

SW 662C

SOLID WASTE MANAGEMENT

*Abstracts from the Literature
1975-1978*

**HEALTH AND
SAFETY**

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

HEALTH AND SAFETY

This bibliography (SW-767) from the SWIRS data base was
compiled by Ronald E. Ware and Dorothy P. Mitchell.

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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.: 047111
 (2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: S; T
 (4) AUTHOR: Wilson, D. G., ed.
 (6) BOOK TITLE: Handbook of Solid Waste Management.
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: This handbook is designed for those engaged in the design or implementation of waste processing systems. Information on the properties, handling, processing, and disposal of solid waste is provided, based on government and other studies. Numerous aspects of solid waste management are covered: health and injury hazards, collection system parameters, transportation, mechanical handling and processing, incineration and pyrolysis, composting and hydrolysis, sanitary landfill, disposal at sea, routing and siting, manpower, and community contracting with private enterprises for solid waste collection services. Special problems of managing waste from industry, agriculture, and forestry are detailed. Resource and energy recovery are considered. Tables of quality specifications for recycled materials are presented, and the technology of separation and energy aspects of reclamation is described. Procedures for estimating solid waste generation rates are outlined. Data on the properties of waste (physical, chemical, and biological) are compiled. A brief history of solid waste management, a survey of local and federal legislation and model contracts for the private collection of residential refuse and for the design and construction of a sanitary landfill project are included. (Retained in SWIRS library).
 (12) KEYWORDS: DISPOSAL; ENERGY; LAW; MANAGEMENT; PROCESS; RECLAMATION; RESOURCE; SOLID; SYSTEM
 (14) HIERARCH TERMS: 1DP/2MX; 1MA/2TQ; 1PT
 (15) STIMS ACC.NO.: 00S46164
 (16) CITATION: New York, NY, Van Nostrand Reinhold Company, 1977. 752 p.

(1) SWIRS ACC.NO.: 046551
 (2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: S; T
 (5) CORPORATE AUTHOR: U.S. Environmental Protection Agency
 (6) BOOK TITLE: Energy/Environment II: Second National Conference on the Interagency R & D Program, Jun. 6 and 7, 1977, Washington, D.C.
 (8) REPORT NO.: EPA-600/9-77-012
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: Proceedings of Energy/Environment II, the second national conference on interagency research and development relating to energy and the environment, are presented. Addresses, papers, and discussions held at each session of the conference are included. Topics addressed include: the status of control technology; compatibility between energy and environmental goals; risk assessment; fuel processing; utility and industrial power; extraction and beneficiation; technology assessment; health effects; atmospheric transport and fate; measurement and monitoring; and ecological effects. (Original retained in SWIRS library).
 (12) KEYWORDS: CONFERENCE; ENERGY; ENVIRONMENT; FEDERAL; RESEARCH
 (14) HIERARCH TERMS: 1EN/2RD; 1EP; 1RP
 (15) STIMS ACC.NO.: 00S45602
 (16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. 563 p.

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- (1) SWIRS ACC.NO.: 045296
 (2) DOMESTIC: F (2) CATEGORY: 07 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: What's with disposables?
 (4) AUTHOR: Sutherland S
 (6) JOURNAL TITLE: Hospital Admin Can
 (10) LANGUAGE: EN (10) PUB. YEAR: 1976
 (11) ABSTRACT: The growing use of disposables in hospitals is described in terms of economics, health care benefits, and procedural problems. The disposables being used include needles and syringes, diapers, catheters, preparatory sponges, gloves, clinical droppers, tongue depressors, uniforms and items of apparel, and laboratory materials. Although using disposables increases the dependency of the hospital on its supply sources and requires some advance planning for storage, the advantages of their use are considered to outweigh the problems. Benefits include reduction of chances for infection, saving personnel time in preparing nondisposable materials that can be applied to more skilled care, saving hospitals money both on supplies and personnel time, and serving the best interests of patients as consumers. The results of several field trials of disposables in hospitals have proven personnel acceptance of their use. Disposal is generally handled by incineration.
 (12) KEYWORDS: DISPOSABLES; DISPOSAL; ECONOMICS; HOSPITAL; INCINERATION
 (14) HIERARCH TERMS: 1DD/2DM; 1IE/2JB
 (15) STIMS ACC.NO.: 00S44343
 (16) CITATION: 18(8):22-23, Aug. 1976.
- (1) SWIRS ACC.NO.: 045177
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S
 (3) ARTICLE TITLE: Microbial aerosols from food-processing waste spray fields.
 (4) AUTHOR: Parker DT
 (6) JOURNAL TITLE: J Wtr Poll Contr Federation
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: Studies were made downwind of microbial aerosols from spray fields for the disposal of potato processing wastewater. Three atmospheric stability conditions were used for grouping field trials: stable, unstable, and transitional. Trials consisted of continuous sampling with aerosol samples for intervals ranging from five to 60 minutes. Samplers were located at three stations downwind from the spray field. Downwind distances from the source field to the sampling station, the concentration of total microbial particles at the sampling station, and the normalized concentration are given. Coliform bearing particle trials in the three stability groups are presented. Predicted normalized downwind concentration distributions were derived from an area source diffusion model; agreement between model predicted and trial measured distributions was good. Study results have established that aerosol particles bearing microorganisms are produced when food processing wastes are sprayed on a disposal field. Using the data, at stable conditions an estimated downwind concentration of 127 particles/cu m at about 10 km is obtained which represents a dilution level that is indistinguishable from background concentrations.
 (12) KEYWORDS: AEROSOL; COLIFORM; DISPOSAL; EFFLUENT; FOOD PROCESSING; HEALTH; LAND; MICROBIOLOGY; MICROORGANISM; PARTICULATE MATTER; RESEARCH; SAMPLING METHODS; SPREADING
 (14) HIERARCH TERMS: 1FD/2FZ; 1HB; 1MF
 (15) STIMS ACC.NO.: 00S44223 (15) SECONDARY AUTHORS: Bondurant JA; Spendlove JC
 (16) CITATION: 49(12):2359-2365, Dec. 1977.

GENERAL

(1) SWIRS ACC.NO.: 044939
 (2) DOMESTIC: F (2) CATEGORY: 07 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Environmental problems of tailings disposal.
 (4) AUTHOR: Down CG
 (6) JOURNAL TITLE: Mining Magazine
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: Environmental problems posed by disposal of mine waste and mill tailings include: safety and stability, air and water pollution, aesthetic nuisance, and reclamation of the land (mainly by revegetation). Impounding tailings (the most common disposal method) can result in all of these problems. The release of polluted water is the single most serious and widespread problem associated with this form of disposal. Advantages of underground disposal of the coarse fraction of tailings as fill include improved recovery of the ore body, reduction in volumes to be impounded, and lessening of surface subsidence. Disadvantages are few. Disposal of tailings into lakes is rare. Advantages of marine disposal are low operating cost, limitless storage area, mechanical failure is unlikely, and physical safety of tailings is maximized.
 (12) KEYWORDS: AIR; DISPOSAL; ENVIRONMENT; LAND; MINE; OCEAN; POLLUTION; PROBLEMS; SAFETY; TAILINGS; VEGETATION; WATER; WATERWAY
 (14) HIERARCH TERMS: 1DB/2DL; 1MI/2M4; 1RB; 1SA
 (15) STIMS ACC.NO.: 00S44035 (15) SECONDARY AUTHORS: Stocks J
 (16) CITATION: 137(1):25-33, July 1977.

(1) SWIRS ACC.NO.: 044802
 (2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S; T
 (5) CORPORATE AUTHOR: Research Triangle Institute
 (6) BOOK TITLE: Ayer, F. A., ed. Proceedings: Conference on Environmental Aspects of Chemical Use in Rubber Processing Operations, Akron, OH, Mar. 12-14, 1975.
 (3) NTIS NO.: PB 244 172 (8) REPORT NO.: EPA-560/1-75-002 (9) CONTRACT NO.: 68-01-2928
 (10) LANGUAGE: EN (10) PUB. YEAR: 1975
 (11) ABSTRACT: The impact of chemical use in rubber processing operations on the environment was the topic of a 1975 conference. Objectives of the conference were to cover and discuss chemical uses, functions of chemicals in rubber processing operations, by-products likely to be introduced, known health or environmental effects from chemicals used, and measures used or available to control environmental contamination. Papers were presented and discussions were held that dealt with industrial emissions and effluent surveys, chemicals and their effects, reclamation and disposal, and academic programs. Seven papers addressed airborne particulate debris from rubber tires, rubber dust from the normal wear of tires, environmental aspects of reclaiming and recycling rubber, environmental aspects of rubber reclamation from the manufacturing standpoint, shredded tires as an auxiliary fuel, tire fired boilers, and scrap tires and fishery resources. (Retained in SWIRS library).
 (12) KEYWORDS: BOILER; BY-PRODUCT; CHEMICAL; CONFERENCE; CONTAMINATE; CONTROL; DISPOSAL; EFFLUENT; EMISSION; FUEL; HEALTH; INDUSTRIAL WASTES; PARTICULATE MATTLR; PROCESS; RECLAMATION; RUBBER; SCRAP; SHREDDING; TIRE
 (14) HIERARCH TERMS: 1CH/2DC/3CH; 1HB; 1IC/2I2; 1RF/2RD/3RB; 1RF/2RF
 (15) STIMS ACC.NO.: 00S43847
 (16) CITATION: Washington, DC, U.S. Environmental Protection Agency, July 1975. 452 p.

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- (1) SWIRS ACC.NO.: 044402
 (2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Study results.
 (5) CORPORATE AUTHOR: W. L. Wardrop and Associates Ltd
 (6) BOOK TITLE: In The Potential for Waste Rubber Utilization in the Prairie Provinces. (8) REPORT NO.: EPS 3-EC-77-15 (9) CONTRACT NO.: OSS76-00356
 (10) LANGUAGE: EN (10) GEO. AREA: 1CD (10) PUB. YEAR: 1977
 (11) ABSTRACT: The results of a study of waste rubber recovery in the Canadian provinces of Alberta, Saskatchewan, and Manitoba are presented. Rubber waste consists of tires and small fabricated products. Due to limitations associated with conventional reclamation methods, several new techniques are being developed to recover rubber crumb from scrap tires. Of these methods, cryogenic processing has the advantages of flexibility with regard to product size, high rubber recovery, and effective separation of rubber from steel and fabric. Proven rubber reuse and processing methods and equipment are available. Retreading results in the largest energy savings of all scrap tire utilization methods. Industrial and governmental conditions tend to constrain the reuse of scrap tires. The major impediment to the increased use of retreaded passenger car tires is public concern about safety. Tire splitting industries utilize a significant number of scrap tires. The predominant method of waste tire disposal is landfill. Markets for rubber crumb and scrap tire generation rates are examined. Consideration is given to the collection, processing, transporting, and disposal of waste rubber products.
 (12) KEYWORDS: CANADA; COLLECTION; DISPOSAL; MARKET; PROCESS; RECLAMATION; RUBBER; SCRAP; TIRE; TRANSPORT; UTILIZE
 (14) HIERARCH TERMS: 1CC/2CM; 1MC; 1PM; 1RF/2RF; 1TF/2TH
 (15) STIMS ACC.NO.: 00S43446
 (16) CITATION: Ottawa, Ontario, Canada, Aug. 1977. p.160-179.
- (1) SWIRS ACC.NO.: 044173
 (2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: G
 (5) CORPORATE AUTHOR: Communication, Research and Pub Ser
 (6) BOOK TITLE: Evaluation of Quantities, Types of Rubber Wastes in Canada. (8) REPORT NO.: EPS 3-EC-77-12 (9) CONTRACT NO.: RN: KE204-5-LP33
 (10) LANGUAGE: EN (10) GEO. AREA: 1CD (10) PUB. YEAR: 1977
 (11) ABSTRACT: The quantities and types of rubber waste generated in Canada are examined, and predictions are made of future trends in and opportunities for waste reduction. Consideration is given to the manufacture of crude rubber and latex and the utilization of rubber products in the Canadian economy by consumers. The availability of waste rubber for recycling is assessed. Reclamation technology for rubber and factors influencing reclamation are explored. The following reclamation techniques are reviewed: road surfacing, cryogenic processing, thermal degradation, surface materials, marine applications, safety, agriculture, and reground flash and scrap rubber reuse. Factors influencing reclamation are identified as collection and segregation and reclamation processes. (Retained in SWIRS library).
 (12) KEYWORDS: AGRICULTURE; CANADA; COLLECTION; GENERATION; OCEAN; PROCESS; RECLAMATION; REDUCTION; RUBBER; SAFETY; THERMAL; UTILIZE
 (14) HIERARCH TERMS: 1RF/2RD/3RB; 1RF/2RD/3RC; 1SB
 (15) STIMS ACC.NO.: 00S43216
 (16) CITATION: Ottawa, Ontario, Canada, Apr. 1977. 51 p.

GENERAL

(1) SWIRS ACC.NO.: 043446
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T
 (3) ARTICLE TITLE: Making water supply nitrate removal practicable.
 (4) AUTHOR: Sheinker M
 (6) JOURNAL TITLE: Public Works
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2NY (10) PUB. YEAR: 1977
 (11) ABSTRACT: In Nassau County, New York, nitrate is being removed from the water supply by a treatment plant which consists of a closed loop ion exchange system. The plant stands adjacent to a pump station on the well site. To avoid the prospect of frequent on and off pumping to accomodate the pulse cycle, a 5,000 gal. hydropneumatic tank was installed and connected with a raw water line which bypasses the exchange system. Automatic valving thus permits continuous operation. An automatic analyzer/controller was installed to take the treatment plant and well out of service when the nitrate level in the finished water reaches a preset maximum. Maintaining an acceptable pH is accomplished by feeding liquid caustic in the form of a 25 percent solution. Arrangements are also made for disinfection with liquid chlorine when the county health department finds it necessary. The original well installation and nitrate removal plant cost more than \$700,000. This project represents the first of its kind and could be a model for other public water supply systems encountering excessive nitrates.
 (12) KEYWORDS: AUTOMATIC; CHLORINE; CONTROL; FACILITY; ION EXCHANGE; NEW YORK; NITROGEN; PH; PUMP; QUALITY; TREATMENT; WATER
 (14) HIERARCH TERMS: 1EF; 1GD; 1TG; 1WA
 (15) STIMS ACC.NO.: 00S42489 (15) SECONDARY AUTHORS: Codoluto JP
 (16) CITATION: 108(6):71-73, June 1977.

(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.: 042044
 (2) DOMESTIC: D (2) CATEGORY: 13 (2) SUBJ.TYPE: T
 (3) ARTICLE TITLE: The need for environmental control officers in hospitals.

- (4) AUTHOR: Mabbett AN
 (6) JOURNAL TITLE: Hospital Topics
 (10) LANGUAGE: EN (10) PUB. YEAR: 1976
 (11) ABSTRACT: The need for environmental control officers in hospitals is discussed. A number of the Occupational Safety and Health Act and national consensus standards are applicable to hospitals but there are no comprehensive national standards for environmental considerations. Increasing attention is being focused on the essential requirement to provide a safe and healthful environment in all hospitals for patients, staff and visitors. The National Environmental Health Association recently adopted a position paper which recommends the addition of environmental professionals to hospital staffs. The professional should be an environmentalist with administrative jurisdiction. The officer would implement decisions and coordinate departmental efforts. The establishment and implementation of medical safety programs is another area which needs attention. Hospital size would determine the type of staff necessary: small and medium size facilities would have an officer, assisted by qualified technicians; large facilities would require a specialist in charge of the staff and program; and very small hospitals could hire consultants or share the services of an administrator with another facility. Initially, the cost of the office would increase the hospital's overall budget but eventually a reduction in cost attributable sickness, absence and accidents would be realized.
 (12) KEYWORDS: CONTROL; ECONOMICS; ENVIRONMENT; HOSPITAL; PERSONNEL; SAFETY
 (14) HIERARCH TERMS: 1HE/2HD; 1PD
 (15) STIMS ACC.NO.: 00S41088
 (16) CITATION: 54(3):1-3, May/June 1976.

- (1) SWIRS ACC.NO.: 041878
 (2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
 (4) AUTHOR: Michaels A (10) GEO. AREA: 1HA/2HF (10) PUB. YEAR: 1977
 (11) ABSTRACT: Consideration is given to hazardous waste, sewage sludge disposal, and landfill leachate aspects of solid waste disposal. Hazardous waste is defined as any type of waste that poses a substantial threat to human health or living organisms. General categories of hazardous waste are identified as toxic chemical, flammable, radioactive, explosive, and biological. Hazardous waste may take the form of solids, sludge, liquids, or gases. Examples of damages caused by the improper disposal of hazardous waste are cited in Pennsylvania, New Jersey, Minnesota, and Colorado. A method for sewage sludge processing and disposal is proposed. In the method, sludge is mixed with pulverized solid waste in a ratio of one part of sludge to 1.5 parts of solid waste. The mixture of sludge and pulverized solid waste is fed to pyrolysis gasifiers, with combustible gases burned in a combustion chamber equipped with heat transfer cyclodryers used to reduce moisture in sludge from 94 to 86 percent. With regard to landfill leachate, it is noted that leachate constituents involve organics, pathogenic organisms, and soluble nutrients such as nitrogen, phosphorus, and potash. Such constituents may be removed or attenuated by percolation through landfill subsoil. Calcium and sodium may be exchanged, depending on the absorption or exchange capacity of subsoil. Soluble ions may be leached into ground water. Various factors in handling and controlling landfill leachate are detailed.
 (12) KEYWORDS: CONTROL; DISPOSAL; HAZARDOUS; LEACH; MATERIALS HANDLING; SAFETY; SANITARY LANDFILL; SLUDGE; TOXIC; TREATMENT
 (14) HIERARCH TERMS: 1HA/2HG
 (15) STIMS ACC.NO.: 00S40922
 (18) DOC.CIT.: Michaels. A. The solid waste forum: hazardous waste. Public Works, 108(3):50, 52, 114, 116, Mar. 1977.

GENERAL

(1) SWIRS ACC.NO.: 041705
 (2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) GEO. AREA: 1AC (10) PUB. YEAR: 1976
 (11) ABSTRACT: The National Research Council's report, "Halocarbons: Environmental Effects of Chlorofluoromethane Release," is discussed. The Council's research indicates that the longterm release of some fluorocarbons at present rates will cause an appreciable reduction in the amount of stratospheric ozone. It is thought that escalated rates of skin cancer and possible far reaching damage to animal and plant life systems could result from the reduction of the earth's protective ozone shield. Challenges to the theory of ozone depletion, made by an organization representing the fluorocarbon industry, are noted. The 12 recommendations of the National Research Council are presented. The thrust of Federal and State regulatory involvement in the area of technology applications is apparently growing and the implications of this are suggested. Worldwide releases of chlorofluoromethane are noted by millions of pounds for aerosols, air conditioning/refrigeration, and plastic foams.
 (12) KEYWORDS: AEROSOLS; AIR; CHEMICAL; DISEASE; EPA; FEDERAL; GOVERNMENT; HAZARDOUS; HEALTH; INORGANIC; INTERNATIONAL; OXYGEN; POLLUTION; REGULATIONS; RESEARCH
 (14) HIERARCH TERMS: 1HL
 (15) STIMS ACC.NO.: 00S40749
 (18) DOC.CIT.: Report on ozone reduction points to need for possible regulation of fluorocarbon release. Professional Engineer, 46(11):25-27, Nov. 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: 1PI
 (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.

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(1) SWIRS ACC.NO.: 040896
 (2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: T
 (4) AUTHOR: Maurer AH (10) GEO. AREA: 1MA; 1MJ (10) PUB. YEAR: 1976
 (11) ABSTRACT: A plan and specification review of architectural and engineering aspects to be considered when planning installation of waste handling systems in multifamily dwellings is presented. Lowrise residential buildings, single highrise apartment buildings, and residential complexes are considered. Items logically most applicable to the building's configuration are reviewed. In lowrise residential buildings, the sink mounted garbage grinder and the undercounter compactor provide waste processing within the individual residence. In this building, the resident would manually transport waste to a waste collection room where a container or compactor should be provided. In single highrise apartment buildings, the logical choice is a gravity chute (garbage grinders are desirable but undercounter compactors would not be used together with a chute). For processing, compaction is recommended. In residential complexes, garbage grinders should be planned. Resident undercounter compactors if planned should be coordinated with chute openings. A full pneumatic chute system or a gravity/pneumatic chute system should be considered. After transport, compaction is the most commonly used processing method. Whichever system is chosen, it is recommended that quality equipment be purchased, and performance investigated. (Article appears in the Proceedings of the Conference on Solid Waste Management in Buildings, St. Louis, Missouri, November 15-16, 1972. The entire Proceedings may be found in the Handbook cited.)
 (12) KEYWORDS: BUILDING; CHUTE; COMPACTION; DISPOSAL; DISPOSER; FIRE; MAINTENANCE; MANAGEMENT; PLANNING; PNEUMATIC; RESIDENTIAL; SAFETY; TRAINING; TRANSPORT
 (14) HIERARCH TERMS: 1E2
 (15) STIMS ACC.NO.: 00S39940
 (18) DOC.CIT.: Maurer, A. H. Design criteria: architectural/engineering. In Building Research Advisory Board. Handbook on Solid Waste Management in Buildings. Washington, National Academy of Sciences, 1976. p. 132-144.

(1) SWIRS ACC.NO.: 040274
 (2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G (10) GEO. AREA: 1HB (10) PUB. YEAR: 1976
 (11) ABSTRACT: A pamphlet on pollution as a major cause of many aspects of poor health is presented. Intended for the general public, the major forms of pollution (air, water, solid waste, noise, etc.) are discussed in relation to how different pollutants effect the health of the individual and the community, and how to prevent rather than cure environmental ailments. (Retained in SWIRS library)
 (12) KEYWORDS: AIR; DISEASE; EFFECT; EPA; HEALTH; NOISE; PESTICIDE; POLLUTION; PUBLIC RELATIONS; RADIATION; REFUSE; WATER
 (14) HIERARCH TERMS: 1ED
 (15) STIMS ACC.NO.: 00S39318
 (18) DOC.CIT.: Office of Public Affairs. Pollution and your health. Washington, U. S. Environmental Protection Agency, May 1976. 17 p.

(1) SWIRS ACC.NO.: 040169
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T
 (4) AUTHOR: Carey G (10) GEO. AREA: 1US/2MA (10) PUB. YEAR: 1976

GENERAL

(11) ABSTRACT: The placing of a pumping station in the midst of a picturesque sport and tourist area in Rockport, Massachusetts is described. The water pollution abatement program includes a secondary treatment facility, a pumping station, force main, effluent piping and gravity sewers. The effluent piping connects to an existing ocean outfall. The only available area for the facility was in a small park surrounded by antique shops. Construction was planned such that it would not disturb the unique character of Rockport, the design of the pumping station minimized the above ground portion of the station; the station superstructure was constructed with rough board form concrete; ventilation was arranged by extending two discharge pipes about 15 ft into the air; hypochlorite was selected over chlorine as a safety measure and for odor control; electrical controls are located in the substructure to minimize the size of the superstructure; the station was built far back on the lot to provide maximum park space; and the materials selected for the structure facade and landscaping blend into the scenic surroundings.

(12) KEYWORDS: AESTHETIC; CHLORINE; DESIGN; ENVIRONMENT; MASSACHUSETTS; MUNICIPALITY; POLLUTION; PUBLIC UTILITY; PUMP; TREATMENT; WASTE WATER; WATERWAY

(14) HIERARCH TERMS: 1MA; 1RC

(15) STIMS ACC.NO.: 00S39213

(16) DOC.CIT.: Carey, G. Pumping station blends into artists' colony. Water and Wastes Engineering, 14(11):96-98, Nov. 1976.

(1) SWIRS ACC.NO.: 039957

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

(11) ABSTRACT: A representative of the Mobay Chemical Corporation discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 4, 1975 in Rosemont, Illinois. The chemical company produces pesticides, along with other agricultural products, and generates some waste materials that require special precautions for disposal. The first consideration in hazardous waste management is identified as minimizing the amount of hazardous waste generated. In chemical processing, this means extraction and other techniques to recover and recycle material. To be classified as hazardous, waste should be either toxic, explosive, or highly corrosive. With regard to responsibility and liability, the generator of hazardous waste should be responsible for it until the waste has been delivered to a disposal site. Policies of the Mobay Chemical Corporation are noted with regard to the selection of disposal firms. These involve visiting a proposed disposal site and checking for environmental concerns, permits, ground water protection, restricted public access, and technical competence. A question and answer session follows the presentation.

(12) KEYWORDS: CHEMICAL; CONFERENCE; CORROSION; DISPOSAL; DISPOSER; EPA; EXPLOSION; HAZARDOUS; INDUSTRY; LAND; MANAGEMENT; PESTICIDE; PRIVATE; PRODUCE; RESPONSIBILITY; SAFETY; SITES; TOXIC; TREATMENT

(15) STIMS ACC.NO.: 00S39001

(16) DOC.CIT.: Frisbie, L. Representing the Mobay Chemical Corporation, 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. 637-644.

HEALTH AND SAFETY

(1) SWIRS ACC.NO.: 039928
(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: G (10) PUB.
YEAR: 1976
(11) ABSTRACT: A representative of Chemtrol discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 2, 1975 in Newark, New Jersey. Various aspects of hazardous waste management are addressed, including the management of chemical waste, packaging and identifying hazardous waste materials, and safety in the recovery of hazardous waste. The implementation of a hazardous waste management program is detailed. A seminar on the management of hazardous waste is reported that was held on April 4, 1975 in Nashville, Tennessee. The reduction of waste disposal costs through a closed loop process is described and illustrated. Guidelines for the packaging and identification of waste products are outlined, and safety considerations in the reuse of hazardous waste are noted. A question and answer session follows the presentation.
(12) KEYWORDS: CHEMICAL; CLASSIFICATION; CONFERENCE; CONTROL; EPA; HAZARDOUS; INDUSTRY; MANAGEMENT; PACKAGING; PROGRAM; RECLAMATION; REDUCTION; SAFETY
(15) STIMS ACC.NO.: 00538972
(18) DOC.CIT.: Shuster, E. Representing Chemtrol, 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. 264-305.

(1) SWIRS ACC.NO.: 034326
(2) DOMESTIC: D (2) CATEGORY: 05 (2) SUBJ.TYPE: G (10) PUB.
YEAR: 1976
(11) ABSTRACT: Encouraging citizens to accept curbside collection is discussed. The major obstacle to curbside collection is political opposition. Citizens perceive, rightly, that curbside collection is a decrease in service level. Two approaches can be taken to counter this. The switch to curbside can be combined with implementation of bags or rollout container systems; the second approach is to show the direct relationship between costs and service level. Ways in which implementing cities have gotten around the opposition are cited. It is important that elderly and handicapped persons be given backyard service but requests should be screened to avoid abuses. Substantial savings can be realized when the switch is combined with rerouting and crew size reduction. Among the many benefits are: savings of up to 50 percent; injuries to collectors decrease; citizen complaints about missed pickups, gates left open, residential property damage decrease; and employee morale increases since the job is more desirable.
(12) KEYWORDS: BENEFIT; COLLECTION; CONTAINER; COST REDUCTION; MANAGEMENT; PERSONNEL; PUBLIC RELATIONS; SAFETY
(15) STIMS ACC.NO.: 00538370
(18) DOC.CIT.: Bartolotta, R. J. How to encourage citizens to accept curbside collection. Solid Wastes Management, 19(8):46, Aug. 1976.

(1) SWIRS ACC.NO.: 039169
(2) DOMESTIC: D (2) CATEGORY: 22 (2) SUBJ.TYPE: T (10) PUB.
YEAR: 1976
(11) ABSTRACT: Two recent projects have evaluated solid waste baling and landfiling. Funded by the Environmental Protection Agency (EPA), system I was on a full scale, high pressure baling plant and landfill in St. Paul, Minnesota. System II, cosponsored by EPA and the

City of San Diego, California, was on a low pressure baling combined with shredding operation. Both systems were evaluated according to performance; environment; landfill characteristics; gas generation; litter, dust, and noise; and costs. The evaluation concluded that using a baler as part of a solid waste management system offers the following advantages: (1) extends the landfill's useful life by increasing the in situ density by about 60 percent; (2) improves the cost effectiveness of local solid waste collection and provides a transfer station for better long distance hauling and disposal; (3) increases resource recovery opportunities by providing a central transfer facility which can incorporate materials separation and reclaimed product baling; (4) reduces negative environmental impacts at the landfill including negligible settlement, and reduced litter, dust, odor, vectors, fires, traffic, earth addition, noise, pollution, and safety hazards; (5) reduces the cost and improves the operating efficiency of the landfill by requiring less work equipment, personnel, and cover material while improving operating standards; (6) increases the potential usability of the finished site by improving the foundation bearing values and reduces the landfill stabilization waiting time needed. Baling is considered feasible in large communities and may be feasible in small communities. Individual evaluations need to be made.

(12) KEYWORDS: BALING; CALIFORNIA; COMBINED; DISPOSAL; EPA; GASSES; MINNESOTA; PERSONNEL; POLLUTION; REDUCTION; REFUSE; RESEARCH; SAFETY; SANITARY LANDFILL; SHREDDING; TRANSPORT

(15) STIMS ACC.NO.: 00S38213

(18) DOC.CIT.: Stone, R. , and R. Kahle. Evaluation of solid waste baling and landfilling. APWA Reporter, 43(10):24-26, Oct. 1976.

(1) SWIRS ACC.NO.: 038762

(2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Goals, objectives, and principles of erosion and sediment control are presented. It is noted that erosion and sediment pollution results in clogged ditches, culverts, and storm sewers; muddy streams, reduced channel capacities, and increased flood flows; damaged plant and animal life; filled in ponds, lakes, and reservoirs; and damaged plant and animal life; filled in ponds, lakes, and reservoirs; and damaged vital aquatic habitats. The workbook on erosion and sediment control is concerned with the following topics: types of soil, relationships between rainfall and runoff, erosion and sedimentation, plant materials, control of runoff during construction, vegetative soil stabilization, stream erosion control, temporary soil stabilization, control of sediment generated on construction sites, erosion and sediment control planning, wooded site development, and foreman and inspector responsibilities. The workbook involved a joint effort by the Maryland Water Resource Administration, Environmental Protection Agency, Department of Transportation, and the Department of Agriculture. (Document retained in SWIRS library)

(12) KEYWORDS: CLASSIFICATION; CONSTRUCTION; CONTROL; DOA; EARTH; EPA; EROSION; FORESTRY; GOVERNMENT; MANAGEMENT; MANUAL; PERSONNEL; PLANNING; PRECIPITATE; RESPONSIBILITY; SEDIMENTATION; SITES; STABILIZATION

(15) STIMS ACC.NO.: 00S37806

(18) DOC.CIT.: Mills, T. R. Erosion and sediment control: audiovisual training program workbook. Environmental Protection Publication EPA-600/8-76-001-b. Washington, U. S. Environmental Protection Agency, June 1976. 85 p.

HEALTH AND SAFETY

(1) SWIRS ACC.NO.: 038647
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: G (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: This paper presents the neoplasia experience of men working in the wood products industry. The method used is an age and year of death specific, proportionate mortality analysis. Men who work in the wood products industry in the state of Washington were divided roughly into two classes: men who work in the forests and men who work in the mills. The mortality patterns seen in certain parts of the wood products industry and in carpenters suggest that these work environments contain carcinogens. Whether the carcinogenic agents are the woods themselves, chemical and physical breakdown products of wood, or agents associated with wood processing or treatment, remains to be resolved. Population based studies should be done to corroborate and refine the findings of this study.
 (12) KEYWORDS: ANALYSIS; CARCASS; DATA; DISEASE; EFFECT; EXPOSURE; HEALTH; INDUSTRY; OCCUPATION; PULP; WASHINGTON; WOOD
 (15) STIMS ACC.NO.: 00S37691
 (13) DOC.CIT.: Milham, S. Neoplasia in the wood and pulp industry. Annals of the New York Academy of Sciences, 271:294-300, May 28, 1976.

(1) SWIRS ACC.NO.: 038626
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: Occupational exposure to kepone is addressed in a recommended standard of the National Institute for Occupational Safety and Health (NIOSH). Clinical symptoms experienced by workers in a kepone manufacturing plant are reported. NIOSH has identified less than 50 establishments processing or formulating pesticides using kepone and estimates that 600 workers are potentially exposed to kepone. Based on the results of a bioassay of technical grade kepone, NIOSH assumes that kepone is a potential human carcinogen. It is recommended that the workplace environment level for kepone be limited to one microgram per cubic meter as a time weighted average concentration for up to a 10 hour workday, 40 hour workweek. Eight sections of the NIOSH recommended standard are detailed: (1) environmental (workspace) air; (2) medical; (3) labeling or posting; (4) personal protective equipment and clothing; (5) informing employees of hazards from kepone; (6) work practices; (7) sanitation; (8) monitoring and recordkeeping requirements.
 (12) KEYWORDS: CHEMICAL; EXPOSURE; HEALTH; MONITOR; OCCUPATION; PERSONNEL; PESTICIDE; SAFETY; STANDARD; TOXIC
 (15) STIMS ACC.NO.: 00S37670
 (13) DOC.CIT.: U. S. Department of Health, Education, and Welfare. NIOSH recommended standard for occupational exposure to kepone. Cincinnati, OH, National Institute for Occupational Safety and Health, 1976. 6 p.

(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

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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. Pournier. Enquete portant sur la consommation familiale de pesticides dans les familles habitant dans de grands ensembles de la region Parisienne: methodology. (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 24-26, 1974. v. 3. Luxembourg, Commission of the European Communities, 1975. p. 1789-1894.

(1) SWIRS ACC.NO.: 033008

(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The keynote speaker (administrator of the Environmental Protection Agency) at an exposition of the National Solid Waste Management Association addresses the viewpoint of government on patterns of industry solid waste developments. Historical aspects of solid waste management are reviewed. The significance of the 275 million dry tons of solid waste generated annually by industry in the United States is stressed. Studies are noted which indicate that hazardous waste, generated mainly by industry and requiring special procedures in handling, storage, transport, processing, and disposal, have health and environmental impacts far greater than past or prevailing practices would suggest. It is estimated that 10 to 15 percent of the 275 tons of dry waste contain hazardous materials such as toxic metals and organic solvents in sufficient concentrations to be potentially hazardous to public health if disposed of improperly. Consideration is given to the use of waste as fertilizer, financial expenditures for waste collection and disposal, recycling, role of the public in curtailing packaging waste, source separation programs, future emphasis on materials recovery, progress of waste disposal programs, and activities sponsored by the Environmental Protection Agency.

(12) KEYWORDS: EPA; GOVERNMENT; HAZARDOUS; HISTORY; INDUSTRY; MANAGEMENT; PERSONNEL

(15) STIMS ACC.NO.: 00537052

(18) DOC.CIT.: Train, R. F. Meeting future shock with a dose of past shock. Solid Wastes Management, 9(7):30, 70-72, 74, 76, July 1976.

(1) SWIRS ACC.NO.: 037998

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

(11) ABSTRACT: Competency in fighting fires aboard naval vessels is examined in relation to pollution control and the safety and protection of personnel. Training must be conducted continuously to maintain competency in fighting fires and is done most efficiently in schools located at major naval ship support facilities. An essential element in the training curriculum of fire fighters is exposure to actual or simulated shipboard fires. Hydrocarbon fuel involved in fires releases black smoke and has resulted in complaints from residents situated near naval facilities. Smoke removal studies are described that have been conducted by the Naval Facilities Engineering Command (NAVPAC) to

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investigate engineering solutions for the removal or abatement of smoke. One study concluded that an afterburner was the only system that could effectively remove smoke and unburned hydrocarbons, leaving essentially no visible emissions. The afterburner method of smoke abatement requires considerable fuel to oxidize pollutants and, due to the significant increase in fuel prices during 1974 and 1975, efforts were directed toward the reduction of fuel consumption by using heat exchangers to preheat combustion air by removing heat from stack exhaust gases. Concurrent with this effort were studies and laboratory tests made for NAVFAC on a newly developed water spray system to reduce smoke during training exercises without burning additional fuel. This technique uses an atomized water spray injected over the surface of burning oil in conjunction with an automatic ignition system. Other studies on smoke control are cited, along with training requirements for the control of fires at naval facilities.

(12) KEYWORDS: CONTROL; FIRE; FUEL; INVESTIGATION; MILITARY; REDUCTION; SMOKE; TRAINING

(15) STIMS ACC.NO.: 00S37042

(18) DOC.CIT.: Hildebrand, F. C. Pollution control at Navy fire-fighting schools. Military Engineer, 68(442):100-101, Mar. /Apr. 1976.

(1) SWIRS ACC.NO.: 037477

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

(11) ABSTRACT: An increasing number of communities are finding that use of bags as refuse containers can reduce collection time by as much as 50 percent. Moreover, both collectors and residents appear to prefer the lighter, almost noise and odor free bags which tend to reduce container-related injuries. EPA and National Sanitation Foundation standards now allow jurisdictions to choose between paper and plastic bags since neither has a significant environmental advantage. Plastic bags presently are less expensive than paper bags but have safety risks since children can suffocate inside a plastic bag. On the other hand, paper bags have a "breathing" action which allows entrapped moisture to escape and thereby reduces the rate at which bacteria breed. Disadvantages of bag-dependent disposal systems identified by EPA include costs associated with replacement of conventional containers and with bag distribution, risks that animals will rip open the bags, and the unsuitability of bags for disposing of some items such as branches, boxes, and heavy or sharp pointed objects.

(12) KEYWORDS: ASSOC; COLLECTION; COMPARISON; CONTAINER; ECONOMICS; EPA; INJURY; MUNICIPALITY; NOISE; ODOR; PAPER; PLASTIC; REDUCTION; SAFETY; STANDARD; TIME

(15) STIMS ACC.NO.: 00S36521

(18) DOC.CIT.: Anon. Refuse: it's in the bag. American City and County, 91(7):39-40, July 1976.

(1) SWIRS ACC.NO.: 037385

(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Trends in the storage, collection, processing, recovery and disposal of solid waste are projected. The following trends are noted: (1) storage - containerization methods which involve mechanized container service and manual disposable bag collection systems, shift from backdoor/backyard to curbside service, focus on container safety, modification to or replacement of mechanized metal containers due to noise abatement requirements, and emphasis on

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consumer interests for container design and use; (2) collection greater application of front and side loader collection systems, changes in the provision of refuse collection services, increased reliance on private sector systems by municipal sanitation departments, reinitiation of source separation and collection programs, introduction of different designs for side loaders, placement of small transfer stations in urban and rural areas, greater application of conventional transfer stations, and increased emphasis on safety and noise emission; (3) processing - development and application of on-site incinerators with heat recovery capability, application of low density balers, renewed interest in high density fuel technology; (4) refuse recovery - increased operation of recovery plants and technology demonstration facilities; and (5) disposal - continuing use of sanitary landfills and increased attention on pollution control techniques and citizen awareness of proper waste disposal practices.

(12) KEYWORDS: AUTOMATIC; COLLECTION; CONTAINER; CURB; DEPT OF SANITATION; DESIGN; DISPOSAL; FUEL; LOADER; MUNICIPALITY; PRIVATE; PROCESS; PROJECTION; RECLAMATION; STORAGE; TRANSFER STATION

(15) STIMS ACC.NO.: 00S36430

(18) DOC.CIT.: Greco, J. R. A projection of trends likely to occur in storage, collection, processing, recovery, and disposal. Waste Age, 7(5):66, 68, 70-71, 110-111, May 1976.

(1) SWIRS ACC.NO.: 037243

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Processes involved in the preparation of potable water supplies are detailed. The availability of water and its characteristics are discussed in relation to requirements of State boards of health which usually reflect Public Health Service drinking water standards and goals expressed by the American Water Works Association's Committee on Water Quality Goals. Water treatment plants are categorized as filtration plants which perform clarification by coagulation, sedimentation, and filtration; sterilization; and removal of objectionable tastes and odors and as plants that may perform the preceding functions but whose primary purpose is water softening. Water plant waste disposal is discussed in terms of settled sediment and wash water disposal. Household softening and conditioning is considered for hard water areas where there are no municipal water treatment plants. Details on the following potable water preparation processes are provided: screening of objects or materials which may interfere with pumping and other water treatment operations, straining, taste and odor control, flocculation, sedimentation, filtration, softening, and disinfection. (Document retained in SWIRS library)

(12) KEYWORDS: COMPOSITION; CONTROL; FACILITY; FILTER; FLOCCULANT; ODOR; PH; PROCESS; PURIFICATION; SEDIMENTATION; STANDARD; STATE; STERILIZE; WASTE WATER

(15) STIMS ACC.NO.: 00S36336

(18) DOC.CIT.: Vaughn, J. C. Preparing potable water. In: Gehm, H. W., and J. I. Bregman, eds. Handbook of water resources and pollution control. New York, Van Nostrand Reinhold Company, 1976, 340 p. (p. 362-385).

(1) SWIRS ACC.NO.: 037099

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: A selection and arrangement of equipment to process solid waste are addressed. It is recommended that a flow sheet be established which includes the following elements: identification of

basic families of equipment to be used, consideration of alternate lines for refuse to follow when basic lines experience problems, quantitative analysis of material entering each point of the total process and the split of material leaving the process, rate of material processing any piece of equipment is to handle, and qualification of refuse before and after each stage of the total process. Physical arrangements of equipment require basic decisions relating to reliability of flow, access to equipment, and costs which include those of building structures. Physical arrangements are detailed for receiving and shredding buildings and for primary infeed conveyors. It is recommended that the length of contract or number of years of desired life be the focal point in equipment maintenance and that conveyor design specifications consider the following: OSHA (Occupational Safety and Health Administration) regulations, need for ladders and walkways, type of conveyor drive desired, provision for conveyor drive stands, conveyor supports, skirt dimensions, shipping procedures and assembly requirements, controls, transfer chutes, and standardization of drive components. Recommendations are made for maximizing the effectiveness of equipment selection and arrangement procedures.

(12) KEYWORDS: CONFERENCE; CONSTRUCTION; CONTRACT; CONVEYOR; DESIGN; ECONOMICS; EQUIPMENT; FACILITY; MAINTENANCE; OPERATIONS RESEARCH; SHREDDING; SPECIFICATION

(15) STIMS ACC.NO.: 00S36144

(18) DOC.CIT.: Handler, I. Consideration for component equipment design specifications. 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. 253:266).

(1) SWIRS ACC.NO.: 036868

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Consideration is given to the selection and arrangement of equipment in processing solid wastes. The first step in developing component equipment design specifications is to establish a flow sheet which includes the following elements: equipment to be used, alternate lines for refuse to follow when basic lines experience problems, quantitative analysis of materials entering each point of the total process, rate of material processing any piece of equipment is to handle, and qualification of refuse before and after each stage of the total process. Physical arrangements of equipment are detailed in relation to flow reliability, access, and costs. Design considerations in selecting shredders are provided, along with details on conveyor arrangements, pit conveyors, hopper design, and metal pan conveyors. Equipment maintenance is discussed, and the economics of source separation is examined. Other major items for consideration in conveyor design specifications are noted, including OSHA (Occupational Safety and Health Administration) regulations, need for ladders and walkways, type of conveyor drive desired, provision for conveyor drive stands, conveyor supports minimized for floor access and for neatness, skirt dimensions, shipping procedures and assembly requirements, controls required, transfer chutes, and standardization of drive components. Recommendations on the arrangement of equipment for source separation of solid wastes are given.

(12) KEYWORDS: CONVEYOR; DESIGN; ECONOMICS; EQUIPMENT; HOPPER; MAINTENANCE; OPERATIONS RESEARCH; PROBLEMS; PROCESS; SEPARATING; SHREDDING; SPECIFICATION

(15) STIMS ACC.NO.: 00S35913

(18) DOC.CIT.: Handler, I. Considerations for component equipment design specifications. Waste Age, 7(2):10, 12-14, 42, 44, 48, Feb. 1976.

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(1) SWIRS ACC.NO.: 035651
 (2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: G (10) PUB.
 YEAR: 1975
 (11) ABSTRACT: Congress wrote into the Solid Waste Disposal Act, as amended by the Resource Recovery Act of 1970, a requirement that the Federal Government study the hazardous waste problems and submit recommendations. The U. S. Environmental Protection Agency (EPA) has submitted these to Congress. EPA is pursuing a program which includes: determining the quantity and composition of hazardous wastes and their sources; identifying and assessing safe treatment and disposal methods; developing criteria for proper processing and disposal of hazardous wastes; understanding the health and environmental effects of improper waste management; and relaying to industry, and State and local Governments information on hazardous waste management. Industry generates at least 10 million tons of nonradioactive hazardous wastes a year. This amount is growing at a rate of 5 to 10 percent each year. Technology is available to dispose of most nonradioactive hazardous wastes. With or without Federal legislation the States are the proper focal points for the management of hazardous wastes; their capacity must be encouraged to grow. A waste management program should: reduce the amount of hazardous wastes generated; concentrate wastes at the source to reduce handling problems; stimulate waste exchange programs between industries; recapture and recycle components of the waste; destroy some wastes in high temperature incinerators; detoxify and neutralize wastes destined for land disposal; and build especially designed landfills for hazardous wastes. (This document is retained in the SWIRS library.)
 (12) KEYWORDS: DISPOSAL; ENVIRONMENT; EPA; FEDERAL; GOVERNMENT; HAZARDOUS; HEALTH; INDUSTRY; LAW; MANAGEMENT; RADIOACTIVE; SOLID WASTE DISPOSAL ACT; STATE; TOXIC; TREATMENT
 (15) STIMS ACC.NO.: 00S34696
 (18) DOC.CIT.: Hazardous wastes. Environmental Protection Publication SW-138. Washington, D. C., U. S. Environmental Protection Agency, 1975. 24 p.

(1) SWIRS ACC.NO.: 034678
 (2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: G (10) PUB.
 YEAR: 1975
 (11) ABSTRACT: The sanitation department has an extremely high rate of injury. Ways of reducing injuries to solid waste workers while on the job are examined. The average direct cost of injuries for each sanitation employee per year is 240 dollars. The indirect cost is estimated to be five times as great. The Injury Reporting and Information System (IRIS) compares the injury rates and direct costs per employee per year between five large cities. Results are illustrated in eight figures. The rate of injuries and costs was not high for all cities, a few of which resolved some of their injury problems. If nationwide data is gathered from more IRIS users, the central problems can be attacked, such as studying the effects of different crew sizes on injury rates, point of pickup, height of dump station, and hours worked per day. Work must be coordinated and the solid waste industry must determine what approaches it should use before effective injury reduction programs can be installed.
 (12) KEYWORDS: COLLECTION; COMPUTER; DATA; ECONOMICS; INJURY; MUNICIPALITY; PERSONNEL; PLANNING; REFUSE; SAFETY
 (15) STIMS ACC.NO.: 00S33722
 (18) DOC.CIT.: Wener, S. D. Making refuse collection safer. Nation's Cities, 13(9):28-31, Sept. 1975.

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(1) SWIRS ACC.NO.: 034286
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T (10) PUB.
 YEAR: 1975

(11) ABSTRACT: This article discusses the use of compactor/containers for refuse collection at the Richmond Mall shopping center in Richmond Heights, Ohio. The refuse collection system was designed by FDK Enterprises, Inc., of Cleveland, Ohio. After careful evaluation of the particular needs of the mall, FDK designed a total service package which included extensive training for both Mall management and tenants, close liason with tenants, management, and the hauling service, and a detailed program of housekeeping and maintenance procedures. Four compactor/container units have been placed at service areas around the perimeter of the mall. The compactor/container units, supplied by Cobey Waste Control, include 2 cu yd compactors and 40 cu yd roll-off containers. The units are quiet, discrete, and economical. The company providing collection service provides regular on-the-job operating and safety instruction to new Mall employees. The units are water washed after every service cycle and are treated with deodorizer and disinfectant sprays when necessary. A key-lock access system records the loading of the compactor by each merchant using the unit, which serves as the basis for service charges. Effective sanitary maintenance of solid waste storage areas has been one benefit of this system.

(12) KEYWORDS: BENEFIT; COLLECTION; COMMERCIAL; COMPACTION; CONTAINER; DESIGN; EQUIPMENT; FEE; INSTITUTION; MAINTENANCE; OHIO; SYSTEM; TRAINING

(15) STIMS ACC.NO.: 00S33330

(13) DOC.CIT.: Compactor/containers improve refuse service at shopping mall. Waste Age, 6(5):30-31, May 1975.

(1) SWIRS ACC.NO.: 034120
 (2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: T (10) PUB.
 YEAR: 1975

(11) ABSTRACT: This article describes the activities of the Waste Equipment Manufacturers' Institute (WEMI), which is an organization of manufacturers of waste handling and resource recovery equipment and systems. WEMI provides a forum for manufacturers to discuss advancements in technology and productivity in the application of waste collection, processing, disposal, and recovery equipment. WEMI assesses the equipment needs in the waste management field and the effects of governmental policy and standards on the design, construction, and application of equipment and technology. The organization also provides a means by which members can contribute to the development of waste equipment safety standards, noise emission standards, component and refuse container interchangeability guidelines, equipment rating criteria, and guidelines for sizing and installation of stationary waste processing equipment and systems. The membership functions through the following four equipment committees: mobile, stationary compactor, waste processing, and sanitary landfill. A Thermal and Energy Systems Committee composed of members of the Incinerator Institute of America has recently been formed within WEMI. Although WEMI has been concerned primarily with equipment and systems for collection, haulage, and disposal of solid wastes in the past, it has become increasingly involved in resource and energy recovery activities.

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(12) KEYWORDS: COLLECTION; COMPACTION; CRITERIA; DISPOSAL; EQUIPMENT; INDUSTRY; MANAGEMENT; PRODUCE; RECLAMATION; REGULATIONS; STANDARD; SYSTEM

(15) STIMS ACC.NO.: 00S33164

(18) DOC.CIT.: The waste equipment makers. Environmental Science and Technology, 9(5):410-411, May 1975.

(1) SWIRS ACC.NO.: 033542

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

(11) ABSTRACT: This study of mechanized residential solid waste collection is now available from the National Technical Information Service, Springfield, Virginia. The main objective of the first phase of this demonstration project in Scottsdale, Arizona, which was funded by the U. S. Environmental Protection Agency, was to determine the feasibility and public acceptance of a system of containerizing residential refuse into municipally owned containers. A questionnaire and oral interviews were used to determine the level of acceptability of a container furnished by the city receiving varying levels of service. The following combinations were tested: one family per 80 gal container with two collections per week; 160 gal containers with one family and one collection or two families and two collections; and 300 gal containers with two families and one collection or four families and two collections. Health Department evaluation and observation concluded that the new program, even when there was a reduction to one collection per week, created no sanitation problems and was generally superior to the old conventional collection system which included two collections per week. Since the new containers were too heavy to be collected manually, an existing front-end loader was modified to handle the containers mechanically. A hydraulically controlled swing arm set in a forklift frame was attached to the front end loading mechanism. The driver can operate all of the loading and container releasing functions from the cab, so only one person is needed for each collection route. (This document is retained in the SWIRS library.)

(12) KEYWORDS: ARIZONA; AUTOMATIC; CAPACITY; COLLECTION; CONTAINER; DATA; DEMONSTRATION; LPA; EQUIPMENT; FREQUENCY; GRANT; HEALTH; MUNICIPALITY; PERSONNEL; PUBLIC RELATIONS; SURVEY

(15) STIMS ACC.NO.: 00S32586

(18) DOC.CIT.: Stragier, A. G. Phase I: feasibility and acceptability of containerized system: I. In Mechanized residential solid waste collection. Washington, D. C. , U. S. Environmental Protection Agency, 1975. p. 14-22.

Section 2

ECONOMICS

- (1) SWIRS ACC.NO.: 046753
(2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: G
(5) CORPORATE AUTHOR: U.S. Environmental Protection Agency
(6) BOOK TITLE: Study of Environmental Impacts of Selected Disposable versus Reusable Products with Health Considerations.
(8) REPORT NO.: SW-152c
(9) CONTRACT NO.: 4010-D
(10) LANGUAGE: EN (10) PUB. YEAR: 1978
(11) ABSTRACT: This study compares the resource and environmental impacts of reusable products with their disposable counterparts. Product categories discussed include: towels, napkins, diapers, bedding, containers (cups and tumblers), and plates. The resource and environmental profile analysis provided a comparison of resource inputs (raw materials, energy, and water) and environmental outputs (air emission, waterborne wastes, process solid wastes, and postconsumer solid wastes) associated with the products described. The analysis included impacts from raw material extraction through product disposal, including steps of materials processing, product manufacture, and use. The health aspects analysis reported on the health concerns which have been identified concerning the use and disposal of the products listed. The economic analysis was not completed due to a lack of detailed information from industries representing these products. (Retained in SWIRS library).
(12) KEYWORDS: ANALYSIS; DISPOSABLES; ENVIRONMENT; HEALTH; INDUSTRY; PAPER; RECLAMATION; RESEARCH
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1978. 690 p.

- (1) SWIRS ACC.NO.: 039503
(2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
(11) ABSTRACT: Present pollution control regulations may be unreasonable in the long term. Costs will outweigh benefits and the environment may get dirtier. The Clean Air Act amendments (1970) and the Water Pollution Control Act amendments (1972) have had visible effects on the improvement of the environment to date but further rigid adherence to the regulations may be ruinous. The U. S. Environmental Protection Agency (EPA) found its manpower resources severely taxed dealing with environmentalists seeking sterner enforcement, and companies seeking relief from the statutes. Some major cities may never be able to comply with present laws and there is little EPA can do.

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Laws concerning industries are easier to enforce but there is evidence that prices have risen, plants have closed, and expansion has been affected by pollution regulations. Increasingly EPA is granting exemptions and variances selectively, and this is undermining the credibility of the statutes. With chlorination of drinking water, public health ceased to be an issue in the water pollution control question and the components and results of air pollution have never been identified. The cost of pollution control is being prohibitive and rising disproportionately as standards rise. Abatement also consumes energy and pollution processing methods also produce pollution, often in a more dangerous form than the original. A study of the advanced sewage plant at South Lake Tahoe, California, demonstrated high costs and energy consumption as well as byproduct pollutants. It is suggested that less waste production by conservation, reuse, and recycling are the keys to better pollution control. Legislation might better be aimed at taxing effluents, thus providing flexibility and incentive. So far this method has been resisted by legislators, environmentalists, and regulators, but an added advantage would be to permit administrators to experiment with the system without crippling the economic system or eroding the credibility of the legal system.

(12) KEYWORDS: CALIFORNIA; ECONOMICS; ENVIRONMENT; EPA; FACILITY; LAKE TAHOE; LAW; POLLUTION; PROBLEMS; RESPONSIBILITY

(15) STIMS ACC.NO.: 00S38547

(16) DOC.CIT.: Alexander, T. It's time for new approaches to pollution control. Fortune, 94(5):129-234, Nov. 1976.

(1) SWIRS ACC.NO.: 038953

(2) DOMESTIC: D (2) CATEGORY: 03 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Approaches to the elimination of automotive graveyards are described. Automobile graveyards are defined as tracts of land containing accumulations of junk vehicles that are not apparently destined for use as a source of parts for scrap. Estimates run as high as 20 million wrecks in automobile repair shops, scrap processing plants, and graveyards across the nation. A General Motors report is described in which data were presented on the distribution of junk car accumulation. General Motors removed almost 2,500 cars from an area within a 20 mile radius around Traverse City, Michigan. The corporation offered free removal of all derelict and abandoned cars in a campaign which had strong public support. An ingenious approach to the elimination of automotive graveyards was employed in Columbia County, New York. The county health department declared that abandoned cars were breeding grounds for rats. Funds from a rodent control program administered by the New York State Department of Health were used for a junk and abandoned car drive. A portable crusher was used to smash the hulks hauled in by volunteers, netting 12,000 derelicts at a cost of \$20,000. Schoharie County, New York used funds and trained unemployed persons in the stripping of derelict vehicles and ran a scrap cleanup program. Maryland encourages the movement of old cars by paying a bounty of \$10 to the scrap processor for each car recycled. State law also discourages an owner from abandoning his old car by fining him \$200.

(12) KEYWORDS: ABANDONED; AUTOMOBILE; COLLECTION; DISPOSAL; DUMP; INCENTIVE; MARYLAND; MICHIGAN; NEW YORK

(15) STIMS ACC.NO.: 00S37997

(18) DOC.CIT.: Mining the automotive graveyards. In Mantell, C. L., ed. Solid Wastes: Origin, Collection, Processing, and Disposal. New York, John Wiley and Sons, 1975. p. 783-787.

HEALTH AND SAFETY

(1) SWIRS ACC.NO.: 038839
 (2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: T (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: The manufacture processes of steel products, and economic models and projections for the industry are presented in light of the 1972 legislation on waste water control and cleanup. Every stage of steel production generates effluents either directly from materials processing (e. g. , rolling and cold finishing) or indirectly as a result of air pollution controls (e. g. , wet scrubbers for sintering plants). Cost estimates are presented of the capital expenditures for water pollution control equipment necessary to bring the United States steel and iron industry into compliance with the environmental guidelines based on 1973 and 1983 dollars. The capital cost to achieve the effluent limitation levels corresponding to the "best practical technology" (BPT) are \$2. 66 billion in 1973 dollars. To advance from BPT to "best available technology" (BAT) will require an additional \$0. 43 billion, yielding a cumulative BAT capital cost of \$3. 1 billion. However, the annualization factor, which is utilized by Federal, State, and local tax laws have a major and preferential role in reducing the cost of satisfying increasingly stringent water quality standards: taking this preferential tax treatment into consideration, total annualized cost to achieve BPT treatment level is about \$750 million in 1973 dollars; and BAT figure corresponding is \$959 million.
 (12) KEYWORDS: CONTROL; COST REDUCTION; ECONOMICS; EFFECT; EFFLUENT; GOVERNMENT; INDUSTRY; METAL; POLLUTION; PROJECTION; REGULATIONS; SIMULATION; TAXES
 (15) STIMS ACC.NO.: 00S37883
 (18) DOC.CIT.: Lin, A. I. , and R. A. Leone. The iron and steel industry. In Leone, R. A. , ed. Environmental Controls: the Impact on Industry. Lexington, MA, D. C. Heath and Company, 1976. p. 67-82.

(1) SWIRS ACC.NO.: 038572
 (2) DOMESTIC: F (2) CATEGORY: 08 (2) SUBJ.TYPE: G (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: Pollution control activities of Canadian Industries Limited (CIL) are described. Pollution control is emerging as one of the company's fastest growing business activities. It is estimated that, by 1980, sales of CIL special services and technology will total close to \$100 million. The special services and technology are primarily designed for environmental safety. The operation of CIL's environmental activities and projects is detailed. The first step in the selling technology employed by CIL occurred in 1967 when a joint venture was formed with Chemtech Engineering Limited. The new company marketed a sodium chlorate process to control pollution in the pulp and paper industry. A new type of biological treatment unit for sewage has been designed by CIL. The first unit is being built in Paris, Ontario, Canada.
 (12) KEYWORDS: CANADA; CLEANUP; CONTROL; ECONOMICS; INDUSTRY; MARKET; POLLUTION; PRIVATE; TECHNOLOGY
 (15) STIMS ACC.NO.: 00S37616
 (18) DOC.CIT.: CIL proves clean-up can be profitable. Canadian Chemical Processing, 60(3):21-22, Mar. 1976.

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(1) SWIRS ACC.NO.: 037992
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: Federal standards on industrial noise and cotton dust from U. S. textile mills are examined. It is anticipated that there will be an 0.2 mg per cu m limit for cotton dust and that the textile industry will be required to spend significant amounts of money to comply with the standard. Four consequences of the proposed Federal standards are noted: (1) many smaller and marginal companies may curtail their operation; (2) larger companies will be giving increased scrutiny to their mills, particularly older ones, and some plants will undoubtedly close; (3) the textile industry may undergo radical changes over a 20 year period in terms of the proposed stringent standards; (4) textile mills may not be able to make definite plans for development because they do not know if today's new machines will be in compliance tomorrow. The feasibility of compliance with both noise and cotton dust standards is discussed, with emphasis on possible citations issued by the Occupational Safety and Health Administration (OSHA) for noncompliance. Industry estimates for meeting an 0.2 mg per cu m standard are expected to exceed \$2 billion. OSHA recommends three changes in work practices for textile mills: (1) clean up work areas at the end of a shift; (2) offshift blowing down; (3) promotion of improved work practices. Consideration is given to the potential danger of toxic substances in the textile mill environment.
 (12) KEYWORDS: DUST; ECONOMICS; EFFECT; FEDERAL; INDUSTRY; NOISE; PLANT-INDUSTRIAL; PROBLEMS; REDUCTION; STANDARD; TEXTILE
 (15) STIMS ACC.NO.: 00S37036
 (18) DOC.CIT.: Will reason rule federal standards? Textile World, 126(3):47, 49-50, Mar. 1976.

(1) SWIRS ACC.NO.: 037897
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: The economic effectiveness of using chlorine for treating waste water is examined. It is noted that increasing emphasis upon environmental protection, including the protection of public health, has increased the practice of chlorinating effluent from waste water treatment plants. The manufacture of chlorine for disinfection purposes requires large inputs of energy. Chlorine gas is then cooled, compressed, and sometimes liquified. Additional energy is required for this concentration. Energy requirements for chlorine manufacture using a diaphragm type cell are tabulated. Chlorine is a powerful oxidizing agent and is very soluble in water. While it eliminates pathogens, it is an extremely strong biocide that also damages fish and other aquatic organisms. Treatment plant and stream flow data are tabulated with regard to toxicological aspects of chlorine, along with data on the results of proper chlorination. The use of chlorine in municipal treatment plant operations in Oregon is noted and it is pointed out that energy saved by not producing extra chlorine in the summer months ranges from 15 to 20 percent of electricity used by the treatment plant.
 (12) KEYWORDS: CHLORINE; CONSERVATION; DATA; ECONOMICS; EFFECT; ENERGY; STERILIZE; TOXIC; UTILIZE
 (15) STIMS ACC.NO.: 00S36941
 (18) DOC.CIT.: Huff, E. S. Careful chlorination yields multiple savings. Water and Sewage Works, 123(7):42-43, July 1976.

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(1) SWIRS ACC.NO.: 037216
 (2) DOMESTIC: D (2) CATEGORY: 05 (2) SUBJ.TYPE: T (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: A mechanized system for refuse collection is described. The Rapid Rail loader is a device which is easily attached to any standard side loading truck and is capable of automatically picking up and emptying standard containers. Significant cost savings can be achieved with the Rapid Rail vehicle because of increased equipment speed and reduced personnel requirements. One individual is able to make 750 stops per day at individual homes using 90-gal containers. When 300-gal alley containers are used, 1,800 families can be serviced each day. When translated into costs including amortization of containers, it is shown that costs can be as low as \$1.50 per month for families using 300-gal containers or \$2.00 per month for families using smaller bins. Other advantages associated with the Rapid Rail loader system involve fewer injuries and improved aesthetics. When deciding to implement the Rapid Rail system, consideration must be given to container performance, maintenance, parked cars, container size, and container costs.
 (12) KEYWORDS: AUTOMATIC; COLLECTION; CONTAINER; COST REDUCTION; EQUIPMENT; LOADER; MAINTENANCE; PERSONNEL; REDUCTION; SAFETY
 (15) STIMS ACC.NO.: 00S36261
 (18) DOC.CIT.: Bartolotta, R. J. Cities mechanize pickup. Solid Wastes Management, 19(2):44, 1976.

(1) SWIRS ACC.NO.: 036555
 (2) DOMESTIC: D (2) CATEGORY: 08 (2) SUBJ.TYPE: G (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: The economic consequences of using salt (sodium chloride and calcium chloride) on highways to melt snow and ice are investigated. A literature search and several surveys were carried out in order to determine the types and extent of damages that occur due to salt use on highways; over 320 references were compiled. An indepth analysis was performed on the data obtained from literature studies and through surveys. The following major cost parameters were investigated in relation to the environmental impact of highway structures, vehicles, and utilities. A cost estimate was developed for each parameter. The total annual cost of salt-related damage was estimated at \$3 billion or about 15 times the annual national cost for salt purchase and application. While the largest costs resulted from damage to vehicles, the most serious damage was considered to be the pollution of water supplies and resulting health degradation. It was recommended that the level of salt usage be reduced, based on prevailing local conditions. (Author Abstract Modified)
 (12) KEYWORDS: ANALYSIS; AUTOMOBILE; ECONOMICS; HEALTH; HIGHWAY; LITERATURE; MELT; POLLUTION; REDUCTION; SALT; SNOW; SURVEY; WATER
 (15) STIMS ACC.NO.: 00S35599
 (18) DOC.CIT.: Murray, D. M., and U. F. Ernst. An economic analysis of the environmental impact of highway deicing. Environmental Protection Agency Publication EPA-600/2-76-105. Cincinnati, U. S. Environmental Protection Agency, May 1976, 128 p. (Environmental Protection Technology Series).

Section 3

LAWS AND REGULATIONS

(1) SWIRS ACC.NO.: 047064
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Fall congress underscores changes due from RCRA.
 (6) JOURNAL TITLE: NSWMA Reports
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: Changes likely to occur as a result of the 1976 Resource Conservation and Recovery Act (RCRA) with regard to solid waste management are discussed. The changes occurring are being made to provide at least minimal protection of human health and the environment. Three factors important to the success of RCRA were identified as: (1) quality of planning and direction from EPA's Office of Solid Waste; (2) willingness and capacity of states and communities to become involved; and (3) adequate funding. Legislation is being prepared by EPA on landfill and ground water criteria, and preparations are underway for a sanitary landfill survey. Besides cooperation between government and private industry to fulfill the objectives of the RCRA, a key component of its implementation is concluded to be public support for siting and operation of waste processing and disposal facilities.
 (12) KEYWORDS: FEDERAL; LAW; MANAGEMENT; MATERIALS HANDLING; RECLAMATION; SANITARY LANDFILL; SITES
 (14) HIERARCH TERMS: 1LP/2DP; 1LP/2PF; 1RR
 (15) STIMS ACC.NO.: 00S46117
 (16) CITATION: 12(12):1, 10, Dec. 1977.

(1) SWIRS ACC.NO.: 045585
 (2) DOMESTIC: D (2) CATEGORY: 14 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Missouri Solid Wastes Management Law.
 (6) JOURNAL TITLE: Sanitation Ind Yearbook
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2MO (10) PUB. YEAR: 1976
 (11) ABSTRACT: The Missouri Solid Wastes Management Law is presented in full. Solid wastes collection and disposal must be provided by each city and county who may levy and collect charges and taxes for services. The governing body of counties with cities with populations of 450,000 or more and the governing body of each county which has joined with it to form a regional planning commission must adopt a plan for the disposal of solid wastes. Cities and counties must submit solid waste management plans to the State Division of Health whose duties are noted. General provisions for solid wastes disposal areas and processing facilities are noted. Sanitary landfill rules and regulations are intended to provide for solid waste disposal area operations that will have minimal impact on the environment. Requirements are set forth which will ensure that design, construction, and operation of the sanitary landfill will protect the public health, prevent nuisances, and meet applicable standards. The law covers the following areas: solid wastes accepted and excluded, site selection design, water quality, air quality, gas control, vectors, aesthetics, cover material, compaction, health and safety, and record keeping.
 (12) KEYWORDS: AIR; COLLECTION; COMPACTION; CONSTRUCTION; CONTROL; COUNTY; DESIGN; DISPOSAL; ENVIRONMENT; FEE; GAS; HEALTH; INSECT; LAW; MANAGEMENT; MISSOURI; MUNICIPALITY; QUALITY; REFUSE; REGIONAL; REGULATIONS; SAFETY; SANITARY LANDFILL; SITES; SOLID; TAXES; WATER
 (14) HIERARCH TERMS: 1LB/2LA; 1LB/2LB; 1LB/2LG
 (15) STIMS ACC.NO.: 00S44633
 (16) CITATION: 13:31, 34, 37, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 1976.

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(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: 1DS/2DW; 1HA/2HF; 1LS/2LG
 (15) STMS 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.: 040740
 (2) DOMESTIC: F (2) CATEGORY: 19 (2) SUBJ.TYPE: G
 (4) AUTHOR: Fleckinger R (10) GEO. AREA: 1EU/2FR (10) PUB. YEAR: 1976
 (11) ABSTRACT: Legal disputes on the subject of the removal of slaughtering wastes and offals in public slaughterhouses have made it possible to establish a jurisprudence at the level of the counsel of state. After definition of the wastes concerned and a review of the legislation, this paper specifies this jurisprudence in terms of which the expenses of said removal are imposed on users and can be recovered in the form of an extra charge per kg of the meat. An examination of the jurisprudence established by the Supreme Court of Appeals in an audience of February 12, 1935, then by the decision of the counsel of state on June 17, 1970, makes it possible to respond to two questions: (1) expenses for the removal of slaughtering wastes in public slaughterhouses are the responsibility of the users and enter into the framework of furnishing a service, the expense of which can be recovered by supplementary charges or by incorporation into the use fee (one user); and (2) the establishment of a removal fee for slaughtering wastes per kg of meat, such as the wastes have been defined, but does not remove the obligation of proportioning said fee for services rendered to slaughterhouse users. The recent legislation relative to

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the modernization of the meat marked and cutting up of animals contributes to the solution of this important problem in the interest of hygiene and public health.

(12) KEYWORDS: DISPOSAL; ECONOMICS; EUROPE; FLE; FRANCE; LAW; POLLUTION; RESPONSIBILITY; SLAUGHTERHOUSE

(14) HIERARCH TERMS: 1AG/2AP; 1LB/2LB

(15) STIAS ACC.NO.: 00S39784

(13) DOC.CIT.: Fleckinger, R. L'enlèvement des déchets d'abattage dans les abattoirs publics. (Removal of slaughtering wastes in public slaughterhouses.) Bulletin de l'Académie Vétérinaire de France, 49(2):193-201, 1976.

(1) SWIRS ACC.NO.: 040017

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

(11) ABSTRACT: A representative of the General Motors Corporation discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 11, 1975 in San Francisco, California. The statement is made that, in many instances, there is a tendency to regulate the disposal of industrial waste materials solely because they are easy to control even though such waste materials could easily be landfilled with similar waste products from street collection activities. Controls used in General Motors plants to deal adequately with hazardous waste are noted. Long term advantages resulting from the volume reduction of waste are explored. It is felt that government regulation of hazardous waste management is necessary. Hazardous waste is divided into three categories: liquids, sludges, and solids. The conclusion is reached that there is a need for consistent regulations applicable to all generators of waste. Such regulations should consider the fact that most industrial waste, according to General Motors, presents no special problems beyond that of street collected residential and commercial waste and is safe for disposal in sealed and properly operated landfills.

(12) KEYWORDS: AUTOMOBILE; CONFERENCE; EPA; HAZARDOUS; INDUSTRY; MANAGEMENT; REDUCTION; REGULATIONS; SAFETY; SANITARY LANDFILL; VOLUME

(15) STIAS ACC.NO.: 00S39061

(18) DOC.CIT.: Van Zile, D. K. Representing the General Motors Corporation, on hazardous waste management. In Corson, A. S., P. A. Savage, and C. A. Baggett, 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. 1570-1583.

(1) SWIRS ACC.NO.: 039285

(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Legislative issues concerning solid waste management in the United States are examined. Data on the generation of municipal waste are provided, and the environmental effects of solid waste are discussed. Three interrelated issues are identified with regard to solid waste management: (1) how to curtail the adverse effects on the environment and public health resulting from improper waste disposal on land; (2) how to bring about the recovery of energy and materials from waste; (3) waste reduction. The solid waste management strategy of the U. S. Environmental Protection Agency is detailed. Under consideration are legislative proposals to insure the regulation of all land disposal, including hazardous and municipal waste, by State governments

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operating under Federal guidelines; make Federal funds available to State and local governments to plan and implement resource and energy recovery systems; encourage through financial and other means regional solid waste management planning; enhance the Environmental Protection Agency's capacity to provide solid waste management technical assistance and information base on energy and materials recovery, waste reduction options, and environmental and health effects of improper disposal practices; internalize the cost of solid waste management; study and report on ways of reducing solid waste generation; and investigation management practices and costs affecting solid waste.

(12) KEYWORDS: CONFERENCE; ECONOMICS; ENVIRONMENT; EPA; HEALTH; MANAGEMENT; PLANNING; PUBLIC; REGULATIONS; RESPONSIBILITY; US

(15) STIMS ACC.NO.: 00S38329

(19) DOC.CIT.: Meyers, S. Status of solid waste management in the United States. In Proceedings; Second International Congress of the International Solid Waste Association, Padua, Italy, June 24, 1976. Washington, U. S. Environmental Protection Agency, 1976. 22 p.

(1) SWIRS ACC.NO.: 038753

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

(11) ABSTRACT: Standards proposed by the Environmental Protection Agency (EPA) for the effective management of nonradioactive hazardous waste are examined. The purpose of EPA's position statement is to describe a preferred waste management strategy or set of priorities for hazardous waste control that adequately protect the public health and the environment. Responsibility for the control of radioactive waste, previously covered by the Atomic Energy Act of 1954, has been assigned to EPA, the Nuclear Regulatory Commission, and the Energy Research and Development Administration. Although State and local government officials and Federal agencies are the primary audience for the position statement, it should be of interest to hazardous waste generators, waste treatment and disposal industry, and concerned citizens. Desired waste management options are identified in order of priority as waste reduction, waste separation and concentration, waste exchange, energy and materials recovery, waste incineration and treatment, and secure ultimate disposal. Implementation aspects of hazardous waste management controls are considered. (Document retained in SWIRS library)

(12) KEYWORDS: EPA; HAZARDOUS; MANAGEMENT; STANDARD

(15) STIMS ACC.NO.: 00S37797

(18) DOC.CIT.: U. S. Environmental Protection Agency. Effective hazardous waste management (non-radioactive): position statement. Federal Register, 41(161):35050-35051, Aug. 18, 1976.

(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.: 00S36128

(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, 382 p. (p. 67-75).

(1) SWIRS ACC.NO.: 037014

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

(11) ABSTRACT: The legislative approach taken in Oregon to solve problems associated with disposable beverage containers is described. The following legislative goals of beverage container legislation are identified: litter reduction, solid waste reduction, energy and resource conservation, and safety. Potential legislation approaches to the control of beverage container disposal include a container tax and a selective container ban. Oregon's legislative efforts to minimize problems in the disposal of beverage containers are discussed, with emphasis on the economic impact of legislation requiring a deposit on all containers. Businesses directly affected by container legislation are considered to include container manufacturers, brewers, beer distributors, soft drink bottlers and canners, and retailers. It is pointed out that the most direct potential impact of container legislation on consumers is its effect on beverage prices. Indirect effects relate to product choices, competition, inconvenience, deposits, and utility and interest losses. The effect of Oregon legislation on the market is assessed. Legislative techniques for dealing with the impact of container regulation are proposed. It is concluded that a mandatory deposit on beverage containers in Oregon has been effective in promoting environmental goals while not being detrimental to the beverage industry itself. The major impact of such legislation is felt by the container industry.

(12) KEYWORDS: BOTTLE; BREWERY; CAN-FOOD; CANNING; COMMERCIAL; CONSERVATION; CONTAINER; ECONOMICS; LAW; LITTER; OREGON; PERSONNEL; PROBLEMS; REDUCTION; SAFETY; TAXES

(15) STIMS ACC.NO.: 00S36059

(18) DOC.CIT.: Gudger, C. M., and K. D. Walters. Beverage container regulation: economic implications and suggestions for model legislation. Ecology Law Quarterly, 5(2):265-290, 1976.

(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 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.: 033243

(2) DOMESTIC: D (2) CATEGORY: 14 (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 legislative and regulatory policy for hazardous waste management in California. A variety of hazardous wastes are produced in California by such industries as oil drilling and refining, agriculture, metals finishing, and chemical processing and research. Over 3.5 million tons of non-radioactive industrial wastes are produced in the State each year. The California State Water Resources Control Board has instituted three broad classes of disposal sites in an effort to minimize the potential for water contamination. Class I sites have the least potential for water pollution and can accept any type of non-radioactive hazardous waste. Some Class II sites may accept limited types of hazardous wastes. However, many hazardous wastes are deposited in sites operated by industries on their own property which are unclassified. The following State and local agencies in California are involved in some way in the regulation of hazardous waste management or in an advisory role in this area: the Department of Health, local health departments, the Water Resources Control Board and Regional Water Quality Control Boards, the Air Resources Board, the Department of Industrial Relations, the California Highway Patrol, the California Department of Food and Agriculture, and the Solid Waste Management Board. (This document is retained in the SWIRS library.)

(12) KEYWORDS: CALIFORNIA; CONTROL; DISPOSAL; GENERATION; GOVERNMENT; HAZARDOUS; HEALTH; INDUSTRY; MANAGEMENT; POLLUTION; REGULATIONS; SANITARY LANDFILL; STATE; TOXIC; WATER

(15) STIMS ACC.NO.: 00S32287

(18) DOC.CIT.: Collins, H. P., and D. L. Strom. California's legislative and regulatory policy for hazardous waste management: I. 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 Waste Management Association, 1975. p. 145-149.

Section 4

PROCESSING AND DISPOSAL

(1) SWIRS ACC.NO.: 045783
(2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Treatment processes selected for a given waste stream.
(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: Treatment processes considered appropriate for resource recovery, detoxification, or volume reduction before ultimate disposal of potentially hazardous wastes from the inorganic chemicals industry are specified for given waste streams. Information is also given on process and benefit-cost analyses, in terms of applications, installations, operations, environmental consequences (air and water pollution, solid waste generation, and safety and health), cost, energy requirement, and equipment. Technologies described for treating the inorganic waste streams include calcination, dissolution, distillation, electrolysis, evaporation, filtration, high gradient magnetic separation, neutralization and pH control, and precipitation. (Retained in SWIRS library).
(12) KEYWORDS: CHEMICAL; HAZARDOUS; INORGANIC; MANAGEMENT; PROCESS; RECLAMATION; REDUCTION; RESOURCE; TREATMENT
(14) HIERARCH TERMS: 1CB/2CA/3CB; 1HA/2HG; 1RG; 1VB
(15) STIMS ACC.NO.: 00S44837
(16) CITATION: Washington, DC, U.S. Environmental Protection Agency, 1977. p.5-1--5-141.

(1) SWIRS ACC.NO.: 043739
(2) DOMESTIC: F (2) CATEGORY: 10 (2) SUBJ.TYPE: G
(3) ARTICLE TITLE: Setting a safety standard.
(6) JOURNAL TITLE: Materials Reclamation Weekly
(10) LANGUAGE: EN (10) GEO. AREA: 1US; 1EU/2UK (10) PUB. YEAR: 1977
(11) ABSTRACT: In view of Great Britain's Factory Inspectorate's concern about the risks of operating various types of scrap processing machinery, the American National Standards Institute's safety requirements for design, use, and maintenance of metal scrap processing equipment are presented. The ANSI Standard is concerned with specific types of scrap processing equipment. It covers alligator shears, metal cleaning shears, automatic guillotine shears, shredders, hydraulic casting breakers, battery breakers, briquetters, turnings crushers, baling presses, car body compactors, industrial scrap compactors, engine pullers, road and yard vehicles, and conveying equipment. Alarm systems and guards are also covered. Techniques such as topping are also covered.
(12) KEYWORDS: EQUIPMENT; EUROPE; GREAT BRITAIN; PERSONNEL; PROCESS; RECLAMATION; SAFETY; SCRAP; STANDARD; TRAINING; US
(14) HIERARCH TERMS: 1FE; 1PD; 1SA
(15) STIMS ACC.NO.: 00S42782
(16) CITATION: 129(16):23-25, Apr. 16, 1977.

HEALTH AND SAFETY

- (1) SWIRS ACC.NO.: 042745
 (2) DOMESTIC: F (2) CATEGORY: 12 (2) SUBJ.TYPE: S; T
 (3) ARTICLE TITLE: Computer control of a batch digester plant.
 (4) AUTHOR: Coombes GE
 (6) JOURNAL TITLE: Appita
 (10) LANGUAGE: EN (10) PUB. YEAR: 1976
 (11) ABSTRACT: The application of a computer control system to a nine-digester, two-species, batch-digester plant is described. Except for chip charging, the computer completely controls all phases of digester operation; charge, toff, cook, relief, and blow. A hierarchical control structure is utilized for maximum efficiency. The lower level DDC control interacts directly with the process, and is commanded by the operational control which performs; all functions associated with each phase of digester operation, and extensive safety checks. The upper levels contain Kappa number modelling and control, steam flow control, and the interactive scheduling function. Potential production increases, steam and chemical savings have been realized as well as the normal indirect gains associated with computer control. As yet, the target reduction in Kappa number variance has not been achieved.
 (12) KEYWORDS: BATCH; COMPUTER; CONTROL; DIGESTOR; PLANT-INDUSTRIAL; PULP
 (14) HIERARCH TERMS: 1CG; 1FE/2EU; 1IC; 1PE
 (15) STIMS ACC.NO.: 00S41788 (15) SECONDARY AUTHORS: Kohn PC
 (16) CITATION: 30 (2):148-154, Sept. 1976.
- (1) SWIRS ACC.NO.: 042270
 (2) DOMESTIC: D (2) CATEGORY: 11 (2) SUBJ.TYPE: T
 (3) ARTICLE TITLE: Operation and maintenance.
 (6) BOOK TITLE: In Municipal-scale Thermal Processing of Solid Wastes. (9) CONTRACT NO.: 68-03-0293
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: Operation and maintenance parameters of a thermal processing facility for the disposal of solid waste are detailed. Manpower requirements for municipal incinerators are estimated. Operational guides are noted as flow diagrams, engineering drawings, and safety rules and procedures. The need for an operation manual is stressed. Such a manual, accompanied by a training program, should include procedures for plant startup from a cold start, plant startup after an emergency shutdown, routine operation, routine shutdown, emergency shutdown, and lubrication and routine servicing of equipment. Factors related to maintenance and repairs involve recordkeeping, maintenance and equipment manuals, routine maintenance, the maintenance of buildings, and maintenance and repair costs. Consideration is given to the importance of performance and operating data. Methods for preparing data records are described.
 (12) KEYWORDS: CRITERIA; EQUIPMENT; FACILITY; INCINERATION; MAINTENANCE; MUNICIPALITY; PERSONNEL; REFUSE; SAFETY
 (14) HIERARCH TERMS: 11A/2IL; 11A/2IO
 (15) STIMS ACC.NO.: 00S41314
 (16) CITATION: Washington, U.S. Environmental Protection Agency, 1977. p.322-333. (Solid Waste Management Series.)
- (1) SWIRS ACC.NO.: 042268
 (2) DOMESTIC: D (2) CATEGORY: 07 (2) SUBJ.TYPE: S; T
 (3) ARTICLE TITLE: Solid wastes that require special consideration.
 (6) BOOK TITLE: In Municipal-scale Thermal Processing of Solid Wastes. (8) REPORT NO.: Unpublished, SW-133C (9) CONTRACT NO.: 68-03-0293

PROCESSING AND DISPOSAL

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

(11) ABSTRACT: The handling of special types of waste components in municipal refuse for incineration is explored. Special waste components include bulky items, obnoxious and hazardous materials, high and low heating value combustibles, sewage sludge, and various industrial types of waste. Examples of bulky waste components are noted. Approaches to the handling of bulky waste are described. These include shredding, either mixed with other solid waste in a feed preparation or resource recovery system or separately for adding back to unshredded waste for incineration. Highly flammable, explosive, toxic, radioactive, and environmentally disruptive materials are classified as hazardous. Typical types of hazardous waste are listed, and procedures for the safe and environmentally acceptable disposal of hazardous waste are described. Consideration is given to the plastics component of municipal refuse and the problems posed by these materials in disposal. Obnoxious waste components are identified as pathological waste, food and meat processing waste, dead animals, and odiferous chemicals. Alternatives to the handling and disposal of obnoxious waste and sewage sludge are detailed.

(12) KEYWORDS: BULKY WASTES; COMPOSITION; CRITERIA; EXPLOSION; FIRE; HAZARDOUS; INCINERATION; MANAGEMENT; MUNICIPALITY; REFUSE; SAFETY; TOXIC; TREATMENT

(14) HIERARCH TERMS: 1DD; 1HA; 1IA/2IM; 1RD/2RB

(15) STIMS ACC.NO.: 00S41312

(16) CITATION: Washington, U.S. Environmental Protection Agency, 1977. p.276-284. (Solid Waste Management Series.).

(1) SWIRS ACC.NO.: 041844

(2) DOMESTIC: F (2) CATEGORY: 19 (2) SUBJ.TYPE: S (10) GEO. AREA: 1PM; 1WA/2WJ (10) PUB. YEAR: 1977

(11) ABSTRACT: The use of sodium hypochlorite as a disinfectant and odor controlling agent is reviewed. Tips on using the chemical are given for the following areas: filtration plants, wells, reservoirs (new water main disinfection), wastewater treatment and disinfection, and odor control. The chemical makeup of sodium hypochlorite and its reaction are noted. Disinfecting with sodium hypochlorite is a convenient and economical method of treating drinking water. It is now being used around filtration plants as an alternative to chlorine gas because of its reduced safety requirements. Tables show how to determine approximate volume of water in a well and how to calculate the amount of hypochlorite required when disinfecting new water mains. Sodium hypochlorite is added to industrial wastes either to minimize odors and/or oxidize organic contaminants. Sewage, manufacturing, and rendering plants may treat their odors by exposing odor laden air to the chemical which will oxidize the odorous components.

(12) KEYWORDS: AIR; CHEMICAL; CHLORINE; CONTROL; FACILITY; ODOR; ORGANIC; SAFETY; SEWAGE; SODIUM; STERILIZE; TREATMENT; WASTE WATER; WATER

(14) HIERARCH TERMS: 1CB

(15) STIMS ACC.NO.: 00S40888

(13) DOC.CIT.: A refresher on sodium hypochlorite. Water and Pollution Control, 115(1) 11-12, Jan. 1977.

(1) SWIRS ACC.NO.: 041725

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; F

(4) AUTHOR: Sontheimer H (10) GEO. AREA: 1WA/2WB (10) PUB. YEAR: 1976

(11) ABSTRACT: The use of adsorption processes in the purification of drinking water is explored. Adsorption plants such as activated carbon filters can be used for the removal of taste and odor, as well as for reducing the total load of organic substances and contaminants which are hazardous to health. Alternatives to adsorption include biological oxidation, chemical oxidation, precipitation and flocculation, ion exchange, and membrane processes. Adsorption processes are particularly effective for the removal of dissolved organics, and examples are described and graphically illustrated to show this importance. Recommendations are made for controlling adsorption processes (activated carbon filters) in drinking water treatment. These include an evaluation of activated carbon with several parameters, an evaluation of the running time with different parameters, periodic control of the effectiveness of activated carbon filters, and coordination of additional treatment steps with the effectiveness of activated carbon filters.

(12) KEYWORDS: ACTIVATED CARBON; ADSORPTION; COMPARISON; CONTAMINATE; CONTROL; FILTER; ORGANIC; PROCESS; PURIFICATION; TREATMENT; WATER

(14) HIERARCH TERMS: 1PM

(15) STIMS ACC.NO.: 00S40769

(18) DOC.CIT.: Sontheimer, H. The importance of adsorption processes in drinking water treatment. In Sontheimer, H., ed. Translation of Reports on Special Problems of water Technology. v. 9. Adsorption. Environmental Protection Publication EPA-600/9-76-030. Cincinnati, U. S. Environmental Protection Agency, Dec. 1976. p. 1-15.

(1) SWIRS ACC.NO.: 041561

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: G

(4) AUTHOR: Tofflemire TJ (10) GEO. AREA: 1SF; 1SL (10) PUB. YEAR: 1976

(11) ABSTRACT: Literature on the land application of wastewater is reviewed. A history of land application of waste was reported with examples of the three main types of systems, irrigation, land overflow, and rapid infiltration. System design of many different techniques were described. U. S. Environmental Protection Agency policy, research, and guidelines, and a report on evaluation of land application systems have been issued. Other general subjects reviewed were, loading constraints, health constraints, and leaching of accumulated salts. Economic aspects were reported for general types of land application systems, and comparison with advanced wastewater treatment was made in another report. Individual systems reported include spray irrigation of lagoon effluent, effects of sewage effluent on forest soils, joint municipal industrial systems, irrigation with sugar cane wastewater, flood irrigation of primary effluent, trickle irrigation, spray runoff, design and operating data on mound systems, shallow injection well recharge of tertiary effluent, leaching pit, septic tank tile fields, spreading basins, and lagoon intermittent sand filter systems. Nutrient transport in soil was studied, and many studies on phosphate retention were reported. One hundred and thirty eight references are cited.

(12) KEYWORDS: CROP; DEEP WELL; DISPOSAL; ECONOMICS; EFFECT; FILTER; HEALTH; IRRIGATION; LAND; LEACH; LITERATURE; REGULATIONS; SEWAGE; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1LA

(15) STIMS ACC.NO.: 00S40605

(18) DOC.CIT.: Toiflemire, T. J. Wastewater treatment: land application of wastewater. Journal Water Pollution Control Federation, 48 (6):1180-1191, June 1976.

PROCESSING AND DISPOSAL

(1) SWIRS ACC.NO.: 041460
 (2) DOMESTIC: F (2) CATEGORY: 12 (2) SUBJ.TYPE: T
 (4) AUTHOR: Houveng HO (10) PUB. YEAR: 1976
 (11) ABSTRACT: Procedures for reducing the quantity of hydroxylic waste sludge formed on the treatment of electroplating effluent and for the safe disposal of remaining waste are evaluated. Waste from effluent treatment in the electroplating industry primarily consists of metal hydroxides present in rinse water from pickling and plating operations. Minor quantities of insoluble cyanides, silicates, and phosphates may also be present, as well as oil and grease. It is shown that a substantial reduction of electroplating waste can be achieved by inprocess measures, although certain quantities of waste will always remain and must be disposed of adequately. About half of the waste consists of iron from pickling operations and chromium hydroxides. Copper, nickel, and zinc are not present in waste to make them valuable from the resource recovery point of view. Uses for metals extracted from electroplating waste are noted, and various approaches to the ultimate disposal of nonrecoverable electroplating waste are described.
 (12) KEYWORDS: CHROMIUM; DISPOSAL; EFFLUENT; ELECTRICAL; INDUSTRY; IRON; NON-FERROUS; PLANT-INDUSTRIAL; PLATING; REDUCTION; SAFETY; VOLUME
 (14) HIERARCH TERMS: 11C/212
 (15) STIMS ACC.NO.: 00S40510
 (18) DOC.CIT.: Houveng, H. O. Principles for the reduction and treatment of hydroxylic waste from the electroplating industry. In Jenkins, S. H., ed. Proceedings, the Second International Congress on Industrial Waste Water and Wastes, Stockholm, 1975. Progress in Water Technology, 8(2-3):169-173, 1976.

(1) SWIRS ACC.NO.: 041256
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: G (10) GEO. AREA: 1EB/2EE; 1HB (10) PUB. YEAR: 1976
 (11) ABSTRACT: Guidelines are presented to insuring a safe environment for individuals employed by scrap processing industries. A health and safety program is described, and guidelines are offered with regard to the reduction of unsafe acts and practices, hazards of scrap processing industries, storage yards, machine guarding, fire prevention, and safety in the operation of power tools. Frequently violated regulations of the Occupational Safety and Health Act are noted. These relate to walking and working surfaces, exits and exit markings, occupational health and environmental control, hazardous materials, personal protective equipment, general environmental controls, medical and first aid, fire protection, compressed air equipment, materials handling and storage, machinery and machine guarding, hand and portable powered tools, welding, cutting, and brazing. Recordkeeping requirements associated with the implementation of a safety program in scrap processing industries are noted. Sources of additional information on health and safety are listed. (Retained in SWIRS library)
 (12) KEYWORDS: EQUIPMENT; MANUAL; PERSONNEL; PROCESS; PROGRAM; REGULATIONS; SAFETY; SCRAP
 (14) HIERARCH TERMS: 1MD/2MT
 (15) STIMS ACC.NO.: 00S40300
 (18) DOC.CIT.: Health and safety guide for scrap processors. DHEW Publication No. (NIOSH) 76-125. Cincinnati, OH, U. S. Department of Health, Education, and Welfare, Apr. 1976. 86 p.

HEALTH AND SAFETY

(1) SWIRS ACC.NO.: 041049
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S; T
 (4) AUTHOR: Farrell JB (10) PUB. YEAR: 1975
 (11) ABSTRACT: The use of high level radiation to reduce or eliminate pathogens in waste water and sewage sludge is investigated. The relevant effects of radiation to sludge treatment include the following: (1) destruction of microorganisms and parasites; (2) radiation induced oxidation; (3) modification of molecular structures to decrease toxicity or enhance biodegradability; and (4) changes in colloid systems to improve settling or sludge dewatering. Major sludge irradiation investigations underway in various parts of the world are noted. Particulation is given to activities in Germany, Switzerland, and the United States (Boston, Massachusetts and Albuquerque, New Mexico). The economics of using high level radiation to reduce or eliminate pathogens in sludge are assessed. Anticipated future developments are noted, including synergistic effects when oxygen or chlorine are added to sludge or waste water during irradiation, developments to reduce irradiation costs, and irradiation of raw sludge. Alternatives to the use of radiation for the reduction or minimization of pathogens are examined.
 (12) KEYWORDS: COMPARISON; CONTROL; DATA; ECONOMICS; EUROPE; GERMANY; PATHOGEN; RADIATION; SLUDGE; SWITZERLAND; TREATMENT; US
 (14) HIERARCH TERMS: ISI/286
 (15) STIMS ACC.NO.: 00S40093
 (18) DOC.CIT.: Farrell, J. B. High energy radiation in sludge treatment - status and prospects. 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. 124-133.

(1) SWIRS ACC.NO.: 040879
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T (10) GEO. AREA: 1EE; 1MA; 1PM (10) PUB. YEAR: 1976
 (11) ABSTRACT: Specific information is presented on pulverizer performance that should be considered by building designers/owners as they assess the alternative components available for use in a highrise multifamily building refuse handling system. Pulverizers are described in terms of weight, volume, density, and composition of refuse after processing; environmental conditions maintained (including contribution to air pollution and to building sewer systems and vermin infestation, odor, and noise); utility and fuel requirements/consumption; personnel practices; costs; usable types of refuse container; storage requirements; fire protection considerations; ability to handle all refuse; reliability and availability; cleaning requirements; serviceability; and complexity and safety of operation. A volume reduction ratio of about 4:1; a weight increase ratio of about 2:1; and a density increase ratio of around 3:1 can be expected from pulverizers. Considerable attention must be paid to cleaning and vermin control practices. Capital cost for purchase and installation of pulverizer systems will be about \$25,000. Fire protection sprinkler systems should be provided. Acceptable reliability of pulverizers appears only to be achievable when adequately trained personnel provide full time attention to the operating equipment. Extensive training of operator and maintenance personnel will be necessary.
 (12) KEYWORDS: BUILDING; EQUIPMENT; FIRE; GRIND; MAINTENANCE; MANAGEMENT; PERSONNEL; RESIDENTIAL; RODENT; TRAINING
 (14) HIERARCH TERMS: 1MJ
 (15) STIMS ACC.NO.: 00S39923
 (18) DOC.CIT.: Pulverization. In Building Research Advisory Board. Handbook on Solid Waste Management in Buildings. Washington, National Academy of Sciences, 1976. p. 23-24.

PROCESSING AND DISPOSAL

(1) SWIRS ACC.NO.: 040878
 (2) DOMESTIC: D (2) CATEGORY: 11 (2) SUBJ.TYPE: T (10) GEO.
 AREA: 11A; 1MJ (10) PUB. YEAR: 1976
 (11) ABSTRACT: Specific information is presented on incinerator performance that should be considered by building designers/owners as they assess the alternative components available for use in a highrise multifamily building refuse handling system. Incinerators are described in terms of weight, volume, density, and composition of refuse after processing; environmental conditions maintained (including contribution to air pollution and to building sewer systems and vermin infestation, odor, and noise); utility and fuel requirements/consumption; personnel practices; costs; usable types of refuse container; storage requirements; fire protection considerations; ability to handle all refuse; reliability and availability; cleaning requirements; serviceability; and complexity and safety of operation. Incineration results in a volume reduction ratio of approximately 5.3:1; a weight reduction ratio of approximately 2:1; and a density increase ratio of about 3:1. A reduction in particulate, gaseous, odorous, and smoke emissions sufficient to meet many standards can be achieved with off the shelf incineration equipment. However, although an incinerator may meet criteria against which it was designed it may fall short of emission standards set by many States. Capital costs of about \$20,000 will be required to purchase and install an incinerator/wet scrubber system.
 (12) KEYWORDS: ANALYSIS; BOD; BUILDING; COD; CONTAINER; DISPOSAL; ECONOMICS; EMISSION; INCINERATOR; MANAGEMENT; REFUSE; RESIDENTIAL; SCRUBBER; SEWAGE; SLUDGE
 (14) HIERARCHY TERMS: 1MA
 (15) STIMS ACC.NO.: 00S39922
 (18) DOC.CIT.: Incineration. In Building Research Advisory Board. Handbook on Solid Waste Management in Buildings. Washington, National Academy of Sciences, 1976. p. 14-22.

(1) SWIRS ACC.NO.: 040877
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T (10) GEO.
 AREA: 1CD; 1MJ; 1PM (10) PUB. YEAR: 1976
 (11) ABSTRACT: Specific information is presented on compactor performance that should be considered by building designers/owners as they assess the alternative components available for use in a highrise multifamily building refuse handling system. Compactors are described in terms of weight, volume, density, and composition of refuse after processing; environmental conditions maintained (including contribution to air pollution and to building sewer systems and vermin and insect infestation, odor, and noise); utility and fuel requirements/consumption; personnel practices; costs; usable types of refuse container; storage requirements; fire protection considerations; ability to handle all refuse; reliability and availability; cleaning requirements; serviceability; and complexity and safety of operation. A volume reduction ratio of approximately 3:1 and a density increase ratio of approximately 2.66:1 can be expected from compactors. They are inherently susceptible to vermin infestation and odor problems and require daily hosing and weekly cleaning with detergent. Capital cost of about \$8,000 will be required for purchase and installation of a chute compactor. Monthly maintenance costs of around \$3,500 and monthly operating costs of about \$100 if disposable containers are used should be expected. Operational and design characteristics of a compactor may dictate that a particular type of refuse container be used. A fire protection sprinkler system should be provided. Complexity of compactor operations is such that training of janitorial staff is necessary.
 (12) KEYWORDS: BUILDING; COMPACTION; DISPOSAL; ECONOMICS; FIRE; MAINTENANCE; ODOR; PROCESS; REFUSE; RESIDENTIAL; RODENT

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(14) HIERARCH TERMS: 1MA
 (15) STIMS ACC.NO.: 00S39921
 (13) DOC.CIT.: Compaction. In Building Research Advisory Board. Handbook on Solid Waste Management in Buildings. Washington, National Academy of Sciences, 1976. p. 17-19.

(1) SWIRS ACC.NO.: 040768
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: G
 (4) AUTHOR: English NW (10) GEO. AREA: 1GD; 1SB (10) PUB. YEAR: 1976

(11) ABSTRACT: Literature on the water reclamation and reuse aspects of wastewater treatment is reviewed. General surveys of water reuse in the United States were reported, and the World Health Organization has stressed the international aspects of reuse. Models for evaluating the economic efficiency of water reuse were developed. Industrial reuse was reported and the subjects dealt with were, methodology to economically evaluate potential power plant recycle/reuse programs, the advantages of sealed cooling systems, discharge standards for poultry processing plants, physical chemical treatment and recycling of effluents, treatment of wastewater from a demineralization system, and automatic car wash recycle systems. Water reuse at a coal gasification plant was reported, as well as ion exchange for the removal of color and minerals from kraft bleach plant waste. Integrated recovery methods were described in metal finishing and agriculture, and the use of municipal wastewater and sewage for industrial cooling purposes has been researched. Systems for using primary and secondary effluent for irrigation purposes were reported, for both food crops and forest, and studies have been conducted on the effects of such irrigation. The economic, conservational, and research factors of groundwater recharging were reported and results of an injection system using tertiary treated trickling filter effluent were presented. A computerized mathematical model for domestic water reuse was reported, and various domestic reuse schemes were reported although there is a need for further health research. The development of water reuse technology was discussed, and reports range from the modification of present systems to a presentation of a system for future spacecraft.

(12) KEYWORDS: AGRICULTURE; CROP; ECONOMICS; EFFLUENT; GROUND WATER; INDUSTRY; ION EXCHANGE; IRRIGATION; LITERATURE; METAL; MUNICIPALITY; QUALITY; RECLAMATION; SIMULATION; TREATMENT; WASTE WATER; WATER; WEO

(14) HIERARCH TERMS: 1WA
 (15) STIMS ACC.NO.: 00S39812 (15) SECONDARY AUTHORS: Mitchell PM
 (13) DOC.CIT.: English, J. W., and T. M. Mitchell. Wastewater treatment: water reclamation and reuse. Journal Water Pollution Control Federation, 48 (6):1174-1180, June 1976.

(1) SWIRS ACC.NO.: 040633
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; F
 (4) AUTHOR: Nebgen J. (10) GEO. AREA: 1GS/2PA (10) PUB. YEAR: 1976

(11) ABSTRACT: The alumina/lime/soda desalination process for waters in which the principal sources of salinity are sulfate salts and has been field tested at the

Commonwealth of Pennsylvania's Acid Mine Drainage Research Facility, Hollywood, Pennsylvania, as a method to recover potable water from acid mine drainage. The alumina/lime/soda process involves two treatment stages. Raw water is reacted with sodium aluminate and lime in the first stage to precipitate dissolved sulfate as calcium sulfoaluminate. In the second stage, the alkaline water (pH = 12.0) recovered from the first stage is carbonated to precipitate excess hardness. Following carbonation, product water meets United States Public Health Service specifications for drinking water. Alumina/lime/soda process economics are influenced most by the cost of sodium aluminate. Widespread application of the alumina/lime/soda process will increase demand for sodium aluminate, and should spur interest in alternate sources of this treatment chemical. Operating costs for recovering potable water from an acid mine drainage having an acidity of 700 mg/l and a sulfate level of 750 mg/l are estimated to be in the range of \$0.21 to \$0.27/per cm. (Retained in SWIRS library)

(12) KEYWORDS: ACID; ALUMINUM; CHEMICAL; DESALINIZATION; DRAINAGE; FACILITY; LIME; MINE; PENNSYLVANIA; PROCESS; PURIFICATION; RECLAMATION; TREATMENT; WASTE WATER

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

(15) STIMS ACC.NO.: OCS39677 (15) SECONDARY AUTHORS: Valentine M; Weatherman DF

(16) DOC.CIT.: Nengen, J. W., D. F. Weatherman, and M. Valentine. Treatment of acid mine drainage by the alumina-lime-soda process. Environmental Protection Publication EPA-600/2-76-206. Cincinnati, U. S. Environmental Protection Agency, Sept. 1976. 105 p. (Environmental Protection Technology Series.)

(1) SWIRS ACC.NO.: 040538

(2) DOMESTIC: D (2) CATEGORY: 22 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Runnells DD (10) GEO. ARFA: 1GC (10) PUB. YEAR: 1976

(11) ABSTRACT: Because of increasingly stringent laws governing discharge of fluid wastes to surface waters, the alternative of discharge to the subsurface has become attractive. The physical/chemical processes that prevail in the subsurface are not well understood, but they are clearly not identical to processes of purification in surface waters. For example, in the subsurface the process of oxidation may be of little value in significantly reducing the concentration of discharged contaminants; in contrast, oxidation plays an important role in purifying surface waters. Eleven physical/chemical processes can be identified as having potential value for purifying wastes discharged to the subsurface, as follow: dilution, buffering of pH, precipitation by reaction, hydrolysis, oxidation or reduction, filtration, volatilization, biological assimilation, radioactive decay, membrane filtration, and sorption. Discharge to the vadose zone may be a safe means of disposal of wastes in arid regions. But it is necessary to carefully test the suitability of a particular site for a particular waste.

(12) KEYWORDS: CLIMATE; DESERT; DISPOSAL; EARTH; GROUND WATER; INVESTIGATION; LAND; LEACH; METAL; NEW MEXICO; OXIDATION; PROCESS; PURIFICATION; REDUCTION; REGULATIONS; SAFETY; SITES; UNDERGROUND; WASTE WATER

(14) HIERARCH TERMS: 1WA/2WF

(15) STIMS ACC.NO.: 00S39582

(16) DOC.CIT.: Runnells, D. D. Wastewaters in the vadose zone of arid regions: geochemical interactions. Ground Water, 14(6):374-384, Nov./Dec. 1976.

HEALTH AND SAFETY

(1) SWIRS ACC.NO.: 040436
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T (10) GEO. AREA: 1HA/2HF (10) PUB. YEAR: 1976
 (11) ABSTRACT: Three levels of technology for the treatment and disposal of potentially hazardous solid waste from the leather tanning and finishing industry are identified. The three levels are as follows: (1) technology currently employed by typical facilities; (2) best technology currently employed; and (3) technology necessary to provide adequate health and environmental protection. Treatment is applicable to only one tannery waste stream. Sludge from waste water pretreatment or treatment facilities can be dewatered. The removal of as much moisture as possible can lead to reduce on site storage requirements, improved hauling, more acceptable disposal practices, and generally lower disposal costs. Gravity and mechanical dewatering techniques appear to be the only treatment methods applicable to waste water treatment sludge. The potential hazard from tannery waste comes from the possibility of heavy metals leaching from disposal sites and entering the surface or ground water system. Technology for tannery waste treatment is examined in relation to the following criteria: current usage in the industry, risk potential, environmental adequacy, monitoring techniques, limitations, impact, and implementation time.
 (12) KEYWORDS: BENEFIT; DISPOSAL; DRYING; ENVIRONMENT; EPA; HAZARDOUS; HEALTH; INDUSTRY; LEACH; METAL; MONITOR; OSWMP; SLUDGE; SURVEY; TANNERY WASTE; TECHNOLOGY; TREATMENT
 (14) HIERARCHY TERMS: 1TA
 (15) STIMS ACC.NO.: 00S39480
 (18) DOC.CIT.: Approach to the selection of treatment and disposal technologies. In SCS Engineers, Inc. Assessment of Industrial Hazardous Waste Practices--Leather Tanning and Finishing Industry. Washington, U. S. Environmental Protection Agency, Nov. 1976. p. 147-149.

(1) SWIRS ACC.NO.: 039939
 (2) DOMESTIC: D (2) CATEGORY: 09 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976
 (11) ABSTRACT: A representative of the Monsanto Company discusses hazardous waste management at a public meeting held by the Environmental Protection Agency on December 4, 1975 in Rosemont, Illinois. The management of hazardous waste from the chemical processing industry is examined. Methods of disposal used by the Monsanto Company are detailed, and the desirability of recovery, recycling, and secondary uses of waste is stressed. The company opposes the mandatory use of public land for hazardous waste disposal to the exclusion of alternative sites. Hazardous waste is defined, and the development of criteria for identifying hazardous waste is explored. Responsibilities for the management of hazardous waste are delineated (generator, transporter, processor, and disposer). Consideration is given to safety in the disposal of hazardous waste, site monitoring and recordkeeping, and feasible methodologies for limiting the amount of hazardous waste disposed of on land. A question and answer session follows the presentation.
 (12) KEYWORDS: ASSOC; CHEMICAL; CRITERIA; DEFINITION; DISPOSAL; EPA; HAZARDOUS; INDUSTRY; LAND; MANAGEMENT; MONITOR; RECLAMATION; RESPONSIBILITY; SAFETY; SITES
 (15) STIMS ACC.NO.: 00S38983
 (18) DOC.CIT.: Eby, D. Representing the Monsanto Company, on hazardous waste management. In Corson, A. S., P. A. Savage, and C. A. Baggett, 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. 405-427.

PROCESSING AND DISPOSAL

(1) SWIRS ACC.NO.: 039109
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: The advantages of a hydraulic machine developed by Vanesco Limited in the United Kingdom for shearing purposes are described. The hydraulic shear is the first one of its type to be sold to the U. S. scrap processing industry. Since the machine is hydraulic, it does not have any shear pins to break because a safety valve is fitted to prevent any possible damage if the machine is overloaded. There is complete control during cutting action. A recycling company in Colorado used the hydraulic machine and found that its adjustable cutting speed made it possible to cut large cable with exceptional rapidity. The company also processed about 1,000 feet of 2.5 inch diameter cable through the machine and expects to handle about 1,500 to 1,800 net tons of metal during 1976.
 (12) KEYWORDS: EQUIPMENT; GREAT BRITAIN; HYDRAULIC; ILLUSTRATIONS; MAINTENANCE; METAL; SAFETY; SCRAP
 (15) STIMS ACC.NO.: 00538153
 (18) DOC.CIT.: Vanesco's hydraulic alligator shear. Recycling Today, 14(8):96, Aug. 1976.

(1) SWIRS ACC.NO.: 038911
 (2) DOMESTIC: D (2) CATEGORY: 01 (2) SUBJ.TYPE: S; T (10) PUB.
 YEAR: 1975
 (11) ABSTRACT: The nitrogen cycle is described in which PFC (plow, furrow, cover) and SSI (subsoil injector) organic wastes in slurry form in the aerobic and biologically active layer of soil where microorganisms degrade wastes to carbon dioxide, water, and nutrients. The PFC method of waste disposal consists of depositing a slurry or semisolid waste in a 6 to 8 inch deep plowed furrow. The SSI injects a band of slurry up to 1.5 inches thick and 24 inches wide, 6 to 8 inches beneath soil or growing crops. PFC and SSI techniques utilize soil media in the aerobic region for degradation and green plants for the eventual utilization and recycling of organic waste. With a closed system, there are no odors and no opportunities for flies or other pests to breed. Unless there is massive soil erosion, no surface runoff of pollutants occurs with these techniques. Equipment for both techniques consists of a subsoil injector and a tank mounted on a trailer with an adjustable tongue. The nitrogen cycle is graphically illustrated, as well as the recycling and utilization of biodegradable waste in soil.
 (12) KEYWORDS: AEROBIC; BIOLOGICAL; DECOMPOSE; EARTH; EQUIPMENT; HEALTH; MICROORGANISM; NITROGEN; SLURRY
 (15) STIMS ACC.NO.: 00537955
 (18) DOC.CIT.: The nitrogen cycle. In Mantell, C. L., ed. Solid Wastes: Origin, Collection, Processing, and Disposal. New York, John Wiley and Sons, 1975. p. 193-195.

(1) SWIRS ACC.NO.: 038857
 (2) DOMESTIC: F (2) CATEGORY: 21 (2) SUBJ.TYPE: S; T (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: Experiments of NASA's National Space Technology laboratories have shown that in tropical and subtropical conditions, water hyacinths absorb organics, heavy metals, nutrients, and other chemical elements from wastewater while producing large quantities of plant material. This water hyacinth biomass, when grown in sewage free of toxic metals, is a potential source of protein fertilizer, methane gas, and other valuable products. A half hectare lagoon covered with

water hyacinths, with a minimum sewage retention time of two weeks, should be able to purify to acceptable levels the daily wastes of 1,000 people. Water hyacinths could prove useful in treating effluents polluted with toxic heavy metals. Because of their high protein and mineral content, water hyacinths show considerable promise as an animal feed supplement and water hyacinth meal is a good organic fertilizer and soil conditioner because of its high nitrogen and mineral content. The hyacinth is a warm weather plant but NASA is experimenting with extending its range by using heat from raw sewage, greenhouse type canopies, or thermal discharges from industrial operations. Using hot water from nuclear power plants is appealing because the hyacinths could act as an added safety filtration system for removing radioactive elements.

(12) KEYWORDS: ABSORPTION; CLIMATE; FEED; FERTILIZER; FOLIAGE; GENERATION; LAGOONS; METAL; METHANE; PURIFICATION; REDUCTION; SEWAGE; TREATMENT; UTILIZE; WASTE WATER

(15) STIMS ACC.NO.: 00S37901

(18) DOC.CIT.: Woliverton, B., and R. C. McDonald. Don't waste waterweeds. New Scientists, 71(1013):318-320, Aug. 12, 1976.

(1) SIRS ACC.NO.: 037730

(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: The improvement of municipal solid waste management is discussed by a member of the Ontario Ministry of the Environment. Provincial systems approach was to emphasize improved management rather than government legislation to control the handling and disposal of waste insofar as the enforcement of the latter would necessarily reduce the disposal options available to municipalities and would result in substantially increased costs. The Provincial Resource Recovery Program was initiated by the Ontario province in 1974 as a solid waste management approach that delineated preventive pollution planning, conservation, and public health safety, and included objectives and solution approaches as follows: (1) materials quantity reduction of those which would most likely result in waste; (2) change in manufacture method or type of material utilized to accommodate and simplify separation and reclamation of waste; (3) source separation in the household, commercial establishment, or factory; (4) planned, coordinated waste management systems; (5) central resource recovery plants; (6) possible additional processing facilities to accommodate separation at central plants; and (7) encouragement of reutilization of reclaimed materials through market development. An outline of the program is given with organizational description, societal implications, and progress to date.

(12) KEYWORDS: CANADA; CONSERVATION; CONTROL; DISPOSAL; FACILITY; GOVERNMENT; HEALTH; MANAGEMENT; MUNICIPALITY; PLANNING; POLLUTION; PROBLEMS; PROGRAM; RECLAMATION; SAFETY

(15) STIMS ACC.NO.: 00S36824

(18) DOC.CIT.: Williamson, W. Ontario's resource recovery program. Scrap Age, 33(6):176-180, June 1976.

(1) SIRS ACC.NO.: 037579

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Requirements for textile water treatment are addressed in relation to regulations of the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency

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(EPA). According to a 1970 Department of Commerce study, the textile mill products industry discharges 461 billion gal of water each year. A modern waste treatment system for this industry must accomplish the following: preliminary treatment to remove grit and solid materials, primary treatment to remove settleable and floatable solids, secondary treatment to remove biodegradable organic matter, and tertiary treatment to remove solids resistant to secondary treatment. Primary treatment includes equalization, neutralization, and disinfection. Secondary treatment involves the oxidation of organic matter. Examples of known tertiary processes for the removal of organic pollutants are absorption (including carbon adsorption), foam oxidation, and chemical oxidation. Details on primary, secondary, and tertiary forms of treatment for the textile industry are provided.

(12) KEYWORDS: CHEMICAL; CLEANUP; DISCHARGE; EPA; FEDERAL; FOAM; INDUSTRY; MANAGEMENT; ORGANIC; OXIDATION; QUANTITY; REGULATIONS; STERILIZE; TEXTILE; TREATMENT; WATER

(15) STIMS ACC.NO.: 00S36623

(18) DOC.CIT.: Anon. Textile water cleanup: federal overkill. Textile World, 126(3):61, 63, 65, Mar. 1976.

(1) SWIRS ACC.NO.: 037538

(2) DOMESTIC: D (2) CATEGORY: 03 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: A process is described that was developed by Solid Conversion Systems Inc. in Cheshire, Connecticut to reuse scrap tire rubber. The process is capable of reusing the total tire, whereas previous reclamation effects by tire companies concentrated on carbon black. The mobile shredders of Solid Conversion Systems can handle 2,000 tires in an 8 hr day, for a charge ranging from 30 cents to \$1 per tire. The firm has a minicomputer that records all tire dealers, recappers, municipalities, health and fire departments, and any other agency or individual involved in tire disposition. The computer also keeps track of tire flows and where concentrations are located. Tire processing plants are planned, and the feasibility of regional tire collection centers in New England is being assessed. The conversion process will produce about 12 sizes of "crumb" rubber for the following uses: fuel, highway surfacing, sports and leisure activities, and construction. The use of reclaimed rubber in a New England community is discussed.

(12) KEYWORDS: COMPUTER; CONSTRUCTION; EQUIPMENT; FUEL; HIGHWAY; MONITOR; MOVABLE; PROCESS; RECLAMATION; RECREATION AREA; RUBBER; SCRAP; SHREDDING; SPECIAL; TIRE; UTILIZE

(15) STIMS ACC.NO.: 00S36582

(18) DOC.CIT.: Chadbourne, R. D. Recycled rubber hits the road. New Englander, 23(2):49-53, June 1976.

(1) SWIRS ACC.NO.: 034288

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

(11) ABSTRACT: This article describes the refuse disposal system in use in Charleston County, South Carolina, which consists of a sanitary landfill with shredded waste. Federal general revenue sharing funds were used to finance construction of the shredding facility. The plant is located on a 3-acre site in the city of Charleston and the county has agreed to fill the surrounding 73 acres with the plant product over the next 3 to 5 years, after which it is expected that the land can be used for industrial development sites. Two 20-ton per hr and one 40-ton

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per hr shredding units are used at the facility. The plant went into operation at the same time that 13 of the 15 county dumps were closed down by health officials. The larger unit is capable of grinding such bulky wastes as refrigerators and tires. The entire system is automated, and personnel are limited to six workers who load and maintain the conveyor lines and one person who operates and monitors the system through closed circuit television. Public collection agencies use the facility at no charge, while private collectors pay 2.37 dollars per ton of refuse. The county is planning to gradually introduce reclamation programs, the first of which will be recovery of ferrous metal, which is expected to be initiated in the near future. Use of the waste as a supplemental fuel is also being investigated. County residents are encouraged to visit the pulverization plant.

(12) KEYWORDS: COUNTY; DISPOSAL; ECONOMICS; EQUIPMENT; FACILITY; GRIND; MANAGEMENT; PLANNING; RECLAMATION; REDUCTION; REGIONAL; SANITARY LANDFILL; SHREDDING; SYSTEM; VOLUME

(15) STIMS ACC.NO.: 00S33332

(18) DOC.CIT.: Black, R. L. County refuse disposal system meets today's needs. Public Works, 106(6):94-95, June 1975.

(1) SWIRS ACC.NO.: 033418

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

(11) ABSTRACT: This report on the feasibility of using the Ridgewood Army Weapons Plant facility as a waste management and resource recovery center was prepared for the Hamilton County (Ohio) Board of County Commissioners. This chapter presents an evaluation of the site and facilities. Hamilton County is required by the terms of the property conveyance to use the site for the public benefit in terms of health and recreation and to report annually to the Department of Health, Education, and Welfare on the use of the property. The County has resolved to develop the facility as a county wide solid waste disposal processing center and recreation facility for use jointly with the City of Cincinnati. The site is located within Cincinnati and occupies about 50 acres, with most of the building, equipment, and storage yards concentrated within a 20 acre self-contained area. Surrounding land is used largely for industrial and transportation purposes and the site has good access to major roads. The municipal incinerator is located on an adjacent site. The Baltimore and Ohio Railroad runs near the site and a spur track already exist connecting the site to the main line. An inventory of the buildings now existing on the site is presented. The buildings are generally in good condition, although some rehabilitation and correction of safety hazards would be required. Ten of the buildings are classified as heavy industrial, while six are minor or specialized buildings. Most of the industrial buildings could be cleared of existing equipment, yielding high quality operational space with good existing rail and bay crane facilities. (This document is retained in the SWIRS library.)

(12) KEYWORDS: CENTRALIZED; CINCINNATI; DISPOSAL; FACILITY; MANAGEMENT; MILITARY; MUNICIPALITY; OHIO; PLANNING; REFUSE; REGIONAL; SITES; TRANSPORT

(15) STIMS ACC.NO.: 00S32462

(18) DOC.CIT.: PEDCO-Environmental Specialists, Inc. Evaluation of the physical plant: I. In Ridgewood Army Weapons Plant evaluation and resource recovery feasibility study. Cincinnati, Ohio, Apr. 1975. p. III (1-17).

Section 5

ANALYSIS, RESEARCH AND DEVELOPMENT

(1) SWIRS ACC.NO.: 046186
 (2) DOMESTIC: F (2) CATEGORY: 27 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Education in environmental health.
 (4) AUTHOR: Singleton DJ
 (6) JOURNAL TITLE: Environmental Health
 (10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1977
 (11) ABSTRACT: Results of a British survey are presented. An attempt was made in this study to: (1) identify areas where environmental health problems exist; (2) determine environmental health officers' perceptions of their role and function; and (3) estimate the extent of training in education and assess the role of the British Area Health Authority vis-a-vis environmental health departments. Environmental health officers stated that health education ought to be involved more in their work, and if extra training were offered, the majority would take advantage of it. Literature on health education is not received very often by most environmental health departments. Most environmental health officers would prefer to have their own health education sections. Where sections are not established, little use is made of existing health education sections which are a feature of Area Health Authorities. If health education is to play a part in environmental health in the future, consideration will have to be given to priorities for training of environmental health officers, to the allocation of resources within the environmental health departments, and to effective liaison with existing health education departments of Area Health Authorities.
 (12) KEYWORDS: ENVIRONMENT; GREAT BRITAIN; HEALTH; PERSONNEL; TRAINING
 (14) HIERARCH TERMS: 1EI/2PO; 1HE; 1PH
 (15) STIMS ACC.NO.: 00S45237
 (16) CITATION: 85(3):63-64, Mar. 1977.

(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, filtration, 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.: 044356
- (2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: G
- (3) ARTICLE TITLE: Evaluation procedures, criteria, and constraints.
- (4) AUTHOR: Wyatt JM
- (5) CORPORATE AUTHOR: Engineering-Science, Inc
- (6) BOOK TITLE: In Sludge Processing, Transportation and Disposal/Resource Recovery: A Planning Perspective. (8) REPORT NO.: WPD 12-75-01 (9) CONTRACT NO.: 68-01-3104
- (10) LANGUAGE: EN (10) PUB. YEAR: 1975
- (11) ABSTRACT: A planning framework within which residual waste disposal and/or reuse alternatives can be selected and evaluated is presented. Residual waste processing and disposal and reuse alternatives are described and illustrated. Sludge producing and sludge handling unit processes are examined. Criteria for evaluating alternatives are given. They are concerned with economic aspects of residual waste disposal and management, the impact of residual waste processing and disposal on environmental quality (water, air, land, flora and fauna, aesthetics, public health, the community, and resource conservation), feasibility (financial feasibility, public acceptability, land use compatibility, and ease of implementation), and performance (effectiveness and reliability, adaptability, and calamity resistance).
- (12) KEYWORDS: AIR; CRITERIA; DISPOSAL; ECONOMICS; EFFLUENT; MANAGEMENT; PLANNING; PROCESS; RESIDUE; SLUDGE; TREATMENT; WASTE WATER; WATER
- (14) HIERARCH TERMS: 1MA/2MH; 1SI/2SY; 1SI/2S2
- (15) STIMS ACC.NO.: 00S43400 (15) SECONDARY AUTHORS: White PE Jr
- (16) CITATION: Washington, DC, U.S. Environmental Protection Agency, Dec. 1975. p.158-180.

- (1) SWIRS ACC.NO.: 043208
- (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: G
- (3) ARTICLE TITLE: Standards for viruses in effluents, sludges, and ground and surface waters.
- (4) AUTHOR: Sproul OJ
- (6) BOOK TITLE: In Baldwin, L. B., J. M. Davidson, and J. P. Gerber, eds. Virus Aspects of Applying Municipal Waste to Land.
- (10) LANGUAGE: EN (10) PUB. YEAR: 1977
- (11) ABSTRACT: Necessary elements of standards for viruses in water and sludge are detailed. Four reasons for the establishment of standards for viruses in water and sludge are cited: (1) human health; (2) reduction in the treatment of water by subsequent downstream

industrial and municipal users; (3) maintenance of recreational and economic opportunities; and (4) improvement of public confidence in the ability of public officials to control the environment. The establishment of virus standards may be based on cause and effect relationships, analytical detection limits, or treatment technology. Standards of the World Health Organization and the U.S. Public Health Service and in South Africa and Canada for viruses in drinking water are noted, as well as standards in Montgomery County, Maryland for viruses in treated effluent. Goals for viruses in water and sludge are identified.

(12) KEYWORDS: EFFLUENT; GROUND WATER; HEALTH; HUMAN; INDUSTRY; MUNICIPALITY; RECREATION AREA; SLUDGE; STANDARD; VIRUS

(14) HIERARCH TERMS: 1LB/2LA; 1MP; 1SI/2S4

(15) STIMS ACC.NO.: 00S42251

(16) CITATION: Gainesville, FL, University of Florida, (1977). p.131-135.

(1) SWIRS ACC.NO.: 042940

(2) DOMESTIC: D (2) CATEGORY: 22 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: The indispensable (sometimes intractable) landfill.

(4) AUTHOR: James SC

(6) JOURNAL TITLE: Technology Review

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

(11) ABSTRACT: Projections show that the amount of net waste to be disposed of will level off by 1985 due to resources recovered and waste reduction policies but there will still be 30 million tons of waste per year more than at present for landfill. Tighter regulations for municipal and hazardous waste disposal sites will benefit the environment but will place a greater burden on the overall economics of waste disposal. The most common source of landfill problems stems from the generation of leachate caused by water percolating through the solid wastes. Raw leachate contains many substances, primarily heavy metals, that are potential threats to human health and/or can cause severe damage to the environment. One way to prevent leachate generation and contaminant migration is to assure that landfill sites meet the proper soil and geologic requirements. Present disposal practices of hazardous wastes include land dumping or burial, ocean dumping, incineration, and deep well injection. By following the prescribed methods, these practices are usually acceptable. Gas is produced in landfill sites as a result of the microbial decomposition of the deposited organic matter. The methane in the gas represents an excellent energy resource; but it is also an explosive. Gas from landfills has been the cause of numerous accidents. In many areas, recreational facilities have been built on completed fills.

(12) KEYWORDS: ACCIDENT; DISPOSAL; ECONOMICS; ENERGY; ENVIRONMENT; HAZARDOUS; HEALTH; LEACH; METHANE; MUNICIPAL; RECLAMATION; RECREATION AREA; REFUSE; SAFETY; SANITARY LANDFILL

(14) HIERARCH TERMS: 1DD/2DP; 1HA; 1HB; 1LC; 1SD/2SG

(15) STIMS ACC.NO.: 00S42033

(16) CITATION: 79(4):38-47, Feb. 1977.

(1) SWIRS ACC.NO.: 042158

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Wastewater sampler plug-free in operation round-the-clock.

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(4) AUTHOR: Shinnors RM
 (6) JOURNAL TITLE: Chemical Processing
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2KY (10) PUB. YEAR: 1977
 (11) ABSTRACT: A sampler, used at the Murray, Kentucky, division of Vanderbilt Chemical Corporation which has resisted corrosion and is plug free although it has been in operation since 1971, 24 hours a day, seven days a week is described. The Murray Division facilities provide for containment and treatment of liquid effluents in normal and catastrophic situations. At a predetermined time, the sampler lowers a sample cup into the outfall stream. After filling, the cup is raised to the top of a stand pipe where it is mechanically emptied into a composite sample container. Sample frequency can be adjusted easily to give the required volume of composite samples. Sample volume can be adjusted between 50 to 1000cc. Automatic controls such as safety cut offs of feed pumps via electrical interlocks, overflow alarms and automatic weighing systems are inherent in the process pollution prevention systems.
 (12) KEYWORDS: EQUIPMENT; KENTUCKY; MONITOR; PLANT-INDUSTRIAL; QUALITY; SAMPLING METHODS; WASTE WATER
 (14) HIERARCH TERMS: 1EE/2ES; 1IC; 1MK; 1PK
 (15) STIMS ACC.NO.: 00S41202
 (16) CITATION: 40 (1):35, Jan. 1977.

(1) SWIRS ACC.NO.: 041265
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: G
 (4) AUTHOR: Basta DJ (10) GEO. AREA: 1WA/2WH (10) PUB. YEAR: 1976
 (11) ABSTRACT: The impact of degradable and suspended solids on water quality management is investigated. Provisions of the Water Pollution Control Act Amendments of 1972 and implementation of the act by the Environmental Protection Agency are detailed. The act states that more stringent limitations on discharges from point sources may be imposed wherever the application of certain technology levels is insufficient to achieve ambient water quality standards already promulgated. Nonpoint sources constitute the other major category of discharge sources, and it is noted that Federal regulations contain few provisions relating to these sources. The relative importance of point and nonpoint discharge sources is assessed in relation to regulatory requirements. The National Residuals Discharge Inventory (NRDI) is described as a technique for analyzing water quality. The NRDI is a computational system structured to permit estimates of potential reductions in liquid residuals discharged from point and nonpoint sources and the associated costs of such reductions under alternative water quality management policies. The three components of the NRDI are inventories of production and consumption activities that generate and discharge residuals to surface water, a set of unit process residuals discharge reduction functions applicable to industrial and/or municipal waste, and a procedure for computing a water quality index. The estimation of residuals discharges is explored, with emphasis on industrial, municipal, nonirrigated agricultural, and urban storm water runoff discharges. The impact of discharges on water quality is considered.
 (12) KEYWORDS: ANALYSIS; FEDERAL; MANAGEMENT; QUALITY; REGULATIONS; SAMPLING METHODS; STANDARD; WATER
 (14) HIERARCH TERMS: 1WA/2WB
 (15) STIMS ACC.NO.: 00S40309 (15) SECONDARY AUTHORS: Bower BT
 (18) DOC.CIT.: Basta, D. J. , and B. T. Bower. Point and nonpoint sources of degradable and suspended solids: impacts on water quality management. Journal of Soil and Water Conservation, 31(6):252-259, Nov.-Dec. 1976.

- (1) SWIRS ACC.NO.: 041151
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T
 (4) AUTHOR: Rand MC (10) PUB. YEAR: 1976
 (11) ABSTRACT: Standard methods for water and wastewater examination of the American Public Health Association (APHA) are presented. The procedures described in these standards are intended for the examination of waters within a wide range of quality. These waters include water suitable for domestic or industrial supplies, surface waters, groundwaters, cooling or circulating water, boiler water, boiler feed water, wastewater effluents after varying degrees of treatment, and untreated municipal or industrial waste waters. An effort has been made to present methods that apply as generally as possible, and where alternative methods are necessary for samples of different composition, to present the basis for selecting the most appropriate method. Certain parts of these standards present procedures that are intended for use with sludges and sediments. Many water plant laboratories perform analysis on bulk chemicals received for the treatment of water. These standards are not intended to cover such analyses. An APHA committee prepares and issues standards for water treatment chemicals. Each separate standard describes the acceptable physical and chemical characteristics of the material and presents methods, for collecting the sample and determining the major components in order to ascertain compliance with the specifications. (Retained in SWIRS library)
 (12) KEYWORDS: ANALYSIS; APHA; CHEMICAL; COMPOSITION; POLLUTION; QUALITY; SAMPLING METHODS; STANDARD; TREATMENT; WASTE WATER; WATER
 (14) HIERARCH TERMS: 1WA/2WB
 (15) SPIMS ACC.NO.: 00S40195 (15) SECONDARY AUTHORS: Greenberg AE; Taras MJ
 (18) DOC.CIT.: Rand, M. C. , A. E. Greenberg, and M. J. Taras, eds. Standard methods for the examination of water and wastewater. 14th ed. Washington, DC, American Public Health Association, 1976. 1193 p.

- (1) SWIRS ACC.NO.: 041143
 (2) DOMESTIC: P (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T
 (4) AUTHOR: Wood LB (10) PUB. YEAR: 1976
 (11) ABSTRACT: An investigation was conducted to examine, on a pilot scale, the feasibility of achieving improvements in the activated sludge process by using pure oxygen instead of air. The objectives of the investigation were to achieve an increased rate of carbonaceous oxidation, and increased rate of ammonia removal, the production of activated sludge with better sludge density and settlement characteristics, and the production of a reduced quantity of surplus sludge. The investigation was carried out at a sewage treatment works in England and was initiated in 1971. The use of pure oxygen instead of air did not increase the growth rate of organisms responsible for carbonaceous and ammonia oxidation, and the rate of oxidation for these substances for a unit mass of organisms was not changed. It was confirmed that the maximum growth rate of *Nitrosomonas* could be reduced in single stage systems by low pH in mixed liquor when the latter was enclosed with oxygen and carbon dioxide was allowed to build up in the gas space. The greater facility provided by the use of oxygen in allowing high concentrations of mixed liquor suspended solids to be maintained, however offered the possibility of greater hydraulic loading and smaller volumetric capacity for plants aimed only at the removal of BOD (biochemical oxygen demand) load. There was no evidence

of a reduction in the quantity of sludge produced. The rate of growth associated with organism oxidizing carbonaceous substrate was similar to that of air based sludge and resulted in a similar sludge yield. No evidence was found of increased sludge removal by endogenation and lysis.

(12) KEYWORDS: ACTIVATED SLUDGE; AIR; BULKING; COMPARISON; CONTROL; DATA; EFFECT; FACILITY; INVESTIGATION; MICROBIOLOGY; OXYGEN; SETTLEMENT

(14) HIERARCH TERMS: 1SI/2SY

(15) STIMS ACC.NO.: 00S40187 (15) SECONDARY AUTHORS: Durkin MK; King RP

(18) DOC.CIT.: Wood, L. B., R. P. King, and M. K. Durkin. The operation of a simplex activated sludge pilot plant in an atmosphere of pure oxygen. Public Health Engineer, 4(2):36-43, Mar. 1976.

(1) SWIRS ACC.NO.: 041050

(2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: S; T

(4) AUTHOR: Bryan FH (10) GEO. AREA: 1MA/2MD; 1WA (10) PUB. YEAR: 1975

(11) ABSTRACT: An overview of research projects supported by the National Science Foundation with regard to the management of municipal waste water treatment residuals is presented. The foundation's Division of Advanced Environmental Research and Technology has research projects in the field of regional environmental management, weather modification, environmental aspects of trace contaminants, environmental effects of energy, earthquake engineering, and fire research. A research program on national needs, initiated in 1969 by the foundation, focuses on the environment, energy, productivity, and resources. The application of management principles to improve regional environmental quality is discussed. Four objectives of the research program on residuals management are identified: (1) identify capabilities and limitations of known processes for the management of residuals; (2) evaluate new technological approaches for processing and managing municipal and industrial residuals; (3) achieve reconciliation of processing economies of scale promised by regionalization of residuals management with apparent collection system diseconomies; and (4) seek alternative management concepts for the conversion of residuals into products or forms that minimize or eliminate risk to human health. Several research projects of the foundation are described.

(12) KEYWORDS: ASSOC; CONTAMINATE; CONTROL; CRITERIA; DISASTER; ENVIRONMENT; GRANT; MANAGEMENT; MUNICIPALITY; POLLUTION; PROGRAM; RESEARCH; TECHNOLOGY; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1GC

(15) STIMS ACC.NO.: 00S40094

(18) DOC.CIT.: Bryan, E. H. Management of municipal wastewater treatment residuals. In U. S. Environmental Protection Agency. Proceedings; the 1975 National Conference on Municipal Sludge Management and Disposal, Anaheim, CA, Aug. 16-20, 1975. Rockville, MD, Information Transfer, Inc., 1975. p. 134-138.

(1) SWIRS ACC.NO.: 040558

(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G (10) GEO. AREA: 1ED (10) PUB. YEAR: 1976

(11) ABSTRACT: A report to Congress of the environmental research plans of the Office of Research and Development (ORD), U. S.

Environmental Protection Agency (EPA) is presented. The program is in support of EPA's legal commitments and the structure and organization of ORD, together with its objectives, are described. The four ORD offices pursue research on six major elements: (1) environmental loading and contamination associated with human activities and natural resources; (2) environmental processes that result in pollutant transformation, transport, and removal processes; (3) pollutant identification, characterization, and measurement; (4) development of measurement and monitoring methods; (5) determination of health, ecological, and other welfare effects; (6) development of alternative control technologies and management methods to affect environmental enhancement and restoration. The health and ecological effects program has seven major categories that provide information for establishment and reevaluation of water and air quality criteria, ocean disposal criteria, pesticide registration, effluent standards for toxic and hazardous materials, and radiation standards. The industrial processes program has two subprograms for point and nonpoint sources, the Minerals, Processing, and Manufacturing Industries Subprogram and the Renewable Resources Industry Subprogram. The Public Sector Activities Program is divided into waste management, water supply, and environmental management. The Monitoring and Technical Support Program is composed of research on measurement techniques and equipment development, quality assurance and technical support. Energy/Environment Program's three subprograms are described. They are health and ecological effects/energy, energy extraction and processing technology, and energy conservation, utilization, and technology assessments. The 1976 Plan and Five Year Plan is given for each project. (Retained in SWIRS library)

(12) KEYWORDS: AIR; CLASSIFICATION; EPA; HEALTH; LAW; MEASUREMENTS; MONITOR; OCEAN; PESTICIDE; PLANNING; POLLUTION; PROGRAM; RESEARCH; TRANSPORT; WATER

(14) HIERARCHY TERMS: 1AF

(15) STMS ACC.NO.: 00S39602

(16) DOC.CIT.: 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. 159 p.

(1) SWIRS ACC.NO.: 033903

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

(11) ABSTRACT: An organized effort to control the solid waste problem in Erie County, Pennsylvania is described. An environmental health survey report entitled ERIELAND 2000 was issued in 1967. Recommendations were made in this report with regard to the establishment of a solid waste disposal authority, application to the State of Pennsylvania and to the Federal Government for funding to conduct a study of solid waste problems and to develop a master plan, enactment of legislation to eliminate open dumping and burning, handling and disposal of industrial waste, and the control of discarded automobiles and other bulky waste. A countrywide study of solid waste disposal sites and practices was completed in 1968, and a solid waste disposal authority was formed in 1969. An attitude survey conducted in 1969 showed that the public's knowledge about solid waste practices was fragmented, disorganized, and often erroneous. In 1967, the Erie County Department of Health conducted a survey of all 40 municipalities in the county to determine solid waste storage practices, volume of refuse collection, and methods of disposal. A survey was made of all industries in the county in 1968 to determine the volume of refuse generated and disposal practices. In 1969, the State Solid Waste Management Act became effective, and the provisions of the act are outlined.

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(12) KEYWORDS: ADMINISTRATION; COUNTY; DISPOSAL; LAW; MANAGEMENT;
PENNSYLVANIA; SURVEY

(15) STIMS ACC.NO.: 00S37947

(18) DOC.CIT.: Example of legislation and cooperation: Erie County,
Pennsylvania. In Mantell, C. L. , ed. Solid Wastes: Origin, Collection,
Processing, and Disposal. New York, John Wiley and Sons, 1975. p. 53-67.

(1) SWIRS ACC.NO.: 033702

(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

(18) DOC.CIT.: Markle, R. A. , R. B. Iden, and F. A. Sliemers. 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 256 768 AS.)

(1) SWIRS ACC.NO.: 038559

(2) DOMESTIC: F (2) CATEGORY: 02 (2) SUBJ.TYPE: S; T (10) PUB.
YEAR: 1975

(11) ABSTRACT: The current status of the sampling methodology and
the electron microscopic techniques used to identify, count and size
asbestos particles in environmental media is discussed and data from
ambient air sampling near a California asbestos processing plant are
presented. The California population is exposed to asbestos from
natural sources such as wind and water erosion of asbestos containing
rock formations and from a multitude of anthropogenic sources. Of
particular concern are such sources as asbestos mines and mills,
automobile brake linings, asbestos spraying for fireproofing of
buildings, asbestos cement pipes for transporting drinking water,

talcum, and the widespread use of asbestos filters in the food, drug and beverage industries. Inhalation of asbestos fibers in sufficient quantity is associated with at least three diseases: asbestosis, lung cancer and mesothelioma, with latency periods measured in decades. Thus it is recommended that long range monitoring programs be established now to help assess the health effects of this pollutant. The mechanism of pathogenicity may be dependent on the size of the fibers, so monitoring schemes should include size distribution data as well as identification and counting techniques. Since most of the particles of asbestos found in environmental media are too small to be resolved by the optical microscope, electron microscopy must be used.

(12) KEYWORDS: ASBESTOS; AUTOMOBILE; CALIFORNIA; EFFECT; FIREPROOF; FOOD; HEALTH; MEASUREMENTS; MINE; MONITOR; PIPELINE; POPULATION; SAMPLING METHODS; WATER

(15) STIMS ACC.NO.: 00S37603

(18) DOC.CIT.: Wesolowski, J. J., R. Stanley, and G. Smith. Asbestos measurements in the California environment. 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. 1729-1737.

(1) SWIRS ACC.NO.: 038553

(2) DOMESTIC: F (2) CATEGORY: 02 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: A procedure has been developed which facilitates investigation of the toxicological problems that may arise in industry. The procedure for an INRS type investigation in the plastics packaging industry is described following the outbreak of an occupational related disease. The procedure is progressive. Each stage only comes into action if the previous stage has failed to find a solution to the hazard. It comprises: (1) local teams of specialist observers trained in the problems of industrial hygiene; (2) an infrastructure to collect and transmit data to analytical and research laboratories for processing; (3) multidisciplinary teams called upon to study the extent and implications of the problem, and to consolidate local observations; (4) chemical laboratories specializing in the sampling and analysis of industrial substances present in working atmospheres; (5) experimental toxicological laboratories. These particular laboratories should be capable of carrying out tests on animals in order to provide the preventer with specific methods of early detection, and of carrying out appropriate biological analysis on human samples; also a working party within which physicians, toxicologists, and statisticians should be present to interpret the results obtained during the previous stages. When the facts have been ascertained and the causes demonstrated, the report is then sent to the competent authorities so that they can take the necessary steps. (Text in French)

(12) KEYWORDS: DATA; DISEASE; HEALTH; INDUSTRY; INVESTIGATION; LABORATORY; OCCUPATION; PLASTIC; PROCESS

(15) STIMS ACC.NO.: 00S37597

(18) DOC.CIT.: Cicolella, A., D. Gradiski, and J. L. Magadur. Exemple de recherche dans une atmosphere d'une substance chimique cause d'effets pathologiques. (Investigation of an atmospheric chemical pollutant with pathological effects.) 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. 1661-1666.

HEALTH AND SAFETY

(1) SWIRS ACC.NO.: 038417
(2) DOMESTIC: F (2) CATEGORY: 10 (2) SUBJ.TYPE: T (10) PUB.
YEAR: 1976

(11) ABSTRACT: Recent studies undertaken to determine the total environmental impact of water chlorination are reported. Scientists have long been concerned over toxic materials that arise during chlorination of secondary plant effluent. During sludge digestion, ammonia is produced and dissolves in the water. When chlorine is added later to the effluent, it reacts to form hypochlorite and chloramines. Studies show that it is the chloramines that kill disease agents (as measured by coliform bacteria counts). However, the same chloramines cause fish kills when the treated water is released to water courses. Studies are now being conducted on alternative disinfection methods such as ozonation, ultraviolet radiation or gamma radiation, particularly in terms of cost effectiveness.

(12) KEYWORDS: CHLORINE; ECONOMICS; PROCESS; RADIATION; SEWAGE; STERILIZE; WASTE WATER

(15) STIMS ACC.NO.: 00537461

(18) DOC.CIT.: Chlorine looks secure as water reagent. Canadian Chemical Processing, 60(3):28-29, Mar. 1976.

(1) SWIRS ACC.NO.: 037409
(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T (10) PUB.
YEAR: 1976

(11) ABSTRACT: A \$4-million research and development program is described that was initiated by the Environmental Protection Agency (EPA) to characterize the fluidized bed coal combustion process. As part of the EPA program, interagency transfers of funds were effected to obtain the assistance of the Energy Research and Development Administration, Tennessee Valley Authority, and the Federal Energy Administration. The fluidized bed coal combustion process involves the combustion of coal within a bed of granular noncombustible material such as limestone or dolomite. Data which have been compiled to date on sulfur dioxide and nitrogen oxide emissions suggest that fluidized bed coal combustion may effectively control these pollutants. The EPA fluidized bed combustion program is designed to develop information on the emission and control of sulfur dioxide and nitrogen oxides. The program is divided into two major subobjectives: (1) environmental assessment; and (2) control technology development. Projects being carried out under EPA's program are discussed according to the following categories: broad environmental assessment, comprehensive analysis of emissions, solid and liquid waste disposal, experimental and engineering studies, and paper studies. Other Federal agencies participating in the EPA fluidized bed combustion program are noted. (Document retained in SWIRS library)

(12) KEYWORDS: COMBUSTIBLE; CONFERENCE; CONTROL; DATA; EMISSION; EPA; FLUIDIZED BED; FOSSIL FUEL; NITROGEN; OXYGEN; PROCESS; PROGRAM; RESEARCH; SULFUR

(15) STIMS ACC.NO.: 00536454

(13) DOC.CIT.: Menschel, D. B. The U. S. Environmental Protection Agency program for environmental characterization of fluidized-bed combustion systems. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 205-211).

(1) SWIRS ACC.NO.: 037406
 (2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYFF: S; T (10) PUB.
 YEAR: 1976

(11) ABSTRACT: Research and development aspects of the Department of Agriculture's program for the reclamation of lands affected by mining are reviewed. The program is concerned with anticipating and ameliorating the effects of fossil fuel and mineral development on the environment, surface resources, people, and agricultural production. The program coordinates the individual efforts of several agencies within the Department of Agriculture (USDA): Agricultural Stabilization and Conservation Service, Agricultural Research Service, Cooperative State Research Service, Economic Research Service, Extension Service, Forest Service, and Soil Conservation Service. Program goals, objectives, and benefits are detailed, with emphasis on such objectives as land reclamation, improved water use, water and air quality, maintenance and promotion of viable rural communities, agricultural and forest productivity, and environmental amenities. Field units implementing the program are noted, as well as research and development components of the program. Research and development aspects include:

(1) impact of alternative mineral extraction methods, related transportation systems, and industrial plants processing mined materials; and (2) reclamation technology (overburden analysis, redeposition, hydrology, amendments, plant materials, cost-effectiveness, pilot testing, and information systems). Roles of USDA agencies in the program are delineated, and principal contacts for research and development aspects of the program are noted. (Document retained in SWIRS library)

(12) KEYWORDS: CONFERENCE; DOA; EFFECT; ENVIRONMENT; FOSSIL FUEL; LAND; MINE; MINERAL; PROGRAM; QUALITY; RECLAMATION; RESEARCH; TECHNOLOGY; TRANSPORT; WATER

(15) STIMS ACC.NO.: 00S36451

(18) DOC.CIT.: Ward, D. J. USDA research and development for reclamation of lands affected by mining. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 182-185).

(1) SWIRS ACC.NO.: 037405
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: S; T (10) PUB.
 YEAR: 1976

(11) ABSTRACT: The prevention of adverse environmental effects in coal development activities in the eastern United States is addressed. Eastern fields dominate the coal industry both in terms of production from surface and underground mines and in terms of the number of mines. Environmental damages resulting from eastern surface mining are noted. Measures to reduce such environmental impacts are discussed, with emphasis on the development of new mining methods and reclamation techniques, reduction of acid mine drainage, and improved sediment problems. Environmental damages resulting from underground mines include acid mine drainage, subsidence, and sediment from surface facilities. The surface mining program of the Environmental Protection Agency is described in relation to the development of manuals on paleoenvironment analysis as a predictor of acid mine drainage, field and laboratory methods applicable to overburdens and mine soils, control of sediment and erosion during mining, revegetation, and prediction and pollution abatement model for mine drainage. The

development of new mining and reclamation methods is noted, and the Environmental Protection Agency's program to develop technology for dewatering underground mines is detailed along with other aspects of the agency's overall underground mining program. Resources being expended on eastern coal mining are tabulated. (Document retained in SWIRS library)

(12) KEYWORDS: ACID; CONFERENCE; DRAINAGE; EFFECT; ENERGY; ENVIRONMENT; EPA; FOSSIL FUEL; INDUSTRY; LAND; MINE; PROGRAM; PROJECTION; RECLAMATION; REGIONAL; UNDERGROUND; US

(15) STIMS ACC.NO.: 00S36450

(18) DOC.CIT.: Hill, R. D. Environmental control technology of eastern coal development. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 180-181).

(1) SWIRS ACC.NO.: 037402

(2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Objectives of the Biological Services Programs within the Fish and Wildlife Service are reviewed. The Fish and Wildlife Service's energy efforts are primarily concerned with minimizing the impact of energy developments on fish, wildlife, and related environmental values. The Biological Services Program has five terrestrial objectives: (1) define key terrestrial problems resulting from energy development; (2) obtain tools to deal effectively with terrestrial problems; (3) test and demonstrate tools and methods under controlled conditions; (4) learn how and where to put improved information to work on environmental problems; and (5) become involved in decision making as an active participant. Operational details of the Biological Services Program are presented in relation to the accomplishment of its objectives. Particular emphasis is placed on the analysis of ecological information pertaining to terrestrial areas under stress from energy extraction and processing. It is anticipated that the analysis of such information will improve ecological surveys and inventories and monitoring procedures, ecosystem classification techniques, ecosystem development assessment, predictive capabilities, and means for mitigating adverse impacts of energy development. Planned activities of the Fish and Wildlife Service are noted, along with interagency participation activities. Resources allocated to the conduct of terrestrial projects are tabulated. (Document retained in SWIRS library)

(12) KEYWORDS: ANIMAL; BIOLOGICAL; COLLECTION; CONFERENCE; DATA; EFFECT; ENERGY; FEDERAL; FISH; MANAGEMENT; MONITOR; PLANNING; PROBLEMS; PROGRAM; PROJECTION; RESEARCH; TECHNOLOGY

(15) STIMS ACC.NO.: 00S36447

(18) DOC.CIT.: Quinn, H. B., Jr. Terrestrial effects of energy development on fish and wildlife resources. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 160-163).

(1) SWIRS ACC.NO.: 037393

(2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: S; T (10) PUB.
YEAR: 1976

(11) ABSTRACT: Studies on the transformation and transport of energy-related pollutants are presented. The Environmental Protection Agency (EPA) is concerned with the meteorological processes that control the dilution and transport of pollutants; chemical and physical processes that affect the transformation and removal of pollutants; welfare effects such as visibility reduction, materials damage, and climatic change; and mathematical models that relate emissions to ambient air quality. Technical aspects of energy-related pollutant transport are discussed. The Midwest Interstate Sulfur Transformation and Transport (MISTT) Project is described that was initiated by EPA to measure the transformation and transport of energy-related pollutants in power plant and urban plumes. Significant accomplishments of this project are delineated. The Mesoscale Sulfur Balance Study (MESO) is also described that was conducted to determine the fraction of aerosol, collected in ambient rural air, which may be attributed to sulfate formed during long-range transport. Other energy-related pollutant transport studies are noted, including a planned complex terrain study; Aerosol Composition, Effects, and Sources (Project ACES); Tennessee Valley Authority programs; and programs of the Energy Research and Development Administration and industry. Resources allocated to the study of energy-related pollutants are tabulated. (Document retained in SWIRS library)

(12) KEYWORDS: AEROSOLS; AIR; CONFERENCE; CONVERT; DILUTION; EMISSION; ENERGY; EPA; MATHEMATICAL MODEL; MEASUREMENTS; POLLUTION; PRODUCE; QUALITY; REGIONAL; RESEARCH; TRANSPORT; TVA

(15) STIMS ACC.NO.: 00S36438

(18) DOC.CIT.: Wilson, W. E. Transformation and transport of energy-related pollutants. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 33-37).

(1) SWIRS ACC.NO.: 037391

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

(11) ABSTRACT: The proceedings of a conference on health, environmental, and technology aspects of energy use are reported. The conference was held in Washington, D. C. on February 9-11, 1976 and was sponsored by the Environmental Protection Agency. The conference proceedings represent a coordinated approach taken by 23 agencies and bureaus of the Federal Government to conduct a program for evaluating the environmental effects of energy sources and uses and to develop and demonstrate effective environmental control technology. Conference presentations are organized according to 12 major categories: (1) overview of energy and the environment; (2) atmospheric transport of energy-related pollutants; (3) measurement and monitoring; (4) environmental health effects of energy technology; (5) marine ecological effects; (6) fresh water ecological effects; (7) terrestrial ecological effects; (8) energy resource extraction; (9) fuel processing; (10) flue gas technology; (11) energy conservation; and (12) integrated assessment of energy systems. (Document retained in SWIRS library)

HEALTH AND SAFETY

(12) KEYWORDS: CONFERENCE; CONSERVATION; CONTROL; DISTRICT OF COLUMBIA; ECOLOGY; ENERGY; ENVIRONMENT; EPA; FUEL; HEALTH; MEASUREMENTS; POLLUTION; PROGRAM; TECHNOLOGY; WATERWAY

(15) STIMS ACC.NO.: 00S36436

(18) DOC.CIT.: U. S. Environmental Protection Agency. Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Environmental Protection Publication 600/7-76-002. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p.

(1) SWIRS ACC.NO.: 037262

(2) DOMESTIC: D (2) CATEGORY: 19 (2) 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 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; FISP; 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.: 036584

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

(11) ABSTRACT: Sprague-Dawley rats were exposed to methyl mercuric chloride in their drinking water to evaluate the effect of long-term oral exposure to methyl mercury on the metabolic responses of brain tissue. Methyl mercuric chloride was added to the drinking water at levels of 0.01, 0.10, 1.0, and 10 mg per liter in four experimental groups of rats; a fifth group served as the control. At 10 mg per liter, animals exhibited neurological symptoms typical of methyl mercury and a significant decrease in growth occurred which was associated with decreased consumption of food. Responses of respiratory intermediates to stimulation were altered in cerebral cortex slices taken from exposed animals, and effects on tissue pyridine nucleotide reduction by electrical stimulation was observed at 0.1 mg per liter; this rate progressively decreased at higher dose levels. Reoxidation of reduced pyridine nucleotide was also inhibited at 0.1 mg per liter at both 90 and 180 days of exposure. Potassium-stimulated aerobic glycolysis was enhanced in its initial stages at 0.10 mg per liter but progressively declined at 1.0 and 10 mg per liter. A close parallel was observed between the time constant of pyridine nucleotide oxidation following electrical stimulation and the responsiveness of the aerobic

glycolytic rate to stimulation by potassium. Experimental results suggested an initial defect in the oxidation of cytoplasmic NADH which progresses to a loss in the metabolic control of cytoplasmic oxidation. (Author Abstract Modified)

(12) KEYWORDS: BACTERIA; CONCENTRATION; CONTAMINATE; CONVERT; DATA; EFFECT; ELECTRICAL; EXPOSURE; INVESTIGATION; MEASUREMENTS; MERCURY; OXIDATION; PHYSIOLOGICAL; RODENT; WATER

(15) STIMS ACC.NO.: 00S35628

(18) DOC.CIT.: Bull, R. J. Methyl mercury and the metabolic responses of brain tissue. Environmental Protection Agency Publication EPA-600/1-76-013. Cincinnati, U. S. Environmental Protection Agency, Mar. 1976, 24 p. (Environmental Health Effects Research Series).

(1) SWIRS ACC.NO.: 036242

(2) DOMESTIC: D (2) CATEGORY: 02 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: World Health Organization. Proceedings of the International Conference on Environmental Sensing and Assessment are reported. The conference was held in Las Vegas, Nevada during September 14-19, 1975. Topics addressed in this first volume of a two-volume report on conference proceedings include the following: toxic materials with special reference to heavy metals, halogenated organics, design for environmental monitoring systems, evaluation and assessment of problems associated with waste disposal processes, monitoring and evaluation of atmospheric particulate matter, pesticides, evaluation and assessment of ground water quality, application of remote sensing techniques for monitoring and assessing environmental pollution, merger of technology and governance (panel discussion), inorganics, Federal Working Group on Pesticide Management (panel discussion), environmental modeling, evaluation of problems associated with energy extraction and utilization processes, and measurement and assessment of problems associated with nuclear fuel processing.

(12) KEYWORDS: AIR; CONFERENCE; DESIGN; ENERGY; INTERNATIONAL; METAL; MONITOR; ORGANIC; PESTICIDE; PROBLEMS; PROCESS; RECLAMATION; TECHNOLOGY; TOXIC

(15) STIMS ACC.NO.: 00S35287

(18) DOC.CIT.: World Health Organization. Proceedings; International Conference on Environmental Sensing and Assessment, Volume 1, Las Vegas, NV, Sept. 14-19, 1975. New York City, Institute of Electrical and Electronics Engineers Inc, 1976, 544 p.

(1) SWIRS ACC.NO.: 035730

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

(11) ABSTRACT: Disposal of forestry material and wood waste in a landfill is costly and could be hazardous. A new concept in solid waste incineration, called trench incineration or air curtain destruction, is discussed. An attempt to apply this method to municipal refuse proved infeasible because of particulate emissions and gaseous pollutants. The design consists of an enclosure with an opening at the top. Material to be burned is fed from the top and a curtain of compressed air is blown across the top, providing not only a source of oxygen but also a blanket to retain gasses and small particles until they are totally exhumed. Improvements in the design have given a volume reduction of almost 99 percent for some types of wood wastes. Studies have been made testing the efficiency, economy, and pollution effects of this method. One study showed that emissions were favorable after the system was

sufficiently warmed up. The temperature around the area was considered to be a hazard, and proper safety precautions were recommended. Studies on the effects of fan speed showed that the temperature in the trench increased with the fan speed. Tests on the design indicated that the walls of the trench should be vertical, with set dimensions for the width. Scraping and abrasion tended to increase widths, making the trenches unusable after some time. Stabilized pits with concrete walls can be used to solve this problem.

(12) KEYWORDS: AIR; BENEFIT; COMBUSTIBLE; ECONOMICS; FORESTRY; GASSES; INCINERATOR; INDUSTRY; OXYGEN; PITS; POLLUTION; PROBLEMS; PROCESS; TRENCH; WOOD

(15) STIMS ACC.NO.: 00S34775

(18) DOC.CIT.: Hoyt, G. W. Air curtain destructors--an efficient and economical solution to tree and wood waste disposal. Waste Age, 6(7):36, 38-39, 42-43, July 1975.

(1) SWIRS ACC.NO.: 032944

(2) DOMESTIC: F (2) CATEGORY: 19 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This report gives an outline of the actual state of the development of Japanese oil treating agents as well as the safety problems encountered in their use. Japan is in urgent need of developing oil treatment technology since maritime mishaps are on the increase as the import of crude oil increases. At present, one of two largely classified oil treatment methods is the mechanical method which is to adsorb effluent oil by the use of oil fences and oil recovery ships. However, the efficiency of this method sharply drops when meteorological conditions are poor. Because of this operational inefficiency, the other method, chemical treatment, is in wide use. Emulsifying, settling and collecting agents are usually included in this category, but again the use of these chemicals has its shortcomings, such as the contamination of marine products. A few actual cases are furnished as examples. Tables are provided. (Text in Japanese)

(12) KEYWORDS: ADSORPTION; CHEMICAL; EFFLUENT; JAPAN; OCEAN; OIL; PROBLEMS; SHIP; TREATMENT

(15) STIMS ACC.NO.: 00S31988

(18) DOC.CIT.: Okubo, K. Abura shorizaino anzensei to kaihatu jittai. The safety and development of oil treating agents. Kagaku Kojo, 19(4):2B-30, 1975

Section 6

METALS AND TOXIC SUBSTANCES

(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; 1PM
 (15) STIMS ACC.NO.: 00S46291
 (16) CITATION: Park Ridge, NJ, Noyes Data Corporation, 1976.
 p.73-96.

(1) SWIRS ACC.NO.: 045092
 (2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Slag industry operators review processing techniques.
 (4) AUTHOR: Herod S
 (6) JOURNAL TITLE: Pit and Quarry
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: At the 1977 annual meeting of the Plant Operators' Committee of the National Slag Association, reports and discussions focused on slag pit excavation, plant operations, maintenance, and the performance of various types of equipment. Quality control, environmental controls, safety and special projects also were examined. An extensive review of safety in the industry was given, as the industry's safety record was thought to be in need of improvement. The need for top quality control throughout the industry was emphasized, due to users demand for closer tolerance and adherence to specifications. Markets for slag products were discussed. A potential area in slurry overlay was noted as was a growing demand for steel slag in skid resistant applications for roads and highways. Sessions on slag pit excavation covered blast furnace and steel slag pits, and reviewed merits of hydraulic excavators, dozers, wheel loaders, and magnets.

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(12) KEYWORDS: CONSTRUCTION; CONTROL; EQUIPMENT; HIGHWAY; INDUSTRY; MAINTENANCE; MARKET; QUALITY; QUARRY; SAFETY; SLAG; SLURRY; SPECIFICATION

- (14) HIERARCH TERMS: 1IC; 1MD/2MU
- (15) STIMS ACC.NO.: 00S44138
- (16) CITATION: 69(12):94-95, June 1977.

(1) SWIRS ACC.NO.: 044849

(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Sick cows, human fears in Md. county.

(4) AUTHOR: Raver M

(6) JOURNAL TITLE: Washington Post

(10) LANGUAGE: EN (10) GFO. AREA: 1US/2MD (10) PUB. YEAR: 1977

(11) ABSTRACT: In rural Maryland, dairy farmers located near an aluminum reduction plant, which emits 500 lbs. of fluoride a day, fear that their animals, soil, crops, and their own bodies are being poisoned. Pollutants emitted by an electric power company's coal burning generating plant and a cement plant add further pollutants to the area. Herds within a 2 mile radius of the plant have been plagued with fevers, coughing fits, lameness, mishapen hooves, decayed teeth, infertility, reduced milk production and untimely death. Human residents have noticed changes in their own health: dizzy spells, nausea, arthritic pains, and muscle aches. A fluoride allergy specialist who examined 10 residents, considered 5 poisoned. University of Maryland School of Agriculture veterinarians studying a local herd found many poisoned. An expert in the study of fluorides and their effect on plants and animals considers Maryland fluoride standards for cattle forage protects only the aluminum industries. He also accused state employees carrying out testing procedures and fluoride analysis of either fraudulently manipulating the sample analysis data or of being totally incompetent, or both.

(12) KEYWORDS: ANALYSIS; CATTLE; CROP; DAIRY; EMISSIONS; FARM; HAZARDOUS; HEALTH; HUMAN; MARYLAND; POLLUTION; SAFETY; SAMPLING METHODS; SOIL; STANDARD; TOXIC

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

(15) STIMS ACC.NO.: 00S43894

(16) CITATION: p.B1, B4, Aug. 7, 1977.

(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 preferably 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/2BK; 1DD/2DW; 1HA/2HG

(15) STIMS ACC.NO.: 00S43119

(16) CITATION: Filed Jan. 27, 1976 issued June 28, 1977.

(1) SWIRS ACC.NO.: 033207

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: The removal, concentration, and recovery of zinc cyanide and cyanide ion from industrial electroplating wastes can be readily achieved with the weakly basic anion exchange resin, Amberlite XE-275. A major disadvantage in previous attempts to use anion exchange resins for cyanide removal was the difficulty of regeneration. Dilute sodium hydroxide easily strips both the metal cyanide and cyanide in a regeneration cycle. This new nondestructive process is promising for the recovery and recycle of water and costly chemicals now wasted and for the elimination of sludge disposal problems associated with current destructive pollution abatement methods. The method features no precipitation steps and the regenerant can be recycled for reuse in an electroplating plant.

(12) KEYWORDS: CONCENTRATION; ELECTROLYSIS; ION EXCHANGE; METAL; PLATING; PROCESS; REDUCTION; RESIN; TOXIC

(15) STIMS ACC.NO.: 00S37931

(18) DOC.CIT.: Moore, F. L. An improved ion exchange resin method for removal and recovery of the zinc cyanide and cyanide from electroplating wastes. Journal of Environmental Science and Health, 7:459-467, 1976.

(1) SWIRS ACC.NO.: 038543

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

(11) ABSTRACT: A methodology has been developed with a view of evaluating quantitatively in any given situation, the heavy metals ingested by man, as a function of levels in the environment, diet and transfer characteristics, and taking into account concentrations and dilutions which may occur at the different transfer stages, such as production, processing and distribution of foodstuffs. Conversely, the same methodology can be used to determine in each case, the limiting capacity of the environment. Given the complexity of the different parameters occurring during transfer processes, sensitivity studies appear to be essential, in order to define which research should be given priority. In order to exemplify the interrelations this methodology was applied to the transfer of the heavy metals (especially mercury, cadmium, lead, copper, and zinc) in the food chains, both in water and in the soil. (Text in French)

(12) KEYWORDS: CONTAMINATION; EARTH; EFFECT; FOOD; FOOD PROCESSING; HUMAN; METAL; NON-FERROUS; RESEARCH; WATER

(15) STIMS ACC.NO.: 00S37587

(18) DOC.CIT.: Eittel, R. , A. Garnier, and G. Lacourly. Methodologie pour l'evaluation de l'exposition de l'homme resultant de la contamination des aliments par les metaux lourds: etude de quelques cas concrets. (Methods for evaluating man's exposure to foodstuffs contaminated by heavy metals: study of some concrete cases.) 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. 1441-1449.

(1) SWIRS ACC.NO.: 038531

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

(11) ABSTRACT: In a statewide investigation and survey for lead poisoning in an asymptomatic population, blood specimens were obtained from more than 7,700 children between 1 and 6 years of age who resided in 20 Illinois cities of intermediate size (populations of 10,000 to 150,000). The percentage of children evidencing undue absorption of lead in each city varied from 9.6 to 31.3 percent, while the main blood lead levels of the samples from the different cities varied from 19.3 micrograms/100 ml to 32.9 micrograms/100 ml. Preliminary analysis of Phase Two Screening revealed extremely interesting results. The percent of asymptomatic children screened who demonstrated blood lead values in excess of 40 mcg percent ranged from 5.5 percent in one location to 13.5 percent in another locale. These figures are lower than the range reported during the 1971 campaign (9.6 to 31.3 percent). Despite the apparent reduction in range values, it is still alarming to note the significant percentage of children, randomly screened, who demonstrated elevated blood lead levels. The findings suggest that pediatric lead intoxication is not confined to urban slums, but does occur with alarming frequency in smaller communities.

(12) KEYWORDS: ABSORPTION; AGE; BIOLOGICAL; EFFECT; HUMAN; ILLINOIS; MUNICIPALITY; NON-FERROUS; POPULATION; RURAL; SAMPLING METHODS; SURVEY; TOXIC; US

(15) STIMS ACC.NO.: 00S37575

(18) DOC.CIT.: Pine, P. R. , and D. D. Dobin. The incidence of elevated blood lead values in an asymptomatic pediatric population residing in a major American industrial state. 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. 1223-1231.

(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 insoluble 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.: 038132

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1975

(11) ABSTRACT: An extensive pilot study is reported that was conducted to investigate the removal of iron and manganese from the municipal water system in Moscow, Idaho using an ozone oxidation system. The study demonstrated that ozone effectively oxidized iron and manganese to an insoluble form which could be filtered from water. Manganese was more difficult to oxidize than iron. Treating raw water (iron and manganese concentrations of 9.5 and 1.2 milligrams per liter, respectively) with an ozone dosage rate of 8.3 milligrams per liter removed all iron and manganese to below Public Health Drinking Water Standards. Reducing the ozone dosage to 6.3 milligrams per liter still removed iron but an 0.1 milligram per liter manganese residual remained. Using only oxygen without ozone precipitated iron to a concentration of 4.0 milligrams per liter, but manganese was only reduced to 0.7 milligrams per liter. Both components were far above drinking water standards. Complete oxidation of the minerals required a reaction time of 30 seconds. Filtration studies indicated that a relatively fine medium was required to remove oxide precipitation. Cost comparisons with other treatment systems showed that the ozone process was economically attractive. The operating cost of ozone treatment was low (\$0.05 per 1,000 gallons).

(12) KEYWORDS: CONFERENCE; IDAHO; IRON; METAL; MUNICIPALITY; OXYGEN; QUALITY; RECLAMATION; SOLUBILITY; STANDARD; SYSTEM; WATER

(15) STIMS ACC.NO.: 00S37226

(18) DOC.CIT.: Furgason, R. R., and R. O. Day. Iron and manganese removal with ozone. In Langworthy, V. W., ed. *Proceedings; Third Annual Pollution Control Conference on the Water and Wastewater Equipment Manufacturers Association*, Apr. 1-4, 1975. Ann Arbor, MI, Ann Arbor Publishers, Inc., 1975. p. 171-192.

(1) SWIRS ACC.NO.: 037412

(2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Trace elements in coal processing waste are discussed, and a program funded by the Environmental Protection Agency (EPA) to assess environmental problems associated with coal processing waste is described. It is noted that clay minerals are present in coal and coal refuse in greatest abundance. About 40 trace or minor elements have been identified in coal, with most trace elements distributed among major mineral constituents of coal. Many trace elements such as lead, cadmium, arsenic, selenium, and mercury are of considerable concern because of the low tolerance of plants and animals for them.

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Recognizing a need for information on which to properly assess the potential environmental problems from trace elements in coal cleaning waste, EPA initiated a program to accomplish four objectives: (1) identify chemical forms, mineralogy, and associations of trace elements in coal refuse materials and establish an understanding of the chemical properties and behavior of these materials; (2) determine the fate of trace elements during the weathering and burning of coal waste and identify those elements or processes of possible environmental concern; (3) establish chemical or physical methods for preventing or controlling environmental contamination from trace elements in coal refuse; and (4) investigate methods for economically removing or recovering useful trace minerals or metals from coal refuse materials. Task activities to accomplish these objectives are noted, along with interagency participation and resources allocated to conduct the program. (Document retained in SWIRS library)

(12) KEYWORDS: CHEMICAL; CLAY; COLLECTION; CONFERENCE; CONTROL; EPA; FOSSIL FUEL; METAL; MINERAL; PROCESS; PROGRAM; TOXIC; TRANSPORT

(15) STIMS ACC.NO.: 00S36457

(18) DOC.CIT.: Wewerka, R. M., J. M. Williams, and P. L. Wanek. Assessment and control of environmental contamination from trace elements in coal processing wastes. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 226-229).

(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.: 00S36324

(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.: 037212
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S (10) PUB.
 YEAR: 1976
 (11) ABSTRACT: The acute toxicity of tetravalent platinum was studied in vitro using rabbit alveolar macrophages and human lung fibroblasts. Alveolar macrophages were exposed in tissue culture for 20 hrs to platinum dioxide or platinum tetrachloride. There was no evidence of platinum dioxide dissolution, and no decrease in viable cells at concentrations as high as 500 micrograms per ml was observed. Platinum tetrachloride was soluble in the macrophage system and, after a 20-hr exposure, resulted in loss of viability in 50 percent of the cells originally present at a concentration of 59 micrograms of platinum per ml. After a 20-hr exposure, rapidly growing human lung fibroblasts were rendered nonviable by platinum tetrachloride at comparable concentrations. A decrease in total cellular adenosine triphosphate was observed at lower concentrations in macrophages and fibroblasts, along with a reduction in phagocytic activity of macrophages as compared to controls. With fibroblasts, a 50-percent decrease in the incorporation of 14 carbon-labeled thymidine was observed after a 22-hr exposure to platinum tetrachloride at a concentration of 0.007 micromoles. High concentrations were required to inhibit the incorporation of 14 carbon-labeled uridine and 14 carbon-labeled leucine. Time course studies indicated that the inhibition of 14carbon-labeled thymidine incorporation was nearly complete after 7 hrs in the presence of 0.06 micromoles of platinum tetrachloride. Under the same conditions there was little inhibition of 14carbon-labeled leucine incorporation and moderate inhibition of 14carbon-labeled uridine incorporation. Higher concentrations of platinum tetrachloride were required to inhibit 14carbon-labeled thymidine incorporation into the acid-precipitable fraction. It was concluded that the preferential inhibition of DNA synthesis by platinum tetrachloride may result from an impairment of the incorporation process. (Author Abstract Modified)
 (12) KEYWORDS: ANALYSIS; CARBON; CHEMICAL; COMPARISON; CONCENTRATION; DATA; EFFECT; EXPOSURE; HUMAN; MEASUREMENTS; METAL; RESEARCH; SOLUBILITY; TOXIC
 (15) STIMS ACC.NO.: 00S36257
 (18) DOC.CIT.: Waters, M. D., T. O. Vaughan, and D. J. Abernethy. Toxicity of platinum (IV) salts for cells of pulmonary origin. Environmental Health Perspectives, 12:45-56, Dec- 1975.

- (1) SWIRS ACC.NO.: 036015
 (2) DOMESTIC: F (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T (10) PUB.
 YEAR: 1975
 (11) ABSTRACT: The results obtained through experiments in regard to the stability and the concrete solidification of chrome hydroxide are demonstrated. Oxidation-reduction potential (ORP) of sexivalent chrome changes according to the changes in pH values, and the hydrogen ion has an enormous effect in the process of reductive reaction. Relation between pH value and ORP, relation between reductive reaction formula of chromic acid and theoretical volume of the reducing agent are shown in a diagram and table respectively. It is concluded that the concrete solidification is appropriate enough to contain the effluence of sexivalent chrome in the case of chrome sludge reclamation. It is anticipated that the effluence of sexivalent chrome will be prevented by taking enough curing after the solidification.
 (12) KEYWORDS: ACID; ANALYSIS; CHEMICAL; CHROMIUM; CONCRETE; HYDROGEN; ION; PH; PROCESS; RECLAMATION; REDUCTION; SLUDGE; SOLID

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(15) STIMS ACC.NO.: 00S35060

(18) DOC.CIT.: Inoue, M., O. Okita. Detoxication disposal of toxic substances: reductive treatment of sexivalent chrome and concrete solidification. Yugai busshitsu no mugaiika shori: kakuroma no kangen shori to konkuritokokeika ni tsuite. In Proceedings; 19th Japan Environmental Sanitation Lecture Meeting, Yamagata, Oct 22-23, 1975. Tokyo, Ministry of Health and Welfare, p. 69-70, 1975.

(1) SWIRS ACC.NO.: 033989

(2) DOMESTIC: F (2) CATEGORY: 12 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: The European Economic Community (EEC) Commission is seeking action to stop the dumping of red sludge into the English Channel. The sludge is the principal waste product of the titanium dioxide industry, a major supplier to the paint, plastic and ink manufacturers. It has been discovered that 87 percent of the sludge produced in England is being dumped into the English Channel, and a directive by the EEC Commission seeks to force manufacturers to reduce their pollution gradually by 95 percent over the next 10 years. The reduction of oxygenation and pH of sea water, which in turn reduces the plankton population, is the result of the dumping of red sludge. The EEC authorities also want a sampling program to assess effects of past and continuing dumping on fish, and the potential, if any, to harming human health.

(12) KEYWORDS: CONTROL; DISPOSAL; EUROPE; GREAT BRITAIN; OCEAN; PH; REDUCTION; SLUDGE

(15) STIMS ACC.NO.: 00S33033

(18) DOC.CIT.: Sludge dumpers under fire. New Scientist, 67(963):433, Aug. 1975.

Section 7

SLUDGE DISPOSAL AND GROUNDWATER PROTECTION

(1) SWIRS ACC.NO.: 047913
 (2) DOMESTIC: F (2) CATEGORY: 10 (2) SUBJ.TYPE: S; T
 (3) ARTICLE TITLE: Distribution of total and fecal coliform organisms from septic effluent in selected coastal plain soils.
 (4) AUTHOR: Reneau RB Jr
 (6) JOURNAL TITLE: Public Health Reports
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: The distribution of total and fecal coliform bacteria in three Atlantic coastal plain soils in Virginia were studied in a three year experiment. The soils studied were Varina, Goldsboro, and Beltsville sandy loams. These and similar soils are considered only marginally suitable for septic tank installation because the restricting soil layers result in the subsequent development of seasonal perched water tables. Horizontal and vertical movement of indicator organisms were determined by collecting samples for piezometers placed at selected distances and depths from the drain fields in the direction of the groundwater flow. Results indicated: large reductions in total and fecal coliform bacteria were noted in the perched groundwaters above the restricting layers as distance from the drain field increased; these restricting soil layers appeared to be effective barriers to the vertical movement of indicator organisms; and the reduction in the density of the coliform bacteria above the restricting soil layers could be attributed to dilution, filtration, and dieoff as the bacteria moved through the natural soil system.
 (12) KEYWORDS: BACTERIA; COLIFORM; EARTH; EFFLUENT; HEALTH; SEPTIC TANK
 (14) HIERARCHY TERMS: 1GW; 1HE; 1MM; 1PF; 1SJ/2HE; 1ST
 (15) STIMS ACC.NO.: 00S46965 (15) SECONDARY AUTHORS: Pettry DE; Shannhotlz MI
 (16) CITATION: 92(3):251-259, May-Jun. 1977.

(1) SWIRS ACC.NO.: 047259
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Slaughterhouses killing humans?
 (4) AUTHOR: McGargle PP
 (6) JOURNAL TITLE: Moneysworth
 (10) LANGUAGE: EN (10) PUB. YEAR: 1978
 (11) ABSTRACT: It has been hypothesized that feeding excrement and garbage to animals intended for human consumption is linked to the high incidence of cancer, heart disease, and gallstones among Americans. Material previously used as fertilizer is cooked to a dry powder, at temperatures low enough to enable concentrated sex hormones to remain physiologically active. The powder is utilized after processing to feed chickens, hogs, and dairy cows. It is suggested that the concentrations of hormones, cholesterol, and sodium nitrite in these animals as well as the use of synthetic growth hormones contribute to human pathogenesis. Evidence backing this conclusion is cited as etiological factors for the various diseases described and the presence of the etiological agents in animal food which are passed in turn to humans

consuming the animals. Suggestions are made for diminishing these practices and associated risks, including: using slaughterhouse waste as fertilizer instead of animal food; returning to higher temperature methods of rendering wastes to make constituents inactive and ineffective on subsequent consumers; removing nitrites from processed meat; and discontinuing the use of synthetic hormones in farm animal feed.

(12) KEYWORDS: ANIMAL; DISEASE; FECES; FOOD; FOOD PROCESSING; HAZARDOUS; HEALTH; HUMAN; MANURE; SLAUGHTERHOUSE; TOXIC

(14) HIERARCHY TERMS: 1FO/250; 1BE; 1HO

(15) STIMS ACC.NO.: 00S46313

(16) CITATION: 8(5):1, 26, 27, Mar. 1978.

(1) SWIRS ACC.NO.: 047109

(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Activated sludge treatment conserves water.

(4) AUTHOR: Bohac CE

(6) JOURNAL TITLE: Water Sewage Works

(10) LANGUAGE: EN (10) PUB. YEAR: 1978

(11) ABSTRACT: Treatment and reuse potential of wastewater generated from service areas where water conservation devices are in use has been investigated. An examination of activated sludge treatment kinetics was undertaken. A synthetic domestic wastewater was used to determine the effect of increased wastewater strength caused by water conservation measures. Substrate removal rates were measured for activated sludge processes treating wastewater with influent chemical oxygen demands over a wide range. A doubling of the total substrate concentration resulted in a maximum increase of 23% in the total substrate removal rate. The implication of this finding is that little aeration tank volume in secondary treatment plants can be saved by reducing wastewater flow. The total dissolved solids concentration in the treated wastewater, serving as an indicator of its reuse potential, increased by approximately 0.7 mg/l per mg/l increase in raw wastewater COD. It was concluded that activated sludge total BOD and COD effluent concentrations will increase almost proportionately to the increase in influent BOD and COD concentrations. It will be more difficult for an activated sludge treatment plant to meet BOD and COD effluent concentration requirements, as the strength of the influent wastewater increases. No aeration tank volume reduction is recommended for activated sludge treatment plants.

(12) KEYWORDS: ACTIVATED SLUDGE; CONSERVATION; HEALTH; TREATMENT; WATER

(14) HIERARCHY TERMS: 1SP/2BP; 1SP/2HE

(15) STIMS ACC.NO.: 00S46223 (15) SECONDARY AUTHORS: Sierka RA

(16) CITATION: 125(5):63-72, May 1976.

(1) SWIRS ACC.NO.: 047113

(2) DOMESTIC: D (2) CATEGORY: 06 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: biological processing: composting and hydrolysis.

(4) AUTHOR: Golueke CG

(6) BOOK TITLE: In Wilson, D. G., ed. Handbook of Solid Waste Management.

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

(11) ABSTRACT: The conversion of organic solid waste into a stable, humus like product for use as a soil conditioner by the biological

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process of composting is evaluated. Composting systems are classified on the basis of oxygen usage, temperature, and technological approach. Microbial groups found in composting material are identified, and the utility of isolates and inoculums is assessed. The nature of substrate incomposting is that of the waste being processed, with nutrient balance being essential. Rate controlling factors in the composting process are moisture content, temperature, pH level, the availability of oxygen (aeration), and genetic traits. Steps in composting involve sorting, grinding, composting itself, and storage. In composting, it is necessary to determine the degree of stabilization required, the duration of the composting stage, and the extent of volume reduction required. Technological aspects of composting are considered, including windrow and mechanized systems. Potential adverse health effects are assessed, and the nature and value of finished compost are examined. The feasibility of composting in solid waste management is analyzed. (Retained in SWIRS library).

(12) KEYWORDS: COMPOSTING; HEALTH; HYDROLYSIS; MANAGEMENT; MICROBIOLOGY; PROCESS; TECHNOLOGY; UTILIZE

(14) HIERARCH TERMS: 1CQ/2HE; 1CQ/2MX; 1MM

(15) STIMS ACC.NO.: 00S46171

(16) CITATION: New York, NY, Van Nostrand Reinhold Company, 1977. p.197-225.

(1) SWIRS ACC.NO.: 046984

(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Combustion processing of sludge - potential health and nuisance considerations.

(4) AUTHOR: Shilesky DM

(6) BOOK TITLE: In Proceedings: Third National Conference on Sludge Management Disposal and Utilization, Miami Beach, FL, Dec. 14-16, 1976.

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

(11) ABSTRACT: Effluent streams from the processing of sludge by incineration are considered in relation to potential health and nuisance problems. Particular emphasis is placed on sludge quantities, the disposition of sludge, sludge disposal guidelines and pertinent regulations, and land application. Air, water, and land effects of sludge incineration and their potential health hazards are discussed. Sludge combustion effluent streams relating to potential health effects are analyzed. Important parameters in this analysis are sulfur oxides, nitrogen oxides, carbon monoxide, photochemical oxidants (hydrocarbons), metals (lead), and organics. Odor and noise are major sources of nuisance from the combustion of sewage sludge. (Retained in SWIRS library).

(12) KEYWORDS: AIR; EFFLUENT; HEALTH; INCINERATION; LAND; NUISANCE; PROBLEMS; REGULATIONS; SLUDGE; WATER

(14) HIERARCH TERMS: 1LF/2DP; 1SP/2HE; 1SP/2HF

(15) STIMS ACC.NO.: 00S46037 (15) SECONDARY AUTHORS: Wyatt JM

(16) CITATION: Rockville, MD, Information Transfer Inc., 1977. p.154-159.

(1) SWIRS ACC.NO.: 046951

(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T

(5) CORPORATE AUTHOR: Information Transfer Inc

(6) BOOK TITLE: Proceedings: Third National Conference on Sludge Management Disposal and Utilization, Miami Beach, FL, Dec. 14-16, 1976.

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

(11) ABSTRACT: Disposal and utilization aspects of sludge

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management were the focus of a national conference held in Miami Beach, FL, on December 14-16, 1976. The conference was sponsored by the Energy Research and Development Administration, the Environmental Protection Agency, the National Science Foundation, and Information Transfer Inc. Forty-three presentations were made that dealt with such topics as sludge treatment, sludge transport, sludge composting, sludge irradiation, the disposal of municipal sludge on land, the potential for sludge reclamation and recovery, institutional considerations in sludge management, health and nuisance considerations in sludge management, combustion processing of sludge, biological effects of irradiation with high-energy electrons, anaerobic sludge digestion, sludge research, and energy production from solid waste. (Retained in SWIRS library).

(12) KEYWORDS: DISPOSAL; FLORIDA; MANAGEMENT; RECLAMATION; SLUDGE; UTILIZE

(14) HIERARCH TERMS: 1MA/2TC; 1SP/2DP; 1SP/2UT

(15) STIMS ACC.NO.: 00S46004

(16) CITATION: Rockville, MD, Information Transfer Inc., 1977. 210

p.

(1) SWIRS ACC.NO.: 046914

(2) DOMESTIC: F (2) CATEGORY: 10 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Noxious gases and odours.

(4) AUTHOR: Noren O

(6) BOOK TITLE: In Taiganides, E. P., ed. Animal Wastes.

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

(11) ABSTRACT: Gas and odor emission problems associated with degradation processes continually working in animal manure and urine are considered. The gases formed depend, to some extent, on whether degradation is aerobic or anaerobic. Gases released under aerobic conditions are odorless and nontoxic, while gases released during anaerobic degradation are toxic and malodorous. Hydrogen sulfide and ammonia are the primary toxic gases in manure. Permissible gas concentrations in terms of health are stipulated for these gases, and the toxification process is described. Gas concentrations differ widely between various manure handling systems and phases of manure handling. The design of slurry systems to prevent gas poisoning is discussed. Odors from feedlots and buildings are more of a nuisance than a health hazard. Odor measurement, sources and strength, and control are addressed. The reduction of odor release during waste handling can be achieved by treating manure, incorporating slurry directly into the soil, or using various management techniques. (Retained in SWIRS library).

(12) KEYWORDS: AEROBIC; ANAEROBIC; ANIMAL; GASSES; HEALTH; MANURE; ODOR; PROCESS; SLURRY; TOXIC

(14) HIERARCH TERMS: 1HE; 1ME/2HE; 1OF; 1TM

(15) STIMS ACC.NO.: 00S45967

(16) CITATION: Essex, England, Applied Science Publishers Ltd, 1977. p.111-129.

(1) SWIRS ACC.NO.: 046913

(2) DOMESTIC: F (2) CATEGORY: 10 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Health effects from waste utilization.

(4) AUTHOR: Mojovec J

(6) BOOK TITLE: In Taiganides, E. P., ed. Animal Wastes.

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

(11) ABSTRACT: Potential health effects resulting from the utilization of animal feedlot waste are examined. Primary emphasis is placed on public health problems associated with the utilization of animal waste in refeeding. Three things must first be established for waste to be eligible as a supplemental feed to animals: its nutritive value; its safety to animals; and the safety of its residues in animal products consumed by humans. The processing of animal excreta can be effective in reducing toxic levels and/or eliminating pathogenic elements. Physiological observations, detailed necropsies, and examinations of histological sections have revealed no detectable adverse effects for animals fed processed waste up to a certain level. The use of unprocessed feedlot waste presents problems of zoonosis, aesthetic problems, and pathogen viability. Salmonella viability, for example, is affected by temperature, the dilution of waste, and solids concentration. To insure the control of infectious disease from feedlots, it is recommended that liquid manure be disposed of after a minimum of seven days of storage. If infection of animals with an infectious disease agent is verified, liquid waste must be disinfected before disposal. (Retained in SWIRS library).

(12) KEYWORDS: ANIMAL; DISPOSAL; FEED LOT; HEALTH; MANURE; PROCESS; UTILIZE

(14) HIERARCH TERMS: 1AQ/2FD; 1HE; 1ME/2UT

(15) STIMS ACC.NO.: 00S45966

(16) CITATION: Essex, England, Applied Science Publishers Ltd, 1977. p.105-109.

(1) SWIRS ACC.NO.: 046536

(2) DOMESTIC: D (2) CATEGORY: 07 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Can California cope with its mounting sludge volumes?

(4) AUTHOR: Wassermann KL

(6) JOURNAL TITLE: Civil Engineering

(10) LANGUAGE: EN (10) GEO. AREA: 1US/2CA (10) PUB. YEAR: 1978

(11) ABSTRACT: Ways in which California might cope with its soaring volumes of sewage sludge are examined. The upgrading of many sewage treatment plants and the banning of ocean disposal of sludge by 1980 are compounding the problem. In the debate over ocean disposal, advantage such as low disposal cost, minimum energy demand, and the absence of air pollution are pitted against environmental concerns. The sludge problem is most acute in urban areas where little land is available for sludge lagooning or sludge drying beds. Sludge recycling to agricultural lands or use as a soil amendment are environmentally and economically sound but State Department of Health constraints may make these methods impractical. Incineration, pyrolysis, and other thermal processing methods are being studied to determine whether they are cost effective and can meet air quality standards.

(12) KEYWORDS: AGRICULTURE; CALIFORNIA; CONTROL; DISPOSAL; ECONOMICS; ENVIRONMENT; HEALTH; INCINERATION; LAGOONS; OCEAN; POLLUTION; PYROLYSIS; SEWAGE; SLUDGE; SOIL CONDITIONER; STANDARD; TREATMENT

(14) HIERARCH TERMS: 1DP/2HE; 1DP/2MX; 1EP; 1SP/2DP

(15) STIMS ACC.NO.: 00S45589

(16) CITATION: 48(2):60-65, Feb. 1978.

(1) SWIRS ACC.NO.: 046216

(2) DOMESTIC: F (2) CATEGORY: 21 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Reduction in sewage contamination in Sydney rock oysters.

(4) AUTHOR: Qadri RB
 (6) JOURNAL TITLE: Food Tech Austral
 (10) LANGUAGE: EN (10) GEO. AREA: 1AU (10) PUB. YEAR: 1976
 (11) ABSTRACT: Research was conducted on methods of purification (depuration) of contaminated oysters grown commercially in the Georges River/Botany Bay area of Sydney. Seasonal analyses labeled all oysters grown in the estuary as unsatisfactory in bacteriological quality. Suggested methods for reducing the levels of sewage bacteria in these polluted oysters include: (1) relaying them in a clean body of water; (2) freezing; and (3) frozen storage under controlled conditions. Feasibility and economic considerations of each technique are considered; their effectiveness, measured in coliform counts, is tabulated.
 (12) KEYWORDS: AUSTRALIA; BACTERIA; CONCENTRATION; HEALTH; POLLUTION; RESEARCH; SHELL; WATERWAY
 (14) HIERARCH TERMS: 1AN; 1BC; 1RP; 1WE/2HE
 (15) STIMS ACC.NO.: 00S45267 (15) SECONDARY AUTHORS: Buckle KA; Edwards RA
 (16) CITATION: 28 (11) :411-416, Nov. 1976.

(1) SWIRS ACC.NO.: 046063
 (2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: T
 (3) ARTICLE TITLE: Sludge digestion and disposal.
 (6) BOOK TITLE: In Billings, C. H., S. H. Conner, and J. R. Kircher, eds. 1977 Public Works Manual and Catalog File.
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: Processes involved in the treatment and disposal of sludge are categorized and described. Treatment processes include: thickening, stabilization, conditioning, dewatering, heat drying, reduction, and final disposal. Particular emphasis is placed on anaerobic digestion (tank design and capacity, biological action, sludge handling, gas collection, supernatant disposal, mixing and scum breaking, floating covers, and heating sludge); gas utilization (storage, digester instrumentation, safety devices, gas heated boilers, engine selection, and accessories); chemical stabilization; dewatering sludge through air drying and vacuum filters; sludge as fertilizer; filter cake drying; and sludge disposal by incineration, wet air oxidation, and fluidized beds. A list of domestic manufacturers of equipment and materials used in sludge treatment and disposal are noted. (Retained in SWIRS library).
 (12) KEYWORDS: DIGESTION; DISPOSAL; EQUIPMENT; SLUDGE; TREATMENT
 (14) HIERARCH TERMS: 1SP/2ET; 1TV
 (15) STIMS ACC.NO.: 00S45113
 (16) CITATION: Shepherdsville, KY, Public Works Journal Corporation, 1977. p.D-38--D-49.

(1) SWIRS ACC.NO.: 045853
 (2) DOMESTIC: F (2) CATEGORY: 12 (2) SUBJ.TYPE: G
 (4) AUTHOR: Anderson GK
 (6) BOOK TITLE: Guidelines for the Control of Industrial Wastes.
 12. Slaughterhouse Wastes. (8) REPORT NO.: WHO/WD/77.19
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: Guidelines for the treatment and disposal of slaughterhouse waste are presented in this publication of the World Health Organization. Meat production processes are illustrated, and the quantity and characteristics of waste generation from such processes are discussed. The polluting nature of slaughterhouse waste is

examined. Waste reduction and reclamation measures are explored, including reduction in waste volume, reduction in waste strength, and reduction in pollution load through the recovery of by-products. Four methods of waste water treatment and disposal are detailed: (1) segregation and pretreatment; (2) aerobic biological treatment (biological filters and activated sludge); (3) anaerobic biological treatment (anaerobic lagoons and anaerobic digestion); and (4) sludge disposal. Data resulting from the analysis of slaughterhouse waste water are provided. (Retained in SWIRS library).

(12) KEYWORDS: AEROBIC; ANAEROBIC; DISPOSAL; INDUSTRY; POLLUTION; RECLAMATION; REDUCTION; SLAUGHTERHOUSE; SLUDGE; TREATMENT; WASTE WATER; WHO

(14) HIERARCH TERMS: 1PD/2FO; 1PD/2PW; 1SH

(15) STIMS ACC.NO.: 00S44902

(16) CITATION: Geneva, Switzerland, World Health Organization, 1977. 13 p.

(1) SWIRS ACC.NO.: 045834

(2) DOMESTIC: F (2) CATEGORY: 20 (2) SUBJ.TYPE: G

(3) ARTICLE TITLE: Moglichkeiten der Behandlung und Verwendung von Abprodukten. (Possibilities of treating and utilizing waste products).

(4) AUTHOR: Baeck H

(6) JOURNAL TITLE: Technik

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

(11) ABSTRACT: Utilization of waste material is viewed from a broad angle. Research on new methods of waste use is presented as top priority. Public Health, economics, and reclamation facilities are given special attention. It is suggested that more emphasis be placed on installations with the capability of treating several types of waste. When processing a waste product, it should be considered together with the framework of its industrial branch, its territory and the economy as a whole. (Original text in German).

(12) KEYWORDS: ECONOMICS; FACILITY; GERMANY; INDUSTRY; RECLAMATION; RESEARCH; TREATMENT

(14) HIERARCH TERMS: 1IC/2JA; 1MJ/2NA; 1SB; 1TG

(15) STIMS ACC.NO.: 00S44883

(16) CITATION: 32(8):451-453, Aug. 1977.

(1) SWIRS ACC.NO.: 045759

(2) DOMESTIC: F (2) CATEGORY: 10 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Effect of sewage treatment by stabilization pond method on the survival of intestinal parasites.

(4) AUTHOR: Veerannan KM

(6) JOURNAL TITLE: Indn J Environ Hlth

(10) LANGUAGE: EN (10) GEO. AREA: 1IA/2II (10) PUB. YEAR: 1977

(11) ABSTRACT: Three stabilization ponds were studied to determine their efficiency in reducing parasitic cysts and ova in sewage. The pond at the Tambaram T.B. Sanitorium was found to be the most effective, eliminating up to 100 percent of the protozoan cysts. The pond at Kodungaiyur, however, was more efficient in removing helminthic ova. Results prove the suitability of the stabilization pond method in reducing intestinal parasites in sewage. Tables are included.

(12) KEYWORDS: HEALTH; INDIA; PARASITE; REDUCTION; SEWAGE; STABILIZATION

(14) HIERARCH TERMS: 1HB; 1PC; 1SP/2SR; 1TG

(15) STIMS ACC.NO.: 00S44808

(16) CITATION: 19(2):100-106, Apr. 1977.

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(1) SWIRS ACC.NO.: 045542
 (2) DOMESTIC: F (2) CATEGORY: 24 (2) SUBJ.TYPE: S
 (3) ARTICLE TITLE: Virus removal in activated sludge sewage treatment.
 (4) AUTHOR: Rao VC
 (6) JOURNAL TITLE: Progress Water Tech
 (10) LANGUAGE: EN (10) GEO. AREA: 1AI/2II (10) PUB. YEAR: 1977
 (11) ABSTRACT: An evaluation of virus removal by the activated sludge sewage treatment plant at Dadar, Bombay is presented. The two-year study revealed that, in primary settling, the average percent reduction during monsoon, autumn, winter and summer was 29.3, 65.2, 52.3 and 64.3 respectively; in the final unchlorinated effluent, the average reduction percentages were 97.3, 94.0, 97.1 and 97.3. The average percent removal of viruses in the various seasons was in the range of 94.0-97.3. The analytic methods which proved most ideal under these tropical conditions are described.
 (12) KEYWORDS: ACTIVATED SLUDGE; ANALYSIS; DATA; HEALTH; INDIA; PATHOGEN; SAMPLING METHODS; SEWAGE; TREATMENT; VIRUS
 (14) HIERARCH TERMS: 1PC; 1SP/2SU; 1SI/2SX; 1SI/2S4
 (15) STIMS ACC.NO.: 00S44590 (15) SECONDARY AUTHORS: Lakhe SB; Waghmare SV
 (16) CITATION: 9(1):113-127, 1977.

(1) SWIRS ACC.NO.: 045501
 (2) DOMESTIC: F (2) CATEGORY: 24 (2) SUBJ.TYPE: T
 (3) ARTICLE TITLE: The ultimate disposal of sludge.
 (4) AUTHOR: Silvester DK
 (6) JOURNAL TITLE: Public Health Engr
 (10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1976
 (11) ABSTRACT: Treatment requirements for disposal of sludge to land in three forms (liquid, organic, inert) were reviewed with reference to design and operation of water pollution control facilities at Newton Abbot, England. It was determined that disposal as a liquid or as organic matter has advantages of economy and convenience of handling, but there are serious environmental and health nuisances, slow digestion and reentrance into the environment, and build-up of toxic materials by these methods. Disposal as inert matter after incineration is more expensive, but also easier to dispose of by reduction of bulk and because it is absorbed immediately into the environment. Based on these considerations, design of new facilities selected incineration and inert disposal methods. Discussion of the facility's design and operation is appended.
 (12) KEYWORDS: DESIGN; DISPOSAL; ECONOMICS; ENVIRONMENT; INCINERATION; SLUDGE; TREATMENT
 (14) HIERARCH TERMS: 1DD/2DO; 1SP; 1SI/2S5
 (15) STIMS ACC.NO.: 00S44549 (15) SECONDARY AUTHORS: Lewis K
 (16) CITATION: 4(6):153-159, Nov. 1976.

(1) SWIRS ACC.NO.: 043872
 (2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T
 (3) ARTICLE TITLE: AWT plant meets tough demands.
 (4) AUTHOR: Benham JF
 (6) JOURNAL TITLE: Waste and Wastes Engineering
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2OK (10) PUB. YEAR: 1977
 (11) ABSTRACT: Tertiary treatment is being provided in Lawton, Oklahoma, one of the first communities in the Southwest to face stringent effluent and design criteria for wastewater treatment. The Health Department requires that the treatment plant produce high

quality effluent. Design provisions allow for additional facilities to remove nitrogen in the future. The plant is designed for an average treatment capacity of 10 mgd. The flow scheme incorporates conventional preliminary and primary treatment followed by two stage biological treatment and by a chemical precipitation and granular media filtration section. The economics of chemical purchases for phosphorus removal received special attention. The sludge incineration produces carbon dioxide by sludge combustion which can be used in place of purchased carbon dioxide, for recarbonation. The plant is one of the first to provide adequate capacity for treatment of all flow, including wet weather flow peaks. A 500 acre feet effluent storage basin was constructed on the plant site for storage of reclaimed water. Provisions have also been made to disinfect the water prior to discharge to the stream. Preliminary studies and design planning are described and an account of the basic process flow is given. The Lawton plant design data for the current project and for anticipated expansions are tabulated.

(12) KEYWORDS: BIOLOGICAL; BOD; CARBON DIOXIDE; CHEMICAL; EFFLUENT; FILTER; GOVERNMENT; INCINERATION; NITROGEN; OKLAHOMA; PHOSPHORUS; REGULATIONS; SLUDGE; STANDARD; STATE; STORAGE; TREATMENT; WASTE WATER

(14) HIERARCH TERMS: 1LB/2LG; 1MA/1MD; 1SF/2ST

(15) STIMS ACC.NO.: 00S42915

(16) CITATION: 14(2):59-62, 75, Feb. 1977.

(1) SWIRS ACC.NO.: 043756

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T

(3) ARTICLE TITLE: Soils infiltration and evaporation of wastewater by aerobic processes.

(4) AUTHOR: Young AN Jr

(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: The use of aerobic treatment systems to provide effluent that can be properly infiltrated or evaporated from marginal soil or soil with little or no ability to absorb water is explored. The ultimate goal of sewage disposal and large treatment systems should be the complete recycling of waste water effluent to eliminate health hazards and recharge water tables to maintain an ecological balance in nature. Another aspect of recycling waste water effluent is the proper use of soil and the development of areas for treated effluent beyond conventional methods associated with the employment of septic tanks. If drainage fields are maintained in aerobic conditions, microorganisms develop to prey on bacteria. Each organism is capable of consuming 100,000 to 1,000,000 bacteria per day, thereby retaining porous conditions or openings in the interstices of even difficult soil such as clay. Aerobic drainage fields or evapotranspiration beds, if properly constructed, also efficiently oxidize nutrients contained in waste water and retain them within soil or permit their uptake to vegetation planted on the surface of shallow disposal areas. Such fields or beds develop heat which is approximately 10 times the heat or energy developed through anaerobic processes. Specific uses of aerobic drainage fields and evapotranspiration beds to permit the efficient disposal of treated waste water effluent are cited.

(12) KEYWORDS: AEROBIC; BACTERIA; DISPOSAL; DRAINAGE; EFFLUENT; ENERGY; HEALTH; HEAT; LAND; MICROORGANISM; RECLAMATION; SEWAGE; SYSTEM; TREATMENT; VEGETATION; WASTE WATER

(14) HIERARCH TERMS: 1EE/2ES; 1MP; 1PM; 1SF/2SS

(15) STIMS ACC.NO.: 00S42799

(16) CITATION: Mt. Prospect, IL, Institute of Environmental Sciences, 1977. p.115-117.

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(1) SWIRS ACC.NO.: 043207
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S
 (3) ARTICLE TITLE: Persistence of poliovirus I in soil and on vegetables irrigated with sewage wastes: potential problems.
 (4) AUTHOR: Larkin EP
 (6) BOOK TITLE: In Baldwin, L. H., J. M. Davidson, and J. P. Gerder, eds. Virus Aspects of Applying Municipal Waste to Land.
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: The persistence of the human enterovirus, poliovirus I, on lettuce and radishes irrigated with sewage waste and in soil where the vegetables were grown was studied. Virus recovery in vegetable samples was monitored over 3 years. The survival of poliovirus I in soil flooded with inoculated sewage sludge and effluent was determined during two summer growing seasons and one winter period. Poliovirus I persisted on spray irrigated lettuce and radishes for up to 36 days. The longest period of survival in soil was during the winter, when viruses were detected after 96 days. During the summer, the longest survival period in soil was 11 days. Poliovirus I was recovered from mature vegetables 23 days after flooding of the plots had ceased. Since viruses have been shown to pass through sewage treatment plants, sometimes with little or no reduction in titer or infectivity, it is believed that the use of sewage sludge and effluent for the growth of crops which are consumed raw is potentially hazardous. Sewage irrigated crops that enter the household in a raw state and later undergo a heat treatment process are also considered to be potentially hazardous because of the problem of cross contamination.
 (12) KEYWORDS: HEALTH; IRRIGATION; MONITOR; PROBLEMS; SEWAGE; SOIL CONDITIONER; VEGETABLE; VIRUS
 (14) HIERARCH TERMS: 1HB; 1MF; 1MK; 1SF/2SU
 (15) STIMS ACC.NO.: 00S42250 (15) SECONDARY AUTHORS: Sullivan R; Tierney JT
 (16) CITATION: Gainesville, FL, University of Florida, (1977). p.119-130.

(1) SWIRS ACC.NO.: 042952
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S
 (3) ARTICLE TITLE: Persistence of Mycobacterium bovis BCG in soil and on vegetables spray-irrigated with sewage effluent sludge.
 (4) AUTHOR: Van Donsel DJ
 (6) JOURNAL TITLE: J Food Protection
 (10) LANGUAGE: EN (10) PUB. YEAR: 1977
 (11) ABSTRACT: Concerns for public health, specifically the potential for tuberculosis contamination as a result of land disposal methods of sewage and sludge prompted this study to determine the survival of mycobacteria in soil irrigated with sewage effluent and sludge and to establish the likelihood of contamination of vegetables eaten raw. Survival of Mycobacterium bovis BCG on garden plots spray irrigated with sewage effluent or sludge was studied to determine persistence of mycobacteria under conditions approximating current practices. The D value (90 percent reduction time) in effluent sprayed soil was 11 days; and in sludge sprayed soil, 8 days. On effluent sprayed radishes, the D value was 6 days, and on sludge sprayed radishes, 4 days; however, this difference was not significant. Isolation from lettuce was too erratic to determine a true survival rate, but the organism was isolated sporadically for up to 35 days. Other literature is noted which deals with the incidence of tubercle bacilli occurring in typical urban sewage after treatment.
 (12) KEYWORDS: DISEASE; DISPOSAL; EFFLUENT; HEALTH; IRRIGATION; LAND; MICROBIOLOGY; MICROORGANISM; PATHOGEN; SEWAGE; SLUDGE; VEGETABLE
 (14) HIERARCH TERMS: 1DU/2DK; 1HB; 1MF
 (15) STIMS ACC.NO.: 00S41995 (15) SECONDARY AUTHORS: Larkin EP
 (16) CITATION: 40 (3):160-163, Mar. 1977.

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(1) SWIRS ACC.NO.: 042793
 (2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S
 (3) ARTICLE TITLE: Bacteriological investigation of Alberta meat-packing plant wastes with emphasis on Salmonella isolation.
 (4) AUTHOR: Vanderpost JM
 (6) JOURNAL TITLE: Applied and Environmental Microbiology
 (10) LANGUAGE: EN (10) GEO. AREA: 1CD (10) PUB. YEAR: 1977
 (11) ABSTRACT: The waste treatment facilities and final effluents of 11 meat packing plants in the Province of Alberta Canada were investigated to determine the numbers of indicator bacteria and the presence of Salmonella. The efficiency of the treatment systems presently in operation in reducing bacterial numbers was examined and the need for disinfection and for bacterial standards for these effluents was established. Data showed that the final effluents were of very poor quality bacteriologically, with numbers of indicator organisms comparable to those found in raw sewage. Primary treatment facilities were ineffective in reducing the numbers of these bacteria. The secondary treatment facility investigated (using aerating tank activated sludge) achieved greater than a 99 percent reduction of indicator bacteria. Salmonella were isolated from the final effluents of 78 percent of the plants, including the plant using secondary treatment. In total, 21 Salmonella serotypes were isolated. Salmonella isolates were not antibiotic resistant, but certain coliform and fecal coliform isolates demonstrated resistance to chloramphenicol, tetracycline, and ampicillin.
 (12) KEYWORDS: ACTIVATED SLUDGE; AERATION; BACTERIA; CANADA; COLIFORM; DATA; EFFLUENT; FACILITY; FECAL; FOOD PROCESSING; HEALTH; MICROBIOLOGY; SEWAGE; STANDARD; STERILIZE; TREATMENT
 (14) HIERARCHY TERMS: 1FD/2FR; 1HB; 1MF
 (15) STIMS ACC.NO.: 00S41836 (15) SECONDARY AUTHORS: Bell JB
 (16) CITATION: 33(3):538-545, Mar. 1977.

(1) SWIRS ACC.NO.: 042501
 (2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: T
 (3) ARTICLE TITLE: Poultry processing wastewater--advanced treatment and reuse.
 (4) AUTHOR: McGrail DT
 (6) BOOK TITLE: In Proceedings: the Seventh National Symposium on Food Processing Wastes, Atlanta, GA, Apr. 7-9, 1976. (8) REPORT NO.: EPA-600/2-76-304
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2MD (10) PUB. YEAR: 1976
 (11) ABSTRACT: A report is presented on a water reuse project undertaken by the Bureau of Sanitary Engineering of the Maryland State Department of Health and Mental Hygiene at the Sterling Processing Corporation in Oakland, Maryland which slaughters, eviscerates, and processes broilers for consumption. An advanced treatment plant was designed and built to study the possibility of recycling poultry processing wastewater. Wastewater characteristics, facilities design and operations, and project details are given. It was demonstrated that the reclaimed wastewater satisfies the chemical, biological and physical limits for potable grade water. It is recommended that the study be continued in order to demonstrate the presence of any significant health characteristics not demonstrated by existing drinking water standards. Another aspect of the study was to demonstrate the safety of poultry processed in this reclaimed water.
 (12) KEYWORDS: DEMONSTRATION; DESIGN; FOOD; FOOD PROCESSING; INDUSTRY; MARYLAND; PLANT-INDUSTRIAL; POULTRY; RECLAMATION; SAFETY; SLAUGHTERHOUSE; TREATMENT; WASTE WATER; WATER
 (14) HIERARCHY TERMS: 1FD/2FU; 1FD/2FW; 1IC/2JA; 1PM
 (15) STIMS ACC.NO.: 00S41544
 (16) CITATION: Cincinnati, OH, U.S. Environmental Protection Agency, December 1976. p.298-307. (Environmental Protection Technology Series.)

HEALTH AND SAFETY

(1) SWIRS ACC.NO.: 041866
 (2) DOMESTIC: F (2) CATEGORY: 01 (2) SUBJ.TYPE: S
 (4) AUTHOR: Ward GM (10) GEO. AREA: 1MB/2MI; 1MB/2MP; 1RB (10)
 PUB. YEAR: 1976
 (11) ABSTRACT: Research studies on the effective use of nutrients from cattle waste are reported. Some components of animal waste contain residues after digestion, although microbial protein resulting from bacterial growth in the rumen and large intestine commonly represents a higher quality protein than that found in cattle feed. The preparation of cattle waste and its use as feed material are detailed. The most simple approach to refeeding cattle waste is to remove air dried waste from feedlots, grind it, and mix it in rations. Other processing methods are described, and data are presented on manure constituents and the chemical composition of cattle feces. The use of dried cattle manure as poultry feed is examined. Health and regulatory aspects associated with the recycling of animal waste are explored, with emphasis on the potential hazard from pathogens and non nutritive feed additives. Protein is identified as the most valuable nutrient from cattle waste. It is pointed out that feeding trials with fresh or dried cattle manure and manure products have not resulted in any evident disease or pathological conditions.
 (12) KEYWORDS: CATTLE; FEED; HEALTH; INVESTIGATION; MANURE; PATHOGEN; PROCESS; PROTEIN; RECLAMATION; SAFETY; UTILIZE
 (14) HIERARCH TERMS: 1HB
 (15) STIMS ACC.NO.: 00S40910 (15) SECONDARY AUTHORS: Muscato T
 (18) DOC.CIT.: Ward, G. M., and T. Muscato. Processing cattle waste for recycling as animal feed. World Animal Review, (20):31-35, 1976.

(1) SWIRS ACC.NO.: 041850
 (2) DOMESTIC: D (2) CATEGORY: 20 (2) SUBJ.TYPE: T
 (4) AUTHOR: Kowalczak J (10) GEO. AREA: 1US/2MS (10) PUB. YEAR: 1976
 (11) ABSTRACT: Operations of Northeast Metal Processors in Plantersville, Mississippi, are detailed. The firm has concreted about 5 acres of land which is layed out so that material from industrial plants can be sorted as it comes in. After material is unloaded or dumped, it is evaluated and then upgraded. Sixteen employees are responsible for processing the material. Equipment used by the firm includes a briquette, baler, flattener, front end loaders, and hydraulic loaders. Most of the equipment employed in scrap processing is hydraulically operated. Safety and maintenance aspects of the scrap processing operations are examined.
 (12) KEYWORDS: EQUIPMENT; INDUSTRY; MISSISSIPPI; OPERATIONS RESEARCH; PLANT-INDUSTRIAL; PROCESS; SCRAP; SEPARATING
 (14) HIERARCH TERMS: 1MD/2MS/3ME; 1MD/2MT
 (15) STIMS ACC.NO.: 00S40894
 (18) DOC.CIT.: Kowalczak, J. A very unique operation-and then some. Scrap Age, 33(12):106, 126, 131, Dec. 1976.

(1) SWIRS ACC.NO.: 041796
 (2) DOMESTIC: D (2) CATEGORY: 07 (2) SUBJ.TYPE: S; T
 (4) AUTHOR: Leckie J (10) GEO. AREA: 1DD/2DO; 1EC/2ET (10) PUB. YEAR: 1975
 (11) ABSTRACT: Methods for handling the disposal of human and animal waste are detailed. Particular attention is given to methane digesters. The digestion process is described, as well as the design of digesters. Factors to consider in the use of methane digesters are

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noted, including the general composition of waste, substances inhibiting digester operation, the ratio of carbon to nitrogen, feed slurry, the calculation of detention time (chemical oxygen demand, solids retention time, temperature, and safety), digester characteristics, digester products, and the digestibility of algae. Other waste handling techniques are addressed. These involve the Clivus Multrum system primarily for single family houses, outhouses, septic tanks, and oxidation ponds. In the use of oxidation ponds, consideration must be given to bacteria and algae, waste water and the biochemical oxygen demand, climatic factors, construction and maintenance, and the harvesting and processing of algae.

(12) KEYWORDS: ANIMAL; CRITERIA; DIGESTOR; DISPOSAL; FECES; HUMAN; METHANE; OPERATIONS RESEARCH; REFUSE; SAFETY; SYSTEM

(14) HIERARCH TERMS: 1MB/2MO

(15) STIMS ACC.NO.: 00S40840 (15) SECONDARY AUTHORS: Halvadakis C

(18) DOC.CIT.: Leckie, J. , and C. Halvadakis. Waste-handling systems. In Leckie, J. , G. Masters, and H. Whitehouse. Other Homes and Garbage: Designs for Self-sufficient Living. San Francisco, CA, Sierra Club Books, 1975. p. 188-231.

(1) SWIRS ACC.NO.: 040858

(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S (10) GEO. AREA: 1US/2NJ; 1US/2NY/3NY (10) PUB. YEAR: 1976

(11) ABSTRACT: Environmental impacts associated with the application of sludge to land are evaluated. Environmental impacts, both beneficial and adverse, are considered according to the following topics: heavy metals, nutrients, organic materials, pathogens, and others. Parameters determining the ultimate mobility of heavy metals in soils are plant tolerance and heavy metal uptake and movement. Some heavy metals are essential plant nutrients, and nutrients are important in plant growth and development. The effect of nitrogen, phosphorus, and inorganic salts on the acceptability of land application of sludge is discussed. Nitrogen loading, in conjunction with heavy metals, is considered to be the most significant determinant of land application acceptability. The nitrogen content of sludge depends on sludge processing and application procedures, soil pH, and weather conditions. Phosphorus and inorganic salts found in waste water sludge do not generally cause severe environmental impacts. Waste water sludge does contain a number of pathogenic organisms which are potential health hazards, although there is very little evidence of actual disease transmission to humans or animals by the land application of stabilized sludge. Other impacts of a land application program are related to land use and employment.

(12) KEYWORDS: CONTAMINATE; CRITERIA; DISPOSAL; EFFECT; ENVIRONMENT; LAND; LEACH; MANAGEMENT; METAL; NEW JERSEY; NEW YORK; PATHOGEN; PLANNING; PROGRAM; REGIONAL; SLUDGE; WASTE WATER

(14) HIERARCH TERMS: 1SI; 1SJ

(15) STIMS ACC.NO.: 00S39902

(18) DOC.CIT.: Environmental assessment of land application. 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. VIII. 52-VIII. 57.

(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; 1PK; 1WA

(15) STIMS ACC.NO.: 00539391

(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. 130.

(1) SWIRS ACC.NO.: 040776

(2) DOMESTIC: D (2) CATEGORY: 01 (2) SUBJ.TYPE: T

(4) AUTHOR: Jewell WJ (10) PUB. YEAR: 1976

(11) ABSTRACT: Literature concerning agricultural wastes is reviewed. Three articles discuss legal and economic considerations. Waste characteristics and impacts are the subject of 38 studies which included determinations of the impact on beef feedlot manure accumulation in outdoor areas affected by animal density and surface slope and measurements of the public health effects of pathogens in beef cattle manure found in oxidation ditch treatment systems. The potential impact of cattle feedlot runoff to cause algal growth is reported. In another study, the geochemical characteristics of stream sediments is related to quality changes to a nearby animal production operation. The rheology and pumping characteristics of animal wastes was the subject of one of several articles concerning the transportation of animal wastes. Waste treatment is the subject of 30 studies which looked specifically at runoff from feedlots, pig waste treatment, and poultry wastes. Land disposal of wastes in agriculture account for 57 articles which deal with animal wastes, wastewater sludge, and application wastewater in agriculture/domestic wastewater (including a summary of 111 abstracts on irrigation with wastewater and organic wastes), and food processing and miscellaneous waste land application. Energy production and refeeding as applied to reuse of agricultural wastes are the subjects of a significant number of papers. Eighteen articles discuss nonpoint source pollution. Systems analysis and modeling were the concern of eight authors. The proceedings of the third International Symposium on Livestock Waste contains 181 papers focusing on management aspects. One hundred and ninety one references are included.

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(12) KEYWORDS: AGRICULTURE; CATTLE; DRAINAGE; ENERGY; FEED LOT; IRRIGATION; LAND; LITERATURE; MANAGEMENT; MANURE; OXIDATION DITCH; PATHOGEN; POLLUTION; POULTRY; SLUDGE

(14) HIERARCH TERMS: 1AB

(15) STIMS ACC.NO.: 00S39820 (15) SECONDARY AUTHORS: Smith DJ

(18) DOC.CIT.: Jewell, W. J. , and D. J. Smith. Industrial wastes: agricultural wastes. Journal Water Pollution Control Federation, 48(6):1263-1280, June 1976.

(1) SWIRS ACC.NO.: 038500

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

(11) ABSTRACT: The disinfection of polio virus in sewage by ozone was examined employing two different methods. First, the filtered sewage together with a virus inoculum was added to a buffer solution which contained ozone. The most outstanding finding was the complete disappearance of the ozone immediately after the addition of the effluent. At the same time there was a rapid reduction in virus titer. After the initial reduction, the virus titer remained unchanged. The degree of virus inactivation was dependent on ozone concentration and on the amount of organic matter in the effluent. With increased ozone concentration and decreased organic matter, a large percentage of viruses were inactivated. With the second method, ozone was bubbled into filtered sewage containing a virus inoculum. Inactivation of the virus started after a lag period of about 30 seconds even before ozone residual in the sewage was detected. It was concluded that ozone was a very potent virus disinfectant even in contaminated water.

(12) KEYWORDS: DISEASE; OXYGEN; RESEARCH; SEWAGE; STERILIZE; TREATMENT; VIRUS

(15) STIMS ACC.NO.: 00S37544

(18) DOC.CIT.: Katzenelson, E. , and N. Biedermann. Disinfection of viruses in sewage by ozone. Water Research, 10(7):629-631, 1976.

(1) SWIRS ACC.NO.: 039329

(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Since it is customary to spread solid fraction, removed from treatment plants processing dairy waste materials on farm land, the possibility that this waste material (sludge) may contain mycobacteria and could cause disease or sensitize cattle grazing on treated pastures was investigated. Sixty three samples of dairy creamery effluent were examined for the presence of mycobacteria. Thirty two strains were isolated, comprising *M. fortuitum*, *M. peregrinum*, *M. gordonae*, and *M. marianum* (*scrofulaceum*); four remained unidentified. Ten strains, representative of all the groups isolated, were tested for their effect on experimental animals. None were found pathogenic for guinea pigs or mice, but a number produced a minimal amount of skin sensitization (erythema) in guinea pigs injected with avian and mammalian tuberculus. The samples of effluent sludge were collected at the point of discharge from dairy factories. Methods applied to isolating the mycobacteria are described in detail. There was little indication that dairy effluent sludge was of any significance in the epidemiology of mycobacterial infections. The Public Health Laboratory in Cardiff (Great Britain) is credited with supplying the strains used in the preparation of antisera. The study was conducted by the Institute for Research on Animal Diseases, Compton, Newbury, Berkshire (Great Britain).

(12) KEYWORDS: BACTERIA; DAIRY; EFFLUENT; EPIDEMIOLOGY; GREAT BRITAIN; SLUDGE

(15) STIMS ACC.NO.: 00S37373

(16) DOC.CIT.: Matthews, P. R. , P. Collins, and P. W. Jones. Isolation of mycobacteria from dairy creamery effluent sludge. The Journal of Hygiene, 76(3):407-413, June 1976.

(1) SWIRS ACC.NO.: 037884

(2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Benefits ensuing from the addition of baking soda to septic tanks are explored. Flow through a septic tank is discussed, along with the hydraulic characteristics of septic tanks. The results of field demonstrations on the effectiveness of dead spaces in septic tanks are presented which show that liquid volumes of the tanks have considerable proportions of hydraulically less active zones where dissolved or suspended solids can be stored and exchanged slowly with hydraulically active zones. The use of cationic polymers as additives to septic tanks is examined, as well as screening cationic polymer flocculants. Research on the addition of baking soda to septic tanks is reported. Studies performed at the University of Connecticut showed that better flocculation of suspended solids resulted from the addition of baking soda. At the University of Southern California, septic tanks were fortified with sodium bicarbonate, sodium chloride, sodium carbonate, sodium hydroxide, potassium bicarbonate, and potassium chloride. Fortified effluent was allowed to settle for a day and supernatants were collected and analyzed for various components. Data showed a complexity of interactions, a lowering of suspended solids, and what would have been a decrease in turbidity had more settling time been provided. Sodium bicarbonate is considered as a cationic flocculant, and the relationship between its addition to septic tanks and soil structure, suspended solids, and sorption of sodium by sewage solids is addressed.

(12) KEYWORDS: ABSORPTION; BENEFIT; CHEMICAL; COMPOSITION; EARTH; EFFECT; FLOCCULANT; HYDRAULIC; POLYMER; REDUCTION; SEPTIC TANK; SODIUM; SOLID; SUSPENDED; TREATMENT

(15) STIMS ACC.NO.: 00S36928

(16) DOC.CIT.: Winneberger, J. H. , and M. S. Weinberg. Beneficial effects of baking soda added to septic tanks. Journal of Environmental Health, 38(5):322-326, Mar. /Apr. 1976.

(1) SWIRS ACC.NO.: 037871

(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: A field investigation is reported that was conducted near Ottawa, Ontario, Canada to determine the efficiency of a septic tile system. A collecting tank was installed into which a portion of septic tank effluent from the system of an individual household was diverted for analysis. Soil at the test site had the ability to reduce a high percentage of TSS (total suspended solids), BOD (biochemical oxygen demand), COD (chemical oxygen demand), and soluble organic carbon present in septic tank effluent. Phosphate reductions were usually in the 25 to 50 percent range. High ammonia reductions were observed. With an increase in ammonia reduction, corresponding increases in nitrification were generally observed. Nitrification led to nitrate buildup in ground water and nearby lakes, thus causing possible health hazards and possibly accelerating eutrophication. The efficiency of septic tile was influenced by seasonal variations. Greater efficiencies were observed during the early fall and late

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summer when the unsaturated depth of soil was greater. These efficiencies tended to decrease, however, with respect to BOD and TSS and to a greater extent in the case of ammonia nitrogen during the winter period when water levels started to rise. Nitrate nitrogen levels also showed

(12) KEYWORDS: AMMONIA; BOD; CARBON; COD; NITROGEN; ORGANIC; PHOSPHATE; REDUCTION; SEASONAL; SEPTIC TANK; SOLID; SOLUBILITY; SUSPENDED

(15) STIMS ACC.NO.: 00S36915

(18) DOC.CIT.: Viraraghavan, T. , and R. G. Warnock. Efficiency of a septic tile system. Journal of the Water Pollution Control Federation, 48(5):934-944, May 1976.

(1) SWIRS ACC.NO.: 037828

(2) DOMESTIC: F (2) CATEGORY: 19 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: Noting that discharges from conventional sewage treatment plants pollute the environment with potentially dangerous viruses, a need for simple and more efficient means for the elimination of viruses (along with other pollutants) from sewage has been delineated. The use of lime shows promise in this respect. In experiments, a one liter sample of sewage was contaminated with approximately 50,000,000 plaque forming units (PFU) of poliovirus 1 (Sabin). An aqueous slurry of lime was then added drop by drop till a pH of 11.5 was achieved. After stirring for 15 more minutes, the sample was allowed to stand for one hour. A portion of the resulting supernatant was removed for virus assay. The virus from the sludge was eluted with 10 percent fetal calf serum in saline. BS-C-1 cells were used for plaque assay. In eight such experiments, using different batches of sewage, no virus could be detected in the supernatant; the virus recovered from the sludge represented only 0.001 percent of the input PFU. This remaining virus became undetectable after a 24 hour storage of the sludge at 28 degrees C. The virus eliminating efficiency of the process was not affected by lowering the sample temperature to 4 degrees C. The lime treatment of sewage, therefore, appears worthy of further investigation. However, little information is available on the removal and inactivation of human pathogenic viruses during the high pH lime treatment of sewage.

(12) KEYWORDS: CONTROL; DATA; LIME; PATHOGEN; PH; PROCESS; RESEARCH; SEWAGE; STORAGE; TEMPERATURE; TREATMENT; VIRUS

(15) STIMS ACC.NO.: 00S36872

(18) DOC.CIT.: Sattar, S. A. , S. Ramia, and J. C. Westwood. Calcium hydroxide (lime) and the elimination of human pathogenic viruses from sewage: studies with experimentally contaminated (poliovirus type 1, Sabin) and pilot plant samples. Canadian Journal of Public Health, 67(3):221-226, May/June 1976.

(1) SWIRS ACC.NO.: 037747

(2) DOMESTIC: F (2) CATEGORY: 01 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: A study analyzing Poultry Byproduct Meal, prepared from poultry waste materials in India, considered the usefulness of the byproduct as a poultry feed, its safety as protein substitute, and its positive nutritive value. Processing is discussed with emphasis on the dry rendering process; pressing to remove fat; crushing, grinding and sieving; and yields. Changes that occur during manufacture and storage of the meal were studied, particularly those due to oxidation. The nutritive value and digestibility were shown to vary considerably depending upon the age of the bird, the processing technique utilized

and the period of storage involved. The study concludes that the processing of poultry byproducts in India is not organized and needs to be mechanized to develop methods that will prevent fat oxidation in the meal and will insure sterilization to conform to public health laws. Poultry Byproducts Meal, however, contains approximately 55 percent protein and compares favorably with fish meal in nutritive value. It can be used at 5 percent level in chick rations, and at 7.5 percent in grower, layer and breeder rations.

(12) KEYWORDS: FAT; FEED; INDIA; MANURE; OFFAL; OXIDATION; POULTRY; PROCESS; RECLAMATION; STORAGE

(15) STIMS ACC.NO.: 00S36791

(18) DOC.CIT.: Rao, V. A. and T. J. Mahadevan. Processing and utilization of poultry byproducts meal. Poultry Guide, 13(3):56-58, Mar. 1976.

(1) SWIRS ACC.NO.: 037678

(2) DOMESTIC: F (2) CATEGORY: 19 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: The utilization or oxidation ponds for dairy waste treatment is discussed. A two stage oxidation system is most commonly used on farms since it is more economical in land use than a single system. This system involves a combination of an anaerobic pond followed by an aerobic pond, with each having a separately and well defined function. These functions are detailed with regard to solids reduction, digestion process, BOD (biochemical oxygen demand) reduction, temperature stability, oxygenation of effluent and pollutants such as phosphate and sulfate. Design criteria for an oxidation system are detailed. It is noted that, for safety reasons, oxidation ponds must be positioned at a minimum of 45 meters from a dairy and should be sited away from dwellings. Soil type must be considered, and soils containing large amounts of gravel or coarse sand are not suitable for ponds. Where water tables are high and water supplies are drawn from shallow wells, there may be a risk of contaminating the water supply. When ponds are constructed above ground level, banks must be well compacted. Flows between ponds should be taken through pipes or channels and not be allowed to overflow banks or to discharge on to them. Specific design criteria for pond sizes are tabulated. Monitoring of an oxidation system at a dairy in New Zealand is described, and the system's performance is evaluated.

(12) KEYWORDS: AEROBIC; AGRICULTURE; ANAEROBIC; BOD; CRITERIA; DAIRY; DESIGN; DIGESTION; OXIDATION; REDUCTION; SAFETY; SITES; SOLID; SYSTEM; TEMPERATURE

(15) STIMS ACC.NO.: 00S36722

(18) DOC.CIT.: Nelson, S. G. Treatment of dairy wastes. New Zealand Journal of Agriculture, 132(3):14-17, 19, Mar. 1976.

(1) SWIRS ACC.NO.: 037643

(2) DOMESTIC: F (2) CATEGORY: 24 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1975

(11) ABSTRACT: The destroying effect of ionizing radiation on parasitic resistant stages in sludge has been tested. Suitable for that process is an electron beam accelerator which will be provided with energy from the electric power supply network which can be switched on and off according to the requirements. Such modern utilities have an enormous beam capacity and a high operating safety. The process works according to the continuous flow principle and at room temperature. In a series of 13 experiments the effect of different doses was tested. A dose of 430 kRad (accelerated voltage:400 kV, beam current:10 mA,

irradiation time:24 sec.) can easily be obtained in practical work and is economically acceptable. By these means approximately 97 percent of the following parasitic stages have been destroyed: undeveloped eggs of *Ascaris suum*, *Trichuris suis*, *Fasciola hepatica* and gastrointestinal strongylids of pigs, embryonated eggs of *Capillaria obsignata* and probably of *Paenia spec.* A few third stage larvae of *Oesophagostomum* (Strongylidae) of pigs survived even 108 sec of irradiation; however, they did not develop to maturity in the definitive host. Approximately 25 percent of the sporulated oocysts of *Eimeria tenella* were still infective after 108 sec of irradiation. (Author Abstract) (Original text in German)

(12) KEYWORDS: ELECTRICAL; GERMANY; ION; PARASITE; RADIATION; REDUCTION; RESEARCH; SLUDGE

(15) STIMS ACC.NO.: 00536687

(18) DOC.CIT.: Enigk, K. , Holl, P. , and Dey-Hazra, A. Die Vernichtung parasitaerer Dauerformen im Klaerschlamme durch Bestrahlung mit niederenergetischen Elektronen (Destruction of parasitic resistant stages in sludge by irradiation with low accelerating voltage electrons). Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. I Abt. Orig. , B, 161(1):61-71, Oct. 1975.

(1) SWIRS ACC.NO.: 037552

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

(11) ABSTRACT: A study was initiated to investigate the fate of virus infectivity in water of the Gulf of Mexico and to evaluate certain factors in the survival of these viruses. Poliovirus I was selected for study. Because it is a relatively strong virus and readily isolated from contaminated water, a knowledge of its fate was considered to have practical importance in evaluating the viral hazard of polluted marine water. Study results are presented in relation to the effect of preheating or prefiltering marine water on the loss of infectivity (LOI) for poliovirus I, effect of container adsorption and elution on poliovirus infectivity when suspended in marine water, effect of salinity on loss of poliovirus infectivity when suspended in marine water, evaluation of the presence of a resistant strain of poliovirus to explain two component LOI curves, and the influence of virion aggregation on the loss of poliovirus PFU (plaque forming units) in marine water. Typically, three LOI were lost in 5 to 6 days at 24 degrees C. It was suggested that LOI was not a result of container adsorption or virion aggregation and that it was not a resistant component within the stock virus found that would explain the two component curves often observed with virus loss. Viral infectivity loss occurred in raw, filter sterilized, and autoclaved marine water. Loss was also observed when the virus was suspended in artificial sea water. No explanation for LOI other than true inactivation of the virion was found.

(12) KEYWORDS: ADSORPTION; CONTAINER; CONTAMINATION; FILTER; HEAT; INFECTION; REDUCTION; SALT; SUSPENDED; VIRUS; WATER; WATERWAY

(15) STIMS ACC.NO.: 00536596

(18) DOC.CIT.: Akin, E. W. , W. F. Hill, Jr. , and G. B. Cline. The loss of poliovirus 1 infectivity in marine waters. Water Research, 10(1):59-63, 1976.

(1) SWIRS ACC.NO.: 037551

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

(11) ABSTRACT: The effect of fertilization on the species composition of salt marsh diatoms is explored. Two fertilizers, urea

and a commercial mixture containing sewage sludge, were applied to salt marsh plots. A thorough study of the diatom population in the fertilized plots was made after 3 yrs or more of fertilization. The diversity of epibenthic diatoms in the salt marsh was reduced by fertilization with both sewage sludge and urea. Counts of 500 individuals were sufficient to demonstrate a lower total number of species, a smaller number of rare species, and a greater dominance of the most abundant species in fertilized areas as compared with controls. *Navicula salinarum* Grun, which formed 5 to 9 percent of the diatoms in controls became dominant in fertilized plots and comprised 20 to 25 percent of the population. It was concluded that diatoms can be used to demonstrate the effects of pollution, stress, and productivity in fresh water.

(12) KEYWORDS: ALGAE; COMMERCIAL; FERTILIZER; MARSH; REDUCTION; SALT; SEWAGE; SLUDGE; WATERWAY

(15) STIMS ACC.NO.: 00S36595

(18) DOC.CIT.: Van Raalte, C. D., I. Valiela, and J. M. Teal the effect of fertilization on the species composition of salt marsh diatoms. *Water Research*, 10 (1):1-4, 1976.

(1) SWIRS ACC.NO.: 037223

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: The ozonization of secondary effluent is discussed as an effective method of disinfection. An experiment at the Blue Plains waste treatment plant in Washington, D. C. is cited in which ozonolysis shifted the pH of effluent toward neutrality, regardless of the nature of secondary effluent to which ozone was applied. The action of and problems with ozone in treating secondary effluent are discussed. Safety considerations in ozone use are noted, with emphasis on oxidizing and toxicological properties of the compound. It is concluded that ozone provides a viable alternative to the use of chlorine for disinfecting secondary effluent with a concurrent degree of tertiary treatment. Ozone dosages between 5 and 10 mg per liter can disinfect to a level below most legal requirements. High ozone dosages will probably be required if effluent contains a significant amount of industrial loading with ozone oxidizable materials. The concurrent decrease of chemical oxygen demand and coliform levels with ozonization argues against the necessity of satisfying an ozone demand due to dissolved organics before any disinfection can occur. An added benefit of ozone disinfection is an ozone-induced frothing process capable of removing significant amounts of suspended and dissolved materials via oxidation and physical separation by flotation.

(12) KEYWORDS: CHLORINE; COD; COLIFORM; COLLECTION; DISTRICT OF COLUMBIA; EFFLUENT; FACILITY; FLOTATION; ORGANIC; OXYGEN; PH; PROBLEMS; SAFETY; SEPARATING; STERILIZE; TOXIC; TREATMENT

(15) STIMS ACC.NO.: 00S36268

(18) DOC.CIT.: Nebel, C., R. D. Gottschling, and Pl. C. Unangst. Ozone provides alternative for secondary effluent disinfection, part 3. *Water and Sewage Works*, 123 (6):81-83, June 1976.

(1) SWIRS ACC.NO.: 037025

(2) DOMESTIC: F (2) CATEGORY: 01 (2) SUBJ.TYPE: F (10) PUB. YEAR: 1976

(11) ABSTRACT: The advantages and disadvantages of solid and liquid manure processes are explained and a specific set of criteria for evaluating their performance is given. Energy expenditures can be reduced by more than 50 percent with liquid as opposed to solid manure processes. In both stalls with fissured ground in walking and feeding

areas, the volumes of scattered material are reduced when the liquid manure process is retained. Other factors in choosing an efficient process include the type and age of animals; utilization of livestock; and output and health of livestock. Odor can be controlled more efficiently through the liquid manure process in high level tanks than through ditches containing solid manure. Cost considerations, including the extraction of marketable material from dung, are additional factors in judging the efficacy of the two processes. (Original text in German)

(12) KEYWORDS: AGE; ANIMAL; CONTROL; CRITERIA; DATA; ENERGY; LIQUID; LIVESTOCK; MANURE; ODOR; PROCESS; REDUCTION; SOLID; STORAGE; UTILIZE

(15) STIMS ACC.NO.: 00S36070

(18) DOC.CIT.: Blanken, G. Solid and liquid manure - its advantages and disadvantages. (Fest-und Fleussignistseine vor-und vachteile.) Landtechnik, 31(2):49-52, Feb. 1976.

(1) SWIRS ACC.NO.: 036570

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

(11) ABSTRACT: The acute toxicity of residual chlorine in sewage plant effluent was determined for the copepod *Cyclops bicuspidatus thomasi* and the rotifer *Keratella cochlearis*. The 96-hr median lethal toxicity level for *Cyclops* was 0.084 mg per liter total residual chlorine added as monochloramine. When *Cyclops* was exposed to sodium hypochlorite, the 96-hour level was 0.069 mg per liter total residual chlorine. The 4-hr median lethal toxicity level for *Keratella* was 0.019 mg per liter total residual chlorine added as monochloramine. Chemical studies showed that sodium sulfite was an efficient yet inexpensive chemical agent for reducing chlorine residuals which did not produce undesirable byproducts. Complete reduction was accomplished in less than 20 sec. Bioassay studies indicated that sodium sulfite added to chlorinated water completely eliminated the acute toxicity of residual chlorine to both *Cyclops* and *Keratella* organisms. Field studies in the Milwaukee, Wisconsin harbor and adjacent Lake Michigan indicated that measurable chlorine residuals were confined to a very small area surrounding effluent from a sewage treatment plant. Significant reductions in the populations of benthic organisms were observed in the effluent plume area after the start of chlorination. (Author Abstract Modified)

(12) KEYWORDS: ANIMAL; BIOLOGICAL; CHEMICAL; CHLORINE; ECONOMICS; EFFECT; EFFLUENT; MICROORGANISM; MILWAUKEE; REDUCTION; SEWAGE; TOXIC; WATERWAY

(15) STIMS ACC.NO.: 00S35614

(18) DOC.CIT.: Beeton, A. M., P. K. Kovacic, and A. S. Brooks. Effects of chlorine and sulfite reduction on Lake Michigan invertebrates. Environmental Protection Agency Publication EPA-600/3-76-036. Duluth, MN, U. S. Environmental Protection Agency, Apr. 1976, 122 p. (Ecological Research Series).

(1) SWIRS ACC.NO.: 035274

(2) DOMESTIC: D (2) CATEGORY: 24 (2) SUBJ.TYPE: S (10) PUB.
YEAR: 1975

(11) ABSTRACT: An evaluation of the permanent inactivation of virus in the activated sludge process was made. Activated sludge was inoculated with tritium-labeled poliovirus in batch reactors, and the fate of the virus was followed by tracing the radioactive label and infectivity with time. The initial total virus in the system was 4.8×10^8 to the tenth power plaque-forming units (PFU). The initial adsorption of 1.9×10^8 to the ninth power PFU per g of sludge was followed by a period of no significant reduction in the titer in the supernatant. The decrease in infectivity titer of the supernatant after a period of 1 hr followed the empirical relationship: the initial virus concentration in the supernatant per g of initial mixed liquor suspended solids (MLSS) equals the virus concentration in the supernatant at any time, times the time in minutes raised to a constant of 0.32. The results show that some of the poliovirus adsorbed to the activated sludge particles is inactivated and that virus particles that are not infective may be released into the supernatant. However, the association of virus particles with sludge and the fact that infectious virus particles can be eluted from sludge solids must be considered in evaluating sludge disposal alternatives and in virus monitoring techniques proposed for sewage treatment plant effluents.

(12) KEYWORDS: ACTIVATED SLUDGE; DATA; DISPOSAL; EPIDEMIOLOGY; HAZARDOUS; MICROBIOLOGY; MICROORGANISM; MONITOR; SAFETY; SEWAGE; STERILIZE; TREATMENT; VIRUS; WASTE WATER

(15) STIMS ACC.NO.: 00534319

(18) DOC.CIT.: Malina, J. F. , K. R. Ranganathan, B. P. Sagik, and B. E. Moore. Poliovirus inactivation by activated sludge. Water Pollution Control, 47 (8):2178-2183, Aug. 1975.

Section 8

DUST, GAS, AND AIR POLLUTION CONTROL

- (1) SWIRS ACC.NO.: 044851
(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S
(3) ARTICLE TITLE: Are microbiological air quality standards for hospitals realistic?
(4) AUTHOR: Powitz RW
(6) JOURNAL TITLE: Journal of Environmental Health
(10) LANGUAGE: EN (10) PUB. YEAR: 1976
(11) ABSTRACT: The need for microbiological air quality standards in hospitals is examined as a way to reduce or eliminate microbes in air and thus to prevent nosocomial infections. Microbial air standards for health care facilities are presently technologically and administratively infeasible, but, the reduction of aerial microbial contamination can be realized. When setting air quality standards, the characteristics of airborne pathogen bearing particles in a heterogeneous system and their potential relationship to disease production must be considered. Meaningful standards must consider particle size distribution and number and types of organisms per particle as well as personnel/patient activity and population at risk. An evaluation of the role of air in a total environment hygiene index of the hospital must start with patient susceptibility and resistance. Air sampling is presently not considered an essential activity for an infection control program.
(12) KEYWORDS: AIR; CONTROL; DISEASE; HEALTH; HOSPITAL; HUMAN; INFECTION; MICROBIOLOGY; MICROORGANISM; PATHOGEN; QUALITY; SANITARY; STANDARD
(14) HIERARCH TERMS: 1HB; 1MF
(15) STIMS ACC.NO.: 00S43896
(16) CITATION: 39(3):196-197, Nov.-Dec. 1976.
- (1) SWIRS ACC.NO.: 044845
(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S; T
(3) ARTICLE TITLE: Sulfur dioxide emission limitation (SDEL) program at TVA power plants.
(4) AUTHOR: Leavitt JM
(6) JOURNAL TITLE: Air Pollution Control Association
(10) LANGUAGE: EN (10) GEO. AREA: 1US/2TN (10) PUB. YEAR: 1976
(11) ABSTRACT: The Tennessee Valley Authority (TVA) is conducting a program of intermittent control of sulfur dioxide (SO₂) emissions at 9 of its coal fired power plants. The program is designed to limit SO₂ emissions by reducing generation during adverse atmospheric conditions to avoid exceeding ambient SO₂ standards. Each plant is identified as a Class I or Class II program, based primarily on its design and operational complexity. Class I programs operate 7 days/week from early morning through midafternoon, Class II programs operate 24 hours/day and 7 days/week. Environmental data stations (EDS) are located at each plant; staff have the responsibility for collection and validation of onsite meteorological data, SO₂ mobile and fixed monitoring network data, plant operational data, and local meteorological forecast data. At the EDS, this data is entered into a computer operating model. This real time dispersion model uses meteorological control criteria to identify days when adverse dispersion conditions are likely to occur and, consequently, to schedule plant generation reduction.
(12) KEYWORDS: AIR; CLIMATE; COMPUTER; CONTROL; DATA; EMISSIONS;

FOSSIL FUEL; MONITOR; PLANT-INDUSTRIAL; POLLUTION; POWER; SAFETY;
SULFUR; TENNESSEE; TVA

(14) HIERARCH TERMS: 1AC/2AE; 1CG; 1HB; 1IC; 1MA/2ME; 1MK

(15) STIMS ACC.NO.: 00S43890 (15) SECONDARY AUTHORS: Clark RE;
George LA

(16) CITATION: 26 (12):1133-1140, Dec. 1976.

(1) SWIRS ACC.NO.: 043173

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T

(3) ARTICLE TITLE: Dust and fume problems averted with impingement
baffle scrubber.

(4) AUTHOR: Reisdorf RC

(6) JOURNAL TITLE: Chemical Processing

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

(11) ABSTRACT: An improved gas scrubber used to collect dust and
fumes from a hydrochloric acid bottle filler and a steam cleaning
compound mixing tank is described. A more efficient removal system and
a cleaner environment for plant personnel has resulted. The scrubber
can handle 2400 cfm at ambient conditions with a pressure drop of 4.1
in. W. G. recirculating 5 gpm of water at free flow to the plates and 3
gpm of water at 20 psig to the sprays. Constructed of one fourth inch
FRP, the scrubber has PVC impingement baffle plates and spray piping
and was supplied with carbon steel support legs. The scrubber operates
with low power requirements. The unit removes materials ranging from
submicron fumes to larger micron sized dust particles suspended in gas
streams. Efficiencies in excess of 99 percent can be realized on most
types of dust or fumes.

(12) KEYWORDS: ACID; CONTROL; DUST; EMISSION; HEALTH; PERSONNEL;
POLLUTION; POLYVINYL CHLORIDE; SCRUBBER

(14) HIERARCH TERMS: 1AC/2AF; 1EE/2EN; 1HB

(15) STIMS ACC.NO.: 00S42216 (15) SECONDARY AUTHORS: Powers J

(16) CITATION: 40 (1):43, Jan. 1977.

(1) SWIRS ACC.NO.: 042917

(2) DOMESTIC: F (2) CATEGORY: 10 (2) SUBJ.TYPE: S

(3) ARTICLE TITLE: Current information on the health risk of
asbestos.

(4) AUTHOR: Elmes PC

(6) JOURNAL TITLE: Royal Society of Health

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

(11) ABSTRACT: Current information on the health risk of asbestos
in Great Britain is presented. Exposure to asbestos can result in five
situations: the presence of asbestos in the tissues without disease;
the presence of asbestos in the tissue causing certain benign changes;
the presence of asbestos in the tissue and a mesothelioma (cancer)
around the lung or around the intestines; asbestos in the lungs with
tissue damage and primary bronchial cancer; or asbestos present with
potentially fatal damage to the lungs but no cancer (asbestosis). A
description of the physical activity of asbestos fibers in the tissues
is given. The filter mechanism by which exposed people filter out large
asbestos dust particles in the nose and throat is also described. The
larynx may also filter out some smaller particles. Occupational hazards
associated with asbestos are noted. Research indicates that the more
processing the asbestos receives, the finer the division of the fiber
bundles and the more dangerous it becomes. Lung response to retained
dust is described in detail. The difficulties in the establishment of a
safety standard are discussed. Symptoms of asbestosis and the progress
of the illness are noted and symptoms of lung cancer and the course of

the disease are described. Researchers are far from determining the level and duration of exposure, and the exact types of fiber needed to trigger mesothelioma. (pleural and peritoneal).

(12) KEYWORDS: ASBESTOS; DISEASE; EUROPE; FIBER; FILTER; GREAT BRITAIN; HAZARDOUS; HEALTH; OCCUPATION; PARTICULATE MATTER; RESEARCH; SAFETY; STANDARD

(14) HIERARCH TERMS: 1AC/2AJ; 1HB

(15) STIMS ACC.NO.: 00S41960

(16) CITATION: 96(6):248-252, Dec. 1976.

(1) SWIRS ACC.NO.: 041881

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T

(4) AUTHOR: Davis H (10) GEO. AREA: 1EE; 1MI (10) PUB. YEAR: 1977

(11) ABSTRACT: The installation of dust collectors at a mining company in central Pennsylvania is detailed. The primary source of dust generated in the mining company is an air operated cleaning table area where raw coal is separated from other materials. To solve this dust problem, a fully automated combination of a wet suppression system and fabric filter dust collectors was installed. The wet suppression system controls dust generated at five points on the conveyor system entering and leaving the coal cleaning building. Three of the fabric filter dust collectors contain dust generated by air cleaning tables, and the fourth filter captures fugitive dust within the cleaning building itself. Factors considered in the installation of dust collectors are noted. To permit uninterrupted production of the mine, continuous duty collectors on stream at all times are used. All dust collectors feature top access for easy entry into bags for inspection or replacement. In compliance with Federal regulations, the collectors are equipped with explosion relief doors, sprinkler systems, handrails, and other safety accessories. The wet suppression system has a valuable secondary effect that virtually eliminates dust problems and conserves coal fines on the conveyor system and in the stockpile area. This secondary effect prevents wind erosion and wasting of fines that serve as useful end products.

(12) KEYWORDS: CONTINUOUS; CONTROL; DESIGN; DUST; EQUIPMENT; FIBER; FILTER; FOSSIL FUEL; MINE; OPERATIONS RESEARCH; PENNSYLVANIA; SPECIFICATION

(14) HIERARCH TERMS: 1AC/2AF

(15) STIMS ACC.NO.: 00S40925

(18) DOC.CIT.: Davis, H. How to install new dust collectors without shutting down the plant. Coal Age, 82(3):110-112, Feb. 1977.

(1) SWIRS ACC.NO.: 041120

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: The Mystaire scrubber removes particles in the 0.01 micrometer range, odors, and acid mists with the expenditure of little power. The new air pollution device was the result of a search for a means of removing ultrasonic mists. The scrubber is comprised of hundreds of layers of bonded mesh (the "Waterweb"). If the mesh is saturated solidly with water, the combination has an almost catalytic effect in wetting out submicrometer sized particles flowing in the air. It takes a 50 in. water gauge pressure drop to abate titanium tetrachloride fumes with standard techniques; the Mystaire does it with 4 in. , or about one tenth the energy. The physical characteristics of the Waterweb operation are described and compared to traditional

methods. Problems relating to control of perchloric acid fumes are discussed. The experimental scrubber, digestion scrubber, and safety hood are pictured and their operation described.

(12) KEYWORDS: AIR; CONTROL; PARTICULATE MATTER; POLLUTION; SCRUBBER; TECHNOLOGY

(14) HIERARCH TERMS: 1AC/2AF

(15) STIMS ACC.NO.: 00S40164

(18) DOC.CIT.: Scrubber for air pollution abatement. American Laboratory, 8(12):55-59, Dec. 1976.

(1) SWIRS ACC.NO.: 040924

(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S

(4) AUTHOR: Hasselblad V (10) GEO. AREA: 1US/2TN (10) PUB. YEAR: 1977

(11) ABSTRACT: Previous studies of lung function in children have indicated that decreases in lung function are associated with higher air pollution exposures. For this reason, three quarter second timed forced expiratory volume was chosen as one of the health indicators in the Environmental Protection Agency's Community Health Environmental Surveillance System (CHESSE). The city of Chattanooga, Tennessee was chosen because of its exposure to a large stationary source of nitrogen dioxide NO₂. The present study, conducted 1971 to 1972, was a follow-up to an earlier study performed by Shy, et al 1968 to 1969. The present study did not confirm the slight differences found in the earlier study. This might be explained by the reduction in nitrogen dioxide levels since the 1968/1969 study. (Retained in SWIRS library)

(12) KEYWORDS: AGE; AIR; ANALYSIS; EFFECT; EXPOSURE; GASSES; HEALTH; HUMAN; MUNICIPALITY; NITROGEN; OXYGEN; POLLUTION; TENNESSEE

(14) HIERARCH TERMS: 1AC; 1HB

(15) STIMS ACC.NO.: 00S39968

(18) DOC.CIT.: Hasselblad, V. Lung function in school children: 1971-1972 Chattanooga study. Environmental Protection Publication EPA-600/1-77-002. Research Triangle Park, NC, U. S. Environmental Protection Agency, Jan. 1977. (Environmental Health Effects Research Series.)

(1) SWIRS ACC.NO.: 040303

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T

(4) AUTHOR: Bintzer WW (10) GEO. AREA: 1AC/2AF (10) PUB. YEAR: 1976

(11) ABSTRACT: The installation of an air curtain on electric furnaces at Lukens Steel Company, Coatesville, Pennsylvania, has provided a method to improve emission control along with several improvements to the furnace operation. For example, there is less power consumption, less electrode consumption, improved slag control and greater safety. Other advantages include: reduced heat losses by eliminating infiltrated air through the door, and a corresponding power saving; reduced demand on the air pollution control system; improved slag control by reduced oxidation of the slag surface; increased life of the prerduced iron feed pipe, electrode holders, mast arms, and the delta area of the roof refractory; and a general reduction of the dust level of the shop.

(12) KEYWORDS: AIR; BENEFIT; CONTROL; DUST; ELECTRICAL; EQUIPMENT; FURNACE; INDUSTRY; METAL; PENNSYLVANIA; POLLUTION; SAFETY; SLAG; SYSTEM; WASTE HEAT

(14) HIERARCH TERMS: 1MD/2MQ

(15) STIMS ACC.NO.: 00S39347 (15) SECONDARY AUTHORS: Malehorn RA

(18) DOC.CIT.: Bintzer, W. W. , and R. A. Malehorn. Air curtains on electric furnaces at Lukens Steel Co. Iron and Steel Engineer, 53(7):53-55, July 1976

DUST, GAS, AND AIR POLLUTION CONTROL

(1) SWIRS ACC.NO.: 039589
(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S (10) PUB.
YEAR: 1976
(11) ABSTRACT: Two facilities, one producing rock wool by retort melting and fiber formation by spinning, and the other utilizing slag, glass scrap, and fly ash in a reverberatory furnace to form a melt which is spun, were surveyed for dust exposures of employees. Each plant was divided into "dust zones" on the basis of processing operations, ventilation methods, or employee jobs. Personnel associated with different "dust zones" and job titles wore dust sampling filters and air pumps for one work shift. These filters were analyzed to determine the weight of total dust in the air, expressed as milligrams per cubic meter, and fiber concentrations, expressed as fibers per cubic centimeter in two size categories, greater than one micrometer and less than one micrometer. The results are discussed.
(12) KEYWORDS: DUST; EQUIPMENT; EXPOSURE; FIBER; FILTER; HEALTH; MEASUREMENTS; PARTICULATE MATTER; PERSONNEL; PLANT-INDUSTRIAL; TEXTILE; VENTILATOR
(15) STIMS ACC.NO.: 00S38633
(18) DOC.CIT.: Corn, M, Y. Hammad, and D. Whitter. Employee exposure to airborne fiber and total particulate matter in two mineral wool facilities. Environmental Research, 12(1):59-74, Aug. 1976.

(1) SWIRS ACC.NO.: 038948
(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S; T (10) PUB.
YEAR: 1975
(11) ABSTRACT: The collection of particulate emissions in a lead smelting plant of the General Battery Corporation (GBC) is discussed. Due to a court order to abate particulate emissions resulting from the manufacturing process, GBC opened a new secondary lead smelting plant in Reading, Pennsylvania at an investment of about \$3.5 million. More than \$1.5 million was allocated to the control of particulates. GBC reclaims batteries, recovering lead from old batteries and then resmelting it and using it to make new ones. About 80 percent of lead used in batteries is recycled. After the recycling operation, lead is melted in one of two blast furnaces or in a reverberatory furnace. Battery cases are crushed and used as landfill. The air pollution control systems installed at the GBC plant satisfy not only neighboring complaints but also requirements of the Pennsylvania Department of Public Health. Odors are minimized by incineration at 2,400 F. Lead oxide emissions and aerosols are trapped by baghouses. Sulfur dioxide emissions are scrubbed out with a Venturi scrubber and mist eliminator.
(12) KEYWORDS: CONTROL; ECONOMICS; EMISSION; FURNACE; NON-FERROUS; PARTICULATE MATTER; PENNSYLVANIA; PLANT-INDUSTRIAL; POLLUTION; RECLAMATION; SYSTEM
(15) STIMS ACC.NO.: 00S37992
(18) DOC.CIT.: Particulate collection in a lead smelting plant. In Mantell, C. L., ed. Solid wastes: Origin, Collection, Processing, and Disposal. New York, John Wiley and Sons, 1975. p. 723-725.

(1) SWIRS ACC.NO.: 038591
(2) DOMESTIC: D (2) CATEGORY: 16 (2) SUBJ.TYPE: G (10) PUB.
YEAR: 1976
(11) ABSTRACT: Procedures developed for and problems encountered in management of airborne hazard assessment in small plants are described. While large industrial facilities normally employ industrial hygienists who are specially trained in the techniques for evaluation and

monitoring airborne hazards and exposure levels to known toxic substances, smaller operations generally have felt they could not afford such personnel nor sophisticated measuring equipment. The National Safety Council, however, has produced a number of periodicals which contain data on numerous chemicals as well as recommended procedures to be followed in plant processing, several of which are described.

(12) KEYWORDS: AIR; ASSOC; CHEMICAL; CLASSIFICATION; DUST; GASSES; HAZARDOUS; MANUAL; MONITOR; PERSONNEL; PLANT-INDUSTRIAL; REDUCTION; TRAINING

(15) STIMS ACC.NO.: 00S37625

(18) DOC.CIT.: For the small plant - identifying and reducing airborne hazards. National Safety News, 113(1):77-78, Jan. 1976.

(1) SWIRS ACC.NO.: 038324

(2) DOMESTIC: D (2) CATEGORY: 02 (2) SUBJ.TYPE: S (10) PUB. YEAR: 1976

(11) ABSTRACT: The generally low sulfate levels and high nitrate levels in the San Francisco Bay air basin were studied. For 5 years (1969 to 1973) sulfate and nitrate fractions were analyzed from high volume particulate samples at 8 stations in the Bay area. The area wide 5 year mean for sulfate was 2.68 mg/cu m, only slightly above the remote nonurban sulfate background level. However, the similar 5 year nitrate mean of 2.78 mg/cu m was well above the national urban average. On isolated occasions, when fuel oil (instead of natural gas) had to be used, both sulfate and nitrate fractions showed 24 hour values in excess of 20 mg/cu m. The sulfates were primarily in the fine size range, less than 0.65 µm, resulting in ill effects on health and in reduction of visibility. The accelerated conversion rate for gaseous sulfur dioxide to particulate sulfate ion, when compared to eastern states, indicated the much greater relative importance of photochemical processes under California climatic conditions. The nitrate salts, primarily ammonium nitrate, provided a good index of photochemical activity. It is suggested that both sulfate and nitrate data offer better indices of air quality in general than do total suspended particulate data and that more emphasis should be placed on the control of nitrogen oxide emissions.

(12) KEYWORDS: AIR; ANALYSIS; CALIFORNIA; CONTROL; EMISSION; GASSES; MEASUREMENTS; NITROGEN; PARTICULATE MATTER; POLLUTION; SULFUR; SUSPENDED

(15) STIMS ACC.NO.: 00S37368

(18) DOC.CIT.: Sandberg, J. S., D. A. Levaggi, and R. D. DeMandel. Sulfate and nitrate particulates as related to sulfur dioxide and nitrogen oxide gases and emissions. Journal of the Air Pollution Control Association, 26(6):559-564, June 1976.

(1) SWIRS ACC.NO.: 038024

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

(11) ABSTRACT: Odor problems of a sewage treatment plant in Dublin, Ireland are discussed. The sewage pumping station in Dublin is the end point of a long pipeline collecting waste from a large area. Due to the layout of the sewage system, odor is a significant problem. Major ingredients of sewage air are noted, with indole and skatole having a power fecal smell. Indole is involved in intestinal putrefaction and skatole is related to protein decomposition. Adding to the seriousness of the odor problem is the fact that these gases have a low hydrogen sulfide odor threshold which means that even the most small quantity of air pollution by the substances causes severe nervous stress. Generally

accepted odor thresholds are as follows: indole 0.09 ppm; skatole 0.075 ppm; and hydrogen sulfide 0.1 ppm. Ozone was first used to control odor but did not prove to be effective. Equipment was later installed for the destructive deodorization of air, the principle of the method based on the fact that ozone is not directly formed from oxygen but that radiant energy in the ultraviolet region of the spectrum will break the oxygen molecule into its atoms which are powerful oxidants. The advantages of producing nascent oxygen atoms by using ultraviolet radiation are discussed, along with operational details of the technique.

(12) KEYWORDS: GASSES; HYDROGEN; IRELAND; ODOR; PIPELINE; PLANT-INDUSTRIAL; REDUCTION; SEWAGE; SULFUR

(15) STIMS ACC.NO.: 00S37068

(18) DOC.CIT.: Summer, W. Destructive air deodorization at a Dublin Sewage works. Process Biochemistry, 11(1):26-27, Jan./Feb. 1976.

(1) SWIRS ACC.NO.: 037764

(2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: Dust control systems, which are more economical than dust collection systems, prevent waste of valuable materials which would otherwise be lost to the average bakery facility. By controlling inplant flour and sugar dust while collecting less process material, a dust control system can increase the profit per pound of product processed. This is the key difference between dust control and dust collection and can make a significant difference in bakery operating costs. A dust control system which actually forces product dust back into the processing line is illustrated in the article. Criteria for evaluating design standards and cost effectiveness in minimizing operating expenses are also included. The authors conclude that, except in very rare instances, dust control systems insure that safety and environmental regulations can be met and profits maximized, by collecting as little process material as possible without interfering with the processing operation.

(12) KEYWORDS: BAKERY; COLLECTION; CONTROL; COST REDUCTION; DESIGN; DUST; SYSTEM

(15) STIMS ACC.NO.: 00S36808

(18) DOC.CIT.: Owen, L., and W. Leist. Dust control vs dust collection. The Bakers Digest, 50(3):18-22, June 1976.

(1) SWIRS ACC.NO.: 037743

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1976

(11) ABSTRACT: This article discusses oil mist emission control in gas turbine vent systems. Oil mists result from oils in industrial and marine gas turbine lubricating systems breaking down into fine, submicron, particles which become a visible aerosol remaining in the air until impinged on some surface or dissipated in the atmosphere. Such oil mists pollute the air near the turbine intake as well as create safety hazards as they collect on nearby surfaces. One practical method of eliminating oil mists is to apply an accessory two stage type electrostatic precipitator directly to lube oil vents. A power supply, an ionizing section, and a collecting section are the three major components in an electrostatic precipitator. The power supply converts the normal 120 volt 60 Hertz single phase input current into high voltage direct current which energizes the ionizing and collecting sections. In most cases, oil collected by the precipitator can be returned directly to the lubricating system. In addition to minimizing operating costs, a precipitator can significantly reduce make up

requirements. These precipitators have been commercially applied in numerous gas turbine installations including peaking and base load and auxiliary power generation, process use, marine propulsion, and in a variety of turbine designs where either petroleum based or synthetic lubricants are routinely used.

(12) KEYWORDS: AEROSOLS; CONTROL; COST REDUCTION; ELECTROSTATIC PRECIPITATOR; EMISSION; FINE; GASSES; OIL; SAFETY; SYSTEM

(15) STIMS ACC.NO.: 00S36787

(18) DOC.CIT.: Donovan, G. E. Oil mist emission control in gas turbine vent systems. Diesel and Gas Turbine Progress, 42(4):24-25, Apr. 1976.

(1) SWIRS ACC.NO.: 037445

(2) DOMESTIC: D (2) CATEGORY: 30 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: EPA, the City of St. Louis, and the Union Electric Company published the results of environmental tests to characterize pollutant emissions at a refuse processing and firing facility plant using refuse-derived fuel (RDF) as a supplementary fuel in a coal burning utility boiler. Included were evaluation of RDF dust emissions and equipment sound levels. The tests demonstrate that collected RDF dust contained levels of bacteria and virus significantly above those in suburban air. Further tests are being conducted to evaluate potential occupational and environmental health hazards posed by this dust. Results also showed that burning of RDF to provide up to 15% of the heat to the pulverized coal firing boiler does not appreciably affect the emission of gaseous pollutants, although particulate emissions are increased as the result of electrostatic precipitator performance losses. Moreover, firing at RDF increased boiler residue accumulation rates by a factor of 4 to 5 and increased the water pollution levels of an ash pond effluent for 16 to 64 pollutants evaluated. Relative to equipment sound levels, the tests showed that at eight of the 16 plants surveyed, sound levels exceeded 90 dBA, which may require that new refuse processing plants be designed for improved sound suppression.

(12) KEYWORDS: ASH; BOILER; DUST; ELECTRICAL; ELECTROSTATIC PRECIPITATOR; EMISSION; FOSSIL FUEL; GASSES; NOISE; POLLUTION; REFUSE; RESIDUE; WATER

(15) STIMS ACC.NO.: 00S36489

(18) DOC.CIT.: Kilgroe, J. D., L. J. Shannon, and P. G. Gorman. Environment assessment of the St. Louis - Union Electric refuse firing system. Transactions of the American Nuclear Society, 23(51):30-31, 1976.

(1) SWIRS ACC.NO.: 037421

(2) DOMESTIC: D (2) CATEGORY: 29 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: The nitrogen oxide control strategy of the Environmental Protection Agency (EPA) is detailed. EPA's strategy, known as maximum stationary source technology (MSST) is designed to increase the degree and effectiveness of nitrogen oxide control from existing and new stationary sources because of difficulties in achieving desired levels of control from mobile sources. EPA's overall program for controlling nitrogen oxide emissions from stationary sources includes two main technologies: (1) control of combustion processes (combustion modification); and (2) control of post combustion products (flue gas treatment). Combustion modification minimizes the formation of nitrogen oxides during combustion, while flue gas treatment removes nitrogen oxides from gaseous products of combustion.

Processes for the treatment of flue gas in removing nitrogen oxides are categorized as follows: dry processes (reduction), and wet processes (oxidation followed by scrubbing). The allocation of funds to EPA's nitrogen oxide control program is discussed. Future control measures are noted, along with interagency participation efforts and resources allocated to the nitrogen oxide flue gas treatment program. It is concluded that combustion modification is an inexpensive and effective method for achieving nitrogen oxide reduction from stationary combustion sources and that nitrogen oxide flue gas treatment provides an add-on technology to be used in addition to combustion modification when high removal efficiencies are desired. (Document retained in SWIRS library)

(12) KEYWORDS: CHIMNEY; COLLECTION; CONFERENCE; CONTROL; ECONOMICS; EMISSION; EPA; MOVABLE; NITROGEN; OXYGEN; TECHNOLOGY

(15) STIMS ACC.NO.: 00S36466

(18) DOC.CIT.: Stern, R. D. The EPA development program for NO(x) flue gas treatment. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 280-283).

(1) SWIRS ACC.NO.: 037419

(2) DOMESTIC: D (2) CATEGORY: 29 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: The application of nonregenerable flue gas desulfurization (FGD) technology is discussed in relation to the research, development, and demonstration program of the Environmental Protection Agency (EPA) in the FGD area. The primary purpose of EPA's program is to improve, develop, and demonstrate reliable, cost-effective, and environmentally acceptable FGD processes for reducing sulfur dioxide emissions from both existing and new stationary combustion sources. Nonregenerable FGD processes generate waste products such as calcium sulfite or gypsum for disposal. EPA's program on nonregenerable FGD is concerned with three major areas: (1) lime/limestone scrubbing; and (3) double alkali scrubbing. Tasks related to FGD waste disposal and utilization include an environmental assessment of FGD waste disposal, disposal economics, alternate disposal methods, and utilization of waste. The major thrust of EPA's lime/limestone scrubbing effort involves continuation of the advanced testing program at EPA's prototype test facility located at a coal fired station of the Tennessee Valley Authority. Extensive developmental efforts are being conducted to achieve near-term commercialization of double alkali processes for coal fired utility applications. Interagency participation in FGD research and development is noted, and resources allocated to nonregenerable FGD control technology are tabulated. Recommendations are made with regard to future work in the FGD technology area. (Document retained in SWIRS library)

(12) KEYWORDS: ALKALINE; CHIMNEY; COLLECTION; CONFERENCE; DISPOSAL; EMISSION; EPA; GASSES; LIME; PROCESS; PROGRAM; REDUCTION; RESEARCH; RESIDUE; SCRUBBER; SULFUR; TECHNOLOGY

(15) STIMS ACC.NO.: 00S36464

(18) DOC.CIT.: Maxwell, M. A. The EPA program for control of SO(x) emissions from stationary combustion sources: nonregenerable flue gas desulfurization. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 271-274).

(1) SWIRS ACC.NO.: 037418
 (2) DOMESTIC: D (2) CATEGORY: 21 (2) SUBJ.TYPE: S; T (10) PUB.
 YEAR: 1976

(11) ABSTRACT: The Environmental Protection Agency (EPA) program for regenerable flue gas desulfurization (FGD) is described. Flue gas desulfurization is considered to be the major sulfur oxide control technique that will have widespread application to large coal fired combustion sources within the next 10 to 15 years. EPA's program to support FGD technology includes laboratory investigations, bench and pilot scale developmental evaluations, and prototype and full-scale demonstrations. Significant programs and processes being supported by EPA's research, development, and demonstration effort are concerned with magnesium oxide scrubbing, Wellman-Lord process which incorporates a sulfur dioxide reduction process and produces elemental sulfur, catalytic oxidation, alternate reductant gases, advanced regenerable demonstration, ammonia scrubbing/ammonia bisulfate regeneration process, economics of marketing sulfuric acid and elemental sulfur produced by regenerable FGD systems at coal fired power plants, economics of regenerable FGD processes, energy conservation in FGD processes, and citrate process demonstration. Future activities that are noted, along with resources allocated to the study of FGD systems. It is noted that, as of November 1975, 115 U. S. flue gas cleaning systems were operational, under construction, or planned. (Document retained in SWIRS library)

(12) KEYWORDS: CATALYST; CHIMNEY; COLLECTION; COMBUSTIBLE; CONFERENCE; CONTROL; EPA; FOSSIL FUEL; GASSES; OXIDATION; PROCESS; PROJECTION; REDUCTION; RESEARCH; SCRUBBER; SULFUR; TECHNOLOGY

(15) STIMS ACC.NO.: 00S36463

(18) DOC.CIT.: Stern, R. D. Regenerable flue gas desulfurization technology for stationary combustion sources. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 267-270).

(1) SWIRS ACC.NO.: 037413
 (2) DOMESTIC: D (2) CATEGORY: 12 (2) SUBJ.TYPE: S; T (10) PUB.
 YEAR: 1976

(11) ABSTRACT: Studies and projects of the Environmental Protection Agency (EPA) are reported that are concerned with physical and chemical aspects of coal cleaning for pollution control. Sulfur dioxide is the primary pollutant associated with coal cleaning, and the applicability of coal desulfurization to sulfur dioxide emission control is dependent upon emission regulations which must be met. Physical methods of coal cleaning are effective in meeting emission regulations, although chemical coal cleaning is capable of higher levels of desulfurization. A major objective of EPA's coal cleaning is to identify and support the development of various processes capable of being used to meet sulfur dioxide emission standards in a commercially competitive manner. Corollary objectives are the characterization of all pollutants from these processes and the development of appropriate pollution control technologies. Studies on physical and chemical coal cleaning methods are noted, and EPA's coal cleaning program activities are considered according to six major areas: (1) general support; (2) input material characterization; (3) environmental source assessment; (4) control technology development; (5) physical coal cleaning development; and (6) chemical coal cleaning development. It is felt that the relatively low costs of physical and chemical coal cleaning processes will make these pollution abatement techniques increasingly attractive in future years. Resources allocated by EPA and other Federal agencies to coal cleaning

research and development are tabulated. (Document retained in SWIRS library)

(12) KEYWORDS: AIR; CHEMICAL; COLLECTION; COMMERCIAL; CONFERENCE; EMISSION; EPA; FOSSIL FUEL; OXYGEN; POLLUTION; QUALITY; REDUCTION; REGULATIONS; RESEARCH; SULFUR; TECHNOLOGY

(15) STIMS ACC.NO.: 00S36458

(18) DOC.CIT.: Kilgroe, J. D. Physical and chemical coal cleaning for pollution control. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 230-237).

(1) SWIRS ACC.NO.: 037410

(2) DOMESTIC: D (2) CATEGORY: 19 (2) SUBJ.TYPE: S; T (10) PUB. YEAR: 1976

(11) ABSTRACT: Fluidized bed combustion is discussed as a technique for minimizing air pollution from coal fired power plants. In the Environmental Protection Agency's standards of performance for new stationary sources, maximum allowable emissions from a new coal burning power plant for sulfur dioxide, nitrogen oxides, and particulate solids are 1.2, 0.7, and 0.1 pounds per BTU of heat, respectively, based on a 2-hr average. The application of fluidized bed combustion to industrial and commercial boilers and heaters is considered, and the program of the Energy Research and Development Administration in the fluidized bed combustion field is described. Research and development projects related to fluidized bed combustion are noted that are being sponsored by the Electric Power Research Institute and by the Environmental Protection Agency. The research and development program of the Argonne National Laboratory is also described. Equipment and instrumentation required for fluidized bed combustion experiments are detailed. Combustion studies using bituminous coal are cited, along with combustion studies using low sulfur subbituminous and lignite coals and trace element distribution studies. (Document retained in SWIRS library)

(12) KEYWORDS: AIR; COMBUSTIBLE; CONFERENCE; EPA; FLUIDIZED BED; FOSSIL FUEL; INVESTIGATION; NITROGEN; OXYGEN; PLANT-INDUSTRIAL; POLLUTION; POWER; PROCESS; PROGRAM; STANDARD; SULFUR

(15) STIMS ACC.NO.: 00S36455

(18) DOC.CIT.: Vogel, G., W. Swift, and A. Jonke. Control of atmospheric pollution by fluidized-bed combustion. Environmental Protection Publication 600/7-76-002. In: Proceedings; National Conference on Health, Environmental Effects, and Control Technology of Energy Use, Washington, DC, Feb. 9-11, 1976. Washington, DC, U. S. Environmental Protection Agency, 1976, 340 p. (p. 212-219).

(1) SWIRS ACC.NO.: 037289

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

(11) ABSTRACT: The emission of vinyl chloride from polymerization sludge during handling and land disposal is discussed in a paper presented at the Third Japan-United States Governmental Conference on Solid Waste Management in May 1976. It is noted that vinyl chloride monomer (VCM) is retained in sludge waste produced during polyvinyl chloride (PVC) processing at production plants. A study was conducted with 17 grab air samples collected for laboratory analysis to evaluate whether the VCM content at three landfills was detrimental to the

health of landfill workers or nearby residents. VCM concentrations were measured using the gas chromatographic-flame ionization detection analytical technique. Calculations were made to determine the rate at which VCM is released from PVC sludge. A background air concentration of about 0.1 to 0.3 ppm appeared to be present in air at landfills where PVC sludge has been disposed of for several years. It was determined that instantaneous VCM air concentrations on the order of 1.0 ppm can occur at normal breathing heights (1.5 meters) above ground levels at landfills as long as 24 hrs after PVC sludge deposits are covered. Prevailing landfill air temperatures and ground temperatures appeared to influence VCM release rates. It was found that time-weighted average sampling is required to determine if concentrations of VCM in air pose a health hazard either at landfills or in adjacent residential or public access areas. (Document retained in SWIRS library)

(12) KEYWORDS: AIR; CONCENTRATION; CONFERENCE; EMISSION; HAZARDOUS; HEALTH; MEASUREMENTS; PERSONNEL; POLYMER; POLYVINYL CHLORIDE; PUBLIC; SAMPLING METHODS; SLUDGE

(15) STIMS ACC.NO.: 00S36334

(18) DOC.CIT.: Markle, R. A., R. B. Iden, and P. A. Sliemers. A preliminary examination of vinyl chloride emissions from polymerization sludges, during handling and land disposal. 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. 7. 2. 1 - 7. 2. 19).

(1) SWIRS ACC.NO.: 036576

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

(11) ABSTRACT: Cardiopulmonary and metabolic responses of 20 adult males before, during, and after 2-hr exposure to either filtered air or 0.05 ppm ozone were determined under various ambient temperature and humidity conditions. The subjects, who ranged in age from 19 to 29 yrs, were exposed to filtered air or ozone under four ambient conditions:

(1) 25 degrees C, 45 percent relative humidity (rh); (2) 31 degree C, 85 percent rh; (3) 35 degrees C, 40 percent rh; and (4) 40 degrees C, 50 percent rh. Exercise at 40 percent of each subject's maximal aerobic capacity was performed after 60 to 90 min of exposure. There were no cardiovascular changes due to ozone exposure, but heart rate increased and stroke volume decreased with increasing heat stress. Rectal, mean body, and mean skin temperature also increased in the presence of heat and were significantly correlated with the WBGT (wet bulb globe temperature) index. There was a decrease in vital capacity and total lung capacity due primarily to a reduction in inspiratory capacity following ozone exposure. Maximum expiratory flow was also reduced following ozone exposure but, as with vital capacity, the greatest decrease occurred immediately following the exercise period in ozone. The combination of heat stress and ozone exposure resulted in significantly greater impairment of pulmonary function and more numerous reported symptoms than in room temperature ozone exposure. It was concluded that tracheal/bronchial irritation caused by ozone reduces vital capacity and maximum expiratory flow and that this effect is more pronounced when ozone exposure occurs in a hot environment.

(Author Abstract Modified)

(12) KEYWORDS: AIR; BIOLOGICAL; CONCENTRATION; EFFECT; EXPOSURE; FILTER; GASES; OXYGEN; PARTICULATE MATTER; POLLUTION; TEMPERATURE

(15) STIMS ACC.NO.: 00S35620

(18) DOC.CIT.: Horvath, S. M., and L. J. Polinsbee. Effects of low levels of ozone and temperature stress. Environmental Protection Agency Publication EPA-600/1-76-001. Research Triangle Park, NC, U. S. Environmental Protection Agency, Mar. 1976, 84 p. (Environmental Health Effects Research Series).

DUST, GAS, AND AIR POLLUTION CONTROL

(1) SWIRS ACC.NO.: 036435
(2) DOMESTIC: F (2) CATEGORY: 19 (2) SUBJ.TYPE: S (10) PUB.
YEAR: 1975
(11) ABSTRACT: Systems of waste removal and dust control on worksites have thus far been designed with inadequate protection from cotton dust. In West Germany the maximum permissible concentration of cotton dust on worksites is 1.5 mg/cu m. Reference is made to the study conducted by Her Majesty's Factory Inspectorate (HMFI) on the so-called Low Volume/High Velocity (LV/HV) system of exhaust, capable of handling from 10,000 to 12,000 feet/min (50-66 meters/sec) of air (10 to 250 cu ft/min or 17 to 425 cu m/h), according to Control and Safety Guide, published by the Asbestos Research Council. A number of such exhaust systems are now being installed also in cotton mills, mainly for the prevention of byssinosis. A description of the system (with diagrams) is given.
(12) KEYWORDS: COLLECTION; CONTROL; DESIGN; DUST; EMISSION; STANDARD; SYSTEM; TEXTILE
(15) STINS ACC.NO.: 00S35480
(18) DOC.CIT.: Dietrich, R. Waste and dust removal by low volume/high velocity exhaust systems. (Abfallentsorgung und entstäubung nach dem LV/ system.) Textil Praxis International, 9:1131-1135, 1975.

(1) SWIRS ACC.NO.: 036285
(2) DOMESTIC: D (2) CATEGORY: 10 (2) SUBJ.TYPE: S (10) PUB.
YEAR: 1975
(11) ABSTRACT: Conclusions of the Interagency Task Force on Inadvertent Modification of the Stratosphere are presented. Fluorocarbon releases to the stratosphere are examined by the task force; such releases are considered to be of importance because a reduction in the average long-term concentration of ozone would result in an increased amount of harmful ultraviolet radiation reaching the earth's surface. In addition to postulated human health effects such as an increased incidence of skin cancer, it is felt that the growth and development of certain plant and animal species might be altered by fluorocarbon releases and that the balance of delicate ecosystems might be disturbed. The stratospheric effects of fluorocarbon-11 and fluorocarbon-12 are examined, and the climatic effects of ozone reduction are discussed. Biological and health effects of ozone reduction are detailed, along with selected aspects of the fluorocarbon industry. Federal regulation of products that release fluorocarbons to the stratosphere is investigated and government and industry research programs on fluorocarbons are reviewed.
(12) KEYWORDS: CONCENTRATION; EFFECT; GASES; HEALTH; OXYGEN; RADIOACTIVE; REDUCTION; ULTRAVIOLET; VEGETATION
(15) STINS ACC.NO.: 00S35330
(18) DOC.CIT.: Council for Environmental Quality. Fluorocarbons and the environment: report of federal task force on inadvertent modification of the stratosphere (IMOS). Washington DC, U. S. Government Printing Office, June 1975, 109 p.

Section 9

RADIOACTIVE WASTE

- (1) SWIRS ACC.NO.: 044824
 (2) DOMESTIC: F (2) CATEGORY: 21 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Radiolabelling water's courses.
 (4) AUTHOR: White KE
 (6) JOURNAL TITLE: Chemistry in Britain
 (10) LANGUAGE: EN (10) GEO. AREA: 1EU/2UK (10) PUB. YEAR: 1976
 (11) ABSTRACT: Three typical applications of radioactive tracers being used to study water systems, and a very large scale study of the dispersion of nuclear waste at sea are summarized. Tracer operations are put in correct perspective here in terms of radiological safety. Radioactive properties and reasons for using tracers are outlined, comparing them to dyes. One exercise illustrates the applications of radiotracers in large water systems. The purpose was to determine the degree of short circuiting and its effects on raw water quality. Tracer concentrated and tracer free water dispersion patterns were recorded. The data are helpful to avoid taking polluted water into bankside reservoirs. A second study assessed the effect of a new sewerage scheme with a proposed outfall in the vertical position. Little was known about the hydraulics of this estuary. Radiotracer dispersion records can provide guidelines for new sewerage schemes and the degree of treatment facilities necessary to achieve water quality standards at sensitive points in an estuary. A further study illustrates the use of tracers to follow sludge solids, assessing the dispersion and dilutions taking place in a bay. Such studies can be conducted without risk to the public and may result in considerable reduction in public expenditure.
 (12) KEYWORDS: GREAT BRITAIN; ISOTOPE; OCEAN; RADIOACTIVE; RESEARCH; SLUDGE; WATERWAY
 (14) HIERARCH TERMS: 1HB; 10A/2UG; 1RA; 1RE
 (15) STIMS ACC.NO.: 00S43869
 (16) CITATION: 12(12):375-379, 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: 1HA/2HG (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.: 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. H., 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.: 035910

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

(11) ABSTRACT: Hundreds of families may be exposed to radiation in a central Florida county because the buildings in which they live and work are on reclaimed phosphate mining land. The U. S. Environmental Protection Agency (EPA), in a letter to the State Governor suggested discouragement of further construction on the Polk County mining land. Hundreds of buildings showed elevated levels of radioactive radon, which is a gas formed by the breakdown of uranium. Florida produces 82 percent of the nation's phosphate rock, which contains relatively high concentrations of uranium. EPA says that the continual exposure for 10 years to the highest level measured could double the normal risk of lung cancer for people living in that area. In Grand Junction, Colorado, Federal and State Governments are paying for the removal of uranium and radium processing mill tailings used as backfill and as a base for concrete foundations, concrete slab floors, and patios in residential areas. In Japan, the government is checking buildings to determine the extent of possible contamination of soil and air by chromium bearing wastes used as landfill. The Japanese and Grand Junction situations also involve cancer threats.

(12) KEYWORDS: CHROMIUM; EPA; FEDERAL; FLORIDA; GOVERNMENT;

HEALTH AND SAFETY

HAZARDOUS; HEALTH; MINE; PHOSPHATE; PROBLEMS; RADIOACTIVE; RECLAMATION;
STATE

(15) STIMS ACC.NO.: 00S34955

(18) DOC.CIT.: Radiation risk: reclaimed phosphate land in Florida
poses cancer danger. Engineering News-Record, 195(15):11, Oct. 9. 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.: 033525

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

(11) ABSTRACT: The use of disposable plastic bags for containment of radioactive laboratory and hospital wastes is unsatisfactory for a number of reasons, from breakage and tearing to difficulty in compaction of wastes. An alternative was sought and found in the use of fiber drums with heavy polyethylene liners. These can then be transferred directly to 55 gal drums. These operations required no handling of plastic bags containing radioactive waste, and there is an improved utilization of space and a reduction of waste pick-ups required.

(12) KEYWORDS: CONTAINER; DISPOSAL; FIBER; HAZARDOUS; HEALTH;
LINER; POLYETHYLENE; RADIOACTIVE; SAFETY

(15) STIMS ACC.NO.: 00S32569

(18) DOC.CIT.: Port, E. A. CXXIII: An improved container for
radioactive waste in laboratories and hospitals. Journal of Chemical
Education, 52(4):A248, A251, Apr. 1975.

Section 10

TRAINING AND SAFETY MANAGEMENT

(1) SWIRS ACC.NO.: 043712
 (2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Pesticide container recycling.
 (5) CORPORATE AUTHOR: Garrity-Sandage Assoc., Inc
 (6) BOOK TITLE: In Special Substances Report 1977. v.2.
 Curriculum Development. (8) REPORT NO.: 76-4300-01
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2IA (10) PUB. YEAR: 1977
 (11) ABSTRACT: Training guidelines are presented for those persons in Iowa who are involved in the decontamination, disposal, and recycling of used and empty farm pesticide containers. The target audience for the guidelines includes farm chemical suppliers, farmers, and scrap metal dealers. Objectives of pesticide safety and container disposal seminars are delineated. A narrative script for slide presentations on the cleaning and disposal of containers is presented. Poison information and treatment centers in Iowa are listed. The organization of a pesticide container disposal project is detailed, and a pesticide container disposal evaluation and survey form is included.
 (12) KEYWORDS: CHEMICAL; CONTAINER; DISPOSAL; FARM; IOWA; METAL; PESTICIDE; PROGRAM; RECLAMATION; SAFETY; SCRAP; SURVEY; TOXIC; TRAINING; TREATMENT
 (14) HIERARCH TERMS: 1CI/2DV; 1EB/2EF; 1PE; 1SB
 (15) STIMS ACC.NO.: 00S42755
 (16) CITATION: Mason City, IA, Garrity-Sandage Associates, Inc., Apr. 1977. p.5-31.

(1) SWIRS ACC.NO.: 043711
 (2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: T
 (3) ARTICLE TITLE: We need trained operators-now!
 (4) AUTHOR: Vonic M
 (6) JOURNAL TITLE: Water and Wastes Engineering
 (10) LANGUAGE: EN (10) PUB. YEAR: 1976
 (11) ABSTRACT: The present and future need for trained wastewater plant operators is discussed. A recent survey has revealed a gap between the supply of well trained operators and the demand for them. The gap will continue to increase due to the increased construction of municipal and industrial water pollution control plants as mandated by Federal law. Two sets of surveys were made in 1975 and in 1976 to determine: the number of water pollution control plants (municipal and industrial); the number of certified plant operators; training programs and recommendations. In 1975 there were over 58,000 plants which will increase to about 61,000 by 1980; the number of operators in 1975 was about 50,800; 35 out of 50 states reported a gap between supply and demand for qualified plant operators; there are two plus operators per plant in the United States while three per plant is thought to be adequate. It is also noted that the qualified operator of today will need further instruction when new facilities are constructed. Recommendations were made as follows: the Federal government should be financially committed to the building of plants and the instruction of operators, providing nationwide certification and personnel requirements for the plants; the states should promote basic training programs for treatment plant operators.
 (12) KEYWORDS: CONTROL; LAW; MUNICIPALITY; PERSONNEL; PLANT-INDUSTRIAL; POLLUTION; TRAINING; WASTE WATER
 (14) HIERARCH TERMS: 1EB/2EE; 1PD
 (15) STIMS ACC.NO.: 00S42754
 (16) CITATION: 13(12):48-51, 53, 55, Dec. 1976.

HEALTH AND SAFETY

(1) SWIRS ACC.NO.: 042934
 (2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G
 (3) ARTICLE TITLE: Safety in solid waste.
 (4) AUTHOR: Van Beek G
 (6) JOURNAL TITLE: Waste Age
 (10) LANGUAGE: EN (10) GEO. AREA: 1US/2VA (10) PUB. YEAR: 1977
 (11) ABSTRACT: As a result of a stepped up safety program started in 1972, the City of Norfolk, Virginia's, Solid Waste Removal Division have experienced a decided downward trend in all accident categories. Medical and compensation costs are about 50 percent of 1972 costs in spite of higher rates. New employees receive tetanus shots, T. B. scratches, and a thorough indoctrination and training. Weekly employee safety meetings are held. Supervisors conduct on the spot investigations of vehicle and employee accidents. Disciplinary action is given if needed. The Division operates 56 collection routes offering twice a week service at the curb. The city is provided a weekly trash service for brush, grass clippings, small appliances. 200 personnel are split into three man crews operating rear loaders.
 (12) KEYWORDS: ACCIDENT; COLLECTION; PERSONNEL; REFUSE; SAFETY; TRAINING; VIRGINIA
 (14) HIERARCH TERMS: 1AA; 1EB/2EE; 1HB
 (15) STIMS ACC.NO.: 00S41977
 (16) CITATION: 8(5):46, 48, May 1977.

(1) SWIRS ACC.NO.: 040040
 (2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G
 (4) AUTHOR: Schultze W (10) PUB. YEAR: 1976
 (11) ABSTRACT: Recognizing the need for training personnel capable of handling the complexities of solid waste management, Wilson County Technical Institute in Wilson, North Carolina, has designed a Sanitary Landfill Operating Manager Option Curriculum which is the only one of its kind in the nation. The curriculum provides the necessary theoretical background and practical skills needed in the field. Three options are offered: (1) a 9 month Landfill Operator Certificate program; (2) a 12 month Landfill Operating Manager Diploma program; (3) and a 2 year Associate of Applied Science Degree, Sanitary Landfill Technology program. Fulltime or parttime study is possible and the Institute is prepared to send an instructor to train personnel in distant areas on request.
 (12) KEYWORDS: COUNTY; MANAGEMENT; NORTH CAROLINA; PERSONNEL; REFUSE; SANITARY LANDFILL; TRAINING; UNIVERSITY
 (14) HIERARCH TERMS: 1MA
 (15) STIMS ACC.NO.: 00S39084 (15) SECONDARY AUTHORS: Pappas J
 (18) DOC.CIT.: Schultze, W., and J. Pappas. The role of Wilson County Technical Institute in solid waste management training. Waste Age, 7(10):21, Oct. 1976.

(1) SWIRS ACC.NO.: 037716
 (2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976
 (11) ABSTRACT: Courses in ecology and environmental science are noted that are being offered in colleges and universities, with emphasis on the environmental health science technology program at Middlesex County College in Edison, New Jersey. It is pointed out that environmental health science technicians are needed in six major job categories: (1) laboratory technicians to perform air, water, and waste water analyses; (2) water and waste water treatment plant operators; (3) air pollution inspectors; (4) stack samplers; (5) public health

enforcement officers (sanitarians and food and drug inspectors); and (6) industrial hygiene technicians. Duties of these technicians are delineated, with the goal of an environmental health science curriculum being to prepare graduates for employment in the fields enumerated. At Middlesex County College, students also receive on the job training in an internship program. Positions obtained by graduates of the college since 1973 are tabulated.

(12) KEYWORDS: ENGINEERING; HEALTH; NEW JERSEY; OCCUPATION; TECHNOLOGY; TRAINING; UNIVERSITY

(15) STIMS ACC.NO.: 00S36760

(18) DOC.CIT.: Smith, R. G. , and A. Sherman. Technician training in environmental health science. Journal of the Air Pollution Control Association, 26(8):792-793, Aug. 1976.

(1) SWIRS ACC.NO.: 037710

(2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1976

(11) ABSTRACT: Solid waste safety programs are discussed in relation to a safety program visibility quotient (SPVQ). Safety is considered in terms of customers, insurance carriers, opinions of business associates, competition, and purchasing policy. The role of management and supervisory personnel in an organization's safety program is examined, along with techniques for evaluating the effectiveness of a safety program one of the major ways of evaluating a safety program is considered to be an organization's accident and injury record.

(12) KEYWORDS: INDUSTRY; MANAGEMENT; PROGRAM; SAFETY

(15) STIMS ACC.NO.: 00S36754

(18) DOC.CIT.: Van Beek, G. SPVQ, where's the evidence? Waste Age, 7(7):10-11, July 1976.

(1) SWIRS ACC.NO.: 035699

(2) DOMESTIC: F (2) CATEGORY: 27 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: This is the second year that North Straffordshire Polytechnic offered honors and ordinary degree programs in solid waste management. Mechanical engineering was used as the parent discipline because the problems associated with solid waste management, such as incineration, separation, and heat recovery, were more allied to it than to civil engineering. The syllabus for the honors degree draws on topics from the same range but there is less coursework in each topic area. Honors undergraduates get 144 hr in their final year. Local authorities have not stepped forward to sponsor students; they probably did not have the resources this year. Efforts are being made to convince industry to sponsor solid waste management students.

(12) KEYWORDS: INCINERATION; INDUSTRY; LOCAL; MANAGEMENT; PERSONNEL; SEPARATING; TRAINING; UNIVERSITY; WASTE HEAT

(15) STIMS ACC.NO.: 00S34744

(18) DOC.CIT.: Milbank, P. waste graduates. Surveyor Public Authority Technology, 146(4350):9-11, Oct. 24, 1975.

(1) SWIRS ACC.NO.: 034928

(2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: T (10) PUB. YEAR: 1975

(11) ABSTRACT: This environmental protection publication in the solid waste management series presents information on the major

components of commercial refuse collection systems. This section discusses the development of effective personnel administration in commercial refuse collection operations. Proper selection and training of personnel is an important first step in establishing an efficient operation. Rigid physical examinations should be provided prior to employment. Prospective employees should also be evaluated for mechanical skill, congeniality, and intelligence. Employees should be provided with extensive information on the equipment used, the routes to be covered, and the procedures to be used. New employees should spend several days with an experienced worker to learn the proper procedure. Training should also include instruction in safety precautions, first aid, and fire fighting techniques. Continued service should be encouraged through dependable and stable employment, with opportunities for advancement and retirement. Suggested personnel job descriptions and employment standards are provided for senior foreperson, and equipment operator for a refuse collection operation. A variety of non-collection personnel are also needed for office work, maintenance and repair operations, and supervisory functions. (This document is retained in SWIRS library.)

(12) KEYWORDS: COLLECTION; COMMERCIAL; MANAGEMENT; MUNICIPALITY; PERSONNEL; PRIVATE; PROBLEMS; REFUSE; SAFETY; STANDARD; TRAINING

(15) STIMS ACC.NO.: 00533973

(18) DOC.CIT.: The City of Scottsdale, Arizona. Personnel considerations. In A handbook for initiating or improving commercial refuse collection. Cincinnati, Ohio, U. S. Environmental Protection Agency, 1975. p. 45-58.

(1) SWIRS ACC.NO.: 033453

(2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Personnel trained in the engineering and scientific disciplines involved in environmental engineering will be in demand in the near future and will experience good job opportunities and competitive salary schedules. Summaries of the engineering and scientific manpower engaged in the various sectors of environmental engineering obtained through surveys and reported in three Environmental Protection Agency Reports indicate that an increase of approximately 100 percent is anticipated in the number of engineers and scientists that will be required for non-government air and water pollution control activities over the next 5 years. Tables with the actual and projected figures for non-government, state and local, and U. S. EPA projections are given.

(12) KEYWORDS: AIR; ENVIRONMENT; EPA; FEDERAL; GOVERNMENT; LOCAL; PERSONNEL; POLLUTION; PRIVATE; STATE; TRAINING; WATER

(15) STIMS ACC.NO.: 00532497

(18) DOC.CIT.: Middlebrooks, E. J. Manpower needs for environmental engineering. Public Works, 106 (5):98-99, May 1975.

(1) SWIRS ACC.NO.: 032158

(2) DOMESTIC: D (2) CATEGORY: 27 (2) SUBJ.TYPE: G (10) PUB. YEAR: 1975

(11) ABSTRACT: Currently, wastewater treatment and water purification plant operators are required to be certified, however,

RADIOACTIVE WASTE

incineration plant operators are not. The sanitation Supervisor of East Hartford Connecticut emphasizes the need for State and national training programs for incinerator plant operating personnel. Those who should be required to be certified are: the plant superintendent, the assistant superintendent, foremen, furnace operators, crane operators, and all other personnel whose job function is directly related to the combustion efficiency of the plant. Grade levels of certification should be established along with corresponding salary levels. The State of Connecticut did have a training and certification program which resulted in the certification of the superintendent only. The program has since been forgotten.

(12) KEYWORDS: CONNECTICUT; FACILITY; FEDERAL; INCINERATION; INCINERATOR; MANAGEMENT; PERSONNEL; POLLUTION; STATE; TRAINING; TREATMENT; WASTE WATER; WATER

(15) STIMS ACC.NO.: 00S31202

(18) DOC.CIT.: Congdon, H. W. Good operators mean better incineration. The American City, 90(3):63, Mar. 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	Conser Devt
Deutschen	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

HAZARDOUS WASTE MANAGEMENT

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)	millimeter (mm)
acre-foot (acre-ft)	mile (mile)
centimeter (cm)	newton (N)
cubic centimeter (cu cm)	one kilogram force (kgf)
cubic foot (cu ft)	one pound force (lbf)
cubic inch (cu in)	pascal (Pa)
cubic meter (cu m)	pound (lb)
cubic meters per minute (cu m/min)	pounds per square foot (psf)
cubic yard (cu yd)	pounds per square inch (psi)
ft (ft)	square centimeter (sq cm)
gallon (gal)	square foot (sq ft)
gallons per minute (gal/min)	square inch (sq in)
hectare (ha)	square kilometer (sq km)
inch (in)	square meter (sq m)
kilogram (kg)	square mile (sq mile)
meter (m)	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

<u>Language</u>	<u>Code</u>	<u>Language</u>	<u>Code</u>
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	BE	Maltese	MT
(White Russian)		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

HAZARDOUS WASTE MANAGEMENT

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 2Cl 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

HIERARCHIC TERMS

	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

HAZARDOUS WASTE MANAGEMENT

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	

HIERARCHIC TERMS

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

HAZARDOUS WASTE MANAGEMENT

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

HIERARCHIC TERMS

1MX	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

HAZARDOUS WASTE MANAGEMENT

	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)	

HIERARCHIC TERMS

	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

HAZARDOUS WASTE MANAGEMENT

	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)	

HIERARCHIC TERMS

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	2LI	Libya
1AN	Antarctica	2LT	Lithuania
1AS	Asia	2LU	Louisiana
1AU	Australia	2MA	Maine
1CA	Canada	2MD	Maryland
1CB	Caribbean	2MH	Massachusetts
1EU	Europe	2MI	Melbourne
1MA	Marshall Islands	2MJ	Michigan
1ME	Mexico	2MN	Minnesota
1MI	Middle East	2MP	Mississippi
1NZ	New Zealand	2MR	Missouri
1SA	South America	2MT	Montana
1SU	Soviet Union	2NB	Nebraska
1US	United States	2NE	Nepal
		2NF	Netherlands
2AA	Alabama	2NG	Nevada
2AC	Alaska	2NH	New Hampshire
2AE	Alberta	2NJ	New Jersey
2AG	Americar Samoa	2NM	New Mexico
2AI	Arizona	2NQ	New York
2AN	Argentina	2NR	North Carolina
2AR	Arkansas	2NT	North Dakota
2AS	Austria	2NY	Norway
2BE	Belgium	2OH	Ohio
2BI	Brazil	2OK	Oklahoma
2BR	British Columbia	2ON	Ontario
2CA	California	2OR	Oregon
2CH	China (Mainland)	2PC	Pakistan
2CI	China (Taiwan)	2PE	Pennsylvania
2CO	Colorado	2PJ	Peru
2CT	Connecticut	2PL	Poland
2CZ	Czechoslovakia	2PR	Puerto Rico
2DE	Delaware	2RI	Rhode Island
2DN	Denmark	2SA	Saskatchewan
2DT	District of Columbia	2SF	South Africa
2FI	Finland	2SI	South Carolina
2FL	Florida	2SK	South Dakota
2FR	France	2SP	Spain
2GB	Gabon	2SR	Sweden
2GE	Georgia	2SU	Switzerland
2GM	Germany (East)	2SY	Sydney
2GN	Germany (West)	2TA	Tasmania
2GU	Guam	2TE	Tennessee
2HI	Hawaii	2TK	Texas
2HK	Hong Kong	2TN	Thailand
2HU	Hungary	2UG	Uganda
2IA	Idaho	2UK	United Kingdom
2II	Illinois	2UT	Utah
2IL	India	2VA	Venezuela
2IN	Indiana	2VE	Vermont
2IO	Indonesia	2VI	Victoria
2IQ	Iowa	2VN	Virginia
2IR	Ireland	2VR	Virgin Islands
2IS	Israel	2WA	Washington
2IT	Italy	2WR	West Virginia
2JM	Jamaica	2WW	Wisconsin
2JP	Japan	2WY	Wyoming
2KS	Kansas	2YU	Yugoslavia
2Ky	Kentucky		
2LE	Lebanon	3AI	Aiken
		3AK	Akron

GEOGRAPHICAL

3AL	Albany	3GL	Glasgow
3AM	Ames	3HA	Hague
3AS	Amsterdam	3HF	Haifa
3AT	Atlanta	3HG	Hamburg
3BA	Baltimore	3HJ	Hanford
3BC	Bangkok	3HL	Harlem
3BI	Basel	3HM	Hartford
3BK	Barking	3HO	Honolulu
3BL	Bavaria	3HR	Hopewell
3BN	Berkeley	3HU	Houston
3BR	Berlin	3IT	Ithaca
3BS	Birmingham	3JE	Jerusalem
3BT	Boston	3JH	Johannesburg
3BV	Bridgeport	3JP	Joplin
3BW	Broward	3KC	Kansas City
3CA	Calumet	3KH	Karlsruhe
3CD	Camden	3KN	Knox
3CF	Casteljaloux	3KS	Kosovo
3CI	Cheshire	3KW	Kracow
3CJ	Chicago	3LC	Lancaster
3CN	Cincinnati	3LI	Lima
3CP	Cleveland	3LL	Liverpool
3CT	Clinton	3LO	London
3CU	Columbus	3LS	Los Angeles
3CY	Cook	3LY	Lycoming
3CZ	Czestochowa	3MA	Madras
3DE	Denver	3MD	Madrid
3DI	Detroit	3MH	Manchester
3DN	Dublin	3MI	Maui
3DT	Duluth	3ML	Melbourne
3DU	Dusseldorf	3MM	Miami
3EB	Ebingen	3MO	Milwaukee
3ED	Edinburgh	3MP	Minneapolis
3EK	Elk Creek	3MR	Mobile
3EM	Elmira	3MT	Montgomery
3EY	Ely	3MU	Munich
3FB	Fairbanks	3MY	Muskegon
3FI	Finham	3NA	Nashville
3FL	Flagstaff	3ND	New Delhi
3FN	Frankfort	3NL	New Orleans
3FR	Franklin	3NO	New York City
3SA	St. Croix	3NR	Niagara
3SC	St. Joseph	3NU	Nurnberg
3SD	St. Louis	3OC	Ochtrup
3SE	St. Paul	3OT	Ottawa
3SG	St. Petersburg	3PA	Paris
3SI	San Diego	3PC	Passaic
3SN	San Francisco	3PH	Philadelphia
3SO	Santa Ana	3PN	Phoenix
3SP	Santa Barbara	3PS	Pinellas
3SR	Savannah	3PW	Piscataway
3ST	Stockholm	3RC	Rochester
3SU	Stuttgart	3RO	Rocky Flats
3TA	Tel Aviv	3VE	Ventura
3TC	Tocks Island	3VI	Virginia Beach
3TK	Tokyo	3WA	Walcheren
3TN	Toronto	3WE	Weidenau-Geisweid
3TO	Trenton	3WK	West Nyack
3TR	Tripoli	3WM	Willamette River
3TU	Tucson	3WY	Winnebago
3VC	Venice	3YO	Yosemite
3GA	Gainesville	3ZU	Zurich
3GE	Geneva		

Appendix F

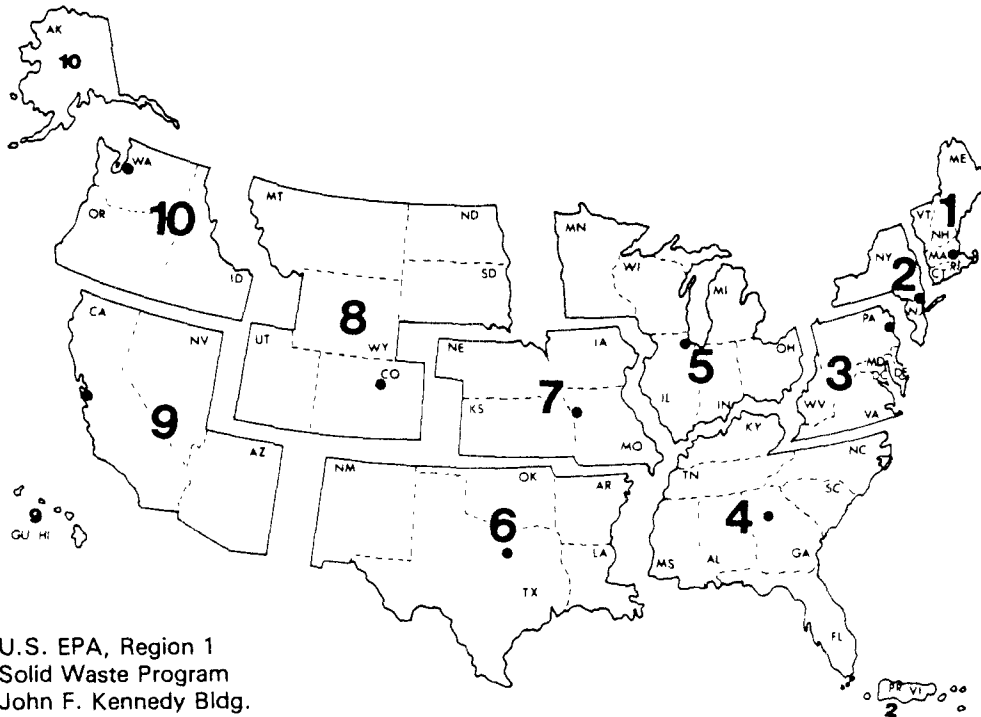
DOCUMENT CATEGORY CODES

01	AGRICULTURAL WASTES		Rural
	Crop residues		State
	Manure	17	OCEAN DISPOSAL
	Timber/other vegetation	18	PACKAGING
02	ANALYSIS OF SOLID WASTE	19	PROCESSING/REDUCTION
	Data	20	RECYCLING
03	AUTOMOBILES		Incinerator residue
04	BULKY WASTES		Industrial wastes
05	COLLECTION		Mining wastes
06	COMPOST		Municipal refuse
07	DISPOSAL		Scrap metal
08	ECONOMICS	21	RESEARCH
	Disposal costs	22	SANITARY LANDFILL
	Financing facilities	23	SEPARATION
	Pollution control costs	24	SLUDGE
	Marketing information	25	STORAGE
	Taxes and incentives	26	STREET CLEANING
09	HAZARDOUS WASTES	27	TRAINING, EDUCATION, PUBLIC RELATIONS
10	HEALTH/SAFETY		
11	INCINERATION	28	TRANSPORT
12	INDUSTRIAL WASTES	29	SOURCE REDUCTION
13	INSTITUTIONAL WASTES	30	ENERGY
14	LAWS/REGULATIONS		Demand, for solid waste management
15	LITTER		Fuel from wastes
16	MANAGEMENT		Heat utilization from incineration
	Municipal		
	Regional		

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Solid Waste Program
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U.S. EPA, Region 2
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26 Federal Plaza
New York, NY 10007
212-264-0503

U.S. EPA, Region 3
Solid Waste Program
6th and Walnut Sts.
Philadelphia, PA 19106
215-597-9377

U.S. EPA, Region 4
Solid Waste Program
345 Courtland St., N.E.
Atlanta, GA 30308
404-881-3016

U.S. EPA, Region 5
Solid Waste Program
230 South Dearborn St.
Chicago, IL 60604
312-353-2197

U.S. EPA, Region 6
Solid Waste Section
1201 Elm St.
Dallas, TX 75270
214-767-2734

U.S. EPA, Region 7
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Kansas City, MO 64108
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Solid Waste Section
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Denver, CO 80295
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Solid Waste Program
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1200 6th Ave.
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