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Analysis of Postulated Accidents at the Proposed Decontamination and Waste Treatment Facility at the Lawrence Livermore National Laboratory Mar 27 2021 Accidents that might occur during the handling, treatment, or storage of radioactive and chemically hazardous wastes are discussed and analyzed in this report. General guidance to radiological accident considerations is given in LA-10294 (Reference 1). The models and assumptions used in the analysis for determining the amount of radioactivity or hazardous material released to the environment and the extent of exposure to facility workers and the public are presented. No high hazard areas were found to exist at DWTF. Only the decontamination building and the liquid waste receiving/feed tank area of the incinerator building have been determined to be moderate hazard facilities. All other areas at DWTF are classified as low hazard. The seismic design of the storage building, a low hazard facility, was upgraded to moderate hazard to further ensure its structural integrity during a design basis earthquake (DBE).

Decontamination/Destruction Technology Demonstration for Organics in Transuranic Waste Jun 10 2022 The United States Department of Energy's Savannah River Site has approximately 5000 55-gallon drums of 238Pu contaminated waste in interim storage. These may not be shipped to WIPP in TRUPACT-II containers due to the high rate of hydrogen production resulting from the radiolysis of the organic content of the drums. In order to circumvent this problem, the 238Pu needs to be separated from the organics--either by mineralization of the latter or by decontamination by a chemical separation. We have conducted ''cold'' optimization trials and surrogate tests in which a combination of a mediated electrochemical oxidation process (SILVER II{trademark}) and ultrasonic mixing have been used to decontaminate the surrogate waste materials. The surrogate wastes were impregnated with copper oxalate for plutonium dioxide. Our process combines both mineralization of reactive components (such cellulose, rubber, and oil) and surface decontamination of less reactive materials such as polyethylene, polystyrene and polyvinylchloride. By using this combination of SILVER II and ultrasonic mixing, we have achieved 100% current efficiency for the destruction of the reactive components. We have demonstrated that: The degree of decontamination achieved would be adequate to meet both WIPP waste acceptance criteria and TRUPACT II packaging and shipping requirements; The system can maintain near absolute containment of the surrogate radionuclides; Only minimal pre-treatment (coarse shredding) and minimal waste sorting are required; The system requires minimal off gas control processes and monitoring instrumentation; The laboratory trials have developed information that can be used for scale-up purposes; The process does not produce dioxins and furans; Disposal routes for secondary process arisings have already been demonstrated in other programs. Based on the results from Phase 1, the recommendation is to proceed to Phase 2 and use the equipment at Savannah River Site to demonstrate the processing of genuine plutonium contaminated wastes.

Safe Management of Wastes from Health-care Activities Jun 17 2020 This is the second edition of the WHO handbook on the safe, sustainable and affordable management of health-care waste--commonly known as "the Blue Book". The original Blue Book was a comprehensive publication used widely in health-care centers and government agencies to assist in the adoption of national guidance. It also provided support to committed medical directors and managers to make improvements and presented practical information on waste-management techniques for medical staff and waste workers. It has been more than ten years since the first edition of the Blue Book. During the intervening period, the requirements on generators of health-care wastes have evolved and new methods have become available. Consequently, WHO recognized that it was an appropriate time to update the original text. The purpose of the second edition is to expand and update the practical information in the original Blue Book. The new Blue Book is designed to continue to be a source of impartial health-care information and guidance on safe waste-management practices. The editors' intention has been to keep the best of the original publication and supplement it with the latest relevant information. The audience for the Blue Book has expanded. Initially, the publication was intended for those directly involved in the creation and handling of health-care wastes: medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers. This is no longer the situation. A wider range of people and organizations now have an active interest in the safe management of health-care wastes: regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students. They should also find the new Blue Book of benefit to their activities. Chapters 2 and 3 explain the various types of waste produced from health-care facilities, their typical characteristics and the hazards these wastes pose to patients, staff and the general environment. Chapters 4 and 5 introduce the guiding regulatory principles for developing local or national approaches to tackling health-care waste management and transposing these into practical plans for regions and individual health-care facilities. Specific methods and technologies are described for waste minimization, segregation and treatment of health-care wastes in Chapters 6, 7 and 8. These chapters introduce the basic features of each technology and the operational and environmental characteristics required to be achieved, followed by information on the potential advantages and disadvantages of each system. To reflect concerns about the difficulties of handling health-care wastewaters, Chapter 9 is an expanded chapter with new guidance on the various sources of wastewater and wastewater treatment options for places not connected to central sewerage systems. Further chapters address issues on economics (Chapter 10), occupational safety (Chapter 11), hygiene and infection control (Chapter 12), and staff training and public awareness (Chapter 13). A wider range of information has been incorporated into this edition of the Blue Book, with the addition of two new chapters on health-care waste management in emergencies (Chapter 14) and an overview of the emerging issues of pandemics, drug-resistant pathogens, climate change and technology advances in medical techniques that will have to be accommodated by health-care waste systems in the future (Chapter 15).

Nuclear Engineering Questions Nov 22 2020

Guidance for Implementing and Documenting Closure (waste Removal and Decontamination) for Indoor RCRA Hazardous Waste Container Storage Areas May 17 2020

Technologies for Environmental Management Jun 29 2021 The Department of Energy's Environmental Management Program (DOEEM) is one of the largest environmental clean up efforts in world history. The EM division charged with developing or finding technologies to accomplish this massive task, its Office of Science and Technology (OST), has been reviewed extensively, including six reports from committees of the National Research Council's (NRC's) Board on Radioactive Waste Management (BRWM) that have been released since December 1998. These committees examined different components of OST's technology development program, including its decision-making and peer review processes and its efforts to develop technologies in the areas of decontamination and decommissioning, waste forms for mixed waste, tank waste, and subsurface contamination. Gerald Boyd, head of OST, asked the Board on Radioactive Waste Management (BRWM) to summarize the major findings and recommendations of the six reports and synthesize any common issues into a number of overarching recommendations.

Waste Conditioning: Decontamination Dec 04 2021

Affordable Cleanup? Dec 16 2022 The Energy Policy Act of 1992 called on the National Academy of Sciences to conduct a study and provide recommendations for reducing the costs of decontaminating and decommissioning (D&D) the nation's uranium enrichment facilities located at Oak Ridge, Tennessee; Raducah, Kentucky; and Portsmouth, Ohio. This volume examines the existing plans and cost estimates for the D&D of these facilities, including such elements as technologies, planning and management, and identifies approaches that could reduce D&D costs. It also assesses options for disposition of the large quantities of depleted

uranium hexafluoride that are stored at these sites.
Solving Hazardous Waste Problems Sep 13 2022
Decontamination and Volume Reduction System for Transuranic Waste at Los Alamos National Laboratory, Los Alamos, New Mexico - Environmental Assessment Oct 22 2020 The Proposed Action is to reduce the volume of oversized metallic transuranic (TRU) wastes at Los Alamos National Laboratory (LANL) that would require disposal at the Waste Isolation Pilot Plant (WIPP) by using a decontamination and compaction process. The proposed process, called the decontamination and volume reduction system (DVRS), would be implemented within an existing structure at the Department of Energy's (DOE's) solid radioactive waste storage and disposal area located at Technical Area (TA) 54. The preferred location is Dome 226. Other equivalent locations would be Domes 229, 230, and 231, adjacent to Dome 226, or a pre-engineered structure that would be placed adjacent to Dome 226. The proposed DVRS would provide the capability to process and dispose of approximately 3,120 yd3 (2,400 m3) of oversized metallic TRU waste currently in storage at TA-54 within a substantially reduced operating period. The majority of this oversized metallic TRU waste, which is currently too big to fit into the approved waste containers used for the WIPP Project, would be sorted, segregated, and decontaminated to meet low-level radioactive waste (LLW) criteria, and then compacted and disposed of on-site as LLW. The remainder of the oversized metallic TRU waste, which cannot be sufficiently decontaminated to meet LLW criteria, would be cut up and compacted to fit into the WIPP-approved waste containers, packaged, and shipped as TRU waste to WIPP. In addition to the existing inventory of oversized metallic TRU waste, the proposed DVRS would also be able to process an additional 3,900 yd3 (3,000 m3) of oversized metallic TRU waste that may result from on-site decontamination and decommissioning activities and equipment replacement at other LANL facilities. The DVRS is expected to process the total estimated 7,020 yd3 (5,400 m3) of oversized metallic TRU waste in about six years. The proposed construction and implementation of the DVRS at LANL would provide DOE with a low-risk, high-benefit opportunity to implement previously used technology (a similar unit has been used at Erwin, Tennessee) to dispose of LANL's oversized metallic TRU waste in an environmentally safe manner. In line with the DOE TRU Waste Management Plan for LANL (LANL 1996), the DVRS would enable DOE to accelerate cleanup objectives while achieving substantial cost savings. Environmental effects under either the Proposed Action or the No Action alternative would be minimal. On average, worker doses would remain well below allowable DOE limits for the Proposed Action. Worker doses could be higher under the No Action alternative but should also remain well below DOE limits. The volume of TRU waste sent to WIPP for disposal would be reduced from 7,020 yd3 (5,400 m3) to 442 yd3 (340 m3) under the Proposed Action.
Methods for the Minimization of Radioactive Waste from Decontamination and Decommissioning of Nuclear Facilities Aug 12 2022 Simple text and photographs introduce the life of George Washington Carver.
New York Scrapbook Oct 02 2021
Analysis of the Application of Decontamination Technologies to Radioactive Metal Waste Minimization Using Expert Systems Apr 27 2021 Radioactive metal waste makes up a significant portion of the waste currently being sent for disposal. Recovery of this metal as a valuable resource is possible through the use of decontamination technologies. Through the development and use of expert systems a comparison can be made of laser decontamination, a technology currently under development at Ames Laboratory, with currently available decontamination technologies for applicability to the types of metal waste being generated and the effectiveness of these versus simply disposing of the waste. These technologies can be technically and economically evaluated by the use of expert systems techniques to provide a waste management decision making tool that generates, given an identified metal waste, waste management recommendations. The user enters waste characteristic information as input and the system then recommends decontamination technologies, determines residual contamination levels and possible waste management strategies, carries out a cost analysis and then ranks, according to cost, the possibilities for management of the waste. The expert system was developed using information from literature and personnel experienced in the use of decontamination technologies and requires validation by human experts and assignment of confidence factors to the knowledge represented within.
Proceedings of the International Conference on Decommissioning and Decontamination and on Nuclear and Hazardous Waste Management Feb 06 2022
Prudent Practices in the Laboratory Jan 25 2021 Prudent Practices in the Laboratory--the book that has served for decades as the standard for chemical laboratory safety practice--now features updates and new topics. This revised edition has an expanded chapter on chemical management and delves into new areas, such as nanotechnology, laboratory security, and emergency planning. Developed by experts from academia and industry, with specialties in such areas as chemical sciences, pollution prevention, and laboratory safety, Prudent Practices in the Laboratory provides guidance on planning procedures for the handling, storage, and disposal of chemicals. The book offers prudent practices designed to promote safety and includes practical information on assessing hazards, managing chemicals, disposing of wastes, and more. Prudent Practices in the Laboratory will continue to serve as the leading source of chemical safety guidelines for people working with laboratory chemicals: research chemists, technicians, safety officers, educators, and students.
Laboratory Decontamination and Destruction of Carcinogens in Laboratory Wastes Aug 20 2020 IARC and the NIH were joined by the French Ministry of the Environment in the development of a program to establish and validate methods for the decontamination of wastes contaminated by chemical carcinogens and the treatment of spillages with such compounds. Eight volumes have been published dealing with aflatoxins, nitrosamines, polycyclic aromatic hydrocarbons, hydrazines, nitrosamides, haloethers, aromatic amines and a series of antineoplastic agents (IARC Scientific Publications Nos. 37, 43,49, 54, 55, 61, 64 and 73). In this volume, the ninth of the series, methods of degradation are presented for four commonly investigated mycotoxins: ochratoxin A, citrinin, patulin, and sterigmatocystin. In view of new findings, a re-investigation has also been performed for aflatoxins and these compounds have been tested in one of the methods. The five methods presented can be applied to various waste categories and three of them to spillage treatment. Chemical and biological information concerning these compounds is also presented in an appendix to these methods.
Decontamination of Hot Cells K-1, K-3, M-1, M-3, and A-1, M-Wing, Building 200 Apr 15 2020 The purpose of this project was to remove radioactively contaminated materials and equipment from the hot cells, to decontaminate the hot cells, and to dispose of the radioactive waste. The goal was to reduce stack releases of Rn-220 and to place the hot cells in an emptied, decontaminated condition with less than 10 [mu]Sv/h (1 mrem/h) general radiation background. The following actions were needed: organize and mobilize a decontamination team; prepare decontamination plans and procedures; perform safety analyses to ensure protection of the workers, public, and environment; remotely size-reduce, package, and remove radioactive materials and equipment for waste disposal; remotely decontaminate surfaces to reduce hot cell radiation background levels to allow personnel entries using supplied air and full protective suits; disassemble and package the remaining radioactive materials and equipment using hands-on techniques; decontaminate hot cell surfaces to remove loose radioactive contaminants and to attain a less than 10 [mu]Sv/h (1 mrem/h) general background level; document and dispose of the radioactive and mixed waste; and conduct a final radiological survey.
Guide for Decontaminating Buildings, Structures, and Equipment at Superfund Sites Jul 23 2023
DWTF (decontamination and Waste Treatment Facilities) Assessment Jul 31 2021 The purpose of this study has been to evaluate the adequacy of present and proposed decontamination and waste treatment facilities (DWTF) at LLNL, to determine the cost effectiveness for proposed improvements, and possible alternatives for accomplishing these improvements. To the extent possible, we have also looked at some of the proposed environmental compliance and cleanup (ECC) projects.
A Review of Decontamination and Decommissioning Technology Development Programs at the Department of Energy May 09 2022

Decontamination Waste Management Nov 03 2021
Report of Exploratory Trenching for the Decontamination and Waste Treatment Facility at Lawrence Livermore National Laboratory, Livermore, California Sep 20 2020 Three exploratory trenches, totaling about 1,300 ft in length were excavated and logged across the site of a proposed Decontamination and Waste Treatment Facility (DWTF), to assess whether or not active Greenville fault zone, located about 4100 ft to the northeast, pass through or within 200 ft of the site. The layout of the trenches (12-16 ft deep) was designed to provide continuous coverage across the DWTF site and an area within 200 ft northeast and southwest of the site. Deposits exposed in the trench walls are primarily of clay, and are typical of weakly cemented silty sand to sandy silt with the alluvial deposits in the area. Several stream channels were encountered that appear to have an approximated east-west orintation. The channel deposits consist of well-sorted, medium to coarse-grained sand and gravel. A well-developed surface soil is laterally continuous across all three trenches. The soil reportedly formed during late Pleistocene time (about 35,000 to 40,000 yr before present) based on soil stratigraphic analyses. A moderately to well-developed buried soil is laterally continuous in all three trenches, except locally where it has been removed by channelling. This buried soil apparently formed about 100,000 yr before present. At least one older, discontinuous soil is present below the 100,000-yr-old soil in some locations. The age of the older soil is unknown. At several locations, two discontinuous buried soils were observed between the surface soil and the 100,000-yr-old soil. Various overlapping stratigraphic units could be traced across the trenches providing a continuous datum of at least 100,000 yr to assess the presence or absence of faulting. The continuity of stratigraphic units in all the trenches demonstrated that no active faults pass through or within 200 ft of the proposed DWTF site.
Report of Commission on Street Cleaning and Waste Disposal, the City of New York, 1907 Apr 20 2023
Long-term Decontamination Engineering Study Feb 23 2021 This report was prepared by Westinghouse Hanford Company (WHC) with technical and cost estimating support from Pacific Northwest Laboratories (PNL) and Parsons Environmental Services, Inc. (Parsons). This engineering study evaluates the requirements and alternatives for decontamination/treatment of contaminated equipment at the Hanford Site. The purpose of this study is to determine the decontamination/treatment strategy that best supports the Hanford Site environmental restoration mission. It describes the potential waste streams requiring treatment or decontamination, develops the alternatives under consideration establishes the criteria for comparison, evaluates the alternatives, and draws conclusions (i.e., the optimum strategy for decontamination). Although two primary alternatives are discussed, this study does identify other alternatives that may warrant additional study. hanford Site solid waste management program activities include storage, special processing, decontamination/treatment, and disposal facilities. This study focuses on the decontamination/treatment processes (e.g., waste decontamination, size reduction, immobilization, and packaging) that support the environmental restoration mission at the Hanford Site.
Decontamination of Waste Waters from Radiochemical Laboratories and Experimental Atomic Reactors Apr 08 2022
Final Programmatic Environmental Impact Statement Related to Decontamination and Disposal of Radioactive Wastes Resulting from March 28, 1979, Accident Three Mile Island Nuclear Station, Unit 2, Docket No. 50-320, Metropolitan Edison Company, Jersey Central Power and Light Company, Pennsylvania Electric Company Jul 19 2020
Lawrence Livermore National Laboratory Decontamination and Waste Treatment Facility Aug 24 2023
Decontamination Processes for Waste Glass Canisters Sep 01 2021 The process which will be used to decontaminate waste glass canisters at the Savannah River Plant consists of: decontamination (slurry blasting); rinse (high-pressure water); and spot decontamination (high-pressure water plus slurry). No additional waste will be produced by this process because glass frit used in decontamination will be mixed with the radioactive waste and fed into the glass melter. Decontamination of waste glass canisters with chemical and abrasive blasting techniques was investigated. The ability of a chemical technique with HNO3-HF and H2C2O4 to remove baked-on contamination was demonstrated. A correlation between oxide removal and decontamination was observed. Oxide removal and, thus, decontamination by abrasive blasting techniques with glass frit as the abrasive was proposed and demonstrated.
The Army's Procurement and Management of Decontamination Solution No. 2 Jan 05 2022
Waste Disposal--Decontamination and Decontamination Laundry Facilities Mar 07 2022
Electrolytic Decontamination of Metal Low Level Waste (LLW) and Mixed Low Level Waste (MLLW). Dec 24 2020 Metal objects resulting from ER activities were decontaminated using electrolytic methods. The project involved about 500 kg of ballistic test projectiles, 23 augers and drill heads, and 50 pieces of shrapnel containing lead. All objects were free-released and either reclaimed as scrap metal or reused. Electrolytic decontamination was proven to be an effective method to decontaminate metal waste objects to free-release standards. A cost analysis showed the process to be economical, especially when applied to decontamination of mixed waste, TRU waste, or when the recovered materials could be reused or recycled. The cost of decontamination of scrap iron is approximately equal to the cost of its land disposal as low level waste.
Decontamination of Waste Solution from Davies-Gray Analyses in a Pilot-facility for Process Development Nov 15 2022
Assessment of the Proposed Decontamination and Waste Treatment Facility at LLNL. Feb 18 2023 To provide a centralized decontamination and waste treatment facility (DWTF) at LLNL, the construction of a new installation has been planned. Objectives for this new facility were to replace obsolete, structurally and environmentally sub-marginal liquid and solid waste process facilities and decontamination facility and to bring these facilities into compliance with existing federal, state and local regulations as well as DOE orders. In a previous study, SAIC conducted a preliminary review and evaluation of existing facilities at LLNL and cost effectiveness of the proposed DWTF. This document reports on a detailed review of specific aspects of the proposed DWTF.
Conversion of Transuranic Waste to Low Level Waste by Decontamination May 29 2021 As a followup to an FY-1984 cost/benefit study, a program was conducted in FY-1985 to transfer to the relevant DOE sites the information and technology for the direct conversion of transuranic (TRU) waste to low-level waste (LLW) by decontamination. As part of this work, the economic evaluation of the various TRUW volume reduction and conversion options was updated and expanded to include site-specific factors. The results show, for the assumptions used, that size reduction, size reduction followed by decontamination, or in situ decontamination are cost effective compared with the no-processing option. The technology transfer activities included site presentations and discussions with operations and waste management personnel to identify application opportunities and site-specific considerations and constraints that could affect the implementation of TRU waste conversion principles. These discussions disclosed definite potential for the beneficial application of these principles at most of the sites, but also confirmed the existence of site-specific factors ranging from space limitations to LLW disposal restrictions that could preclude particular applications or diminish expected benefits. 8 refs., 2 figs., 4 tabs.
Biosafety in the Laboratory Mar 19 2023 Biosafety in the Laboratory is a concise set of practical guidelines for handling and disposing of biohazardous material. The consensus of top experts in laboratory safety, this volume provides the information needed for immediate improvement of safety practices. It discusses high- and low-risk biological agents (including the highest-risk materials handled in labs today), presents the "seven basic rules of biosafety," addresses special issues such as the shipping of dangerous materials, covers waste disposal in detail, offers a checklist for administering laboratory safetyâ€"and more.
Waste Disposal Jan 17 2023

Metal Decontamination for Waste Minimization Using Liquid Metal Refining Technology May 21 2023 The current Department of Energy Mixed Waste Treatment Project flowsheet indicates that no conventional technology, other than surface decontamination, exists for metal processing. Current Department of Energy guidelines require retrievable storage of all metallic wastes containing transuranic elements above a certain concentration. This project is in support of the National Mixed Low Level Waste Treatment Program. Because of the high cost of disposal, it is important to develop an effective decontamination and volume reduction method for low-level contaminated metals. It is important to be able to decontaminate complex shapes where surfaces are hidden or inaccessible to surface decontamination processes and destruction of organic contamination. These goals can be achieved by adapting commercial metal refining processes to handle radioactive and organic contaminated metal. The radioactive components are concentrated in the slag, which is subsequently vitrified; hazardous organics are destroyed by the intense heat of the bath. The metal, after having been melted and purified, could be recycled for use within the DOE complex. In this project, we evaluated current state-of-the-art technologies for metal refining, with special reference to the removal of radioactive contaminants and the destruction of hazardous organics. This evaluation was based on literature reports, industrial experience, plant visits, thermodynamic calculations, and engineering aspects of the various processes. The key issues addressed included radioactive partitioning between the metal and slag phases, minimization of secondary wastes, operability of the process subject to widely varying feed chemistry, and the ability to seal the candidate process to prevent the release of hazardous species.
Decontamination and Waste Treatment Facility (DWTF) Final Environmental Assessment (EA) B1 Jun 22 2023
Decontamination and Waste Treatment Facility for the Lawrence Livermore National Laboratory, Livermore, California Oct 14 2022
Cleaning Up Sites Contaminated with Radioactive Materials Jul 11 2022 This publication features papers presented at the Workshop on Cleaning Up Sites Contaminated with Radioactive Materials, held in Moscow in June 2007. This activity was organized by the National Academies in cooperation with the Russian Academy of Sciences and with funding provided by the Russell Family Foundation. The workshop was designed to promote exchanges of information on specific contaminated sites in Russia and elsewhere and to stimulate greater attention to the severity of the problems and the urgent need to clean up sites of concern to the local and international communities.