LEACH; TOXIC

(15) STIMS ACC.NO.: 00S37749

(16) DOC.CIT.: Alesii, B. A. , and W. H. Fuller. The mobility of three cyanide forms in soils. In Fuller, W. H. , ed. Proceedings; the Residual Management by Land Disposal Proceedings of the Hazardous Waste Research Symposium, University of Arizona, Tucson, Feb. 2-4, 1976. Environmental Protection Publication EPA-600/9-76-015. Cincinnati, OH, U. S. Environmental Protection Agency, July 1976. p. 213-223. (Distributed by the National Technical Information Service, Springfield, VA, as PB 256 766 AS.)

(1) SWIRS ACC.NO.: 038702

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Vinyl chloride monomer (VCM) is retained in sludge wastes produced during polyvinyl chloride (PVC) processing at production plants. Industry is actively investigating processing improvements that may reduce the amount of VCM in these sludges in the future and is looking at alternate disposal and recycle schemes. However, the PVC sludges currently being disposed of at landfills may still contain sufficient VCM to constitute a potential health hazard when the gaseous VCM escapes. In a preliminary, low level study done to determine whether a potential threat to the health of landfill workers or nearby residents exists, 17 grab air samples were collected for laboratory analysis of VCM content at three landfills where these sludges were disposed. Samples of an PVC sludges which were disposed at the three landfills also were collected. VCM concentrations in the grab air and sludge samples were measured using the gas chromatographic flame ionization detection analytical technique. The release rate of VCM from sludge also was measured under controlled laboratory conditions, using a specially designed apparatus.

(12) KEYWORDS: AIR; GASSES; HEALTH; INDUSTRY; MATHEMATICAL MODEL; POLYVINYL CHLORIDE; REDUCTION; RESEARCH; SAFETY; SAMPLING METHODS; SANITARY LANDFILL; SLUDGE

(15) STIMS ACC.NO.: 00S37746

(16) DOC.CIT.: Markle, R. A. , K. B. Iden, and F. A. Slieners. A preliminary examination of vinyl chloride emissions from polymerization sludges, during handling and land disposal. In Fuller, W. H. , ed. Proceedings; the Residual Management by Land Disposal Proceedings of the Hazardous Waste Research Symposium, University of Arizona, Tucson, Feb. 2-4, 1976. Environmental Protection Publication EPA-600/9-76-015. Cincinnati, OH, U. S. Environmental Protection Agency, July 1976. p. 186-194. (Distributed by the National Technical Information Service, Springfield, VA, as PB 256 766 AS.)

(1) SWIRS ACC.NO.: 038689

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Procedures and equipment for the sampling of liquid and sludge hazardous wastes are discussed. The techniques are primarily applicable to bulk (vacuum trucks) and barreled wastes. Materials of a wide range of viscosity, corrosivity, volitivity, and solids content have been successfully handled, and the techniques are designed to give representative samples of actual complex multiphase wastes. Equipment design is simple and inexpensive and allows for rapid sampling necessary for obtaining total input data on large hazardous waste sites. Sampling handling and preservation are discussed in consideration of the wide variety of wastes handled. Appropriate sampling techniques do not necessarily produce samples statistically

representative of the total waste stream; the presence of sampling personnel significantly perturbs the flow of waste into a disposal site. Approaches to deal with this problem are discussed. Experiences in a large scale sampling program in the Los Angeles area at six hazardous waste sites are related as well as the approaches to classification and analysis of the resultant hazardous waste potpourri.

(12) KEYWORDS: CALIFORNIA; DESIGN; EQUIPMENT; HAZARDOUS; LIQUID; LOS ANGELES; ON SITE; PERSONNEL; PH; PROCESS; SAMPLING METHODS; SLUDGE

(15) STIMS ACC.NO.: 00537733

(18) DOC.CIT.: Stephens, R. D. Hazardous waste sampling. In Fuller, W. H. , ed. Proceedings; the Residual Management by Land Disposal Proceedings of the Hazardous Waste Research Symposium, University of Arizona, Tucson, Feb. 2-4, 1976. Environmental Protection Publication EPA-600/9-76-015. Cincinnati, OH, U. S. Environmental Protection Agency, July 1976. p. 45-50. (Distributed by the National Technical Information Service, Springfield, VA, as PB 256 708 AS.)

(1) SWIRS ACC.NO.: 03d256

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Quantitative measurements of rates and modes of disappearance of pesticides under field conditions are difficult to obtain because environmental parameters cannot be satisfactorily controlled and monitored. A laboratory model agroecosystem was constructed to simulate field conditions which permitted simultaneous measurement of pesticide residues in soil, plants, water and air with the objective of reducing pesticide mobility. The design and construction of five agroecosystems are described in detail. The first phase of research in the agroecosystem was devoted to measuring pesticide residues in air. The aerial residues in the exhaust air are trapped on polyurethane foam plugs, which are sampled periodically. Initial results demonstrated that toxaphene and DDT volatilized off of fiber glass cloths and cotton leaf surfaces, but the rate of volatilization decreased very rapidly with time. Efficiency of trapping by the polyurethane plugs was very high with recoveries greater than 98 percent. Short term objectives were to test the utility of the agroecosystem for comparing the mobility of different classes of pesticides and thereby identifying potential environmental problems. Long term objectives were to explore the possibilities of determining bioaccumulation of pesticides in terrestial organisms and interfacing our system with other model ecosystems, particularly the aquatic ecosystem.

(12) KEYWORDS: AGRICULTURE; CHAMBER; ECONOMICS; ENVIRONMENT; FILTER; LABORATORY; MONITOR; PESTICIDE; RESIDUE; SIMULATION; SOLVENT

(15) STIMS ACC.NO.: 00537300

(18) DOC.CIT.: Beall, M. L. , Jr. , R. G. Nash, and P. C. Kearney. Agroecosystem - a laboratory model ecosystem to simulate agricultural field conditions for monitoring pesticides. In Ott, W. R. , O. Albrecht, and R. Clark, eds. Proceedings; the Conference on Environmental Modeling and Simulation, Cincinnati, OH, Apr. 19-22, 1976. Environmental Protection Publication EPA-600/9-76-016. Washington, U. S. Environmental Protection Agency, July 1976. p. 790-793.

(1) SWIRS ACC.NO.: 03d248

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A simple mathematical model has been developed to aid in the management of hazardous chemical disposal in sanitary landfill sites. The model is based upon chemical mass balance and incorporates the important physical/chemical parameters: (1) hydrodynamic flow velocity based upon the porosity and hydrodynamic gradient of the porous medium (2) variable water table; (3) variable rainfall; (4) reversible adsorption/desorption phenomena; (5) first order irreversible sorption, if any; (6) first order chemical reaction; (7) first order microbial degradation kinetics. The chemical, which is deposited into the landfill in any time pattern desired, is routed vertically by rainfall infiltration to the water table where movement

in the horizontal direction occurs. The simplicity of the model and the resulting computer simulation program permits a ten year run to be computed and plotted automatically for approximately $60. The application of the model for a typical sanitary landfill (Brown's Island Landfill, Salem, Oregon) is demonstrated.

(12) KEYWORDS: CHEMICAL; COMPUTER; DISPOSAL; HAZARDOUS; MANAGEMENT; MATHEMATICAL MODEL; OREGON; SANITARY LANDFILL; TRANSPORT

(15) STIMS ACC.NO.: 00S37292

(18) DOC.CIT.: Ellzy, E. , and F. F. Landstrom. Model of the movement of hazardous waste chemicals for sanitary landfill sites. In Ott, W. R. , O. Albrecht, and R. Clark, eds. Proceedings; The Conference on Environmental Modeling and Simulation, Cincinnati, OH, Apr. 19-22, 1976. Environmental Protection Publication EPA-600/9-76-016. Washington, U. S. Environmental Protection Agency, July 1976. p. 609-613.

(1) SWIRS ACC.NO.: 038078

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: The application of spectrofluorimetry to the measurement and identification of polycyclic aromatic hydrocarbons (PAH) in aqueous solutions was investigated. At naperion absorbances equal to or less than 0. 05, the fluorescence intensities of solutions containing naphthalene, anthracene, pyrene, and fluoranthene in water are a superposition of the component fluorescence spectra. At the higher PAH optical densities of the mg/l level and when viewed perpendicular to the excitation light, the fluorescence spectra vary unpredictably with the concentration. The PAH fluorescence intensity is unaffected by the presence of sodium chloride at sea water concentrations and by the presence of mg/l concentrations of iron, zinc, cobalt, or nickel cations in the water.

(12) KEYWORDS: ANALYSIS; CONCENTRATION; HAZARDOUS; HYDROCARBON; LIGHT; MEASUREMENTS; POLLUTION; SPECTROGRAPHIC; WATER

(15) STIMS ACC.NO.: 00S37122

(18) DOC.CIT.: Schwarz, F. P. , and S. P. Wasik. Fluorescence measurements of carcinogenic and polycyclic aromatic hydrocarbons in water. In: Proceedings; International Conference on Environmental Sensing and Assessment, Las Vegas, NV, Sept. 14-19, 1975. New York, NY, Institute of Electrical and Electronics Engineers, 1976, p. 1-5. (Distributed by the National Technical Information Service, Springfield, VA, as PB252734.)

(1) SWIRS ACC.NO.: 038077

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Results of a high resolution mass spectrometric investigation to determine the major polynuclear aromatic hydrocarbons (PNA) in samples derived from various fuel conversion processes and related plant emissions is given. Studied were particulate materials and extracts of hydrocarbons in the particulate materials collected on filters placed in flue gas streams from coking, smelting, and similar industrial operations. The analysis considered 14 highly carcinogenic PNA, with nine unique formulas. Additional quantitative data were obtained by low ionizing voltage techniques for major aromatic hydrocarbon classes where possible. The gases evolved from the particulate samples were also identified.

(12) KEYWORDS: ANALYSIS; CHIMNEY; CONVERT; DATA; EMISSION; FILTER; FLY ASH; FOSSIL FUEL; FUEL; HAZARDOUS; HYDROCARBON; INVESTIGATION; ION; ORGANIC; PARTICULATE MATTER; SAMPLING METHODS; SPECTROGRAPHIC

(15) STIMS ACC.NO.: 00S37121

(18) DOC.CIT.: Sharkey, A. G. , J. L. Schultz, and C. White. Analysis of polycyclic organic material in coal, coal ash, fly ash, and other fuel and emission samples. Environmental Protection Publication EPA 600/2-76-075. Research Triangle Park, NC, U. S. Environmental Protection Agency, Mar. 1976, 26 p. (Distributed by the National Technical Information Service, Springfield, VA, as PB253453.)

(1) SWIRS ACC.NO.: 038045
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Controls on the use of polychlorinated biphenyls (PCBs) by the electrical industry are discussed. A representative of Westinghouse Electric Corporation points out that there are 209 possible homologs of PCBs. The basic difference in PCBs is the degree of chlorination, or the number of chlorine atoms in the molecule. Aroclor compounds are used as examples and the amount of chlorine contained in them is given. The level of chlorination appears to be the most significant factor in the relative biodegradability of PCBs, the rate of biodegradability decreasing as the number of chlorine atoms per biphenyl molecule increases. Chromatographically derived data on degration, plus the extreme difficulty experienced in developing analytical tools to correctly identify and quantify mixtures of PCBs used within Westinghouse's own plants led the firm to conclude that many agencies supervising PCBs analyses are arriving at erroneous results. It is felt that government standards on PCBs are being imposed on a basis supporting data that are derived from an analytical technique that does not reflect accurate technology. Studies being conducted by the Environmental Protection Agency on PCBs are noted, as well as actions taken by the Food and Drug Administration and the States of Michigan and Indiana. Alternative fluids proposed by various industries are also cited.
(12) KEYWORDS: BIOLOGICAL; CHLORINE; DATA; DECOMPOSE; ELECTRICAL; EPA; FACILITY; HAZARDOUS; INDUSTRY; POLYCHLORINATED; RESEARCH; SAFETY
(15) STIMS ACC.NO.: 00S37089
(18) DOC.CIT.: Electrical industry self-policies PCBs use. Electrical World, 185(12):131, 133-134, June 15, 1976.

(1) SWIRS ACC.NO.: 037567
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The decomposition of chemicals to environmentally innocuous substances is examined. Field and laboratory data are being collected by the Environmental Protection Agency (EPA) to assess and model sources and sinks of synthetic chemicals. EPA has established a 15-member pollutant and transformation advisory committee to investigate a pollutant's entrance and fate in the environment. The committee will evaluate existing data on pollutant translocation, pollutant transmutation after interaction with other systems, and the implications of these alterations on EPA rulemaking. In an effort to develop early warning systems, EPA will monitor the presence and activity of suspected carcinogens in environmental media, under a 5-yr assessment program that has received initial funding of $1.1 million. In addition to activities within EPA, many basic research and modeling efforts are being undertaken at universities and private companies. The fate of synthetic chemicals in aqueous media is discussed, as well as the effect of such chemicals on soils. Emphasis is placed on the effect of pesticides and pathways for chemical decomposition. It is pointed out that ultraviolet radiation from the sun is sufficiently energetic to bring about photochemical transformation of xenobiotics dispersed in natural environments. The use of mathematical models to describe the transport or transformation of pollutants is addressed.
(12) KEYWORDS: CHEMICAL; CONVERT; DECOMPOSE; EFFECT; ENVIRONMENT; EPA; HAZARDOUS; MONITOR; POLLUTION; PROGRAM; TRANSPORT
(15) STIMS ACC.NO.: 00S36611
(18) DOC.CIT.: Anon. Tracking the elusive pollutant. Environmental Science and Technology, 10(7):640-641, July 1976.

(1) SWIRS ACC.NO.: 037236
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975
(11) ABSTRACT: The operational chronology and representative photographic data, including benthic color plates, from an oceanographic investigation near the Farallon Islands are presented. The purpose of this operation performed for EPA Office of Radiation

Programs, was to locate and investigate a site used in the early 1950's for disposal of radioactive waste, and to determine the conditions of the containers, primarily 55-gallon drums. The operation employed the U. S. Navy Cable-Controlled Underwater Recovery Vehicle (CURV III). Waste containers were located at 650-meter and 900-meter depths. Precision navigation methods were used to ensure that the site could be located again for any future studies. Sediment grab samples and cores were taken, along with a sample of marine spore from one of the containers. Extensive benthic photography and video recording were utilized for documentation of the bottom targets that were investigated. Although some containers appeared to be partially crushed and breached, the majority appeared intact. (Author Abstract Modified) (Document retained in SWIRS library)

(12) KEYWORDS: CONTAINER; DATA; DISPOSAL; ILLUSTRATIONS; INVESTIGATION; LITERATURE; MAINTENANCE; OCEAN; RADIOACTIVE; SITES; STORAGE; SURVEY

(15) STIMS ACC.NO.: 00S36281

(18) DOC.CIT.: Interstate Electronics Corporation. Operations report - a survey of the Farallon Islands 500-fathom radioactive waste disposal site. IEC Report 4460C1648. Ananeim, CA, Interstate Electronics Corporation, Dec. 1975, 71 p.

(1) SWIRS ACC.NO.: 037231

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The effect of halogenated carbons on the environment is reviewed, along with maximum permissible concentrations of the compounds in reservoir waters. Early reports on organic contaminants were concerned with DDT and other pesticides, detergents, and hydrocarbons and with the significance of trace organics in surface water. Reports on trace organics in surface water were related to the effect of trace organics on aquatic biota, man, and animals; sources of organics from industry, domestic waste, and natural runoff; concentrations of contaminants in surface water; characteristics, taste, and odor of trace organics; and detection methods and apparatus. Halogenated hydrocarbons are considered to be stable compounds which could cause considerable risk. Data on halogenated hydrocarbons are tabulated in order of increasing carbon atoms and number of hydrogen atoms in molecules. Maximum permissible concentrations are expressed in milligrams per liter. A survey conducted by the Environmental Protection Agency is cited which emphasizes the significance of contaminated water supplies in 79 cities in relation to the presence of halogenated hydrocarbons.

(12) KEYWORDS: CONCENTRATION; CONTAMINATE; DATA; DETERGENT; EFFECT; ENVIRONMENT; EPA; HAZARDOUS; HYDROCARBON; MUNICIPALITY; ORGANIC; PESTICIDE; SURVEY; WATERWAY

(15) STIMS ACC.NO.: 00S36276

(18) DOC.CIT.: Borvath, A. L. Maximum permissible concentrations of halogenated hydrocarbons in reservoir waters - a review. Chemistry and Industry, (2):26-27, Jan. 3, 1976.

(1) SWIRS ACC.NO.: 037219

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975

(11) ABSTRACT: The relationship between emissions from coal-fired steam plants and trace element flows at a watershed is examined. A mass balance study of trace element flows at the Tennessee Valley Authority Allen Steam Plant in Memphis, Tennessee showed that most of the released mercury, some selenium, and probably most chlorine and bromine were discharged to the atmosphere as gases. The elements arsenic, cadmium, copper, gallium, molybdenum, lead, antimony, zinc, and selenium were concentrated in fly ash compared to slag and were more concentrated in ash discharged through the stack than in that collected by the precipitator. Aluminum, barium, calcium, cerium, cobalt, europium, iron, hafnium, potassium, lanthanum, magnesium, manganese, rubidium, scandium, silicon, samarium, tantalum, titanium, and thorium showed little preferential partitioning between slag and collected or

discharged fly ash. The elements chromium, cesium, sodium, nickel, uranium, and vanadium exhibited behavior intermediate between the previous two groups. Information on stack emissions of trace elements from the Allen plant was used to estimate the likely range of air concentrations and input to the Walker Branch Watershed which was within 20 km of three coal-fired steam plants. Estimated input values were compared to measurements of cadmium, chromium, copper, mercury, manganese, nickel, lead, and zinc in wet precipitation falling on the watershed during 1973 and 1974. Dry deposition of these elements could not be measured directly but estimates indicated that deposition could be of the same order of magnitude as rainwater input. A 6-month mass balance study indicated that the watershed efficiently retained lead, cadmium, and copper, while chromium, manganese, zinc, and mercury were less well retained. (Author Abstract Modified)

(12) KEYWORDS: ANALYSIS; CHEMICAL; CONCENTRATION; EMISSION; FACILITY; FLY ASH; FOSSIL FUEL; GASSES; METAL; NON-FERROUS; PLANT-INDUSTRIAL; POWER; SLAG; TOXIC; TVA

(15) STIMS ACC.NO.: 00536264

(18) DOC.CIT.: Lindberg, S. E. , A. W. Andren, and R. J. Raridon. Mass balance of trace elements in Walker Branch Watershed: relation to coal-fired steam plants. Environmental Health Perspectives, 12:9-18, Dec. 1975.

(1) SWIRS ACC.NO.: 037155

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Representatives of the aquatic invertebrate species of water flea (Daphnia magna), midge (Chironomus tentans), and scud (Gammarus fasciatus), and the fish species bluegill (Lepomis macrochirus), fathead minnow (Pimephales promelas), and brook trout (Salvelinus fontinalis) were chronically exposed to various concentrations of atrazine in separate flowing-water systems. Maximum acceptable toxicant concentrations (MATC) of atrazine for the selected species in soft water were estimated using survival growth, and reproduction as indicators of toxic effects. The MATC was estimated to be between 0. 11 and 0. 23 mg/l for midges, between 0. 14 and 0. 25 mg/l for water fleas, and between 0. 06 and 0. 14 for the scud. For fishes the MATC was estimated to be between 0. 09 and 0. 50 mg/l for bluegills, between 0. 21 and 0. 52 mg/l for fathead minnows, and between 0. 06 and 0. 12 mg/l for brook trout. The incipient LC50 for fishes and the 48-hour LC50 for invertebrates was estimated from acute exposures and was used to calculate application factors (MATC/LC50). For aquatic invertebrates and atrazine the estimated application factors were between 0. 15 and 0. 31 for midges, between 0. 02 and 0. 04 for water flea, and between 0. 01 and 0. 02 for scud. Application factors were estimated between 0. 01 and 0. 07 for bluegills, between 0. 01 and 0. 03 for fathead minnows and between 0. 01 and 0. 02 for brook trout. (Document retained in SWIRS library)

(12) KEYWORDS: BIOLOGICAL; CHEMICAL; CONCENTRATION; DATA; EXPOSURE; FISH; INVESTIGATION; MEASUREMENTS; PESTICIDE; TOXIC; WATERWAY

(15) STIMS ACC.NO.: 00536200

(18) DOC.CIT.: Macek, K. J. , K. S. Buxton, and S. Sauter. Chronic toxicity of atrazine to selected aquatic invertebrates and fishes. Environmental Protection Publication 600/3-76-047. Duluth, MN, U. S. Environmental Protection Agency, May 1976, 58 p. (Ecological Research Series) (Distributed by National Technical Information Service, Springfield, VA)

(1) SWIRS ACC.NO.: 037154

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Several authors have reported that the harmful effects of ammonia are primarily related to the pH and temperature of the water because only the un-ionized ammonia is toxic. The un-ionized fraction increases with rising pH and with rising temperature. Other factors such as dissolved oxygen, alkalinity, free carbon dioxide, sodium ions, total dissolved solids, prior exposure to ammonia, physical stress, general physiological status, and the presence of

other additive toxins or other mitigating parameters will have a great affect on the overall toxicity of ammonia to aquatic organism. The actual reported toxic concentrations of ammonia vary from 0. 16 mg/l to 16. 5 mg/l ammonia-nitrogen. This apparent variability often resulted from the investigator's failure to report pH and temperature values as well as other factors which may have biased their results. It appears that the highest concentration of un-ionized ammonia which apparently will not cause any adverse effects is 0. 02 mg/l ammonia-nitrogen. (Document retained in SWIRS library)

(12) KEYWORDS: ALKALINE; AMMONIA; ANALYSIS; CARBON; CHEMICAL; CONCENTRATION; DATA; EXPOSURE; FISH; HAZARDOUS; ION; OXYGEN; PH; TEMPERATURE; TOXIC; WATER

(15) STIMS ACC.NO.: 00536199

(18) DOC.CIT.: Willingham, W. T. Ammonia toxicity. Environmental Protection Publication 908/3-76-001. Denver, CO, U. S. Environmental Protection Agency, Feb. 1976, 103 p. (Distributed by National Technical Information Service, Springfield, VA)

(1) SWIRS ACC.NO.: 037120

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: Air pollution emissions associated with landfill, incineration, and pyrolysis solid waste disposal processes are evaluated. Process descriptions for and environmental impacts of these processes are detailed. The major problems associated with landfill disposal are land space limitations, leachate contamination of ground waste, and the generation of methane gas through anaerobic decomposition of refuse. Incineration is a combustion process in which the weight and volume of charged solid waste are considerably reduced, thus facilitating disposal. Major incinerator waste streams having environmental impact potential are combustion residue and flue gas. Pyrolysis of organic materials to produce gaseous or liquid distillates involves raising the temperature of the refuse charge in a reactor to a value at which volatile components distill off, leaving behind carbon and an inert residue. Major air pollution emissions from the pyrolysis process include molten residue discharged from the furnace base and product gases. Data on atmospheric emissions from landfills, incineration, and pyrolysis are provided.

(14) KEYWORDS: AIR; CARBON; CONFERENCE; CONTAMINATE; DATA; DISTILLATION; EMISSION; ENVIRONMENT; EXPLOSION; INCINERATION; LEACH; POLLUTION; PROBLEMS; PYROLYSIS; RESIDUE; SANITARY LANDFILL

(15) STIMS ACC.NO.: 00536165

(18) DOC.CIT.: Tomanu, J. P. Air pollution considerations of solid waste disposal processes. In: Proceedings; Fifth Annual Symposium of the Los Angeles Regional Forum on Solid Waste Management, University of California, Los Angeles, May 21, 1975. Torrance, CA, Los Angeles Reginal Forum on Solid Waste Management, 1976, 160 p. (p. 96-116).

(1) SWIRS ACC.NO.: 037109

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Various categories of wastes are listed along with their origin according to wastes with components having special harmful effects; and wastes with a lesser harmful effect, which can be evaluated only in connection with their quantity and the varying local conditions relating to the economy of wastes. Included are wastes of vegetable and animal origin, as well as refining products (not including rubber and textile, rest home and hospital wastes). (Original text in German)

(14) KEYWORDS: ANIMAL; CLASSIFICATION; GERMANY; HAZARDOUS; SLUDGE; TOXIC

(15) STIMS ACC.NO.: 00536154

(18) DOC.CIT.: Nordrhein-westphalia. Draft waste catalogue. Evaluation of wastes according to their content in harmful substances. (Abfall-katalog. Bewertung der Abfaelle entsprechendihrer schad stoffinhalte.) Jan. 23, 1976, 20 p.

(1) SWIRS ACC.NO.: 037081
(2) DOMESTIC: D (2) CATEGORY: 04 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Chemical aspects of hazardous waste management are noted. The chemical viewpoint of hazardous waste management is summarized in terms of three major steps: (1) segregate hazardous waste from all other waste; (2) keep various types of hazardous waste separated from each other; and (3) process hazardous materials to produce environmentally acceptable end products when there is no opportunity for recycling. Conventional concepts in solid waste management are considered, including a large and relatively constant volume of waste, constant composition of waste, containment of waste in a specific location, and control of waste to prevent adverse environmental effects. The chemical viewpoint is contrasted with conventional concepts in that it emphasizes a relatively small volume of hazardous waste which must be kept segregated from the bulk of nonhazardous waste and special handling of residues from processed hazardous waste to prevent the regeneration of toxic characteristics. It is concluded that the cost of proper hazardous waste management will be higher than that of nonhazardous waste management. However, the potential cost associated with inadequate disposal of hazardous waste is much higher in terms of economics and environmental damage.
(12) KEYWORDS: CHEMICAL; COMPOSITION; CONFERENCE; CONTROL; DISPOSAL; ECONOMICS; ENVIRONMENT; HAZARDOUS; MANAGEMENT; SEPARATING; TOXIC; VOLUME
(15) STIMS ACC.NO.: 00S36126
(18) DOC.CIT.: Brown, W. F. The chemical viewpoint of hazardous wastes management. In: National Solid Wastes Management Association. Proceedings; Fourth National Congress on Waste Management Technology and Resource and Energy Recovery, Atlanta, November 12-14, 1975. Washington, DC, U. S. Environmental Protection Agency, 1976, 382 p. (p. 37-45).

(1) SWIRS ACC.NO.: 037079
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: An approach to the management of hazardous waste is detailed. Hazardous waste materials generated in Alaska, Idaho, Oregon, and Washington were surveyed to estimate types and quantities of waste, determine waste management and disposal practices, identify existing and potential hazardous waste disposal sites, project future waste generation patterns, and develop cooperative concepts to enhance hazardous waste management within the study region. Four potential sources of hazardous waste were identified: (1) industrial operations which produce a hazardous residual as part of their process or handle hazardous materials; (2) State and Federal activities which handle hazardous materials; (3) agricultural operations which handle large quantities of pesticides; and (4) hazardous waste management industry. Surveys of these sources were conducted to obtain detailed information. The effectiveness of a regional survey approach to the evaluation of hazardous waste management is discussed in relation to the expected benefits of obtaining detailed information and whether such benefits exceed the cost of direct contact with all potential hazardous waste sources.
(12) KEYWORDS: ALASKA; COLLECTION; CONFERENCE; DISPOSAL; ECONOMICS; HAZARDOUS; IDAHO; INFORMATION; MANAGEMENT; OREGON; QUANTITY; REGIONAL; SURVEY; WASHINGTON
(15) STIMS ACC.NO.: 00S36124
(18) DOC.CIT.: Dawson, G. W. , and M. W. Bradley. Regional approach to chemical waste management: how do you derive your data base? In: National Solid Wastes Management Association. Proceedings; Fourth National Congress on Waste Management Technology and Resource and Energy Recovery, Atlanta, November 12-14, 1975. Washington, DC, U. S. Environmental Protection Agency, 1976, 382 p. (p. 10-21).

(1) SWIRS ACC.NO.: 036959
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: A method is disclosed for disposal of water soluble sodium sulfur oxide-containing wastes resulting from industrial processes producing fly and/or bottom ash from fossil fuel utilization and waste or excess sodium sulfur oxide compounds, particularly disposal of sodium sulfite and/or sodium sulfate resulting from wet or dry sodium alkali scrubbing of tail or flue gases to reduce SO emissions as from smelters, power plants, paper plants, glass plants and industrial boiler operations. The process involves mixing sodium sulfur oxide wastes with an alumina and silica-containing fly ash and/or bottom ash, forming an agglomerate, such as a pellet or briquette, and sintering in the range of about 1000 to 2300 degrees F. The resultant sintered particle shows lower solubility than the current standard of calcium sulfate, being . 01 to . 001 as soluble as the starting sodium sulfur oxides, has increased density (as high as 2. 3 g/l), and reduced volume as compared to the dry fly ash or sodium sulfur oxide wastes, and fixes heavy metals. fly ash leaching and dusting problems are substantially overcome. Sodium sulfur oxides include sodium sulfite, sulfate, bisulfite, bisulfate, thiosulfite, persulfite (pyrosulfite), thiosulfate, persulfate (pyrosulfate), and mixtures thereof. Sintered particle may be disposed of by known landfill techniques, or used as an aggregate for mulch, road beds, concrete, asphalt or the like.
(12) KEYWORDS: ALKALINE; DISPOSAL; EMISSION; FLY ASH; FOSSIL FUEL; INDUSTRY; LEACH; OXYGEN; PATENT; REDUCTION; SANITARY LANDFILL; SCRUBBER; SINTER; SOLUBILITY; SULFUR
(15) STIMS ACC.NO.: 00S36004
(18) DOC.CIT.: Dulin, J. M. , E. C. Rosar, and R. B. Bennett. Industrial Resources, Inc. Sodium sulfur oxides wastes disposal process. U. S. Patent No. 3,962,080. Issued June 8, 1976.

(1) SWIRS ACC.NO.: 036883
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: A list of categories is given in which various types of hazardous wastes are specified. Legal definitions are added as guidelines. Hazardous wastes are those that should not be discharged together with household wastes. In many cases the legal definitions are not comprehensible for laymen. Hence the necessity of using catalogues. The Niedersachen catalogue of "Hazardous Industrial Waste" (Industrielle Sonderabfaelle) divides the wastes into four basic categories: solid, palpy, liquid, solvents. It is being debated whether other West German Lands should adopt the Niedersachsen catalogue. (Original text in German)
(12) KEYWORDS: CLASSIFICATION; DEFINITION; GERMANY; HAZARDOUS; LAW; MANUAL
(15) STIMS ACC.NO.: 00S35928
(18) DOC.CIT.: Anon. Catalogue of hazardous wastes (Sondermuell-kataloge.) Chemische Industrie, 1:28-30, Jan. 1975.

(1) SWIRS ACC.NO.: 036547
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The relationship between median lethal concentrations of various chemicals and exposure times was determined for six species of freshwater fish in a flow-through system. Acute toxicity tests were performed with selenium dioxide, sodium arsenite, sodium cyanide, sodium pentachlorophenate, beryllium sulfate, and lead chloride. Test fish species included bluegill, channel catfish, fathead minnow, brook trout, flagfish, and Ozark-strain goldfish. Lowest median lethal concentrations observed in the study were 0. 114 mg per liter for sodium cyanide, 0. 18 mg for sodium pentachlorophenate, 2. 9 mg for selenium dioxide, 18. 0 mg for sodium arsenite, 25. 4 mg for beryllium sulfate, and greater than 100 mg for lead chloride. Toxicity curves relating median lethal concentrations to exposure times were of three

types. One curve, resembling a rectangular hyperbola, characterized the toxicity of sodium cyanide. Another curve, sigmoid in shape, characterized the toxicity of selenium dioxide. Both curves were observed in toxicity tests with sodium pentachlorophenate, sodium arsenite, and beryllium sulfate. Linear toxicity curves were recorded for some fish species exposed to selenium dioxide, sodium arsenite, and beryllium sulfate, but these were usually encountered when exposure times were less than 96 hrs. (Author Abstract Modified)

(12) KEYWORDS: CHEMICAL; CONCENTRATION; DATA; EFFECT; EXPOSURE; FISH; TIME; TOXIC

(15) STIMS ACC.NO.: 00S35591

(18) DOC.CIT.: Cardwell, R. D. , D. G. Foreman, and P. R. Payne. Acute toxicity of selected toxicants to six species of fish. Environmental Protection Agency Publication EPA-600/3-76-008. Duluth, MN, U. S. Environmental Protection Agency, Mar. 1976, 117 p. (Ecological Research Series).

(1) SWIRS ACC.NO.: 036361

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975

(11) ABSTRACT: Cyanide wastes arise in three main forms: spent case hardening salts containing 10 to 15 percent cyanide; spent plating baths, dips, stripping solutions etc, which contains several percent cyanide; and reuse waters which generally contain cyanide at less than 1,000 milligrams per liter. Experiments are described for the electro-chlorination of cyanide reuse waters using planar electrode cells; this method utilizes sodium chloride and though the cyanide is destroyed, metal is precipitated and must be filtered out. A letter alternative electrolytic method uses the Chemelec cell in which metals are recovered as a high purity deposity on the cathode as the cyanide is destroyed. The chemistry and comparative costs of chlorination versus electrolytic treatments are tabulated. Batch and continuous processes are described. The experimental method using a simulated copper cyanide rinse water should be equally applicable to all cyanide plating solution. If the recovered metal has a value of 250 to 350 pounds per ton, the cyanide can be destroyed at zero cost.

(12) KEYWORDS: CHEMICAL; COMPARISON; ECONOMICS; ELECTROLYSIS; ENERGY; FILTER; GREAT BRITAIN; HAZARDOUS; METAL; PRECIPITATE; SALT; SEPARATING; SIMULATION; TOXIC

(15) STIMS ACC.NO.: 00S35406

(18) DOC.CIT.: Hillis, M. R. Treatment of cyanide wastes by electrolysis. Transactions of the Institute of Metal Finishing, 53(2):65-73, 1975.

(1) SWIRS ACC.NO.: 036277

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The methylation chemistry of platinum, palladium, lead, and manganese was compared using methylcobalamin as a biological alkylating agent. Methylation is considered to be an important and well recognized determinant of metal toxicity, a striking example being the health hazard associated with methylated mercury. The possible biological methylation of metals related to emissions arising from the use of automotive fuels, fuel additives, and catalytic control devices is of special concern in the Environmental Protection Agency's Fuel and Fuel Additives Program. Salts of platinum, palladium, and lead and oxides of lead all containing the metal in a 4+ balance were observed to demethylate methylcobalamin, a biologically active form of Vitamin B-12. Inorganic salts and oxides of manganese were unreactive. No evidence was found for a stable monomethyl-metal derivative using palladium and lead compounds as reactants, although salts of platinum 4+ did result in the formation of stable methylation products. It was

concluded that these reaction products could exist in fresh water ecosystems and exhibit toxic effects on mammalian cells.

(12) KEYWORDS: ALKALINE; AUTOMOBILE; BIOLOGICAL; CHEMICAL; COMPARISON; CONTROL; EMISSION; FUEL; METAL; NON-FERROUS; SALT; TOXIC; VITAMIN; WATERWAY

(15) STIMS ACC.NO.: 00S35322

(18) DOC.CIT.: Taylor, R. T. Comparative methylation chemistry of platinum, palladium, lead, and manganese. Environmental Protection Agency Publication EPA-600/1-76-016. Research Triangle Park, NC, U. S. Environmental Protection Agency, Mar. 1976, 26 p. (Environmental Health Effects Research Series.)

(1) SWIRS ACC.NO.: 036084

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Criteria used by 23 hazardous substance classification systems to define a hazardous substance are described. The predominance of Federal classification systems is explained by the number of Federal statutes mandating the regulation of hazardous substances in food, in transport, in the work environment, and in the air and water environment. It is noted that the supply component of military services used hazard ratings to help determine precautions needed for the storage and shipment of materials. Only California's classification system has been developed for the purpose of comprehensively managing hazardous wastes, including their transport and disposal. Criteria used by each of the hazardous substance classification systems are presented in tabular form, with every system utilizing toxicological criteria in determining whether a substance should be classified as hazardous. Many systems utilize the toxicology criterion as the primary screen for identifying hazardous substances, although their focus is on acute rather than chronic toxicity data. The source of criteria for each hazardous substance classification system is noted, if available. A report appendix lists standards recommended by NIOSH (National Institute for Occupational Safety and Health) for various hazardous substances.

(12) KEYWORDS: CLASSIFICATION; DATA; FEDERAL; FOOD; HAZARDOUS; PERSONNEL; REGULATIONS; STORAGE; SYSTEM; TOXIC; TRANSPORT

(15) STIMS ACC.NO.: 00S35129

(18) DOC.CIT.: Kohan, A. A. A summary of hazardous substance classification systems. Cincinnati, HO, U. S. Environmental Protection Agency, Dec. 1975, 55 p.

(1) SWIRS ACC.NO.: 033959

(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975.

(11) ABSTRACT: This paper presents an assessment of the generation of hazardous wastes and of hazardous wastes management practices in the organic chemicals industry. This industry, Standard Industrial Classification Code 281, includes the following industries: alkalies and chlorine; industrial gasses; inorganic pigments; and other industrial inorganic chemicals. Data are provided on the generation of the following hazardous waste constituents by the various segments of this industry: asbestos, arsenic, beryllium, cadimum, chromium, copper, cyanides, lead, mercury, halogenated hydrocarbons, pesticides, selenium, and zinc. About 55 percent of the production in SIC 281 is by plants in the other industrial inorganic chemicals sub-category, but this section produces about 90 percent of the potentially hazardous wastes. Wastes from the inorganic chemicals industry are generally subjected to some combination of the following treatment and disposal processes: chemical detoxification; high temperature processing; open dumping; municipal discharge to municipal sewers; deep well injection; and ocean dumping. Most of the potentially hazardous wastes from this industry are disposed of by ponding, lagooning, landfilling, or dumping, generally in the absence of adequate containment, monitoring, or leachate control programs. It is suggested that appropriate safeguards to upgrade land disposal operations could be implemented in

some cases with only moderate increases in cost. (This document is retained in the SWIRS library.)

(12) KEYWORDS: ANALYSIS; CHEMICAL; DATA; DISPOSAL; ECONOMICS; GENERATION; HAZARDOUS; INDUSTRY; INORGANIC; MANAGEMENT; PROBLEMS; PROJECTION; SURVEY; TREATMENT

(15) STIMS ACC.NO.: 00S33003

(18) DOC.CIT.: Morekas, S. Waste volumes and characteristics from inorganic chemicals industry. In Proceedings; National Conference on Management and Disposal of Residues from the Treatment of Industrial Wastewaters, Washington, D. C. , Feb. 3-5, 1975. Rockville, Maryland, Information Transfer, Inc. p. 41-47.

(1) SWIRS ACC.NO.: 033242

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This conference was cosponsored by the National Solid Wastes Management Association and the U. S. Environmental Protection Agency. This presentation discusses the proper application of chemical and hazardous waste treatment technology to the waste streams involved. Until about 1970, most industrial wastes were simply diluted and discharged to convenient bodies of water. The trend now is toward land disposal of these wastes, but in many cases hazardous and chemical wastes are being deposited in landfills which are not equipped to handle them. Other chemical wastes are being discharged to sewer systems that have only primary treatment. It is suggested that the key to proper implementation of a waste treatment program is control, involving both complete knowledge of the waste stream to be treated and full analysis of the treatment alternatives available. Wastes streams that have potential value should be sent to a company that has resource recovery equipment and facilities. Wastes without value should be destroyed by thermal oxidation, by neutralization combined with chemical stabilization and water treatment, or by disposal landfills having adequate leachate control facilities. SCA/Chem-Trol Pollution Services, Inc. , has developed a closed loop process to determine whether a given waste can be safely and profitably handled at their centralized treatment facilities. This closed loop process presents a flow diagram showing the proper implementation and handling of chemical and hazardous wastes. Proper analysis of the waste material is essential to the provision of proper equipment for waste handling and for transportation arrangements. Lack of proper identification of wastes can result in mixing incompatible wastes or exposing personnel or other people on the highways to unnecessary risks. (This document is retained in the SWIRS library.)

(12) KEYWORDS: ANALYSIS; CENTRALIZED; CHEMICAL; COMPOSITION; CONTROL; DISPOSAL; FACILITY; HAZARDOUS; HEALTH; INDUSTRY; PROBLEMS; RECLAMATION; REGULATIONS; TRANSPORT; TREATMENT

(15) STIMS ACC.NO.: 00S32286

(18) DOC.CIT.: Wagner, L. E. Application of chemical and hazardous wastes management technology. In Compilation of Papers from Third National Congress, Waste Management Technology and Resource Recovery, San Francisco, California, Nov. 14-15, 1974. Washington, D. C. , National Solid Wastes Management Association, 1975. p. 137-143.

Section 8
METALS AND TOXIC SUBSTANCES

(1) SWIRS ACC.NO.: 047959
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Asbestos-type lung damage.
(4) AUTHOR: Richards B
(6) JOURNAL TITLE: Washington Post
(10) LANGUAGE: EN (10) GEO. AREA: 1MI; 1US (10) PUB. YEAR: 1978
(11) ABSTRACT: Researchers have produced evidence that zeolite minerals may belinked to a rare form of lung cancer (mesothelioma) previously believed to be caused only by asbestos exposure. Turkish villagers apparently developed the disease after breathing zeolite containing dust. Since the mineral is found widely in soft rock formations throughout the western U.S., a recommendation is given to carry out a study of its hazardous properties. Forms of zeolite are presently being used in refineries to aid in the distillation of crude oil into gasoline and in municipal sewage waste treatment test facilities.
(12) KEYWORDS: ASBESTOS; DISEASE; ENVIRONMENT; EXPOSURE; HAZARDOUS; MIDDLE EAST; MINERAL; OCCUPATION; PATHOGEN; REFINERY; RESEARCH; US
(14) HIERARCH TERMS: 1HC/2AN; 1IN/2AN; 1MO
(15) STIMS ACC.NO.: 00S47011
(16) CITATION: p. A3, Jun. 27, 1978.

(1) SWIRS ACC.NO.: 046219
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Environmental impact of cadmium.
(4) AUTHOR: Varma MM
(6) JOURNAL TITLE: J Environ Health
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: The environmental impact of cadmium is described in water, air, and food media to assess the probable risk for human exposure and health effects. Such health effects are suggested as renal damage, hypertension, respiratory effects, carcinogenesis, teratogenesis and embryotoxicity, liver dysfunction, anemia, and testicular damage. Animal studies on health effects are reviewed to indicate the range and probability of such effects on humans. Studies on human tissue have shown that currently dietary intake of cadmium is close to the provisional maximum intake established by the World Health Organization, and there is some evidence that cadmium levels in food may be increasing. A significant increase in the amount of cadmium being released to the environment and a forecast for the future were also reported. It was concluded that in order to minimize buildup of cadmium in the world food chain, restrictions should be placed on application of sewage sludge to agricultural land and substitutes should be researched for current cadmium applications. It is proposed that a phased ban on the use of cadmium be introduced to aid control.
(12) KEYWORDS: CONTAMINATE; DISPOSAL; ENVIRONMENT; FOOD; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC
(14) HIERARCH TERMS: 1HC/2AN; 1HE; 1MK/2HV
(15) STIMS ACC.NO.: 00S47272 (15) SECONDARY AUTHORS: Katz HM
(16) CITATION: 40(6):308-314, May-Jun. 1978.

(1) SWIRS ACC.NO.: 047947
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Norrtorp - svenskt behandlingscentrum for miljofarligt avfall. (Norrtorp - A Swedish treatment center for toxic and harmful waste).
(4) AUTHOR: Forsstrom A
(6) JOURNAL TITLE: Kemisk Tidskrift
(10) LANGUAGE: SD (10) GEO. AREA: 1EU/2SR (10) PUB. YEAR: 1978
(11) ABSTRACT: Swedish Waste Converting Ab (SAKAB) have placed an order with Gotaverken Angteknik Ab and the Swiss Von Roll AG to plan a treatment plant for toxic and harmful waste material. The plant is expected to cost over 100 million crowns. Practically all the toxic and harmful waste produced in Sweden would be treated at the plant, and would be brought there from the regional receiving stations. The material would first be analyzed in a laboratory and then incinerated in a rotating furnace at temperatures up to 1200 C. The flue gases from the furnace would be cautiously cleaned in an electro filter system and with water scrubbers. The whole plant would be enclosed, so that contaminated smoke, gases or water could not leave the area, but would be continuously controlled in the laboratory. All the vehicles that have delivered waste would be washed before leaving the treatment area. Solvents would be purified in a distillation system and could then be reused in the paint and pharmaceutical industries. Water contaminated waste oil would be separated for reuse. Besides the recovery of solvents and oil, the plant will be powered by a steam driven generator. If a final order for the construction of the plant is received by April 1978, the plant will be in function by the mid 1980s. (Original text in Swedish).
(12) KEYWORDS: ANALYSIS; HAZARDOUS; INCINERATION; LABORATORY; OIL; PLANT-INDUSTRIAL; RECLAMATION; SOLVENT; SWEDEN; TOXIC; TREATMENT
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2FF; 1NG
(15) STIMS ACC.NO.: 00S46999 (15) SECONDARY AUTHORS: Forsstrom, A.
(16) CITATION: 90(2):13, Feb. 1978.

(1) SWIRS ACC.NO.: 047536
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Control of heavy metals and toxic materials in municipal residues.
(4) AUTHOR: Weddle BR
(6) BOOK TITLE: In Composting of Municipal Residues and Sludges, 1977 National Conference, Aug. 23-25, 1977.
(10) LANGUAGE: EN (10) GEO. AREA: 1CA; 1EU/2SR; 1EU/2UK; 1US (10) PUB. YEAR: 1978
(11) ABSTRACT: Criteria and regulations for solid waste disposal are considered in relation to the control of heavy metals and toxic materials in municipal residues. Both U.S. and foreign environmental controls are examined. Guidelines on the addition of cadmium to agricultural land in Sweden, Canada, England, and the U.S. are discussed. Guidance provided by soil scientists and agronomists and federal agencies concerned with the application of cadmium to agricultural land are reviewed. State guidelines and the Environmental Protection Agency's technical bulletin on municipal sludge management are discussed, as well as provisions of the Resource Conservation and Recovery Act. The latter act defines such important concepts as solid waste, disposal, and hazardous waste and proposes criteria that will affect sludge management practices. (Retained in SWIRS library).
(12) KEYWORDS: CANADA; CONTROL; DISPOSAL; FEDERAL; GREAT BRITAIN; INTERNATIONAL; METAL; MUNICIPALITY; REGULATIONS; RESIDUE; SWEDEN; TOXIC; US
(14) HIERARCH TERMS: 1LF/2FF; 1LF/2IB; 1MK/2HV; 1TM
(15) STIMS ACC.NO.: 00S46589
(16) CITATION: Rockville, MD, Information Transfer, Inc., 1978. p.113-116.

(1) SWIRS ACC.NO.: 047468
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: The potential for rational health and environmental damages from industrial residue disposal.
(4) AUTHOR: Lazar EC
(6) BOOK TITLE: In Disposal of Residues on Land Proceedings: National Conference on Disposal of Residues on Land, St. Louis, MO, Sep. 13-15, 1976.
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The inadequacy of existing methods of hazardous waste management is discussed. Prevailing hazardous waste disposal practices often result in the release of harmful (toxic or carcinogenic) materials to the environment, causing injury to human health and also environmental and economic damage. The area of concern is the impact of these disposal practices on human health. The effects are mostly chronic, following years of exposure to trace amounts of toxicants. Of over 400 hazardous waste disposal related damage incidents documented by the Environmental Protection Agency's Office of Solid Waste Management Programs, the majority relate to groundwater contamination. Most cases of detected groundwater contaminations affect water supply wells. Of approximately 35 million metric tons of potentially hazardous waste generated by major industries, existing methods of management may not be adequate to prevent their escape into the environment. Over 80% of potentially hazardous waste goes to landfills, dumps, and surface impoundments. Most areas of industrial concentration, and consequently disposal sites, are located in wet regions of the country where precipitation exceeds evapotranspiration potential, increasing the likelihood of soil infiltration and runoff. Most areas of industrial concentration are underlain by groundwater aquifers vulnerable to pollutants. (Retained in SWIRS library).
(12) KEYWORDS: DISPOSAL; ENVIRONMENT; GROUND WATER; HAZARDOUS; HEALTH; INDUSTRY; RESIDUE
(14) HIERARCH TERMS: 1GW; 1HC/2DP; 1HE
(15) STIMS ACC.NO.: 00S46522 (15) SECONDARY AUTHORS: Giles AB; Testani R
(16) CITATION: Rockville, MD, Information Transfer Inc., 1977. p.196-202.

(1) SWIRS ACC.NO.: 047344
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Thomann RV
(5) CORPORATE AUTHOR: Manhattan College
(6) BOOK TITLE: Size Dependent Model of Hazardous Substances in Aquatic Food Chain. (8) REPORT NO.: EPA-600/3-78-036
(9) GRANT NO.: R803680030
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2NQ (10) PUB. YEAR: 1978
(11) ABSTRACT: A model of toxic substance accumulation is constructed that introduces organism size as an additional independent variable. The model represents an ecological continuum through size dependency; classical compartment analyses are therefore a special case of the continuous model. Size dependence is viewed as a very approximate ordering of trophic position. The analysis of some PCB data in Lake Ontario is used as an illustration of the theory. A completely mixed water volume is used. Organism size is considered from 100 micrometer to 10(6) micrometer. PCB data were available for 64 um net hauls, alewife, smelt, sculpin and coho salmon. The analysis indicated that about 30% of the observed 0.5 microgram PCB/gm fish at the coho salmon size range is due to transfer from lower levels in the food chain and about 70% from direct water intake. The model shows rapid accumulation of PCB with organism size due principally to decreased excretion rates and decreased biomass at higher trophic levels. The analysis indicates that if a level of 5 microgram PCB/gm at 10(6) micrometer is sought, total (dissolved and particulate) water

concentration would have to be about 36 ng/1 or about 66% of the present 55 ng/1. (Retained in SWIRS library).
(12) KEYWORDS: CONTAMINATE; HAZARDOUS; MATHEMATICAL MODEL; NEW YORK; POLLUTION; TOXIC; WATER; WATERWAY
(14) HIERARCH TERMS: 1HC/2AN; 1TM; 1WE/2AN
(15) STIMS ACC.NO.: 00S46398
(16) CITATION: Duluth, MI, U.S. Environmental Protection Agency, Apr. 1978. 40p.

(1) SWIRS ACC.NO.: 047249
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Zinc.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of zinc are considered. The most common effects of zinc poisoning in humans are nonfatal metal fume fever caused by the inhalation of zinc oxide fumes and illnesses arising from the ingestion of acidic foods prepared in zinc galvanized containers. Data on zinc emissions are tabulated, and methods for the detection of zinc and its compounds are described. Environmental standards for zinc, the removal of zinc from air and water, the disposal of solid zinc waste, and the economic impact of pollution control are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK/2ZI; 1TM
(15) STIMS ACC.NO.: 00S46303
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.339-349.

(1) SWIRS ACC.NO.: 047248
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Vanadium.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of vanadium, a relatively abundant element in the earth's crust, are considered. Vanadium is toxic to humans and animals through the inhalation of relatively low concentrations. It can inhibit the synthesis of cholesterol and other liquids, cysteine, amino acids, and hemoglobin. Low concentrations also act as strong catalysts on serotinin and adrenaline. Chronic exposure to environmental air concentrations of vanadium is statistically associated with the incidence of cardiovascular disease and certain types of cancer. Human exposure to high concentrations of the element result in: irritation of the gastrointestinal and respiratory tracts, anorexia, coughing, hemoptysis, the destruction of epithelium in the lungs and kidneys, pneumonia, bronchitis and bronchopneumonia, tuberculosis, and effects on the nervous system. Major sources of vanadium emissions are metallurgical processes producing vanadium emissions are metallurgical processes producing vanadium metal and concentrates, the alloy industry, the chemical industry, power plants and utilities, and coal and oil refining industries. Data on vanadium emissions are provided, and methods for its detection and analysis are described. Environmental standards for vanadium, the removal of the element from air and water, and the disposal of solid vanadium waste are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00S46302
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.326-338.

(1) SWIRS ACC.NO.: 047246
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Selenium.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of selenium, a byproduct of copper recovery, are considered. Selenium compounds are particularly the water soluble compounds are toxic to humans and animals. In humans, mild inhalation of selenium dust, fumes, or vapors irritates the membranes of the eyes, nose, throat, and respiratory tract and causes lacrimation, sneezing, nasal congestion, and coughing. Prolonged exposure through inhalation can cause marked pallor, a coated tongue, gastrointestinal disorders, nervousness, and a garlic odor of breath and sweat. The selenium content of air averages 0.001 mg per cu m. Methods for the detection and analysis of selenium are described. Environmental standards for selenium, the removal of selenium from air and water, the disposal of solid selenium waste, and the economic impact of pollution control are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00S46300
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.303-318.

(1) SWIRS ACC.NO.: 047245
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Nickel.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of nickel are considered. Nickel is one of the relatively nontoxic metals found in human tissues, ranking in this respect with iron, cobalt, copper, and zinc. Nickel and its compounds are of concern as air pollutants, however, because harmful effects of exposure to them have been observed among industrial workers. Exposure to airborne nickel dust and vapors may produce cancer of the lungs and sinuses, other disorders of the respiratory system, and dermatitis. The chronic and acute toxicity of nickel is examined, as well as allergies and sensitization and the carcinogenicity of nickel. The most likely sources of nickel in the air appear to be emissions from metallurgical plants using nickel, engines burning fuel containing nickel additives, and plating plants. Data on nickel emissions and concentrations are provided, and methods for its detection are described. Environmental standards for nickel, the removal of the compound from air and water, the disposal of solid nickel waste, and the economic impact of pollution control are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK/2NI; 1TM
(15) STIMS ACC.NO.: 00S46299
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.283-302.

(1) SWIRS ACC.NO.: 047244
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Molybdenum.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of molybdenum, a constituent of certain enzymes and minerals, are

considered. Molybdenum has a relatively low order of toxicity. Despite the fact that humans are exposed to rather high amounts of molybdenum primarily via food, there is no substantial age related accumulation of it in the body. Methods for the detection of molybdenum are described, and information on sources and emissions of molybdenum is presented. The tolerance for molybdenum in irrigation water is only 0.005 mg/l for continuous use, with the tolerance on a short term use basis in fine textured soil being 0.05 mg/l. Environmental standards for molybdenum, the removal of the compound from air and water, and the disposal of solid molybdenum waste are discussed. (Retained in SWIRS library).

(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER

(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1HK; 1TM

(15) STIMS ACC.NO.: 00S46298

(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.277-282.

(1) SWIRS ACC.NO.: 047243

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Mercury.

(4) AUTHOR: Sittig M

(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: Pollution control and worker protection aspects of mercury are considered. The toxicity of mercury varies greatly with its chemical form. Monovalent mercury is relatively nontoxic due to the low solubility of its salts. Tissues and erythrocytes, however, can oxidize monovalent mercury to highly toxic divalent mercury. Organic mercury is also highly toxic. Elemental mercury, both in liquid and vapor form, is equally toxic due to its lipid solubility, lack of charge, and membrane permeability. Usually in trace amounts, mercury is found throughout the ecosystem, in soil, water, air, and living species. Hazards of mercury are related to its toxicity and the localized occurrence of high concentrations of mercury in the environment. Data on mercury emissions are tabulated. Flow diagrams of mercury recovery using 1973 and 1983 technology are included. Mercury losses from industrial processes are examined, and analytical methods for the detection of mercury are described. Environmental standards for mercury, the removal of mercury from air and water, the disposal of solid mercury waste, and the economic impact of pollution control are discussed. (Retained in SWIRS library).

(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER

(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1HK; 1TM

(15) STIMS ACC.NO.: 00S46297

(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.204-276.

(1) SWIRS ACC.NO.: 047242

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Manganese.

(4) AUTHOR: Sittig M

(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: Pollution control and worker protection aspects of manganese, an essential micronutrient, are considered. Manganese is a respiratory irritant and a systemic poison when inhaled primarily as oxides in excessive amounts. Studies on the toxicity of manganese are cited. Manganese emissions to the atmosphere result primarily from industrial processes and fuel combustion. Industrial emission sources include the production of manganese metal from: manganese ore, iron and steel industries, blast furnace and electric furnace production of ferromanganese, aluminum production, magnesium production, the manufacture of dry cell batteries, the manufacture and use of welding rods, the manufacture of manganese chemicals, and fertilizer mixing and application. Emission data for manganese are provided, and methods for its detection are described. Environmental standards for manganese, the

removal of the compound from air and water, the disposal of solid manganese waste, and the economic impact of pollution control are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00S46296
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.184-203.

(1) SWIRS ACC.NO.: 047241
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Lead.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of lead are considered. Numerous studies on the health effects of exposure to lead are cited. Major stationary sources of lead are the primary and secondary smelting of lead, the smelting of brass, nonferrous foundries, storage battery manufacturing, paint manufacturing, and glass and insecticide manufacturing. Data on lead emissions and lead levels in industrial wastewater are tabulated. Methods for the detection of lead are described. Occupational exposure to inorganic lead should be controlled so that workers are not exposed to a concentration greater than 0.15 mg per cu m, determined as a time weighted average exposure for an eight hour day. Environmental standards for lead, the removal of lead from air and water, the disposal of solid lead waste, and the economic impact of pollution control are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK/2LB; 1TM
(15) STIMS ACC.NO.: 00S46295
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.155-183.

(1) SWIRS ACC.NO.: 047240
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Indium.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of indium, a compound that improves corrosion resistance and increases hardness and fatigue resistance in electrical components, are considered. Indium and most of its compounds are considered to be moderately toxic irritants. When ingested or inhaled, however, indium is severely toxic. The environmental hazard from indium appears to result from the use and disposal of radioactive isotopes and not from chemical toxicity. Methods for the detection of indium are described. Environmental standards for indium, the removal of the compound from air and water, and the disposal of indium solid waste are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00S46294
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.149-154.

(1) SWIRS ACC.NO.: 047239
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Copper.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of copper, used widely in industry, are considered. The toxicity of copper salts is examined, based on various experimental studies. Primary sources of copper in industrial waste streams are metal process pickling baths and plating baths. Copper bearing acid mine drainage also contributes significant quantities of dissolved copper to waste streams. Soluble copper waste is of particular concern because of its high degree of toxicity to aquatic organisms. Copper can be monitored in the air by emission spectroscopy and atomic absorption. Copper can be monitored in water by atomic fluorescence, electrochemical techniques, spark source mass spectrometry, and xray fluorescence. Environmental standards for copper, the removal of copper from air and water, the disposal of solid copper waste, and the economic impact of pollution control are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1HK/2C4; 1TM
(15) STIMS ACC.NO.: 00S46293
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.132-148.

(1) SWIRS ACC.NO.: 047238
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Chromium.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of chromium, occurring in nature primarily as chromite or as chrome iron ore, are considered. The exposure of industrial workers to airborne chromium compounds and chromic acid mists, particularly hexavalent chromates, can cause irritation of the skin and respiratory tract, dermatitis, perforation of the nasal septum, ulcers, and cancer of the respiratory tract. Chromium metal is thought to be nontoxic. Hexavalent compounds appear to be much more harmful than trivalent compounds, with toxic effects depending on solubility. Data on sources and estimates of chromium containing emissions in 1970 are provided. Methods for the detection of chromium and environmental standards for chromium are described. The removal of chromium from air and water, the disposal of solid chromium waste, and the economic impact of pollution control are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1HK; 1TM
(15) STIMS ACC.NO.: 00S46292
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.97-131.

(1) SWIRS ACC.NO.: 047237
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Cadmium.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of cadmium, often used as an anticorrosion coating agent on outdoor fittings and a byproduct of zinc smelting, are considered. Cadmium has unquestioned chronic toxicity leading to serious pathological consequences when ingested in quantities only three to 13 times greater

than average intake rates. Health effects of cadmium, both proven and probable, include increased blood pressure, increased incidence of arteriosclerotic disease, and reduced life expectancy. Cadmium is ingested from a number of sources, such as air, food, and tobacco. Studies indicate that the average U.S. adult ingests 50 to 60 micrograms of cadmium per day, with most passed through the body. Data on cadmium emission estimates are provided. The metals industry is the major source of cadmium emissions to the atmosphere. Cadmium dusts and fumes are produced in the extraction, refining, and processing of metallic cadmium. Principal sources of aqueous cadmium waste are noted, and various methods for the detection of cadmium are described. Environmental standards for cadmium, the removal of cadmium from air and water, the disposal of solid cadmium waste, and the economic impact of pollution controls are discussed. (Retained in SWIRS library).

(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER

(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM

(15) STIMS ACC.NO.: 00S46291

(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.73-96.

(1) SWIRS ACC.NO.: 047236

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; P

(3) ARTICLE TITLE: Boron.

(4) AUTHOR: Sittig M

(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: Pollution control and worker protection aspects of boron, used primarily in glass making, are considered. In general, boron compounds are toxic to humans and animals when ingested. Data on boron emissions in the U.S. as of 1973 are tabulated. To detect boron in airborne contaminants collected in air filters, a small portion of the filter is rolled up into a cylinder and placed in a hollow graphite electrode. This portion of the filter is directly excited by a condensed spark discharge in an oxygen atmosphere, with sample burns producing spectra. Other devices and techniques for the detection of boron are described. The permissible boron limit in domestic water and in irrigation water is 1.0 ppm. There are no particular handling procedures for boron oxide and salts except to avoid their ingestion. Boron trichloride requires labeling since it is a corrosive liquid. The removal of boron from air and water and the disposal of solid boron waste are discussed. (Retained in SWIRS library).

(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER

(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM

(15) STIMS ACC.NO.: 00S46290

(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.61-72.

(1) SWIRS ACC.NO.: 047235

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; P

(3) ARTICLE TITLE: Beryllium.

(4) AUTHOR: Sittig M

(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.

(10) LANGUAGE: EN (10) PUB. YEAR: 1976

(11) ABSTRACT: Pollution control and worker protection aspects of baryllium, used primarily in beryllium copper alloy and beryllium metal production, are considered. Almost all known beryllium compounds are acknowledged to be toxic in both soluble and insoluble forms, depending on the amount of material inhaled and the length of exposure. Soluble beryllium compounds such as beryllium sulfate and beryllium chloride commonly cause acute pneumonitis. Insoluble compounds such as metallic beryllium and beryllium oxide can produce chronic pulmonary disease (berylliosis). Industries are the major potential sources of beryllium in the atmosphere. The most common method of sampling beryllium

concentrations in air is the use of a high volume sampler which draws air to be analyzed through a filter for the specified sampling period. Other methods for the detection of beryllium are described. Standards proposed for beryllium exposure and handling by the National Institute for Occupational Safety and Health are noted. The removal of beryllium from air and water, the disposal of solid beryllium waste, and the economic impact of pollution control are discussed. (Retained in SWIRS library).

(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00546289
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.43-60.

(1) SWIRS ACC.NO.: 047234
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Barium.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of barium, a suitable weighting agent for oil and gas well drilling muds, are considered. When breathed or swallowed, barium may show minimal toxicity; however, it may accumulate in the lungs and cause mild lung disease. Added to diesel oil to control smoke in exhausts, it appears in high concentrations behind idling buses and trucks. According to the Bureau of Mines, there are no environmental problems associated with the mining and beneficiation of barium other than the normal land disturbance generally resulting from mine operations. Dusts and fumes of barium compounds may be collected by any of the usual methods for particulate matter collection. For concentrations of barium encountered in ambient air, sampling must be done with membrane filters. The permissible concentration of barium in domestic water supplies is 1.0 ppm. The removal of barium from air and water and the disposal of solid barium waste are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00546286
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.35-42.

(1) SWIRS ACC.NO.: 047233
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Arsenic.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of arsenic, a constituent in a number of minerals, are considered. Arsenic is toxic to some degree in most chemical forms. Arsenic compounds may be ingested, inhaled, or absorbed through the skin. It is estimated that 1.5 million workers in the U.S. are potentially exposed to inorganic arsenic, including arsine and lead arsenate. No direct reading instruments are available for determining arsenic in the field. Dusts and fumes of inorganic arsenic compounds can be collected on a cellulose membrane filter. Various other analytical methods for the detection of arsenic are described. The National Institute for Occupational Safety and Health recommends that worker exposure to arsenic and its inorganic compounds be controlled. Inorganic arsenic should be controlled so that no worker is exposed to a concentration in excess of 0.002 mg per cu m of air, as determined by a 15 minute sampling period. The removal of arsenic from air and water and the

disposal of solid arsenic waste are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00S46287
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.19-34.

(1) SWIRS ACC.NO.: 047232
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Antimony.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of antimony, found primarily in mineral ores, are considered. Occupational exposure to antimony ore, pure antimony, and antimony oxides has been implicated in an increased incidence of pneumoconiosis, a disease of the lungs caused by the habitual inhalation of irritant minerals or metallic particles. Potential exposure comes from food and fluids in contact with: ceramic enamels, pewter, and Britannia metal; from clothing impregnated with antimony trioxide for flameproofing; and from air in dust from the wear of rubber and fumes of type metal. Traditional analytical methods are available for determining antimony concentrations in ores, minerals, and even latter dusts, although precision instrumental methods are required in the trace analysis of this material and its compounds in air, water, and biological specimens. The release into the environment of antimony and its compounds is provisionally limited to contamination levels of 0.005 ppm in air and 0.05 ppm in water. Exposure to antimony dust and its salts can cause dermatitis. Antimony vapors, when inhaled, can cause respiratory and gastrointestinal problems. Under certain conditions, antimony dust or vapors can also constitute a fire hazard. The removal of antimony from air and water and the disposal of solid antimony waste are discussed. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00S46286
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.7-18.

(1) SWIRS ACC.NO.: 047231
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Sittig M
(6) BOOK TITLE: Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The prevention of toxic metals poisoning in industries and in the general environment is considered in this 30th volume of the Noyes Data Corporation's Pollution Technology Review Series. Detailed consideration is given to the following metals: antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, indium, lead, manganese, mercury, molybdenum, nickel, selenium, tin, vanadium, and zinc. Each toxic metal is examined in terms of toxicity, extent of exposure, detection, environmental standards, handling procedures, removal from air, removal from water, solid waste disposal, and economic impact of controls. (Retained in SWIRS library).
(12) KEYWORDS: CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; MANAGEMENT; METAL; POLLUTION; TOXIC
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK; 1TM
(15) STIMS ACC.NO.: 00S46285
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. 350 p.

(1) SWIRS ACC.NO.: 047062
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Estimated arsenic waste generation.
(4) AUTHOR: Blumenthal JL
(5) CORPORATE AUTHOR: TRW Systems Group
(6) BOOK TITLE: In Hazardous Waste Disposal Program, Eighth Monthly Report.
(8) NTIS NO.: PB-257 331 (8) REPORT NO.: TRW-21485-6008-TO-00
(9) CONTRACT NO.: EPA-68-03-0089
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Estimates of arsenic compound waste generated by various industrial sources in the U.S. are tabulated. The estimates are in terms of Bureau of Census regions. Two categories of arsenic compound waste are considered: (1) arsenic oxide released to the atmosphere in the burning of coal for power generation; and (2) arsenic oxide recovered as a component of particulate matter from the refining of copper, lead, and zinc ores. Soil contaminated by the continued use of arsenic-containing pesticides is also covered in the estimates. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CHEMICAL; CONTAINER; EARTH; FOSSIL FUEL; GENERATION; HAZARDOUS; METAL; PESTICIDE
(14) HIERARCH TERMS: 1HC; 1MK; 1PJ
(15) STIMS ACC.NO.: 00S46115 (15) SECONDARY AUTHORS: Clausen JF; Dal Porto DF
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sep. 1972. p.319-321.

(1) SWIRS ACC.NO.: 047061
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Estimated mercury waste generation.
(4) AUTHOR: Blumenthal JL
(5) CORPORATE AUTHOR: TRW Systems Group
(6) BOOK TITLE: In Hazardous Waste Disposal Program, Eighth Monthly Report.
(8) NTIS NO.: PB-257 331 (8) REPORT NO.: TRW-21485-6008-TO-00
(9) CONTRACT NO.: EPA-68-03-0089
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The generation of waste containing mercury is summarized in tabular form. Two sources of waste are paint manufacture and use, where organic mercury compounds are the active ingredient in anti-fouling and mildew-resistant paint. Mercury in brine sludge is computed on the basis of 12 lbs of mercury per ton of chlorine. Mercury fungicide waste is calculated on the basis of pesticide distribution throughout the U.S. The electrical apparatus estimate is based on population distributions and the assumption that 50% of the annual production of mercury and mercury compound-containing devices goes into the waste stream annually. Estimates of stored surplus or obsolete materials from the military inventory are also presented. (Retained in SWIRS library).
(12) KEYWORDS: GENERATION; HAZARDOUS; MERCURY; PAINT
(14) HIERARCH TERMS: 1HC; 1MK
(15) STIMS ACC.NO.: 00S46114 (15) SECONDARY AUTHORS: Clausen JF; Dal Porto DF
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sep. 1972. p.315-317.

(1) SWIRS ACC.NO.: 047060
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Estimated lead waste generation.
(4) AUTHOR: Blumenthal JL
(5) CORPORATE AUTHOR: TRW Systems Group
(6) BOOK TITLE: In Hazardous Waste Disposal Program, Eighth Monthly Report.
(8) NTIS NO.: PB-257 331 (8) REPORT NO.: TRW-21485-6008-TO-00
(9) CONTRACT NO.: EPA-68-03-0089
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The generation of waste from two sources of lead compound-contaminated waste is summarized in tabular form. The first

source is paint manufacture where lead compounds, primarily basic lead carbonate, are used for pigments. The paint sludge estimate is 0.5% of paint manufactured in vats and is distributed by Bureau of Census regions for manufacturers withover 20 employees. Old paint estimates assume that 10% of all paint manufactured is discarded in the containers in which it is sold. Lead in brine sludge is the second source of lead compound-contained waste. (Retained in SWIRS library).
(12) KEYWORDS: CONTAMINATE; GENERATION; HAZARDOUS; METAL; PAINT; SLUDGE
(14) HIERARCH TERMS: THC; TMK/2LD
(15) STIMS ACC.NO.: 00S46113 (15) SECONDARY AUTHORS: Clausen JF; Dal Porto DF
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sep. 1972. p.311-313.

(1) SWIRS ACC.NO.: 047059
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Estimated cadmium waste generation.
(4) AUTHOR: Blumenthal JL
(5) CORPORATE AUTHOR: TRW Systems Group
(6) BOOK TITLE: In Hazardous Waste Disposal Program, Eighth Monthly Report.
(8) NTIS NO.: PB-257 331 (8) REPORT NO.: TRW-21485-6008-TO-00
(9) CONTRACT NO.: EPA-68-03-0089
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Estimates of soluble cadmium waste generated by the electroplating industry in the U.S. are presented in tabular form. Data are generally given in terms of Bureau of Census regions. The electroplating industry is the major source of soluble cadmium waste. Other sources of aqueous cadmium waste are cadmium compound manufacturers, the paint industry, and the plastic industry. The total amount of cadmium waste generated in the U.S. was estimated by assuming that 18% of all cadmium used for electroplating is lost as waste. Approximately eight million lbs of cadmium are used annually for electroplating, and 18% of this figure results in 1.44 million lbs of water-soluble cadmium waste. This amount of waste is distributed geographically, based on a waste generation factor applied to each state. Cadmium waste is in the form of a dilute aqueous solution composed of other heavy metals, cyanides, and metal surface cleaning agents. Treatment is generally accomplished by coagulation with commercial grade lime, followed by sedimentation and sand filtration. Activated carbon beds an ion exchange units are also successful treatment methods for aqueous cadmium waste. (Retained in SWIRS library).
(12) KEYWORDS: GENERATION; HAZARDOUS; METAL; TREATMENT
(14) HIERARCH TERMS: THC; TMK; TTV
(15) STIMS ACC.NO.: 00S46112 (15) SECONDARY AUTHORS: Clausen JF; Dal Porto DF
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sep. 1972. p.301-309.

(1) SWIRS ACC.NO.: 047041
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Profile reports: thallium (430) and thallium sulfate (431).
(4) AUTHOR: Blumenthal JL
(5) CORPORATE AUTHOR: TRW Systems Group
(6) BOOK TITLE: In Hazardous Waste Disposal Program, Eighth Monthly Report.
(8) NTIS NO.: PB-257 331 (8) REPORT NO.: TRW-21485-6008-TO-00
(9) CONTRACT NO.: EPA-68-03-0089
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The hazardous properties of thallium and thallium sulfate waste are discussed. Thallium results as a byproduct in the production of cadmium, and thallium and thallium sulfate are used as depilatories and in rodenticides and insecticides. On contact with the skin, thallium and thallium compounds are readily solubilized by the

formation of chloride which then penetrates into the body. The toxicity and epidemiology of the compounds are not influenced by the mode of entry. The most drastic clinical symptom is alopecia (baldness). Thallium and its compounds are diffused readily through the body and may damage the nervous system and gastrointestinal tract. Respiratory failure and cardiac depression have been noted in laboratory animals. The compounds are relatively unreactive. Waste management practices for the handling, storage, transportation, and disposal/reuse of thallium waste are examined. Two disposal options are noted: (1) stockpiling of zinc dross containing trace quantities of thallium; and (2) production of thallium from stockpiled zinc dross. The treatment of thallium and thallium sulfate waste in national disposal sites is evaluated. (Retained in SWIRS library).

(12) KEYWORDS: DISPOSAL; HAZARDOUS; HEALTH; MANAGEMENT; METAL; SITES; TREATMENT

(14) HIERARCH TERMS: 1HC/2DP; 1HC/2PT; 1HE; 1HA/2TQ

(15) STIMS ACC.NO.: 00S46094 (15) SECONDARY AUTHORS: Clausen JP; Dal Porto DP

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sep. 1972. p.125-132.

(1) SWIRS ACC.NO.: 046657

(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Sludge treating process.

(4) AUTHOR: Fukushima F

(7) PATENT DATA: U.S. Patent No. 4,053,401

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A process for treating sludges containing mercury, cadmium, lead or arsenic will coagulate and solidify the sludges. When a sulfur compound or colloidal sulfur is added to sludge in combination with a bituminous emulsion, heavy metals and other poisonous pollutants are converted to water insoluble or hardly soluble sulfur compounds. They are readily removed from the separated water layer. When an inorganic coagulant or organic polymeric coagulant is added in combination, the coagulating and solidifying effects can be further increased. The heavy metals and other pollutants fixed in the solid layer are hardly dissolved out and therefore, the separated solid cakes can be used for reclaiming or as water shielding walls.

(12) KEYWORDS: HAZARDOUS; METAL; PATENT; POLLUTION; SLUDGE; SULFUR; TREATMENT; WATER

(14) HIERARCH TERMS: 1HA/2DP; 1S1/2SL; 1SP/2CI

(15) STIMS ACC.NO.: 00S45709 (15) SECONDARY AUTHORS: Kobayashi K; Sugita T

(16) CITATION: Oojihon, Japan, filed Nov. 25, 1975 issued Oct. 11, 1977.

(1) SWIRS ACC.NO.: 046366

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(5) CORPORATE AUTHOR: U.S. Environmental Protection Agency

(6) BOOK TITLE: Assessment of Industrial Hazardous Waste Practices in the Metal Smelting and Refining Industry. V. III. Ferrous Smelting and Refining. (8) REPORT NO.: SW-145c.3 (9) CONTRACT NO.: 68-01-2604

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Investigations were conducted of on-land disposal of process and pollution control residuals from the U.S. metal smelting and refining industry. Results are given of studies on iron and steel smelting and refining, iron and steel foundries, ferroalloys, and other primary metal products. Characteristics of each industrial sector, including plant locations, production capacities, and smelting and refining processes, were identified and described. Land-disposed or stored residuals, such as slags, dusts, and sludges, were identified and characterized by physical and chemical properties. State, regional, and national estimates were made of the total quantities of land-disposed or stored residuals and potentially hazardous constituents thereof. Current methods employed by the ferrous metals industry for disposal or storage of such residuals on land are described, i.e., lagoon storage of sludges and open dumping of slags, sludges, and dusts. Methods of residual treatment and disposal

considered adequate for health and environmental protection are also described. Finally, the costs incurred by typical plants in each smelting and refining category for current and environmentally sound residual disposal or storage on land were estimated. (Retained in SWIRS library).

(12) KEYWORDS: DISPOSAL; DUMPING; DUST; ECONOMICS; ENVIRONMENT; HAZARDOUS; HEALTH; INDUSTRY; LAGOONS; LAND; METAL; OPEN; REFINERY; RESIDUE; SLAG; SLUDGE; STORAGE

(14) HIERARCH TERMS: 1DP/2IN; 1HC/2DP; 1HC/2PT; 1MI/2IN/3DP; 1MI/2IN/3PT; 1SW; 1SW/2MX

(15) STIMS ACC.NO.: 00S45436

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 149 p.

(1) SWIRS ACC.NO.: 046385

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Secondary non-ferrous smelting and refining of copper, lead, and aluminum.

(5) CORPORATE AUTHOR: U.S. Environmental Protection Agency

(6) BOOK TITLE: In Assessment of Industrial Hazardous Waste Practices in the Metal Smelting and Refining Industry. V. II. Primary and Secondary Nonferrous Smelting and Refining. (8) REPORT NO.: SW-145c.2 (9) CONTRACT NO.: 68-01-2604

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Investigative and analytical results of on-land disposal or storage of process and pollution control residuals from U.S. secondary nonferrous smelting and refining industries are presented. Information is given on the copper, lead, and aluminum industries in terms of plant location, production capacity, residual identification and characterization, quantitative estimates of residuals, current methods used for disposal or storage of such wastes, methods of treatment and disposal considered environmentally sound, and cost estimates for environmentally sound disposal or storage. (Retained in SWIRS library).

(12) KEYWORDS: ALUMINUM; DISPOSAL; HAZARDOUS; INDUSTRY; INVESTIGATION; METAL; NON-FERROUS; RESIDUE; STORAGE

(14) HIERARCH TERMS: 1HC/2DP; 1HC/2PT; 1MK/2AM; 1MK/2C4; 1MK/2LB

(15) STIMS ACC.NO.: 00S45435

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. p.239-307.

(1) SWIRS ACC.NO.: 046303

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(5) CORPORATE AUTHOR: Arthur D. Little, Inc

(6) BOOK TITLE: Physical, Chemical, and Biological Treatment Techniques for Industrial Wastes. V. I.

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: The need for treatment processes which can detoxify, destroy, or apply resource recovery principles to hazardous industrial wastes is stressed. This study examined 47 unit engineering processes for their applicability to the task of treating hazardous industrial wastes. Some of these unit processes are commonly used for industrial waste treatment while others require further R&D efforts before they will become commercially attractive. Four (dialysis, electrophoresis, freeze drying and zone refining) were found not to be applicable to waste treatment. Presented are comprehensive descriptions of each of the unit processes, including information on the basic principles, areas of application, economics, energy and environmental considerations, and an outlook for future use on industrial wastes. The report serves as an up-to-date reference textbook on potential treatment processes. (Retained in SWIRS library).

(12) KEYWORDS: ECONOMICS; ENERGY; ENVIRONMENT; HAZARDOUS; INDUSTRY; PROCESS; REFUSE; RESEARCH; TREATMENT

(14) HIERARCH TERMS: 1HC/2DP; 1HC/2PT; 1RP; 1TV

(15) STIMS ACC.NO.: 00S45353

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. Various pagings.

(1) SWIRS ACC.NO.: 046247
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Tin.
(4) AUTHOR: Sittig M
(6) BOOK TITLE: In Toxic Metals: Pollution Control and Worker Protection.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Pollution control and worker protection aspects of tin are considered. The toxicity of inorganic and organic tin is examined. Exposure to the dust or fumes of inorganic tin causes a benign pneumoconiosis stannosis. Brief contact with organic tin compounds may cause acute skin burns. Epidemiological exposure to inorganic tin and organotin is evaluated. The major source of tin entering the environment is tin plate used to coat steel cans for the containment of food and other materials. Environmental standards for tin, the removal of tin from air and water, and the disposal of solid tin waste are discussed. Data on tin emissions are tabulated. (Retained in SWIRS library).
(12) KEYWORDS: AIR; CONTROL; DISPOSAL; ENVIRONMENT; HAZARDOUS; HEALTH; METAL; POLLUTION; TOXIC; WATER
(14) HIERARCH TERMS: 1HC/2AN; 1HC/2DP; 1HE; 1MK/2TI; 1TM
(15) STIMS ACC.NO.: 00S46301
(16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976. p.319-325.

(1) SWIRS ACC.NO.: 045854
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(6) BOOK TITLE: Disposal of Hazardous Wastes: Chromium Recycling.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The hazardous nature of chromium is considered, and methods for its disposal are discussed. Three chromium applications are of concern: metallurgical, chemical, and refractory. Only the chemical application category presents significant pollution problems. An overall waste disposal plan is advocated in the form of setting up a disposal system at the national level so that small and medium size enterprises can be provided with collective means to eliminate pollution caused by chromium in a technically and economically sound manner. A detailed discussion of the three chromium groups is presented. Consideration is given to the toxicity of chromium, trivalent chromium, hexavalent chromium, and various sources of chromium pollution. Pollution control techniques are described. (Retained in SWIRS library).
(12) KEYWORDS: CHROMIUM; CONTROL; DISPOSAL; HAZARDOUS; METAL; POLLUTION; TOXIC
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1PH; 1TD
(15) STIMS ACC.NO.: 00S44903
(16) CITATION: North Atlantic Treaty Organization, Sep. 1976. 124 p.

(1) SWIRS ACC.NO.: 044816
(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T
(4) AUTHOR: Wilson DA
(6) BOOK TITLE: Recovery of Cadmium and Nickel From Scrap Batteries.
(10) LANGUAGE: EN (10) PUB. YEAR: 1971
(11) ABSTRACT: A cyclic leaching process was developed for selectively leaching and recovering cadmium from nickel cadmium scrap battery waste. The six major steps in the process are the following: (1) washing the plates to remove KOH electrolyte, (2) roasting at 550 to 600 C to oxidize metallic cadmium and decompose cadmium and nickel salts, (3) leaching with an ammonium nitrate solution, (4) precipitation of the leached cadium from solution as cadmium carbonate using CO 2 gas, (5) removal of CO 2 from the lixiviator by adjusting to pH 4.5, heating and evacuating the system, and (6) removal of small amounts of leached nickel from the lixiviator using a solvent extraction technique. The regenerated lixiviator is then recycled to leach additional plates. Cadmium extraction was 94 percent and the

cadmium carbonate product contained 0.14 percent nickel and 0.12 percent cobalt impurity. The leached plates were smelted to a high nickel low iron alloy with no detectable amounts of cadmium. (Retained in SWIRS library).

(12) KEYWORDS: ACID; COMPOSITION; DATA; EQUIPMENT; LEACH; METAL; NON-FERROUS; RECLAMATION; RESIDUE; SCRAP

(14) HIERARCH TERMS: 1ME/2MZ; 1SB

(15) STIMS ACC.NO.: 00S43861 (15) SECONDARY AUTHORS: Wiegard BJ Jr

(16) CITATION: Washington, DC, U.S. Department of the Interior, 1971. 15 p.

(1) SWIRS ACC.NO.: 044779

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Stewart IM

(5) CORPORATE AUTHOR: Walter C. McCrone Associates, Inc

(6) BOOK TITLE: The Impact of Point and Non-Point Sources on Levels of Waterborne Asbestos. Final Report-Part II Non-point Sources and Point Sources Manufacturing Asbestos Products. (8) REPORT NO.: EPA-560/6-76-020 (9) CONTRACT NO.: EPA 68-01-2690

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2DC (10) PUB. YEAR: 1976

(11) ABSTRACT: The Office of Toxic Substances of the Environmental Protection Agency has sponsored a nationwide survey to determine the impact of point and nonpoint sources on levels of waterborne asbestos. Part I of the final report presented the results of analyses of water from the ten Regional cities. Part II of the final report, contained herein, presents the results of the analyses of water from natural sources and from point sources manufacturing asbestos products. Results described indicate that waterborne levels of asbestos originating from natural sources may be as high as 10 to the 8th 8 fibers per liter and is subject to seasonal variation. Where asbestos was found, fibers were usually below 5 micrometers in length. Levels of asbestos originating from asbestos product manufacture may range from below the detection limits of electron microscopy to values in excess of 10 to the 12th fibers per liter. Levels of asbestos fibers above 5 micrometers in length were found in excess of 10 to the 11th fibers per liter. The major impact on the environment due to such sources would be expected from asbestos paper plants which combine a high fiber content with a large effluent flow. (Retained in SWIRS Library).

(12) KEYWORDS: ANALYSIS; ASBESTOS; DATA; EPA; INDUSTRY; SITES; WATER

(14) HIERARCH TERMS: 1HA/2HH

(15) STIMS ACC.NO.: 00S43824 (15) SECONDARY AUTHORS: Rumecki HJ; Putscher RE

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Oct. 1976. 166 p.

(1) SWIRS ACC.NO.: 044637

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Kansas study sees end to export of hazardous liquid, solid wastes.

(6) JOURNAL TITLE: Solid Waste Systems

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2KS (10) PUB. YEAR: 1977

(11) ABSTRACT: The article is a summary of a report from the Kansas Division of Environment, Bureau of Environmental Sanitation. The report discusses the needs for proper disposal of hazardous liquid and solid wastes in Kansas, and recommends the first steps in establishing workable hazardous waste management machinery. The primary current method of disposing of hazardous waste in Kansas is exporting the unwanted material to neighboring states. The state exports 57 percent of all liquid wastes and 21 percent of solid sludge mixtures containing hazardous wastes. The report notes that Kansas cannot expect to continue getting rid of hazardous waste this way for much longer, due to high transportation costs and political and legislative barriers. The report points out that a complete hazardous waste program will

require several revisions of the present Kansas Solid Waste Management Act. Four revisions are recommended.

(12) KEYWORDS: DISPOSAL; HAZARDOUS; KANSAS; LIQUID; REFUSE; SOLID
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 1LB/2LG; 1MA/2MG
(15) STIMS ACC.NO.: 00S43682
(16) CITATION: 6(4):14-15, Aug. 1977.

(1) SWIRS ACC.NO.: 044434
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Fuller WH
(5) CORPORATE AUTHOR: Univ of Arizona
(6) BOOK TITLE: Movement of Selected Metals, Asbestos, and Cyanide in Soil: Applications to Waste Disposal Problems. (8) REPORT NO.: EPA-600/2-77-020 (9) CONTRACT NO.: 68-03-0208
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: This report presents information on movement of selected hazardous substances in soil which can be applied to problems of selecting and operating land disposal sites for wastes containing arsenic, asbestos, beryllium, cadmium, chromium, copper, cyanide, iron, lead, mercury, selenium, and zinc. The information is based on a literature review, laboratory studies of movement of hazardous substances through soil in municipal landfill leachate, and the author's experience in soil science and waste disposal. The report also presents general information on soils and geological materials and specific information on the chemistry of the selected hazardous substances which is relevant to an understanding of their migration in soil. Critical information gaps are identified, particularly as regards the chemistry and soil adsorption behavior of mixtures of several hazardous substances in the presence of high concentrations of other organic and inorganic solutes, a situation commonly encountered in leachates from municipal and hazardous solid wastes. In spite of these information gaps, it is concluded that waste disposal practice can be improved by application of present information. The report contains a bibliography of 81 related citations. (Retained in SWIRS library).
(12) KEYWORDS: ASBESTOS; BIBLIOGRAPHY; CHEMICAL; CONTAMINATE; DATA; DISPOSAL; GEOLOGIC; GROUND WATER; HAZARDOUS; INDUSTRY; LEACH; METAL; MUNICIPALITY; POLLUTION; SOIL; TRANSPORT
(14) HIERARCH TERMS: 1GD; 1HA/2HF; 1LC; 1ME; 1SJ
(15) STIMS ACC.NO.: 00S43478
(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, April 1977. 242 p.

(1) SWIRS ACC.NO.: 043833
(2) DOMESTIC: D (2) CATEGORY: 02 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Testing program.
(6) BOOK TITLE: In Poe and Associates. Smelter Residue Report for North Central Industrial Park, Blackwell, Oklahoma.
(8) NTIS NO.: PB 256 510
(9) GRANT NO.: 08-6-016000
(10) LANGUAGE: EN (10) GEO. AREA: 1US/20K (10) PUB. YEAR: 1976
(11) ABSTRACT: A testing program was initiated to provide a basis for the elimination of residue and pollution from zinc smelting operations at an industrial park in Blackwell, Oklahoma. Agricultural test samples were collected, and standard chemical tests were performed to determine available zinc in soil. The chemical tests were not intended to provide a complete answer to the inability of soil to sustain plant growth. Residue, clay, and pond bottom samples from the industrial site were quantitatively tested for heavy metals to obtain information on their toxicity potential, solubility, and marketability. A water sample from the jig pond was tested to determine the solubility of heavy metals in storm water runoff. Atomic absorption spectrophotometry and colorimetric methods were employed to analyze the sample for arsenic, cadmium, zinc, lead, mercury, copper, selenium, and

silver. The results of the testing program are presented in an appendix to the report.
(12) KEYWORDS: AGRICULTURE; ANALYSIS; CHEMICAL; INDUSTRY; METAL, NON-FERROUS; RESIDUE; SELENIUM; SPECTROGRAPHIC; TOXIC; WATER
(14) HIERARCH TERMS: 1HA/2HF; 11C/21Y
(15) STIMS ACC.NO.: 00S42876
(16) CITATION: Washington, DC, U.S. Department of Commerce, July 1976. p.13-15.

(1) SWIRS ACC.NO.: 043349
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(4) AUTHOR: Moon DK
(6) BOOK TITLE: New England PCB Waste Management Study.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Polychlorinated biphenyl (PCB) waste management practices in the New England area of the United States are examined. The study focused on past and present (1976) PCB waste streams generated directly or indirectly by transformer and capacitor manufacturing plants located in New England. An investigation was made of the potential for PCB contamination of surface and subsurface water caused by drainage from land disposal sites. The types of sites were divided into three categories: (1) disposal sites receiving quantities of PCB liquid and/or solid waste; (2) disposal sites receiving volumes of industrial waste but not specifically PCB waste; and (3) disposal sites receiving residential and commercial waste. Information was obtained on PCB waste generated and PCB waste processing and disposal. A PCB land sampling program was conducted, and PCB emissions from municipal solid waste incineration were studied. The study results demonstrated that concentrations of PCB's entered the environment in surface and subsurface water samples from land disposal sites, sludge from municipal solid waste incinerator. Recommendations are made for the improvement of PCB waste management, and information on PCB treatment and disposal is appended. (Retained in SWIRS library).
(12) KEYWORDS: DISPOSAL; EMISSION; INCINERATOR; INDUSTRY; LAND; MANAGEMENT; MUNICIPALITY; PROCESS; REGIONAL; SITES; SLUDGE; SOLID; TREATMENT; WASTE WATER
(14) HIERARCH TERMS: 1DD/2DL; 1IA/2IM; 1MA/2ME; 1PM
(15) STIMS ACC.NO.: 00S42392 (15) SECONDARY AUTHORS: Huebner DA; Leighton IW
(16) CITATION: Boston, MA, U. S. Environmental Protection Agency, Nov. 1976. 62 p.

(1) SWIRS ACC.NO.: 043188
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Sources of polychlorinated biphenyls in Wisconsin.
(4) AUTHOR: Kleinert SJ
(6) JOURNAL TITLE: Wisconsin Natural Resources Bulletin
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2WI (10) PUB. YEAR: 1976
(11) ABSTRACT: A perspective on the polychlorinated biphenyl (PCB) problem in Wisconsin is presented. Studies have confirmed the presence of PCBs in fish in Lake Michigan and other waters of the state. The Wisconsin Department of Natural Resources has found PCBs in municipal waste water treatment plant effluents and in effluents from iron and steel foundries, aluminum foundries, and paper mills recycling waste paper. Because their solubility in water is low, it is believed that most of the PCBs discharged from paper mills are adsorbed on fibers and particulate matter removed in mill waste water treatment systems. Discharges of PCBs from pulp and paper mills recycling waste paper will diminish as the mills meet discharge permit requirements. The electrical industry also uses PCBs as dielectric fluids in some capacitors and transformers. Proper disposal and handling of these fluids and defective equipment are necessary to prevent their release to the environment. Fallout from the air is another source of PCBs entering the environment.
(12) KEYWORDS: CHLORINE; EFFLUENT; FIBER; PAPER; PLANT-INDUSTRIAL; SOLUBILITY; WASTE WATER; WATERWAY; WISCONSIN
(14) HIERARCH TERMS: 1HA; 11C/21Y; 1WA/2WG
(15) STIMS ACC.NO.: 00S42251
(16) CITATION: 41(1):12-13, Jan.-Feb. 1976.

(1) SWIRS ACC.NO.: 043056
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Removal of lead from aqueous solution using metallic magnesium.
(4) AUTHOR: Broun TT Jr
(5) CORPORATE AUTHOR: PPG Industries, Inc
(7) PATENT DATA: U. S. Patent No. 4,010,186
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A method for removing dissolved organic lead from aqueous streams using metallic magnesium is described. The solution, at a pH of from seven to 11, is contacted with metallic magnesium in the presence of chloride ion provided by hydrochloric acid or sodium chloride. The temperature of the solution should be in the range of 10 degrees to 110 degrees C. The time period for the reaction may range from one to 48 hours. Insoluble lead compounds are formed and may be separated from the aqueous solution to provide a solution containing substantially reduced levels of dissolved organic lead. Generally the water soluble organic lead compounds are found in the various wash waters of a tetraalkyllead plant. Typically, the contaminating soluble organic lead compounds are trialkyllead chlorides, triallkyllead hydroxides, dialkyllead dichlorides and dialkyllead dihydroxides. The removal of lead by the process results in a solution where the dissolved lead remaining in solution is less than 500 ppm. The magnesium employed may take any convenient form.
(12) KEYWORDS: HAZARDOUS; METAL; ORGANIC; PATENT; PRECIPITATE; SOLUTION; WASTE WATER; WATER
(14) HIERARCH TERMS: 1BA/2HG; 1ME/2MY; 1WA/2WP
(15) STIMS ACC.NO.: 00S42099
(16) CITATION: filed Apr. 5, 1971 issued Mar. 1, 1977.

(1) SWIRS ACC.NO.: 043098
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Hot spot in Oregon.
(4) AUTHOR: Shea K
(6) JOURNAL TITLE: Environment
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2OR (10) PUB. YEAR: 1976
(11) ABSTRACT: Oregon's plans to bury some 600,000 gallons of hazardous waste chemicals at a remote desert site where the chemicals are stockpiled are discussed. The series of legal and bureaucratic maneuvers which culminated in the stockpiling is recounted. The suspicion that there might be some 2,4,5T residues included, one of the most poisonous chemicals ever made, is voiced. The State is convinced that on site burial is the only answer to the disposal problem. Accordingly, trenches will be dug 20 feet wide by 3 feet deep between the rows of stockpiled drums which will then be pushed into the trenches, crushed with a bulldozer, and covered with 2 feet of sand topped with 6 inches of gravel. Many Oregonians are concerned that this could result in contamination of fresh water reserves. The corrosive nature of the wastes has already caused much damage to the containers. At least half of the original inventory has either spilled onto the desert or evaporated into the air.
(12) KEYWORDS: BURY; CHEMICAL; CORROSION; DISPOSAL; HAZARDOUS; OREGON; POLLUTION; QUALITY; TOXIC; WATER
(14) HIERARCH TERMS: 1HA/2HF; 1LB/2LG; 1WA/2WG
(15) STIMS ACC.NO.: 00S42141
(16) CITATION: 18(19):6-9, Dec. 1976.

(1) SWIRS ACC.NO.: 043081
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Process for gasifying carbonaceous solids and removing toxic constituents from aqueous effluents.
(4) AUTHOR: Gorbaty ML
(5) CORPORATE AUTHOR: Exxon Research and Engineering Co
(7) PATENT DATA: U.S. Patent No. 3,975,168
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: An improved process for the elimination of potentially toxic inorganic constituents from gaseous and aqueous effluents formed during coal gasification and similar operations is

described. Carbonaceous feed materials are reacted at high temperatures to form a product gas stream containing hydrogen sulfide and coal, coal char or other materials containing trace elements are burned in a combustion zone to generate process heat. Such pollutants can be readily removed by scrubbing the product gas and the flue gas produced in the combustion zone with water to remove water soluble constituents, combining the two aqueous effluent streams, stripping gaseous contaminants from the combined stream and then removing solids from the aqueous stripper effluent. Toxic trace element contaminants are precipitated and recovered as insoluble sulfides which may be disposed of without danger to the environment. The sulfides are removed from solution by filtration, centrifugation or the like and disposed of by landfill or other proceedures.

(12) KEYWORDS: EFFLUENT; FOSSIL FUEL; GASIFICATION; GASSES; HYDROGEN; PATENT; PROCESS; SULFUR; TOXIC; WATER

(14) HIERARCH TERMS: 1HA/2HG; 1SE/2SP

(15) STIMS ACC.NO.: 00S42124

(16) CITATION: filed Apr. 2, 1975 issued Aug. 17, 1976.

(1) SWIRS ACC.NO.: 042810

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Polybrominated biphenyls (PBB) environmental contamination in Michigan, 1973-1976.

(4) AUTHOR: Kay K

(6) JOURNAL TITLE: Environmental Research

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: Polybrominated biphenyls (PBB) environmental contamination in Michigan from 1973 to 1976 is discussed. Contamination occurred when the PBB manufacture accidentally substituted toxic PBB for nontoxic magnesium oxide in the formulation of animal feed. Claims of continuing ill effects to animals and man from PBB contamination have engendered intense activity at government level to establish the role of PBB and to bring the problem to an effective solution. It is not possible to identify the toxic substituents of the PBB that may have been responsible for the ill effects. Some ill effects have been reproduced by treating laboratory models with PBB. Liver changes, fetal resorption, and decreased weight of offspring have been observed. Hyperkeratosis has not been produced in species other than cattle. The occurrence of PBB in human blood, depot fat, and breast milk has been well established, but ill effects to human health have not been confirmed to date. Notwithstanding, many claims continue to be advanced in this regard. A summary of experimental evidence on the toxicity of PBB is given. State regulatory and administrative policies are noted.

(12) KEYWORDS: ACCIDENT; CATTLE; ENVIRONMENT; GOVERNMENT; HAZARDOUS; HUMAN; INVESTIGATION; LABORATORY; MICHIGAN; REGULATIONS; RESEARCH; STATE; TOXIC

(14) HIERARCH TERMS: 1AA; 1AG; 1HA

(15) STIMS ACC.NO.: 00S41853

(16) CITATION: 13(1):74-93, Feb. 1977.

(1) SWIRS ACC.NO.: 042738

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: The uptake of lead, zinc, cadmium, and copper by the pulmonate mollusc, Helix aspersa Muller, and its relevance to the monitoring of heavy metals contamination of the environment.

(4) AUTHOR: Coughtrey PJ

(6) JOURNAL TITLE: Oecologia

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: The occurrence of lead, zinc, cadmium, and copper in individuals of Helix aspersa from two sites of varying degrees of contamination was studied. The Helix aspersa were collected from the two sites at different distances from a smelting complex at Avonmouth, UK. Shells were retained for further study while the soft parts were analysed by atomic absorption spectroscopy. Zinc, cadmium, and copper increased in a linear fashion with animal weight. Statistical analysis of the data, using correlation and regression techniques, yielded information on apparent intermetallic effects. Because metal uptake and

body weight show a positive linear relationship only the use of animals of similar weight and/or size can be used for monitoring purposes.
(12) KEYWORDS: ABSORPTION; ANALYSIS; CONTAMINATE; ENVIRONMENT; FISH; METAL; MONITOR; NON-FERROUS; SHELL; SPECTROGRAPHIC
(14) HIERARCH TERMS: 1AE; 1HA; 1WA/2WB
(15) STIMS ACC.NO.: 00S41781 (15) SECONDARY AUTHORS: Martin MH
(16) CITATION: 27(1):65-74, 1977.

(1) SWIRS ACC.NO.: 042728
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Disposal of toxic wastes--1. Electroplating and electrochemical machining wastes.
(4) AUTHOR: Boden PJ
(6) JOURNAL TITLE: Conservation and recycling
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The disposal of electroplating and electrochemical machining wastes is discussed. Simple dilution of plating effluents has, until recently, been considered an adequate safety measure. Worldwide experience shows that even diluted effluents can cause serious pollution and contamination. The reclamation of wastes from these industries is not well developed. Fortunately, external factors, such as water shortages and material price rises are encouraging plant operators to take measures towards recovery, among them ion exchange, evaporation, and reclaiming. The treatment applied in any given case depends on the policy of local authorities and on the potential savings accruing from extraction processes. Certain poisonous and radioactive wastes arise as a result of industrial processes and many cannot economically be used again or easily rendered harmless. Some suitable storage and disposal methods are described and possible future developments discussed.
(12) KEYWORDS: CHEMICAL; DISPOSAL; ECONOMICS; EFFLUENT; ELECTRICAL; EVAPORATION; HAZARDOUS; ION EXCHANGE; PLATING; POLLUTION; RADIOACTIVE; RECLAMATION; STORAGE; WATER
(14) HIERARCH TERMS: 1HA; 1HA; 1WA/2WG
(15) STIMS ACC.NO.: 00S41771
(16) CITATION: 1(1):111-118, 1976.

(1) SWIRS ACC.NO.: 042656
(2) DOMESTIC: D (2) CATEGORY: 11 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: A study of heavy metal emissions from fluidized bed incinerators.
(4) AUTHOR: Copeland BJ
(6) BOOK TITLE: In Purdue Research Foundation. Proceedings: the 30th Industrial Waste Conference, Purdue University, Lafayette, IN, May 6-8, 1975.
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2MD (10) PUB. YEAR: 1977
(11) ABSTRACT: Analyses were performed to evaluate the emission of lead chromium, arsenic, mercury, cadmium, copper, silver, and zinc from the processing of sludge in fluidized bed incinerators. The fludized bed incineration technique, with its extended heat transfer service, heat reservoir, high residence time, isothermal operation at temperatures above the ignition point of the particular waste material, and any subsequent noxious gases, is feasible for waste incineration. With the increasing emphasas on energy recovery, fluidized bed systems are being designed and constructed to oxidize combinations of sewage sludge, grease, skimmings, and solid waste with no requirement for auxiliary fuel. Tests with two fludized bed incinerators in Laurel, Maryland showed that less than 2 percent of all heavy metal input, except mercury, involved mass emissions. Mercury stack emissions varied from 20 to 100 percent, but were still 10 to 30 percent of the Federal regulation for mass mercury emissions. Further reduction in stack mercury emissions would have to be accomplished using chemical precipitation or mechanical condensation techniques. The water solubility of each metal was low, and this was reflected in the low concentrations of heavy metals in classified liquid effluent. It was determined that total reduction of recirculated heavy metal loadings in

waste treatment could be accomplished by recirculating classifier effluent to a scrubbing system.
(12) KEYWORDS: ANALYSIS; CADMIUM; EMISSION; FACILITY; FLUIDIZED BED; INCINERATION; INCINERATOR; MANAGEMENT; MARYLAND; MERCURY; METAL; NON-FERROUS; SCRUBBER; SLUDGE; TOXIC
(14) HIERARCH TERMS: 1IB/2IF; 1IB/2IW; 1MD
(15) STIMS ACC.NO.: 00S41699
(16) CITATION: Ann Arbor, MI, Ann Arbor Science Publishers, Inc., 1977. p.78-89.

(1) SWIRS ACC.NO.: 042486
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(5) CORPORATE AUTHOR: United States Testing Company, Inc
(6) BOOK TITLE: Toxicological and skin corrosion testing of selected hazardous materials.
(8) NTIS NO.: PB 264 975 (8) REPORT NO.: DOT/MTB/OHMO-76/2 (9) CONTRACT NO.: DOT-OS-30077
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Selected toxicological tests were undertaken on twelve organic chemicals in animals to determine if these qualified as hazardous materials according to the Department of Transportation Hazardous Materials Regulations. Overall toxicological and skin corrosion tests results are summarized. The twelve materials studied were benzene, benzene sulfonic acid, 1-chloro-nitrobenzene, chloropicrin, ethyl benzene, monochloroacetic acid, nitrobenzene, phenol, styrene, toluene-2, 4-diisocynate (TDI), trichloroacetic acid, and ortho-xylene. Parameters utilized in the tests were (1) toxicity by inhalation, (2) toxicity by oral ingestion, (3) toxicity by skin absorption, and (4) skin corrosion. Procedures, descriptions and detailed results are given. (Retained in SWIRS library)
(12) KEYWORDS: ADMINISTRATION; ANIMAL; CHEMICAL; CHLORINE; DATA; EFFECT; FEDERAL; HAZARDOUS; INVESTIGATION; KERATIN; NITROGEN; ORGANIC; PHENOL; SULFUR; TOXIC; TRANSPORT
(14) HIERARCH TERMS: 1HA/2HH
(15) STIMS ACC.NO.: 00S41529
(16) CITATION: Washington, U.S. Department of Transportation, Apr. 1976. 28 p.

(1) SWIRS ACC.NO.: 041938
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Studies on the survival and fate of enteroviruses in an experimental model of a municipal solid waste landfill and leachate.
(4) AUTHOR: Sobsey MD
(6) JOURNAL TITLE: Applied Microbiology
(10) LANGUAGE: EN (10) PUB. YEAR: 1975
(11) ABSTRACT: In laboratory scale municipal solid waste lysimeters containing simulated refuse, and seeded with either laboratory or field strains of poliovirus type 1 and echovirus type 7, viruses were not detected in the lysimeter leachate produced over a 4 month period. In addition, viruses were not detected in the lysimeter refuse contents after termination of lysimeter operation. These results appeared to be due to virus retention in the lysimeter caused by virus adsorption and virus inactivation. Evidence for virus inactivation was provided by the results of experiments on virus inactivation in composite leachate samples. Evidence for virus adsorption was supported by the rapid adsorption of viruses to various municipal solid waste components in the presence of a salt solution similar in composition to the major inorganic salts of leachates.
(12) KEYWORDS: ADSORPTION; ANALYSIS; INVESTIGATION; LEACH; LYSIMETER; MUNICIPALITY; SALT; SANITARY LANDFILL; VIRUS
(14) HIERARCH TERMS: 1AE; 1HA; 1LC; 1MP
(15) STIMS ACC.NO.: 00S40992 (15) SECONDARY AUTHORS: Melnick JL; Wallis C
(16) CITATION: 30(4):565-574, Oct. 1975.

(1) SWIRS ACC.NO.: 041935
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Treatment of harmful substances. part 4.
(4) AUTHOR: Kawahara H
(6) JOURNAL TITLE: Yosui to Haisui
(10) LANGUAGE: JA (10) PUB. YEAR: 1976
(11) ABSTRACT: A review is presented of the possible treatments available in dealing with harmful substances. Chromium (Cr) and cadmium (Cd) removal are specifically discussed. Cr removal treatment by ion exchange resins, and Cd removal by ion flotation, and activated carbon sorption are discussed in detail. (Text in Japanese)
(12) KEYWORDS: ACTIVATED CARBON; CHROMIUM; CONTROL; HAZARDOUS; ION EXCHANGE; JAPAN; METAL; REDUCTION; TREATMENT
(14) HIERARCH TERMS: 1HA/2HG; 1SE/2SO; 1SE/2SP
(15) STIMS ACC.NO.: 00S40979
(16) CITATION: 18(1):77-83, 1976.

(1) SWIRS ACC.NO.: 041646
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Baker DE (10) GEO. AREA: 1ME; 1SF/2SU (10) PUB. YEAR: 1977
(11) ABSTRACT: The problems involved in the monitoring of sewage sludges, soils, and crops for zinc (Zn) and cadmium (Cd) are discussed, and research results that aid in establishing approaches and standards for protecting the food chain from unsafe accumulations of Cd are presented. A review of literature pertinent to Zn and Cd uptake from sludge amended soils and/or human food chain contamination by these is also included. Experiment procedures and conclusions are detailed.
(12) KEYWORDS: ANALYSIS; CRITERIA; CROP; DATA; EARTH; INVESTIGATION; METAL; MONITOR; NON-FERROUS; PROBLEMS; RESEARCH; SLUDGE
(14) HIERARCH TERMS: 1MA
(15) STIMS ACC.NO.: 00S40690 (15) SECONDARY AUTHORS: Amacher MC; Doty WT
(18) DOC.CIT.: Baker, D. E. , M. C. Amacher, and W. T. Doty. Monitoring sewage sludges, soils and crops for zinc and cadmium. In Loehr, R. C. Land as a Waste Management Alternative: Proceedings of the 1976 Cornell Agricultural Waste Management Conference. Ann Arbor, MI, Ann Arbor Science Publishers Inc. , 1977. p. 261-281.

(1) SWIRS ACC.NO.: 041645
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Sidle RC (10) GEO. AREA: 1US/2PA (10) PUB. YEAR: 1977
(11) ABSTRACT: An evaluation is presented on the longterm effects of wastewater disposal with regard to heavy metals in selected areas of the Penn State "living filter" project. Areas considered included a reed canarygrass area, a corn area, and an abandoned agricultural field which had been planted with white spruce. Plant uptake over time and soil accumulation of metals were examined. Copper (Cu), zinc (Zn), and cadmium (Cd) were the heavy metals of primary concern. The major areas of interest were plant toxicities caused by excessive metal loadings, ultimate food chain toxicities resulting from crop uptake, and subsequent transfer of these metals through foods to animals and humans. Cu and Zn did not usually approach toxic levels in the ultimate food chain as a result of wastewater land disposal since plant toxicities occur before these metals reach levels that would be harmful to animals and humans; Cd posed the greatest concern since it is readily taken up by plants and accumulates in the vital organs of animals and humans eating these plants.
(12) KEYWORDS: CROP; DISPOSAL; EARTH; EFFECT; FILTER; FOOD; FORESTRY; HUMAN; INVESTIGATION; LAND; METAL; NON-FERROUS; TOXIC; UTILIZE; VEGETATION; WASTE WATER
(14) HIERARCH TERMS: 1ME/2NB; 1SF/2SU; 1SJ; 1VC
(15) STIMS ACC.NO.: 00S40689 (15) SECONDARY AUTHORS: Kardos LT
(18) DOC.CIT.: Sidle, R. C. , and L. T. Kardos. Heavy metal relationships in the Penn State "living filter" system. In Loehr, R. C. Land as a Waste Management Alternative: Proceedings of the 1976 Cornell Agricultural Waste Management Conference. Ann Arbor, MI, Ann Arbor Science Publishers Inc. , 1977. p. 249-260.

(1) SWIRS ACC.NO.: 041643
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(4) AUTHOR: Melsted SW (10) GEO. AREA: 1SJ (10) PUB. YEAR: 1977
(11) ABSTRACT: An analysis of previously published data is presented as is an attempt to show that the transfer of cadmium from the soil to corn grain and from corn grain to pheasant tissue may be expressed, and predicted, through logarithmic relationships. Maximum loading rates for sewage sludges on land will be influenced by the degree to which crops will absorb hazardous elements from sludge amended soils and the degree to which animals will absorb these same elements from grain and forage; monitoring disposal sites similarly assumes the ability to predict metal movement through the food chain.
(12) KEYWORDS: ANALYSIS; ANIMAL; CROP; DISPOSAL; EARTH; EFFECT; FOOD; HAZARDOUS; LAND; MATHEMATICAL MODEL; METAL; MONITOR; PROJECTION; SLUDGE; SOIL CONDITIONER; TRANSPORT; UTILIZE
(14) HIERARCH TERMS: 1S1/2S9
(15) STIMS ACC.NO.: 00S40687 (15) SECONDARY AUTHORS: Hinesly TD; Tyler JJ
(18) DOC.CIT.: Melsted, S. W. , T. D. Hinesly, and J. J. Tyler. Cadmium transfer from sewage sludge-amended soil to corn grain to pheasant tissue. In Loehr, R. C. Land as a Waste Management Alternative: Proceedings of the 1976 Cornell Agricultural Waste Management Conference. Ann Arbor, MI, Ann Arbor Science Publishers Inc. , 1977. p. 199-208.

(1) SWIRS ACC.NO.: 041556
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Koppenaal DW (10) GEO. AREA: 1HA (10) PUB. YEAR: 1976
(11) ABSTRACT: The possible hazards resulting from coal conversion processes are discussed. These processes are likely to increase in the United States and there is already a large synthetic fuel consumption. Plants requiring 15,000 tons per day of coal and producing 250 cu ft of synthetic natural gas per day are the most efficient size, and 176 suitable U. S. sites have been identified. Estimates are made of sulfur quantities released and of other pollutants that would be found in the wastewater. Eleven pilot plants are operating, but little has been done to study chemical byproducts. The chemical nature of coal is described with some of its physical characteristics and the sulfur content that present several technological and environmental problems. There are three primary coal conversion processes planned for the United States; coal gasification, coal liquefaction, and solvent refined coal. Each process is outlined and presented diagramatically. The processes are conducive to the formation of organometallics, particularly coal liquefaction. Some of the major organometallic compounds that may be formed are metal porphyrin compounds, metal carbonyls, metallocenes, arene carbonyls, metal alkyls, organo hydrides, and metal chelates, and other unpredictable compounds that maybe toxic, carcinogenic, and detrimental in use as fuel or feedstock in further refining processes.
(12) KEYWORDS: AIR; BY-PRODUCT; CHEMICAL; ENVIRONMENT; FOSSIL FUEL; FUEL; GASIFICATION; GASSES; HAZARDOUS; HEALTH; POLLUTION; SOLVENT; SULFUR; WASTE WATER
(14) HIERARCH TERMS: 1M1/2M5
(15) STIMS ACC.NO.: 00S40600 (15) SECONDARY AUTHORS: Mananan SE
(18) DOC.CIT.: Koppenaal, D. W. , and S. E. Manahan. Hazardous chemicals from coal conversion processes. Environmental Science and Technology, 10(12):1104-1107, Nov. 1976.

(1) SWIRS ACC.NO.: 041339
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) GEO. AREA: 1AC/2AE; 1TD (10) PUB. YEAR: 1976
(11) ABSTRACT: An in depth study that attempts to assemble, organize, and interpret present day information on arsenic and its compounds, and the effects of these substances on man, animals, and plants is presented. Emphasis is given to the effects of arsenic on man, conclusions are drawn from the evaluation of current knowledge on the subject, and recommendations are made for further research. Although arsenic is highly toxic in many of its forms, a number of

factors suggest that it probably is not a general pollution problem. In fact, there are indications that it may be an essential trace element. While much arsenic enters the atmosphere from the burning of coal, the concentrations are too low to be a matter of concern. (Retained in SWIRS library)

(12) KEYWORDS: BURNING; CHEMICAL; CONCENTRATION; EFFECT; EPIDEMIOLOGY; FOSSIL FUEL; HUMAN; TOXIC; VEGETATION

(14) HIERARCH TERMS: 1CB

(15) STIMS ACC.NO.: 00S40383

(18) DOC.CIT.: Subcommittee on Arsenic. Arsenic. Environmental Protection Publication EPA-600/1-76-036. Research Triangle Park, NC, U. S. Environmental Protection Agency, Nov. 1976. 488 p. (Environmental Health Effects Research Series.)

(1) SWIRS ACC.NO.: 040963

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Boden PJ (10) GEO. AREA: 1DD/2DL (10) PUB. YEAR: 1976

(11) ABSTRACT: Disposal/storage of toxic electroplating and electrochemical machining effluents are dealt with. Simple dilution of plating effluents has, until recently, been considered an adequate safety measure, but worldwide experience shows that even diluted effluents can cause serious pollution and contamination. Several methods of control are described. The treatment applied in any given case depends on the policy of local authorities and on the potential savings accruing from extraction processes. Certain poisonous and radioactive wastes arise as a result of industrial processes and many cannot economically be used again or easily rendered harmless. Their disposal must therefore be permanent and under adequate control. Some suitable storage and disposal methods are described and possible future developments discussed.

(12) KEYWORDS: CHEMICAL; CONTROL; DILUTION; DISPOSAL; EFFLUENT; ELECTRICAL; INDUSTRY; METAL; PLATING; POLLUTION; STORAGE; TOXIC; TREATMENT

(14) HIERARCH TERMS: 1HA/2HG

(15) STIMS ACC.NO.: 00S40007

(18) DOC.CIT.: Boden, P. J. Disposal of toxic wastes - 1. electroplating and electrochemical machining wastes. Conservation and Recycling, 1(1):111-118, 1976.

(1) SWIRS ACC.NO.: 040765

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Leland HV (10) GEO. AREA: 1ME/2NB (10) PUB. YEAR: 1976

(11) ABSTRACT: Literature on the effects of industrial wastes from heavy metals and related trace elements on aquatic life is reviewed. Several general reviews and symposia on environmental contamination are noted. Transport processes, environmental distributions, and biological effects of heavy metals were focal points of several conferences and resulting publications. Sixty articles concern trace elements in natural waters (freshwaters and marine and brackish waters) while 113 reviews concern literature relating to trace elements in freshwater, marine, and brackish water sediments. The physical/chemical forms of trace elements are noted in several articles. Bioaccumulation and toxicity of trace elements, specifically relating to aquatic flora and aquatic fauna (invertebrates and fishes) account for the majority of articles reviewed. Several investigators proposed the use of aquatic macrophytes to monitor heavy metal pollution in freshwaters and to concentrate metals from solution. Studies concerning mercury concentrations are particularly evident, and laboratory microcosm and field studies have provided information on bioaccumulation of several

trace elements in aquatic ecosystems. Two hundred and seventy one references are cited.
(12) KEYWORDS: EFFECT; ENVIRONMENT; FISH; LABORATORY; LITERATURE; MEASUREMENTS; MERCURY; METAL; MONITOR; QUALITY; RESEARCH; SALT; TOXIC; VEGETATION; WATER
(14) HIERARCH TERMS: IWA
(15) STIMS ACC.NO.: 00S39829 (15) SECONDARY AUTHORS: Copenhaver ED; Wilkes DJ
(18) DOC.CIT.: Leland, H. V. , D. J. Wilkes, and E. D. Copenhaver. Industrial wastes: heavy metals and related trace elements. Journal Water Pollution Control Federation, 48(6):1459-1486, June 1976.

(1) SWIRS ACC.NO.: 039643
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975
(11) ABSTRACT: Oil and soil interaction effects resulting from an oil spill are explored. The purpose of the investigation was to determine the degree of oil retention from an oil spill area in view of natural physical weathering to evaluate the compositional changes of natural oil retained in soil material. Soil (sand) samples were obtained at three separate time periods: one day after the oil spill, 174 days after the oil spill, and 368 days after the oil spill. A total of 45 soil samples were obtained in the three separate time periods. The percentage of oil retained over the one year period of weathering was determined at various intervals, and compositional changes were studied by gas liquid chromatography and infrared techniques. The oil spill occurred near Pearse Island in British Columbia, Canada. The results of gas liquid chromatography indicated that the loss of low molecular weight n-paraffins, and the results of infrared techniques indicated the formation of sulfones and ether groups due to the oxidation reaction resulting from natural exposure. It was established that up to 4 percent of oil was retained in soil material after 6 months of exposure and that about 3. 5 percent remained after a year.
(12) KEYWORDS: CANADA; CONCENTRATION; ECOLOGY; EFFECT; INVESTIGATION; OIL; RESIDUE; SAMPLING METHODS; SAND; SITES; SPILLAGE
(15) STIMS ACC.NO.: 00S38687
(18) DOC.CIT.: Young, R. N. , and A. J. Sethi. Compositional changes of a fuel oil from an oil spill due to natural exposure. Water, Air, and Soil Pollution, 5(2):195-205, Dec. 1975.

(1) SWIRS ACC.NO.: 039625
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Sediments in the Hayle estuary in a historical mining area of Cornwall have been found to contain exceptionally high concentrations of tin, arsenic, copper, lead, tungsten, and zinc. In this study, the distribution of these heavy metals is correlated with pollution from past mining activity through mine waste discharge into streams, and changes which took place at the time of the development and the Upton Towans, which are two blown sand deposits separated by the Hayle estuary. One table and three figures illustrate the report.
(12) KEYWORDS: CLAY; GREAT BRITAIN; HAZARDOUS; METAL; MINE; MINERAL; NON-FERROUS; POLLUTION; SAND; SEDIMENTATION; TRANSPORT; WATERWAY
(15) STIMS ACC.NO.: 00S38669
(18) DOC.CIT.: Yim, W. W. Heavy metal accumulation in the estuarine sediments in a historical mining of Cornwall. Marine Pollution Bulletin, 7(8), Aug. 1976.

(1) SWIRS ACC.NO.: 039624
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Industrial copper and zinc pollution reduces the decomposition rate, phosphatase activity, and phosphorus mineralization rate in the mor horizon of conifer forest surrounding a brass mill in Sweden. There is statistical evidence for copper being more responsible

for this effect than zinc at about equal concentrations. A negative influence on the phosphatase activity is measureable already at a low degree of pollution. A higher pH of the soil may counteract the heavy metal effect to some extent. Two tables and four figures are presented.
(12) KEYWORDS: CHEMICAL; EARTH; HAZARDOUS; MATHEMATICAL MODEL; METAL; MINERAL; NON-FERROUS; ORGANIC; PH; PHOSPHORUS; POLLUTION; SAMPLING METHODS; SCANDINAVIA; VEGETATION
(15) STIMS ACC.NO.: 00S38668
(18) DOC.CIT.: Tyler, G. Heavy metal pollution, phosphatase activity, and mineralization of organic phosphorus in forest soils. Soil Biology and Biochemistry, 8(4):327-332, 1976.

(1) SWIRS ACC.NO.: 039457
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: A patented closed loop process is described for treating waste water resulting from the chemical extraction of uranium from ore. Water is evaporated to form a concentrated solution and is then subjected to crystallization of the least soluble salt component in it via further evaporation, cooling, or simultaneous cooling and a partial vacuum. The crystallized component is separated from the original liquor, and the original liquor is then fed back after the removal of residual uranium to an extraction installation where acids used in the process are replaced. The pure condensate produced during evaporation of the waste water is employed as a replacement for the fresh water employed in ore processing. The invention constitutes a process for the treatment of radioactively contaminated waste water emitted from installations for chemically preparing uranium ores.
(12) KEYWORDS: CONCENTRATION; CONTAMINATE; LIQUOR; MINE; PATENT; RADIOACTIVE; SEPARATING; SOLID; TREATMENT; WASTE WATER
(15) STIMS ACC.NO.: 00S38501
(18) DOC.CIT.: Klicka, V. , J. Mitas, and J. Vacek. (Vyzkumny ustav chemickuch zarizeni, Brno, Czechoslavaka). Treatment of waste water from uranium ore preparation. U. S. Patent No. 3,988,414; filed Dec. 17, 1974; issued Oct. 26, 1976.

(1) SWIRS ACC.NO.: 039420
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: This invention pertains to a process for the removal of dissolved mercury salts from aqueous solutions. The mercury is recovered from solution by precipitation as mercury sulfide and contacting the solution with zinc sulfide particles. This process is also effective for waste effluents with low ionic strength such as those obtained in mercury catnode chlorine cell operations.
(12) KEYWORDS: CHEMICAL; MERCURY; PATENT; PRECIPITATE; PROCESS; RECLAMATION; SALT; TREATMENT; WASTE WATER
(15) STIMS ACC.NO.: 00S38464
(18) DOC.CIT.: Neal, J. A. (Georgia-Pacific Corporation). Process for recovery of dissolved mercury salts from aqueous solutions. U. S. Patent No. 3,989,623; filed Sept. 8, 1975; issued Nov. 2, 1976.

(1) SWIRS ACC.NO.: 039142
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: This data sheet, revised by the Chemical Section of the National Safety Council, discusses the health hazards of using mercury and the precautions necessary to avoid these hazards. Emphasis is on reducing the ways mercury vapor may get into the workroom air. Also discussed are shipping and container problems, waste disposal, symtoms of mercury poisoning, threshold limit values, air sampling techniques, ventilation, personal protection and medical examinations for persons who might potentially be exposed to mercury.
(12) KEYWORDS: CONTAINER; CONTROL; HAZARDOUS; HEALTH; MERCURY; MONITOR; OCCUPATION; PROBLEMS; TRANSPORT
(15) STIMS ACC.NO.: 00S38186
(18) DOC.CIT.: Mercury. National Safety News, 113(1):69-71, Jan. 1976.

(1) SWIRS ACC.NO.: 038339
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Mine waste samples from twelve abandoned metalliferous workings or disused fluorspar tailing dams were analyzed for physical and chemical characteristics. High levels of lead, zinc and fluoride were found in all the mine wastes. Plant nutrients, nitrogen and phosphorus concentrations were low. The major factor determining the phytotoxicity of the substrate at the mine workings is the zinc concentration. Plants were collected from each site and analyzed for fluoride levels, which were found to vary with species and physicochemical characteristics of the substrate. Reinstatement of disused tailing dams is for recreational or aesthetic reasons; the agricultural value of the vegetation is restricted by heavy metal and fluoride concentrations.
(12) KEYWORDS: AESTHETIC; CONTAMINATE; FOLIAGE; GREAT BRITAIN; METAL; MINE; MINERAL; NON-FERROUS; RECLAMATION; RECREATION AREA; TAILINGS; TOXIC; VEGETATION
(15) STIMS ACC.NO.: 00S37383
(18) DOC.CIT.: Johnson, M. S. Natural colonization and reinstatement of mineral waste containing heavy metals and fluoride. Fluoride, 9(3):153-162, July 1976.

(1) SWIRS ACC.NO.: 038302
(2) DOMESTIC: F (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: The extraction and analysis of heavy metals leachate at two urban waste landfill sites in Japan are discussed. Contaminated water, permeating from the landfill sites, contributes to soil and crop contamination in the rice fields. An analysis of hazardous wastes in groundwater indicates varying concentrations of heavy metals including iron, manganese, cadmium, chromium and lead. Sources for these unsoluble heavy metals in wastes include incineration ash, polyvinyl chloride products, inorganic pigments, home electric appliances, and manufacturers dumping plating sludge. As a result of anaerobic decomposition, sulfur substances are transformed to hydrogen sulfide. The significant effects of pH and oxidation reduction potential on the extraction of heavy metals are discussed. A considerable concentration of heavy metals is expected to accumulate in the bottom strata of sediment deposits.
(12) KEYWORDS: CONTAMINATE; DATA; FACILITY; GROUND WATER; HAZARDOUS; INDUSTRY; JAPAN; METAL; MUNICIPALITY; PROCESS; SANITARY LANDFILL; SEDIMENTATION; SITES; TRANSPORT
(15) STIMS ACC.NO.: 00S37346
(18) DOC.CIT.: Giken, K. K. Study on the process of generation of industrial wastes containing harmful substances; report of the fiscal year 1974. Japan, Ministry of Health and Welfare, Mar. 1975. 15 p.

(1) SWIRS ACC.NO.: 037760
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: An investigation is presented of cadmium adsorption by soils with different physicochemical characteristics to determine the nature of the reactions involved. Cadmium adsorption by soils was investigated at two temperatures to determine whether the reaction is of a chemical or a physical nature. The results suggest that cadmium adsorption by soils is at least partly of a chemical nature, which is also supported by the low rate of attaining equilibrium at both temperatures. The physical adsorption proceeds much faster. Similar statistics for the two temperatures give further evidence that temperature does not change the nature of reactions involved in cadmium adsorption by soils. Further work on the temperature effect would help to clarify the mechanism, particularly if only one type of adsorbent is involved. During the study, the calculated Langmuir adsorption maxima

and bonding energy coefficients were well correlated with cation exchange capacity, organic matter, and clay content.
(12) KEYWORDS: ADSORPTION; CHEMICAL; CONCENTRATION; DATA; EARTH; EFFECT; HAZARDOUS; HEALTH; MATHEMATICAL MODEL; ORGANIC; PHYSICAL; TEMPERATURE; TOXIC
(15) STIMS ACC.NO.: 00S36804
(18) DOC.CIT.: Levi-Minzi, R. , G. F. Soldatine, and R. Raffaldi. Cadmium adsorption by soils. Journal of Soil Science, 27(1):10-15, 1976.

(1) SWIRS ACC.NO.: 037668
(2) DOMESTIC: D (2) CATEGORY: 01 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Polychlorinated biphenyls (PCB) are widespread, toxic, environmental contaminants. Two common sources of PCB contamination are disposal of sewage sludge on land and the use of PCB as pesticide extenders in agricultural areas. The purpose of this study was to determine the extent to which PCB residues in the soil are absorbed by carrots. Experimental field plots were treated with polychlorinated biphenyl Aroclor 1254 in December of 1971 and the carrots planted in July of 1972. Test and control samples of soil and carrots were taken several times in autumn of 1972 and 1973. PCB content was analyzed by gas chromatography. The less highly chlorinated PCB residues were absorbed five to eight times greater by the carrots than the more highly chlorinated residues. The degree of transfer of PCB residues from soil to carrots was similar to that of some persistent organochlorine pesticides. The PCB residues were absorbed through the carrot roots, and most of the residues were contained in the peel. Very small quantities of PCB residues were found in the carrot tissues. Small amounts were found in the carrot foliage, suggesting contamination by soil dust.
(12) KEYWORDS: ABSORPTION; ANALYSIS; CONCENTRATION; CONTAMINATE; CROP; DATA; DISPOSAL; EARTH; ENVIRONMENT; LAND; PESTICIDE; POLLUTION; POLYCHLORINATED; RESIDUE; SLUDGE; TOXIC
(15) STIMS ACC.NO.: 00S36712
(18) DOC.CIT.: Iwata, Y. , and F. A. Gunther. Translocation of the polychlorinated biphenyl Aroclor 1254 from soil into carrots under field conditions. Archives of Environmental Contamination and Toxicology, 4(4):44-59, Apr. 1976.

(1) SWIRS ACC.NO.: 037335
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Mercury was measured in over 100 fish from Lake Erie and from Pymatuning Lake and Mosquito Lake, two large nonindustrialized lakes near Lake Erie. The following types of fish were examined: sunfish, perch, catfish, white bass, and carp. Analyses were performed on the upper back muscle beneath the skin just behind the gill cover and just below the anterior dorsal fin of fish. All fish in the two nonindustrialized lakes except carp contained the same low content of mercury (about 0. 1 ppm). Carp had distinctly higher levels of mercury (about 0. 25 ppm). In Lake Erie, carp also contained about 0. 25 ppm of mercury but, in contrast with the two other lakes, this was not higher than mercury levels found in species which also contained 0. 25 to 0. 35 ppm of mercury. Study results confirmed the complexity of accumulative metals in the food web and the need for analyzing several species of varying ecological niches. It was suggested that carp rather than fish higher in the food web, may be the best biological magnifiers for interlake comparisons of mercury in unpolluted lakes that are only moderately eutrophic whereas fish high in the food web may be the best magnifiers for oligotrophic lakes. (Author Abstract) (Document retained in SWIRS library)
(12) KEYWORDS: ANALYSIS; BIOLOGICAL; COMPARISON; CONCENTRATION; FISH; FOOD; MEASUREMENTS; MERCURY; METAL; WATERWAY
(15) STIMS ACC.NO.: 00S36380
(18) DOC.CIT.: Aronson, J. L. , M. Spiesman, and A. K. Aronson. Note on the distribution of mercury in fish species in three Ohio lakes. Environmental Pollution, 10(1):1-7, 1976.

(1) SWIRS ACC.NO.: 037323
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975
(11) ABSTRACT: Asbestos or asbestiform minerals include several types or groups of fibrous crystalline substances with special thermal and electrical properties that have long encouraged their use in the manufacture of such products as roofing, insulation, brake linings, fireproof curtains, etc. Their occurrence as pollutants in the ambient air and in supplies of food and drinking water has caused considerable concern because occupational exposures to asbestos have been found to induce mesothelioma of the pleura and peritoneum, as well as cancer of the lung, esophagus, and stomach, after latent periods of about 20 to 40 years. Transmission electron microscopy, often together with selected area electron diffraction, has been the principal technique used to identify and characterize asbestos fibers in ambient air and water samples. Because of the poor sensitivity of other analytical methods, electron microscopy is also being used for routine measurement of airborne or waterborne asbestos concentrations, although it is ill-suited for this purpose. Even with the future development of more appropriate quantitative procedures, however, electron microscopy in combination with electron diffraction will continue to be valuable as a reference method and articularly for research applications, e. g. , in support of health effects studies where maximal information on fiber counts and size distributions are needed. (Document retained in SWIRS library)
(12) KEYWORDS: AIR; ASBESTOS; CLASSIFICATION; CONCENTRATION; EXPOSURE; FIBER; HAZARDOUS; HEALTH; MEASUREMENTS; MINERAL; OCCUPATION; POLLUTION; PROCESS; SAMPLING METHODS; WATER
(15) STIMS ACC.NO.: 00S36368
(18) DOC.CIT.: Mueller, P. K. , A. E. Alcocer, and R. L. Stanley. Asbestos fiber atlas. Environmental Protection Publication 650/2-75-036. Research Triangle Park, NC, U. S. Environmental Protection Agency, Apr. 1975, 58 p. (Environmental Protection Technology Series)

(1) SWIRS ACC.NO.: 036698
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The fate of metals in burning municipal refuse is studied for aluminum, chromium, copper, zinc, tin, lead and iron. Samples were taken from the unburned refuse and incinerator residue. The 7 metals were included in this study both because they span a wide range of toxicity and because they represent the bulk of the metals found in domestic solid wastes. These metals are introduced into an incinerator as a part of the raw refuse. They are incinerated with the refuse and modified to enter the environment (1) as part of the residue remaining after incineration, (2) in the process waters used to collect the flyash and quench the residue, and (3) as particulate matter leaving the stack. As an aid to future metal investigations, this paper is directed toward (1) assessing sampling, sample preparation, and analytical procedures for determining the presence of the selected metals and (2) completing a total analysis for metals present in refuse and incinerator residue. These issues are approached by determining the range of selected metals within the composites, and examining the statistical characteristics of samples drawn from a composite to determine variability. (Author's Abstract Modified)
(12) KEYWORDS: ALUMINUM; ANALYSIS; EMISSION; FLY ASH; INCINERATOR; IRON; METAL; MUNICIPALITY; NON-FERROUS; PARTICULATE MATTER; REFUSE; RESIDUE; SAMPLING METHODS; TOXIC; WATER
(15) STIMS ACC.NO.: 00S35743
(18) DOC.CIT.: Schoenberger, R. J. , and J. Bender. Analysis of metals found in incinerator residue. In: Proceedings; 1976 National Waste Processing Conference, Boston, May 23-26, 1976. The American Society of Mechanical Engineers, 1976, 585 p. (p. 499-511).

(1) SWIRS ACC.NO.: 036567
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The toxicity of copper was compared for the aquatic organism Daphnia magna cultured in reconstituted versus pond water and fed on trout pellet versus vitamin enriched algal foods. Copper stress was monitored to determine its effects on longevity, reproduction, and instantaneous rate of population growth. The effects of chronic copper stress were highly variable when animals were tested in reconstituted water. Such effects were probably due to variability in the quality of distilled water. Vitamin enriched algal food was superior to trout granule food in culturing Daphnia magna. Control animals lived much longer and test animals were less sensitive to chronic copper stress. The acute and chronic toxicity of copper was compared for four species of Daphnia. When tested in pond water and fed vitamin enriched algae, the two largest species (Daphnia magna and Daphnia pulex) were significantly less sensitive to acute copper stress than the two smallest species (Daphnia parvula and Daphnia ambigua). There was no significant difference in sensitivity to chronic copper stress when reduced longevity was used as the index. Copper application factors for the four species varied from 0.47 to 0.62. (Author Abstract Modified)
(12) KEYWORDS: AERATION; ALGAE; BOD; COMPARISON; CONCENTRATION; CULTURE; EFFECT; LABORATORY; MEASUREMENTS; MONITOR; NON-FERROUS; PROJECTION; TOXIC; VITAMIN
(15) STIMS ACC.NO.: 00S35611
(18) DOC.CIT.: Winner, R. W. Toxicity of copper to Daphnids in reconstituted and natural waters. Environmental Protection Agency Publication EPA-600/3-76-051. Duluth, MN, U. S. Environmental Protection Agency, May 1976, 69 p. (Ecological Research Series).

(1) SWIRS ACC.NO.: 036549
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: A 3-year study was conducted to evaluate the transport, fate, and geochemical interactions of mercury, cadmium, and other inorganic pollutants in the southeastern coastal littoral-salt marsh environment of the United States. Study objectives were as follows: (1) determine the rate of inorganic pollutant input to salt marsh estuaries; (2) examine geochemical interaction of pollutant materials in salt marsh estuaries; and (3) assess the ultimate fate of pollutants in coastal littoral waters. It is concluded that southeastern rivers are similar in their concentrations of dissolved mercury and cadmium, with mean values of 0.04 to 0.07 and 0.3 and 1.0 micrograms per liter, respectively. High levels of dissolved and particulate organic matter in southeastern rivers can influence the fate of metal pollutants, particularly at a river-estuary interface where the flocculation of organic matter acts to scavenge metals from the water column. Industrialized estuaries differ from undeveloped estuaries only in the concentration of heavy metals in bottom sediments. Estuaries act as sinks for iron, manganese, and other transition metals. The accumulation of mercury in salt marsh sediments may be followed by slow release due to methylation, and mercury levels in coastal littoral water vary seasonally due to atmospheric inputs. The residence time of mercury and cadmium in coastal littoral water is estimated to be 17 and 3 wks, respectively.
(12) KEYWORDS: CHEMICAL; EFFECT; FLOCCULANT; GEOLOGIC; MERCURY; METAL; ORGANIC; PARTICULATE MATTER; POLLUTION; REGIONAL; SEDIMENTATION; TRANSPORT
(15) STIMS ACC.NO.: 00S35593
(18) DOC.CIT.: Windom, H. L. Geochemical interactions of heavy metals in southeastern salt marsh environments. Environmental Protection Agency Publication EPA-600/3-76-023. Corvallis, OR, U. S. Environmental Protection Agency, Mar. 1976, 36 p. (Ecological Research Series).

(1) SWIRS ACC.NO.: 036363
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: This is the second part of an investigation dealing with toxic metal residues found in the disposed Beaumont Leys sewage farm (England); the first part considered metals, zinc, copper and nickel which are toxic to plants. This report deals with lead, cadmium, arsenic and chromium; pharmacological and toxic properties, recommended and statutory limits, natural distribution in soil, and the origin in sewage are discussed for each metal. The survey of metals indicated that the toxic metal content of soil samples coincided closely with the effluent-irrigation and sludge-spreading fields of the old, now abandoned, sewage works. Of greatest concern were the high lead and zinc contents of the sludge fields; the former is toxic to man and animals - the latter is toxic to plant life. Samples of vegetables raised on Beaumont Leys soils showed that only zinc is appreciably taken up, and in no case was zinc content above the recommended maximum of 50 parts per million. The site studied was also considered as a possible building site, and measurements of wind-blown dust were made to determine possible hazards of lead inhalation. Results were variable but indicated no abnormal hazard. The danger to children ingesting the soil was not considered high. For building on the site however, it was recommended that the top two feet of soil be removed from the sludge area before construction was undertaken.
(12) KEYWORDS: ABANDONED; CHROMIUM; CONCENTRATION; DUST; EFFLUENT; FACILITY; GREAT BRITAIN; HAZARDOUS; IRRIGATION; MEASUREMENTS; NON-FERROUS; SEWAGE; SLUDGE; TOXIC
(15) STIMS ACC.NO.: 00S35408
(18) DOC.CIT.: Pike, E. R. , L. C. Graham, and M. W. Fogden. An appraisal of toxic metal residue in the soils of a disused sewage farm, part 2. Journal of the Association of Public Analysts, 13(2):48-63, June 1975.

(1) SWIRS ACC.NO.: 036230
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: There has been a great deal of interest in ways of controlling mine wastes in Canada, due to the toxicity of dissolved heavy metals to commercial fish, such as the Atlantic salmon and speckled trout. Heavy metals, such as copper, lead, zinc, and nickel are toxic to fish at low concentrations. Sublethal concentrations of heavy metals can also adversely affect fish by affecting reproductive and migratory behavior. Methods of treating and recycling surface and underground aqueous wastes, mill process waste, and solid wastes are discussed. Solid wastes, containing tailings, are usually impounded on land, but these are also dumped in the ocean or used as backfill in mining operations. The most common method of treating base metal mining wastes in Canada is by discharge into a tailings pond with controlled pH. Heavy metals are precipitated and settled out with the suspended solids. The reclamation of land areas after mining operations cease was also discussed. Revegetation is difficult in areas where acid wastes have drastically lowered soil pH. The vegetation in these areas tends to take up toxic substances, making its harvesting or use as wildlife forage hazardous.
(12) KEYWORDS: BIOLOGICAL; CANADA; CONTROL; FISH; HAZARDOUS; METAL; MINE; PROCESS; RECLAMATION; SOLUBILITY; TAILINGS; TOXIC; TREATMENT; UNDERGROUND
(15) STIMS ACC.NO.: 00S35275
(18) DOC.CIT.: Bell, A. V. Waste controls at base metal mines. Environmental Science and Technology, 10(2):130-135, Feb. 1976.

(1) SWIRS ACC.NO.: 036214
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: Effluent from tanneries contains a number of toxic substances among them compounds of chromium, sulphides and compounds of phenol (volatile) with water vapor. Ionizing irradiation is discussed as one of the separation methods, i. e. the effect of gamma raying on

the sedimentation process and disinfection of the effluent. Tanning liquor was tested for decomposition of phenol under irradiation. A table is given on parameters of irradiated liquors containing phenol, mimosa, quebracho and tannin. Concentrations are given in kg/cu m (for phenol - it is 0.950; and volatile phenol with water vapor, in g/cu m, is 950). Chemical and biological oxygen demands are listed; for phenol they are 2190 g/cu m of 02 and 54 g/cu m of 02, respectively. Diagrams show gamma doses. For phenol composition the dose is 12.5 Mrad.

(12) KEYWORDS: BOD; COD; COLLECTION; DECOMPOSE; ION; PHENOL; PURIFICATION; RADIATION; SEDIMENTATION; STERILIZE; TANNERY WASTE

(15) STIMS ACC.NO.: 00S35259

(18) DOC.CIT.: Bogus, W., M. Pekala and S. Perkowski. Purification of tannery effluent wastes: pheno removal by irradiation. (Oczyszczanie sciekow garbarsich: radiacyjne usuwanie fenoli.) Gaz, Woda i Technika Sanitarna, 10:302-301, 1975.

(1) SWIRS ACC.NO.: 036091

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Available data on the behavior of americium in plant and soil systems are reviewed and analyzed. Americium is considered to be a major radioactive pollutant and, of its 12 isotopes, americium-241 is generally regarded as the most serious environmental hazard. Past investigations which attempted to evaluate americium in soil and plant systems demonstrated that changes in pH and the addition of various concentrations of complexing or chelating agents to soils will influence the biological availability of americium in such systems. It is therefore concluded that the chelation of americium may increase plant uptake and lead to human beings via the food chain. It is recommended that mechanisms of chelation be explored, since americium can be toxic to plants and retard normal plant growth. In addition, factors affecting the biological availability and mobility of americium in soil systems, such as by local soil properties and microbial metabolism, need further investigation. It is also recommended that the mode, rate, chemical form, and amount of americium incorporated in various plant organs be investigated. The use of americium as a tool for measuring various soil parameters is discussed.

(12) KEYWORDS: ANALYSIS; BIOLOGICAL; CHEMICAL; CONCENTRATION; FOOD; HAZARDOUS; LAND; MEASUREMENTS; METAL; NON-FERROUS; PH; POLLUTION; RADIOACTIVE; VEGETATION

(15) STIMS ACC.NO.: 00S35136

(18) DOC.CIT.: Brown, K. W. Americium - its behavior in soil and plant systems. Las Vegas NV, U. S. Environmental Protection Agency, Jan. 1976, 11 p.

(1) SWIRS ACC.NO.: 036064

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: The effects of soil cadmium levels on cadmium uptake by a number of forage species was studied experimentally in pot cultures of alfalfa, white clover, sudangrass, tall fescue and bermudagrass grown in soil to which municipal sewage sludge amended by cadmium sulfate. The increasing use of sludges on agricultural and pasture lands and the high toxicity of cadmium to plants and animals makes it desirable to know more about the long-term influence of disposing sewage wastes on productive lands. Chemical analyses of plant clippings and soil samples were performed after plant growth experiments were completed. Soil analysis showed cadmium concentrations of 15, 30, 40, 95 and 145 micrograms cadmium per gram soil, associated with a 25% yield depression for sudangrass, alfalfa, clover, fescue and

bermudagrass. Corresponding cadmium concentrations in the plant clippings were 9, 24, 17, 37 and 43 micrograins per grain.
(12) KEYWORDS: AGRICULTURE; ANALYSIS; ANIMAL; CHEMICAL; DISPOSAL; LAND; METAL; MUNICIPALITY; SAMPLING METHODS; SEWAGE; SLUDGE; TOXIC; VEGETATION
(15) STIMS ACC.NO.: 00S35109
(18) DOC.CIT.: Bingham, F. T. , A. L. Page, R. J. Mahler. University of California. Yield and cadmium accumulation of forage species in relation to cadmium content of sludge-amended soil. Journal of Environmental Quality, 5(1):57-60, 1976.

(1) SWIRS ACC.NO.: 036017
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The effects of municipal sewage effluent, and effluent injected with an anaerobically digested liquid sludge, upon the uptake of copper, zinc, cadmium and lead, by reed canarygrass and corn are reported. The canarygrass was spray-irrigated throughout the year from 1964 through 1970 with effluent only, and the effluent plus sludge during years 1971, 72 and 73. The corn area received only effluent during the growing season throughout the years 1963 to 1973. Increased copper and zinc concentrations and total uptake were observed in the reed canarygrass. Irrigation of corn with effluent produced little or no change in heavy metal uptake compared to that seen in normally fertilized soil. The only hazard postulated by the authors may be in the higher copper levels seen in the irrigated reed canarygrass if fed to sheep. Zinc levels in both grass and corn were well below reported phytotoxic levels. Cadmium levels in the crops were below those of effluent or soil and were regarded as desirable due to ultimate toxic effects of cadmium in the food chain.
(12) KEYWORDS: ANAEROBIC; CROP; DIGESTION; DISPOSAL; EFFLUENT; IRRIGATION; LAND; LIVESTOCK; METAL; MUNICIPALITY; NON-FERROUS; SEWAGE; SLUDGE; TOXIC; VEGETATION
(15) STIMS ACC.NO.: 00S35062
(18) DOC.CIT.: Sidle, R. C. , J. E. Books, L. T. Kardos. Heavy metals application and plant uptake in a land disposal system for waste water. Journal of Environmental Quality, 5(1):97-101, 1976.

(1) SWIRS ACC.NO.: 035677
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975
(11) ABSTRACT: This paper relates to a study on the properties of industrial wastes containing toxic substances in Kanagawa Prefecture during 1972 to 1974. An elution test was conducted on the 83 test materials collected from various industrial wastes, and nine were found to be hazardous. The various conditions for the elution test and pretreatment of test materials for analysis of cadmium, lead, chromium, and arsenic were investigated. The following subjects are discussed concerning the factors which influence the elution test of the wastes containing toxic substances: amount of solution for the elution test and the shape of the container; duration for elution and solvent; and elution test of solution in suspension with the solvent. (Text in Japanese)
(12) KEYWORDS: ANALYSIS; CHROMIUM; HAZARDOUS; INDUSTRY; INVESTIGATION; JAPAN; RESEARCH; SOLVENT; TOXIC; WATER
(15) STIMS ACC.NO.: 00S34722
(18) DOC.CIT.: Tsuchiya, K. , H. Fukui, K. Watanabe, and K. Takahashi. Sangyo haikibutsu no seijochosa to bunsekiho ni kansuru kento. Investigation on properties of industrial wastes and its analytical method. Yosui to Haisui, 17(10):1293-1300, 1975.

(1) SWIRS ACC.NO.: 035663
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975
(11) ABSTRACT: The soil and the plants in the Wollongong, Australia area show relatively high contamination by metals. These heavy metals probably travel by air; there is a strong correlation between the levels in the soil and herbage, and the distance from the smelting

complex. Another source of heavy metals for the harbors is the effluent that is discharged from the rivulets which empty directly into the harbor. The most important is Allan's Creek in which a number of industries dump their effluent. Mining operations in Wales have contaminated river and sea water with zinc concentrations that range from 0. 04 to 0. 25 ppm. These levels in Wales were toxic to fish. The levels in Wollongong harbor range in concentration from 0. 1 to 1. 34 ppm. Compared to normal sea water, the concentration of zinc in the midharbor water is ten times higher, copper is forty, manganese is 70, iron is 120, cadmium is 350, and lead is 10,000 times higher. The main source of this heavy pollution is industrial outfalls.

(12) KEYWORDS: CONCENTRATION; EARTH; EFFLUENT; FISH; HARBOR; INDUSTRY; IRON; METAL; NON-FERROUS; OCEAN; POLLUTION; TOXIC; VEGETATION; WATER; WATERWAY

(15) STIMS ACC.NO.: 00S34708

(18) DOC.CIT.: Beavington, F. Pollution by heavy metals of rivulet and harbour water in Wollongong. Search, 6(9):390-391, Sept. 1975.

(1) SWIRS ACC.NO.: 035350

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: In August residents of a low lying part of Tokyo noticed yellow water seeping out of the ground. It was found to contain 100 parts per million of hexavalent chromium. Demands to trace the source of the chromium led to the discovery that the local government had known for some time that the Nippon Chemical Co. had dumped 527,000 tons of hexavalent chromium polluted slag at 34 sites in around Tokyo between 1938 and 1971. Nippon Chemical admitted that it had concealed information from the Labour Standards Office about deaths from lung cancer of eight workers involved in the production of nichromate soda from chromium ore. An investigation revealed that the death rate among Nippon Chemical workers was 26. 5 times greater than the national average. The total cost of the cleanup is estimated at 1000 million yen. The company says it is unable to pay for such a cleanup. The ministry of International Trade and Industry launched a nationwide survey of chromate pollution. Other firms were dumping hexavalent chromium slag in residential areas. Urine samples from employees and area residents contained high amounts of the metal. A news agency carried out its own survey and found out that 41 people have died from diseases related to hexavalent chromium and 232 persons are suffering from perforation of the nasal septum, an occupational disease in the chromium industry. An organization called the Council of Hexavalent Chromium Pollution Victims has been set up to fight for adequate compensation.

(12) KEYWORDS: CHEMICAL; CHROMIUM; DISEASE; ECONOMICS; GOVERNMENT; HAZARDOUS; INDUSTRY; JAPAN; LOCAL; METAL; NON-FERROUS; PERSONNEL; POLLUTION; SLAG; TOXIC

(15) STIMS ACC.NO.: 00S34395

(18) DOC.CIT.: Fairborn, J. Chromium pollution hits Japan. New Scientist 67(967):650, Sept. 18, 1975.

(1) SWIRS ACC.NO.: 033673

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: The increasing frequency of red tides (massive quantities of plankton) in Japan's Inland Sea is being blamed on the dumping of waste products in the sea. The cause of red tides has never been well established, but there is strong conjecture that it is being caused by the dumping since 1957 of huge amounts of waste containing cadmium and mercury. Consequences have been the destruction of fish and shellfish in the waters, or the rendering of seafood harmful for human consumption. Two fishermen's cooperatives have appealed to the Japanese Environmental Dispute Coordination Commission for help.

(12) KEYWORDS: CHEMICAL; DUMPING; FISH; HAZARDOUS; HEALTH; INDUSTRY; JAPAN; OCEAN; TOXIC

(15) STIMS ACC.NO.: 00S32717

(18) DOC.CIT.: Cadmium and mercury cause more problems in Japan. New Scientist, 67(961):320, Aug. 7, 1975.

(1) SWIRS ACC.NO.: 033014
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975
(11) ABSTRACT: Discussion on the collection, detoxification, and disposal of dangerous and toxic wastes, is presented. Dangerous and toxic wastes, both solid and liquid, should be subjected to preliminary treatment at the site where they are generated, and transferred to regional specialized treatment facilities for final treatment and disposal. Liquid wastes should be concentrated, and, whenever possible, dangerous and toxic wastes should be incinerated. Disposal in quarries should be abandoned in view to groundwater contamination hazards. (Text in French)
(12) KEYWORDS: CENTRALIZED; DISPOSAL; HAZARDOUS; INCINERATION; LIQUID; QUARRY; TOXIC; TREATMENT
(15) STIMS ACC.NO.: 00S32056
(18) DOC.CIT.: Collecte et traitement des dechets toxiques et dangereux. Collection and treatment of toxic and dangerous wastes. Traitements de Surface, (135):7-17, Jan./Feb. 1975.

(1) SWIRS ACC.NO.: 033609
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: An outbreak of poisoning in humans, horses and other animals led to the identification of tetrachlorodibenzodioxin as the apparent cause. Exposure was related to the spraying of contaminated waste oil on riding arenas for dust control. The contamination resulted from the improper disposal of a toxic industrial waste. The pathologic effects and chemical identification of tetrachlorodibenzodioxin are described.
(12) KEYWORDS: CHEMICAL; DISPOSAL; HAZARDOUS; HEALTH; INDUSTRY; TOXIC
(15) STIMS ACC.NO.: 00S32653
(18) DOC.CIT.: Tetrachlorodibenzodioxin: An accidental poisoning episode in horse arenas. Science, 188(4189):738-740, May 1975.

Section 9
PESTICIDES

(1) SWIRS ACC.NO.: 047058
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Estimated pesticide waste generation.
(4) AUTHOR: Blumenthal JL
(5) CORPORATE AUTHOR: TRW Systems Group
(6) BOOK TITLE: In Hazardous Waste Disposal Program, Eighth Monthly Report.
(8) NTIS NO.: PB-257 331 (8) REPORT NO.: TRW-21485-6008-TO-00
(9) CONTRACT NO.: EPA-68-03-0089
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: Estimates of pesticide waste generation throughout the U.S. are summarized in tabular form. Pesticides are divided into three types: herbicides, insecticides, and fungicides. Pesticide production waste, agricultural waste, and Department of Defense waste are considered. Data are generally presented by Department of Agriculture regions, as well as by states when possible. Pesticide production waste is generally in the form of organic sludge, tars, off-grade products, and dilute liquids. The ratio of dilute waste to concentrated waste (sludge, tars, and off-grade products) usually ranges from 0.01 to 100 for the spectrum of chemical production processes utilized in the pesticide industry. (Retained in SWIRS library).
(12) KEYWORDS: DATA; GENERATION; HAZARDOUS; PESTICIDE; REGIONAL
(14) HIERARCH TERMS: 1HC; 1PJ
(15) STIMS ACC.NO.: 00S46111 (15) SECONDARY AUTHORS: Clausen JF; Dal Porto DF
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sep. 1972. p.281-299.

(1) SWIRS ACC.NO.: 044769
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Method for treating residues, left over after the gas release, of pest control, agents that contain earth metal phosphides and/or alkaline earth metal phosphides.
(4) AUTHOR: Schoom W
(7) PATENT DATA: U.S. Patent No. 4,039,611
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A method for the treatment of the residue of pest control agents that contain earth metal phosphides and/or alkaline earth metal phosphides is described. The pest control agent contains as an active ingredient a metal phosphide which generates, upon contact with water, hydrogen phosphide as a toxic gas. A water soluble oxidizing agent is added to a container of water to provide an oxidizing water solution with a pH of below 7. The water is present in an amount sufficient to decompose any remaining unreacted metal phosphide which may be present in the residue. The oxidizing agent is present in an amount sufficient to oxidize any hydrogen phosphide gas generated by the residue. The oxidizing agent is selected from the group consisting of a mixture of calcium hypochlorite and citric acid, chromic acid, a mixture of sodium perborate and citric acid, a mixture of potassium percarbonate and citric acid and a mixture of sodium percarbonate with manganates. The pest control agent residue left after use is added to the oxidizing solution and remains until after any

unreacted metal phosphide in the residue has been converted to a harmless state.
(12) KEYWORDS: ALKALINE; GASES; HAZARDOUS WASTE; METAL; PH; PHOSPHORUS; PROCESS; RESIDUE; TOXIC; TREATMENT
(14) HIERARCH TERMS: 1HA/2HG; 1IC/2I2
(15) STIMS ACC.NO.: 00S43814
(16) CITATION: Bergen-Enkheim, Germany, filed Mar. 14, 1975 issued Aug. 2, 1977.

(1) SWIRS ACC.NO.: 043749
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Pesticides in agricultural runoff.
(6) BOOK TITLE: In Control of Water Pollution from Cropland. V.2. An overview. (8) REPORT NO.: ARS-H-5-2
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The existence of pesticides in agricultural runoff is investigated. Information on pesticide persistence in soil, which affects the relationship between the amount of residue moved in runoff and the time elapsed since the application of a pesticide, is provided. Characteristic levels of pesticides found in the aquatic ecosystem are noted. The impact of pesticides on aquatic organisms is assessed. Methods for removing pesticide residues from the aquatic environment are described, and areas within the broad area of pesticides in runoff that require additional research are identified. Statistical data are provided on trends in the use of agricultural pesticides in various countries. The dissipation of pesticides from treated land is discussed. Factors affecting the pathway of pesticide movement into water courses are noted as adsorption and solubility, leachability, and formulation. Factors influencing the amount of pesticides moved into water courses include the time after application, persistence in soil, antecedent soil moisture, proximity to water courses, and placement of pesticides. A bibliography on pesticide management practices is provided.
(12) KEYWORDS: AGRICULTURE; BIBLIOGRAPHY; DATA; GROUND WATER; HAZARDOUS; INTERNATIONAL; LEACH; PESTICIDE; RESIDUE; SOIL; TIME; WATERWAY
(14) HIERARCH TERMS: 1HA; 1PE; 1WA/2WA
(15) STIMS ACC.NO.: 00S42792
(16) CITATION: Washington, DC, U.S. Government Printing Office, June 1976. p.91-119.

(1) SWIRS ACC.NO.: 043742 (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Landfills for pesticide waste disposal.
(4) AUTHOR: Ghassemi M
(6) JOURNAL TITLE: Environmental Science and Technology
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Information is presented on the social, political, economic, and institutional aspects of the establishment and operation of landfills for the disposal of pesticides and other hazardous wastes. Data is presented for seven existing landfills which accept pesticide wastes. The landfills represent a wide spectrum of waste processing and disposal methods, site characteristics, and operating agencies. The following general conclusions are offered: (1) when possible, a sparsely populated or isolated location is most desirable; (2) in landfills receiving pesticides and nonhazardous wastes it is preferable if a portion of the site is fenced off and devoted solely to the disposal of pesticides; (3) positively worded signs are psychologically more acceptable to the public than "hazardous waste" signs; (4) an effective public relations program is valuable to the acceptance of a pesticide disposal site; (5) rinsing regulations are difficult to enforce; (6) high fees, elaborate paper work, and limited hours will discourage potential users; (7) industrial waste generators prefer to deal with those operating financially sound and environmentally aware disposal sites; and (8) resource recovery, involving reconditioning and

reuse of rinsed pesticide containers, is environmentally more desirable than container disposal in landfills.
(12) KEYWORDS: CONTAINER; DISPOSAL; ENVIRONMENT; HAZARDOUS; MANAGEMENT; PESTICIDE; PUBLIC RELATIONS; RECLAMATION; SANITARY LANDFILL
(14) HIERARCH TERMS: 1ED; 1PE; 1SD
(15) STIMS ACC.NO.: 00S42785 (15) SECONDARY AUTHORS: Quinlivan SC; Day HR
(16) CITATION: 10(13):1209-1214, Dec. 1976.

(1) SWIRS ACC.NO.: 043483
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(4) AUTHOR: Duvall DS
(5) CORPORATE AUTHOR: Univ. of Dayton Research Institute
(6) BOOK TITLE: Laboratory Evaluation of High-Temperature Destruction of Kepone and Related Pesticides. (8) REPORT NO.: EPA-600/2-760299
(9) GRANT NO.: R-803540-01-0
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Thermal destruction testing was conducted with three pesticides: Kepone, Mirex, and DDT. A specialized laboratory technique incorporating a two stage quartz system was developed. It is important to note that in this system the pesticide was first converted to the gas phase, then exposed to the high temperature destruction conditions. Critical parameters of temperature and residence time were accurately measured. Both the Kepone and DDT molecules, at a residence time were accurately measured. Both the Kepone and DDT molecules, at a residence time of 1 second, were essentially destroyed at 500 degrees C; however, Mirex, at the same residence time, required 700 degrees C for destruction. (Retained in SWIRS library).
(12) KEYWORDS: EQUIPMENT; GASIFICATION; PESTICIDE; RESEARCH; TEMPERATURE; TOXIC
(14) HIERARCH TERMS: 1HA/2HG; 1PE
(15) STIMS ACC.NO.: 00S42526 (15) SECONDARY AUTHORS: Rubey WA
(16) CITATION: Cincinnati, OH, U. S. Environmental Protection Agency, Dec. 1976. 70 p.

(1) SWIRS ACC.NO.: 042809
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Influence of different organochlorine pesticides on the development of the sea urchin embryo.
(4) AUTHOR: Bresch H
(6) JOURNAL TITLE: Environmental Research
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The action of the pesticides aldrin, dieldrin, endrin, heptachlor, DDT, and methoxychlor, on the development of fertilized sea urchin eggs was investigated. Dieldrin did not affect development, endrin demonstrated slight effect and aldrin led to greatly abnormal development and lysis of the embryos. DDT also affected development but less than aldrin. Methoxychlor demonstrated toxic effects similar to those observed with heptachlor. Independent of these morphological observations, data on the incorporation of (3H)thymidine in early developmental stages were obtained. Unlike all other compounds, methoxychlor significantly inhibited deoxyribonucleic acid synthesis. In contrast to the effects produced here, methoxychlor is much less toxic to mammals than DDT. The meaning of these results for practical purposes is discussed.
(12) KEYWORDS: ANIMAL; CHLORINE; DISPOSAL; ENVIRONMENT; HAZARDOUS; ORGANIC; PESTICIDE; RESEARCH; TOXIC
(14) HIERARCH TERMS: 1ED; 1HA; 1PE
(15) STIMS ACC.NO.: 00S41852 (15) SECONDARY AUTHORS: Arendt U
(16) CITATION: 13(1):121-128, Feb. 1977.

(1) SWIRS ACC.NO.: 042516
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(4) AUTHOR: Ghassemi M
(5) CORPORATE AUTHOR: TRW Systems, Inc
(6) BOOK TITLE: A Study of Selected Landfills Designed as Pesticide Disposal Sites.
(8) NTIS NO.: PB250717 (8) REPORT NO.: EPA-530/SW-114C (9) CONTRACT NO.: 68-01-2956
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA; 1US/2GA; 1US/2IA; 1US/2ID; 1US/2LA; 1US/2MO; 1US/2MS; 1US/2NV (10) PUB. YEAR: 1975
(11) ABSTRACT: Results are presented of an indepth survey into the various aspects of selected landfills used for the disposal of pesticide waste. Specific sites chosen for operations investigation were the Agricultural Chemical Container Disposal Sites in Nevada; Wes Con Inc., Titan Sites in Idaho; Powersville Sanitary Landfill in Georgia; Concrete Culverts for Pesticide Encapsulation in Sanitary Landfills in Mississippi; Wheeling Disposal Site in Missouri; Browning-Ferris Industries, Inc., Landfill in Louisiana; Des Moines Metropolitan Solid Waste Agency Sanitary Landfill in Iowa; and the Big Blue Hills Disposal Site, Simi Sanitary Landfill, and Imperial County Pesticide Container Disposal Sites all in California. Information collected on the ten sites indicated that similarities and differences among the sites operations and establishment reflected primarily those between state regulations, local waste disposal needs, and cost factors. Results of the survey are detailed and are intended for use as a literature source and manual for the pesticide disposal site planner. (Retained in SWIRS library)
(12) KEYWORDS: CALIFORNIA; CRITERIA; DISPOSAL; GEORGIA; IDAHO; INFORMATION; IOWA; LOUISIANA; MISSISSIPPI; MISSOURI; NEVADA; OPERATIONS RESEARCH; PESTICIDE; PLANNING; SANITARY LANDFILL; SITES; SURVEY
(14) HIERARCH TERMS: 1HA/2HF; 1PE; 1SD/2SG
(15) STIMS ACC.NO.: 00S41559 (15) SECONDARY AUTHORS: Quinlivan S
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Nov. 1975. 131 p.

(1) SWIRS ACC.NO.: 042515
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Quinlivan S
(5) CORPORATE AUTHOR: TRW Systems, Inc
(6) BOOK TITLE: Survey of Methods Used to Control Wastes Containing Hexachlorobenzene.
(8) NTIS NO.: PB253051 (8) REPORT NO.: EPA-530/SW-120c (9) CONTRACT NO.: 68-01-2956
(10) LANGUAGE: EN (10) PUB. YEAR: 1975
(11) ABSTRACT: Survey results of methods used to control wastes containing hexachlorobenzene (HCB) are discussed. The specific objectives of the survey were to identify the sources and characteristics of manufacturing wastes containing HCB, to review and document methods used for treatment and disposal of HCB wastes, and to evaluate the environmental adequacy of the treatment and disposal methods. Fourteen industries/operations were identified as possible sources of HCB wastes generation and included chlorinated solvents productions, pesticide manufacturing, nitroso and styrene rubber production, and seed treatment industries. It is recommended that consideration be given to the potential environmental hazards associated with the disposal of HCB wastes at sanitary landfills, and that incineration with emission control and byproduct recovery be further assessed as the most desirable method for the destruction of HCB wastes. (Retained in SWIRS library)
(12) KEYWORDS: CHEMICAL; CHLORINE; CONTROL; DISPOSAL; EFFECT; ENVIRONMENT; HAZARDOUS; INCINERATION; INDUSTRY; PROCESS; RUBBER; SANITARY LANDFILL; SOLVENT; SURVEY; TREATMENT
(14) HIERARCH TERMS: 1HA/2HF; 1HA/2HG; 1HA/2HH; 1IC
(15) STIMS ACC.NO.: 00S41558 (15) SECONDARY AUTHORS: Ghassemi M; Santy M
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Nov. 1975. 87 p.

(1) SWIRS ACC.NO.: 042396
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Distribution, metabolism and perinatal toxicity of pesticides with reference to food safety evaluation: a review of selected literature.
(4) AUTHOR: Khera KS
(6) BOOK TITLE: In Mehlman, M. A., R. E. Shapiro, and H. Blumenthal, eds. New Concepts in Safety Evaluation.
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: Information is presented on a wide background of pesticides which are constantly exposed to humans. Their likely uses, chemical composition, impurities, distribution in food commodities, metabolites or degradation products, permissable levels of human intake, and teratogenic potential are summarized. Information on pesticide safety for human fetal development is stressed.
(12) KEYWORDS: ANALYSIS; BIOLOGICAL; CHEMICAL; CLASSIFICATION; COMPOSITION; EFFECT; EXPOSURE; FOOD; HEALTH; HUMAN; INFORMATION; MANUAL; PESTICIDE; SAFETY; TOXIC
(14) HIERARCH TERMS: 1AE; 1HB; 1PE
(15) STIMS ACC.NO.: 00S41439
(16) CITATION: Washington, DC, Hemisphere Publishing Corporation, 1976. p.369-420.

(1) SWIRS ACC.NO.: 042164
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Mounting quantities of pesticide wastes require safe burial sites.
(6) JOURNAL TITLE: Solid Wastes Management
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: An in depth case study of 10 landfills which are used exclusively for pesticide wastes, or were designed to accept a variety of materials including pesticides is examined. The sites varied widely in their history, purpose, and mode of operation. The type and quantity of wastes accepted also differed considerably. Eight of the 10 sites have no onsite, predisposal wastes treatment. The cost of establishing and running a pesticide disposal site is considered. Certain conclusions are drawn which are applicable to the planning, establishment, and operation of all waste disposal sites. There is a great need for such sites. When feasible, landfills should be established in isolated areas. Where a portion of a site is used for pesticide disposal, that portion should be fenced off and posted. An effective public relations program is important in securing community acceptance of a disposal site. Rinsing regulations are hard to enforce but desirable. High gate fees and limited opening hours can discourage users. Resource recovery, involving the reuse of large containers and the shredding of rinsed containers to salvage metals, is environmentally more desirable than landfill disposal and is more acceptable to the public.
(12) KEYWORDS: CONTAINER; CONTROL; DISPOSAL; HAZARDOUS; MANAGEMENT; PESTICIDE; PUBLIC RELATIONS; SANITARY LANDFILL
(14) HIERARCH TERMS: 1HA/2HF, 1IL; 1SJ/2SJ
(15) STIMS ACC.NO.: 00S41213
(16) CITATION: 19(13):36, 56-57, Dec. 1976.

(1) SWIRS ACC.NO.: 041993
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Land disposal of hazardous wastes: an example from Hopewell, Virginia.
(4) AUTHOR: Walz DH
(6) JOURNAL TITLE: Ground Water
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2VA/3HW (10) PUB. YEAR: 1977
(11) ABSTRACT: In early September 1975 a Technical Committee was established by the Virginia State Department of Health to clean up and dispose of a manufacturing plant which had produced the pesticide Kepone, in Hopewell, Virginia. The committee recommended that the hazardous wastes be buried in a virgin section of the new City of

Hopewell landfill. The disposal pit was designed to encapsulate the wastes in clay and plastic. The project was completed in early March 1976. The disposal site is monitored by the Virginia State Water Control Board via an observation well and an underdrain system.

(12) KEYWORDS: BURY; CLAY; DISPOSAL; GROUND WATER; LAND; LEACH; MONITOR; MUNICIPALITY; PESTICIDE; PLASTIC; PROGRAM; SANITARY LANDFILL; SITES; VIRGINIA

(14) HIERARCH TERMS: 1HA; 1PE; 1SD/2SG

(15) STIMS ACC.NO.: 00S41037 (15) SECONDARY AUTHORS: Chestnut KT Jr

(16) CITATION: 15(1, Special Issue):75-80, Jan.-Feb. 1977.

(1) SWIRS ACC.NO.: 041622

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(4) AUTHOR: Lawson G (10) GEO. AREA: 1US/2FL (10) PUB. YEAR: 1976

(11) ABSTRACT: Disposal of pesticides in Dade County, Florida, is a serious problem because of heavy year round agricultural activity necessitating the use of fertilizers and pesticides. Principal methods for disposing of deteriorated pesticides and empty containers are burial, open burning, open storage, and open dumping. Because burial sites are unmarked, there is no accurate account of how widely this practice is used. Burning is done in open dump areas or fields. Indiscriminate dumping is the most widely practiced disposal method. Open storage is practiced by the more conscientious who hope that a solution of this disposal problem will be forthcoming. Environmental health problems associated with present disposal methods include water contamination, air contamination, and direct contact. The best way to dispose of deteriorated pesticides or residuals in containers is by destruction.

(12) KEYWORDS: AGRICULTURE; AIR; BURNING; BURY; CONTAINER; COUNTY; DISPOSAL; DUMPING; FLORIDA; HEALTH; PESTICIDE; POLLUTION; SAFETY; STORAGE; TOXIC; WATER

(14) HIERARCH TERMS: 1DD/2DF; 1PE

(15) STIMS ACC.NO.: 00S40666

(18) DOC.CIT.: Lawson, G. Pesticides pose disposal problem in Florida agricultural area. Journal of Environmental Health, 39(2):80-82, Sept./Oct. 1976.

(1) SWIRS ACC.NO.: 041520

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Lamberton JG (10) GEO. AREA: 1CI/2DV; 1DD/2DO (10) PUB. YEAR: 1976

(11) ABSTRACT: A study to determine how effectively pesticide containers are cleaned in the field by triple rinsing or by processing with detergents in a barrel cleaning installation was made. The studies included an analysis of samples of the drum itself, with special efforts to include the residues left in the chime of the rinsed or washed containers. Although barrels for several different types of pesticides were used, phorate was the only one for which an adequate number of barrels was available. Results showed that most (more than 95 percent) of the pesticide was removed when both triple rinsing and plant processing was employed. Either one of the processes used singly removed more than 60 percent of the residual phorate and had much greater variability than when both processes were used. The mean for plant processing was lower and the difference in the mean for the two processes was significant. The average amount of phorate remaining in the dual processed barrels was 1.27 g/drum and if these drums were used for drinking water, the amount could be considered a major health

hazard. Smaller animals and pets would be exposed to sublethal levels of phorate compound under these circumstances.
(12) KEYWORDS: CLEANUP; CONTAINER; HAZARDOUS; INVESTIGATION; PESTICIDE; PROCESS; RESIDUE; WASH
(14) HIERARCH TERMS: 1PE
(15) STIMS ACC.NO.: 00S40564 (15) SECONDARY AUTHORS: Tomson PA; Witt JM
(18) DOC.CIT.: Lamberton, J. G. , P. A. Tomson, and J. M. Witt. Pesticide container decontamination by aqueous wash procedures. Bulletin of Environmental Contamination and Toxicology, 16(5):528-535, Nov. 1976.

(1) SWIRS ACC.NO.: 041459
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Bokil SD (10) GEO. AREA: 1AI/2IN (10) PUB. YEAR: 1976
(11) ABSTRACT: The overall problem of the widespread presence of pesticides in the environment is discussed from the point of view of environmentalists concerned about the integrity of the environment. The aspects covered include the growth of the pesticide industry in India, the presence of pesticides on land, in air and water and the consequential effects on ecological cycles. The mechanisms of pesticide action and the toxic effects on living beings are also considered.
(12) KEYWORDS: CONTROL; ECOLOGY; EFFECT; ENVIRONMENT; FAR EAST; HUMAN; INDIA; INDUSTRY; PESTICIDE; TOXIC
(14) HIERARCH TERMS: 1ED; 1PE
(15) STIMS ACC.NO.: 00S40503 (15) SECONDARY AUTHORS: Iyengar L
(18) DOC.CIT.: Bokil, S. D. , and L. Iyengar. Pesticides in the environment. Journal of Scientific and Industrial Research, 34(11):625-630, Nov. 1976.

(1) SWIRS ACC.NO.: 040949
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) GEO. AREA: 1US/2VA (10) PUB. YEAR: 1976
(11) ABSTRACT: Difficulties experienced by Allied Chemical in the disposal of kepone and materials contaminated by kepone are explored. The selection of disposal methods and sites is a major problem. Particular reference is made to the problems caused by kepone in the James River area of Virginia. The Justice Department ordered Allied Chemical to pay for the costs of cleaning up the James River and stated that it should make suitable remuneration for expenses incurred by the Environmental Protection Agency in sampling, monitoring, and analyzing various media for kepone. The expenses of the Environmental Protection Agency have exceeded $1 million, according to the Justice Department. Allied Chemical was fined $13. 2 million in October 1976 for discharging kepone into the James River. Burning tests, which would cost the Environmental Protection Agency $116,000 and the State of Virginia $84,000, were scheduled to begin in late October 1976 and were to have been completed in November 1976. Based on the results of these tests, a mobile incineration was to be designed for use in disposing of kepone. Allied Chemical faced engineering difficulties and the tests were rescheduled for December 1976 or January 1977. Problems involved in the disposal of burnable and nonburnable materials are delineated.
(12) KEYWORDS: CHEMICAL; CLEANUP; DISPOSAL; ECONOMICS; EPA; FINE; HAZARDOUS; INCINERATOR; INDUSTRY; MOVABLE; PROCESS; SITES; TOXIC; VIRGINIA; WATERWAY
(14) HIERARCH TERMS: 1TD/1DD
(15) STIMS ACC.NO.: 00S39993
(18) DOC.CIT.: Allied has hard time disposing of kepone. Chemical and Engineering News, 54(49):6, Nov. 29, 1976.

(1) SWIRS ACC.NO.: 040535
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(4) AUTHOR: Grison P (10) GEO. AREA: 1MF; 1PE (10) PUB. YEAR: 1976
(11) ABSTRACT: The use of new pesticides with entomopathogenic germs such as Bacillus thuringiensis raises the problem of knowing the fate of the microorganisms introduced and disseminated in large numbers in the agricultural or forest ecosystems in order to control the populations of insect pests. For this purpose an air sampling was developed by comparing the performances of several types of sensors as well as a soil sampling which allows separate scrutiny of the superficialcial plant litter and the subterranean layers it covers. The investigations regularly effected in each intervention zone allowed study of the germ survival and persistence : whereas in the air layer the B. thuringiensis spores can no more be detected after two or three years by the sensors utilized because of their important dispersion, in the soil top layers their accumulation which remains more easy to detect seems to make possible a longer study of the persistence. The trials achieved in addition to determine the influence of the environment factors on the germ survival reveal the protecting effect of the forest stands as far as the role of ultraviolet rays and sun rays are concerned. The mode of contamination seems to play a predominant role in the reactions towards the environment factors. (Text in French)
(12) KEYWORDS: AIR; CONTROL; EARTH; EFFECT; ENVIRONMENT; EUROPE; FRANCE; INSECT; INVESTIGATION; MICROORGANISM; PESTICIDE; POLLUTION; SAMPLING METHODS; TRANSPORT
(14) HIERARCH TERMS: 1ED
(15) STIMS ACC.NO.: 00S39579 (15) SECONDARY AUTHORS: Martouret D; Servais B
(18) DOC.CIT.: Grison, P. , D. Martouret, and B. Servais. Pesticides microbiens et environnement. (Pesticides and environment.) Annales de Zoologie Ecologie Animale, 8(2):133-160, 1976.

(1) SWIRS ACC.NO.: 040473
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Adams RT (10) GEO. AREA: 1PE (10) PUB. YEAR: 1976
(11) ABSTRACT: Simulation of Contaminant Reactions and Movement (SCRAM) is a computer simulation designed to predict the movement of pesticides from agricultural lands. SCRAM is composed of deterministic submodels which describe the following physical processes: infiltration, percolation, evaporation, runoff, sediment loss, pesticide adsorption and desorption in the soil profile, pesticide microbial degradation in the soil profile, and pesticide volatilization. SCRAM predictions of these physical processes are compared to experimental data furnished by the Southeast Environmental Research Laboratory in cooperation with the Southern Piedmont Conservation Research Center. Simulated runoff for two small watersheds (less than 3 hectares) near Athens, Georgia, agrees reasonably well with experimental data. Sediment loss is not as accurately predicted. Predictions of pesticide loss in the runoff and on the sediment are in reasonable agreement with experimental data if allowance is made for the effects of inaccurately predicting sediment loss. (Retained in SWIRS library)
(12) KEYWORDS: AGRICULTURE; BIOLOGICAL; COMPUTER; DECOMPOSE; EARTH; EROSION; EVAPORATION; GEORGIA; HYDROLOGY; MATHEMATICAL MODEL; PERCOLATE; PESTICIDE; PROCESS; PROJECTION; SIMULATION; TRANSPORT; WATERWAY
(14) HIERARCH TERMS: 1AE
(15) STIMS ACC.NO.: 00S39517 (15) SECONDARY AUTHORS: Kuriso FM
(18) DOC.CIT.: Adams, R. T. , and F. M. Kuriso. Simulation of pesticide movement on small agricultural watershed. Environmental Protection Publication EPA-600/3-76-066. Athens, GA, U. S. Environmental Protection Agency, Sept. 1976. 342 p. (Ecological Research Series.)

(1) SWIRS ACC.NO.: 040097
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Yang HS (10) GEO. AREA: 1FD/2FX (10) PUB. YEAR: 1976
(11) ABSTRACT: Sugarbeet pulp and molasses from 57 processing plants in 16 states sampled for pesticide residues. No molasses samples contained detectable pesticide residues, but about 15 percent of the pulp samples contained low levels of dieldrin, toxaphene, or DDT and its degradation products. Sugarbeet pulp, when used as animal feed, can be a source of pesticidal contamination of human food. Three tables present number and type of samples collected, chemical compounds, and arithmetic mean and range of pesticide residues.
(12) KEYWORDS: ANALYSIS; CATTLE; CHEMICAL; CHLORINE; CONTAMINATE; FEED; HAZARDOUS; ORGANIC; PESTICIDE; PLANT-INDUSTRIAL; PULP; RESIDUE; SUGAR; TECHNOLOGY; TOXIC; US
(14) HIERARCH TERMS: 1PE
(15) STIMS ACC.NO.: 00S39141 (15) SECONDARY AUTHORS: Mitchell WG; Wiersma GB
(18) DOC.CIT.: Yang, H. S. , G. B. Wiersma, and W. G. Mitchell, Organochlorine pesticide residues in sugar beet pulps and molasses from 16 states, 1971. Pesticides Monitoring Journal, 10(2):41-43, Sept. 1976.

(1) SWIRS ACC.NO.: 039499
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Three chronic bioassays of the widely used insecticide Guthion were conducted with fathead minnows. All tests were begun with eggs, and the longest lasted 20 days after termination of spawning, a total of 250 days. Parameters measured were survival, growth, fecundity, and growth and survival of second generation fry and eggs. The most sensitive criteria for effect of the toxicant was fecundity. The maximum acceptable toxicant concentration was between 0. 33 and 0. 51 micrograms/liter Gutnion and the application factor between . 00017 and . 00027. (Retained in SWIRS library)
(12) KEYWORDS: EFFECT; FISH; ORGANIC; PESTICIDE; PHOSPHATE; POLLUTION; QUALITY; RESEARCH; TOXIC; WATER
(15) STIMS ACC.NO.: 00S38543
(18) DOC.CIT.: Adelman, I. R. , and L. L. Smith, Jr. Standard test fish development. part 2. chronic toxicity of guthion to the fathead minnow. Environmental Protection Publication EPA-600/3-76-061b. Duluth, MN, U. S. Environmental Protection Agency, July 1976. 31 p. (Ecological Research Series.)

(1) SWIRS ACC.NO.: 039472
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The presence and effects of pesticides (i. e. , insecticides, herbicides, fungicides, etc.) and industrial toxicants in the estuarine ecosystem are presented. The industrial toxicants refer, primarily, to polychlorinated biphenyls, but phthalate esters, polychlorinated terphenyls, chlorinated dibenzodioxins and dibenzofurans are also discussed. The review covers literature of the last decade, with emphasis on the most recent 5 years. However, the 700 plus references in the bibliography span a much wider range. A permuted keyword retrieval system (SPINDEX) is provided to allow practical use of the bibliography by scientists, academicians, and societal decision makers. (Retained in SWIRS library)
(12) KEYWORDS: BIBLIOGRAPHY; DATA; ECOLOGY; EFFECT; LITERATURE; ORGANIC; PESTICIDE; POLYCHLORINATED; SYNTHETIC; TOXIC; WATERWAY
(15) STIMS ACC.NO.: 00S38516
(18) DOC.CIT.: Lineer, J. L. , M. E. Haynes, and M. L. Klein. The ecological impact of synthetic organic compounds on estuarine ecosystems. Environmental Protection Publication EPA-600/3-76-075. Gulf Breeze, FL, U. S. Environmental Protection Agency, Sept. 1976. 364 p. (Ecological Research Series.)

(1) SWIRS ACC.NO.: 039390
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Results of laboratory studies to quantitatively predict chemical and photochemical transformation rates and products of pesticides in water are presented. Included is a general discussion of relevant transformation processes and associated kinetic expressions. The processes treated in most detail are hydrolysis, direct photolysis, and reaction with singlet oxygen. Implications of other processes such as oxidation and sensitized photolysis are also discussed. Results of detailed studies are included for the pesticides, malathion, carbaryl, methoxychlor, captan, and 2,4-D esters. The measured rate constants and half lives indicate that chemical and/or photochemical processes of these compounds are likely to be important in the aquatic environment.
(12) KEYWORDS: ANALYSIS; CHEMICAL; DECOMPOSE; EFFECT; HYDROLYSIS; LIGHT; OXIDATION; PESTICIDE; POLLUTION; PROCESS; SYSTEM; TRANSPORT; WATER
(15) STIMS ACC.NO.: 00S38434
(18) DOC.CIT.: Wolf, L. W. , R. G. Zepp, and G. Baughman. Chemical and photochemical transformation of selected pesticides in aquatic systems. Environmental Protection Publication EPA-600/3-76-067. Athens, GA, U. S. Environmental Protection Agency, Sept. 1976. 141 p. (Ecological Research Series.)

(1) SWIRS ACC.NO.: 039379
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1975
(11) ABSTRACT: Chemical degradation/detoxification methods for the disposal of small quantities of pesticide wastes are studied. The objective is to advise pesticide users of safe, readily available chemical methods for pesticide disposal. Another objective is to warn th
(12) KEYWORDS: CHEMICAL; CLASSIFICATION; DECOMPOSE; DIRECTORY; DISPOSAL; HAZARDOUS; MANUAL; PESTICIDE; PUBLIC; TECHNOLOGY
(15) STIMS ACC.NO.: 00S38423
(18) DOC.CIT.: Shih, C. C. , and D. F. DalPorto. Handbook for pesticide disposal by common chemical methods. Environmental Protection Publication EPA-530/sw-112c. Wasington, U. S. Environmental Protection Agency, Dec. 1975. 109 p. (Distributed by National Technical Information Services, Springfield, VA, as PB 252 864.)

(1) SWIRS ACC.NO.: 038832
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: Applications of macroreticular XAD 2 resin sorption methods fo the convenient monitoring of selected lipophilic contaminants in water are discussed. In one extensive study the concentrations of three pesticides, atrazine, DDE, and dieldrin, in various surface, subsurface and finished waters were measured. The amounts ranged from several micrograms to less than one nanogram per liter (ng/l) of water. Surface water from every major watershed in the State of Iowa had appreciable levels of contamination with seasonal and climatic fluctuations which were consistent with an agricultural runoff model. Waters from shallow wells and from water treatment plants were also contaminated. The contamination was either not detected or found at less than one ng/l in water from deep wells located outside the alluvial plain of contaminated rivers. Water treatment processes, even charcoal bed filtration as employed at one modern treatment plant, were shown to be ineffective in reducing the pesticide concentration. Other applications and tests of the resin sorption method for monitoring selected organic contaminants are presented, as well as numerous tables and diagrams. (Document retained in SWIRS library.)
(12) KEYWORDS: CONCENTRATION; CONTAMINATE; IOWA; MEASUREMENTS; MONITOR; PESTICIDE; PROCESS; RESEARCH; RESIN; UNIVERSITY; WATER; WATERWAY
(15) STIMS ACC.NO.: 00S37876
(18) DOC.CIT.: Junk, G. A. , J. J. Richard, and J. S. Fritz. Resin sorption methods for monitoring selected contaminants in water. Ames, Iowa State University, 1976. 43 p.

(1) SWIRS ACC.NO.: 038587
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Forty nine reports on endrin toxicity and distribution in freshwater are summarized. Endrin is one of the most toxic of all economic poisions to fish. The review examines acute toxicity to fish, freshwater insects and crustacea, the effects of chronic toxicity on growth, gonad development, thyroid activity, serum characteristics, body fat, behavior and mortality, endrin uptake in various species of fish, endrin resistance in freshwater organisms, factors affecting endrin toxicity and the environmental distribution of endrin. Maximal amounts of 2 pptr endrin in water are recommended if aquatic organisms are to be protected.
(12) KEYWORDS: CALIFORNIA; CONTROL; EFFECT; ENVIRONMENT; FISH; MISSOURI; PESTICIDE; POLLUTION; TOXIC
(15) STIMS ACC.NO.: 00537631
(18) DOC.CIT.: Grant, B. F. Endrin toxicity and distribution in freshwater: a review. Bulletin of Environmental Contamination and Toxicology, 15(3):283-290, Mar. 1976.

(1) SWIRS ACC.NO.: 038563
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: An epidemiological study of pesticide levels is motivated by the very small number of determinations carried out in France among the unexposed population. A further aim of the study is to attempt to establish correlation between the highest blood levels and the source of the polluting substances with a view to suggesting preventive measures to reduce the contamination. It is noted that surveys of various kinds are usually designed to determine the quantities of contaminants ingested with food as the most important, but not the only route of intake. It is concluded that use of household insecticides in the home and determination of the levels of contamination caused by their use may be the critical basis in determination of the source and effect of environmental pollutants on human health. (Text in French)
(12) KEYWORDS: CONTAMINATE; DOMESTIC; EPIDEMIOLOGY; FOOD; PARIS; PESTICIDE; POLLUTION; REDUCTION; UTILIZE
(15) STIMS ACC.NO.: 00537607
(18) DOC.CIT.: Piva, C. , M. L. Efthymiou, and E. Fournier. Enquete portant sur la consummation familiale de pesticides dans les familles habitant dans de grands ensembles de la region Parisienne: methodologie. (Inquiry on pesticide usage in families living in crowded sections of Paris.) In Proceedings; International Symposium on the Recent Advances in the Assessment of the Health Effects of Environmental Pollution, Paris, June 24-28, 1974. v. 3. Luxembourg, Commission of the European Communities, 1975. p. 1789-1894.

(1) SWIRS ACC.NO.: 038558
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975
(11) ABSTRACT: Activated atoms were used to determine the possibility and extent of contamination of underground water by pesticides used in agriculture. The sorption and dynamics of the migration of two organophosphorous pesticides, fenitrothion and malathion, were studied. These two products are currently being proposed as agricultural pesticides. They would replace other substances of the chlorinated hydrocarbon group, including DDT, which are more dangerous to health, but are themselves source of potential contamination of underground waters. Studies were carried out on different types of soil: sandy and clay. Isotherms were determined for the sorption of the pesticides examined, together with their distribution coefficients. The effects of pH values, exchangeable ions, organic substances (organic carbon and nitrogen) and the mechanical composition of the sorption of fenitrothion and malathion were studied. Results of the study, including the washing out factor of these pesticides from the soil by rainfall are given in detail.

Investigations were conducted with the use of the radionuclide labelled compound technique.

(12) KEYWORDS: AGRICULTURE; CONTAMINATE; GROUND WATER; HEALTH; HYDROCARBON; ISOTOPE; PESTICIDE; RADIOACTIVE; SAMPLING METHODS; UTILIZE

(15) STIMS ACC.NO.: 00S37602

(18) DOC.CIT.: Szperlinski, Z. The use of radioisotopes 32P and 35S in studies on behavior of pesticides in the soil. In Proceedings; International Symposium on the Recent Advances in the Assessment of the Health Effects of Environmental Pollution, Paris, June 24-28, 1974. v. 3. Luxembourg, Commission of the European Communities, 1975. p. 1711-1717.

(1) SWIRS ACC.NO.: 038330

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Both DDE and dieldrin are detected in the offshore waters of the western North Atlantic Ocean from the surface to 1,000 m depth. The mean concentrations of the two pesticides are 3. 8 (DDE) and 5. 8 (dieldrin) parts per trillion (ng/l.). Other chlorinated pesticides (lindane, aldrin, DDD, and DDT) could not be detected, at most sample sites, by currently available analytical techniques. The data suggest that considerable variability, both with depth and distance from shore, is a dominant feature of the distribution of chlorinated pesticides in the North Atlantic Ocean. Concentrations of DDE and dieldrin range from 0. 1 to 18. 1 and 0. 4 to 19. 4 ng/l, respectively. The observed environmental distribution of these pesticides would be consistent with an hypothesis of uptake and transport of these compounds on particulates in the sea. The study was done by Department of Environmental Sciences and Engineering, School of Public Health, University of North Carolina, Chapel Hill, N. C. 27514.

(12) KEYWORDS: CHLORINE; HYDROCARBON; OCEAN; PESTICIDE; RESEARCH; TRANSPORT; UNIVERSITY

(15) STIMS ACC.NO.: 00S37374

(18) DOC.CIT.: Jonas, R. B. , and F. K. Praender. Chlorinated hydrocarbon pesticides in Western North Atlantic Ocean. Environmental Science and Technology, 10(8):770-773, Aug. 1976.

(1) SWIRS ACC.NO.: 037812

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Control of wastes in the manufacture of pesticides involves strict process controls, to reduce to a minimum the wastes which must be treated, and advanced waste treatment measure, to successfully treat toxic wastes prior to their release to the air or water. Many methods are used to recover plant wastes. Curbs and collecting sumps are placed around pumping areas. Tanks are used to collect pump drippings and accidental losses. Such lost material may be returned to the process. Drain tiles, connected to a collecting dump, catch contaminants which may have seeped into the ground. Filters and scrubbers recover particulates. Industrial vacuum cleaners are used to immediately clean up spills of dry materials. Empty containers are never abandoned or allowed to accumulate in an area accessible to humans or animals. They are either burned, if combustible, or decontaminated, if noncombustible. If not contaminated, rinse solutions are burned in an isolated area away from water supplies. A summary of the principle wastes generated and the disposal method employed by the producers of the key pesticides is included.

(12) KEYWORDS: CHEMICAL; DEEP WELL; DISPOSAL; HAZARDOUS; INCINERATION; INDUSTRY; OCEAN; ORGANIC; PESTICIDE; SANITARY LANDFILL; TOXIC

(15) STIMS ACC.NO.: 00S36856

(18) DOC.CIT.: Powers, P. W. Pesticide industry waste. In: How to Dispose of Toxic Substances and Industrial Wastes, Noyes Data Corporation, 1976, 497 p. (p. 386-407).

(1) SWIRS ACC.NO.: 037525
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Chemical, biochemical, and toxicological properties of carbamate insecticides are reviewed. In analyzing available literature on the properties of carbamate insecticides, consideration is given to synthesis and residue methodology (chemistry); mode of action, metabolism, and metabolic reactions (biochemistry); and effects of carbamate insecticides on target and nontarget organisms (toxicology). Ten chapters in the book are specifically concerned with the following: development and use of carbamate insecticides, chemistry and synthesis, mode of action (cholinesterase inhibition and signs and symptoms of poisoning), structure-activity relationships of aromatic and oxime carbamates, toxicology, metabolic reactions (hydrolysis, oxidation, and conjugation), metabolism of various carbamates, biological and environmental stability, residue methodology, and resistance and synergism.
(12) KEYWORDS: ANALYSIS; BIOLOGICAL; CHEMICAL; COMPOSITION; ENVIRONMENT; HEALTH; HYDROLOGY; LITERATURE; MANUAL; OXIDATION; PESTICIDE; RESIDUE; SAFETY; TOXIC
(15) STIMS ACC.NO.: 00S36569
(16) DOC.CIT.: Kuhr, R. J. , and H. W. Dorough. Carbamate insecticides: chemistry, biochemistry, and toxicology. Cleveland, CRC Press, Inc. , 1976, 301 p.

(1) SWIRS ACC.NO.: 037375
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: A monitoring program on the environmental effects of using Mirex, an organochlorine pesticide, in pineapple growing areas of Hawaii is reported. A 2-yr surveillance monitoring program was required by the Environmental Protection Agency and was conducted during 1972-1973. Objectives of the program were as follows: (1) determine whether Mirex was escaping from pineapple fields to coastal waters; (2) learn if the pesticide was accumulating in aquatic biota to detectable levels; and (3) select biota and substrates representing a wide range of ecological niches and trophic levels. Results of the 1972-1973 monitoring program indicated that Mirex usage in Hawaii created no aquatic environmental problem. A 1973-1974 Mirex monitoring program emphasized terrestrial rather than aquatic environmental monitoring. Mirex accumulated to appreciable levels in some mammals and birds in one pineapple growing area. In two rat species, Mirex levels peaked out during the first three post-application cycles. Mirex residuals in the mongoose began to drop after the fifth cycle. It appeared that, for birds and rodents, Mirex was assimilated through opportunistic feeding on Mirex baits rather than by a more gradual assimilation through food webs. For the mongoose, the more gradual buildup of detectable Mirex may have been the result of bioaccumulation. There was no evidence of Mirex buildup in the aquatic organisms sampled. It was recommended that biological studies be conducted to determine if the detected levels of Mirex have an adverse effect on wildlife.
(12) KEYWORDS: ANIMAL; BIOLOGICAL; CONCENTRATION; EFFECT; EPA; FRUIT; HAWAII; LAND; LEACH; MEASUREMENTS; MONITOR; OCEAN; PESTICIDE; POLLUTION; PROGRAM; RESEARCH; RODENT
(15) STIMS ACC.NO.: 00S36420
(16) DOC.CIT.: Johnson, J. M. , A. M. Dollar, and D. C. Cox. Mirex monitoring in Hawaii, a cooperative venture. Journal of Environmental Health, 38(4):254-258, Jan. /Feb. 1976.

(1) SWIRS ACC.NO.: 037373
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Fish acetylcholinesterase (AChE) was used to investigate possible antiAChE poisoning resulting from the discharge of effluent into a river system by a manufacturer of organophosphate and carbamate pesticides. Since organophosphate and carbamate pesticides act as nerve poisons by inhibiting the neurotransmitter modulating

enzyme AChE in the nervous system, poisoning of fish was diagnosed by the measurement of brain AChE in fish collected from the Missouri River upstream and downstream from the mouth of the Blue River in Kansas City, Missouri. Other fish were exposed to diluted effluent in glass jars and their brain AChE was measured to determine the combined poisoning potential of compounds present. Fish immediately downstream repeatedly had lower brain AChE activity than fish upstream. Fish exposed to diluted effluent had lower brain AChE activity than unexposed fish. Chemical analyses showed substantial amounts of AChE-inhibiting pesticides in effluent relative to their toxicities. Study data indicated that effluent is a contributing factor in the reduced brain AChE activity of Missouri River fish and that brain AChE is a sensitive and reliable indicator of such pollution. (Author Abstract Modified)

(12) KEYWORDS: BIOLOGICAL; DISCHARGE; DISEASE; EFFECT; EFFLUENT; FISH; MEASUREMENTS; MISSOURI; PESTICIDE; PLANT-INDUSTRIAL; TOXIC; WATERWAY

(15) STIMS ACC.NO.: 00S36418

(18) DOC.CIT.: Coppage, D. L. , and T. E. Braidech. River pollution by anticholinesterase agents. Water Research, 10(1):19-24, 1976.

(1) SWIRS ACC.NO.: 037326

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Laboratory experiments were conducted to determine the effects of mirex, methoxychlor, and malathion on the larval development of crabs (Callinectes sapidus and Rhithropanopeus harrisii species), from the time of hatching until the first crab stage is reached. The effect of a range of concentrations for each insecticide on the survival of larvae was determind, as well as concentrations which were sublethal land lethal. Zoeal and total development to the first crab stage for both species was prolonged in relation to increased concentrations of methoxychlor and malathion. Other sublethal effects of these two insecticides included abnormal development of pleopods for male crabs of both species during early crab stages and autotomy of the legs of Rhithropanopeus harrisii megalopa and early crab stages. Developmental stages in which larvae were particularly sensitive varied in the two crab species and with the three insecticides. Mirex residues of Callinectes sapidus larvae reared in different concentrations of mirex were determined, along with methoxychlor residues of Rhithropanopeus harrisii and Callinectes sapidus larvae reared in concentrations of methoxychlor. (Document retained in SWIRS library)

(12) KEYWORDS: BIOLOGICAL; CHEMICAL; CONCENTRATION; EFFECT; FISH; INVESTIGATION; PESTICIDE; RESIDUE; TOXIC

(15) STIMS ACC.NO.: 00S36371

(18) DOC.CIT.: Bookhout, C. G. , and J. D. Costlow, Jr. Effects of mirex, methoxychlor, and malathion on development of crabs. Environmental Protection Publication EPA-600/3-76-007. Gulf Breeze, FL, U. S. Environmental Protection Agency, Mar. 1976, 86 p. (Ecological Research Series)

(1) SWIRS ACC.NO.: 037321

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Results of a study concerning effects, uptake, and metabolism of mirex, methoxychlor, and 2,4-D in the seaweeds Ulva sp. , Enteromorpha sp. , and Rhodymenia sp. are presented. None of the pesticides, at concentrations corresponding to their maximum solubility in seawater, had any significant effect on photosynthesis, protein, carbohydrate, lipid, chlorophyll, carotenoid or trace metal content of the algae. All three algae removed substantial amounts of mirex and methoxychlor from the medium, but uptake of 2,4-D was extremely low. The rate of uptake of methoxychlor was considerably greater than that of mirex. Enteromorpha accumulated considerably more mirex and methoxychlor than Ulva or Rhodymenia. Both Ulva and Enteromorpha failed to metabolize either mirex or 2,4-D. Enteromorpha metabolized

methoxychlor to a limited extent. After 7 days of incubation with carbon-labelled methoxychlor, a major portion of the label in the tissue and medium was present in unchanged methoxychlor. A small amount of radioactive metabolite, 2,2-bis (p-methoxyphenyl)-1, 1-dichloroethylene, was detected in both the tissue and medium. In addition, medium contained 2,2-bis (p-hydroxyphenyl)-1,1,1-trichloroethane and four unidentified minor radioactive metabolites. Unlike Enteromorpha, Ulva, did not metabolize methoxychlor. (Author Abstract) (Document retained in SWIRS library)

(12) KEYWORDS: ALGAE; ANALYSIS; CHEMICAL; COLLECTION; COMPARISON; CONCENTRATION; EFFECT; INVESTIGATION; METAL; PESTICIDE; PROTEIN; TOXIC; VEGETATION

(15) STIMS ACC.NO.: 00S36366

(18) DOC.CIT.: Sikka, H. C. , G. L. Butler, and C. P. Rice. Effects, uptake, and metabolism of methoxychlor, mirex, and 2,4-D in seaweeds. Environmental Protectioin Publication 600/3-76-048. Gulf Breeze, FL, U. S. Environmental Protection Agency, June 1976, 48 p. (Ecological Research Series)

(1) SWIRS ACC.NO.: 036761

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A 1970 survey of 26 water supplies in the New Orleans metropolitan area was undertaken to assess the quality of drinking water in the area. A continuous liquid/liquid extraction apparatus was used to monitor the levels of eight chlorinated hydrocarbon pesticides in the Mississippi River at a location approximately one river mile above the intakes for New Orleans' water purification facility. Pesticides were sampled for a 7-day period, with recovery rates tabulated for gamma-chlordane, lindane, heptachlor, heptachlor epoxide, dieldrin, endrin, p,p'-DDD, and p,p'-DDT. The results of statistical calculations on pesticide concentrations are presented. These calculations indicated that a minimum of 49. 7 lbs of the eight pesticides (combined weight) is introduced to the Gulf of Mexico on a daily basis.

(12) KEYWORDS: CHLORINE; HYDROCARBON; LOUISIANA; MEASUREMENTS; MONITOR; PESTICIDE; POLLUTION; SAMPLING METHODS; WASTE WATER; WATERWAY

(15) STIMS ACC.NO.: 00S35806

(18) DOC.CIT.: Brodtmann, N. V. , Jr. Continuous analysis of chlorinated hydrocarbon pesticides in the lower Mississippi River. Bulletin of Environmental Contamination and Toxicology, 15(1):33-39, 1976.

(1) SWIRS ACC.NO.: 036453

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The acute toxicity of four technical grade insecticides to the marine copepod Acartia Tonsa Dana was determined by bioassay using standardized procedures, homogeneous populations, and constant laboratory conditions. At a water temperture of 17 degrees C, 96-hour median lethal concentrations or tolerance limits for methyl parathion, azodrin, diazinon, and toxaphene were computed as 0. 89 mg per liter, respectively. Residue analysis for diazinon at zero and 96-hour exposure times revealed that the amount of diazinon uptake by three algal organisms was greater than the amount concentrated by the marine copepod. The toxicity of higher concentrations above 2. 0 ppm (2 mg per liter) offset copepod uptake while, at lower concentrations, quantities concentrated by the copoped were negligible. A literature review is included that was conducted to examine supporting insecticide toxicity data for species closely related to the marine copepod.

(12) KEYWORDS: ALGAE; COMPARISON; CONCENTRATION; DATA; EFFECT; FISH; INVESTIGATION; MEASUREMENTS; PESTICIDE; TOXIC

(15) STIMS ACC.NO.: 00S35498

(18) DOC.CIT.: Khattat, F. H. , and S. Farley. Acute toxicity of certain pesticides to Acartia Tonsa Dana. Environmental Protection Agency Publication EPA-600/3-76-033. Narragansett, RI, U. S. Environmental Protection Agency, May 1976, 29 p. (Ecological Research Series.)

(1) SWIRS ACC.NO.: 036237
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975
(11) ABSTRACT: The effect of small doses of pesticides, i. e. , 0 to one tenth LD50, and their inhibitory effect on cholinesterase in the human organism, were studied on a model. Three organic phosphorus pesticides were investigated: metaphose (mainly), rogor and cidial. It was proven that most toxic effects are produced when the preparations enter the body through the skin.
(12) KEYWORDS: CHEMICAL; EFFECT; HUMAN; INVESTIGATION; MOLECULAR MODEL; PESTICIDE; PHOSPHORUS; TOXIC
(15) STIMS ACC.NO.: 00535282
(18) DOC.CIT.: Spynu, Ye. I. , R. Ye. Sova, and A. V. Bolotnyy. Overall effects of organic phosphorus pesticides. (O kompleksnom deystvii fosfororganicheskikh pestitsidov.) Gigiyena i Sanitariya, 12:15-17, 1975.

(1) SWIRS ACC.NO.: 036115
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Cylodiene insecticides are discussed in relation to their mode of action, excretion, and metabolism. Toxaphene was the primary candidate for investigation, with major emphasis on the mammalian system. The excretion of 36C1-toxaphene was studied in the laboratory rate. Upon extraction, most of the radioactivity occurred in water fractions of urine and feces as ionic chloride, indicating considerable metabolism of toxaphene. Only minimal storage appeared to occur. The uptake of radio activity in several tissues of insects (Leucophaea maderae) was determined after injections of 36C1-toxaphene. In subcellular particles of ventral nerve cord and brain, significant levels of 36C1-toxaphene were observed in larger cell fragments and microsomes were also labeled. Ventral nerve cords of the insects and of cockroaches (Periplaneta americana) showed increased activity when exposed to toxaphene. The toxicity of toxaphene to mosquitofish (Gambusia affinis) was divided into five stages, and the residue level at each stage was determined. Metabolic alteration of toxaphene appeared to be minimal and excretion was not observed.
(12) KEYWORDS: ANALYSIS; BIOLOGICAL; CHEMICAL; EFFECT; HAZARDOUS; INSECT; PESTICIDE; RODENT
(15) STIMS ACC.NO.: 00535160
(18) DOC.CIT.: Crowder, L. A. Mode of action of cyclodiene insecticides. Research Triangle Park, NC, U. S. Environmental Protection Agency, Jan. 1976, 75 p.

(1) SWIRS ACC.NO.: 036103
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Several isolated nerve and muscle preparations from the crayfish and frogs were tested for their suitability in evaluating the toxic effects of pesticides and environmental agents. The abdominal nerve cord preparation isolated from the crayfish was far superior to frog neuromuscular and crayfish neuromuscular preparations for evaluating the neurotoxicity of various agents. Neurotoxicity was mainifested as stimulation and/or paralysis or spontanious discharges of nerve cords. The techniques utilized in the experiments were simple and required only reasonable amounts of conventional electrophysiological equipment. It was determined that toxicity evaluations can thus be performed with a moderate amount of expense. More sophisticated and efficient data acquisition systems could be developed, however, using basically the same techniques. The order of potency for various insecticides in stimulating the crayfish abdominal nerve cord was found to be as follows, in descending order of effect: allethrin, carbofuran, carbaryl, Baygon (propoxur), p,p'-DDT, toxaphene, ferbam, monocrotophos, dursban, chlordimeform, leptophos, and dichlofenthion. No neurotoxic effect was exerted by insect sex

attractants and insect growth regulators which included Altosid, Orfamone, Codlemone, ZR 777, cis-11 tetradecenyl acetate, and TH 6040.
(12) KEYWORDS: ANALYSIS; ANIMAL; BIOLOGICAL; CHEMICAL; ELECTRICAL; EQUIPMENT; HAZARDOUS; INSECT; MEASUREMENTS; PESTICIDE; TOXIC; WATERWAY
(15) STIMS ACC.NO.: 00S35148
(18) DOC.CIT.: Narahashi, T. In-vitro screening methods evaluating the neurotoxic potential of pesticides. Research Triangle Park, NC, U. S. Environmental Protection Agency, Jan. 1976, 45 p.

(1) SWIRS ACC.NO.: 035981
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: A research program is described that was initiated by the U. S. Environmental Protection Agency to determine design and operational criteria for incinerators that can effect complete thermal degradation of pesticides. An incineration system was designed and constructed to evaluate the effect of operational variables (rate of pesticide injection, percent excess air, operating temperature, and retention time) on the efficiency with which organic pesticides can be incinerated. This system included a pilot scale incinerator, three-stage scrubber, and a scrubber water treatment system. Nine pesticides in 15 liquid and solid formulations were tested by injection into the primary combustion chamber. The pesticides studied were DDT, aldrin, picloram, malathion, toxaphene, atrozine, captan, zineb, and mirex. Results of the incineration test were evaluated in terms of the efficiency of active ingredient destruction. Efficiencies of greater than 99. 99 percent were achieved for all pesticsded tested except mirex over a range of combustion chamber retention time-temperature combinations. Test results were used to estimate stack emission rates for the pesticides when incinerated at 1000 C (1832 F) with a 2-sec retention time. Analysis of incinerator effluents showed that high concentrations of sultur dioxide and cyanide were present when organosulfur and organonitrogen pesticides, respecively, were incinerated under certain operating conditions.
(12) KEYWORDS: CHAMBER; DECOMPOSE; DESIGN; EFFLUENT; EMISSION; INCINERATION; INCINERATOR; PESTICIDE; SCRUBBER; THERMAL; WATER
(15) STIMS ACC.NO.: 00S35026
(18) DOC.CIT.: Ferguson, T. L. , F. J. Bergman, G. R. Cooper. Determination of incineration operating conditions necessary for safe disposal of pesticides. Cincinnati, OH, U. S. Environmental Protection Agency, Dec. 1975. 401 p. EPA 600/2-75-041. EPA 68-03-0286.

(1) SWIRS ACC.NO.: 035966
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: Research accomplishments of the Health Effects Research Laboratory within the U. S. Environmental Protection Agency are summarized in regard to the chemistry and mode of action of insecticides, for the period between January 1, 1971 and September 1, 1975. The laboratory's studies on the chemistry and mode of action of insecticides are primarily concerned with intoxication and detoxication processes which take place when an animal or plant is exposed to different organic insecticides. Progress in the following general areas is reported: insecticide selectivity, insecticide metabolism, inhibition of cholinesterase enzymes, structure-activity relationships in insecticides, oxidative conversion of phosphorothionate to phosphate esters, insecticide synergism and insect growth regulators, chemiscal reaction involving carbamate and oryanophosphorus esters, insecticide cyclic nucleotide interactions, insecticide penetration and its relation to resistance, gas chromatography of insecticides, neurophysiological studies on insecticide mode of action, insecticide resistance, and joint action of herbicides and insecticides.
(12) KEYWORDS: BIOLOGICAL; CATALYST; CHEMICAL; MANUAL; ORGANIC; OXYGEN; PESTICIDE; PROCESS; TOXIC
(15) STIMS ACC.NO.: 00S35011
(18) DOC.CIT.: Fukuto, T. R. Chemistry and mode of action of insecticides. Research Triangle Park, NC, U. S. Environmental Protection Agency, Jan. 1976. 325 p. EPA-600/1-76-004.

(1) SWIRS ACC.NO.: 035655
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: Current studies on the effects of ocean pollution were discussed at the Pacific Conference on Chemistry and Spectroscopy. One study is about premature pupping in sea lions, another the lingering effects of dichlorodiphenyl-trichloroethane (DDT). The premature pupping by California sea lions may be linked to an imbalance of mercury, selenium, and bromine in some mothers. The premature births have been associated with pollution of the coastal waters by mercury, cadmium, polychlorinated biphenyls, and perhaps certain viruses. A combination of materials rather than a single one may cause the problem. The pups seem to have lower levels of mercury than normal sea lions. The ratio between concentrations of selenium and mercury in normal sea lions is 2.2 to 1 or less; in premature pups and their mothers the ratio was greater than 3.4 to 1. The livers of mothers and their premature pups have lower concentrations of bromine than normal. Bromine may help detoxify some of the metallic elements. A spokesman for the Southern California Coastal Water Research Project stated that even though the DDT levels in the Pacific Ocean along Southern California have decreased over the past 5 years, DDT will continue to be a major pollutant in that area for years to come. Industrial control measures have reduced DDT in sewage effluents from Los Angeles from 22 tons a year in 1971 to 1.5 tons in 1975. The pesticides have continued to build up in the underlying sediment. DDT levels in crabs, mussels, and other marine animals have declined. Fish that live on the sea bottom near the contaminated sediments have shown no decline in DDT concentrations.
(12) KEYWORDS: ANIMAL; CALIFORNIA; CONCENTRATION; CONTROL; EFFLUENT; FISH; HAZARDOUS; MERCURY; METAL; OCEAN; PESTICIDE; POLLUTION; SEWAGE; TOXIC; VIRUS
(15) STIMS ACC.NO.: 00S34700
(18) DOC.CIT.: Effect of trace metals on sea lions probed. Chemical & Engineering News, 53(46):34, Nov. 17, 1975.

(1) SWIRS ACC.NO.: 032172
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: In the past 4 years, 510 poisoning episodes with 35 fatalities were reported to the North Carolina Pesticides Program. Investigations into these events have delineated three important roles that containers play in the epidemiology of pesticide poisonings: container disposal, inappropriate container design, and lack of safety packaging. Case examples demonstrating the importance of each of these aereas are presented. Farmers and other pesticide users seldom decontaminate containers after use, and pesticide containers never contain instructions of how to render the containers less hazardous after use. However, it is known, for example, that rinsing parathion containers with water twice removes over 90 percent of the pesticide residue. The rinse water could be added to the spray tank. A cash deposit on pesticide containers would encourage their recycling. Pesticides are often sold in containers resembling milk or fruit juice containers. Containers should be designed to look as little as possible like such drinkable beverage containers. Furthermore, it it suggested that iridescent dyes be used in pesticides to further reduce accidental ingestions. Child-proof packaging must be more widely required.
(12) KEYWORDS: CONTAINER; DESIGN; DISEASE; DISPOSAL; HAZARDOUS; HEALTH; HISTORY; NORTH CAROLINA; PACKAGING; PESTICIDE; RECLAMATION; REGULATIONS; SAFETY; STATE; TOXIC
(15) STIMS ACC.NO.: 00S31216
(18) DOC.CIT.: Gebhach, S. H., and W. A. Wiliams. Pesticides containers, Their contribution to poisoning. Archives of Environmental Health, 30(1):49-50, Jan. 1975.

Section 10
RADIOACTIVE WASTES

(1) SWIRS ACC.NO.: 048211
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: The technology of waste management.
(6) JOURNAL TITLE: Nuclear Engring Inter
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2FR (10) PUB. YEAR: 1978
(11) ABSTRACT: Waste management technology is described for vitrification, calcination, compaction, and decontamination. The world's first industrial scale plant for vitrification of highly active wastes (Marcoule, France) will produce about 50 cu m of glass annually from dried, calcined liquid waste combined with glass frit. In the U.S., fluidized bed calcination is being used to condense highly active liquid waste into a form suitable for further treatment, such as incorporation in borosilicate glass. Work is also being carried out to evaluate a nuclear application of induction melting to reduce bulk by a factor of six. The removal of radioactive contamination from metal surfaces is also being studied by means of electropolishing. Demonstration of these techniques has indicated eventual application in radioactive waste handling and disposal.
(12) KEYWORDS: BULKY WASTES; COMPACTION; CONTAMINATE; DISPOSAL; FRANCE; GLASS; HAZARDOUS; MANAGEMENT; RADIOACTIVE; REFUSE; TECHNOLOGY
(14) HIERARCH TERMS: 1HC/2PT; 1RD/2DP
(15) STIMS ACC.NO.: 00S47264
(16) CITATION: 23(272):63-64, Jun. 1978.

(1) SWIRS ACC.NO.: 047057
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Profile report: iodine-129, iodine-131, krypton-85, xenon-133.
(4) AUTHOR: Blumenthal JL
(5) CORPORATE AUTHOR: TRW Systems Group
(6) BOOK TITLE: In Hazardous Waste Disposal Program, Eighth Monthly Report.
(8) NTIS NO.: PB-257 331 (8) REPORT NO.: TRW-21485-6008-TO-00
(9) CONTRACT NO.: EPA-68-03-0089
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The hazardous properties and management of iodine-129, iodine-131, krypton-85, and xenon-133 are discussed. Iodine, krypton, and xenon are produced during the fission of uranium in nuclear reactors. They represent a potential source of environmental contamination since they are released during the reprocessing of nuclear fuels. Consideration is given to uses of the fission products, sources and types of waste, and physical and chemical properties. Iodine, krypton, and xenon are moderately hazardous radioactive nuclides. Krypton and xenon are chemically inert and, once released, do not concentrate in body tissues, but iodine does reconcentrate. The effects of radiation exposure are primarily dependent on the amount of radiation and the portion of the body affected. For iodine, the critical organ is the thyroid. Besides its radiation hazard, iodine is moderately toxic. Krypton and xenon are only slightly toxic. Waste handling, storage, transportation, and disposal/reuse are examined. Iodine recovery can be accomplished by caustic scrubbers, activated charcoal, impregnated charcoal, and silver zeolite. Krypton and xenon recovery options are activated charcoal, cryogenic distillation, and fluorocarbon solvents. Three disposal options are land burial, near

surface storage, and salt deposits. The treatment of waste in national disposal sites is evaluated. (Retained in SWIRS library).
(12) KEYWORDS: CHEMICAL; DISPOSAL; GASSES; HAZARDOUS; MANAGEMENT; PHYSICAL; PROCESS; RADIATION; RADIOACTIVE; RECLAMATION; SITES
(14) HIERARCH TERMS: 1HC/2DP; 1HC/2PT; 1MA/2TQ; 1RD/2DP; 1RD/2SW
(15) STIMS ACC.NO.: 00546110 (15) SECONDARY AUTHORS: Clausen JF; Dal Porto DF
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sep. 1972. p.251-277.

(1) SWIRS ACC.NO.: 047056
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Profile report: carbon-14, cobalt-60, iridium-192, radium-226.
(4) AUTHOR: Blumenthal JL
(5) CORPORATE AUTHOR: TRW Systems Group
(6) BOOK TITLE: In Hazardous waste Disposal Program, Eighth Monthly Report.
(8) NTIS NO.: PB-257 331 (8) REPORT NO.: TRW-21485-6008-TO-00 (9) CONTRACT NO.: EPA-68-03-0089
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The hazardous properties and management of carbon-14, cobalt-60, iridium-192, and radium-226 waste are discussed. These radionuclides are representative of the radioisotopes of commercial interest which are generally produced in the private sector of the economy. Consideration is given to the manufacture and uses of the radionuclides, sources and types of waste, and physical and chemical characteristics. Radium-226 is one of the most hazardous radioactive materials known, with the effects of radiation exposure primarily dependent on the amount of radiation and the portion of the body affected. For radium-226 and carbon-14, the bones are critical. For cobalt-60 and iridium-192, the critical organs are the total body and the kidney, respectively. Carbon is not very toxic except for its radiation hazard. The toxicity of cobalt is also low. The toxicity of iridium is unknown, and radium's main hazard is its radioactivity. Waste handling, storage, transportation, and disposal/reuse are examined. Three disposal options are identified: (1) land burial; (2) near surface solid storage; and (3) salt deposits. The treatment of waste in national disposal sites is evaluated. (Retained in SWIRS library).
(12) KEYWORDS: CHEMICAL; DISPOSAL; HAZARDOUS; MANAGEMENT; PHYSICAL; PROCESS; RADIATION; RADIOACTIVE; RECLAMATION; SITES
(14) HIERARCH TERMS: 1HC/2DP; 1HC/2PT; 1MA/2TQ; 1RD/2DP; 1RD/2SW
(15) STIMS ACC.NO.: 00546109 (15) SECONDARY AUTHORS: Clausen JF; Dal Porto DF
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sep. 1972. p.229-249.

(1) SWIRS ACC.NO.: 044973
(2) DOMESTIC: D (2) CATEGORY: 50 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Characterization of untreated waste oil.
(4) AUTHOR: Chansky S
(5) CORPORATE AUTHOR: GCA Corporation
(6) BOOK TITLE: In Waste Automotive Lubricating Oil Refuse as a Fuel.
(8) NTIS NO.: PB 241 357 (8) REPORT NO.: EPA-600/5-74-032 (9) CONTRACT NO.: 68-01-1859
(10) LANGUAGE: EN (10) PUB. YEAR: 1974
(11) ABSTRACT: The characteristics of untreated automotive waste oil are described. Waste oil lubricants are composed of a heterogeneous group of oils, including waste crankcase oil, transmission fluid, differential gear lubricant, hydraulic oil, and small quantities of solvents. Waste crankcase oil, usually the major portion of waste oil lubricants, contains some or all of the following substances: sulfur, iron, functional additives, gasoline, oxidized materials, atmospheric dust, combustion products, sedimentary materials, and water and other contaminants. Waste oil lubricants are specifically characterized in

terms of gravity, viscosity, pour point, flash point, heating value, neutralization number, and sulfur, ash, silicon, calcium, sodium, iron, magnesium, lead, vanadium, copper, barium, zinc, phosphorus, tin, chromium, nickel, beryllium, manganese, cadmium, silver, strontium, aluminum, titanium, boron, and molybdenum content.

(12) KEYWORDS: AUTOMOBILE; CHEMICAL; COMPOSITION; OIL

(14) HIERARCH TERMS: 1AH; 1CB/2CB/3CF; 1EC/2ET; 10C; 1PF/2P1/3PL

(15) STIMS ACC.NO.: 00S44619 (15) SECONDARY AUTHORS: Carroll J; Kincannon B

(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Sept. 1974. p.48-60.

(1) SWIRS ACC.NO.: 045558

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Hoshasei haikibutsu shoriyo asufaruto kokatai no anzensei. (Safety evaluation of the solidified asphalt blocks used for final disposal of radioactive wastes).

(4) AUTHOR: Moriyama N

(6) JOURNAL TITLE: Nihon Genshiryoku Gakkai Shi

(10) LANGUAGE: JA (10) GEO. AREA: 1AI/2JA (10) PUB. YEAR: 1976

(11) ABSTRACT: The author, a scientist at the Japan Atomic Energy Research Institute, evaluates a method to solidify radioactive wastes using asphalt instead of using cement, plastics and ceramics from the point of safety. This method has already been adopted in Europe and is beginning to be used in Japan. The properties required for the solid asphalt blocks as means of final disposal of radioactive wastes on land, in the ground and in the ocean are pointed out in comparison to the actual properties of the asphalt blocks in relation to such properties as leaching potential, combustibility, radiation resistance and stability of shape. It is stated that asphalt-radioactive waste solid blocks have some disadvantages in combustion-resistance and radiation-resistance when they are kept on land, and other disadvantages in leaching potntial of radioactive nuclides when they are kept in the ground and in the ocean. Since the fuure trend of disposal of these solid blocks relys more and more on the ocean and underground disposal, development of solid blocks with better water-resistance is greatly desired in order to avoid leaching of the radioactive nuclides. (original text in Japanese).

(12) KEYWORDS: ASPHALT; COMBUSTION; DISPOSAL; EARTH; HAZARDOUS; JAPAN; LAND; LEACH; OCEAN; RADIATION; RADIOACTIVE; SAFETY; UTILIZE

(14) HIERARCH TERMS: 1HA/2HF

(15) STIMS ACC.NO.: 00S44606

(16) CITATION: 18(11):21-25, 1976.

(1) SWIRS ACC.NO.: 044484

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: The seabed option.

(4) AUTHOR: Hollister CD

(6) JOURNAL TITLE: Oceanus

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: This article reports on investigations concerning whether radioactive waste can be deposited in the deep seabed. Deep sea trenches were rejected due to unstable geology. Placing waste canisters on the surface of the sea floor was also rejected for fear that corrosion would cause leakage directly into the biosphere. Further direct disposal into ocean wastes would cause contamination within a few decades. Geologic formations are assessed with a view toward establishing some site criteria. The clays in geologically undisturbed seabeds have chemical and physical properties that might provide a suitable isolation medium even if the canister leaked. Teams of scientists were gathered to test these ideas. Sites were selected on the Pacific. Core samples and paleomagnetic measurements indicated depth of sediment and degrees of geological stability. Further studies on the adequacy of the sediment barrier to waste migration, the best sediment type and hole closure techniques will be conducted. It is felt

that sediment clays could effectively isolate radioactive waste from man. More research is suggested.
(12) KEYWORDS: CLAY; CONTAINER; CRITERIA; DISPOSAL; GEOLOGIC; HAZARDOUS; MEASUREMENTS; OCEAN; RADIOACTIVE; SEDIMENTATION; SITES
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 10A/20B; 1RA/2RG; 1SC
(15) STIMS ACC.NO.: 00S43530
(16) CITATION: 20(1):18-25, Winter 77.

(1) SWIRS ACC.NO.: 044472
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Barriers to radioactive waste migration.
(4) AUTHOR: Heath GR
(6) JOURNAL TITLE: Oceanus
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: To keep radioactive waste deposited in deep seabeds from reaching man's environment, natural and artificial barriers must keep the waste container from moving up on the sediment. Three barriers which lie between the buried wastes and the ocean are discussed. First, the glassy waste material itself, which consists of the hot, corrosive, radioactive liquid waste fused into silicate glass. It forms the first barrier and causes the radiation to be released a million times more slowly. The second barrier is the metal container. It will still give off intense heat and radiation, and will be subject to seawater's corrosion. The third barrier is the deep seabed clay in the sediment, which in an undisturbed system could provide a satisfactory barrier to protect man from the buried waste. The effects of the canister's heat, the insertion of the canister and its radiation are still unclear. More work is needed to determine if these factors damage or reinforce the sediment barrier. The findings to date are grounds for a cautious optimism.
(12) KEYWORDS: CONTAINER; DISPOSAL; GLASS; HAZARDOUS; OCEAN; RADIOACTIVE; SAND; SEDIMENTATION
(14) HIERARCH TERMS: 1CI/2DV; 1DD/2DW; 1HA/2HF; 10A/20B; 1RA/2RG
(15) STIMS ACC.NO.: 00S43518
(16) CITATION: 20(1):26-30, Winter 1977.

(1) SWIRS ACC.NO.: 044471
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Disposing of high-level radioactive waste.
(4) AUTHOR: Frosch RA
(6) JOURNAL TITLE: Oceanus
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: This article delves into the problems of wastes produced by commercial nuclear power plants. These radioactive wastes are extremely toxic, with some products having effective lifetimes of more than a million years. Recent court decisions barred the licensing of such plants until questions about disposition of the waste are solved. The scope of the problem, technical, social and economic, is discussed, along with the origin and nature of the waste, reprocessing and reactor types. The problems and possible methods of disposal of the radioactive waste is gone into deeply. The waste could be dispersed evenly into the environment, causing an immeasurable increase to natural background radiation, however, biological and geologic concentration mechanisms pose a danger. Storage and guarding of the waste is being studied, but thousands of years of storage could yeild unforeseen problems, along with corrosion, accidents, terrorism or the fall of our institutions. The waste could be disposed of in the sun, but here the cost and danger in launching it are very high. Geological disposal in Antartica or other stable formations have their problems also. Seabed depositories may be a viable alternative. Public views are unlikely to permit large expansions of nuclear energy without long term waste management programs.
(12) KEYWORDS: ANTARTICA; DISPOSAL; GEOLOGIC; HAZARDOUS; ISOTOPE; OCEAN; RADIATION; RADIOACTIVE; SPACE CRAFT; STORAGE; TOXIC
(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF; 10A/20B; 1RA/2RG; 1RA/2RH
(15) STIMS ACC.NO.: 00S43517
(16) CITATION: 20(1):5-17, Winter 1977.

(1) SWIRS ACC.NO.: 043877
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Environmental impacts of high level radioactive waste disposal.
(4) AUTHOR: Cohen BL
(6) JOURNAL TITLE: IEEE Trans on Nuclear Science
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The environmental impact of high level wastes discharged from fuel reprocessing plants is considered. Potential hazards are considered in light of the following: energy emitted; isotope contributions per unit of time; effects of the worst credible handling; possible fatalities; hazards of inhaling fine particles; and hazards associated with wastes if converted into digestible form and ingested. Investigation results indicate that the potential hazards of the wastes are not inordinately large in comparison with those of other materials used in our society. Nuclear wastes will be around for a long time but barium, copper and arsenic (now present in the atmosphere) will be around forever. Once the waste is buried, the most probable release mechanism is contact by ground water. It would be leached into solution, travel through aquifers with the ground water to reach surface waters, where it could effect food or drink. Hazards would be effective on a short and long term basis. Safeguards against material release are listed. The advantages of using nuclear energy from fission exceeds the hazards inherent in misuse.
(12) KEYWORDS: DISPOSAL; ENVIRONMENT; FOOD; HAZARDOUS; HUMAN; ISOTOPE; METAL; RADIATION; WATER
(14) HIERARCH TERMS: 1DD/2DW; 1ED; 1HA/2HF
(15) STIMS ACC.NO.: 00S42920
(16) CITATION: 23(1):56-59, Feb. 1976.

(1) SWIRS ACC.NO.: 043976
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: R and D for the nuclear waste management concept of the Federal Republic of Germany.
(4) AUTHOR: Bohm H
(6) JOURNAL TITLE: Atomwirtschaft
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2GE (10) PUB. YEAR: 1977
(11) ABSTRACT: Research and development work in nuclear waste management is described in Germany where reprocessing of radioactive nuclear wastes is favored. The advantages and disadvantages of the alternatives: reprocessing or direct ultimate disposal of spent fuels are discussed. An overview of the amounts of fuel and radioactive waste accumulating annually is presented together with an examination of the costs of nuclear waste management. The role of the big science research centers in the development of a waste management system is examined. Changing attitudes have resulted in an expansion of research an development work at these centers in reprocessing, waste treatement, and ultimate storage areas. Centers are concentrating on short and medium term objectives in cooperation with industry. And, centers are increasing their work on neclear safety and the development of a concept for safeguarding nuclear materials in a waste management center. Examples are given which illustrate unresolved problems of waste management of nuclear fuels.
(12) KEYWORDS: DISPOSAL; ECONOMICS; EUROPE; FUEL; GERMANY; HAZARDOUS; MANAGEMENT; RADIOACTIVE; RESEARCH; SAFETY; STORAGE
(14) HIERARCH TERMS: 1EA/2EA; 1HA/2HF; 1HA/2HG; 1HB; 1HA/2HH
(15) STIMS ACC.NO.: 00S43018
(16) CITATION: 22(4):209-213, Apr. 1977.

(1) SWIRS ACC.NO.: 043873
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Incentives for partitioning high-level waste.
(4) AUTHOR: Burkholder HC
(6) JOURNAL TITLE: Nuclear Technology
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The safety incentives for separating and eliminating various elements from high level radioactive wastes prior to final geologic isolation were examined. Various parameters concerning the

transport of radioactivity from the geologic isolation repository to humans were evaluated. Many study parameters had to be estimated and the values used were consistent with current knowledge or selected to maximize the calculated potential radiation doses. A method for estimating the safety incentives for partitioning nuclear power economy wastes was developed and the method applied to a single waste type (high level), a single geosphere pathway (leach incident) and a set of biosphere pathways. A 50 year accumulation dose to an individual living within the region of influence of the underground waste isolation site was estimated. Conditions under which incentives exist for specific partitioning alternatives are defined. The parameters varied were measurement scales for the effectiveness of the radioactivity release barriers provided by geologic isolation systems. Results are displayed graphically. Evaluations and conclusions about partitioning incentives are made.

(12) KEYWORDS: GEOLOGIC; HAZARDOUS; HUMAN; INVESTIGATION; LEACH; PROCESS; RADIATION; SAFETY; TIME

(14) HIERARCH TERMS: 1HA/2HF; 1HA/2HH; 1RA/2RH

(15) STIMS ACC.NO.: 00S42916 (15) SECONDARY AUTHORS: Cloninger MO; Baker DA

(16) CITATION: 31(2):202-217, Nov. 1976.

(1) SWIRS ACC.NO.: 043646

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Management of radioactive waste at Point Lepreau generating station.

(4) AUTHOR: Alikhan S.

(6) JOURNAL TITLE: Nuclear Engineering International

(10) LANGUAGE: EN (10) GEO. AREA: 1CD (10) PUB. YEAR: 1977

(11) ABSTRACT: The following principles are followed in the design and operation of the radioactive waste management facilities at Point Lepreau generating station (New Brunswick). Most of the low activity waste is compacted into 45 gal carbon steel drums. Spent IX resins are initially stored in two underground concrete vaults. Fuel contact resins are segregated from other resins. After 5 years decay in the vaults, the resins will be slurried into carbon steel containers and transported to the solid radioactive waste management facility inside a shielded flask. The storage facilities consist of above ground engineered structures fully isolated from precipitation and from ground water. They are designed to withstand the Design Basis Earthquake test. Complete monitoring facilities are provided as well as sufficient storage capacity for up to 10 unit years operation. All wastes are stored in a retrievable manner. All liquid wastes are received and stored in large tanks and are segregated into low and high activity wastes. Each tank can be recirculated, sampled, diluted, and metered into the condenser cooling water at a rate which maintains the effluent concentrations below the release limits. Gases, vapors, and airborne particulates are monitored and filtered before release to the atmosphere.

(12) KEYWORDS: CANADA; CONTAINER; DISPOSAL; FACILITY; HAZARDOUS; LIQUID; MANAGEMENT; MONITOR; PERSONNEL; RADIOACTIVE; RESIN; SAFETY; SOLID; STORAGE

(14) HIERARCH TERMS: 1HA/2HF; 1SM/2TC

(15) STIMS ACC.NO.: 00S42669

(16) CITATION: 22(258):59-61, June 1977.

(1) SWIRS ACC.NO.: 043591

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Montgomery DM

(6) BOOK TITLE: Radiological Measurements at the Maxey Flats Radioactive Waste Burial Site - 1974 to 1975. (8) REPORT NO.: EPA-520/5-76/020

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2KY (10) PUB. YEAR: 1976

(11) ABSTRACT: The results of radioactive waste measurements at the Maxey Flats burial site in Kentucky during 1974 and 1975 are presented. Evaporator and environmental studies were conducted, and E-series test well measurements were made. In the evaporator study, 15 long lived

radionuclides were identified in stack effluent during the evaporation of waste from six storage tanks. Tritium, observed in every sample of stack discharge, was the predominant radionuclide. The principal vehicle of radioactive waste transport appeared to be precipitation runoff from the surface of the burial site. It was determined that contamination of the site surface could result from a number of sources, including lateral migration through the soil zone from trenches to the land surface, spills during burial and trench pumping operations, and deposition from the evaporator plume. Within the limits of detection of the E-series test well measurements, plutonium was associated with sediment. The mechanism of its movement from trenches was explored. Recommendations are offered for the improvement of monitoring programs at the Maxey Flats site. Supporting data on the measurement results are tabulated. (Retained in SWIRS library).

(12) KEYWORDS: BURY; CONTAINER; ENVIRONMENT; HAZARDOUS; INVESTIGATION; KENTUCKY; LEACH; RADIOACTIVE; STORAGE

(14) HIERARCH TERMS: 1C1/2DV; 1HA; 1RA/2RG; 1SD

(15) STIMS ACC.NO.: 00S42634 (15) SECONDARY AUTHORS: Kolde HE; Blanchard RL

(16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, Jan. 1977. 98 p.

(1) SWIRS ACC.NO.: 043521

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Waste cannister for storage of nuclear wastes.

(4) AUTHOR: Duffy JB

(5) CORPORATE AUTHOR: USA as rep. by the U.S.E.R.D.A

(7) PATENT DATA: U.S. Patent No. 4,021,676

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A storage canister for storing radioactive wastes which have been solidified as a glass is described. The radioactive isotopes are present in concentrations sufficient to produce a large amount of heat. The canister consists of a canister body with a side wall and top and bottom end caps and a fin assembly disposed in the canister body. The fins extend from the center of the canister to a point spaced from the canister wall a distance effective to keep the temperature of the glass at the center of the canister at an acceptable level without producing unacceptable hot spots in the canister wall. The space between the end of the fin and the wall is filled with glass to provide thermal insulation between the fin and the wall. The fin assembly includes a pipe disposed on the axial center line of the canister body having eight fins radiating at 45 degree intervals and extending from a point near the top of the canister to the bottom of the canister. The canister body, central pipe and fins are formed of stainless steel and the central pipe fits over a conical, ceramic standoff attached to the center of the lower end cap.

(12) KEYWORDS: CONTAINER; EQUIPMENT; GLASS; HAZARDOUS; HEAT; METAL; PATENT; RADIOACTIVE; STORAGE

(14) HIERARCH TERMS: 1CI; 1HA; 1RA

(15) STIMS ACC.NO.: 00S42564

(16) CITATION: filed May 7, 1976 issued May 3, 1977.

(1) SWIRS ACC.NO.: 043178

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Progress on radioactive waste disposal should ease public anxiety.

(6) JOURNAL TITLE: Nuclear Engineering International

(10) LANGUAGE: EN (10) GEO. AREA: 1E0/2CE; 1EM/2WG; 1US (10) PUB. YEAR: 1976

(11) ABSTRACT: A report on the International Symposium of the Management of Wastes from the LWR Fuel Cycle held in Denver in July 1976 concludes that progress on radioactive waste disposal should ease public anxiety. The meeting attracted 600 participants from the U.S. and other countries. It was announced that the U.S. budget allocation for solution to the problem would be increased from $4 million in 1976 to over $40 million in 1977. Statements of national policy were made by the United Kingdom (which defended the "go slow" policy); and the Federal Republic of Germany (which explained the concept of a Fuel

Reprocessing Centre capable of handling 1,500 tons LWR fuel per year located over a salt dome so that most of the waste could be disposed of on the spot). The sessions left the impression that techniques of waste management have been developed to a point at which, if applied vigorously, would result in risk to the public substantially smaller than that from accidents to the reactors which produce them. They are infinitesimally life.

(12) KEYWORDS: ACCIDENT; COLORADO; CONFERENCE; DENVER; DISPOSAL; GERMANY; GREAT BRITAIN; HAZARDOUS; INTERNATIONAL; MANAGEMENT; RADIOACTIVE; SAFETY; US

(14) HIERARCH TERMS: 1HA/2HF; 1HB

(15) STIMS ACC.NO.: 00542221

(16) CITATION: 21(247):16, Aug. 1976.

(1) SWIRS ACC.NO.: 043167

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: A permanent home for nuclear waste.

(4) AUTHOR: Rueth N

(6) JOURNAL TITLE: Mechanical Engineering

(10) LANGUAGE: EN (10) GEO. AREA: 1US (10) PUB. YEAR: 1977

(11) ABSTRACT: The search for a permanent repository for high level nuclear wastes from commercial plants is discussed. A waste terminal storage repository of the future is described. Wastes will be placed from 1000 to 3000 ft. underground in stable geologic formations, either salt, crystalline, or argillaceous rock formations. Salt beds will probably be sites for early repositories. About $33.7 million will be spent on terminal storage studies in 1977 to start a nine yr. program. Strong public opposition to studies of these salt formations warns of trouble when disposal is planned. There are 50,000 sq. mi. of salt beds in the U.S. in earthquake free areas, and advantages over the other geologic formations are noted. In assessing possible sites, the area tectonics, seismicity, erosion, structure, hydrogeology, and mineral resources will be analyzed. Tests will be done for rock stress, heat transfer, radiological effects, and soil movement. Two pilot plant sites will be chosen by 1978. These will be expanded to full scale receiving rate and capacity in 1990. Costs are unknown but safety is assured. In 1977, an environmental impact statement on waste management will be published.

(12) KEYWORDS: DISPOSAL; GEOLOGIC; HAZARDOUS; RADIOACTIVITY; SAFETY; SALT; SITES; US

(14) HIERARCH TERMS: 1DD/2DW; 1HA/2HF

(15) STIMS ACC.NO.: 00542210

(16) CITATION: 99(1): 20-27, Jan. 1977.

(1) SWIRS ACC.NO.: 043139

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Uranium waste researchers consider alternate means of tailing disposal.

(4) AUTHOR: Moffett D

(6) JOURNAL TITLE: Canadian Mining Journal

(10) LANGUAGE: EN (10) GEO. AREA: 1CD (10) PUB. YEAR: 1977

(11) ABSTRACT: Canada is the world's second largest producer of uranium. Over 85 percent is produced by the acid leach process. The industry disposes of about 11,000 tons of solid waste per day. Solid waste may be disposed of by land impoundment, lake disposal, or backfill. The largest volume is impounded behind dams (typically about 500 acres with a 100 million ton capacity). All of the solid wastes are radioactive. Little can be done to attenuate the radiation from the surface of the tailing area and the present practice is to restrict access. There are presently over 1,000 acres of inactive tailing areas. Rehabilitative efforts consist of surface treatment such as establishment of a grass cover and effluent control (effluent comes from mine water, process waste, and surface drainage). An analysis of typical final discharge effluents is given together with proposed Federal regulations and guidelines for the uranium industry. Major contaminants are derived from chemicals added in the milling process rather than from the ore. The recycling of water is possible from mine water, process water, and final effluent. The problem of liquid

effluents from surface drainage is almost exclusively associated with inactive or abandoned tailing areas.
(12) KEYWORDS: BASIN; CANADA; CHEMICAL; DISCHARGE; DISPOSAL; DRAINAGE; EFFLUENT; HAZARDOUS; HYDRAULIC; LEACH; MINE; RADIOACTIVE; RECLAMATION; TAILINGS; WATER
(14) HIERARCH TERMS: 1DD/2DK; 1HA/2HG; 1SD/2SJ
(15) STIMS ACC.NO.: 00S42182
(16) CITATION: 98(1):48-50, Jan. 1977.

(1) SWIRS ACC.NO.: 043071
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(3) ARTICLE TITLE: Method and device for closing a receptacle for radioactive wastes.
(4) AUTHOR: Meyer A
(5) CORPORATE AUTHOR: Groupement Activ. Atom. at Advan. "GAAA"
(7) PATENT DATA: U.S. Patent No. 4,016,096
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2FR (10) PUB. YEAR: 1977
(11) ABSTRACT: A method and a device for closing a receptacle for radioactive wastes is described. The method of closing a barrel with an inside lid and an outside lid separated by an O ring having two beads is as follows: arranging the O ring on the top rim of the barrel, on the internal side, with the beads facing towards and away from the interior of the barrel; resting the inside lid on the upper bead bringing the O ring into contact with an annular waste discharge port external to the inside lid; orienting the barrel coaxially beneath the waste discharge port for waste discharge; lifting the inside lid axially from the O ring and the annular ring and filling the barrel with waste; resting the inside lid again on the O ring upper bead; driving the inside lid and the upper bead downward toward the lower bead below the level of the top rim such that any surface portion of the O ring seal between the beads subjected to possible radioactive contamination during waste loading of the barrel is blocked from exposure to the barrel exterior; and installing the outside lid on the barrel overlying the inside lid.
(12) KEYWORDS: APPARATUS; CONTAINER; HAZARDOUS; PATENT; RADIOACTIVE; REFUSE
(14) HIERARCH TERMS: 1CI/2DV; 1HA; 1RA/2RH
(15) STIMS ACC.NO.: 00S42114
(16) CITATION: Le Plessis Robinson, France, filed Sept. 12, 1975 issued Apr. 5, 1977.

(1) SWIRS ACC.NO.: 042979
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: The Soviet answer to nuclear waste
(4) AUTHOR: Belitzky B
(6) JOURNAL TITLE: New Scientist
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2RU; 1US (10) PUB. YEAR: 1977
(11) ABSTRACT: A fourfold expansion, planned by Soviet authorities, for nuclear power has called for a drastic reappraisal of nuclear waste disposal methods. Increasingly, Soviet experts are quesioning the storage techniques adopted by Western countries. Although American scientists claim a very low migration rate for radioisotopes from storage of high level liquid and solid waste burial in crystalline rock at depths of about 450 meters, studies by Soviet scientists have shown unacceptable migration rates. The disposal of low level and medium level fluid wastes has arranged in one area of the USSR in a porous stratum consisting of quartz sandstone and clay. High level wastes must be solidified before ultimate disposal, generally by vitrification. Work is also underway to perfect such techniques as cementation, bitumunization, and fixation in ceramics or asphalt. Cementation has been employed for the disposal of low level wastes for a long time.
(12) KEYWORDS: DISPOSAL; EUROPE; GEOLOGIC; HAZARDOUS; LIQUID; POWER; SAFETY; SOLID; STORAGE; US; USSR
(14) HIERARCH TERMS: 1HA/2HF; 1HA/2HG; 1RA
(15) STIMS ACC.NO.: 00S42022
(16) CITATION: 74(1048):128-129, Apr. 21, 1977.

(1) SWIRS ACC.NO.: 042961
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Fuel reprocessing and waste disposal.
(4) AUTHOR: Levenson M
(6) JOURNAL TITLE: Trans American Nuclear Society
(10) LANGUAGE: EN (10) GEO. AREA: 1EU; 1US (10) PUB. YEAR: 1977
(11) ABSTRACT: Nuclear fuel reprocessing and waste disposal are discussed. Standard reprocessing which separates uranium, plutonium, and fission products into separate streams has been in operation over 30 years in 7 countries. Although many countries are increasing their nuclear programs as a consequence of the oil crisis, no equivalent increase in reprocessing capacity is underway. Reasons for this include: economic and financial questions raised by the instability of the regulatory issues, safety, and national and international uncertainty about proposed regulations. Public reaction to fuel reprocessing and waste disposal, both in the U.S. and in Europe, is examined. Issues raised by the public are noted and addressed. Current concerns focus on hazards from man and nature: man in the form of terrorists and irresponsible countries; and nature in the form of new ice ages, new volcanoes, or instability in the currently accepted laws of chemistry and physics. It is suggested that scientist's aims should be honest objective assessment of the risks, open disclosure of details, balancing of risks versus benefits, and recognition of which alternatives really exist and which alternatives and energy sources are still only hopes.
(12) KEYWORDS: DISPOSAL; ECONOMICS; ENERGY; EUROPE; FUEL; HAZARDOUS; INTERNATIONAL; REGULATIONS; SAFETY; US
(14) HIERARCH TERMS: 1DD/2DL; 1HA; 1HB; 1RA
(15) STIMS ACC.NO.: 00S42004 (15) SECONDARY AUTHORS: Zifferero M
(16) CITATION: (25):103-106, 1977.

(1) SWIRS ACC.NO.: 042910
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Preparation and characterization of sintered glass-ceramics from calcined simulated high-level waste.
(4) AUTHOR: Samsel EG
(6) JOURNAL TITLE: Nuclear Technology
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The development and characterizations of sintered glass - ceramics (SGCs) as a monolithic waste form for the ultimate storage of spent fuel from commercial power plant radioactive waste is reported. The SGCs developed from simulated commercial fluidized bed calcine provide an alternative waste form for ultimate storage. Aluminosilicate flux, sintered with calcine, immobilizes and fixes the waste within a glass - ceramic matrix. High calcine concentration and SGC densities maintain low waste volume, conserving on the number of storage canisters required. SGC properties include high resistance to impact, thermal shock and aqueous dissolution, which are desirable for safe transport and storage. Porosity in SGC is useful in minimizing pressure buildup due to radiolytic gas generation and SGCs appear suitable for storage with a centerline temperature as high as 800 degrees C. Low pressure molding of SGC into thin wall containers appears practical as a manufacturing process.
(12) KEYWORDS: CERAMIC; FLUIDIZED BED; FUEL; GLASS; PROCESS; RADIOACTIVE; RESIDUE; STORAGE
(14) HIERARCH TERMS: 1HA/2HF; 1SM/2TC
(15) STIMS ACC.NO.: 00S41953 (15) SECONDARY AUTHORS: Berreth JR
(16) CITATION: 33(1):68-75, Apr. 1977.

(1) SWIRS ACC.NO.: 042817
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Can nuclear wastes be buried at sea?
(4) AUTHOR: Grimwood P
(6) JOURNAL TITLE: New Scientist
(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1977
(11) ABSTRACT: A preliminary assessment of the radiological consequences of nuclear waste disposal to the deep ocean floor made by Great Britain's National Radiological Protection Board is examined. The

report highlights areas where study and information is required. Most of the NRPB assessment was concerned with developing a model describing how radioactive material deposited on the ocean floor could eventually lead to the irradiation of man, especially through food chains. Calculations show the dominant route of individual and collective exposure for three categories of nuclides (based on time after disposal at which they would give rise to their maximum annual dose): short term, less than 500 years; intermediate term, 500 to 10,000 years; and long term, greater than 10,000 years. This dominant route would be from consuming food derived from marine plankton. Reduction of short term doses could be achieved by designing a container for the wastes which would last hundreds or thousands of years. Only broad conclusions can be drawn from the study. Many significant uncertainties need to be resolved before the disposal of high level radioactive waste on the ocean floor is acceptable.

(12) KEYWORDS: CONTAINER; DISPOSAL; EUROPE; GREAT BRITAIN; HAZARDOUS; MATHEMATICAL MODEL; OCEAN; RADIATION; RADIOACTIVE; RESEARCH

(14) HIERARCH TERMS: 1CI/2DV; 1HA; 1OA

(15) STIMS ACC.NO.: 00S41860 (15) SECONDARY AUTHORS: Webb G

(16) CITATION: 73(1044):709-711, Mar. 24, 1977.

(1) SWIRS ACC.NO.: 042725

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Disposal of toxic wastes--II. poisonous and radioactive wastes.

(4) AUTHOR: Boden PJ

(6) JOURNAL TITLE: Conservation & recycling

(10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1976

(11) ABSTRACT: The disposal of poisonous and radioactive wastes is examined. For many wastes, the toxicity cannot be reduced and three methods of treatment are used: dispersal in rivers or the ocean; storage on special protected sites; and reclamation. The source and danger of radioactive wastes are discussed as are their occurrence, measurement, and relative toxicity. There are two types of radioactive wastes: low level activity and high level activity. In Great Britain, disposal of low level radioactive waste is carried out by burying in the ground in a remote area. Treatment of high level radioactive wastes includes sealing it in specially shielded drums for storage; this is practiced with wastes from nuclear power station effluent cleaning systems. Many countries are arranging disposal of radioactive wastes with methods agreed by the International Atomic Energy Agency. Special containers will be deposited in designated deep water areas which will gradually leak over a long period when the toxicity will have been reduced. Wastes from chemical processing of nuclear fuel are presently being stored as liquids in steel tanks under strict security at the processing plants until research determines how to dispose of them. Proposed methods of disposal include melting, underground disposal; storage in frozen ice or rocks; or shooting into the sun.

(12) KEYWORDS: BURY; CHEMICAL; CONTAINER; DISPOSAL; EUROPE; FUEL; GREAT BRITAIN; INTERNATIONAL; RESEARCH; STORAGE

(14) HIERARCH TERMS: 1HA/2HF; 1RD

(15) STIMS ACC.NO.: 00S41768

(16) CITATION: 1(1):119-128, 1976.

(1) SWIRS ACC.NO.: 042568

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(5) CORPORATE AUTHOR: Panel on Land Burial

(6) BOOK TITLE: The Shallow Land Burial of Low-Level Radioactively Contaminated Solid wastes.

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CO; 1US/2ID; 1US/2IL; 1US/2NM; 1US/2OH; 1US/2SC; 1US/2TN; 1US/2WA (10) PUB. YEAR: 1976

(11) ABSTRACT: Results are given of a study undertaken by the Panel on Land Burial of the U.S. Atomic Energy Commission to investigate the conditions, practices, and problems involved in the near surface ground burial of solid waste contaminated with low levels of radioactive materials. Specific types of contaminated materials dealt with include institutional wastes such as paper towels, laboratory gloves, and even construction materials from an obsolete nuclear reactor. Summaries of

sites surveyed and of other sites that play an important role in this sort of solid waste generation/disposal are given, and include hydrogeologic, climatic, physiographic, and operational details of facility sites. Facilities visited were (1) the Los Alamos Scientific Laboratory, Los Alamos, New Mexico; (2) the Rocky Flats facility in Colorado; (3) the Mound Laboratory in Ohio; (4) the Argonne National Laboratory in Illinois; (5) the Idaho National Engineering Laboratory; (6) the Hanford Works facility in Washington; (7) the Oak Ridge National Laboratory in Tennessee; and (8) the Savannah River Plant in South Carolina. The Panel concludes that present burial practices have not created a hazardous situation, although data gathered on low level radioactive contaminated wastes at Oak Ridge and Savannah facilities positively identify waste leaching. (Retained in SWIRS library)

(12) KEYWORDS: BURY; COLORADO; CONTAMINATE; DISPOSAL; FACILITY; IDAHO; ILLINOIS; INVESTIGATION; LAND; LEACH; NEW MEXICO; OHIO; OPERATIONS RESEARCH; RADIOACTIVE; REFUSE; SAFETY; SITES; SOUTH CAROLINA; TENNESSEE; WASHINGTON

(14) HIERARCH TERMS: 1AE; 1HA/2HF; 1RA/2RG

(15) STIMS ACC.NO.: 00S41611

(16) CITATION: Washington, DC, National Academy of Sciences, 1976. 150 p.

(1) SWIRS ACC.NO.: 042337

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Method for improving the incorporation of radioactive wastes into a vitreous mass.

(4) AUTHOR: Bonniaud R

(5) CORPORATE AUTHOR: Commissariat a l'Energie Atomique.

(7) PATENT DATA: U.S. Patent No. 4,009,990

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A method for improving the incorporation of radioactive wastes into a vitreous mass as well as a calcinator for carrying out the method are described. The calcinating device is provided with a rotatable drum, the axis of which is slightly inclined with respect to the horizontal and is adapted to be mounted inside a furnace where it is used for mixing and heating a mixture of sintered glass particles and radioactive wastes. The calcinator has, at the extremites, two flanges to which are fixed an upper sleeve on a level with which open an inlet conduit for the radioactive liquid, a conduit connected to a hopper for feeding sintered glass and a gas exhaust conduit and a lower sleeve. The extension of the sleeve (which is away from the drum) is provided with an opening for expelling the calcinate obtained and transferring it to a smelting furnace. The calcinator is also provided with a means for rotating and sealing it. Since the bed for treated substances moves, it serves to clean the calcinator, rendering mechanical cleaning unnecessary.

(12) KEYWORDS: COMBINED; GASSES; GLASS; HAZARDOUS; LIQUID; PATENT; PROCESS; RADIOACTIVE; SOLID

(14) HIERARCH TERMS: 1DD/2DO; 1HA/2HG; 1PM; 1RA/2RG

(15) STIMS ACC.NO.: 00S41381 (15) SECONDARY AUTHORS: Jouan A; Sombret C

(16) CITATION: filed Feb. 27, 1975 issued Mar. 1, 1977.

(1) SWIRS ACC.NO.: 042097

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Shroud for storing radioactive spent nuclear fuel cells.

(4) AUTHOR: Mollon L

(5) CORPORATE AUTHOR: Brooks and Perkins, Inc

(7) PATENT DATA: U.S. Patent No. 4,006,362

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A generally tubular shroud for storing radioactive spent nuclear fuel cells is described. Each of the tubular shrouds is composed of inner and outer metallic tubes, preferably formed of stainless steel, dimensioned to provide a space between the inner and outer tubes. The shroud is of rectangular cross section, as are each of the tubes, and the four spaces provided at the sides of the shroud are

generally flat elongated spaces. Sandwiches formed of outer layers of thin aluminum sheet and an intermediate layer of boron carbide are inserted into the spaces. The sandwiches completely fill the spaces with a suitable end overlap at the sides to prevent the escape of neutrons. The shrouds in sposed vertically in the pool and the upper and lower ends of the spaces between the tubes are suitably sealed by folding over longitudinally projecting end portions of one or both tubes beyond the adjacent end of the sandwich. The upper ends of the shrouds have funnel constructions which include portions extending into the upper ends of the spaces between the tubes so as to provide an effective seal.

(12) KEYWORDS: ALUMINUM; CONTAINER; FUEL; HAZARDOUS; METAL; PATENT; RADIOACTIVE; STORAGE
(14) HIERARCH TERMS: 1HA; 1RA/2RH; 1SM/2SO
(15) STIMS ACC.NO.: 00S41141 (15) SECONDARY AUTHORS: Ball KR
(16) CITATION: filed Nov. 17, 1975 issued Feb. 1, 1977.

(1) SWIRS ACC.NO.: 042071
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Removal of radioactive contamination from a nuclear reactor coolant.
(4) AUTHOR: Cooper MH
(5) CORPORATE AUTHOR: Westinghouse Electric Corp
(7) PATENT DATA: U.S. Patent No. 4,010,068
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: The removal of radioactive contaminants from the coolant of a liquid metal cooled fast breeder nuclear reactor is described. The equipment consists of an oscillating cold trap system in which one trap is loaded with reactants while a second trap, in series flow connection, is used to precipitate the radioactive contamination and the excess reactants. When the reactants in the first trap are exhausted, the direction of the flow is reversed; the heating and cooling of the traps are also reversed. The second cold trap then acts as the reactant supply, while the first cold trap operates to remove the impurities by precipitation. When the excess reactant has been exhausted from the second trap, the flow is again switched, reversing the roles of the two cold traps. The system is continuously and reversibly operated in this manner until the reactants can no longer be used to precipitate radioactive contamination contained within the reactor coolant. Sodium hydride, sodium oxide and sodium iodide may be loaded into the oscillating cold trap system. They will effectively and efficiently remove tritium, barium 140, cesium 141, zirconium 95, iodine 131 and iodine 125.
(12) KEYWORDS: CONTAMINATE; HAZARDOUS; PATENT; PRECIPITATE; PROCESS; PURIFICATION; RADIOACTIVE
(14) HIERARCH TERMS: 1HA; 1RA; 1WA/2WD
(15) STIMS ACC.NO.: 00S41115
(16) CITATION: filed Mar. 3, 1975 issued Mar. 1, 1977.

(1) SWIRS ACC.NO.: 042063
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Volume reduction of spent radioactive ion exchange resin.
(4) AUTHOR: Tiepel EW
(5) CORPORATE AUTHOR: Westinghouse Electric Corporation
(7) PATENT DATA: U.S. Patent No. 4,008,171
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A process for reducing the volume of spent radioactive ion exchange resins which have been used for conditioning water circulated through a nuclear reactor is described. The spent resins are discharged from the reactor system as radioactive wastes to a spent resin storage tank in the form of a slurry. The slurry is first vacuum dewatered to remove the free water and then the intrinsic water in the wet resin beads is removed by drying in a vacuum fluidized bed chamber utilizing superheated steam which also acts to fluidize the bed. Further drying is accomplished by spraying the partially dried resin and superheated steam through a steam injected two fluid nozzle for further extraction of intrinsic water from the resins. The steam is

discharged to a condenser and the dried resins to an evacuated disposal drum. Approximate four to one volume reductions from the resin/water slurry to the dried resin is obtainable by practicing the process. The water removed from the wet resins is condensed along with the fluidizing and transporting steam and sent back to the reactor liquid waste processing system.

(12) KEYWORDS: CONCENTRATION; DRYING; FLUIDIZED BED; HAZARDOUS; ION EXCHANGE; PATENT; RADIOACTIVE; REDUCTION; RESIN; VOLUME

(14) HIERARCH TERMS: 1HA; 1RA; 1SE/2SM; 1WB

(15) STIMS ACC.NO.: 00S41107 (15) SECONDARY AUTHORS: Kitzes AS; Lee PK

(16) CITATION: filed Sept. 10, 1973, issued Feb. 15, 1977.

(1) SWIRS ACC.NO.: 042059

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Process of preparing substantially organic waste liquids containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage.

(4) AUTHOR: Baehr W

(5) CORPORATE AUTHOR: Bayer Aktiengesellschaft

(7) PATENT DATA: U.S. Patent No. 4,009,116

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: A process for preparing substantially organic waste liquids containing radioactive or toxic substances for safe nonpollutive handling, transportation and permanent storage is described. The liquids are mixed with polymerizable mixtures consisting of one or more monomeric monovinyl compounds and one or more polyvinyl compounds and polymerization catalysts. The mixture is converted into solid blocks by polymerization at temperatures from 15 to 50 C. The process may be carried out at normal or elevated pressure. A wide variety of monovinyl compounds may be used but styrene, vinyl toluene and methyl acrylate are preferred. A wide variety of polyvinyl compounds may be used but divinyl benzene and trivinyl benzene are preferred. Polymerization catalysts which react at room temperature such as azo-bis-isobutyronitrile are preferred although a number of different ones are available. The hardening may take from several hours to 30 days and may be hastened by heating.

(12) KEYWORDS: EUROPE; GERMANY; LIQUID; MATERIALS HANDLING; ORGANIC; PATENT; POLYMER; PROCESS; RADIOACTIVE; SAFETY; STORAGE; TOXIC; TRANSPORT

(14) HIERARCH TERMS: 1HA/2HG; 1SM/2PC; 1TF/2TH

(15) STIMS ACC.NO.: 00S41103 (15) SECONDARY AUTHORS: Drobnik S; Hild W

(16) CITATION: filed Dec. 20, 1974, issued Feb. 22, 1977.

(1) SWIRS ACC.NO.: 042040

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: ERDA's plans for nuclear wastes rapped.

(6) JOURNAL TITLE: Chemical and Engineering News

(10) LANGUAGE: EN (10) PUB. YEAR: 1977

(11) ABSTRACT: The Energy Research and Development Administration's (ERDA) plans for reburying nuclear wastes is criticized by the National Research Council's Panel on Land Burial. The ERDA practice of burying its solid wastes contaminated with low levels of radioactivity in shallow trenches and pits presents no threat to human health; but the ERDA plan to exhume and rebury much of the wastes that were buried in the earlier days of nuclear technology is considered hazardous. The Panel recommends disposal in a final repository. One of the Panel's concerns the availability of suitable burial land as the amount of waste increases with the construction of new plants and the dismantling of present reactors and facilities as they become obsolete. The panel outlines a number of principles for the selection of future burial sites and recommends several safety measures.

(12) KEYWORDS: BURY; DISPOSAL; FEDERAL; HAZARDOUS; PACKAGING; PROGRAM; RADIOACTIVE; WATERWAY

(14) HIERARCH TERMS: 1HA; 1HB; 1MA/2MB; 1RA/2RG

(15) STIMS ACC.NO.: 00S41084

(16) CITATION: 55(3):7, Jan. 17, 1977.

(1) SWIRS ACC.NO.: 042031
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Radioactive waste disposal of water containing waste using urea-formaldehyde resin.
(4) AUTHOR: Gablin KA
(5) CORPORATE AUTHOR: Nuclear Engineering Company, Inc.
(7) PATENT DATA: U.S. Patent No. 4,010,108
(10) LANGUAGE: EN (10) PUB. YEAR: 1977
(11) ABSTRACT: A method of solidifying radioactive waste material containing free water into a free standing body using a urea formaldehyde resin is described. The radioactive waste material is concentrated to a level suitable for disposal. The water is contacted with ion exchange resin beads capable of taking up radioactive metal cations and holding them within the resin mass. The deionized water is returned to a cooling loop and the wet resin beads containing the radioactive components are disposed of by encapsulating them within a hydrophilic resinous material. Any of the usual urea formaldehyde compositions may be used for the hydrophilic resin. The resin should be capable of curing to a high polymer upon the addition of an acidic curing agent. After the waste material is immobilized within a solid block of hydrophilic resinous material, it may be waterproofed to protect against leaching, if desired. The waste material may be concentrated either by evaporation or filtration.
(12) KEYWORDS: CONCENTRATION; CONTROL; ION EXCHANGE; LEACH; LIQUID; PATENT; RADIOACTIVE; RESIN; SOLID; WASTE WATER; WATER
(14) HIERARCH TERMS: 1HA; 1RA/2RG; 1RA/2RH
(15) STIMS ACC.NO.: 00841075 (15) SECONDARY AUTHORS: Hansen LJ
(16) CITATION: filed Nov. 29, 1975 issued Mar. 1, 1977.

(1) SWIRS ACC.NO.: 041916
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Shale as a repository for radioactive waste: the evidence from Oklo.
(4) AUTHOR: Brookins DG
(6) JOURNAL TITLE: Environmental Geology
(10) LANGUAGE: EN (10) GEO. AREA: 1AF/2GB (10) PUB. YEAR: 1976
(11) ABSTRACT: Study of the 1.8 billion year old uranium ore zones at the Oklo Mine in the Republic of Gabon shows that many of the elements produced by fission have been almost completely retained, as evidenced by proper budgets of stable daughter elements. Plutonium, ruthenium, the rare earth elements, zirconium, and palladium have been effectively retained while most chalcophile elements exhibit some degree of remobilization. The Oklo reactor ores, significantly, occur in shale infilled into a fracture system in organo-argillaceous sandstone. So many of the fission produced elements retained in this shale along with evidence that most others may have been only locally redistributed lends support to considering shales in geologically stable areas for radioactive waste disposal.
(12) KEYWORDS: AFRICA; DISPOSAL; EARTH; LEACH; MINE; MINERAL; RADIOACTIVE; STORAGE
(14) HIERARCH TERMS: 1HA; 1RA/2RG; 1RA/2RH; 1SM/2FD
(15) STIMS ACC.NO.: 00840960
(16) CITATION: 1(5):255-259, 1976.

(1) SWIRS ACC.NO.: 041852
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G
(4) AUTHOR: Hawkes N (10) GEO. AREA: 1EU/2GE (10) PUB. YEAR: 1977
(11) ABSTRACT: The problem of radioactive waste generated by nuclear plants in West Germany is discussed. West Germany plans to have 35,000 megawatts of nuclear capacity installed by 1985. A court decision is noted which stipulated that the construction of a nuclear plant in the country could not occur until a national policy for the disposal of radioactive waste had been developed. Potential sites and methods for the disposal of radioactive waste are being considered by government officials. The thick salt beds in the Lower Saxony area of the country have been chosen as the only geological strata which can be

used for disposing of waste from nuclear reprocessing plants. Other sites are also being considered. Once a site has definitely been selected, it will be used as a waste management facility and as a reprocessing plant. Opposition to the proposed dual facility is significant.

(12) KEYWORDS: DISPOSAL; EUROPE; GERMANY; PLANNING; PLANT-INDUSTRIAL; POWER; RADIOACTIVE; REGULATIONS; SALT; SITES

(14) HIERARCH TERMS: 1DD/2DW; 1LB/2LD; 1RA

(15) STIMS ACC.NO.: 00S40896

(18) DOC.CIT.: Hawkes, N. Science in Europe/nuclear wastes stymie West Germans. Science, 195(4282):962-963, Mar. 11, 1977.

(1) SWIRS ACC.NO.: 041765

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) GEO. AREA: 1RA (10) PUB. YEAR: 1977

(11) ABSTRACT: The Energy Research and Development Administration (ERDA) is expanding its study of deep underground formations within the United States to gather preliminary data on the suitability of geologic disposal for safe, terminal storage of commercial nuclear wastes. Field work, including core drilling, will be conducted along with geologic literature studies. ERDA is preparing a draft generic environmental impact statement on the commercial nuclear waste management program. When a particular location is selected as a potential waste repository, an environmental impact statement specific to that location will be drafted before ERDA submits a request to Congress for construction funds. Public hearings will be conducted as appropriate. Geologic formations to be studied and evaluated are itemized as are the steps which will be taken to assess the repository potential of the formations.

(12) KEYWORDS: DISPOSAL; GEOLOGIC; RADIOACTIVE; RESEARCH; SAFETY; SITES; STORAGE; UNDERGROUND

(14) HIERARCH TERMS: 1RA/2RG

(15) STIMS ACC.NO.: 00S40809

(18) DOC.CIT.: ERDA proposes study of geologic formations for data on underground sites for nuclear waste disposal. Professional Engineer, 47(1):27, Jan. 1977.

(1) SWIRS ACC.NO.: 041620

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Dippel T (10) PUB. YEAR: 1976

(11) ABSTRACT: The decontamination of surfaces, as presently practiced, generates large volumes of radioactive liquid wastes with considerable loads of nonradioactive matter. Optimization work aimed at reducing the quantity of these wastes has been carried out on a liquid cleaning agent, a washing agent for contaminated protective clothing, a decontamination paste, and decontamination with molten salts. The pastes and molten salts, unlike other decontamination agents, can be applied in thin layers, resulting in considerably smaller amounts of waste. These agents are therefore useful alternatives to liquid decontamination media.

(12) KEYWORDS: COMPARISON; LIQUID; PURIFICATION; RADIOACTIVE; REDUCTION; RESIDUE; SALT; TREATMENT; VOLUME

(14) HIERARCH TERMS: 1RA

(15) STIMS ACC.NO.: 00S40664 (15) SECONDARY AUTHORS: Hentschel D; Kunze S

(18) DOC.CIT.: Dippel, T. , D. Hentschel, and S. Kunze. Dekontamination und dekontaminationsabfaelle. (Decontamination and decontamination wastes.) Kerntechnik, 18(12):526-531, Dec. 1976.

(1) SWIRS ACC.NO.: 041557

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Bebbington WP (10) GEO. AREA: 1RA/2RG (10) PUB. YEAR: 1976

(11) ABSTRACT: The need for an industry in the United States to process spent nuclear fuels to remove fission products and plutonium, and reclaim uranium, is discussed. In 19 years one private plant was

opened, and then shut down in 1972, while another awaits a Nuclear Regulatory Commission license. The components and characteristics of spent nuclear fuel are described. Fission products are the chief source of heat and radiation in spent fuel. Several months storage in water pools at the plant is the first step in treatment and research into subsequent treatment done at Hanford, Washington, is outlined. The processes were successful and efficient and 95 percent of the plutonium was recovered; uranium was not recovered and there was a large amount of waste. This work's value for the nuclear fuel processing industry was the development of remote operation and maintenance, and innovations of engineering design, and the plant used is described. Some of the components, properties, and problems of dealing with spent fuel and fission products are outlined, the chief fear being the effects on public health.

(12) KEYWORDS: EUROPE; FUEL; GREAT BRITAIN; HEALTH; HISTORY; INDUSTRY; MAINTENANCE; RADIOACTIVE; RECLAMATION; SOLVENT; STORAGE; TREATMENT

(14) HIERARCH TERMS: 1RA

(15) STIMS ACC.NO.: 00S40601

(18) DOC.CIT.: Bebbington, W. P. The reprocessing of nuclear fuels. Scientific American, 235(6):30-41, Dec. 1976.

(1) SWIRS ACC.NO.: 041389

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Cave L (10) GEO. AREA: 1MA/2MC; 1NA/2RG (10) PUB. YEAR: 1976

(11) ABSTRACT: Problems associated with the management and disposal of nuclear waste are explored. It is pointed out that reprocessing and waste management is the most urgent problem facing the nuclear industry. The position of the Energy Research and Development Administration on nuclear waste is detailed. The administration's preferred choice of technology for highly active waste is to convert it from liquid to solid material within 5 years of its generation and then dispose of evaporated solids in suitable geological formations. England's policies on waste storage are described as well as France's approach to the management of nuclear waste. International aspects of waste management are examined. Consideration is given to the use of concrete wells for storage, governmental responsibility and public interest in the disposal of nuclear waste, commercial waste, technological processes involved in the solidification of highly actively liquid waste from fuel reprocessing, and the ultimate disposal of active waste. Tabular data are provided on the characteristics of solidified high level waste.

(12) KEYWORDS: DISPOSAL; EUROPE; FRANCE; FUEL; GREAT BRITAIN; INTERNATIONAL; LIQUID; MANAGEMENT; PROBLEMS; RADIOACTIVE; SITES; SOLID; STORAGE

(14) HIERARCH TERMS: 1RA/2RH

(15) STIMS ACC.NO.: 00S40433

(18) DOC.CIT.: Cave, L. Management of wastes from the LWR fuel cycle. Nuclear Engineering International, 21(250):69-74, Nov. 1976.

(1) SWIRS ACC.NO.: 041373

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Bowman WB (10) GEO. AREA: 1AE; 1CI (10) PUB. YEAR: 1976

(11) ABSTRACT: A family of curves is developed which can be used to convert exposure rate (mR/hr) into Ci (Curie) content in packaged or drummed radioactive waste. A model based on a cylindrical shape is used. The conversion curves take into account changes in package dimensions, waste density, and average gamma energy.

(12) KEYWORDS: CONTAINER; DESIGN; MATHEMATICAL MODEL; MEASUREMENTS; MONITOR; PACKAGING; RADIOACTIVE; SEEPAGE

(14) HIERARCH TERMS: 1RA/2RH

(15) STIMS ACC.NO.: 00S40417 (15) SECONDARY AUTHORS: Swindle DL

(18) DOC.CIT.: Bowman, W. B. , and D. L. Swindle. Determination of the Ci content of packaged radioactive waste using measured dose rates. Health Physics, 31(5):445-450, Nov. 1976.

(1) SWIRS ACC.NO.: 041348
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Manelle J (10) GEO. AREA: 1EU/2FR (10) PUB. YEAR: 1976
(11) ABSTRACT: The interim storage and final disposal of nuclear waste in France is examined. Provisions have been made for the storage of high level liquid waste, and the construction of new storage tanks is in progress. Factors limiting the disposal of nuclear waste are noted, and data on the production of nuclear waste are provided. Safety aspects of storage are detailed. The primary characteristics of storage tanks for containment include the following: (1) tanks are made of stainless steel with severe quality control requirements; (2) cooling coils suspended inside the tanks are provided; (3) the primary cooling circuit is a closed loop connecting plate exchangers to aerocondensers; (4) agitation is performed by air pulsations; and (5) tank ventilation is related to scrubbers. The French process of vitrification is detailed. The suitability of geological formations for the disposal of nuclear waste is explored.
(12) KEYWORDS: COMPOSITION; DATA; DISPOSAL; EUROPE; FRANCE; GEOLOGIC; RADIOACTIVE; SAFETY; STORAGE; TANK
(14) HIERARCH TERMS: 1RA/2RG; 1RA/2RH
(15) STIMS ACC.NO.: 00S40392 (15) SECONDARY AUTHORS: Sousselier Y
(18) DOC.CIT.: Manelle, J. , and Y. Sousselier. Interim storage and final disposal of nuclear wastes in France. Kerntechnik, 18(12):524-525, Dec. 1976.

(1) SWIRS ACC.NO.: 041331
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Tatyrek AF (10) GEO. AREA: 1HA/2HG (10) PUB. YEAR: 1976
(11) ABSTRACT: The formation and chemistry of pink waste water from TNT processing are addressed. Based on experimental work and field experience with TNT and pink water, it is shown that both are toxic hazards. The treatment of pink waste water is classified according to concentration and destruction methods. Concentration methods include distillation, reverse osmosis, carbon adsorption and regeneration, polymeric adsorption and regeneration, foam separation, solvent extraction, and water recycle. Destruction methods relate to ozonolysis, ozonolysis and ultraviolet techniques, gamma radiation, incineration, aqueous phase catalytic oxidation, and composting and soil disposal. The effectiveness of these treatment methods is detailed, and significant parameters of each treatment method are noted. It is concluded that the major problem to be overcome in the treatment of pink water effluent is the development of an effective and economic process for concentrating large quantities of the very dilute effluent to a significantly more concentrated form which may then be readily destroyed. (Retained in SWIRS library)
(12) KEYWORDS: CONCENTRATION; DISPOSAL; EXPLOSION; HAZARDOUS; PLANT-INDUSTRIAL; TOXIC; TREATMENT; WASTE WATER
(14) HIERARCH TERMS: 1IC/2IY
(15) STIMS ACC.NO.: 00S40375
(18) DOC.CIT.: Tatyrek, A. F. Treatment of TNT munitions wastewaters: the current state of the art. Dover, NJ, Picatinny Arsenal, Oct. 1976. 145 p.

(1) SWIRS ACC.NO.: 041116
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Boden PJ (10) GEO. AREA: 1HA/2HG (10) PUB. YEAR: 1976
(11) ABSTRACT: The disposal of toxic and radioactive wastes is discussed. Many industries use toxic chemicals, thus producing toxic wastes some of which can be rendered harmless at the plant or reduced by conversion to another form. Treatment of wastes whose toxicity cannot be reduced include dispersal in rivers or ocean, storage on special sites, and reclamation. Mercury is particularly dangerous when dispersed in water, as it concentrates in fish, with consequent danger to consumers. Solid waste disposal is mainly by placing the slurries formed in settling ponds, and in Great Britain toxic chemical dumping

sites are licensed and radioactive wastes are handled by governmental disposal service. The operation of a licensed toxic waste dump is described. The advantages and disadvantages of nuclear energy are discussed and the occurrence and characteristics of radioactivity are described, together with the different measurements of radioactivity, and dosage effects. Comparative toxicity of lead, arsenic, and fission products are presented, indicating that water dispersal is not possible for radioactive wastes, and radioactive decay is very slow. The sources of low, and high level activity radioactive wastes are given. In Great Britain a 250 acre site is reserved for disposal of low level activity wastes. Compression and baling of the waste was found costly and added another area of contamination. Incineration was costly and not as effective. High level liquid effluents are processed to remove solids that can then be sealed in drums for transportation by rail to a storage site.

(12) KEYWORDS: COMPACTION; EUROPE; FISH; GREAT BRITAIN; INCINERATION; LICENSE; MERCURY; OCEAN; RADIOACTIVE; SITES; STORAGE; TOXIC; TREATMENT; WATERWAY

(14) HIERARCH TERMS: 1HA/2HF

(15) STIMS ACC.NO.: 00S40160

(18) DOC.CIT.: Boden, P. J. Disposal of toxic wastes. 2. poisonous and radioactive wastes. Conservation and Recycling, 1(1):119-128, 1976.

(1) SWIRS ACC.NO.: 040973

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Merritt WF (10) GEO. AREA: 1LC; 1RA/2RH (10) PUB. YEAR: 1977

(11) ABSTRACT: The results from two test burials of high level wastes, incorporated into nepheline syenite glass and buried in contact with groundwater for 15 yr, indicate that the nuclear wastes from fuel processing for a 30,000 MW(e) nuclear power industry could be incorporated into such glass and stored beneath the water table in the waste management area of Chalk River Nuclear Laboratories (CRNL) without harm to the environment. The process was developed as an alternative to solidification of spent fuel from nuclear power plants, and in solution to the hazard potential of leaching, CRNL created a material so durable that it could be buried underground without containment. The material was a glass based on nepheline syenite, a naturally occurring aluminosilicate mineral. Glass blocks were prepared by combining a mixture of 85 percent nepheline syenite and 15 percent lime with fission product solution in a ceramic crucible. The resulting gel was dried, denitrated at 900 C (1173 K), and melted at 1350 C (1623 K) to form a glass. Volatile components, mainly ruthenium and cesium, were adsorbed on a heated bed of fire brick and iron oxides. Two further field leach tests are in progress.

(12) KEYWORDS: BURY; CANADA; COMMERCIAL; CONTAINER; EFFECT; ENVIRONMENT; GLASS; GROUND WATER; INVESTIGATION; LABORATORY; LEACH; RADIOACTIVE; SOLID; STORAGE; UNDERGROUND

(14) HIERARCH TERMS: 1GB

(15) STIMS ACC.NO.: 00S40017

(18) DOC.CIT.: Merritt, W. F. High level waste glass: field leach test. Nuclear Technology, 32(1):88-90, Jan. 1977.

(1) SWIRS ACC.NO.: 040971

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Moore JG (10) GEO. AREA: 1LC; 1RA/2RH (10) PUB. YEAR: 1977

(11) ABSTRACT: The rates at which strontium, cesium, plutonium, and curium are leached from hydrofracture grout (a modified cement) were measured. These studies utilized the test method proposed by the International Atomic Energy Agency or a modification that exposed smaller specimens with a higher surface to volume ratio to a larger volume of leachant. In general, the isotope leach rate followed the order: cesium, moreso than strontium, more so than curium, moreso than plutonium. The amount of an isotope leached as a function of time depended on the composition of the leachant and varied in the order: distilled water, moreso than tap water, moreso than grout water. Concentrating the waste by a factor of up to 4 (prior to incorporation

into a grout) had little effect on the leach rate of either strontium or cesium. A comparison of the leach data for the grout with results reported previously by other investigators for other products indicates that the grout can provide leach rates comparable to those obtained for wastes incorporated into borosilicate glass.
(12) KEYWORDS: ANALYSIS; COMPARISON; CONCRETE; GLASS; ISOTOPE; LABORATORY; LEACH; MEASUREMENTS; RADIOACTIVE; SIMULATION; TIME
(14) HIERARCH TERMS: 1AE
(15) STIMS ACC.NO.: 00S40015 (15) SECONDARY AUTHORS: Godbee HW; Kibbey AH
(18) DOC.CIT.: Moore, J. G. , H. W. Godbee, and A. H. Kibbey. Leach behavior of hydrofracture grout incorporating radioactive wastes. Nuclear Technology, 32(1):39-52, Jan. 1977.

(1) SWIRS ACC.NO.: 040970
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: T
(4) AUTHOR: Colombo P (10) GEO. AREA: 1US/2NY (10) PUB. YEAR: 1977
(11) ABSTRACT: Techniques are developed for the solidification of radioactive wastes in concrete. Included are the sources, storage, volume reduction, and solidification of liquid wastes at Brookhaven National Laboratory, Upton, New York, using the cement/vermiculite process, as well as solid waste treatment, shipping containers, and off site shipments of solid wastes. The properties of low heat generating high level wastes, simulating those in storage at the Savannah River Plant, solidified in concrete were determined. Polymer impregnation was found to further decrease the leachability and improve the durability of these concrete waste forms. Mathematical models and numerous tables are included.
(12) KEYWORDS: COATING; CONCRETE; CONTAINER; LEACH; LIQUID; POLYMER; PROCESS; RADIOACTIVE; SOLID; STORAGE; TECHNOLOGY
(14) HIERARCH TERMS: 1MA/2MH; 1RA/2RG; 1RA/2RH
(15) STIMS ACC.NO.: 00S40014 (15) SECONDARY AUTHORS: Nielson RM Jr
(18) DOC.CIT.: Colombo, P. , and R. M. Nielson, Jr. Some techniques for the solidification of radioactive wastes in concrete. Nuclear Technology, 32(1):30-38, Jan. 1977.

(1) SWIRS ACC.NO.: 040969
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: T
(4) AUTHOR: Wickland CE (10) GEO. AREA: 1OS/2CO/3RF (10) PUB. YEAR: 1977
(11) ABSTRACT: Large quantities of plutonium contaminated waste are generated at the U. S. Energy Research and Development Administration's (ERDA) nuclear weapons facility, the Rocky Flats Plant. Liquid and solid wastes are generated and treated to produce immobile, stable, solidified wastes. Effective waste management techniques have been incorporated to significantly reduce the volume of waste. Packaging systems have been designed to meet the 20 yr retrievability requirement. The sources of waste generation and the treatment processes performed at Rocky Flats as well as the waste packaging systems utilized to meet U. S. Department of Transportation and ERDA requirements are discussed.
(12) KEYWORDS: COLORADO; CONTAINER; CONTAMINATE; CRITERIA; DESIGN; FACILITY; FEDERAL; MANAGEMENT; OPERATIONS RESEARCH; RADIOACTIVE; REDUCTION; RESIDUE; STABILIZATION; VOLUME
(14) HIERARCH TERMS: 1PM; 1RA/2RB; 1SM/2TC
(15) STIMS ACC.NO.: 00S40013
(18) DOC.CIT.: Wickland, C. E. Packaging Rocky Flats waste. Nuclear Technology, 32(1):25-29, Jan. 1977.

(1) SWIRS ACC.NO.: 040968
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T
(4) AUTHOR: Berreth JR (10) GEO. AREA: 1SM/2SO (10) PUB. YEAR: 1977
(11) ABSTRACT: Corrosion measurements on stainless steel bins used to store high level waste (HLW) calcines at the Idaho Chemical

Processing Plant indicate an internal corrosion rate of 0. 13 mm over 500 yr. From a corrosion standpoint, the existing bins or canisters stored in air will last more than 500 yr. Synthetic commercial HLWs solidified by fluidized bed calcination have been stabilized (nitrates and water removed) at 620 to 720 C to permit their storage in sealed canisters. Heat transfer properties in the canister storage of the basic HLW forms were calculated, based on specified canister configurations, cooling media, and maximum permissible product or canister wall temperature, for a 150 MTU/yr commercial reprocessing plant. The number of canisters required annually varies from approximately 150 to 800 canisters/yr. Numerous tables are given.

(12) KEYWORDS: CHEMICAL; CONTAINER; CORROSION; FACILITY; FLUIDIZED BED; HEAT; IDAHO; MEASUREMENTS; METAL; PROCESS; PROJECTION; RADIOACTIVE; SOLID; STABILIZATION; STORAGE; TIME

(14) HIERARCH TERMS: 1RA/2RH

(15) STIMS ACC.NO.: 00S40012 (15) SECONDARY AUTHORS: Hoskins AP; Rindfleisch JA

(18) DOC.CIT.: Berreth, J. R. , A. P. Hoskins, and J. A. Rindfleisch. Stabilization and storage of solidified high-level radioactive wastes. Nuclear Technology, 32(1):16-24, Jan. 1977.

(1) SWIRS ACC.NO.: 040967

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Mershad EA (10) GEO. AREA: 1US/2OH (10) PUB. YEAR: 1977

(11) ABSTRACT: Operations conducted at Mound Laboratory (Monsanto Research Corporation), Miamisburg, Ohio include the routine handling of multigram quantities of tritium in various research, development, and analytical systems. These operations produce radioactively contaminated effluents that must be processed to remove tritium, tritium oxide, and tritiated pump oil vapors before release of the effluent gases to the environment. In the process of decontaminating the effluent gas stream, appreciable quantities of tritium contaminated liquid wastes are collected. Because of increased emphasis on minimizing tritium release to the environment, considerable effort has been expended in areas of containment, safe handling, and disposal of tritiated liquid waste. Mound Laboratory has developed facilities and methods for the safe handling and packaging of this liquid waste. The primary objectives of all tritiated waste packaging procedures are to (1) minimize effluent releases and personnel exposure during packaging; (2) ensure integrity of the primary containment; (3) minimize tritium permeation to the secondary and tertiary containment; (4) prevent or minimize isotopic exchange with groundwaters; (5) comply with U. S. Energy Research and Development Administration shipping regulations for radioactive wastes; and (6) meet U. S. Department of Transportation shipping requirements.

(12) KEYWORDS: BURY; CONTAINER; CONTAMINATE; EFFLUENT; FACILITY; LABORATORY; OHIO; OIL; OPERATIONS RESEARCH; RADIOACTIVE; TECHNOLOGY; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1RA/2RH; 1SM/2SO; 1SM/2TC

(15) STIMS ACC.NO.: 00S40011 (15) SECONDARY AUTHORS: Dauby JJ; Thomasson WW

(18) DOC.CIT.: Mershad, E. A. , W. W. Thomasson, and J. J. Dauby. Packaging of tritium-contaminated liquid waste. Nuclear Technology, 32(1):53-59, Jan. 1977.

(1) SWIRS ACC.NO.: 040966

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Jackson RR (10) GEO. AREA: 1US/2WA/3HN (10) PUB. YEAR: 1977

(11) ABSTRACT: The strontium (Sr) and cesium (Cs) fractions separated from high radiation level wastes at Hanford are converted to the solid strontium fluoride and cesium chloride salts, doubly encapsulated, and stored underwater in the Waste Encapsulation and Storage Facility. A capsule contains approximately 70,000 curies (Ci) (2. 59 PBq recommended maximum package) of Cs137 or 70,000 to 140,000 Ci (2. 59) to 5. 18 PBq) of Sr90. Materials for fabrication of process equipment and capsules must withstand a combination of corrosive chemicals, high radiation dosages, and, frequently, elevated

temperatures. The two metals selected for capsules, Hastelloy C-276 for strontium fluoride and Type 316L stainless steel for cesium chloride, are adequate for prolonged containment. Additional materials studies are being done both for licensing strontium fluoride as source material and for second generation process equipment.

(12) KEYWORDS: CHLORIDE; CONTAINER; CORROSION; CRITERIA; FACILITY; MANAGEMENT; METAL; OPERATIONS RESEARCH; PROCESS; RADIOACTIVE; SALT; SEPARATING; STABILIZATION; STORAGE; WASHINGTON; WATER

(14) HIERARCH TERMS: 1RA/2RG; 1SM/2SO; 1SM/2TC

(15) STIMS ACC.NO.: 00S40010

(18) DOC.CIT.: Jackson, R. R. Hanford waste encapsulation: strontium and cesium. Nuclear Technology, 32(1):10-15, Jan. 1977.

(1) SWIRS ACC.NO.: 040965

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: T

(4) AUTHOR: Eister WK (10) PUB. YEAR: 1977

(11) ABSTRACT: Radioactive wastes generated in the commercial nuclear power program are to be converted to a stable package form and sent either to a Federally operated repository or to commercially operated shallow land burial sites. The status of alternate technologies to perform these operations has recently been reviewed and published. American and Canadian materials research and development activities related to the commercial package wastes cover a wide range of waste forms and related waste treatment technologies for the various types of radioactive wastes. At this time, specific projects are under way and scheduled for completion to provide the plant scale technology required for the engineered facilities for waste management. Sources, characteristics, and treatment methods of the waste generated are discussed, as well as storage projections and criteria for long term management.

(12) KEYWORDS: BURY; COMMERCIAL; DISPOSAL; ENGINEERING; FACILITY; FEDERAL; MANAGEMENT; PROCESS; RADIOACTIVE; RESEARCH; SITES; STABILIZATION; STORAGE; TECHNOLOGY; TRANSPORT; UNDERGROUND

(14) HIERARCH TERMS: 1RA/2RH

(15) STIMS ACC.NO.: 00S40009

(18) DOC.CIT.: Eister, W. K. Materials considerations in radioactive waste storage. Nuclear Technology, 32(1):6-9, Jan. 1977.

(1) SWIRS ACC.NO.: 040948

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G

(4) AUTHOR: Rochlin GI (10) GEO. AREA: 1SM/2TD (10) PUB. YEAR: 1977

(11) ABSTRACT: Technical irreversibility and site multiplicity are suggested as criteria for safe nuclear waste disposal. In the absence of goals or comprehensive regulatory standards on nuclear waste disposal, three types of waste treatment are generally employed: (1) short term disposal; (2) long term storage; and (3) disposal. Technical irreversibility and site multiplicity are recommended for use in organizing nuclear waste management options in terms of insuring continued isolation from the biosphere in the face of both social and geological uncertainties. Waste products resulting from the nuclear fuel cycle are discussed, and criteria for safe waste disposal methods are examined. Technical irreversibility is defined as the degree to which emplaced waste is resistant to recovery or release, either by accident or by the deliberate application of technology. Technical irreversibility measures resistance to both social and physical intervention. Tabular data are provided which classify several waste disposal methods according to their degree of technical irreversibility. Site multiplicity is considered to aid in minimizing the adverse effects of conceptual or design errors in the disposal of nuclear waste. The application of technical irreversibility and site multiplicity criteria to nuclear waste management is discussed.

(12) KEYWORDS: CRITERIA; DESIGN; DISPOSAL; PUBLIC; RADIOACTIVE; RESIDUE; SAFETY; SITES; STORAGE; TECHNOLOGY

(14) HIERARCH TERMS: 1RA/2RG

(15) STIMS ACC.NO.: 00S39992

(18) DOC.CIT.: Rochlin, G. I. Nuclear waste disposal: two social criteria. Science, 195(4273):23-31, Jan. 7, 1977.

(1) SWIRS ACC.NO.: 040942
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) GEO. AREA: 1RA/2RG (10) PUB. YEAR: 1977
(11) ABSTRACT: The proposal of the Energy Research and Development Administration for the storage of high energy radioactive waste in stable geologic formations is reported. The proposed plan has received the endorsement of the Nuclear Regulatory Commission's independent advisory committee on reactor safeguards. Noting that the first one or two storage sites will retain the option to retrieve waste if anything goes wrong, the advisory committee feels that the Nuclear Regulatory Commission should establish appropriate criteria for licensing and regulating such facilities. The committee stressed the need for a better understanding of the long term risks associated with the disposal of high level radioactive waste. Potential health problems associated with the proposed storage plan, according to the advisory committee, are primarily of a chronic low level nature and will decrease substantially during the first few hundred years of decay. It is recommended that, in the development of criteria for disposal facility licensing, the Nuclear Regulatory Commission include a definition of the forms of waste acceptable for storage and required conditions of waste durability and integrity through some stated minimum period. Consideration should also be given to the volume of waste that may have to be retrieved and actions to be taken following such retrieval, including contingency plans for waste storage. The need for continued research on the long term transport of transuranic elements in geologic structures and on the uptake and retention of radionuclides by plants and animals is emphasized.
(12) KEYWORDS: ADMINISTRATION; CRITERIA; DISPOSAL; ENERGY; FEDERAL; GEOLOGIC; HAZARDOUS; RADIOACTIVE; SAFETY; STORAGE
(14) HIERARCH TERMS: 1MA
(15) STIMS ACC.NO.: 00S39986
(18) DOC.CIT.: Nuclear waste disposal plan gets NRC okay. Chemical and Engineering News, 55(2):8, Jan. 10, 1977.

(1) SWIRS ACC.NO.: 040789
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(4) AUTHOR: Straub CP (10) GEO. AREA: 1RA (10) PUB. YEAR: 1976
(11) ABSTRACT: Literature pertaining to radioactive wastes is revieved. The U. S. Energy Research and Development Administration lists 2,140 references on radioactive wastes. Hearings before the Joint Committee on Atomic Energy summarized information on the status and directions for handling waste materials generated by the nuclear power industry to the year 2000. Treatment aspects of radioactive wastes are dealt with as are a patented method for the adsorption or chemisorption of radioactive ions, and transmutation of the long lived hazardous radionuclides strontium 90 and cesium 137. Storage of radioactive wastes was the subject of two investigations. The National Academy of Sciences report reviewed three concepts for interim storage of solidified high level radioactive wastes. Twelve articles consider the topic of fixation. Comparative data on the various parameters affecting radioactive waste solidification as a guide to plant designers and operators is presented. Investigators found the Aeroject VR 20 Radioactive Waste Management System of fluid bed calcination more economical than conventional solidification processes. Ground disposal of radioactive wastes was the subject of three articles while ocean disposal was discussed in nine. Edmonson et al have prepared a bibliography of 570 non Russian references on marine radioecology while a bibliography by Lehmann contains 131 abstracts on ocean disposal of wastewater, sludge, dredge material, disposal of radioactive wastes, brines, and industrial wastes. Forty four articles and publications are revieved.
(12) KEYWORDS: BIBLIOGRAPHY; DISPOSAL; ENERGY; FEDERAL; HAZARDOUS; ISOTOPE; LITERATURE; OCEAN; RADIOACTIVE; STORAGE; TREATMENT
(14) HIERARCH TERMS: 1DD/2DW
(15) STIMS ACC.NO.: 00S39833
(18) DOC.CIT.: Straub, C. P. Industrial wastes: radioactive wastes. Journal Water Pollution Control Federation, 48(6):1305-1311, June 1976.

(1) SWIRS ACC.NO.: 040783
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(4) AUTHOR: Smith CF (10) GEO. AREA: 1RA/2RG (10) PUB. YEAR: 1976
(11) ABSTRACT: One of the major concerns with the continued growth of the nuclear power industry is the production of the high level radioactive wastes which are by products of the fission process. The risks associated with the disposal of high level wastes derive from the potential for release of radioactive materials into the environment. The assessment of these risks requires a methodology for risk analysis, an identification of the radioactive sources, and a method by which to express the relative hazard of the various radionuclides that comprise the high level waste. The development of a methodology for risk analysis is carried out after a review of previous work in the area of probabilistic risk assessment. The methodology suggested involves the probabilistic analysis of a general accident consequence distribution. In this analysis, the frequency aspect of the distribution is treated separately from the normalized probability function. In the final stage of the analysis, the frequency and probability characteristics of the distribution are recombined to provide an estimate of the risk. The characterization of the radioactive source term is accomplished using the ORIGEN computer code.
(12) KEYWORDS: ACCIDENT; ANALYSIS; BURY; COMPUTER; DISPOSAL; FUEL; GENERATION; HAZARDOUS; ISOTOPE; MANAGEMENT; MATHEMATICAL MODEL; POWER; RADIOACTIVE; TECHNOLOGY
(14) HIERARCH TERMS: 1AE
(15) STIMS ACC.NO.: 00S39827 (15) SECONDARY AUTHORS: Kastenberg WE
(18) DOC.CIT.: Smith, C. F. , and W. E. Kastenberg. On risk assessment of high level radioactive waste disposal. Nuclear Engineering and Design, 39(2-3):293-333, Nov. /Dec. 1976.

(1) SWIRS ACC.NO.: 040758
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(4) AUTHOR: De Bacci M (10) PUB. YEAR: 1976
(11) ABSTRACT: A method of preparing liquid waste fission products for storage is described. The method of preparation is as follows: the waste fission product particles are overcoated by tumbling them with a powder mixture which includes alpha silicon carbide, carbon and a carbonaceous thermosetting binder while a solvent is applied to make the binder tacky; the overcoated particles are consolidated at a temperature to thermoset the binder and form a green body; the bodies are reaction sintered by heating, initially at a temperature to carbonize the binder, then at a temperature to melt the silicon carbide enclosing the waste fission products. The temperature for melting the silicon is about 1600 C.
(12) KEYWORDS: CARBON; COATING; LIQUID; PATENT; PROCESS; RADIOACTIVE; SILICON; SINTER; STORAGE; THERMAL
(14) HIERARCH TERMS: 1RA/2RH
(15) STIMS ACC.NO.: 00S39802 (15) SECONDARY AUTHORS: Price MS
(18) DOC.CIT.: De Bacci, M. , and M. S. Price. (United Kingdom Atomic Energy Authority, London). Preparation for storage of fission products. U. S. Patent No. 3,994,822; filed Jan. 29, 1975; issued Nov. 30, 1976.

(1) SWIRS ACC.NO.: 040600
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T
(4) AUTHOR: Bonniaud R (10) GEO. AREA: 1EU/2FR (10) PUB. YEAR: 1976
(11) ABSTRACT: Continuous vitrification of high level radioactive wastes in France taken to the industrial plant scale is discussed. The first prototype equipment for continuous vitrification was operated for 8000 hr with various simulated fission product solutions. A second prototype has been built particularly to demonstrate remote handling operations. Current developments are directed to the following areas of importance: a study of the continuous vitrification of fission product solutions from the reprocessing of FBR; the examination of the feasibility of continuous denitration prior to vitrification and the

effect of this treatment upon the operation of the calciner; increasing the throughput of the calciner by increasing the flow rate and continuously concentrating prior to calcination; furnace capacity; the effect of high heat to the centerlines of the furnace blocks; and the effects of thermal shocks occuring in the glass during external decontamination of the container. Plant operation conditions are described.

(12) KEYWORDS: EUROPE; FRANCE; FURNACE; GLASS; HEAT; OPERATIONS RESEARCH; PLANT-INDUSTRIAL; PROCESS; RADIOACTIVE; SAFETY

(14) HIERARCH TERMS: 1RA/2RG

(15) STIMS ACC.NO.: 00S39644

(18) DOC.CIT.: Bonniaud, R. Continuous vitrification in France taken to industrial plant scale. Nuclear Engineering International, 21(250):67-69, Nov. 1976.

(1) SWIRS ACC.NO.: 040578

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T

(4) AUTHOR: Bunnell LR (10) GEO. AREA: 1RA/2RG (10) PUB. YEAR: 1976

(11) ABSTRACT: High level radioactive wastes are encapsulated in vitreous carbon for longterm storage. The wastes are mixed as finely divided solids with a suitable resin, formed into an appropriate shape and cured. The cured resin is carbonized by heating under a vacuum to form vitreous carbon. The vitreous carbon shapes may be further protected for storage by encasement in a canister containing a low melting temperature matrix material such as aluminum to increase impact resistance and improve heat dissipation.

(12) KEYWORDS: DISPOSAL; HAZARDOUS; METAL; NON-FERROUS; PATENT; PROCESS; RADIOACTIVE; RESIN; STORAGE; TREATMENT

(14) HIERARCH TERMS: 1SM/2TC

(15) STIMS ACC.NO.: 00S39622 (15) SECONDARY AUTHORS: Bates JL

(18) DOC.CIT.: Bunnell, L. R., and J. L. Bates. Method of encapsulating solid radioactive waste material for storage. U. S. Patent No. 3,993,579; filed Oct. 22, 1975; issued Nov. 23, 1976.

(1) SWIRS ACC.NO.: 040601

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(4) AUTHOR: Corbet A (10) GEO. AREA: 1EU/2FR; 1EU/2UK (10) PUB. YEAR: 1976

(11) ABSTRACT: World wide scientific effort directed at developing high active liquid waste (HLW) solidification processes are discussed. Of particular interest at the moment are the new glass formulations, their leach resistance rates and their ability to stand up to alpha damage. In Great Britain the HARVEST project will determine a future course of action to replace tank storage. At present an effort is being made to develop a feed metering system that does not need maintenance. There are also problems involved in changing components. A comparison is made between the French continuous process and the British HARVEST system. Nearly all international work leads to the production of similar products: special borosilicate glasses in which the radioactive components of the HLW are incorpoated in silica lattice. There are a few differences in the detailed compositions of these glasses. The problems of building a plant in light of the possible changing nature of fuel strength and composition is discussed.

(12) KEYWORDS: COMPARISON; CONSTRUCTION; EUROPE; FRANCE; GLASS; GREAT BRITAIN; LIQUID; RADIOACTIVE; SILICON; SOLID; SYSTEM

(14) HIERARCH TERMS: 1MA; 1RA/2RH

(15) STIMS ACC.NO.: 00S39645

(18) DOC.CIT.: Corbet, A. World-wide push to early solidification of high-active liquid waste. Nuclear Engineering International, 21(250):63-66, Nov. 1976.

(1) SWIRS ACC.NO.: 040401

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Vojtech O (10) PUB. YEAR: 1976

(11) ABSTRACT: The process of incorporation of radioactive wastes into a suitable matrix to form a stable product for longterm disposal

has been analyzed in this study. The changes, occuring during the thermal treatment with glassy materials, i. e. drying, transformation processes, sintering, melting, etc. , have been followed using emanation (radon) thermal analysis (ETA). The method of ETA gives information useful in the evaluation of a suitable fixation system and process. The combination of effects of sintering, reaction product gas release, and related phenomena, can be studied. The "closing" and "opening" of the solid state structure is of considerable importance in optimizing the process of solidification of highly active nuclear wastes. Six figures and a table illustrate the report.

(12) KEYWORDS: ANALYSIS; DISPOSAL; HAZARDOUS; RADIOACTIVE; RESEARCH; SINTER; SOLID; THERMAL

(14) HIERARCH TERMS: 1RA/2RG

(15) STIMS ACC.NO.: 00S39445 (15) SECONDARY AUTHORS: Kourim V; Plasil F

(18) DOC.CIT.: Vojtech, O. , F. Plasil, and V. Kourim. The use of emanation thermal analysis for the investigation of radioactive waste fixation processes. Journal of Radioanalytical Chemistry, 30:583-592, 1976.

(1) SWIRS ACC.NO.: 040386

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(4) AUTHOR: Lewis JB (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1976

(11) ABSTRACT: The problems of treating and disposing of small amounts of radioactive wastes from nuclear power projects are discussed. The major source of radioactive wastes is the fuel element reprocessing plant. Here the fuel is decanned and dissolved in nitric acid so that the uranium can be recovered and, together with the plutonium that has been formed, separated from the fission products. High, medium, and low activity effluents are produced and each stream must be treated appropriately. Alternative systems for disposal and storage of liquids and solids are described and the relative direct and total waste management costs of each are estimated. Nuclear transmutation and various longrange problems relative to particular types of radioactive wates are discussed.

(12) KEYWORDS: DISPOSAL; ENVIRONMENT; EXPOSURE; FUEL; GASSES; GREAT BRITAIN; HAZARDOUS; ISOTOPE; LIQUID; PARTICULATE MATTER; PROBLEMS; RADIATION; RADIOACTIVE; SOLID; STORAGE; WASTE WATER

(14) HIERARCH TERMS: 1RA/2RG

(15) STIMS ACC.NO.: 00S39430

(18) DOC.CIT.: Lewis, J. B. Radioactive wastes and nuclear power: methods of treatment. Physics in Technology, 7(2):77-84, Mar. 1976.

(1) SWIRS ACC.NO.: 040385

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S

(4) AUTHOR: Cohen BL (10) PUB. YEAR: 1976

(11) ABSTRACT: The potential hazards of the high level waste produced in one year from all nuclear fuel reprocessing plants in the United States are calculated as a function of time for direct gamma radiation, inhalation, and ingestion, and scales are given for consequences of the worst credible handling. The probability for buried waste to be released into the environment by several pathways is estimated, and several factors of related interest are discussed. It is concluded that the potential hazards in these wastes are not inordinately large in comparison with those of other hazardous materials used in our society, such as arsenic, barium, copper, chlorine, ammonia, hydrogen cyanide, etc. The requirement for cheap, abundant energy is stressed. Four figures and two tables accompany the report.

(12) KEYWORDS: AMMONIA; CHLORINE; EFFECT; ENVIRONMENT; GEOLOGIC; GROUND WATER; HAZARDOUS; HEALTH; ION; ION EXCHANGE; ISOTOPE; LEACH; PARTICULATE MATTER; RADIATION; RADIOACTIVE; UNDERGROUND

(14) HIERARCH TERMS: 1RA/2RG

(15) STIMS ACC.NO.: 00S39429

(18) DOC.CIT.: Cohen, B. L. Environmental impacts of high level radioactive waste disposal. IEEE Transactions on Nuclear Science, 23(1):56-59, Feb. 1976.

(1) SWIRS ACC.NO.: 039862
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The vacuum freeze distillation method was successfully applied to the preparation of radiochemically pure water samples used for determining the tritium concentration in highly radioactive liquid waste produced in nuclear fuel reprocessing. This method yielded a decontamination factor exceeding 1 million for radioruthenium and other long lived fission products. The isotope effect on the tritium concentration was corrected by applying an enrichment factor determined from experiment. A small portion of the high level liquid waste solution was taken from the Reprocessing Plant of the Japan Atomic Energy Research Institute, neutralized with 2 normal sodium hydroxide,, and subjected to the vacuum freeze distillation. The distillate was subsequently analyzed for tritium by liquid scintillation counting. The tritium concentration in the waste solution was found to be approximaely 0. 13 microcuries per milliliters which corresponded to about 70 percent of the total tritium contained in the original spent fuel rods.
(12) KEYWORDS: CHEMICAL; CONCENTRATION; DISTILLATION; EFFECT; FREEZING; JAPAN; MEASUREMENTS; PROCESS; RADIOACTIVE; RESEARCH; VACUUM; WATER
(15) STIMS ACC.NO.: 00S3890b
(18) DOC.CIT.: Tachimori, S. Determination of tritium concentration in fuel reprocessing liquid waste by vacuum freeze distillation. Journal of Nuclear Science and Technology, 13(8):442-448, Aug. 1976.

(1) SWIRS ACC.NO.: 039791
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: Methods and apparatus for disposing of radioactive waste liquids by solidifying the liquids into hardened masses suitable for disposal by burying are described. Disposal of at least partially radioactive waste material is accomplished by intermixing the waste with a liquid containing a jelling agent consisting of an aqueous suspension of partially polymerized urea formaldehyde and a curing agent to form a free standing hardened mass. The operator of the apparatus can without exposure to the admixed mass of waste accurately determine when the mass is fully solidified. The mixture is then placed in a container, monitored for the appropriate time to add a curing agent after which the mixture is retained until hardening is complete and a surface free of waste water is achieved. The container and its solidified mixture may then be buried for disposal. The waste material includes reactor evaporator bottoms.
(12) KEYWORDS: BURY; COATING; DISPOSAL; HAZARDOUS; LIQUID; PATENT; POLYMER; RADIOACTIVE; SOLID
(15) STIMS ACC.NO.: 00S38835
(18) DOC.CIT.: Gamlin, K. (Nuclear Engineering Company, Inc.). Methods of disposing of radioactive waste. U. S. Patent No. 3,986,977, filed Feb. 3, 1975; issued Oct. 19, 1976.

(1) SWIRS ACC.NO.: 039703
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: The chances of radioactive wastes from nuclear power stations being ingested by people and causing cancer deaths are put into perspective with detailed numerical estimates. The parameters of the study are defined together with the method used to measure dosages. A graph displays the ingestion hazard. A comparison is made between the potency of arsenic and the careless way it is handled and the care that is taken with radioactive waste. An idea that has received much attention is incorporating the waste into pyrex glass. Geographical location of disposal sites has received much attention as has the possibility of leaching by groundwater. Human intrusion could also occur, mainly through drilling the salt in which wastes have been buried. The unlikelihood of both these occurences is explained. The probability of cancer deaths is calculated and displayed in a

supporting graph. Care would be needed initially, for about 600 years, in watching waste repositories, but the burden is small and distant progeny would be more likely to regret present squandering of hydrocarbons than to notice the tiny increase in radioactivity in their environment.

(12) KEYWORDS: DISEASE; DISPOSAL; ENVIRONMENT; GEOGRAPHY; GLASS; GROUND WATER; HAZARDOUS; HEALTH; HYDROCARBON; LEACH; POWER; RADIOACTIVE; SALT; TOXIC

(15) STIMS ACC.NO.: 00538747

(18) DOC.CIT.: Cohen, B. L. Storing radioactive wastes need not be a problem. Nuclear Engineering International, 21(249):38-41, Oct. 1976.

(1) SWIRS ACC.NO.: 039615

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Computerization of the radioactive shipment records (RSR) system for the Maxey Flats low level nuclear waste burial site near Morehead, Kentucky is discussed. In 1972, the Kentucky Radiological Health Department initiated a project to transfer the information contained on RSR onto magnetic computer tape. Data transferred during the project comprised nearly 200,000 computer cards containing information on the burial period from 1963 to 1972. Each of the records on the computer tape contained up to 25 pieces of information. Information items used for determining the Maxey Flats inventory were the burial data, burial location, isotope buried, activity of the buried isotope, volume of waste material burned, and sometimes a footnote number for messages that could not be included in the record. The correction of mistakes in computer records is described, and the waste inventory of the site, as provided in records, is calculated. The inventory is examined according to several classifications: activity for the site and burial pits, accumulated activity by isotope, and waste volume. Comparisons are made with other methods of inventory accounting. It is shown that existing records are not completely reliable. Possible reasons for mismatching are postulated.

(12) KEYWORDS: BURY; CLASSIFICATION; COMPUTER; DATA; KENTUCKY; MONITOR; RADIOACTIVE; SITES; TRANSPORT

(15) STIMS ACC.NO.: 00538659

(18) DOC.CIT.: Gat, U. , J. D. Thomas, and D. T. Clark. Radioactive waste inventory at the Maxey Flats nuclear waste burial site. Health Physics, 30(3):281-289, Mar. 1976.

(1) SWIRS ACC.NO.: 039458

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A patented process for the safe disposal, handling, and storage of radioactive waste is detailed. The invention relates to the disposal of radioactive waste associated with nuclear power production processes. It is shown that the addition of alkali or alkaline earth silicate to radioactive waste cementing material mixture produces a number of advantages over other radioactive waste disposal processes. These include direct solidification of all common nuclear power industry radioactive waste, including boric acid solutions; rapid hardening to a gel in less than 2 minutes, eliminating requirements for continuous mixing to insure homogeneity; solidification of maximum hardness in less than 7 days, compared to 28 days for cement alone without the alkali silicate additive; increased water retention over nonsilicated processes due to the high capacity of silicates for water fixation by hydration; production of more fluid mixes, causing ready adaptability to batch or continuous processing of radioactive waste; and minimum operator training and control required to obtain solidified

waste in a form suitable for safe handling and shipment. Procedures used in the invention for processing radioactive waste are detailed.

(12) KEYWORDS: ALKALINE; BATCH; CONCRETE; CONTINUOUS; DISPOSAL; EARTH; PATENT; PROCESS; RADIOACTIVE; SAFETY; SILICON; SOLID; STORAGE; TREATMENT

(15) STIMS ACC.NO.: 00S38502

(18) DOC.CIT.: Curtiss, D. B. , and H. W. Heacock. (United Nuclear Industries, Inc.). Radwaste disposal by incorporation in matrix. U. S. Patent No. 3,988,258; filed Jan. 17, 1975; issued Oct. 26, 1976.

(1) SWIRS ACC.NO.: 039421

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: A report is presented on the international symposium on management of radioactive wastes from the nuclear fuel cycle (March 1976, Vienna, Austria). The symposium was sponsored by the International Atomic Energy Agency and the Nuclear Energy Agency of OECD (Organization of European Community Development). A major topic of interest at the symposium was technology for the reduction and incorporation of high level radioactive liquid waste, containing essentially all of the radionuclides produced from the use of nuclear power, into solid forms for safe interim storage and eventual disposal. These solid products were characterized and evaluated as to their suitability and long term stability. Presentations also indicated that many countries now are examining the possibilities of disposing of the solidified, high level waste products and the longer life plutonium (alpha) contaminated waste into suitable geological formations. Papers abstracted in this report covered the following topics: and planning, removal of gaseous radionuclides, treatment of low level waste, treatment of hulls and solvent, solidication of high level waste, evaluation of solidified high level waste products, conditioning medium level waste, management of alpha bearing waste, geologic disposal, sea disposal, and radioactive waste burial.

(12) KEYWORDS: AUSTRIA; BURY; CONFERENCE; DISPOSAL; ENERGY; GEOLOGIC; INTERNATIONAL; MANAGEMENT; OCEAN; PLANNING; RADIOACTIVE; STORAGE; TREATMENT

(15) STIMS ACC.NO.: 00S38465

(18) DOC.CIT.: Lennemann, W. Management of radioactive wastes from the nuclear fuel cycle, report on the International Symposium held in Vienna from March 22 to 26, 1976. Atomic Energy Review, 14(2):421-429, June 1976.

(1) SWIRS ACC.NO.: 039417

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Bacteria of the genus Thiobacillus and Ferrobacillus have been discovered in leachate from numerous ore mines. The effect of these bacteria on the leaching of waste uranium materials from which 70 to 80 percent of uranium was previously removed by classical chemical hydrometallurgical procedure has been investigated. The bacteria used are found in the ore and the mine water of Zletovska River locality, Yugoslavia. Parameters of bilogical leaching were examined in the laboratory. Conditions were changed with the aim of increasing the amount of uranium leached. The effect or pyrite added to the waste materials before the beginning of leaching has also been studied. Uranium leaching is directly proportional to the composition and number of ferrobacteria and thiobacteria, and increased by almost twice the value obtained from the same starting materials without using bacteria.

(12) KEYWORDS: BACTERIA; CHEMICAL; EUROPE; HAZARDOUS; LEACH; MICROORGANISM; MINE; RADIOACTIVE; YUGOSLAVIA

(15) STIMS ACC.NO.: 00S38461

(18) DOC.CIT.: Barbic, F. F. , D. M. Bracilovic and B. V. Kajincanic. Bacterial leaching of waste uranium materials. Zeitschrift fuer Allgemeine Mikrobiologie, 16(3):179-186, 1976.

(1) SWIRS ACC.NO.: 038970
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: The magnitude and nature of the radioactive waste problem are discussed. Radioactive waste is a necessary byproduct associated with the operation of nuclear reactors. Nuclear reactors are operated for the production of electric energy, propulsion of ships, production of nuclear weapons and other special nuclear materials, and research and testing. Many types of radioactive waste originate as solutions, sometimes very dilute, and they all contain materials other than radioactive isotopes themselves. While most radioactive waste is at one time in the form of solutions or slurries, it is a steadily increasing trend and in some cases a legal requirement to convert such waste to a solid form. The overall management of radioactive waste is reviewed, with emphasis on the solidification and storage or disposal of solidified waste. Consideration is given to fission and activation products, fissionable material contamination, nuclear fuel reprocessing and types of waste generated, interim storage of liquid waste, solidification and treatment of low level waste, solidification of high level waste, storage of solidified radioactive waste, Federal repository for high level waste, and future improvements in the disposal of radioactive waste.
(12) KEYWORDS: BY-PRODUCT; MANAGEMENT; RADIOACTIVE; STORAGE
(15) STIMS ACC.NO.: 00S38014
(18) DOC.CIT.: Bucknam, J. A. Management of radioactive wastes. In Mantell, C. L. , ed. Solid wastes: origin, collection, Processing, and Disposal. New York, John Wiley and Sons, 1975. p. 949-988.

(1) SWIRS ACC.NO.: 038826
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: Radioactive wastes from nuclear power plants is stored in rock slat formations safe from leachate. A new disposal system designed by Steag-Kernenergie company is described based on the conditioning and solidification of radioactive wastes in mobile units operating at the nuclear power facility. The conditioning consists of treatment that prevents leaching. A picture of the "Fama" mobile unit for conditioning radioactive wastes is given. It was put in operation in November 1975. It weighs 20 tons and may be moved by a truck. During 3 months the unit processed and solidified 60 cubic meters of medium active resins from Gundremmingen nuclear power plant and transported them to the salt mines of Asse. (Text in German)
(12) KEYWORDS: CONTROL; DISPOSAL; EQUIPMENT; GERMANY; LEACH; MOVABLE; PROCESS; RADIOACTIVE
(15) STIMS ACC.NO.: 00S37670
(18) DOC.CIT.: Baatz, H. Behandlung von radioaktiven abfaellen aus Kernkraftwerken fuer die Endlagerung. (Treating radioactive waste from nuclear power plants for terminal disposal.) Atom und Strom, 22(4):103-104, July/Aug. 1976.

(1) SWIRS ACC.NO.: 038703
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: The research and development projects for reprocessing of nuclear power wastes at the Karlsruhe Society for Nuclear Research are evaluated, especially from the viewpoint of safety. The designing stage concerns itself with the construction and future operation of a large scale reprocessing plant for water reactor fuel. The planning stage is as good as completed, but there are still many gaps in the safety domain, especially in the training of personnel that would have the necessary experience to build and run a large scale reprocessing plant for nuclear wastes. For a 1,500 ton per year plant, there would be over 50,000 cubic meters of waste yielding (upon

reprocessing, concentration and solidification) above 4,000 cubic meters of disposable waste. (Text in German)
(12) KEYWORDS: DESIGN; DISPOSAL; GERMANY; PLANNING; PLANT-INDUSTRIAL; POWER; RADIOACTIVE; RESEARCH; SAFETY
(15) STIMS ACC.NO.: 00537627
(18) DOC.CIT.: Koch, G. Auf dem weg zur sicheren wiederaufbereitung (Towards a safe reprocessing of nuclear wastes.) Atomwirtschaft-Atomtechnik, 21(6):314-316, June 1976.

(1) SWIRS ACC.NO.: 038716
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: A method for recovering cesium (Cs) and palladium (Pd) values from nuclear reactor fission product waste is described. The method requires no pH adjustment and permits nitric acid recycle. Under oxidizing conditions, Cs and Pd are recovered from nitric acid fission product solution as an insoluble precipitate after contact with a chloride source. The source can be a soluble chloride or other compound which yields chloride ions in solution. The precipitate is predominantly a combination of Cs, Pd and chlorine. The oxidizing step is carried out electrolytically. After recovering the precipitate, Cs2PdCl6, contacting of the fission product waste solution with a source of nonradioactive Cs ions to cause the precipitation of additional Cs2PdCl6 and the recovery of the additional precipitate is detailed.
(12) KEYWORDS: CHLORIDE; OXIDATION; PATENT; PRECIPITATE; RADIOACTIVE; SEPARATING
(15) STIMS ACC.NO.: 00537760
(18) DOC.CIT.: Campbell, D. (U. S. Energy Research and Development Administration). Recovery of cesium and palladium from nuclear reactor fuel processing waste. U. S. Patent No. 3,979,496; filed Aug. 6, 1975; issued Sept. 7, 1976.

(1) SWIRS ACC.NO.: 038672
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: Delegates to the International Symposium on the Management of Wastes from the LWR (light water reactor) Fuel Cycle (Denver, July 1976) discussed the problems of radioactive waste disposal and the need for international standards. United States Energy Research and Development Administration director R. C. Seamens said that LWR offers the only plausible route towards energy independence. In Europe, a 15 country association (Foratom) is investigating problems of nuclear waste disposal. Spokesmen for Great Britain and West Germany gave accounts of the extent of their country's commitment to nuclear power and the problems of waste disposal. The necessity of coordinating international cooperation in nuclear matters was underlined and an informal organization was arranged at the Symposium. The International Atomic Energy Agency (IAEA) is already involved in aspects of waste disposal; it considers the problem of enforcement of disposal standards more important than their devising. In 1985, the U. S. government expects to begin operation of the first national site for permanent disposal of high level wastes. Projected nuclear industries will produce 11 kinds of nuclear wastes which must either be disposed of or recycled. Disposal of high level waste is causing much public concern. Disposal of phased out reactor or reprocessing plants is also discussed.
(12) KEYWORDS: CONFERENCE; DISPOSAL; ENERGY; EUROPE; FRANCE; GERMANY; GREAT BRITAIN; INTERNATIONAL; RADIOACTIVE; REGULATIONS; SAFETY; STANDARD
(15) STIMS ACC.NO.: 00537716
(18) DOC.CIT.: Experts mull over radioactive waste disposal. Chemical and Engineering News, 54(320):21-23, Aug. 2, 1976.

(1) SWIRS ACC.NO.: 038598
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: Different national approaches to the disposal of nuclear waste are examined. It is estimated that the disposal of nuclear waste by deep burial in stable rock formations will require 10 years of development time. A pilot plant disposal facility located in Belgium is noted. The site, an underground cavity, is scheduled to be ready for operation by 1979. In terms of French policies on nuclear waste disposal, one issue being debated is whether to separate fission products from actinides. It appears to be almost certain that France will bury its waste in deep formations of rock salt or crystalline rock. The target year for the first repository is 1985. In Italy, the results of tests in impervious clay deposits are promising. A processing pilot plant is scheduled for mid 1980. The first reprocessing plant in Spain is scheduled for the late 1980's, and it is hoped that the first waste depository will be ready by 1990. Spain is considering the use of abandoned uranium mines, salt domes, and anhydrite deposits for nuclear waste disposal. The most likely possiblity for nuclear waste disposal in Sweden involves burial in bedrock.
(12) KEYWORDS: BURY; DISPOSAL; FRANCE; ITALY; MANAGEMENT; RADIOACTIVE; SITES; SPAIN; UNDERGROUND
(15) STIMS ACC.NO.: 00S37642
(18) DOC.CIT.: Technology; sites sought for nuclear waste disposal. Chemical and Engineering News, 54(33):23, Aug. 9, 1976.

(1) SWIRS ACC.NO.: 038491
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: The treatment of highly radioactive wastes consists of converting the liquid solutions into a solid stable product. The volume is decreased tenfold, so that a 1,000 Megawatt reactor produces annually about 2 to 2. 5 cubic meters of solid waste. In West Germany, there are three processes for solidifying highly active solutions. The ultimate objective is to build a centralized solidification facility for reprocessing radioactive waste with an annual capacity of 1,500 tons. The immediate objective is a pilot plant at the Karlsruhe reprocessing facilities. Solidified products are basically safe even if geological conditions may turn unfavorable. Borosilicate glass may offer an additional margin of safety. In Europe, the total volume of fission product concentrate from water reactor fuel reprocessing facilities is presently around 100 cubic meters; therefrom about 30 cu m come from the Karlsruhe plant. Additional 2,000 cu m come from fuels of gas cooled reactors. A Foratom (Forum Atomique European) study, presently in print, foresees a production of 9,000 cu m of concentrate from water reactor fuels by 1985. (Text in German)
(12) KEYWORDS: CAPACITY; DISPOSAL; EUROPE; GERMANY; RADIOACTIVE; SAFETY; SOLID; STABILIZATION; VOLUME
(15) STIMS ACC.NO.: 00S37535
(18) DOC.CIT.: Bokelund, H. , E. Ewest, and H. L. Levi. Behandlung hochradioaktiver Abfaelle. (Treatment of highly radioactive waste.) AtomWirtschaft-Atomtechnik, 21(7):352-357, July 1976.

(1) SWIRS ACC.NO.: 038490
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: The largest volume of radioactive waste belongs to the medium and weakly radioactive classes. In these groups waste water represents the largest bulk. Vaporization is recognized as the most effective process for decontaminating low and medium radioactive waste waters. Watery concentrates are consolidated to chemically and physically stable products, thus further reducing the volume. Organic liquid and solid wastes are equally reduced in volume by additional treatment. Methods of treatment are constantly undergoing improvements. A diagram shows the nuclear fuel cycle from uranium ore mining and primary enrichment through conversion plant (to convert the concentrate to uranium hexafluoride), to the main concentration plant, to fuel element production, to nuclear power plant, to reprocessing of

irradiated fuel material, and finally to waste disposal. Another diagram shows the process or treatment of low and medium active waste waters from various nuclear installations (uranium ore dressing, fuel element production, power plant, reprocessing, isotope plant) through the vaporization and distillation stages to the concentrate production and finally (after being solidified in cement or bitumen) to disposal places (salt mines). A detailed diagram is given of the radioactive waste water treatment plant in the nuclear research center in Karlsruhe. Solidification in cement and bitumen is also shown in two diagrams. Noncombustible wastes (filters, glass, etc.) are reduced in volume (1:3 to 1:7); in Karlsruhe, for the last 12 years, about 1500 cu m of such wastes were reduced. They are stored in 200 liter barrels and sealed with concrete. (Text in German)

(12) KEYWORDS: CHEMICAL; DISPOSAL; EVAPORATION; GERMANY; PHYSICAL; PLANT-INDUSTRIAL; RADIOACTIVE; STABILIZATION; STORAGE; TREATMENT; WASTE WATER

(15) STIMS ACC.NO.: 00S37534

(18) DOC.CIT.: Baehr, W. , and W. Hild. Behandlung schwach- und mittelaktiver Abfaelle aus kerntechnischen Anlagen. (Treatment of weak and medium radioactive waste from nuclear installations.) Atomwirtschaft-Atomtechnik, 21(7):346-352, July 1976.

(1) SWIRS ACC.NO.: 038441

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The government of West Germany has developed a disposal system for waste materials from water reactors. The system should be centralized and should be fully operational by mid 1980's. The system involves the following aspects of disposal: reprocessing, fissionable fuel recycling, waste treatment, and waste disposal. Everything should be ready so as to meet the needs of 50,000 Megawatt nuclear power capacity around 1985. Medium and weak radioactive wastes should be properly processed and disposed of in designated places, in which the reprocessing takes place. Highly radioactive waste must be stored in a consolidated form. The final disposal of such material becomes the responsibility of the German Federal government. The disposal technology should be tested in the former salt mine of Asse. All research and development projects in the domain of radioactive wastes should be carried out within the framework of international cooperation. The final disposal of highly radioactive waste should be contemplated only after all the tests at the pilot disposal grounds at Asse are completed. For the time being the low volume of solidified highly radioactive waste (approximately 100 to 150 cu m per year) creates no environmental hazards. (Text in German)

(12) KEYWORDS: DISPOSAL; GERMANY; PLANNING; RADIOACTIVE; SYSTEM

(15) STIMS ACC.NO.: 00S37485

(18) DOC.CIT.: Hagen, M. , and K. P. Kandl. Radioaktive Abfaelle: Arten und Mengen, Behandlung, Lagerung. (Radioactive wastes: types, volumes, treatment, disposal.) Atomwirtschaft-Atomtechnik, 21(7):338-340, July 1976.

(1) SWIRS ACC.NO.: 038439

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: 1 (10) PUB. YEAR: 1976

(11) ABSTRACT: The share of individual types of waste in the total amount of radioactive activity varies within a wide range, since over 99 percent of radioactive nuclides is available in a highly active liquid form; these liquid wastes result from reprocessing of irradiated nuclear fuels. From a 1500 ton/yr reprocessing plant, capable of servicing 40 nuclear power plants, an annual output averages 1,000 cu m of such liquid waste; the latter is reprocessed and solidified, thus reducing its volume. The largest share by volume falls on primary waste products with weak radioactivity. A table is given showing the volume (in cu m/yr) of wastes coming from a 1500 ton reprocessing plant: highly radioactive liquid fission products average 1,000; fuel element cartridges average 850; medium to active concentrates average 1, 000; weakly or medium active solid waste average 5,000; liquid alpha

concentrates average 300; solid alpha waste averages 500. The wastes from fuel element preparation (at a 1500 ton reprocessing plant): noncombustible solid waste at 100; combustible solid waste at 2,000; liquid waste at 500. Total amount of waste: 9,250 (with a total plutonium content, in kg/year, 300; and a total alpha activity, in curie/year, 17,300,000). In 1975, there were in operation in West Germany: 10 nuclear power plants, a 35 ton per year prototype reprocessing plant, a uranium processing plant, five fuel element producing plants, a small isotope producing plant, and five larger state and industrial nuclear research establishments. The total amount of waste from all these facilities (in 1975) was 2500 cu m liquid concentrate, 4,000 cu m solid radioactive waste (processed into 3500 cu m of disposable waste). (Text in German)

(12) KEYWORDS: DATA; DISPOSAL; GERMANY; HAZARDOUS; POWER; RADIOACTIVE

(15) STIMS ACC.NO.: 00537483

(18) DOC.CIT.: Krause, H. Anfall radioaktiver Abfaelle in der Bundesrepublik Deutschland. (Radioactive waste production in West Germany.) Atomwirtschaft-Atomtechnik, 21(7):343-346, July 1976.

(1) SWIRS ACC.NO.: 038438

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: The usual nuclear fuel cycle is discussed: natural uranium, conversion and enrichment, fuel element production, reprocessing of irradiated fuel elements, treatment and disposal of radioactive wastes. Up to now the treatment, transport and disposal of radioactive wastes has involved a relatively small volume of disposable materials. With the future expansion of nuclear power production a new strategy for handling waste has to be developed. The Federal Ministry for Research and Technology ordered a new study of the problem in 1974, with the objective to create a functionally interwoven system of processing, using, recycling and storing nuclear fuel and its waste products. The study should work out plans and implement methods of radioactive waste handling to extend until 1990; it should be available to the Ministry in full detail by the end of 1976. It should aim at environmentally safe disposal technology. A table shows the expected amount of radioactive waste (in 1000 cu m/yr) for 1975, 1980, 1985, and 1990: the amount of waste would rise from about 8000 cu m in 1975 to 12,000 in 1980, to over 20,000 in 1985, and to about 35,000 in 1990. Most of it would come from nuclear power plants. The amount of waste from reprocessing plants, research centers and fuel recycling is not expected, at present, to increase in any significant manner. (Text in German)

(12) KEYWORDS: DATA; DISPOSAL; GERMANY; HAZARDOUS; RADIOACTIVE

(15) STIMS ACC.NO.: 00537482

(18) DOC.CIT.: Dyroff, H., K. Fleischmann, and H. Kitte. Radioaktive Abfaelle und ihre Beseitigung. (Radioactive waste and its disposal.) Atomwirtschaft-Atomtechnik, 21(7):340-342, July 1976.

(1) SWIRS ACC.NO.: 036414

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Nuclear waste management is one of the few issues on which both the nuclear establishment and the opponents of nuclear power share doubts. The industry maintains its "failure" to answer questions on waste disposal is not due to lack of technical knowledge, but because waste management is less important than other parts of the nuclear fuel cycle. The Energy Research and Development Agency (ERDA) is studying four techniques of high level waste disposal: ice sheets, sea floor formations, shallow continental geologic formations, and deep continental geologic formations. One ERDA official has stated that the deep continental geologic formations method appears most reasonable because such formations offer the best possibility of isolating

radioactive waste from the biosphere for the quarter of a million years needed for the latter to become innocuous.

(12) KEYWORDS: DISPOSAL; ECONOMICS; MANAGEMENT; RADIOACTIVE; TREATMENT

(15) STIMS ACC.NO.: 00S37458

(18) DOC.CIT.: Nuclear waste: soul searching. New Scientist, 71(102):288-289, Aug. 5, 1976.

(1) SWIRS ACC.NO.: 038412

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The problems of transforming highly radioactive fission product solutions from reprocessed fuel elements into a form suitable for final deposit are described. As storage in liquid form cannot be considered as optimum, a solidification of radioactive residue is suggested. Criteria are given for the selection of suitable final products. Vitrification, the incorporation of the fission products in glass, is generally suggested as the best method. The development as well as various vitrification processes are described. Chemical and technological problems affiliated with the vitrification and manufacture of monolithic glass blocks are pointed out and alternative processes are described and compared.

(12) KEYWORDS: DISPOSAL; GERMANY; GLASS; PROCESS; RADIOACTIVE; SOLID; STORAGE; TECHNOLOGY

(15) STIMS ACC.NO.: 00S37456

(18) DOC.CIT.: Heimerl, W. , P. Grziwa, and DJ. van Geel. Chemical and technological aspects of the vitrification of high level radioactive wastes. Kerntechnik, 18(6):272-277, June 1976.

(1) SWIRS ACC.NO.: 038206

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: A new and improved procedure was developed for determining leachabilities of proposed radioactive waste forms. Finely divided glass samples are leached in flowing deionized water; leached ions are continuously sorbed on ion exchange resins to control ionic quality. Sorbed ions are eluted from the resin columns for atomic absorption analyses. Leachabilities measured by this procedure are lower and more consistent than those made in stagnant water without continuous ionic control. It is concluded that large variations in leachabilities can be averted by using ion exchange resins to sorb leached ions from solutions. Benefits of the improved procedure are discussed, as well as time: leachability relationships and mathematical data.

(12) KEYWORDS: ABSORPTION; GLASS; ION; LEACH; MEASUREMENTS; PROCESS; RADIOACTIVE; RESIN; STORAGE; TECHNOLOGY

(15) STIMS ACC.NO.: 00S37310

(18) DOC.CIT.: Kelly, J. A. , and R. M. Wallace. Procedure for determining leachabilities of radioactive waste forms. Nuclear Technology, 30(1):47-51, July 1976.

(1) SWIRS ACC.NO.: 038217

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: One of the major environmental concerns associated with the projected increase in nuclear power generation is the treatment and storage of disposal of high level and transuranic radioactive waste. The model, entitled AMRAW (Assessment Method for Radioactive Waste Management) was developed by the University of New Mexico, and provides a detailed assessment methodology for the short term as well as long term quantitative effects on the environment resulting from the release of radionuclides during all phases of radioactive waste management operations. This model includes a fault tree for determination of release probabilities and their resultant magnitudes, an environmental model for calculating transport of radionuclides to man by environmental pathways and an economic model

for an evaluation of associated damages. It is expected that full implementation of this technology assessment model will aid the U. S. Environmental Protection Agency and others in evaluating the radioactive high level and transuranic waste management programs.

(12) KEYWORDS: ENVIRONMENT; ISOTOPE; MANAGEMENT; RADIOACTIVE; SIMULATION; STORAGE; TRANSPORT; TREATMENT; UNIVERSITY

(15) STIMS ACC.NO.: 00537261

(18) DOC.CIT.: Logan, S. E. , and S. M. Goldberg. A radioactive waste management assessment model. In Ott, W. R. , O. Albrecht, and R. Clark, eds. Proceedings; the Conference on Environmental Modeling and Simulation, Cincinnati, OH, Apr. 19-22, 1976. Environmental Protection Publication EPA-600/9-76-016. Washington, U. S. Environmental Protection Agency, July 1976. p. 199-203.

(1) SWIRS ACC.NO.: 038216

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A mathematical model has been developed to predict radionuclide levels in the Great Lakes due to nuclear power generation in the United States and Canada. The calculations have been used to verify the feasibility of proposed international water quality objectives for radioactivity in the Lakes. Dose rates and doses to reference man from the ingestion of Lake waters are predicted based on expected future power generation in this region. The liquid effluents discharged into the Great Lakes from nuclear power plants and other nuclear facilities, such as fuel reprocessing plants, are of particular interest in this regard since some of the entrained radionuclides have relatively long half lives. Results are given in terms of radionuclide concentrations in each lake and the dose rates and doses ensuing from continuous, long term ingestion of system waters. With the model described, it is possible to obtain analytical solutions for the coupled differential equations describing these quantities as a function of time. However, a FORTRAN computer program has been employed to reduce the calculational effort required.

(12) KEYWORDS: CANADA; COMPUTER; ISOTOPE; MATHEMATICAL MODEL; PROJECTION; QUALITY; RADIOACTIVE; TRANSPORT; US; WATER; WATERWAY

(15) STIMS ACC.NO.: 00537260

(18) DOC.CIT.: Sullivan, R. E. , and W. H. Eliett. Radionuclide transport in the Great Lakes. In Ott, W. R. , O. Albrecht, and R. Clark, eds. Proceedings; the Conference on Environmental Modeling and Simulation, Cincinnati, OH, Apr. 19-22, 1976. Environmental Protection Publication EPA-600/9-76-016. Washington, U. S. Environmental Protection Agency, July 1976. p. 161-165.

(1) SWIRS ACC.NO.: 038051

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: The use of radioisotope tracer techniques for the disposal of radioactive solvent waste is addressed. An apparatus is described that was constructed to investigate the possibility of decontamination at the source by washing radiochemicals out into water and discharging them into the normal drainage system in a highly diluted form. The apparatus consists of a stainless steel funnel fixed by means of a silicone rubber bug into the neck of a glass bottle. The bottle stands by a sluice or drain outlet into which overflow is discharged. Waste solvent added to the apparatus accumulates in the top of the bottle, and water flows through the solvent down the funnel wall forming an interface at which water soluble substances are extracted. Washed solvent can be withdrawn from the apparatus via a light solvent outlet. Solvents with density greater than that of water will accumulate at the bottom of the bottle and may be withdrawn via a heavy solvent outlet. Washed solvent with reduced radioactivity can be disposed of in the usual way. Typical rates of radioactivity removal

are presented, and certain disadvantages of the apparatus are discussed.

(12) KEYWORDS: DILUTION; DISPOSAL; EQUIPMENT; RADIOACTIVE; SOLVENT; TECHNOLOGY; WATER

(15) STIMS ACC.NO.: 00S37095

(18) DOC.CIT.: Dean, B. , and W. T. Baker. The disposal of radioactive solvent waste. International Journal of Applied Radiation and Isotopes, 27(3):185-186, Mar. 1976.

(1) SWIRS ACC.NO.: 037987

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: The report discloses the results of an investigation into the requirements for securing land for underground radioactive waste disposal sites, particularly the determination of the size of the land required for security of the residents in the surrounding area. As a result of the investigation, it also proposes a method to determine the size of the disposal site ground and a method for institution of an area for limited use of the land. Distribution of radioactive nuclides in underground waters and minimal allowable size for the disposal site and limited use of the land are investigated, and it is concluded that in spite of various variable environmental parameters such as the velocity of the ground water, diffusion coefficient, equilibrium distribution factor of strontium 90, the determination for the minimal allowable size for a radioactive waste disposal site can be calculated and that institution of an areas for limited use of land is desirable for further assurance of security. (Original text in Japanese)

(12) KEYWORDS: CONTAMINATE; DISPOSAL; FACILITY; GROUND WATER; LAND; PUBLIC; RADIOACTIVE; REGULATIONS; RESEARCH; SAFETY; SITES; SIZE; UNDERGROUND

(15) STIMS ACC.NO.: 00S37037

(18) DOC.CIT.: Inoue, Y. , and S. Morisawa. Hoshasei haikibutsu chichu shobunjo no rittchi joken (Land requirements for a radioactive waste disposal yard). Nihon Genshiryoku Gakkai Shi, 18(5):304-312, May 30, 1976.

(1) SWIRS ACC.NO.: 037892

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A practical method is presented for calculating radioactivity buildup in collection tanks for nuclear power plants. Fifty radioisotopic properties used in radwaste analysis are provided, along with filter, demineralizer, and evaporator properties. It is noted that the treatment of liquid radwaste in a nuclear power plant generally includes collection of the liquid in storage tanks and processing it through a combination of filters, demineralizers, evaporators, and other devices. During collection and processing, activity in the tank has to be determined. This is necessary for calculating shielding thickness and for determining radiation exposure to operating personnel. Although specific emphasis is placed on radiation levels in the collection tank of a radwaste system for a 1,100 MWe boiling water reactor plant, the information can be used to obtain approximate values for other nuclear power plants. Equations are given which govern the rate of activity buildup in a tank.

(12) KEYWORDS: ANALYSIS; COLLECTION; DATA; ISOTOPE; LIQUID; MATHEMATICAL MODEL; PLANT-INDUSTRIAL; RADIOACTIVE; STORAGE; TANK

(15) STIMS ACC.NO.: 00S36936

(18) DOC.CIT.: Amir, S. J. Radwaste buildup in tanks. Power Engineering, 80(6):64-67, June 1976.

(1) SWIRS ACC.NO.: 037860

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: The operation of wiped film evaporators to concentrate aqueous radioactive waste is detailed. Wiped film evaporators provide sufficient waste volume reduction in a single pass

to yield a product that solidifies completely upon cooling. They are small enough to be mounted in or over waste tanks and can be moved from tank to tank. As a result, the existing waste concentrate transfer system could be eliminated. Concentration is completed in one pass without recirculation. Because there is no liquid level, elevation in boiling temperature due to hydrostatic head is eliminated. Because only a small amount of material is in process at any time, holdup time is extremely short. These features make a wiped film evaporator suitable for handling highly viscous or foamy waste materials and solutions containing precipitated solid material. The results of tests are presented which demonstrate that wiped film evaporators are also suitable for concentrating radioactive waste solutions.

(12) KEYWORDS: CONCENTRATION; DESIGN; EQUIPMENT; EVAPORATION; MAINTENANCE; MOVABLE; RADIOACTIVE; REDUCTION; TECHNOLOGY; VOLUME

(15) STIMS ACC.NO.: 00536904

(18) DOC.CIT.: Goodlett, C. B. Putting evaporators to work: concentration of aqueous radioactive waste. Chemical Engineering Progress, 72(4):63-64, Apr. 1976.

(1) SWIRS ACC.NO.: 037808

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Equipment and methods of disposal of radioactive wastes are discussed. Types of waste include combustible wastes, commercial radioactive isotope wastes, reactor off gases, spent fuel processing wastes, and tritium. Methods used include incineration, long term storage, salt deposit, land burial, and deep well disposal.

(12) KEYWORDS: DEEP WELL; DISPOSAL; EQUIPMENT; HAZARDOUS; INCINERATION; INDUSTRY; LAND; RADIOACTIVE; SALT; STORAGE

(15) STIMS ACC.NO.: 00536852

(18) DOC.CIT.: Powers, P. W. Nuclear industry wastes. In: How to Dispose of Toxic Substances and Industrial Wastes, Noyes Data Corporation, 1976, 497 p. (p. 273-300).

(1) SWIRS ACC.NO.: 037805

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: A discussion of acceptable methods which may be used to dispose of specific inorganic chemical substances is presented. The chemicals are: alkali and ammonium fluorides, aluminum, barium and cadmium fluorides, aluminum fluoride manufacture, aluminum oxide, ammonia plant effluents, ammonia soda plant effluents, ammonium chloride and nitrate, ammonium perchlorate and other oxidizers, ammonium persulfate, antimony fluorides, antimony sulfates and sulfides, arsenic trichloride, asbestos, beryllium and beryllium compounds, boric acid manufacture, bromic acid, bromine, calcium carbide, calcium hypochlorite, calcium phosphate, caustic chlorine production wastes, chlorate phosphorus mixtures, chlorosulfonic acid, chrome pigments manufacturing wastes, chromium salts, copper hydroxide and sulfite sludges, cyanides, hydrazine, hydazoic acid, hydrofluoric acid manufacturing wastes, hydrogen cyanide, lead, lead oxide, lead salts, magnesium chlorate, oxide and salts, nickel antimonide, arsenide and selenide, nickel sulfate, chloride and nitrate, nitrogen oxides, phosphate slimes, phosphorus, phosphorus chlorides, phosphorus pentasulfide, selenium, sodium azide, sodium chlorate, sodium hypochorite, sodium metal, sodium perchlorate, sodium silicofluoride manufacturing wastes, sulfuric acid, thallium compounds, titanium dioxide, and titanium tetrachloride process wastes.

(12) KEYWORDS: ALUMINUM; AMMONIA; ASBESTOS; CALCIUM; CHEMICAL; CHLORIDE; CHROMIUM; DISPOSAL; HAZARDOUS; INDUSTRY; INORGANIC; NITROGEN; PHOSPHATE; PHOSPHORUS; PLANT-INDUSTRIAL; SELENIUM; SODIUM

(15) STIMS ACC.NO.: 00536849

(18) DOC.CIT.: Powers, P. W. Inorganic chemical industry wastes. In: How to Dispose of Toxic Substances and Industrial Wastes, Noyes Data Corporation, 1976, 497 p. (p. 227-257).

(1) SWIRS ACC.NO.: 037601
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: A method is presented for treating waste gases containing radioactive contamination, particularly krypton and xenon nuclides. The waste gas stream to be decontaminated is first conducted through an enrichment system wherein the waste gas stream is divided into two partial streams, one of which is substantially free from the radioactive impurities and constitutes the poor gas fraction and another of which constitues the rich gas fraction. The poor gas fraction is discharged, at least in part into the atmosphere while the rich gas fraction is fed into an activated carbon delay path whose output is discharged either directly or indirectly into the atmosphere. Apparatus for carrying out the method is also disclosed.
(12) KEYWORDS: ACTIVATED CARBON; DESIGN; EQUIPMENT; GASSES; GERMANY; PATENT; RADIOACTIVE
(15) STIMS ACC.NO.: 00S36645
(18) DOC.CIT.: Stumpf, W. , H. Queiser, and H. Juentgen. Method and apparatus for treating waste gases containing radioactive impurities, particularly krypton and xenon nuclides. U. S. Patent No. 3,963,460. Issued June 15, 1976.

(1) SWIRS ACC.NO.: 037600
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: A process for reduction in bulk of highly radioactive wastes is discussed. Cation exchange material of the hydrous oxide type is used. Titanium is the preferred metal but niobium, zirconium, and tantalum may also be used with sodium usually the exchangeable ion. Of the two principal streams leaving the process, one will be highly radioactive titanate/zeolite ceramic and the other a slightly radioactive, transuranic-free sodium nitriate waste. Hope is expressed that the Handford wastes can be successfully reduced in bulk utilizing this method.
(12) KEYWORDS: CHEMICAL; DISPOSAL; ECONOMICS; INORGANIC; ION EXCHANGE; PROCESS; RADIOACTIVE; REDUCTION; RESIN; TREATMENT
(15) STIMS ACC.NO.: 00S36644
(18) DOC.CIT.: Anon. New process consolidates radioactive wastes. Chemical and Engineering News, 54:32-33, Jan. 1976.

(1) SWIRS ACC.NO.: 037556
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: The use of a wiped film evaporator for high level radioactive waste is explored. A pilot scale wiped film evaporator is being evaluated for concentrating high radiation level liquid waste from Purex type nuclear fuel recovery processes. The evaluation is being carried out at Battelle's Pacific Northwest Laboratories and is sponsored by the Energy Research and Development Administration. The goal of the evaluation program is to demonstrate a commercially feasible technique for fixing high radiation level waste in a stable solid. The wiped film evaporator is being evaluated as part of a glass making system, with the feedstock being simulated Purex type waste. The evaporator used in testing is a tapered, horizontal drum like unit with about 5 sq ft of heat transfer surfaces. Operation of the evaporator is detailed, with the evaporator drum being heated by a steam jacket. Tabular data are provided on typical simulated waste feedstock compositions, and it is noted that the performance of the evaporator differs slightly for each feedstock composition. Performance in general is related to product concentration as a function of jacket temperature and feed flow rate. The evaporator resulted in the production of concentrates up to 60 weight percent total solids. It is concluded that

the device is efficient for highly concentrating simulated waste slurries.
(12) KEYWORDS: COMPOSITION; CONCENTRATION; EQUIPMENT; EVAPORATION; FUEL; GLASS; HEAT; LIQUID; PROCESS; RADIOACTIVE; RECLAMATION; ROTATING DRUM; SIMULATION; SLURRY
(15) STIMS ACC.NO.: 00S36600
(18) DOC.CIT.: Dierks, R. D. , and W. F. Bonner. Wiped film evaporator for high level wastes. Chemical Engineering Progress, 72(4):61-62, Apr. 1976.

(1) SWIRS ACC.NO.: 037519
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: Solid radioactive waste is incorporated in glass, ceramic or basaltic blocks which are conditioned in waste waters or sludges prior to placement in nonpolluting ultimate storage. The conditioning has the dual benefit of reducing the radioactivity of the radioactive waste and of purifying the waste water or of purifying and facilitating the filterability of the sludge. Such purifying is enhanced by concurrent treatment with oxygen or an oxygen-containing gas and/or with a substance which is readily reduced to radicals.
(12) KEYWORDS: CERAMIC; GERMANY; GLASS; ILLUSTRATIONS; OXYGEN; PATENT; PURIFICATION; RADIOACTIVE; SOLID; TREATMENT
(15) STIMS ACC.NO.: 00S36563
(18) DOC.CIT.: Hild, W. , H. Krause, and K. Scheffler. Conditioning highly radioactive solidified waste. U. S. Patent No. 3,971,717. Issued July 27, 1976.

(1) SWIRS ACC.NO.: 037514
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: A method of and apparatus for the purification of a liquid contaminated with radioactive substances is presented. The liquid is fed into an evaporator which is connected to a column having a multiplicity of supposed plates or floors. The vapor generated in the evaporator is guided through a washing or scrubbing liquid uniformly. The washing liquid at the floors is deflected a number of times in such a manner that the washing liquid itself and together with the droplets entrained by the vapor is uniformly admixed and the washing liquid subjected to a constant intake of the radioactive substance. The concentration of the radioactive substance is reduced in an economical manner.
(12) KEYWORDS: EQUIPMENT; EVAPORATION; ILLUSTRATIONS; LIQUID; PATENT; PURIFICATION; RADIOACTIVE; REDUCTION
(15) STIMS ACC.NO.: 00S36558
(18) DOC.CIT.: Hende, H. Method and apparatus for the purification of a liquid contaminated with radioactive substances. U. S. Patent No. 3,969,194. Issued July 13, 1976.

(1) SWIRS ACC.NO.: 037449
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: According to a new report to Congress from the General Accounting Office entitled "Improvements Needed in the Land Disposal of Radioactive Wastes", there is no guarantee that existing land disposal sites receiving a wide variety of low-level radioactive wastes will not create a public health hazard by reason of the wastes migrating from their original burial sites. The GAO found both a lack of geological criteria for site selection and a lack of data for most existing sites. The report calls for additional geohydrological evaluations and research to establish criteria to insure that future sites are selected on the basis of detailed studies. Gaps in data referred to by GAO are mostly ground-water related and include lack of data concerning infiltration ground-water movement, the extent of rock fractures, and connections between shallow and deep aquifers. The GAO report is supported by EPA studies which show that commercial burial

grounds are not sufficiently analyzed before licensing by various federal agencies.

(12) KEYWORDS: ANALYSIS; BURY; COMMERCIAL; CRITERIA; DISPOSAL; GEOLOGIC; GROUND WATER; HYDROLOGY; LICENSE; RADIOACTIVE; RESPONSIBILITY; SITES; TRANSPORT

(15) STIMS ACC.NO.: 00S36493

(18) DOC.CIT.: Gillies, N. P. GAO finds buried radioactive wastes on the move at some sites. Ground Water, 14(3):174-175, Feb. 1976.

(1) SWIRS ACC.NO.: 037302

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: The operation of a vacuum evaporator-crystallizer to handle radioactive waste is detailed. The vacuum evaporator-crystallizer is being used by Atlantic Richfield to convert high level radioactive waste solutions to solid forms suitable for storage. Approximately 4. 5 million gal of less mobile salt cake, plus about 4 million gal of concentrated liquor, have been generated from nearly 23. 5 million gal of waste processed. The salt cake is composed primarily of sodium nitrate and sodium carbonate, plus some nondrainable trapped liquor. Atlantic Richfield operates the waste managmenet program for the Energy Research and Development Administration (ERDA). Problems associated with program operation are noted, and the construction of a second vacuum evaporator-crystallizer unit is described. Performance aspects of the vacuum evaporator-crystallizer are reported in relation to ERDA standards. Four mechanical difficulties of the unit are identified: pump vibration, broken dip tube, plugged slurry line, and ion exchange column. Future processing plans of Atlantic Richfield are discussed, and the development of a computerized evaporator-crystallizer process model is described.

(12) KEYWORDS: COMMERCIAL; COMPUTER; EQUIPMENT; EVAPORATION; ILLUSTRATIONS; LIQUOR; MANAGEMENT; PLANNING; PROBLEMS; PROGRAM; RADIOACTIVE; REDUCTION; SALT; SOLID; SOLUBILITY; STORAGE; VACUUM; VOLUME

(15) STIMS ACC.NO.: 00S36347

(18) DOC.CIT.: Petrie, J. C. , K. I. Donovan, and R. E. Van der Cook. Putting evaporators to work: vacuum evaporator-crystallizer handles radioactive waste. Chemical Engineering Progress, 72(4):65-71, Apr. 1976.

(1) SWIRS ACC.NO.: 037163

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: As part of the radiation quality assurance program conducted by the U. S. Environmental Protection Agency, calibrated radionuclide solutions are distributed to participating laboratories for instrument calibration and yield determinations. Laboratory performance studies involving the analysis of radionuclides in environmental media are also conducted, and a summary is given of the results of the water cross-check program for 1974. Examination of these results reveals that gross beta is the most difficult (44 percent within the control limits) for the laboratories to analyze. These results indicate the need for improvement in analytical procedures for the radionuclide studies. (Document retained in SWIRS library)

(12) KEYWORDS: ANALYSIS; CHEMICAL; COMPARISON; CONTROL; DATA; EPA; ISOTOPE; LABORATORY; METAL; PROGRAM; QUALITY; RADIATION; WATER

(15) STIMS ACC.NO.: 00S36208

(18) DOC.CIT.: Jarvis, A. N. , R. F. Smiecinski, and D. G. Easterly. The status and quality of radiation measurements of water. Environmental Protection Publication 600/4-76-017. Las Vegas, NV, U. S. Environmental Protection Agency, Apr. 1976, 28 p. (Environmental Monitoring Series) (Distributed by National Technical Information Service, Springfield, VA)

(1) SWIRS ACC.NO.: 037156
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The relative risks to man from radionuclides released to the environment depend heavily on their accumulation or concentration by aquatic organisms. The organisms which accumulate those radionuclides present in the environment may be useful as indicators for environmental monitoring purposes. In addition, these organisms may be directly in food chain pathways to humans. Literature is reviewed and summarized in regard to biological concentration of radionuclides in freshwater and marine environments. Concentration factors for elements found in organisms are tabulated for plants, invertebrates, and fish in marine and freshwater environs. Literature is also reviewed on models developed to calculate the possible radiation dose delivered to humans from radionuclides released into aquatic environments. The model approaches summarized range from simple generalized forms which, at best, give order of magnitude estimates to detailed models for a specific area which may be used to guide waste discharge practices. (Document retained in SWIRS library)
(12) KEYWORDS: BIOLOGICAL; CONCENTRATION; DATA; ENVIRONMENT; FISH; FOOD; ISOTOPE; LITERATURE; MATHEMATICAL MODEL; MONITOR; POLLUTION; RADIATION; VEGETATION; WATERWAY
(15) STIMS ACC.NO.: 00S36201
(18) DOC.CIT.: Patzer, R. G. Concentration factors and transport models for radionuclides in aquatic environments: a literature report. Environmental Protection Publication 600/3-76-054. Las Vegas, NV, U. S. Environmental Protection Agency, May 1976, 64 p. (Ecological Research Series) (Distributed by National Technical Information Service, Springfield, VA)

(1) SWIRS ACC.NO.: 037010
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: The conversion of liquid high level radioactive wastes into granular materials for dispersion into metal matrics is addressed, based on work carried out by the Eurochemic Company in Belgium. The operation of Eurochemic plants has resulted in the accumulation of two types of high level liquid wastes: (1) concentrated fission product solutions from highly enriched uranium processing; and (2) concentrated fission products from low enriched uranium processing. Eurochemic's low temperture solidification process, which is based on calcination to oxide granules by a fluid bed calcination technique, involves the conversion of nitrates in high level wastes to granular phosphates in the presence of aluminum at low tempratures. Sufficient aluminum nitrate and a stoichiometric amount of phosphoric acid are added to the waste feed solution, sprayed into a stirred bed reactor kept at about 550 degrees C, and prefilled with aluminum phosphate particles. The granular phosphate product shows a leachability for cesium and strontium that is more than a thousand times lower than that of corresponding oxide calcines. The glass bead production process is detailed. Three types of metal alloys have been selected for investigation with regard to their suitability as embedding material for different high level waste solids: (1) lead alloys melting in the temperature range from 240 to 320 degrees C; (2) zinc alloys melting in the range from 400 to 500 degrees C; and (3) aluminum alloys melting in the range from 550 to 660 degrees C.
(12) KEYWORDS: ALUMINUM; ASSOC; BELGIUM; CONCENTRATION; CONVERT; FLUIDIZED BED; INDUSTRY; INVESTIGATION; LEACH; LIQUID; METAL; PHOSPHORUS; PROCESS; RADIOACTIVE
(15) STIMS ACC.NO.: 00S36055
(18) DOC.CIT.: van Geel, J. M. , H. Eschrich, and E. J. Detilleux. Conditioning high level radioactive wastes. Chemical Engineering Progress, 72(3):49-51, Mar. 1976.

(1) SWIRS ACC.NO.: 037009
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: A technique for the continuous vitrification of high level radioactive wastes is described that is being developed by the

French Atomic Energy Commission. A facility has been designed to convert all fission products generated at a nuclear reprocessing plant into solid glass material. The first radioactive test run is scheduled for July 1977. Two steps are involved in the vitrification process: (1) continuous calcination; and (2) continuous glass making with the calcined product and suitable additives. Three types of high level radioactive wastes will be reprocessed. One type is related to material testing reactor spend fuels, and the other two types are related to natural uranium spent fuels. The fission product conversion facility has two main sections (vitrification and storage areas), and it is anticipated that the storage area will be large enough to dispose of glass resulting from existing stored solutions and from nuclear reprocessing plant production for the next 10 yrs. It is noted that the storage area can be expanded to meet additional capacity requirements.

(12) KEYWORDS: CALCIUM; CERAMIC; CONVERT; DESIGN; DISPOSAL; FACILITY; FRANCE; FUEL; FURNACE; GLASS; PROCESS; RADIOACTIVE; STORAGE

(15) STIMS ACC.NO.: 00S36054

(18) DOC.CIT.: Bonnlaud, R. , and C. Sombret. Continuous vitrification of radioactive wastes. Chemical Engineering Progress, 72(3):47-48, Mar. 1976.

(1) SWIRS ACC.NO.: 036960

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A method and apparatus reduces the amount of radioactive solids resulting from the filtration of particulate contaminants from liquid in a nuclear reactor plant. A filtration system includes a pre-filter comprising a sheet filter medium through which the reactor liquid passes to remove relatively large particulate contaminants for storage or disposal. The reactor liquid is then passed through a bed of granular filter medium to accumulate substantially all the previously non-filtered contaminants and thereby provide a clarified liquid suitable for reuse in the reactor. Backwash liquid is flowed through the granular filter bed to remove and entrain the accumulated contaminants into a slurry which is received by a reservoir where the slurry is maintained quiescently to settle the contaminants. Removal of liquid from the reservoir concentrates the contaminants for storage or further processing, without the necessity of large quantities of filter aids that would increase the quantity of storage-requiring contaminated solids.

(12) KEYWORDS: COLLECTION; CONCENTRATION; CONTAMINATE; EQUIPMENT; FILTER; ILLUSTRATIONS; LIQUID; PATENT; PROCESS; RADIOACTIVE; REDUCTION; SETTLEMENT; SLURRY; SOLID; STORAGE

(15) STIMS ACC.NO.: 00S36005

(18) DOC.CIT.: Hirs, G. Hydromation Filter Company. Method and apparatus for treating liquid contaminated with radioactive particulate solids. U. S. Patent No. 3,962,078. Issued June 8, 1976.

(1) SWIRS ACC.NO.: 036824

(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Apparatus is disclosed for disposing of radioactive waste materials by placing them into a steel drum together with cement and water, mixing the contents, and then storing the drum for a period of time to permit partial decay of radioactive materials. Also disclosed are remotely controlled apparatus for filling, closing and agitating the drum including special means for unscrewing a cap from the drum, for holding the cap during filling, and for replacing the cap after filling.

(12) KEYWORDS: DECOMPOSE; DESIGN; DISPOSAL; EQUIPMENT; ILLUSTRATIONS; PATENT; RADIOACTIVE; STORAGE

(15) STIMS ACC.NO.: 00S35d69

(18) DOC.CIT.: Stock, A. J. , D. E. Christofer, and J. E. Brinza. Stock Equipment Company. Apparatus for inserting closure means into a container. U. S. Patent No. 3,932,979. Issued Jan. 20, 1976.

(1) SWIRS ACC.NO.: 036515
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976
(11) ABSTRACT: After a first extraction of an aqueous nitric acid solution of spent nuclear fuel by a suitable organic solvent and a first washing of the resulting organic phase by an aqueous solution to remove tritiated water, the organic phase is submitted to a second washing with a volume of dilute aqueous solution of nitric acid free from tritium, said volume being substantially smaller than that of the organic phase, whereby the organic phase is rendered substantially tritium-free and contamination by tritium in the following stages of the process is avoided. (Author Abstract)
(12) KEYWORDS: ACID; CONTAMINATE; DESIGN; FUEL; ILLUSTRATIONS; ORGANIC; PATENT; PROCESS; RADIOACTIVE; SEPARATING; TREATMENT; WASH
(15) STIMS ACC.NO.: 00S35559
(18) DOC.CIT.: Bernard, C. Saint-Gobain Techniques Nouvelles, Courbevoie, France. Treatment of irradiated nuclear fuel. U. S. Patent No. 3,954,654. Issued May 4, 1976.

(1) SWIRS ACC.NO.: 036308
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Witnesses before a House Subcommittee contend that radioactive waste migration has resulted from lack of adequate planning, hydrogeological evaluation, and radiation monitoring at disposal sites. Although radioactive debris does not presently pose a serious health hazard, spokesmen agree that greater care must be taken to establish stringent criteria for licensing federal and commercial disposal grounds. An interagency task force is already meeting to develop a national radioactive waste disposal plan.
(12) KEYWORDS: DISPOSAL; GOVERNMENT; MANAGEMENT; RADIOACTIVE; US
(15) STIMS ACC.NO.: 00S35353
(18) DOC.CIT.: Anon. Radioactive waste disposal inadequate. Chemical and Engineering News, 54(9):5, 1976.

(1) SWIRS ACC.NO.: 036202
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976
(11) ABSTRACT: The U. S. Nuclear Regulatory Commission requires that liquid waste remaining after the reprocessing of spent nuclear fuel be converted to a solid form before storage or shipment. Two major solidification processes, fluidized bed calcination and spray drying, produce a "calcine" which is granular and contains a high proportion of "fines" which are undesirable. A feasibility study was performed to determine whether nuclear waste calcine and a crystalline ceramic matrix can be fabricated by hot pressing into a composite waste form with suitable leaching resistance and thermal stability. The addition of small quantities of low viscosity glass produced a suitable composite. Additional studies are suggested to: optimize the matrix; optimize waste/matrix ratios; use modified calcine. Engineering feasibility must also be determined.
(12) KEYWORDS: CERAMIC; CONVERT; DRYING; FINE; FLUIDIZED BED; GLASS; LEACH; LIQUID; PROCESS; PRODUCE; RADIOACTIVE; SOLID; STORAGE; THERMAL; TRANSPORT
(15) STIMS ACC.NO.: 00S35247
(18) DOC.CIT.: McCarthy, G. J. , and H. T. Davidson. Ceramic nuclear waste forms: II, a ceramic-waste composite prepared by hot pressing. Ceramic Bulletin, 55(2):190-194, 1976.

(1) SWIRS ACC.NO.: 036114
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
(11) ABSTRACT: A tentative reference method is described for the measurement of strontium-89 and strontium-90 in environmental waters. Details of the method are presented in terms of its principle and applicability, range and sensitivity, interferences, precision and accuracy, apparatus, reagents, procedures, calibration, calculations

and reporting. In the method, samples of environmental water sources are collected, preserved with acid-strontium carrier, and analyzed for strontium-89 and/or strontium-90. Both types of strontium are separated from the sample water by precipitating with stable strontium carrier as carbonate. The strontium carbonate is dissolved; yttrium-90 is separated and strontium is then reprecipitated as carbonate, filtered, and counted for combined strontium-89 and strontium-90 activity. Yttrium-90 is allowed to grow in from strontium-90 activity, and strontium carbonate is redissolved. Yttrium-90 is then separated precipitated, and counted for strontium-90 determination. Strontium-89 activity is determined by the difference between total strontium-89 and strontium-90 and separate strontium-90 activities. Recoveries are determined from added and found (recovered) strontium carrier. Counting efficiencies are determined with prepared standard reference samples, and results are reported in picocuries per liter.

(12) KEYWORDS: ANALYSIS; CHEMICAL; CLIMATE; ISOTOPE; MEASUREMENTS; POLLUTION; RADIOACTIVE; REFERENCE; SAMPLING METHODS; SEPARATING; WATERWAY

(15) STIMS ACC.NO.: 00S35159

(18) DOC.CIT.: EPA Environmental Monitoring and Support Lab. Measurement of strontium-89 and strontium-90 in environmental waters: a tentative reference method. Las Vegas, NV, U. S. Environmental Protection Agency, Mar. 1976, 28 p.

(1) SWIRS ACC.NO.: 036090

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The importance of tritium as gas in the contamination of plants and soils is examined. Lettuce plants were grown in a mixture of peat and vermiculite and watered with a modified hoaglands nutrient solution. Studies were conducted in plant growth chambers, and tritium concentrations associated with organic constituents of the lettuce plants were determined by oxidizing dry plant material in a pressurized oxygen bomb and subsequently analyzing the water of combustion. Tritium concentrations in leachate, transpired water, water extracted from the plants, and the water of combustion were analyzed using liquid scintillation techniques. Lettuce plants fumigated with elemental tritium accumulated tritium in plant water as well as in organic constituents. The conversion rate of elemental tritium to tritiated water varied from 0. 5 nanocuries per minute per pot at the start to 0. 8 nanocuries per minute per pot when the 24-day exposure to an air concentration of 5 nanocuries per liter was terminated. Based on the concentration of tritium in various plant tissues, foliar absorption was postulated as the route of plant contamination. Study data indicated that an enzymatically facilitated conversion on the leaf or soil surface was the probable mechanism.

(12) KEYWORDS: CATALYST; CONCENTRATION; GASSES; HAZARDOUS; LAND; MEASUREMENTS; MONITOR; ORGANIC; OXYGEN; POLLUTION; VEGETABLE; VEGETATION; WATER

(15) STIMS ACC.NO.: 00S35135

(18) DOC.CIT.: McFarlane, J. C. Tritium accumulation in lettuce fumigated with elemental tritium. Las Vegas, NV, U. S. Environmental Protection Agency, Jan. 1976, 19 p.

(1) SWIRS ACC.NO.: 036089

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: A neutron activation laboratory with computer coupled equipment and procedures is described that was established to analyze environmental trace materials. The capability of the laboratory for environmental trace material analysis was demonstrated by analyzing various materials, including quality control interlaboratory comparisons. Samples ranged from sewage treatment plant sludge and marine sediment to fresh water containing very low concentrations of molybdenum and ore and fertilizer containing cadmium. It was concluded that neutron activation analysis (NAA) is desirable for environmental tracer experiments because it is sensitive and uses constituent tracer

nuclides rather than introducing other tracers. The total cost of simple equipment in the laboratory was about $40,000 (in 1972), plus access to a time sharing computer system and nuclear reactor. A comparison of analytical results indicated that either atomic absorption or NAA can be used to analyze environmental trace materials, although the minimum size of samples differed significantly for the two methods. It was demonstrated that automated environmental monitoring with graphic display can be carried out using NAA and, in addition to its general usefulness as a sensitive method for trace analysis, NAA can be used as a referee or comparison method.

(12) KEYWORDS: ANALYSIS; COMPARISON; COMPUTER; CONCENTRATION; CONTROL; ECONOMICS; EQUIPMENT; METAL; MONITOR; POLLUTION; PROCESS; SEWAGE; TOXIC; WATERWAY

(15) STIMS ACC.NO.: 00S35134

(18) DOC.CIT.: Feldman, M. H. , D. E. Cawfield, and K. V. Byram. Environmental trace materials: computer coupled radioactivation analysis. Corvallis, OR, U. S. Environmental Protection Agency, Dec. 1975, 36 p.

(1) SWIRS ACC.NO.: 036011

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: An experimental study of Strontium 90 soil content, tests the effect of radioactive metals on 20-day old wheat sprouts; it demonstrates that at a high degree of radioactive soil contamination, with the increase of Sr 90 concentration, increases the accumulation of Sr 90 in vegetation. Experiments were carried out on two types of soil: sod-podzolic - with Ca content of 6. 8 milliequiv per 100 grams of soil, and chernozem - with Ca content of 28. 6 milliequiv per 100 grams of soil. Sprouts were grown in weighing bottles containing 60 g of soil. Soil was netted with distilled water and Sr 90, in the form of Sr Cl2 without a carrier, which then was added to achieve gradual concentrations of 10, 40, 400, 800 nanocurie per gram of soil. Soil was seasoned for 28 days whereupon ten wheat sprout grains were planted in each bottle. The experiment was carried on/in a luminescent chamber for 20 days under a moisture regime slightly lower than actual field conditions.

(12) KEYWORDS: CHAMBER; CONCENTRATION; CONTAMINATE; LAND; RADIOACTIVE; VEGETATION; WATER

(15) STIMS ACC.NO.: 00S35056

(18) DOC.CIT.: Zubareva, I. P. Effect of 90-Sr concentration in soil on accumulation of radioactive strontium in wheat sprouts. Vliyaniye kontsentratsii 90-Sr v pochve na koeffitsienty nakopleniya radiostrontsiya v prorostkakh pshenitsy. Agrokhimiya, 10:135-136, 1975.

(1) SWIRS ACC.NO.: 036019

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: Treatment of waste from atomic power plants, exemplified at the Novovoronezhskaya in Central European Russia, and Beloyarskaya in the Ural region plants, has thus far been described as satisfactory. The entire surrounding area with a radius of 10-12 km, is subject to uninterrupted monitoring. Solid waste products are stored in largecapacity ferroconcrete bins if highly radioactive or are buried in trenches if less radioactive. Where hydrogeological conditions are not favorable, specially-insulated trenches are provided to prevent any washout of radioactive matter. Solid waste with a relatively low radioactivity still presents a problem. Compression of inch waste material is contemplated.

(12) KEYWORDS: BURY; COMPACTION; CONCRETE; GEOLOGIC; MONITOR; PLANT-INDUSTRIAL; POWER; RADIOACTIVE; STORAGE; TREATMENT; TRENCH; WATER

(15) STIMS ACC.NO.: 00S35064

(18) DOC.CIT.: Burnazyan, A. I. , Radiation safety in nuclear power plant operations. Radiatsionnaya bezopasnost pri ekspluatatsii atomnykh elektrostantsiy. Atomnaya Energiya, 39(3):167-172, Sep. 1975.

(1) SWIRS ACC.NO.: 035861
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: Present and future problems in the management of nuclear wastes are considered. Safe operation of a nuclear reactor should encompass the entire nuclear fuel cycle, including fuel supply, reprocessing, and disposal of wastes. The residue from mill tailings is a minor but persistent hazard. Steps should be taken for proper location and disposal of these wastes. Fuel storage space is becoming a pressing problem requiring immediate attention. Decommissioning of facilities will become a problem in another 20 or 30 years. Three stages are required: lock up with surveillance; conversion and restricted site release; and unrestricted site release. Gas recovery processes should be developed and used so that dangerous materials such as krypton 85 and tritium don't escape into the atmosphere and biosphere. The costs versus the benefits must be ascertained for separating alpha bearing wastes from fuels. Two methods of disposal that can be utilized in this century are disposal in the earth surface and in geological formations. Small countries should cooperate in regional centers for fuel reprocessing and waste handling to cut handling and operating costs, to reduce the numbers and sources of radioactivity, and to reduce the risks of accidents. Maturity of nuclear energy is the ability to manage it wisely, safely and in cooperation.
(12) KEYWORDS: ACCIDENT; DISPOSAL; ECONOMICS; FUEL; GASSES; GEOLOGIC; HAZARDOUS; INTERNATIONAL; MANAGEMENT; PLANNING; PROBLEMS; RADIATION; RADIOACTIVE; REGIONAL; STORAGE
(15) STIMS ACC.NO.: 00534906
(18) DOC.CIT.: Lennemann, W. L. , H. E. Parker, and P. J. West. Management of radioactive wastes. International Atomic Energy Bulletin, 17(4):2-13, Aug. 1975.

(1) SWIRS ACC.NO.: 035740
(2) DOMESTIC: D (2) CATEGORY: 09 (4) SUBJ.TYPE: T (10) PUB. YEAR: 1975
(11) ABSTRACT: As nuclear fission increases as a source of energy over the next several decades the problems of treatment, separation, shipment, and long term disposal of radioisotopes will become more acute. The management of these wastes and the technology being developed to treat solid wastes contaminated with radioactivity are described, along with the techniques being considered for long term storage and disposal. Projections of annual rates of generation and accumulation of 10 categories of radioactive wastes are given. A regulation proposed by the U. S. Atomic Energy Commission would prohibit the further burial of commercial transuranium wastes in the soil and would require that they be turned over to Federal custody. An objective of the U. S. Energy Research and Development Agency is to improve the form and composition of waste materials to contribute to economic and effective disposal. Solid contaminated wastes include combustible wastes, liquid and sludge wastes, and non-combustible wastes. Methods of treating combustible wastes include acid digestion, controlled air incineration, pyrolysis, molten salt combustion, fluidized bed combustion, and cyclone incineration. Common techniques for treating liquid and sludge wastes are batch and continuous process phosphate treatment. Non-combustible wastes include many precious metals and thus have a high recovery value. Methods of treatment include smelting, treating cladding hulls before contact, and contaminating cladding hulls. Disposing radioactive wastes safely can be accomplished with existing analytical capabilities and technology.
(12) KEYWORDS: DISPOSAL; ECONOMICS; FEDERAL; HAZARDOUS; MANAGEMENT; METAL; NON-FERROUS; PROJECTION; RADIOACTIVE; RECLAMATION; REGULATIONS; SLUDGE; SOLID; TREATMENT
(15) STIMS ACC.NO.: 00534785
(18) DOC.CIT.: Wolfe, R. A. Problems and prospects in the management of solid radioactive waste. The Journal of Environmental Sciences, 18(4):9-15, July/Aug. 1975.

(1) SWIRS ACC.NO.: 035643
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: Scientists at the Energy Research and Development Administration are looking for ways of disposing of radioactive wastes without creating hazards for future generations. The most serious concerns are the carcinogenic and mutagenic potential of radioactive substances. Inadequate storage or disposal could allow wastes to get into the atmosphere. Up to now, most radioactive wastes were generated by the nuclear weapons research program. The wastes generated by commercially operated nuclear power plants are six times more reactive than the weaponry waste. When the fission products interfere with the reaction, the contaminated fuel is removed from the reactor. The reclaiming of uranium and plutonium from contaminated fuel has not been done on a large scale. At least three elements of the nuclear waste pose serious dangers: plutonium 239; strontium 90; and cesium 137. The carcinogenic plutonium lengthens the hazardous life of the waste to a quarter of a million years. The government is in the process of solidifying its waste. Methods of temporarily storing the wastes were developed by the Atlantic Richfield Company. Deep salt beds have been proposed for a long term disposal of radioactive wastes. Geologic changes might expose the sites but it would take longer for such changes to occur than it takes even the longest lived wastes to decay. The salt bed sites have run into some problems. Geological alternatives include: seabed disposal; burial in granite rock below 3 to 5 thousand feet; and disposal in the Antarctic ice sheet. A uranium mine in Gabon, Africa, was the site of a natural nuclear reactor, two billion years ago; only the cesium has migrated significantly. Whatever disposal system is chosen there will always be the problem of human error.
(12) KEYWORDS: ANTARCTICA; DISPOSAL; ENERGY; FUEL; GEOLOGIC; HAZARDOUS; HEALTH; MINE; OCEAN; PUBLIC UTILITY; RADIOACTIVE; RECLAMATION; SALT; SITES; STORAGE
(15) STIMS ACC.NO.: 00S34688
(18) DOC.CIT.: Gorman, J. Wandering in the nuclear waste land. The Sciences, 15(8):6-10, Nov. 1975.

(1) SWIRS ACC.NO.: 035634
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975
(11) ABSTRACT: A computer program was designed to conduct an inventory of the Maxey Flats nuclear waste burial site. The total site activity was estimated by adding activities by isotopes after decaying the activity from date of burial to present date. Undated depositions were considered buried on the closing date of the pit in which they were put. The activity of individual pits was determined at burial time and at present time. Additions were also made with regard to total isotope activities on the site and volumes of disposal by pit and by site. Although an accurate evaluation of the error associated with the statistics is impossible, this method of recording tends to systematically increase the recorded value against the actual activity of a shipment.
(12) KEYWORDS: BURY; COMPUTER; DISPOSAL; HAZARDOUS; ISOTOPE; MANAGEMENT; PROGRAMMING; RADIOACTIVE; SURVEY
(15) STIMS ACC.NO.: 00S34679
(18) DOC.CIT.: Gat, U. , J. D. Thomas, and D. T. Clark. Maxey Flats nuclear waste burial site-inventory. Transactions of the American Nuclear Society, 265-266, June 9-13, 1975.

(1) SWIRS ACC.NO.: 035619
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975
(11) ABSTRACT: This patent provides a disposal device for ashes generated during the incineration of radioactive wastes from nuclear reactors, which will decrease the volume of the ashes while producing safe and manageable solidified blocks. The wastes treated by this process include such solid combustible wastes as ion exchange resins, cellulose powders, and liquid wastes containing mostly sodium sulfate. The incineration ashes and waste water are mixed and crushed in a

mixing chamber to form a slurry which is 70 to 80 percent water by weight. Liquid wastes are heated to 800 C in the incinerator and are dehydrated to a solid sodium sulfate. At a prescribed interval the slurry enters the incinerator for a very short period of time. These processes are repeated until the incinerator is filled with alternate layers of slurry and solid sodium sulfate. This closed system type disposal device can solidify the wastes without using solidifying agents such as cement and asphalt, and the incinerator also serves as a stock container. (Text in Japanese)

(12) KEYWORDS: ASH; HAZARDOUS; HEAT; INCINERATION; JAPAN; PATENT; RADIOACTIVE; SLURRY; SOLID; SYSTEM; TREATMENT; WASTE WATER

(15) STIMS ACC.NO.: 00S34664

(18) DOC.CIT.: Oda, A. , H. Yusa, A. Odabe, T. Inji, and K. Makata. Shokyaku bai no shori sochi. Disposal device for incinerated ashes. Japanese Patent Sho 50-27956 owned by K. K. Hitachi Seisakujo, Tokyo, Japan. Issued Sept. 11, 1975.

(1) SWIRS ACC.NO.: 035472

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: A study by the Environmental Protection Agency has shown substantially elevated levels of radioactive radon (radium emanation) and its decay products in buildings constructed on reclaimed phosphate mined lands in Polk County, Florida. Continuous exposure for 10 years could double the normal risk of lung cancer for people living in the buildings. Uranium concentrations in Florida phosphate rocks are generally 100 to 150 parts per million, while most United States soils contain 0. 5 to 10 parts per million. Usually these phosphate deposits lie several feet beneath an overburden of soil and rock which absorbs most of the radiation. Removal of this layer during mining allows increased amounts of radiation to be released. The Occupational Safety and Health Administration has proposed the reduction of permissible employee exposure limit to lead from the present limit of 200 micrograms lead per cu m of air to 100 micrograms per cu m. It has also proposed a maximum blood lead level of 60 micrograms per 100 g of blood. Lead industry officials immediately took issue with the standards. Even during a time of high employment and rising fuel costs the public does not want to cut back on environmental programs. This is the conclusion of a June 1975 survey by the Opinion Research Corporation. Four mining companies are planning to use sewer effluent water for their ore processing operation. Use of the treated water would help stretch underground reserves in the area. The water table is going down each year making pumping operations expensive. It is estimated that the mines may buy as much as 25 million of the 33 million gal per day generated by the sewage treatment plant.

(12) KEYWORDS: ECONOMICS; EFFLUENT; ENVIRONMENT; EPA; HEALTH; MINE; NON-FERROUS; PERSONNEL; PHOSPHATE; RADIOACTIVE; SEWAGE; STANDARD; SURVEY; TOXIC; TREATMENT

(15) STIMS ACC.NO.: 00S34517

(18) DOC.CIT.: Alexander, C. Emphasizing environment. Mining Engineering, 27(11):59, Nov. 1975.

(1) SWIRS ACC.NO.: 035412

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975

(11) ABSTRACT: The problem of subsurface, radioactive-contaminant transfer is investigated through the development of a two-dimensional model which considers the simultaneous flow of water and mass. In addition to convection and dispersion, the model treats radioactive decay and cation exchange which are two of the most important attenuation processes. The influence of factors, which control the transport processes subsurface contaminant distributions, is demonstrated through the simulation and analysis of a series of hypothetical cases. Physical transport processes, hydraulic conductivity, porous medium dispersivity and the location of the contaminant inflow zone are considered to be the controlling parameters for the physical transport processes. The attenuation processes are controlled by the radioactive half-life, selectivity coefficients,

cation-exchange capacity, ion charge, and weathering rate. The maximum extent of subsurface contamination in all cases is determined by the physical transport processes. The complexity of the transport process suggests that evaluations or site behavior which are based on rigid guidelines are inadequate for siting and designing waste management sites and for insuring the safety or water supplies.

(12) KEYWORDS: BIBLIOGRAPHY; DECOMPOSE; DESIGN; DISPOSAL; HAZARDOUS; HYDRAULIC; MANAGEMENT; POLLUTION; PROCESS; RADIOACTIVE; RESEARCH; SAFETY; SITES; TRANSPORT; WATER

(15) STIMS ACC.NO.: 00S34457

(18) DOC.CIT.: Schwartz, F. W. On radioactive waste management: an analysis of the parameters controlling subsurface contaminant transfer. Journal of Hydrology, 27(1975):51-71, 1975.

(1) SWIRS ACC.NO.: 034641

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This work is a literature survey of selected articles published between 1969 and 1974 dealing with the use of sorbents in the purification of low-and medium-level radioactive waters. It also surveys selected work in the synthesis and laboratory testing of new sorbents. The term sorbents, in this review refers to the substances in which there is pronounced accumulation of microconstituents from solutions and which are not components of living organisms. Apart from a few exceptions, the review does not deal with sorbents prepared either from costly or from toxic elements. Nor does the review cover the use of ion-exchange membranes and other types of membranes for the purpose mentioned or on sorbents of uranium and its compounds. Under these restrictions, then, the following elements are not reviewed: vanadium; niobium; tantalum; chromium; molybdenum; tungsten; cobalt; nickel; silver; gold; boron; gallium; beryllium; cadmium; mercury; and arsenic. The review ties up with two manuals published by the International Atomic Energy Agency in Vienna. They are "Operation and Control of Ion-exchange Processes for Treatment of Radioactive Wastes" and "Use of Local Minerals in the Treatment of Radioactive Wastes."

(12) KEYWORDS: BIBLIOGRAPHY; DATA; LITERATURE; PURIFICATION; RADIOACTIVE; SURVEY; WATER

(15) STIMS ACC.NO.: 00S33685

(18) DOC.CIT.: Berak, L. , Buher, and M. Marhol. Sorbents for the purification of low-and medium-level radioactive waters. Review of developments, 1969-1974. Atomic Energy Review, 13(2):325-366, June 1975.

(1) SWIRS ACC.NO.: 034212

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: The researchers give an account of the present situation in studies of the extraterrestrial disposal of radioactive wastes in all aspects including technical and economic feasibility as well as safety problems. Extraterrestrial disposal is considered as one of the special technologies for the ultimate management of radioactive wastes from nuclear fuel reprocessing. Scientists place emphasis on the necessity for further studies in order to carry out the disposal of foregoing wastes in space. It is noted, however, that it will be quite possible to dispose of radioactive wastes in space in the near future. Care must be exercised with regard to the safety from pollution, prior to the realization of this form of disposal. The following other topics are discussed: underground disposal (permanent storage); dumping in the ocean; space transportation and destination considerations; and potential hazards in the extraterrestrial disposal. Graphs, illustrations, photos, and tables are provided. (Text in Japanese)

(12) KEYWORDS: DISPOSAL; MANAGEMENT; RADIOACTIVE; SPACE CRAFT

(15) STIMS ACC.NO.: 00S33250

(18) DOC.CIT.: Inoue, Y. , and S. Morizawa. Hoshasei haikibutsu no uchu shobun. Extraterrestrial disposal of radioactive wastes. Genshiryoku Kogyo, 21(3):31-41, Mar. 1975.

(1) SWIRS ACC.NO.: 034131
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975
(11) ABSTRACT: This article discusses the long term hazards involved in the management of nuclear wastes. Euratom's Joint Research Centre at Ispra, Italy, is investigating the problems involved in the separation of actinides, which are the most long lasting radioactive isotopes produced in nuclear power stations, from other radioactive wastes and has evaluated the benefits that chemical separation of the actinides would entail for radioactive waste management. These investigations indicate that the hazards of radioactive waste management could be reduced by a factor of between 1,000 and 10,000 through the decontamination of the low level, short-lived isotopes. Different techniques for separating actinides from high activity waste would allow for various levels of decontamination. However, even if the actinides can be separated from the reprocessed nuclear fuel, the methods for the safe disposal of the separated actinides and the amount and quality of the additional wastes generated by the separation process will need to be examined and evaluated.
(12) KEYWORDS: BENEFIT; DISPOSAL; FUEL; HAZARDOUS; INVESTIGATION; ISOTOPE; MANAGEMENT; PLANT-INDUSTRIAL; POWER; PROBLEMS; RADIOACTIVE; SEPARATING
(15) STIMS ACC.NO.: 00833175
(18) DOC.CIT.: Nuclear waste: long term hazards. New Scientist, 67(957):91, July 10, 1975.

(1) SWIRS ACC.NO.: 034006
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: A remote control miniature field car, developed as part of a safety device project sponsored by the Bonn Ministry of Research and Technology at Karlsruhe Nuclear Research Center, West Germany, can handle and transport nuclear fuel and waste safely. Equipped with a geiger counter, temperature sensors and stereo microphones, the car homes in on its target, moves its arm into position and analyzes its target with an array of spotlight, stereo and closed-circuit TV cameras and aerials. The equipment is only 3.88 m long and can easily be shipped or flown by helicopter to the location where its services would be required.
(12) KEYWORDS: EQUIPMENT; HAZARDOUS; MONITOR; RADIOACTIVE; TRANSPORT
(15) STIMS ACC.NO.: 00833050
(18) DOC.CIT.: News in brief. South African Mining and Engineering Journal, 88(4102):97, Mar. 1975.

(1) SWIRS ACC.NO.: 033441
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: A new regulatory guide is presented for leakage tests on packages for shipment of radioactive materials. The guide is in series and serves to make available to the public methods accpetable to the National Regulatory Staff of implementing specific parts of the Commission's regulations and to delineate techniques used by the staff in evaluating specitic problems or postulated accidents. It also provides guidance to applicants on information needed by the staff in its review of applications for permits and licences.
(12) KEYWORDS: DISPOSAL; FEDERAL; GOVERNMENT; HAZARDOUS; PUBLIC; RADIOACTIVE; REGULATIONS
(15) STIMS ACC.NO.: 00832485
(18) DOC.CIT.: Nuclear regulatory commission: leakage tests. Federal Register, 40(117):25642, June 17, 1975.

(1) SWIRS ACC.NO.: 033409
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: Question: Is power from nuclear sources more important than risks engendered by the same nuclear sources? Plutonium,

the most hazardous factor in the nuclear scheme, can be transmitted into the environment during by-product disposal which takes place in the ocean, or by disruption to the storage areas of high activity wastes. Also radiation danger to workers in plutonium fabrication plants is a big problem. Lack of direct data in the area of radiological protection of personnel exposed to plutonium adds to the problem of control exposure. Time is a factor in the assessment of plutonium and whether its advantages are greater than its risks.

(12) KEYWORDS: DISPOSAL; ENVIRONMENT; HAZARDOUS; PERSONNEL; RADIOACTIVE; SAFETY; STORAGE

(15) STIMS ACC.NO.: 00S32453

(18) DOC.CIT.: Plutonium-the risks vs. the benefits. Laboratory Practice, 10(4):47, Jan. 1975.

(1) SWIRS ACC.NO.: 033364

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: In the highly radioactive wastes arising by fluoride processing of nuclear fuel from fast reactors, most of the fission products are adsorbed on granulated alumina. With the planned operation of nuclear establishments in Czechoslovakia, the production of contaminated aluminum hydroxide should attain roughly 10 tons annually in the 1980's and more than 200 tons by the end of the century. It is necessary to solve the problem of disposal of such large quantities of dangerous materials in the densely populated country. Into basalt, which has already been proved as a suitable fixation medium for liquid radioactive waste, it is possible to fuse further 30 percent aluminum hydroxide without affecting negatively its properties. Basalt from the Slapany locality has been proved to be a suitable fixation medium for fast reactor wastes. During the heat treatment process it is possible to omit the recrystallization stage, thus rendering the process economically more advantageous. (Text in Czech)

(12) KEYWORDS: ALUMINUM; CHEMICAL; CZECHOSLOVAKIA; DISPOSAL; ISOTOPE; PH; PROCESS; RADIOACTIVE

(15) STIMS ACC.NO.: 00S32408

(18) DOC.CIT.: Ralkova, J. , J. Pribyl. Prispevek k likvidaci radioaktivnich odpadu z rychlych reaktoru. A contribution to the disposal of radioactive waste from fast reactors. Ceskoslovenska Akademie Ved 19(1):69-75, 1975.

(1) SWIRS ACC.NO.: 032495

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: Nuclear processing plants apply the Purex process, or variations of it, almost exclusively for extractive separation and decontamination of uranium, neptunium, and plutonium from each other and from impurities. As an extractant, tri-n-butyl phosphate or TBP, which is usually diluted with saturated aliphatic hydrocarbons, such as n-dodecane or refined kerosenes, is used. In the Purex process, the TBP as well as the dilutent, and degraded by radiation and reactive chemicals. Degradation of the extractant phase causes a series of unfavorable effects on the extraction process and equipment operation, such as loss of uranium and plutonium to waste streams and poor separation of the solvent phase, and the formation and deposition of solids. Currently used processes to minimize these disadvantages are considered, however, for the most part, they are not satisfactory. However, a new process has been developed for safe and economic treatment and disposal of spent TBP-kerosene mixtures which is free of the disadvantages of the currently used treatment techniques. This process has been designated the Eurochemic organic waste treatment process, abbreviated the Eurowatt process. A detailed description of the process is contained in this paper. Although the process was

developed specifically for the treatment of spent TBP-kerosene mixtures, it is applicable to other solvent types also.

(12) KEYWORDS: ANALYSIS; CHEMICAL; CONVERT; DESIGN; DISPOSAL; ENERGY; INDUSTRY; LIQUID; PROCESS; RADIOACTIVE; RESEARCH; SOLID; SOLVENT; TREATMENT

(15) STIMS ACC.NO.: 00S31539

(18) DOC.CIT.: Salomon, L. , E. Eschrich, and L. Humblet. Treatment and disposal of tributyl phosphate-kerosene waste by the Eurowatt process. The American Nuclear Society Transactions, 29(1-820):663-665, 1975.

(1) SWIRS ACC.NO.: 032478

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: Most of the high-level radioactive waste at the Idaho National Engineering Laboratory is generated during the reprocessing of spent nuclear fuel at the Idaho Chemical Processing-Plant. The fuel comes from nuclear reactors that use highly enriched uranium-235 fuel. Most of the high-level radioactive waste is first-cycle raffinate from solvent extraction of dissolved fuel solutions. This waste is self-heating in both the liquid and solid forms. Management of these wastes is performed in accordance with the latest requirements and regulations for such waste. Liquid waste is stored safely in doubly contained tanks made of steel. The liquid waste is calcined to a solid and stored safely in underground bins. The calcine can be treated or left untreated in anticipation of ultimate storage. Fluidized bed calcination has been applied to many types of high-level radioactive wastes. The environmental impact of the wastes at the Idaho Chemical Processing Plant has been negligible and should continue to be so.

(12) KEYWORDS: CONTAINER; CONVERT; DESIGN; DISPOSAL; ENVIRONMENT; FACILITY; FLUIDIZED BED; FUEL; IDAHO; LIQUID; MANAGEMENT; RADIOACTIVE; SITES; SOLID; STORAGE

(15) STIMS ACC.NO.: 00S31522

(18) DOC.CIT.: Slansky, G. C. M. Radioactive waste management. Chemtech, 160-164, Mar. 1975.

(1) SWIRS ACC.NO.: 032472

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: The reprocessing of irradiated fuels produces liquid medium level wastes. Since 1966 such wastes have been stored on the Eurochemic site in Belgium in uncoiled steel tanks. Before transporting these wastes to an interim storage facility, it is necessary to convert them to a water-insoluble, solid form. This is done in a two-step process: chemical pretreatment, to insolubilize the radionuclides to eliminate corrosion risks and uncontrollable thermal reactions; and, homogeneous incorporation of the slurry resulting from the chemical pretreatment into bitumen along with the simultaneous evaporation of water to obtain solid bitumen waste. This product is poured into drums suited for interim storage and final disposal. This report described the bituminization and storage installations, evaluates the hazards involved, and analyzes the safety aspects of the operations with regard to public health and environmental considerations.

(12) KEYWORDS: BELGIUM; CONTAINER; CONVERT; DISPOSAL; ENVIRONMENT; FACILITY; LIQUID; PROCESS; RADIOACTIVE; SAFETY; SITES; SOLID; STORAGE; TRANSPORT

(15) STIMS ACC.NO.: 00S31516

(18) DOC.CIT.: Medium level waste bituminization plant and engineered storage facility at Eurochemic. The American Nuclear Society Transactions, 20(1-820):658-661, 1975.

(1) SWIRS ACC.NO.: 032471

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: All liquid radioactive wastes must be solidified in order to prevent the release of radionuclides to the environment. There

are two industrial processes for the solidification of low and medium level liquid wastes: bituminization and cementation. The disadvantages to the latter include: formation of heterogeneous blocks; incomplete setting of cement with some evaporation concentrates; poor resistance of solidified wastes to climatic variations and shocks, high leaching rate, and increased volume after packing. Mainly for these reasons, France uses mostly bituminization. The bituminization process consists of thoroughly mixing these cold liquid wastes with hot bitumen fed at its pumping temperature or with cold bituminous emulsion, and perfectly dehydrating the coated product by progressively heating the soluble and insoluble salts and bitumen. These two processes are carried out simultaneously in a continuous operating evaporator. This paper discussed the safety problems associated with radioactive wastes solidified by bitumen.

(12) KEYWORDS: ANALYSIS; COMPARISON; CONCRETE; CONTAINER; CONVERT; DISPOSAL; ENVIRONMENT; FRANCE; LIQUID; PROBLEMS; PROCESS; RADIOACTIVE; SAFETY; SOLID; STORAGE

(15) STIMS ACC.NO.: 00531515

(18) DOC.CIT.: Lefillatre, G. , and J. Leconnetable. Bituminization of radioactive wastes: safety problems and application fields. The American Nuclear Society Transactions, 20(1-820):657-658, 1975.

(1) SWIRS ACC.NO.: 032470

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: It is fairly common practice to convert liquid and slurry forms of radioactive waste to solids before storage or transport. Economical operation of centralized facilities requires relatively high throughputs of radioactive material. Owing to this factor and the increased difficulties of transporting liquid and slurry radioactive wastes on public roadways, a mobile waste solidification system is proposed. The design of such a proposed unit is described. The advantages of such a unit include: the resulting transportation of only solid wastes; the specific investment costs to reactor owners are lower for the lower throughputs because no costs for location, building, and infrastructure are required; one mobile unit can service 8 light-water reactors each year, thus reducing unit investment cost per reactor; and, the volume of wastes to be transported will be reduced. The unit is especially designed to treat the evaporator and filter concentrates from light-water reactors, however, it could also treat ion exchange material.

(12) KEYWORDS: CONTAINER; CONVERT; DESIGN; ECONOMICS; EQUIPMENT; FACILITY; ION EXCHANGE; LIQUID; MOVABLE; PROCESS; RADIOACTIVE; SLURRY; SOLID; STORAGE; TRANSPORT

(15) STIMS ACC.NO.: 00531514

(18) DOC.CIT.: Shank, E. M. Bituminization of liquid and slurry radioactive waste in a mobile unit. The American Nuclear Society Transactions, 20(1-820):661-662, 1975.

(1) SWIRS ACC.NO.: 032469

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: The Gelsenberg Company of Germany has developed a new process for the solidification of high level radioactive waste solutions. The process, called Pamela, phosphate glass solidification and metal incorporation of high level liquid active waste, consists of: concentration and denitration of the waste solution in the presence of phosphoric acid and formaldehyde; vitrification of the resultant slurry at 1,000 C to produce granulated phosphate glass; offgas cleaning and recovery of concentrated nitric acid; and, incorporation of the glass granules into a suitable metal matrix. The problems of the process and the solutions to those problems are discussed. Also discussed are the

advantages of using this process for the solidification of liquid high level radioactive wastes.
(12) KEYWORDS: ANALYSIS; CHEMICAL; CONVERT; GLASS; LIQUID; METAL; PHOSPHATE; PROBLEMS; PROCESS; RADIOACTIVE; RESEARCH; SLURRY; SOLID; TREATMENT
(15) STIMS ACC.NO.: 00531515
(18) DOC.CIT.: Heimerl, W. A new method for the fixation of high level radioactive wastes. The American Nuclear Society Transactions, 20(1-820):669-671, 1975.

(1) SWIRS ACC.NO.: 032460
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: All light-water reactors have radioactive offgas effluents which must be treated to reduce the radioactivity prior to release to the environment. Good operating practice as well as governmental regulations mandate treatment systems. Basically, there are two ways of dealing with radioactive wastes; temporary storage to permit most of the short-lived nuclides to decay naturally, and removal for permanent storage. Treatment systems for the radioactive offgasses generated in pressurized-water reactors and boiling-water reactors are described, with the commonly employed reduction processes, to meet increasingly stringent requirements for gaseous radioactive emissions. Although the main purpose of these systems is to reduce radioactivity, they are also designed to optimize reliability, maintainability, safety, and cost.
(12) KEYWORDS: ANALYSIS; DESIGN; ENVIRONMENT; EQUIPMENT; GASSES; PLANT-INDUSTRIAL; POWER; RADIOACTIVE; REDUCTION; REGULATIONS; SAFETY; STORAGE; SYSTEM; TREATMENT
(15) STIMS ACC.NO.: 00531504
(18) DOC.CIT.: Stewart, J. E. , and M. R. Knandar. Radwaste reduction techniques for LWR gaseous effluents. The American Nuclear Society Transactions, 20(1-820):649-654, 1975.

(1) SWIRS ACC.NO.: 032459
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975
(11) ABSTRACT: With the expansion and development of nuclear programs, it is necessary to also develop adequate, reliable systems for dealing with the large amounts of radioactive wastes that are produced. Radioactive waste management practices for liquid, solid and gaseous wastes generated at pressurized-water reactors are discussed with frequent reference to operating experience at existing facilities. Unfortunately, in many instances, too little attention is given to unsatisfactory experiences. It is stressed that waste treatment systems must be viewed as a whole. The various functions of such treatment stations, being strongly interconnected and having numerous interactions, require that the different parts of the system and their ancillaries be adapted and coordinated to each other to achieve operable and economical plants.
(12) KEYWORDS: ANALYSIS; ENERGY; ENVIRONMENT; FACILITY; GASSES; LIQUID; MANAGEMENT; PLANT-INDUSTRIAL; POWER; PROBLEMS; RADIOACTIVE; SAFETY; SOLID; SYSTEM; TREATMENT
(15) STIMS ACC.NO.: 00531503
(18) DOC.CIT.: Morgan, L. , G. Gallois, J. Mestrez, and J. Storrer. Trends for PWR radwaste treatment stations a basis of present experience. The American Nuclear Society Transactions, 20(1-820):646-649, 1975.

(1) SWIRS ACC.NO.: 032407
(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975
(11) ABSTRACT: British Nuclear Fuels Ltd. is currently storing its bulky radioactive wastes as liquids in stainless steel tanks surrounded by thick concrete shielding. However, as the expected use of nuclear fuels will increase greatly, new methods are being sought. Storage of the wastes as solids would have the advantages of simplified surveillance and the feasibility of transporting the containers from

one site to another if deemed necessary. A new process, a form of vitrification, has been proved on an experimental scale, and a full-scale demonstration plant is planned for completion by the mid-1980's.

(12) KEYWORDS: CHEMICAL; CONTAINER; FACILITY; FUEL; GREAT BRITAIN; HAZARDOUS; LIQUID; MONITOR; PLANNING; PROCESS; RADIOACTIVE; SITES; SOLID; STORAGE; TRANSPORT

(15) STIMS ACC.NO.: 00S31451

(18) DOC.CIT.: Beatson, C. Nuclear wastes stored as solids. The Engineer, 7, Feb. 6, 1975.

(1) SWIRS ACC.NO.: 032123

(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: Permanent disposal of nuclear wastes, is a problem with no immediate feasible solution. The United States has already produced radioactive wastes that will remain highly toxic for up to 250,000 years; and there are no permanent sites available for disposal. The salt beds in Mexico which have been stable for 250 million years have been considered as possible sites, but they will not be ready for about 20 years. Meanwhile, temporary sites are being explored. One such proposal is to solidify the toxic wastes and seal them in 10 ft high, 2-ton steel canisters and then embed them in concrete casks. The 70-ton casks would then be erected on a barren plot and stored on the surface. This would leave them vulnerable to aircraft attack. Burying them below the surface would require a more complicated cooling system. Schemes that have already been rejected are rocketing the wastes out into space, letting them melt into the polar ice caps, or keeping them moving in railroad cars. The Energy Research and Development Administration estimates that by 2000, 60 million gal of wastes will be produced. Permanent disposal needs will not be critical until then and hopefully, new techniques will be available by then.

(12) KEYWORDS: BURY; CONTAINER; DISPOSAL; GOVERNMENT; HAZARDOUS; LIQUID; MEXICO; RADIOACTIVE; RAIL HAUL; RAILROAD CAR; SALT; SITES; SOLID; SPACE CRAFT; STORAGE; TOXIC; US

(15) STIMS ACC.NO.: 00S31167

(18) DOC.CIT.: The deadly dilemma of nuclear wastes. Environment, 70-71, Mar. 3, 1975.

(1) SWIRS ACC.NO.: 032058

(2) DOMESTIC: F (2) CATEGORY: 09 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This paper was presented at the first European Nuclear Conference held on April 21 to 25, 1975, in Paris, France. It deals with the nature of radioactive wastes generated in the various sectors of the nuclear fuel cycle and their management. The wastes may be characterized as mill-tailings, low level liquid and solid wastes, gaseous wastes, and wastes containing plutonium and other actinides. Management technologies for these wastes are developed. Additional technologies that currently receive attention are: 1) perpetual isolation within the earth until the process of natural decay converts the radionuclides to a stable state; 2) removal from the earth by projection into space, and 3) transmutation of the long-lived radionuclides to stable or short-lived radionuclides. Presently acceptable, but not implemented methods of radioactive waste management or disposal methods involve both engineered storage and geologic storage of solidified high-level wastes. There is also very little cooperation between nations in the implementation of radioactive waste management practices. Radioactive waste management should be viewed as a local, regional, and global problem both in the short-run and long-run terms.

(12) KEYWORDS: DISPOSAL; ECONOMICS; EUROPE; FRANCE; GOVERNMENT; HAZARDOUS; INTERNATIONAL; MANAGEMENT; PROCESS; RADIOACTIVE; REGIONAL; RESEARCH

(15) STIMS ACC.NO.: 00S31102

(18) DOC.CIT.: Lennemann, W. L. , H. E. Parker, and P. J. West. Management of radioactive wastes. The American Nuclear Society Transactions, 20(1820):690, 1975.

Appendix A
ABBREVIATIONS

Administration	Admin
Agrarie	Agra
Agricultural	Agric
Agriculture	Agri
America(n)	Amer
Annals, Annali, Annales	Ann
Applied	Appl
Archiv (e, es)	Arch
Association (cion)	Assoc
Australasian	Austral
Berichte	Ber
British	Brit
Buildings	Bldg(s)
Bulletin	Bull
Canada(ian)	Can
Chemical, Chemistry	Chem
Company	Co
Communication(s)	Comm
Control	Contr
Conservation Development Deutschen	Conser Devt Deutsch
Corporation	Corp
Department	Dept
Division	Div
Energy	Ener
Engineer(s)	Engr(s)
Engineering	Engring
Environment	Env
Environmental	Environ
Experimental	Eptl
Government	Govt
Highway(s)	Hgwy(s)
Incorporated	Inc
Indian	Indn
Industrial	Indus
Industry	Ind
Institute	Inst
Institution	Instit
International	Inter
Izvestiya	Izv
Japan	Jpn
Japanese	Jpnse
Journal	J
Laboratory	Lab
Limited	Ltd
Management	Mgmt
Manufacture(r)	Manuf
Materials	Mater
Metallurgical, Metallurgy	Metall
Microbiology (ical, ia)	Micro
Mining	Mng
National	Natl
New	N
Number	No.
Organization	Org
Packaging	Pkg
Pollution	Poll
Proceedings	Proc
Production	Prod

Professional	Prof
Publication(s)	Pub(s)
Reclamation	Reclam
Report(s)	Rpt(s)
Research	Rsch
Resource	Res
Review(s), Revue, Revista	Rev
Service(s)	Svc(s)
Science(s)	Sci
South	S
Technological	Technol
Technology, Technische, Technica, etc.	Tech
Toxicology	Toxicol
Transactions	Trans
Treatment	Trtmt
University and variations	Univ
United States	U.S.
Water	Wtr
Wissenschaftlichen	Wissen
Zeitschrift	Zeit
Zentrallblatt	Zent
Zhurnal	Zh

Appendix B
QUANTITATIVE MEASUREMENTS

acre (acre)

acre-foot (acre-ft)

centimeter (cm)

cubic centimeter (cu cm)

cubic foot (cu ft)

cubic inch (cu in)

cubic meter (cu m)

cubic meters per minute (cu m/min)

cubic yard (cu yd)

ft (ft)

gallon (gal)

gallons per minute (gal/min)

hectare (ha)

inch (in)

kilogram (kg)

meter (m)

millimeter (mm)

mile (mile)

newton (N)

one kilogram force (kgf)

one pound force (lbf)

pascal (Pa)

pound (lb)

pounds per square foot (psf)

pounds per square inch (psi)

square centimeter (sq cm)

square foot (sq ft)

square inch (sq in)

square kilometer (sq km)

square meter (sq m)

square mile (sq mile)

square yard (sq yd)

ton (ton)

yard (yd)

Months of the Year

Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.

Appendix C
LANGUAGE CODES

Language	Code	Language	Code
Mixed	AA	Lingala	NG
Afrikaans	AF	Macedonian	MC
Albanian	AL	Malayan	ML
Amharic	AR	Malayalam	MA
Arabic	AR	Malay-Indonesian	MI
Armenian	AE	Malagasy	MS
Belorussian (White Russian)	BE	Maltese	MT
		Mandarin	CH
Bulgarian	BU	Marathi	MR
Burmese	BR	Mongolian	MO
Cambodian	CA	Nepali	NE
Cantonese	CH	Ngala	NG
Chinese	CH	Norwegian	NO
Croatian	CR	Papuan	PA
Czech	CZ	Persian	PE
Danish	DA	Polish	PO
Dutch	DU	Portugese	PR
English	EN	Punjabi	PU
Estonian	ES	Pustu	PS
Finnish	FI	Romanian	RO
Flemish	FL	Russian	RU
French	FR	Rwanda	RW
Georgian	GE	Servian	SE
German	GM	Sinhalese	SI
Greek	GR	Slovak	SL
Gujarati	GU	Slovene	SV
Hebrew	HE	Somali	SO
Hindi	HI	Spanish	SP
Hindustani	HI	Swahili	SW
Hungarian (Magyar)	HU	Swedish	SD
Icelandic	IC	Tagalog	TA
Indonesian	MI	Tamil	TM
Italian	IT	Telugu	TE
Japanese	JA	Thai	TH
Javanese	JV	Tibetan	TI
Kashmiri	KA	Turkish	TU
Khmer	CA	Ukrainian	UK
Kirundi	KI	Urdu	UR
Korean	KO	Vietnamese	VI
Latin	LA	White Russian	BE
Latvian	LN	Yiddish	YI
Lithuanian	LI		

Appendix D
HIERARCHIC TERMS

1AC	ACCIDENT	
	(See also PETROCHEMICALS)	
1AG	AGRICULTURAL WASTES	
	(See also ANIMALS, MANURE, FOOD PROCESSING)	
	2C8	CROP RESIDUE
	2LW	LOGGING WASTES
	2PT	PROCESSING
	2UT	UTILIZATION
1AI	AIR POLLUTION	
	2AN	ANALYSIS
	2C2	CONTROL EQUIPMENT
	2DU	DUMPS
	2FD	FEEDLOTS
	2IC	INCINERATOR
	2IN	INDUSTRY
	2LF	LAWS
	2SQ	SMOKE CONTROL
1AL	ALGAE	
	(See MICROORGANISM)	
1AN	ANALYSIS	
1AQ	ANIMALS	
	(See also MANURE)	
	2CD	CARCASS
	2FD	FEEDLOTS
	2VC	VECTOR CONTROL
1AS	ASH	
	2CN	COMPOSITION
	2DP	DISPOSAL
	2UT	UTILIZATION
1AU	AUTOMOBILES	
	2BU	BURNING
	2CL	COLLECTION
	2C6	COSTS
	2DP	DISPOSAL
	2IC	INCINERATION
	2LF	LAWS
	2QU	QUANTITY
	2RT	RAIL TRANSPORT
	2TT	TRANSPORT
	2UT	UTILIZATION
	2VR	VOLUME REDUCTION
1AY	AUTOMOTIVE INDUSTRY	
	(See also AUTOMOBILES)	
	2DP	DISPOSAL
	2PT	PROCESSING
	2UT	UTILIZATION

1BC BACTERIA
(See MICROORGANISMS)

1BL BALING
2ET EQUIPMENT
2PD PAPER
2SC SCRAP METAL

1BU BULKY WASTES
2CL COLLECTION
2DP DISPOSAL
2TT TRANSPORT
2UT UTILIZATION
2VR VOLUME REDUCTION

1CF CELLULOSE

1CH CHEMICALS
2IN INDUSTRIAL WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2PC POST CONSUMER WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION

1CL COLLECTION
(See also CONTAINERS)
2CJ CHUTE SYSTEMS
2CM COMMERCIAL WASTES
2CZ CONTAINERS
2C1 CONTRACTORS
2C6 COSTS
2ET EQUIPMENT
2FR FREQUENCY
2IN INDUSTRIAL WASTES
2IW INSTITUTIONAL WASTES
2LF LAWS
2MY MUNICIPAL WASTES
2PH PERSONNEL
2PQ PNEUMATIC
2RO ROUTES
2RW RURAL AREAS
2TU TRUCKS

1CO COMPACTION
2ET EQUIPMENT

1CP COMPOST
2AN ANALYSIS
2HE HEALTH AND SAFETY
2MG MARKETS
2UT UTILIZATION

1CQ COMPOSTING
2CC CANNERY WASTES
2CF CELLULOSE
2C6 COSTS
2DP DISPOSAL
2ET EQUIPMENT
2HE HEALTH AND SAFETY
2IC INCINERATION
2IT INSTALLATIONS
2LF LAWS
2MX METHODS

2PD PAPER
2PS PROBLEMS
2SI SEPARATION OF NON-ORGANICS
2SP SLUDGE

1CT COMPUTER
(See MANAGEMENT AND PLANNING)

1CX CONSTRUCTION
(See also DEMOLITION WASTES)
2IN INDUSTRIAL WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2PC POST CONSUMER WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION

1CZ CONTAINERS
2DP DISPOSAL

1DA DAIRY (INDUSTRY)

1DE DEEP WELL STORAGE

1DM DEMOLITION WASTES
(See also CONSTRUCTION)

1DP DISPOSAL
(See also INDIVIDUAL METHODS)
2AG AGRICULTURAL WASTES
2CM COMMERICAL WASTES
2C6 COSTS
2DG DREDGING
2FC FACILITIES
2HC HAZARDOUS WASTE
2HE HEALTH AND SAFETY
2IN INDUSTRIAL WASTES
2IW INSTITUTIONAL WASTES
2LF LAWS
2MX METHODS
2MY MUNICIPAL WASTES
2RP RESEARCH
2RV RURAL AREAS

1DR DRUGS
(See also PHARMACEUTICAL WASTES)

1DU DUMPS
2EL ELIMINATION
2HE HEALTH AND SAFETY
2LF LAWS

1EC ECONOMICS
2C6 COSTS
2MG MARKETS
2TX TAXES

1EI EDUCATION
2PH PERSONNEL
2PO PROFESSIONAL
2PV PUBLIC

1EN ENERGY
- 2EC ECONOMICS
- 2RD REFUSE DERIVED FUELS
- 2UT UTILIZATION

1EP ENVIRONMENTAL PROTECTION

1ET EQUIPMENT
- 2AN ANALYSIS
- 2BR BALERS
- 2CL COLLECTION
- 2CO COMPACTION
- 2C3 CONVEYOR
- 2HM HAMMERMILLING
- 2MH MATERIALS HANDLING
- 2SD SALVAGE AND RECLAMATION
- 2SG SANITARY LANDFILL
- 2SI SEPARATORS - FITTERS
- 2SK SHEARING
- 2SL SHREDDING
- 2SU SPREADING
- 2TT TRANSPORTATION
- 2WT WASTEWATER TREATMENT (CONTROL EQUIPMENT)

1FE FERTILIZER
(See also COMPOST, HAZARDOUS)
- 2DP DISPOSAL
- 2RF REFUSE DERIVED FERTILIZER

1FI FIRE

1FL FLY ASH
- 2AN ANALYSIS
- 2DP DISPOSAL
- 2MS MINE STABILIZATION
- 2RC RECOVERY OF CONSTITUENTS
- 2SS SOIL CONDITIONER
- 2UT UTILIZATION
  - 3AR AGGREGATE

1FO FOOD PROCESSING WASTES
- 2BG BAGASSE
- 2BK BAKERY
- 2BP BIOLOGICAL PROCESSING
- 2BW BREWERY
- 2CC CANNERY
- 2CI CHEMICAL PROCESSING
- 2CK COFFEE
- 2DA DAIRY
- 2DP DISPOSAL
- 2FR FRUITS
- 2GF GRAIN AND FEED CROPS
- 2MF MEAT PACKING PLANTS
- 2MP MECHANICAL PROCESSING
- 2MU MOLASSES
- 2PA POULTRY
- 2SE SEAFOOD
- 2SO SLAUGHTERHOUSE
- 2SX SUGAR
- 2UT UTILIZATION
- 2VG VEGETABLE

1FU FUNGI
(See MICROORGANISMS)

1GA GARBAGE GRINDING

1GL GLASS
2IN INDUSTRIAL WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2PC POST CONSUMER WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION

1GR GRANTS

1GW GROUND WATER

1HC HAZARDOUS WASTES
(See also RADIOACTIVE WASTES, HOSPITALS, PESTICIDES)
2AN ANALYSIS
2DP DISPOSAL
2PT PROCESSING

1HE HEALTH AND SAFETY

1HH HEAT RECOVERY
(See INCINERATION)

1HO HOG FEEDING

1HS HOSPITALS
(See also INSTITUTIONAL WASTES; HAZARDOUS WASTES)

2CL COLLECTION
2DI DISPOSABLE ITEMS
2DP DISPOSAL
2HE HEALTH AND SAFETY
2IC INCINERATION

1IC INCINERATION
(See also SPECIFIC WASTES)
2AI AIR POLLUTION
2CM COMMERCIAL WASTES
2CQ COMPOSTING
2C6 COSTS
2EM EMISSIONS
2ET EQUIPMENT
2IN INDUSTRIAL WASTES
2IW INSTITUTIONAL WASTES
2LF LAWS
2MC MANAGEMENT AND PLANNING
2MY MUNICIPAL WASTES
2OS ON SITE
2PE PLANT DESIGN
2PG PLANT OPERATION
2PS PROBLEMS
2RS RESIDUE
2SD SALVAGE AND RECLAMATION
2WA WASTE HEAT UTILIZATION
2WE WATER POLLUTION

1IE INCINERATOR
2FB FLUIDIZED BED
2OP OPEN PIT
2RK ROTARY KILN
2SP SLUDGE
2ST SPECIAL PURPOSE

1IN INDUSTRIAL WASTES
(See also SPECIFIC INDUSTRY, SPECIFIC TREATMENT METHODS)
2AN ANALYSIS
2BP BIOLOGICAL PROCESSING
2CG CENTRALIZED DISPOSAL PLANTS
2CI CHEMICAL PROCESSING
2C6 COSTS
2EF EFFLUENT CHARGES
2LF LAWS
2MP MECHANICAL PROCESSING
2MY MUNICIPAL WASTES
2PY PYROLYSIS
2SJ SEWAGE
2TT TRANSPORTATION
2UT UTILIZATION

1IS INSECTS

1IW INSTITUTIONAL WASTES
2DP DISPOSAL
2PT PROCESSING
2UT UTILIZATION

1LC LAGOONS

1LD LAND RECLAMATION
(See also MINES, SANITARY LANDFILL)

1LF LAWS
2CL COLLECTION
2DP DISPOSAL
2ER ENFORCEMENT
2FF FEDERAL
2IB INTERNATIONAL
2MB MUNICIPAL
2SW STATE

1LH LEACHATE
(See also SANITARY LANDFILL, WATER POLLUTION)

1LR LITTER
2CB CAMPAIGNS
2C6 COST OF REMOVAL
2RJ RECREATION AREAS

1LU LUMBER
2IN INDUSTRIAL WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2PC POST CONSUMER WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION

1MA MANAGEMENT AND PLANNING
2C7 COUNTY
2FF FEDERAL
2IB INTERNATIONAL
2MB MUNICIPAL
2RI REGIONAL
2RW RURAL
2SW STATE
2TQ TECHNIQUES

1ME	MANURE	
	(See also ANIMALS)	
	2CE	CATTLE
	2HE	HEALTH AND SAFETY
	2PA	POULTRY
	2PT	PROCESSING
	2SL	SHEEP
	2SN	STORAGE
	2SZ	SWINE
	2UT	UTILIZATION
1MG	MARKETS	
1MI	METAL, FERROUS	
	2EC	ECONOMICS
	2IN	INDUSTRIAL WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
	2PC	POST CONSUMER WASTES
		3DP DISPOSAL
		3PT PROCESSING
		3UT UTILIZATION
	2SC	SCRAP
	2SN	SLAG
	2SY	SWARF
1MK	METAL, NON-FERROUS	
	2AM	ALUMINUM
	2C4	COPPER
	2EC	ECONOMICS
	2HV	HEAVY
	2LB	LEAD
	2NI	NICKEL
	2PK	PRECIOUS METALS
	2TI	TIN
	2ZI	ZINC
1MM	MICROORGANISMS	
1MO	MINERALS	
1MR	MINES	
	(See also LAND RECLAMATION)	
1MT	MINING INDUSTRY	
	2DP	DISPOSAL
	2PT	PROCESSING
	2UT	UTILIZATION
1MV	MONITORING	
1MY	MUNICIPAL WASTES	
	(See also REFUSE)	
	2CO	COMPACTION
	2DP	DISPOSAL
	2SH	SEPARATION
	2TT	TRANSPORT
	2UT	UTILIZATION
1NO	NOISE	
1OC	OCEAN DISPOSAL	
	2AG	AGRICULTURAL WASTES
	2CM	COMMERCIAL WASTES
	2IN	INDUSTRIAL WASTES

2IW INSTITUTIONAL WASTES
2IX INTERNATIONAL CONTROL
2MY MUNICIPAL WASTES
2SP SLUDGE

1OF ODOR CONTROL

1OL OIL

1PB PACKAGING WASTES
2DP DISPOSAL
2PT PROCESSING
2UT UTILIZATION

1PD PAPER AND PULP
2IN INDUSTRIAL WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2NE NEWSPAPERS
2PC POST CONSUMER WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION

1PF PATHOGENIC WASTES

1PH PERSONNEL

1PJ PESTICIDES

1PL PETROCHEMICALS
2IN INDUSTRIAL WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2OI OIL SPILLS
2PC POST CONSUMER WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION

1PN PHARMACEUTICAL WASTES

1PP PLANNING

1PR PLASTICS
2IN INDUSTRIAL WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2PC POST CONSUMER WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION

1PT PROCESSING

1PV PUBLIC RELATIONS
(See EDUCATION)

1PY PYROLYSIS
(See also INCINERATION)

1RD RADIOACTIVE WASTES
(See also HAZARDOUS WASTES)

2DP DISPOSAL
2SW STORAGE

1RG RECLAMATION
(See SALVAGE AND RECLAMATION)

1RJ RECREATIONAL AREAS
(See also LAND RECLAMATION)

1RM REDUCTION

1RN REFUSE
(See also SPECIFIC TYPES)
2CA CALORIFIC VALUE
2CO COMPOSITION
2QU QUANTITY

1RP RESEARCH
(See SPECIFIC TOPICS; GRANT)

1RR RESOURCE RECOVERY

1RU RUBBER
2IN INDUSTRIAL WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2PC POST CONSUMER WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2TS TIRES

1SB SAFETY
(See HEALTH AND SAFETY)

1SD SALVAGE AND RECLAMATION
(See also SPECIFIC TYPES)

1SF SAND

1SG SANITARY LANDFILL
(See also LAND RECLAMATION; SPECIFIC WASTES)
2CQ COMPOSTING
2C6 COSTS
2DC DECOMPOSITION
2DS DESIGN
2ET EQUIPMENT
2GS GASSES
2GW GROUND WATER
2MC MANAGEMENT AND PLANNING
2OE OPERATIONS
2RL REGULATIONS
2SL SHREDDING
2SO SITES

1SI SEPARATION
2CH CHEMICAL
2LS LIQUID-SOLID
2MD MECHANICAL
2ML METAL
2MX METHODS
2RN REFUSE

1SJ SEWAGE
(See also SLUDGE)
2AN ANALYSIS

2BP BIOLOGICAL PROCESSING
2CI CHEMICAL PROCESSING
2C6 COSTS
2HE HEALTH AND SAFETY
2IP IRRADIATION PROCESSING
2MP MECHANICAL PROCESSING
2TT TRANSPORTATION

1SL SHREDDING

1SN SLAG
(See METAL, FERROUS)

1SO SLAUGHTERHOUSE
(See FOOD PROCESSING WASTES)

1SP SLUDGE
(See also INDUSTRIAL WASTES)
2AN ANALYSIS
2BP BIOLOGICAL PROCESSING
2CI CHEMICAL PROCESSING
2C6 COSTS
2DP DISPOSAL
2ET EQUIPMENT
2HE HEALTH AND SAFETY
2HP HEAT PROCESSING
2IP IRRADIATION PROCESSING
2MP MECHANICAL PROCESSING
2TT TRANSPORTATION
2UT UTILIZATION

1SR SNOW REMOVAL

1ST SOIL

1SU SOURCES OF INFORMATION

1SW STORAGE
2CZ CONTAINERS
2C6 COSTS
2LF LAWS
2MX METHODS
2SO SITES

1SX STREET CLEANING

1SY SURVEYS

1SZ SYSTEMS ANALYSIS
(See MANAGEMENT AND PLANNING)

1TB TANNERY WASTES

1TE TEXTILES
2IN INDUSTRIAL WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION
2PC POST CONSUMER WASTES
3DP DISPOSAL
3PT PROCESSING
3UT UTILIZATION

1TM TOXIC MATERIALS
(See also HAZARDOUS WASTES)

1TR TRANSFER STATIONS
(See also COLLECTION)

1TT TRANSPORTATION
(See also SPECIFIC WASTES)
2C6 COSTS
2MX METHODS
2PM PIPELINES
2PQ PNEUMATIC
2RB RAILROADS
2SN SHIPS
2TK TRUCKS

1TV TREATMENT
(See PROCESSING)

1TY TREES
(See BULKY WASTES; LUMBER)

1VC VECTOR CONTROL
(See ANIMALS; INSECTS)

1VG VEGETATION

1VR VOLUME REDUCTION

1WE WATER POLLUTION
(See also GROUND WATER)
2AG AGRICULTURAL WASTES
2AN ANALYSIS
2CM COMMERCIAL WASTES
2C2 CONTROL EQUIPMENT
2EC ECONOMICS
2HE HEALTH AND SAFETY
2IN INDUSTRIAL WASTES
2LF LAWS
2MY MUNICIPAL WASTES
2SJ SEWAGE

1WO WOOD
(See LUMBER)

Appendix E
GEOGRAPHIC CODES

1AF	Africa
1AN	Antarctica
1AS	Asia
1AU	Australia
1CA	Canada
1CB	Caribbean
1EU	Europe
1MA	Marshall Islands
1ME	Mexico
1MI	Middle East
1NZ	New Zealand
1SA	South America
1SU	Soviet Union
1US	United States
2AA	Alabama
2AC	Alaska
2AE	Alberta
2AG	American Samoa
2AI	Arizona
2AN	Argentina
2AR	Arkansas
2AS	Austria
2BE	Belgium
2BI	Brazil
2BR	British Columbia
2CA	California
2CH	China (Mainland)
2CI	China (Taiwan)
2CO	Colorado
2CT	Connecticut
2CZ	Czechoslovakia
2DE	Delaware
2DN	Denmark
2DT	District of Columbia
2FI	Finland
2FL	Florida
2FR	France
2GB	Gabon
2GE	Georgia
2GM	Germany (East)
2GN	Germany (West)
2GU	Guam
2HI	Hawaii
2HK	Hong Kong
2HU	Hungary
2IA	Idaho
2II	Illinois
2IL	India
2IN	Indiana
2IO	Indonesia
2IQ	Iowa
2IR	Ireland
2IS	Israel
2IT	Italy
2JM	Jamaica
2JP	Japan
2KS	Kansas
2Ky	Kentucky
2LE	Lebanon
2LI	Libya
2LT	Lithuania
2LU	Louisiana
2MA	Maine
2MD	Maryland
2MH	Massachusetts
2MI	Melbourne
2MJ	Michigan
2MN	Minnesota
2MP	Mississippi
2MR	Missouri
2MT	Montana
2NB	Nebraska
2NE	Nepal
2NF	Netherlands
2NG	Nevada
2NH	New Hampshire
2NJ	New Jersey
2NM	New Mexico
2NQ	New York
2NR	North Carolina
2NT	North Dakota
2NY	Norway
2OH	Ohio
2OK	Oklahoma
2ON	Ontario
2OR	Oregon
2PC	Pakistan
2PE	Pennsylvania
2PJ	Peru
2PL	Poland
2PR	Puerto Rico
2RI	Rhode Island
2SA	Saskatchewan
2SF	South Africa
2SI	South Carolina
2SK	South Dakota
2SP	Spain
2SR	Sweden
2SU	Switzerland
2SY	Sydney
2TA	Tasmania
2TE	Tennessee
2TK	Texas
2TN	Thailand
2UG	Uganda
2UK	United Kingdom
2UT	Utah
2VA	Venezuela
2VE	Vermont
2VI	Victoria
2VN	Virginia
2VR	Virgin Islands
2WA	Washington
2WR	West Virginia
2WW	Wisconsin
2WY	Wyoming
2YU	Yugoslavia
3AI	Aiken
3AK	Akron

3AL	Albany
3AM	Ames
3AS	Amsterdam
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3CD	Camden
3CF	Casteljaloux
3CI	Cheshire
3CJ	Chicago
3CN	Cincinnati
3CP	Cleveland
3CT	Clinton
3CU	Columbus
3CY	Cook
3CZ	Czestochowa
3DE	Denver
3DI	Detroit
3DN	Dublin
3DT	Duluth
3DU	Dusseldorf
3EB	Ebingen
3ED	Edinburgh
3EK	Elk Creek
3EM	Elmira
3EY	Ely
3FB	Fairbanks
3FI	Finham
3FL	Flagstaff
3FN	Frankfort
3FR	Franklin
3SA	St. Croix
3SC	St. Joseph
3SD	St. Louis
3SE	St. Paul
3SG	St. Petersburg
3SI	San Diego
3SN	San Francisco
3SO	Santa Ana
3SP	Santa Barbara
3SR	Savannah
3ST	Stockholm
3SU	Stuttgart
3TA	Tel Aviv
3TC	Tocks Island
3TK	Tokyo
3TN	Toronto
3TO	Trenton
3TR	Tripoli
3TU	Tucson
3VC	Venice
3GA	Gainesville
3GE	Geneva
3GL	Glasgow
3HA	Hague
3HF	Haifa
3HG	Hamburg
3HJ	Hanford
3HL	Harlem
3HM	Hartford
3HO	Honolulu
3HR	Hopewell
3HU	Houston
3IT	Ithaca
3JE	Jerusalem
3JH	Johannesburg
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3KS	Kosovo
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3LL	Liverpool
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3LY	Lycoming
3MA	Madras
3MD	Madrid
3MH	Manchester
3MI	Maui
3ML	Melbourne
3MM	Miami
3MO	Milwaukee
3MP	Minneapolis
3MR	Mobile
3MT	Montgomery
3MU	Munich
3MY	Muskegon
3NA	Nashville
3ND	New Delhi
3NL	New Orleans
3NO	New York City
3NR	Niagara
3NU	Nurnberg
3OC	Ochtrup
3OT	Ottawa
3PA	Paris
3PC	Passaic
3PH	Philadelphia
3PN	Phoenix
3PS	Pinellas
3PW	Piscataway
3RC	Rochester
3RO	Rocky Flats
3VE	Ventura
3VI	Virginia Beach
3WA	Walcheren
3WE	Weidenau-Geisweid
3WK	West Nyack
3WM	Willamette River
3WY	Winnebago
3YO	Yosemite
3ZU	Zurich

Appendix F
DOCUMENT CATEGORY CODES

01 AGRICULTURAL WASTES
- Crop residues
- Manure
- Timber/other vegetation

02 ANALYSIS OF SOLID WASTE
- Data

03 AUTOMOBILES
04 BULKY WASTES
05 COLLECTION
06 COMPOST
07 DISPOSAL
08 ECONOMICS
- Disposal costs
- Financing facilities
- Pollution control costs
- Marketing information
- Taxes and incentives

09 HAZARDOUS WASTES
10 HEALTH/SAFETY
11 INCINERATION
12 INDUSTRIAL WASTES
13 INSTITUTIONAL WASTES
14 LAWS/REGULATIONS
15 LITTER
16 MANAGEMENT
- Municipal
- Regional
- Rural
- State

17 OCEAN DISPOSAL
18 PACKAGING
19 PROCESSING/REDUCTION
20 RECYCLING
- Incinerator residue
- Industrial wastes
- Mining wastes
- Municipal refuse
- Scrap metal

21 RESEARCH
22 SANITARY LANDFILL
23 SEPARATION
24 SLUDGE
25 STORAGE
26 STREET CLEANING
27 TRAINING, EDUCATION, PUBLIC RELATIONS
28 TRANSPORT
29 SOURCE REDUCTION
30 ENERGY
- Demand, for solid waste management
- Fuel from wastes
- Heat utilization from incineration

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