

STATE OF COLORADO

Roy Romer, Governor
Patti Shwayder, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION
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**Colorado Department
of Public Health
and Environment**

November 5, 1998

CERTIFIED MAIL # P335 618 557
RETURN RECEIPT REQUESTED



000101762

Bob April, Acting Group Lead
Regulatory Liaison Group
U S Department of Energy
Rocky Flats Field Office
P O Box 928
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**RE Approval of Class 2 Modifications to Four Closure Plans for Interim Status Waste Water Tank Systems,
EPA ID# CO7890010526**

Dear Mr April

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division (the "Division") did not receive any comments during the 30-day public comment period which ended on November 4, 1998 for the proposed revisions to the four approved Closure Plans for interim status waste water tank systems at the Rocky Flats Environmental Technology Site (RFETS) These four closure plans cover the following waste water tank systems Building 883 T-1 and T-2 Tank Systems, Building 889 T-4 and T-5 Series Waste Water Tank Systems, Building 883 A & B Tank Systems, and Building 865 T-1, T-2, and T-3 Series Tank Systems The proposed revisions were submitted by RFETS as a Class 2 modification request requiring prior Division approval RFETS requested the modifications in order to defer closure of portions of the tank systems to building decommissioning due to difficulties in meeting the final clean closure performance standards and due to changes in plans for these tank systems and the buildings they occupy On June 15, 1998, the Division received from RFETS closure certification documentation for portions of these tank systems, and RFETS has subsequently provided information to the Division demonstrating that the remaining portions of these interim status units have achieved "RCRA Stable" status

The Division has determined that these Class 2 permit modifications are appropriate and grants approval to the request Enclosed are the approved revised closure plans marked "CDPHE Final Approved Plan, November 1998 Revised Version " If you have any questions concerning these matters, please contact James Hindman at (303) 692-3345

Sincerely,

Joe Schieffelin, Unit Leader
Federal Facilities Permitting and Compliance

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1/64

DOCUMENT CLASSIFICATION
REVIEW MAINTENANCE PER
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ADMIN RECORDS
IA-A-000893

CLOSURE PLAN

BUILDING 883 T-1 and T-2 SERIES WASTE WATER TANK SYSTEMS

EPA ID# C07890010526

JUNE 23, 1997



Prepared by.

MANUFACTURING SCIENCES CORPORATION

**Prepared for
The United States
Department of Energy
Rocky Flats Field Office**

**Reviewed for Classification
By M S Simmons 'U'
Date June 23, 1997**

CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

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CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

1. Introduction

This Closure Plan describes the method of performing closure activities of the Building 883 T-1 and T-2 Process Waste Water Tank System. This document is based on Part X (Closure), Section (B)(2), of the Rocky Flats Environmental Technology Site's (RFETS) RCRA Part 'B' permit. Included in this Closure Plan are the methods of accomplishing closure and criteria, in the form of closure performance standards, which will be used to evaluate closure performance, in accordance with the applicable sections of Subpart G of Part 265 of the Colorado Hazardous Waste Regulations (6 CCR 1007-3).

This Closure Plan will provide information on and rationale for the method of closure, the defined extent of the unit to be closed under this Closure Plan, the type of closure to be performed, the type of contamination to be addressed, decontamination method to be conducted, decontamination media to be used, the schedule for accomplishing closure, and other information associated with unit closure activities.

2. Facility Description and Operational History

The Rocky Flats Environmental Technology Site is owned and co-operated by the U S Department of Energy. The primary original mission of the site was the production of metal components for nuclear weapons. In support of this mission, Building 883 was utilized to fabricate various components by rolling, pressing, machining and cleaning processes. Other non-weapons projects included the fabrication of calorimeter plates for the CERN research facility in Switzerland, and the manufacture of armor plating used for protecting M1A1 tanks for the U S Army.

Materials used in the facility include enriched uranium (U^{235}), depleted uranium (U^{238}), uranium alloys, beryllium, stainless steels, aluminum and copper. Oils, lubricants, salt compounds, solvents, and aqueous cleaners have been used over the history of the facility in the performance of the mission. As an added safety measure, all radiological materials ever used on plantsite will be presumed to have been used in these buildings.

Building 883 was constructed in 1956, using reinforced concrete, concrete block, steel framing and transite siding. Major additions included the 'A' side Annex completed in the 1960's and the construction of the 'C' side completed in the 1980's.

CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

The nitric acid process waste tank system (T-1 and T-2) was designed to capture spent nitric acid from the etching baths, neutralized acid fumes from the etching baths, and rinse water from the sheet scrubber system located on the "C" side of Building 883. The contents of T-1 and T-2 were neutralized with caustic prior to transfer to the Building 374 Liquid Waste Operations.

Currently the facility is being decontaminated and renovated for conversion to economic development as part of the National Conversion Pilot Project. These activities are authorized in an Interim Measure / Interim Remediation Action (IM/IRA) decision document approved by the Colorado Department of Public Health and Environment (CDPHE) and the U.S. Environmental Protection Agency Region VIII in 1995. As a result of this clean up activity, extensive sampling for both radiological and chemicals of concern has taken place, and as a result the facility conditions are well characterized.

3. Unit Description

The Building 883 waste water system contains T-1 and T-2 series tanks, RCRA Units 40 27 and 40 28. The two 1,220-gallon tanks were utilized to capture spent nitric acid from the metal fabrication and etching process located on the "C" side of building 883. Waste water in the T-1 and T-2 tank system is characterized as corrosive, due to the nitric acid. Acids in the tanks were neutralized with caustic prior to transfer to the Building 374 Liquid Waste Operations. The tank system is currently drained and isolated. Hardened uranium salts remain on the bottom of the tanks as a result of the neutralization process. Ancillary equipment associated with the tanks include piping, pumps, valves and a process waste water transfer line leading to Building 374. In addition, some releases of waste occurred in the secondary containment surrounding the tanks, as evidenced by staining on the floor. Diagrams of the waste water system are included as Figures 1, 2 and 3.

4. Closure Description

4.1 Closure Information

4.1.1 General Provisions

The planned closure activities for the T-1 and T-2 series tanks include the decontamination of all associated piping, pumps, valves and tanks. Therefore, this closure will be considered a "clean closure."

CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

The defined extent of the Unit is illustrated in Figures 1, 2 and 3, included as a component of this document

4.1.2 Types of Contamination

Two types of contamination are expected to be encountered during closure activities. Radiological contamination is expected because of past use of radioactive materials in the facility. As a precaution, 10% of all smear samples taken will be isotopically analyzed by gamma spectroscopy. Chemical contamination is expected because of the past processes and operations performed in the facility. While the Unit 40 Approved Waste Codes indicate the tanks were authorized under interim status to store a variety of waste codes, the tanks will be evaluated against closure standards for only the hazardous wastes and hazardous constituents (as listed in 6 CCR 1007-3, Part 261, Appendix VIII) that were actually managed in the tanks as described in Section 3 of this Closure Plan.

This information is a compilation of laboratory analysis performed in conjunction with the development of the Building Waste / Residue Information and Characterization (WSRIC) Book, and historical knowledge of past processes and operations. In addition, piping and valves that are removed will be characterized for lead and asbestos contaminants prior to disposal.

4.2 Closure Activities

4.2.1 Tanks and Ancillary Equipment

The T-1 and T-2 series tanks will be decontaminated and evaluated against the clean closure standards specified in this section. Tank cleaning will be performed using temporary containment structures or enclosed portions of the existing room. The containment area will be ventilated using portable HEPA filtered air movers to assure containment of radioactive materials and protect the workers involved in the process.

The closure process for the tanks and ancillary equipment will involve manually removing the remaining salts, rinsing with clean water, and sampling and analyzing the final rinsate for pH and total concentrations for each of the following metals (from the list of hazardous constituents as found in Appendix VIII of Part 261 of 6 CCR 1007-3): antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel,

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CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

selenium, silver and thallium This decontamination process will be repeated until the results demonstrate that the Performance Standard has been met

Alternatively, the waste water in the tanks may be treated by performing component and/or phase separation of the solutions by precipitation, filtration, or any combination of these methods After component and/or phase separation has been accomplished, the water phase will be pumped out, characterized, and managed appropriately and the sludge will be manually removed, characterized, and managed appropriately One or both of the tanks may be partially stripped out and partially reduced, or clean closed in place Work will be done in accordance with National Conversion Pilot Project Procedure WP-618 (Doc Ref DE-2616 0), RCRA Closure of Tanks T-1 and T-2, Building 883, dated April, 1998

Following washing and rinsing, analytical tests will be conducted in accordance with the approved lab procedures that meet the requirements of SW-846 to demonstrate the decontamination process has produced results in accordance with the following Closure Performance Standard

The unit, unit equipment, or a portion thereof will be considered decontaminated upon removal of all visible waste residuals and when the final rinsate contains total concentrations of each of the following metals at less than the maximum contaminant levels for drinking water (as identified in RFCA, Attachment 5, Table 2) antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver and thallium The pH of the final rinsate must be between 6 and 9

The final rinsate volume for external surfaces must not exceed two gallons per 100 square feet of surface area rinsed The final rinsate volume for internal surfaces of tanks must not exceed 5% of the capacity of the tank

Following clean closure, portions of the tanks system and ancillary equipment may be reused for non-hazardous waste water or alternatively stripped out and recycled or managed as non-hazardous waste

If it is determined that the tanks cannot be "clean closed", they will be removed in order to undergo cleaning and evaluation against the clean debris standards specified in this section Tank removal will be performed using temporary containment structures or enclosed portions of the existing room The containment area will be ventilated using

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CLOSURE PLAN

Building 883 T-1 and T-2 Series Waste Water Tank Systems

portable HEPA filtered air movers to assure containment of radioactive materials and protect the workers involved in the process. The tanks will be size reduced into manageable pieces. These pieces will be transferred to an existing PermaCon® enclosure located in Room 105 of Building 883 with attached HEPA filtered air movers to protect the workers involved with the process.

Once in the containment structure, the tank pieces will be cleaned using a carbon dioxide (CO₂) pressure cleaning system. The advantage to this cleaning process is that it is aggressive, but leaves no residue other than the materials that are removed from the tank pieces. Consequently there is no generation of additional liquid wastes. Daily inspections to assure control and containment of hazardous wastes and hazardous constituents produced by the decontamination activities in the PermaCon® enclosure located in Room 105 of Building 883 will be performed and documented on inspection log sheets. These inspection log sheets must be completed and must include the date inspected, time of inspection, signature of inspector, and an evaluation the following items: condition of the containment structure to prevent releases, maintenance of the PermaCon® vacuum within required operating limits, adequate aisle space present and clear of obstructions around the unit, proper operation of CO₂ blasting system, and presence of fugitive dust emissions from any openings (doors, windows, vents, etc.). All corrective actions taken to address inspection items will be documented on the inspection log sheets.

To assure there is no release of hazardous wastes during operation of the CO₂ blasting system, all exhaust ventilation will be filtered by HEPA filters prior to discharge from the containment structure, waste generated by the system will either be removed daily from the containment structure or collected daily and managed within a satellite hazardous waste accumulation container at or near the point of generation, and all joints and seams in the containment structure will be sealed as necessary. The CO₂ blasting system will be operated in accordance with the respective Work Package and Operation Instruction documents for this project. Measures will be taken to prevent the tracking of hazardous wastes/constituents out of the unit by personnel or by equipment used in handling the waste. An area will be designated to decontaminate any equipment and personnel leaving the containment structure. Any rinsate from these decontamination activities will be collected and properly managed.

After cleaning, the surface of each component will be visually inspected to evaluate if the closure standard of a "clean debris surface" has been met. A "clean debris surface" means

CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

“the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area ”

[6 CCR 1007-3, § 268 45, Table 1]

If a “clean debris surface” is achieved and the debris does not exhibit a characteristic of hazardous waste identified under Subpart C, Part 261, then that debris will be considered a non-hazardous solid waste and will be removed and managed as non-hazardous debris for subsequent disposal at an appropriate facility. If a “clean debris surface” has not been achieved, the process will be repeated until the standard is met, or the piece will be managed as hazardous waste. Following the completion of all CO₂ activities, the PermaCon® enclosure will be thoroughly cleaned of all waste materials by vacuuming or other means, and the exhaust pre-filters will be changed and managed appropriately as waste. Residuals will be characterized and managed as a waste in accordance with the general requirements identified in 6 CCR 1007-3, Part 268 45(d)(1).

If a clean surface cannot be achieved with additional cleaning, or the CO₂ system is unavailable, the tank pieces will be managed as hazardous waste. If clean closure in place or reduction cannot be achieved, or if it is determined that clean closure or reduction should not be attempted, the system will be made RCRA stable and closure will be deferred to building decommissioning.

4.2.2 Sumps and Below Grade Piping

There are no sumps or below grade piping involved with this Closure Plan. The “sump” shown on Figure 3 is an integral part of the secondary containment system for the Building 883 T-1 and T-2 Tank System, and will be addressed under the closure activities described below in Section 4.2.3.

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CLOSURE PLAN

Building 883 T-1 and T-2 Series Waste Water Tank Systems

4.2.3 Secondary Containment

Secondary containment located in Building 883, Room 139 will be decontaminated in a manner to comply with the provisions of the following Closure Performance Standard

The unit, unit equipment, or a portion thereof will be considered decontaminated upon removal of all visible waste residuals and when the final rinsate contains total concentrations of each of the following metals at less than the maximum contaminant levels for drinking water (as identified in RFCA, Attachment 5, Table 2) antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver and thallium. The pH of the final rinsate must be between 6 and 9

The process will include decontaminating the surfaces using an appropriate decontamination solution (consisting of water and detergent which does not contain hazardous constituents) by manual application, followed by a final rinse with clean water. The final rinsate volume for external surfaces must not exceed two gallons per 100 square feet of surface area rinsed. The rinsate solution will be collected and analytical tests will be conducted in accordance with the approved lab procedures that meet the requirements of SW-846. If the closure standards are not achieved, washing and rinsing will be repeated until the appropriate standards are achieved. If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning.

5. Schedule

The initiation of closure activities for the Building 883 T-1 and T-2 series tanks will commence immediately upon approval of this Closure Plan. Funding has been secured for this activity and a subcontractor has been retained to provide the closure services. It is estimated that the total duration of closure activities will be approximately 60 working days from the approval date of the Closure Plan. If it is anticipated that the total closure activity will exceed 180 days, the Director of the CDPHE will be notified of the additional time necessary to complete the closure and the reason for the delay.

CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

6. Health and Safety Requirements

6.1 Work Control

6.1.1 Health and Safety Plan

Employee health and safety is paramount during the execution of the closure activities detailed in this Closure Plan. All activities for this closure will be conducted using a DOE Health and Safety Plan already approved as part of the National Conversion Pilot Project (NCPP) at RFETS. Radiological activities will be conducted using a DOE Radiation Protection Plan (RPP) already approved as part of the NCPP and that satisfies the requirements of 10 CFR 835. The control of the work to be performed will be provided by a stand alone work package which will be reviewed and approved by the management of the subcontractor tasked with responsibility for the closure activities, as well as the employees which will perform the hand-on work. All procedures and plans will be in compliance with the Occupational Health and Safety Administration (OSHA) requirements (29 CFR 1910.120) for workers at a hazardous waste site. Emergency response and spill response will be covered in the Health and Safety Plan.

All personnel involved in the closure activities will be qualified in accordance with Part IX (Personnel Training), of the Rocky Flats Environmental Technology Site's RCRA Part 'B' permit and will have shown competence in the processes and techniques required to accomplish closure. In addition, all personnel will be trained and qualified as radiological workers per DOE approved requirements.

Industry standard techniques for limiting the spread of contamination (both chemical and radiological) will be instituted to assure both worker safety and to preclude releases of the contamination to the environment. Utilizing these techniques will also have the benefit of waste source reduction and is a key component to the waste minimization efforts that will take place during the performance of the closure activities.

6.1.2 Industrial Hygiene and Safety

The closure activities will be monitored by an on-site Certified Industrial Hygienist (CIH) who will be responsible for the day to day safety compliance, personnel sampling, environmental monitoring and accident / injury reporting requirements. All exposures to hazardous materials and wastes will be strictly controlled and documented. Personnel

CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

Protective Equipment (PPE) requirements will be established prior to initiation of the closure activities, and routinely re-evaluated as phases of work change on the project

6.1.3 Radiological Safety

Since the equipment identified in this Closure Plan has the potential for radiological contamination, a project Radiation Safety Officer will be available during the performance of the closure activities. Pre-surveys for determination of radiological contamination levels will be performed prior to initiation of the closure activities as part of the initial sampling and characterization activities of the work control package. Specifically, 10% of all smear samples taken will be isotopically analyzed by gamma spectroscopy.

7. Waste Generation

7.1 Characterization and Disposition

Wastes generated during performance of this closure activity include decontamination and rinse solutions, PPE, and contamination control plastic, wipes, and tape. Solutions will be batch sampled to ensure waste acceptance criteria are met before being transferred to the Building 374 Liquid Waste Operations for treatment. The dried uranium salts will be managed either as low-level or low-level mixed waste as appropriate. PPE and other miscellaneous waste forms will be managed as low-level or low-level mixed waste as appropriate. Low-level mixed waste storage will be coordinated with the site to ensure proper management.

7.2 Waste Minimization

All activities will be performed with waste minimization in mind. Extensive contamination control techniques will be used to minimize the spread of contamination resulting from the closure activities. Liquid effluent generation will be held to a minimum to reduce the resulting mixed-waste saltcrete produced from the Building 374 Liquid Waste Operations process. Finally, pre-planning and adequate and correct characterization of the wastes will assure proper management, packaging and storage of all containerized wastes originating from this closure activity.

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CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

8. Certification of Closure

Within 60 days after completion of closure activities, the Site will submit to the Colorado Department of Public Health and Environment certification that the tanks, piping, and ancillary equipment and secondary containment have been closed in accordance with this Closure Plan. The certification will be signed by an independent, Colorado-registered professional engineer. An independent, Colorado-registered professional engineer will also conduct inspections of any decontaminated hazardous debris that is determined to meet the "clean debris surface" closure performance standard. Documentation of these inspections will be prepared and certified by the independent, Colorado-registered professional engineer, and will be submitted to the Colorado Department of Public Health and Environment with the certification of closure.

9. Record Keeping

The Site will maintain the following closure records until final closure of the facility:

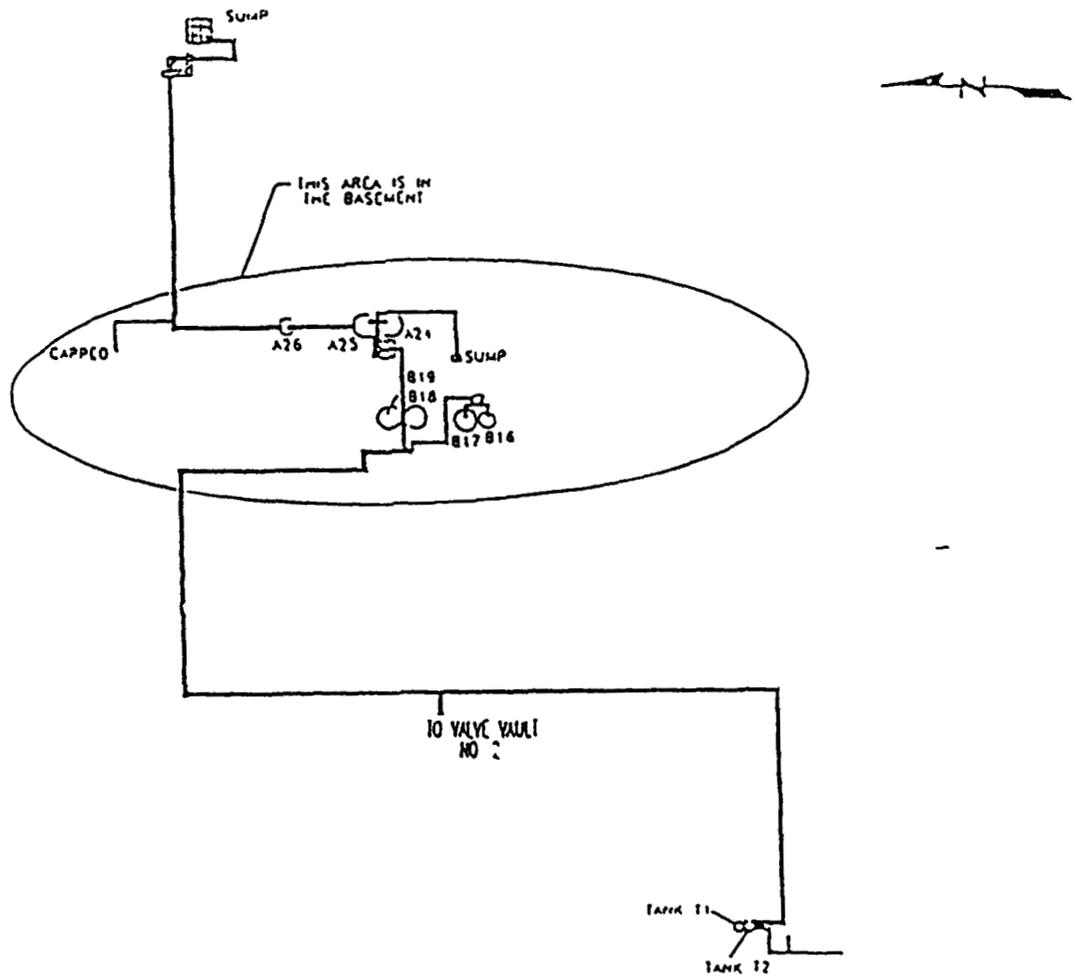
- Record of sampling activities (date, number and type)
- Analytical results
- Records of actions taken to decontaminate or remove and dispose of equipment or structures
- Work control packages governing the closure of this RCRA unit
- Other documentation which verifies that the Site followed the approved Closure Plan

10. Amendment of the Closure Plan

In conducting the closure activities, unexpected events that occur during the implementation of the required closure activities may require an amendment of the existing Closure Plan. Any request for the modification of the Closure Plan will be made within 30 days of identification of the event that causes the modification to be necessary.

CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

Figure 1 - Building 883 Process Waste Line Floor Plan



BLDG 883 PROCESS WASTE LINE
FLOOR PLAN

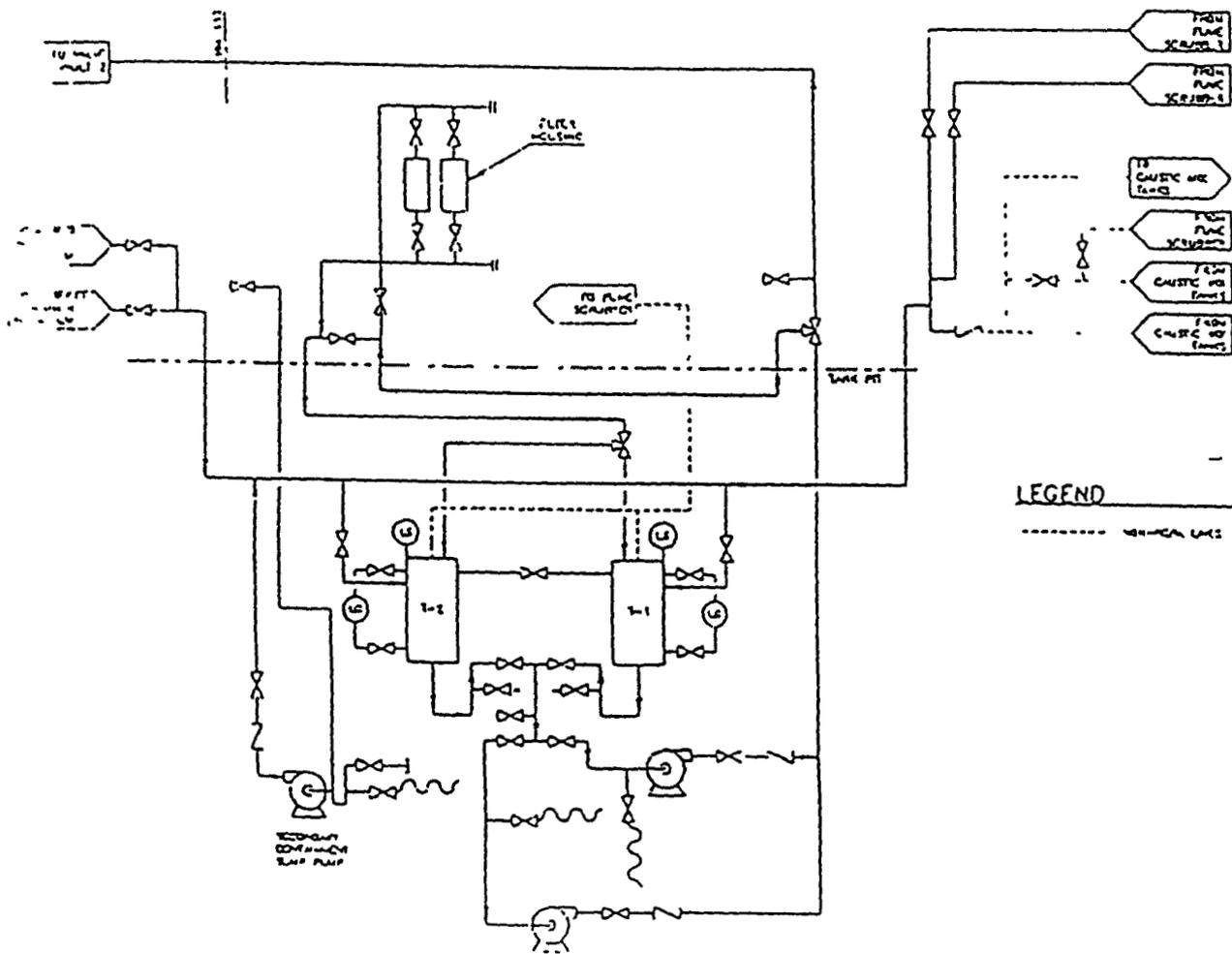
CLOSURE PLAN
Building 883 T-1 and T-2 Series Waste Water Tank Systems

Figure 2 - Tanks T-1 and T-2 Piping and Instrumentation Diagram

1-1 1-2
 PORTAL WATER PUMP

NOTES

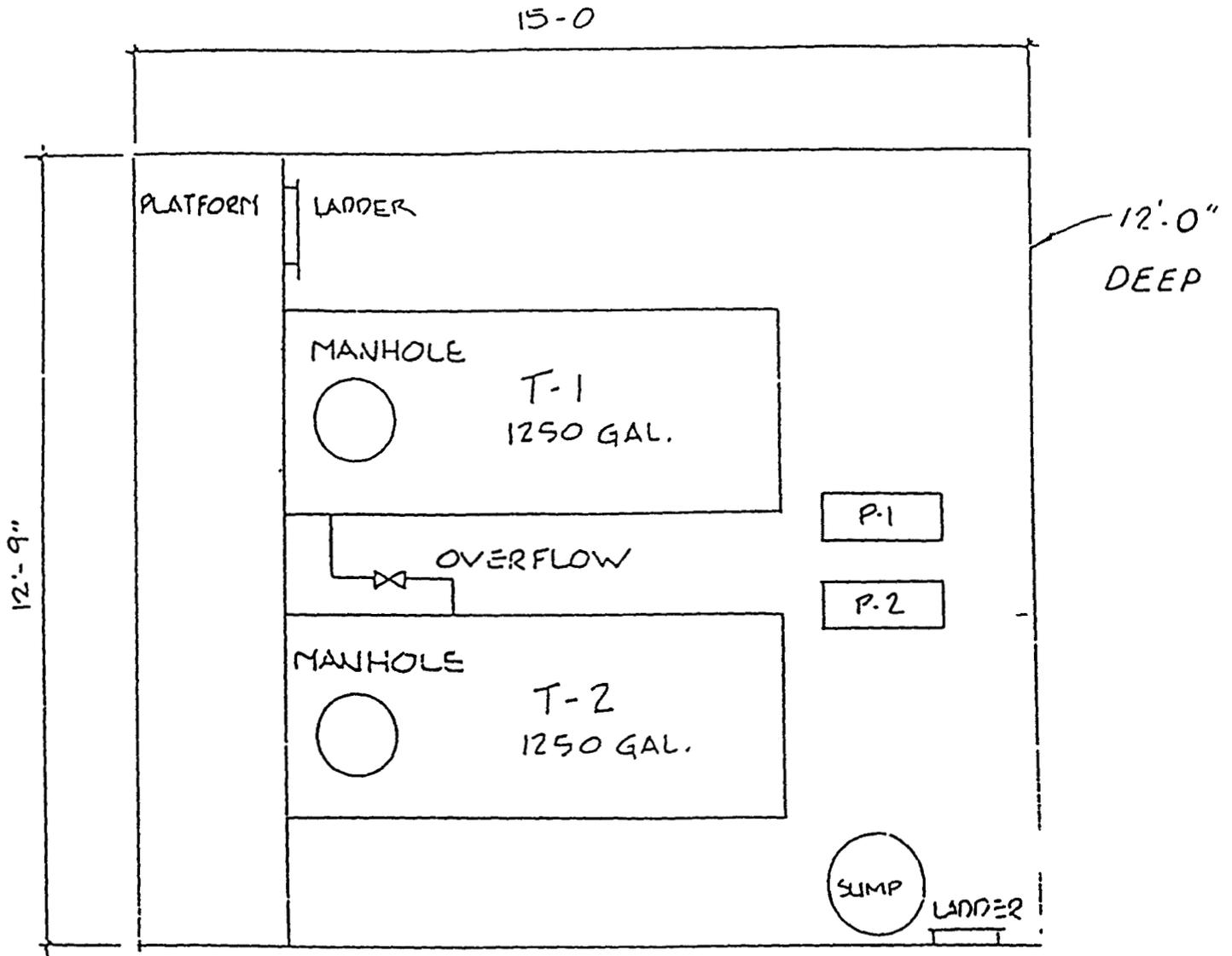
1) EQUIPMENT AND MATERIAL SHOWN IN BRACKETS ARE NOT CONSIDERED PART OF THE REGULATED UNIT



LEGEND

----- NON-REG. LINES

Figure 3 - Secondary Containment Diagram



FLOOR PLAN



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CLOSURE PLAN

**BUILDING 883
A & B SERIES WASTE WATER TANK SYSTEMS**

EPA ID# C07890010526

JUNE 23, 1997



Prepared by

MANUFACTURING SCIENCES CORPORATION

**Prepared for
The United States
Department of Energy
Rocky Flats Field Office**

**Reviewed for Classification
By M S Simmons 'U'
Date June 23, 1997**

CLOSURE PLAN
Building 883 'A' and 'B' Series Tanks

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CLOSURE PLAN
Building 883 'A' and 'B' Series Tanks

1. Introduction

This Closure Plan describes the method of performing closure activities of the Building 883 A&B Series Process Waste Water Tank Systems. This document is based on Part X (Closure), Section (B)(2), of the Rocky Flats Environmental Technology Site's (RFETS) RCRA Part 'B' permit. Included in this Closure Plan are the methods of accomplishing closure and criteria, in the form of closure performance standards, which will be used to evaluate closure performance, in accordance with the applicable sections of Subpart G of Part 265 of the Colorado Hazardous Waste Regulations (6 CCR 1007-3).

This Closure Plan will provide information on and rationale for the method of closure, the defined extent of the unit to be closed under this Closure Plan, the type of closure to be performed, the type of contamination to be addressed, decontamination method to be conducted, decontamination media to be used, the schedule for accomplishing closure, and other information associated with unit closure activities.

2. Facility Description and Operational History

The Rocky Flats Environmental Technology Site is owned and co-operated by the U S Department of Energy. The primary original mission of the site was the production of metal components for nuclear weapons. In support of this mission, Building 883 was utilized to fabricate various components by rolling, pressing, machining and cleaning processes. Other non-weapons projects included the fabrication of calorimeter plates for the CERN research facility in Switzerland, and the manufacture of armor plating used for protecting M1A1 tanks for the U S Army.

Materials used in the facility include enriched uranium (U^{235}), depleted uranium (U^{238}), uranium alloys, beryllium, stainless steels, aluminum and copper. Oils, lubricants, salt compounds, solvents, and aqueous cleaners have been used over the history of the facility in the performance of the mission. As an added safety measure, all radiological materials ever used on plantsite will be presumed to have been used in these buildings.

Building 883 was constructed in 1956, using reinforced concrete, concrete block, steel framing and transite siding. Major additions included the 'A' side Annex completed in the 1960's and the construction of the 'C' side completed in the 1980's.

The original interior of the Building was divided into the 'A' and 'B' sides for the segregation and control of the enriched and depleted uranium fabrication lines. This

CLOSURE PLAN
Building 883 'A' and 'B' Series Tanks

division necessitated the need for two independent waste water collection systems, hence the 'A' (depleted) and 'B' (enriched) series designators. In approximately 1966, enriched uranium operations were transferred to another DOE site. The 'B' side was decontaminated, and the interior was opened up to join the 'A' and 'B' sides. Since that time, the 'A' and 'B' series tanks have been interconnected to provide additional waste water storage capacity for operations conducted within the facility.

Currently the facility is being decontaminated and renovated for conversion to economic development as part of the National Conversion Pilot Project. These activities are authorized in an Interim Measure / Interim Remediation Action (IM/IRA) decision document approved by the Colorado Department of Public Health and Environment (CDPHE) and the U.S. Environmental Protection Agency Region VIII in 1995. As a result of this clean up activity, extensive sampling for both radiological and chemicals of concern has taken place, and as a result the facility conditions are well characterized.

3. Unit Description

The Building 883 waste water system contains the 'A' series tanks, RCRA Units 40 39, 40 40, and 40 41 and the 'B' series tanks, RCRA Units 40 29, 40 30, 40 31 and 40 38. These tanks were utilized to store and / or recycle process waste water solutions potentially containing acids, barium, beryllium, cadmium, chromium, lead, mercury, silver, uranium and uranium oxides, hazardous solvents (e.g. carbon tetrachloride, chloroform, 1,1-dichloroethane, 1,1,1-trichloroethane), non-hazardous solvents, wax and detergent prior to transfer to the waste water treatment system in Building 374. Ancillary equipment associated with the tanks include piping, pumps, valves and a process waste water transfer line leading to Building 374. Diagrams of the waste water system are included as Figures 1, 2, 3, and 4. These diagrams also indicate portions of the tank system which did not manage hazardous waste and are therefore not subject to closure.

Historical records indicate the possibility of accidental releases within Building 883. There is some staining located within the secondary containment area surrounding the tanks in Room 1, as well as on the floor located under the waste water transfer station previously located in Room 105. Decontamination and cleaning of these areas will take place as part of this activity as noted later in this document.

CLOSURE PLAN
Building 883 'A' and 'B' Series Tanks

4. Closure Description

4.1 Closure Information

4.1.1 General Provisions

The planned closure activities for the 'A' and 'B' series tanks include the removal of all piping, pumps, valves and tanks located in Room 1 of Building 883. There is some below grade pipe work which is not accessible until final decontamination and decommissioning of the facility. This facility is currently a part of the National Conversion Pilot Project, in which the facility is being prepared for economic conversion and development activities. As there will be no major demolition of the facility at this time, certain below grade piping will remain in place as it is not reasonable to excavate and remove. Therefore, this closure will be considered "partial." Final removal of below grade piping will be completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future and the status of the remaining unclosed portions of the Unit will be maintained in the Master List of RCRA Hazardous Waste Units at Rocky Flats.

The defined extent of the Unit is illustrated in Figures 1, 2, 3, and 4 included as a component of this document.

4.1.2 Types of Contamination

Two types of contamination are expected to be encountered during closure activities. Radiological contamination is expected because of past use of uranium in the facility. As a precaution, 10% of all smear samples taken will be isotopically analyzed by gamma spectroscopy. Chemical contamination is expected because of the past processes and operations performed in the facility. While the Unit 40 Approved Waste Codes indicate the tanks were authorized under interim status to store a variety of waste codes, the tanks will be evaluated against closure standards for only the hazardous wastes and hazardous constituents (as listed in 6 CCR 1007-3, Part 261, Appendix VIII) that were actually managed in the tanks as described in Section 3 of this Closure Plan.

This information is a compilation of laboratory analysis performed in conjunction with the development of the Building Waste / Residue Information and Characterization (WSRIC) Book, National Conversion Pilot Project sampling for waste characterization,

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Building 883 'A' and 'B' Series Tanks

EPA codes assigned and authorized for accumulation in the system, historical knowledge of past processes and operations, and building baseline radiological surveys performed as a requirement under the NCPP IM/IRA activities. In addition, piping and valves that are removed will be characterized for lead and asbestos contaminants prior to disposal.

4.2 Closure Activities

4.2.1 Tanks

The 'A' and 'B' series tanks will be removed in order to undergo cleaning and evaluation against the clean debris standards specified in this section. Tank removal will be performed using temporary containment structures or enclosed portions of existing rooms. The containment area will be ventilated using portable HEPA filtered air movers to assure containment of radioactive materials and protect the workers involved in the process. The tanks will be size reduced into manageable pieces. These pieces will be transferred to an existing PermaCon® enclosure located in Room 105 of Building 883 with attached HEPA filtered air movers to protect the workers involved with the process.

Once in the containment structure, the tank pieces will be cleaned using a carbon dioxide (CO₂) pressure cleaning system. The advantage to this cleaning process is that it is aggressive, but leaves no residue other than the materials that are removed from the tank pieces. Consequently there is no generation of additional liquid wastes. Daily inspections to assure control and containment of hazardous wastes and hazardous constituents produced by the decontamination activities in the PermaCon® enclosure located in Room 105 of Building 883 will be performed and documented on inspection log sheets. These inspection log sheets must be completed and must include the date inspected, time of inspection, signature of inspector, and an evaluation the following items: condition of the containment structure to prevent releases, maintenance of the PermaCon® vacuum within required operating limits, adequate aisle space present and clear of obstructions around the unit, proper operation of CO₂ blasting system, and presence of fugitive dust emissions from any openings (doors, windows, vents, etc.). All corrective actions taken to address inspection items will be documented on the inspection log sheets.

To assure there is no release of hazardous wastes during operation of the CO₂ blasting system, all exhaust ventilation will be filtered by HEPA filters prior to discharge from the containment structure, waste generated by the system will either be removed daily from

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Building 883 'A' and 'B' Series Tanks

the containment structure or collected daily and managed within a satellite hazardous waste accumulation container at or near the point of generation, and all joints and seams in the containment structure will be sealed as necessary. The CO₂ blasting system will be operated in accordance with the respective Work Package and Operation Instruction documents for this project. Measures will be taken to prevent the tracking of hazardous wastes/constituents out of the unit by personnel or by equipment used in handling the waste. An area will be designated to decontaminate any equipment and personnel leaving the containment structure. Any rinsate from these decontamination activities will be collected and properly managed.

After cleaning, the surface of each component will be visually inspected to evaluate if the closure standard of a "clean debris surface" has been met. A "clean debris surface" means

"the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area."

[6 CCR 1007-3, § 268 45, Table 1]

If a "clean debris surface" is achieved and the debris does not exhibit a characteristic of hazardous waste identified under Subpart C, Part 261, then that debris will be considered a non-hazardous solid waste and will be removed and managed as non-hazardous debris for subsequent disposal at an appropriate facility. If a "clean debris surface" has not been achieved, the process will be repeated until the standard is met, or the piece will be managed as hazardous waste. Following the completion of all CO₂ activities, the PermaCon® enclosure will be thoroughly cleaned of all waste materials by vacuuming or other means, and the exhaust pre-filters will be changed and managed appropriately as waste. Residuals will be characterized and managed as a waste in accordance with the general requirements identified in 6 CCR 1007-3, Part 268 45(d)(1).

If a clean surface cannot be achieved with additional cleaning, or the CO₂ system is unavailable, the tank pieces will be managed as hazardous waste.

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4.2.2 Ancillary Equipment

The ancillary equipment consists of pipes, valves, and pumps. The equipment will be removed and managed as either low-level mixed waste or hazardous waste, as appropriate.

The ancillary equipment will be stripped out in a fashion that leaves the minimum of materials in place. Piping that enters the room from below grade locations, will be stripped back to the point of penetration into the room in a method that will allow capping, blanking or other durable method of isolation as close to the point of penetration as possible. Final removal of below grade piping will be completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future. If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning.

4.2.3 Sumps and Below Grade Piping

The Building 883 waste water system has below grade sumps and piping that are located below the floor slab of the building. The sumps will be decontaminated in a manner to comply with the provisions of the following Closure Performance Standard.

The unit, unit equipment, or a portion thereof will be considered decontaminated upon removal of all visible waste residuals and when the final rinsate contains concentrations of priority pollutants (identified in section 3 of this plan as having been managed in the unit, including carbon tetrachloride, chloroform, 1,1-dichloroethane, and 1,1,1-trichloroethane) and total concentrations of each of the following metals at less than the maximum contaminant levels for drinking water (as identified in RFCA, Attachment 5, Table 2) antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver and thallium. The pH of the final rinsate must be between 6 and 9.

The process will include decontaminating the surfaces using an appropriate decontamination solution (consisting of water and detergent which does not contain hazardous constituents) by manual application, followed by a final rinse with clean water. The final rinsate volume for external surfaces must not exceed two gallons per 100 square feet of surface area rinsed. It is possible that the surface area being rinsed

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is relatively small such that the maximum application rate of two gallons per 100 square feet does not produce adequate volumes for sampling and analysis. In this case, the final rinsate volume must not exceed the minimum amount necessary to collect an adequate sample volume for analysis, and to completely contact the surfaces that may have come into contact with hazardous waste.

The rinsate solution will be collected and analytical tests will be conducted in accordance with the approved lab procedures that meet the requirements of SW-846. If the closure standards are not achieved, washing and rinsing will be repeated until the appropriate standards are achieved. Final removal of below grade sumps will be completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future.

Below grade piping will be washed and rinsed as a part of the ancillary equipment strip out process. The below grade pipes will be physically isolated from the building and left in place. Final removal of below grade piping will be completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future.

If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning.

4.2.4 Secondary Containment

Secondary containment located in Room 1 as well as the floor beneath the transfer station in Room 105 will be decontaminated in a manner to comply with the provisions of the following Closure Performance Standard.

The unit, unit equipment, or a portion thereof will be considered decontaminated upon removal of all visible waste residuals and when the final rinsate contains concentrations of priority pollutants (identified in section 3 of this plan as having been managed in the unit, including carbon tetrachloride, chloroform, 1,1-dichloroethane, and 1,1,1-trichloroethane) and total concentrations of each of the following metals at less than the maximum contaminant levels for drinking water (as identified in RFCA, Attachment 5, Table 2) antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver and thallium. The pH of the final rinsate must be between 6 and 9.

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The process will include decontaminating the surfaces using an appropriate decontamination solution (consisting of water and detergent which does not contain hazardous constituents) by manual application, followed by a final rinse with clean water. The final rinse volume for external surfaces must not exceed two gallons per 100 square feet of surface area rinsed. It is possible that the surface area being rinsed is relatively small such that the maximum application rate of two gallons per 100 square feet does not produce adequate volumes for sampling and analysis. In this case, the final rinse volume must not exceed the minimum amount necessary to collect an adequate sample volume for analysis, and to completely contact the surfaces that may have come into contact with hazardous waste. The rinse solution will be collected and analytical tests will be conducted in accordance with the approved lab procedures that meet the requirements of SW-846. If the closure standards are not achieved, washing and rinsing will be repeated until the appropriate standards are achieved. If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning.

5. Schedule

The initiation of closure activities for the Building 883 'A' and 'B' series tanks will commence immediately upon approval of this Closure Plan. Funding has been secured for this activity and a subcontractor has been retained to provide the closure services. It is estimated that the total duration of closure activities will be approximately 60 working days from the approval date of the Closure Plan. If it is anticipated that the total closure activity will exceed 180 days, the Director of the CDPHE will be notified of the additional time necessary to complete the closure and the reason for the delay.

6. Health and Safety Requirements

6.1 Work Control

6.1.1 Health and Safety Plan

Employee health and safety is paramount during the execution of the closure activities detailed in this Closure Plan. All activities for this closure will be conducted using a DOE Health and Safety Plan already approved as part of the National Conversion Pilot Project (NCP) at RFETS. Radiological activities will be conducted using a DOE Radiation Protection Plan (RPP) already approved as part of the NCP and that

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satisfies the requirements of 10 CFR 835. The control of the work to be performed will be provided by a stand alone work package which will be reviewed and approved by the management of the subcontractor tasked with responsibility for the closure activities, as well as the employees which will perform the hand-on work. All procedures and plans will be in compliance with the Occupational Health and Safety Administration (OSHA) requirements (29 CFR 1910.120) for workers at a hazardous waste site. Emergency response and spill response are covered in the Health and Safety Plan.

All personnel involved in the closure activities will be qualified in accordance with Part IX (Personnel Training), of the Rocky Flats Environmental Technology Site's RCRA Part 'B' permit and will have shown competence in the processes and techniques required to accomplish closure. In addition, all personnel will be trained and qualified as radiological workers per DOE approved requirements.

Industry standard techniques for limiting the spread of contamination (both chemical and radiological) will be instituted to assure both worker safety and to preclude releases of the contamination to the environment. Utilizing these techniques will also have the benefit of waste source reduction and is a key component to the waste minimization efforts that will take place during the performance of the closure activities.

6.1.2 Industrial Hygiene and Safety

The closure activities will be monitored by an on-site Certified Industrial Hygienist (CIH) who will be responsible for the day to day safety compliance, personnel sampling, environmental monitoring and accident / injury reporting requirements. All exposures to hazardous materials and wastes will be strictly controlled and documented. Personnel Protective Equipment (PPE) requirements will be established prior to initiation of the closure activities, and routinely re-evaluated as phases of work change on the project.

6.1.3 Radiological Safety

Since the equipment identified in this Closure Plan has the potential for radiological contamination, a project Radiation Safety Officer will be available during the performance of the closure activities. Pre-surveys for determination of radiological contamination levels will be performed prior to initiation of the closure activities as part of the initial sampling and characterization activities of the work control package. Specifically, 10% of all smear samples taken will be isotopically analyzed by gamma spectroscopy.

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7. Waste Generation

7.1 Characterization and Disposition

Wastes generated during performance of this closure activity include decontamination and rinsate solutions, residuals from the CO₂ blasting process including HEPA filters, stripped out ancillary equipment including pipe, valves and pumps, the tank shells, PPE, and contamination control plastic, wipes, and tape. Solutions will be batch sampled to ensure waste acceptance criteria are met before being transferred to the Building 374 Liquid Waste Operations for treatment. Metal from the tank shells which meets the debris standards will be disposed of as non-hazardous (but possibly low-level radioactive) waste. Ancillary equipment will either be managed as low-level mixed waste or hazardous waste. Metals which do not meet these standards will be characterized appropriately and managed as low-level mixed hazardous waste. Residuals will be managed as indicated in Section 4 of this Closure Plan. Finally, PPE and other miscellaneous waste forms will be managed as low-level or low-level mixed waste as appropriate. Low-level mixed waste storage will be coordinated with the site to ensure proper management.

7.2 Waste Minimization

All activities will be performed with waste minimization in mind. The CO₂ blasting debris technology to be utilized has the benefit that no secondary waste is produced during use. As the CO₂ pellets hit the item being cleaned, the pellet instantly evaporates leaving behind only the original contaminate. Extensive contamination control techniques will be used to minimize the spread of contamination resulting from the closure activities. Liquid effluent generation will be held to a minimum to reduce the resulting mixed-waste saltcrete produced from the Building 374 Liquid Waste Operations process. Finally, pre-planning and adequate and correct characterization of the wastes will assure proper management, packaging and storage of all containerized wastes originating from this closure activity.

8. Certification of Closure

Within 60 days after completion of closure activities, the Site will submit to the Colorado Department of Public Health and Environment certification that the tanks, piping, and

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ancillary equipment and secondary containment have been closed in accordance with this Closure Plan. The certification will be signed by an independent, Colorado-registered professional engineer. An independent, Colorado-registered professional engineer will also conduct inspections of any decontaminated hazardous debris that is determined to meet the "clean debris surface" closure performance standard. Documentation of these inspections will be prepared and certified by the independent, Colorado-registered professional engineer, and will be submitted to the Colorado Department of Public Health and Environment with the certification of closure.

9. Record Keeping

The Site will maintain the following closure records until final closure of the facility:

- Record of sampling activities (date, number and type)
- Analytical results
- Records of actions taken to decontaminate equipment or structures
- Work control packages governing the closure of this RCRA unit
- Other documentation which verifies that the Site followed the approved Closure Plan

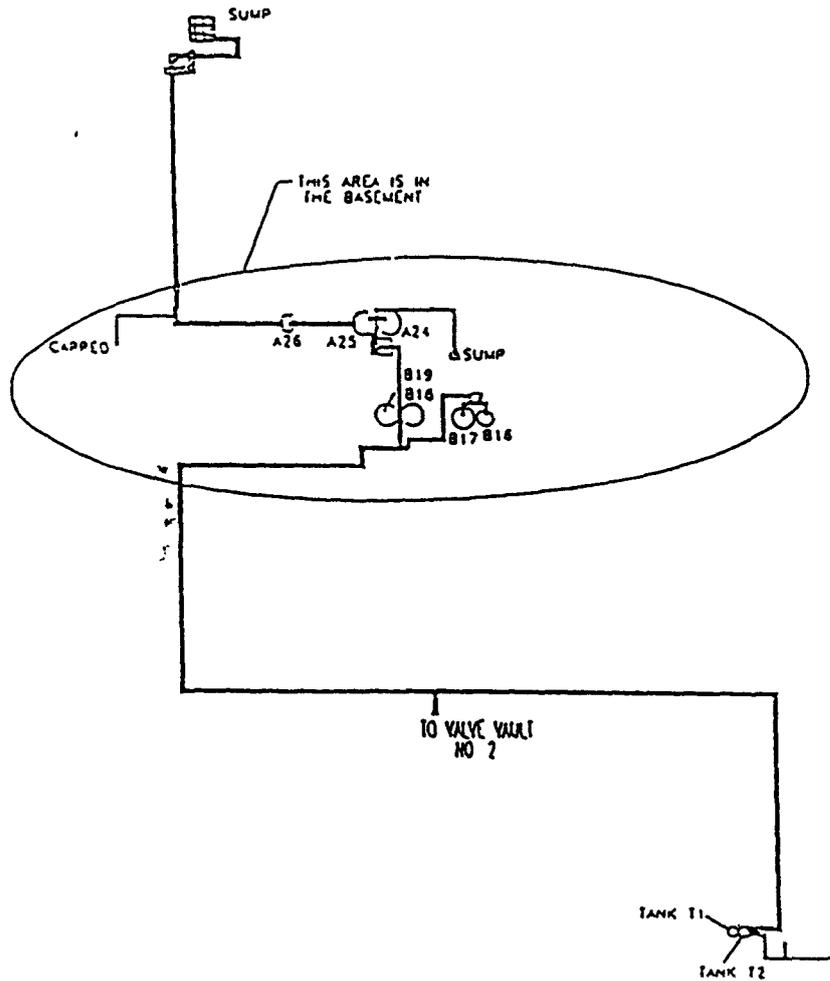
10. Amendment of the Closure Plan

In conducting the closure activities, unexpected events that occur during the implementation of the required closure activities may require an amendment of the existing Closure Plan. Any request for the modification of the Closure Plan will be made within 30 days of identification of the event that causes the modification to be necessary.

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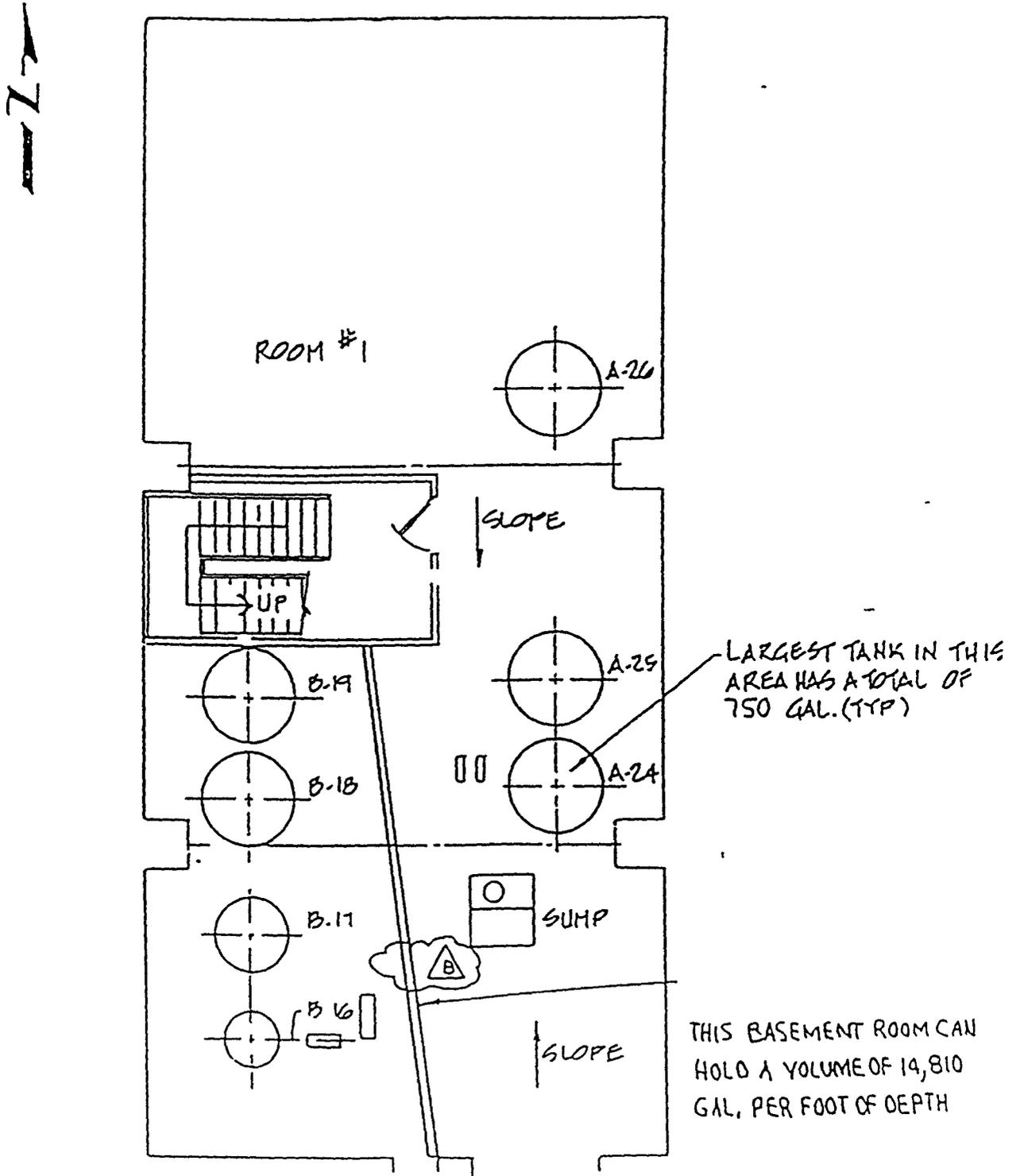
Figure 1 - Building 883 Process Waste Line Floor Plan



BLDG 883 PROCESS WASTE LINE
FLOOR PLAN

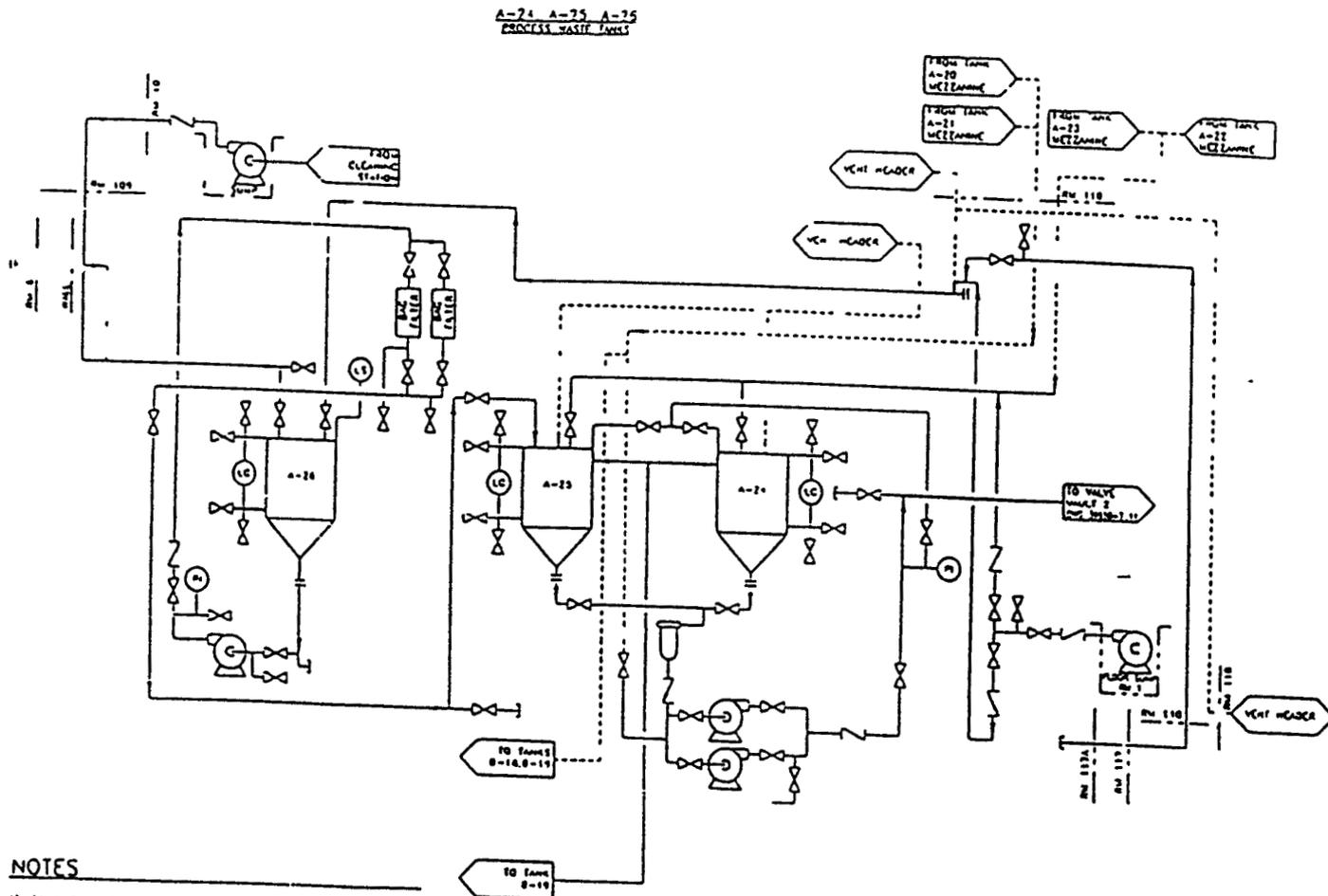
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Figure 2 - Secondary Containment Diagram



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Figure 3 - Tanks A-24, A-25, and A-26 Piping and Instrumentation Diagram



NOTES

- 1) Equipment and material shown in arrow boxes are not considered part of the regulated unit
- 2) 400w 1 floor sump not considered part of this regulated unit

LEGEND

--- DASHED LINES INDICATE NON-REGULATED PIPING

CLOSURE PLAN

BUILDING 865 T-1, T-2 and T-3 SERIES WASTE WATER TANK SYSTEMS (Located in Building 866)

EPA ID# C07890010526

JUNE 23, 1997



Prepared by

MANUFACTURING SCIENCES CORPORATION

**Prepared for
The United States
Department of Energy
Rocky Flats Field Office**

**Reviewed for Classification
By M S Simmons 'U'
Date June 23, 1997**

CLOSURE PLAN
Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

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CLOSURE PLAN
Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

1. Introduction

This Closure Plan describes the method of performing closure activities of the Building 865 T-1, T-2 and T-3 Process Waste Water Tank Systems physically located in Building 866. This document is based on Part X (Closure), Section (B)(2), of the Rocky Flats Environmental Technology Site's (RFETS) RCRA Part 'B' permit. Included in this Closure Plan are the methods of accomplishing closure and criteria, in the form of closure performance standards, which will be used to evaluate closure performance, in accordance with the applicable sections of Subpart G of Part 265 of the Colorado Hazardous Waste Regulations (6 CCR 1007-3).

This Closure Plan will provide information on and rationale for the method of closure, the defined extent of the unit to be closed under this Closure Plan, the type of closure to be performed, the type of contamination to be addressed, decontamination method to be conducted, decontamination media to be used, the schedule for accomplishing closure, and other information associated with unit closure activities.

2. Facility Description and Operational History

The Rocky Flats Environmental Technology Site is owned and co-operated by the U S Department of Energy. The primary original mission of the site was the production of metal components for nuclear weapons. In support of this mission, Building 865 was utilized as a Research and Development facility and was utilized to fabricate various components by rolling, pressing, machining and cleaning processes. Limited production activities took place during the 1980's.

Materials used in the facility include depleted uranium (U^{238}), uranium alloys, beryllium, stainless steels, aluminum and copper. Oils, lubricants, salt compounds, solvents, and aqueous cleaners have been used over the history of the facility in the performance of the mission. As an added safety measure, all radiological materials ever used on plantsite will be presumed to have been used in these buildings.

Building 865 was constructed in the 1970's, using reinforced concrete, concrete block, and steel framing. Currently the facility is being decontaminated and renovated for conversion to economic development as part of the National Conversion Pilot Project. These activities are authorized in an Interim Measure / Interim Remediation Action (IM/IRA) decision document approved by the Colorado Department of Public Health and Environment (CDPHE) and the U S Environmental Protection Agency Region VIII in

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1995 As a result of this clean up activity, extensive sampling for both radiological and chemicals of concern has taken place, and as a result the facility conditions are well characterized

3. Unit Description

The Building 865 waste water system contains T-1, T-2 and T-3 series tanks, RCRA Units 40 17, 40 18 and 40 19 These tanks were utilized to store process waste water solutions potentially containing acids, bases, arsenic, barium, cadmium, chromium, beryllium (in a non-hazardous form), lead, mercury, silver, nickel, hazardous solvents (e g methylene chloride, toluene, Freon [1,1,2-trichloro-1,2,2-trifluoroethane], trichloroethylene, 1,1,1-trichloroethane, xylene and acetone), and non-hazardous solvents, alcohols and cleaners prior to transfer to the waste water treatment system in Building 374 Ancillary equipment associated with the tanks include piping, pumps, valves, sumps, and a process waste water transfer line leading to Building 374 Diagrams of the waste water system are included as Figures 1, 2 and 3 These diagrams also indicate portions of the tank system which services Building 889 and are not a part of this Closure Plan

4. Closure Description

4.1 Closure Information

4.1 1 General Provisions

The planned closure activities for the T-1, T-2 and T-3 series tanks include the decontamination of all associated piping, pumps, valves and tanks located in Building 866 There is some below grade pipe work which is not accessible until final decontamination and decommissioning of the facility and removal of the floor pad For this reason, certain below grade piping will remain in place as it is not reasonable to excavate and remove Therefore, this closure will be considered "partial" Final removal of below grade piping will be completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future and the status of the remaining unclosed portions of the Unit will be maintained in the Master List of RCRA Hazardous Waste Units at Rocky Flats

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The defined extent of the Unit is illustrated in Figures 1, 2 and 3, included as a component of this document

4.1.2 Types of Contamination

Two types of contamination are expected to be encountered during closure activities. Radiological contamination is expected because of past use of radioactive materials in the facility. As a precaution, 10% of all smear samples taken outside the tank system will be isotopically analyzed by gamma spectroscopy. Also, all samples taken inside the tank system will be isotopically analyzed by gamma spectroscopy. Chemical contamination is expected because of the past processes and operations performed in the facility. While the Unit 40 Approved Waste Codes indicate the tanks were authorized under interim status to store a variety of waste codes, the tanks will be evaluated against closure standards for only the hazardous wastes and hazardous constituents (as listed in 6 CCR 1007-3, Part 261, Appendix VIII) that were actually managed in the tanks as described in Section 3 of this Closure Plan.

This information is a compilation of laboratory analysis performed in conjunction with the development of the Building Waste / Residue Information and Characterization (WSRIC) Book, and historical knowledge of past processes and operations. In addition, piping and valves that are removed will be characterized for lead and asbestos contaminants prior to disposal.

4.2 Closure Activities

4.2.1 Tanks

The T-1, T-2 and T-3 series tanks will be decontaminated and evaluated against the clean closure standards specified in this section. Tank cleaning will be performed using temporary containment structures or enclosed portions of the existing room. The containment area will be ventilated using portable HEPA filtered air movers to assure containment of radioactive materials and protect the workers involved in the process.

Loose oil and sludges in the tanks will be removed by washing with an appropriate decontamination solution (consisting of water and detergent which does not contain hazardous constituents), followed by a final rinse with clean water. This decontamination process will be repeated until the results demonstrate that the Performance Standard has been met. Following washing and rinsing, analytical tests

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will be conducted in accordance with the approved lab procedures that meet the requirements of SW-846 to demonstrate the decontamination process has produced results in accordance with the following Closure Performance Standard

The unit, unit equipment, or a portion thereof will be considered decontaminated upon removal of all visible waste residuals and when the final rinsate contains concentrations of priority pollutants (identified in section 3 of this plan as having been managed in the unit, including methylene chloride, toluene, Freon [1,1,2-trichloro-1,2,2-trifluoroethane], trichloroethylene, 1,1,1-trichloroethane, xylene, and acetone) and total concentrations of each of the following metals at less than the maximum contaminant levels for drinking water (as identified in RFCA, Attachment 5, Table 2) antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver and thallium. The pH of the final rinsate must be between 6 and 9

The final rinsate volume for external surfaces must not exceed two gallons per 100 square feet of surface area rinsed. The final rinsate volume for internal surfaces of tanks must not exceed 5% of the capacity of the tank

If it is determined that the tanks cannot be "clean closed" using this method, the tanks will be removed. Tank removal will be performed using temporary containment structures or enclosed portions of the existing room. The containment area will be ventilated using portable HEPA filtered air movers to assure containment of radioactive materials and protect the workers involved in the process. Following washing and rinsing of the tanks, the tanks will be moved to Building 883 where the tanks will be size reduced into manageable pieces. These pieces will be transferred to an existing PermaCon® enclosure located in Building 883 with attached HEPA filtered air movers to protect the workers involved with the process.

Once in the containment structure, the tank pieces will be cleaned using a carbon dioxide (CO₂) pressure cleaning system. The advantage to this cleaning process is that it is aggressive, but leaves no residue other than the materials that are removed from the tank pieces. Consequently there is no generation of additional liquid wastes. Daily inspections to assure control and containment of hazardous wastes and hazardous constituents produced by the decontamination activities in the PermaCon® enclosure located in Room 105 of Building 883 will be performed and documented on inspection log sheets. These inspection log sheets must be completed and must include the date

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Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

inspected, time of inspection, signature of inspector, and an evaluation the following items condition of the containment structure to prevent releases, maintenance of the PermaCon® vacuum within required operating limits, adequate aisle space present and clear of obstructions around the unit, proper operation of CO₂ blasting system, and presence of fugitive dust emissions from any openings (doors, windows, vents, etc) All corrective actions taken to address inspection items will be documented on the inspection log sheets

To assure there is no release of hazardous wastes during operation of the CO₂ blasting system, all exhaust ventilation will be filtered by HEPA filters prior to discharge from the containment structure, waste generated by the system will either be removed daily from the containment structure or collected daily and managed within a satellite hazardous waste accumulation container at or near the point of generation, and all joints and seams in the containment structure will be sealed as necessary The CO₂ blasting system will be operated in accordance with the respective Work Package and Operation Instruction documents for this project Measures will be taken to prevent the tracking of hazardous wastes/constituents out of the unit by personnel or by equipment used in handling the waste An area will be designated to decontaminate any equipment and personnel leaving the containment structure Any rinsate from these decontamination activities will be collected and properly managed

After cleaning, the surface of each component will be visually inspected to evaluate if the closure standard of a "clean debris surface" has been met A "clean debris surface" means

"the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area "

[6 CCR 1007-3, § 268 45, Table 1]

If a "clean debris surface" is achieved and the debris does not exhibit a characteristic of hazardous waste identified under Subpart C, Part 261, then that debris will be considered a non-hazardous solid waste and will be removed and managed as non-hazardous debris for subsequent disposal at an appropriate facility If a "clean debris

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surface" has not been achieved, the process will be repeated until the standard is met, or the piece will be managed as hazardous waste. Following the completion of all CO₂ activities, the PermaCon® enclosure will be thoroughly cleaned of all waste materials by vacuuming or other means, and the exhaust pre-filters will be changed and managed appropriately as waste. Residuals will be characterized and managed as a waste in accordance with the general requirements identified in 6 CCR 1007-3, Part 268 45(d)(1).

If a clean surface cannot be achieved with additional cleaning, or the CO₂ system is unavailable, the tank pieces will be managed as hazardous waste. If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning.

4 2.2 Ancillary Equipment

The ancillary equipment, as shown in Figures 1 and 2, consists of pipes, valves, and pumps. Loose oil and sludges in the ancillary equipment will be removed by washing with an appropriate decontamination solution (consisting of water and detergent which does not contain hazardous constituents), followed by a final rinse with clean water. This decontamination process will be repeated until the results demonstrate that the Performance Standard has been met. Following washing and rinsing, analytical tests will be conducted in accordance with the approved lab procedures that meet the requirements of SW-846 to demonstrate the decontamination process has produced results in accordance with the following Closure Performance Standard:

The unit, unit equipment, or a portion thereof will be considered decontaminated upon removal of all visible waste residuals and when the final rinsate contains concentrations of priority pollutants (identified in section 3 of this plan as having been managed in the unit, including methylene chloride, toluene, freon [1,1,2-trichloro-1,2,2-trifluoroethane], trichloroethylene, 1,1,1-trichloroethane, xylene, and acetone) and total concentrations of each of the following metals at less than the maximum contaminant levels for drinking water (as identified in RFCA, Attachment 5, Table 2): antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver and thallium. The pH of the final rinsate must be between 6 and 9.

CLOSURE PLAN

Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning

4.2.3 Sumps and Below Grade Piping

The Building 865 waste water system has two below grade sumps and piping that are located below the floor slab of the building. Additionally, a sump is located in Building 866. These sumps will be decontaminated in a manner to comply with the provisions of the following Closure Performance Standard

The unit, unit equipment, or a portion thereof will be considered decontaminated upon removal of all visible waste residuals and when the final rinsate contains concentrations of priority pollutants (identified in section 3 of this plan as having been managed in the unit, including methylene chloride, toluene, Freon [1,1,2-trichloro-1,2,2-trifluoroethane], trichloroethylene, 1,1,1-trichloroethane, xylene, and acetone) and total concentrations of each of the following metals at less than the maximum contaminant levels for drinking water (as identified in RCRA, Attachment 5, Table 2) antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver and thallium. The pH of the final rinsate must be between 6 and 9.

The process will include decontaminating the surfaces using an appropriate decontamination solution (consisting of water and detergent which does not contain hazardous constituents) by manual application, followed by a final rinse with clean water. The final rinsate volume for external surfaces must not exceed two gallons per 100 square feet of surface area rinsed. It is possible that the surface area being rinsed is relatively small such that the maximum application rate of two gallons per 100 square feet does not produce adequate volumes for sampling and analysis. In this case, the final rinsate volume must not exceed the minimum amount necessary to collect an adequate sample volume for analysis, and to completely contact the surfaces that may have come into contact with hazardous waste.

The rinsate solution will be collected and analytical tests will be conducted in accordance with the approved lab procedures that meet the requirements of SW-846. If the closure standards are not achieved, washing and rinsing will be repeated until the appropriate standards are achieved. Final removal of these below grade sumps will be

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Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future

Below grade piping will be washed and rinsed as part of the ancillary equipment decontamination process. The below grade pipes which have no further use will be physically isolated from the building and left in place. Final removal of below grade piping will be completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future.

If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning.

4.2.4 Secondary Containment

Secondary containment located in Building 866 will be decontaminated in a manner to comply with the provisions of the following Closure Performance Standard:

The unit, unit equipment, or a portion thereof will be considered decontaminated upon removal of all visible waste residuals and when the final rinsate contains concentrations of priority pollutants (identified in section 3 of this plan as having been managed in the unit, including methylene chloride, toluene, Freon [1,1,2-trichloro-1,2,2-trifluoroethane], trichloroethylene, 1,1,1-trichloroethane, xylene, and acetone) and total concentrations of each of the following metals at less than the maximum contaminant levels for drinking water (as identified in RFCA, Attachment 5, Table 2) antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver and thallium. The pH of the final rinsate must be between 6 and 9.

The process will include decontaminating the surfaces using an appropriate decontamination solution (consisting of water and detergent which does not contain hazardous constituents) by manual application, followed by a final rinse with clean water. The final rinsate volume for external surfaces must not exceed two gallons per 100 square feet of surface area rinsed. It is possible that the surface area being rinsed is relatively small such that the maximum application rate of two gallons per 100 square feet does not produce adequate volumes for sampling and analysis. In this case, the final rinsate volume must not exceed the minimum amount necessary to collect an adequate sample volume for analysis, and to completely contact the surfaces that may

CLOSURE PLAN
Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

have come into contact with hazardous waste. The rinse solution will be collected and analytical tests will be conducted in accordance with the approved lab procedures that meet the requirements of SW-846. If the closure standards are not achieved, washing and rinsing will be repeated until the appropriate standards are achieved. If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning.

5. Schedule

The initiation of closure activities for the Building 865 T-1, T-2 and T-3 series tanks will commence immediately upon approval of this Closure Plan. Funding has been secured for this activity and a subcontractor has been retained to provide the closure services. It is estimated that the total duration of closure activities will be approximately 60 working days from the approval date of the Closure Plan. If it is anticipated that the total closure activity will exceed 180 days, the Director of the CDPHE will be notified of the additional time necessary to complete the closure and the reason for the delay.

6. Health and Safety Requirements

6.1 Work Control

6.1.1 Health and Safety Plan

Employee health and safety is paramount during the execution of the closure activities detailed in this Closure Plan. All activities for this closure will be conducted using a DOE Health and Safety Plan already approved as part of the National Conversion Pilot Project (NCP) at RFETS. Radiological activities will be conducted using a DOE Radiation Protection Plan (RPP) already approved as part of the NCP and that satisfies the requirements of 10 CFR 835. The control of the work to be performed will be provided by a stand alone work package which will be reviewed and approved by the management of the subcontractor tasked with responsibility for the closure activities, as well as the employees which will perform the hand-on work. All procedures and plans will be in compliance with the Occupational Health and Safety Administration (OSHA) requirements (29 CFR 1910.120) for workers at a hazardous waste site. Emergency response and spill response are covered in the Health and Safety Plan.

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All personnel involved in the closure activities will be qualified in accordance with Part IX (Personnel Training), of the Rocky Flats Environmental Technology Site's RCRA Part 'B' permit and will have shown competence in the processes and techniques required to accomplish closure. In addition, all personnel will be trained and qualified as radiological workers per DOE approved requirements.

Industry standard techniques for limiting the spread of contamination (both chemical and radiological) will be instituted to assure both worker safety and to preclude releases of the contamination to the environment. Utilizing these techniques will also have the benefit of waste source reduction and is a key component to the waste minimization efforts that will take place during the performance of the closure activities.

6.1.2 Industrial Hygiene and Safety

The closure activities will be monitored by an on-site Certified Industrial Hygienist (CIH) who will be responsible for the day to day safety compliance, personnel sampling, environmental monitoring and accident / injury reporting requirements. All exposures to hazardous materials and wastes will be strictly controlled and documented. Personnel Protective Equipment (PPE) requirements will be established prior to initiation of the closure activities, and routinely re-evaluated as phases of work change on the project.

6.1.3 Radiological Safety

Since the equipment identified in this Closure Plan has the potential for radiological contamination, a project Radiation Safety Officer will be available during the performance of the closure activities. Pre-surveys for determination of radiological contamination levels will be performed prior to initiation of the closure activities as part of the initial sampling and characterization activities of the work control package. Specifically, 10% of all smear samples taken outside the tank system will be isotopically analyzed by gamma spectroscopy. Also, all samples taken inside the tanks will be isotopically analyzed by gamma spectroscopy.

7. Waste Generation

7.1 Characterization and Disposition

Wastes generated during performance of this closure activity include decontamination and rinsate solutions, PPE, and contamination control plastic, wipes, and tape. Solutions will be batch sampled to ensure waste acceptance criteria are met before

CLOSURE PLAN

Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

being transferred to the Building 374 Liquid Waste Operations for treatment PPE and other miscellaneous waste forms will be managed as low-level or low-level mixed waste as appropriate Low-level mixed waste storage will be coordinated with the site to ensure proper management

7.2 Waste Minimization

All activities will be performed with waste minimization in mind Extensive contamination control techniques will be used to minimize the spread of contamination resulting from the closure activities Liquid effluent generation will be held to a minimum to reduce the resulting mixed-waste saltcrete produced from the Building 374 Liquid Waste Operations process Finally, pre-planning and adequate and correct characterization of the wastes will assure proper management, packaging and storage of all containerized wastes originating from this closure activity

8. Certification of Closure

Within 60 days after completion of closure activities, the Site will submit to the Colorado Department of Public Health and Environment certification that the tanks, piping, and ancillary equipment and secondary containment have been closed in accordance with this Closure Plan The certification will be signed by an independent, Colorado-registered professional engineer An independent, Colorado-registered professional engineer will also conduct inspections of any decontaminated hazardous debris that is determined to meet the "clean debris surface" closure performance standard Documentation of these inspections will be prepared and certified by the independent, Colorado-registered professional engineer, and will be submitted to the Colorado Department of Public Health and Environment with the certification of closure

9. Record Keeping

The Site will maintain the following closure records until final closure of the facility

- Record of sampling activities (date, number and type)
- Analytical results
- Records of actions taken to decontaminate equipment or structures
- Work control packages governing the closure of this RCRA unit
- Other documentation which verifies that the Site followed the approved Closure Plan

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Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

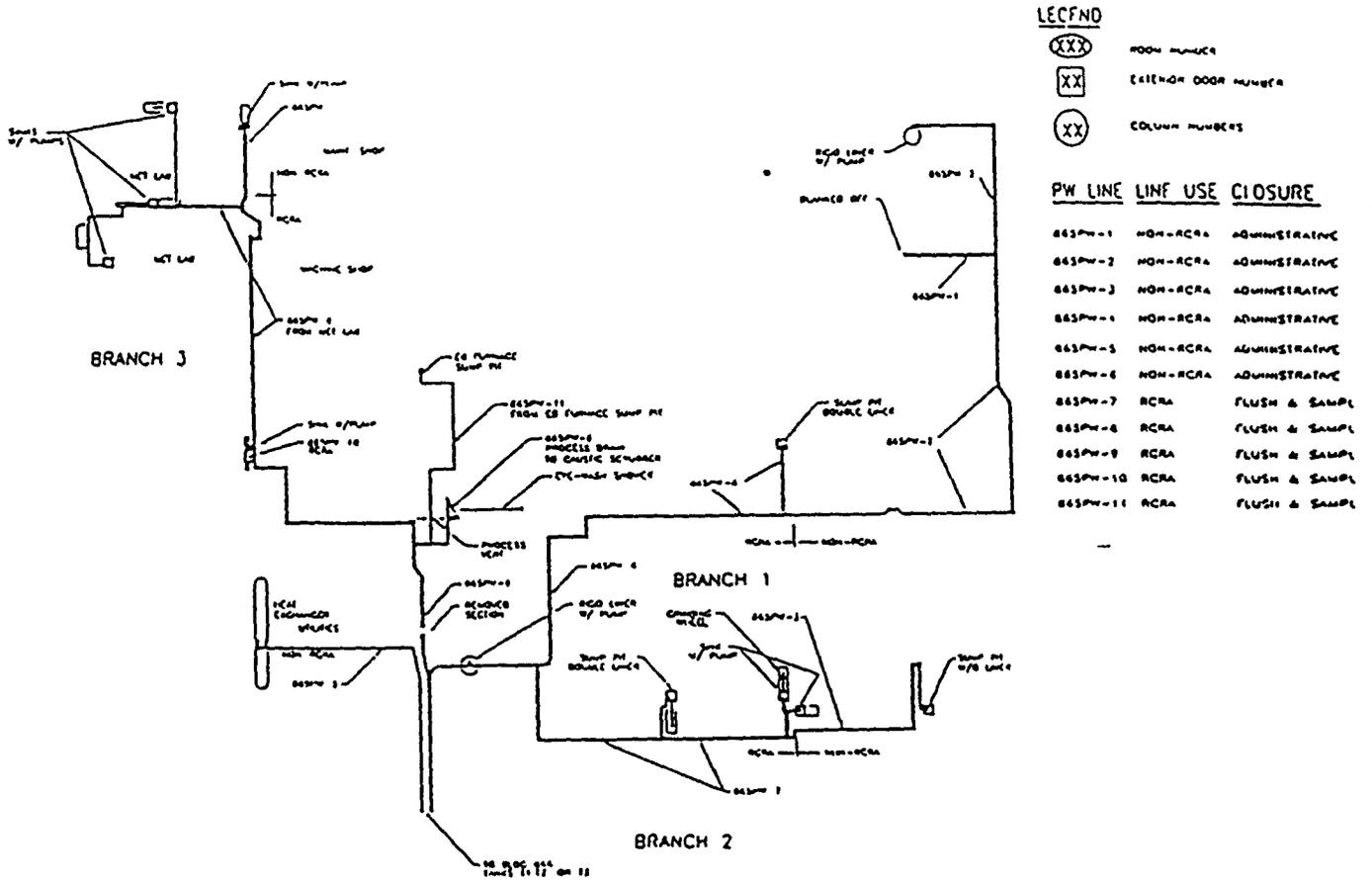
10. Amendment of the Closure Plan

In conducting the closure activities, unexpected events that occur during the implementation of the required closure activities may require an amendment of the existing Closure Plan. Any request for the modification of the Closure Plan will be made within 30 days of identification of the event that causes the modification to be necessary.

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Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

Figure 1 - Building 865 Process Waste Line Floor Plan

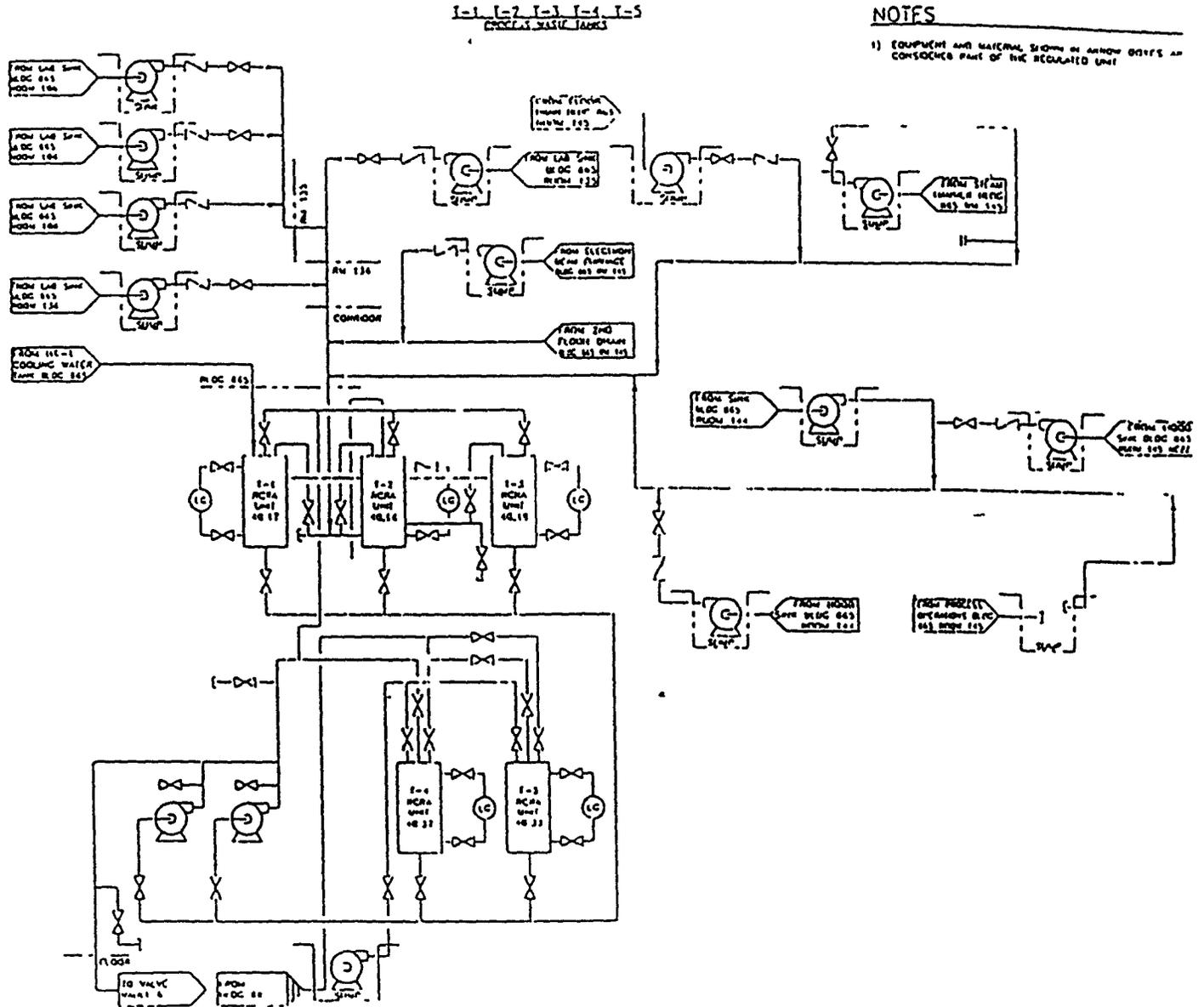


BLDG 865 PROCESS WASTE LINE
FLOOR PLAN

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CLOSURE DESCRIPTION DOCUMENT
Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

Figure 2 - Tanks T-1, T-2 and T-3 Piping and Instrumentation Diagram

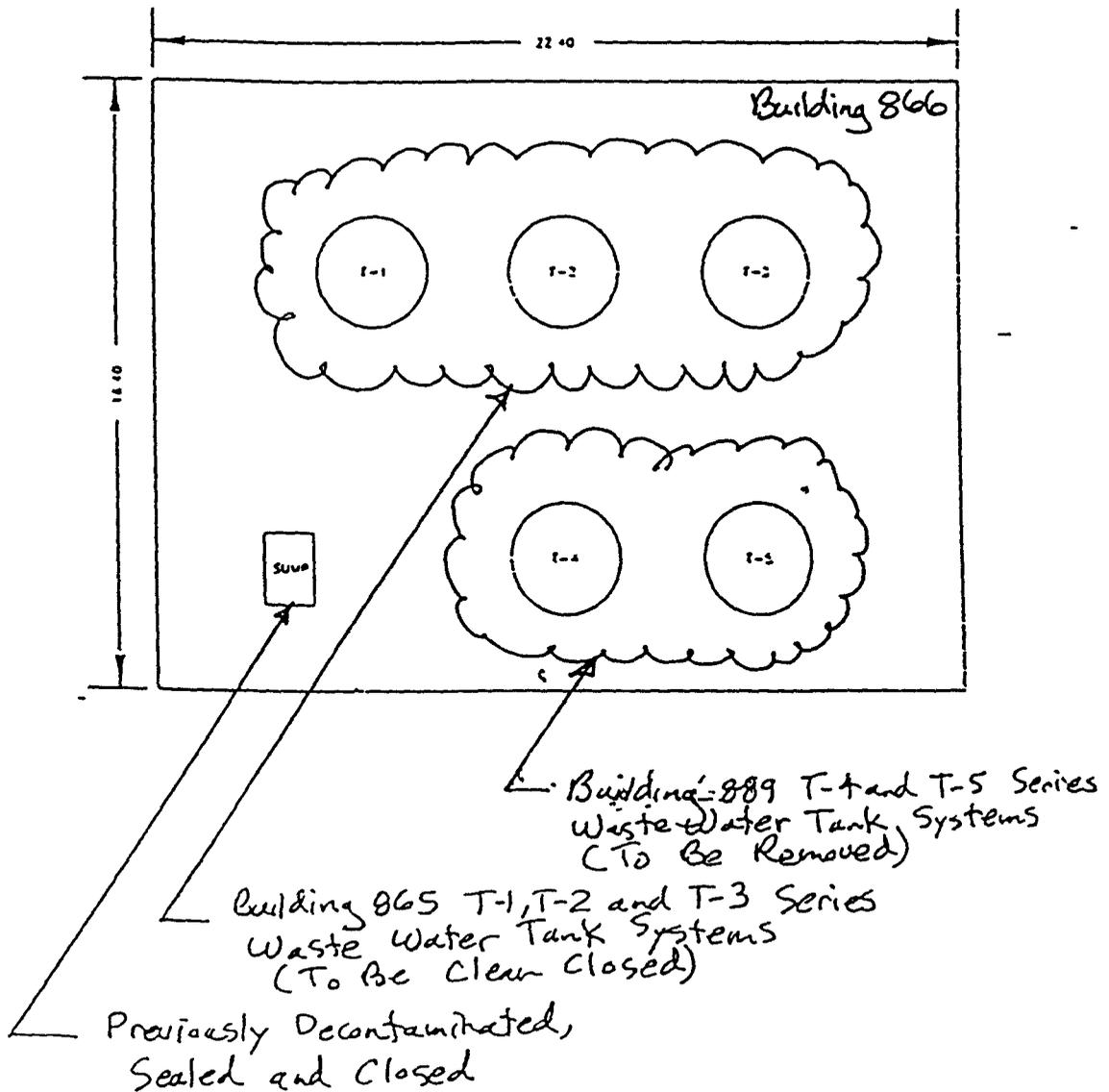


CLOSURE DESCRIPTION DOCUMENT
Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

Figure 3 - Building 866 Secondary Containment

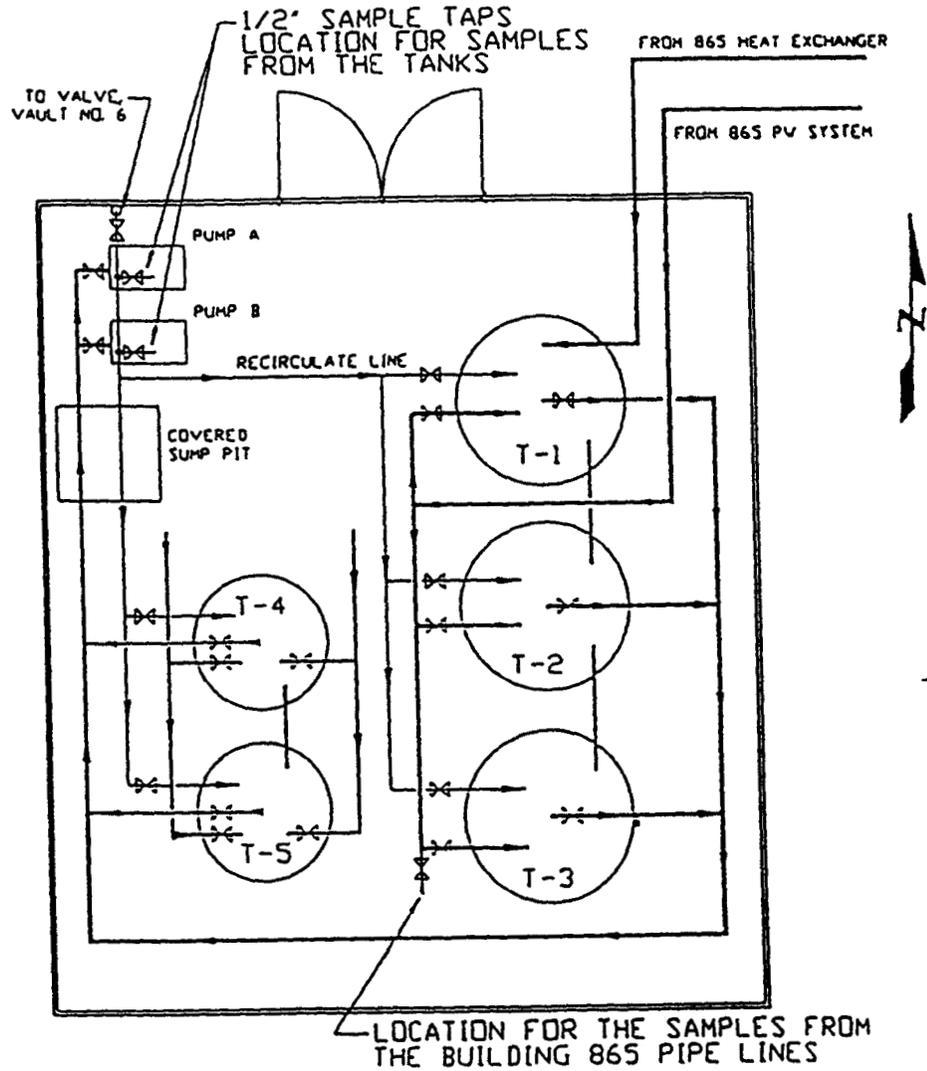
NOTES

1) SECONDARY CONTAINMENT IS A BERMED AREA OF APPROXIMATELY 367 SQ FT



CLOSURE PLAN
Building 865 T-1, T-2 and T-3 Series Waste Water Tank Systems

Figure 4 - Building 866 Piping and Instrumentation Diagram



BLDG 866 PROCESS WASTE SYSTEM CLOSURE
SAMPLE LOCATIONS

CLOSURE PLAN

**BUILDING 889
T-4 and T-5 SERIES WASTE WATER TANK SYSTEMS
(Located in Building 866)**

EPA ID# C07890010526

JUNE 23, 1997



MANUFACTURING SCIENCES CORPORATION

Prepared by.

**Prepared for
The United States
Department of Energy
Rocky Flats Field Office**

**Reviewed for Classification
By M S Simmons 'U'
Date June 23, 1997**

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CLOSURE PLAN
Building 889 T-4 and T-5 Series Waste Water Tank Systems

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CLOSURE PLAN
Building 889 T-4 and T-5 Series Waste Water Tank Systems

1. Introduction

This Closure Plan describes the method of performing closure activities of the Building 889 T-4 and T-5 Process Waste Water Tank Systems physically located in Building 866. This document is based on Part X (Closure), Section (B)(2), of the Rocky Flats Environmental Technology Site's (RFETS) RCRA Part 'B' permit. Included in this Closure Plan are the methods of accomplishing closure and criteria, in the form of closure performance standards, which will be used to evaluate closure performance, in accordance with the applicable sections of Subpart G of Part 265 of the Colorado Hazardous Waste Regulations (6 CCR 1007-3).

This Closure Plan will provide information on and rationale for the method of closure, the defined extent of the unit to be closed under this Closure Plan, the type of closure to be performed, the type of contamination to be addressed, decontamination method to be conducted, decontamination media to be used, the schedule for accomplishing closure, and other information associated with unit closure activities.

2. Facility Description and Operational History

The Rocky Flats Environmental Technology Site is owned and co-operated by the U S Department of Energy. The primary original mission of the site was the production of metal components for nuclear weapons. In support of this mission, Building 889 was utilized to provide size reduction and other waste management activities.

This building was used to clean filters from all over the plantsite and could potentially have plutonium contamination. As an added safety measure, all radiological materials ever used on plantsite will be presumed to have been used in these buildings. If plutonium contamination is found, the current Radiation Protection Plan and associated procedures will be revised to incorporate the safety aspects of handling plutonium.

Building 889 was constructed in the 1960's, using reinforced concrete, concrete block, steel framing and transite siding. Major additions included the addition of a new exhaust filter plenum in the 1980's. This facility was demolished in the summer of 1996, and only the concrete floor pad remains today.

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Building 889 T-4 and T-5 Series Waste Water Tank Systems

3. Unit Description

The Building 889 waste water system contains T-4 and T-5 series tanks, RCRA Units 40 32, and 40 33. These tanks were utilized to store process waste water solutions potentially containing acids, arsenic, barium, beryllium (in a non-hazardous form), lead, mercury, silver, nickel, hazardous solvents (e.g. acetone, xylene, methylene chloride, toluene, trichloroethylene, 1,1,1-trichloroethane), and detergent prior to transfer to the waste water treatment system in Building 374. Ancillary equipment associated with the tanks include piping, pumps, valves and a process waste water transfer line leading to Building 374. Diagrams of the waste water system are included as Figures 1 and 2. These diagrams also indicate portions of the tank system which service Building 865 and are not a part of this Closure Plan.

4. Closure Description

4.1 Closure Information

4.1.1 General Provisions

The planned closure activities for the T-4 and T-5 series tanks include the removal of all associated piping, pumps, valves and tanks located in Building 866. There is some below grade pipe work which is not accessible until final decontamination and decommissioning of the facility and removal of the floor pad. For this reason, certain below grade piping will remain in place as it is not reasonable to excavate and remove. Therefore, this closure will be considered "partial." Final removal of below grade piping will be completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future and the status of the remaining unclosed portions of the Unit will be maintained in the Master List of RCRA Hazardous Waste Units at Rocky Flats.

The defined extent of the Unit is illustrated in Figures 1 and 2, included as a component of this document.

4.1.2 Types of Contamination

Two types of contamination are expected to be encountered during closure activities. Radiological contamination is expected because of past use of radioactive materials in the facility. As a precaution, 10% of all smear samples taken outside the tank system

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Building 889 T-4 and T-5 Series Waste Water Tank Systems

will be isotopically analyzed by gamma spectroscopy. Also, all samples taken inside the tank system will be isotopically analyzed by gamma spectroscopy. Chemical contamination is expected because of the past processes and operations performed in the facility. While the Unit 40 Approved Waste Codes indicate the tanks were authorized under interim status to store a variety of waste codes, the tanks will be evaluated against closure standards for only the hazardous wastes and hazardous constituents (as listed in 6 CCR 1007-3, Part 261, Appendix VIII) that were actually managed in the tanks as described in Section 3 of this Closure Plan.

This information is a compilation of laboratory analysis performed in conjunction with the development of the Building Waste / Residue Information and Characterization (WSRIC) Book, and historical knowledge of past processes and operations. In addition, piping and valves that are removed will be characterized for lead and asbestos contaminants prior to disposal.

4.2 Closure Activities

4.2.1 Tanks

The T-4 and T-5 series tanks will be removed in order to undergo cleaning and evaluation against the clean debris standards specified in this section. Tank removal will be performed using temporary containment structures or enclosed portions of the existing room. The containment area will be ventilated using portable HEPA filtered air movers to assure containment of radioactive materials and protect the workers involved in the process. The tanks will be moved to Building 883 where the tanks will be size reduced into manageable pieces. These pieces will be transferred to an existing PermaCon® enclosure located in Room 105 of Building 883 with attached HEPA filtered air movers to protect the workers involved with the process.

Once in the containment structure, the tank pieces will be cleaned using a carbon dioxide (CO₂) pressure cleaning system. The advantage to this cleaning process is that it is aggressive, but leaves no residue other than the materials that are removed from the tank pieces. Consequently there is no generation of additional liquid wastes. Daily inspections to assure control and containment of hazardous wastes and hazardous constituents produced by the decontamination activities in the PermaCon® enclosure located in Room 105 of Building 883 will be performed and documented on inspection log sheets. These inspection log sheets must be completed and must include the date inspected, time of inspection, signature of inspector, and an evaluation the following items: condition of the containment structure to prevent releases, maintenance of the

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CLOSURE PLAN

Building 889 T-4 and T-5 Series Waste Water Tank Systems

PermaCon® vacuum within required operating limits, adequate aisle space present and clear of obstructions around the unit, proper operation of CO₂ blasting system, and presence of fugitive dust emissions from any openings (doors, windows, vents, etc) All corrective actions taken to address inspection items will be documented on the inspection log sheets

To assure there is no release of hazardous wastes during operation of the CO₂ blasting system, all exhaust ventilation will be filtered by HEPA filters prior to discharge from the containment structure, waste generated by the system will either be removed daily from the containment structure or collected daily and managed within a satellite hazardous waste accumulation container at or near the point of generation, and all joints and seams in the containment structure will be sealed as necessary The CO₂ blasting system will be operated in accordance with the respective Work Package and Operation Instruction documents for this project Measures will be taken to prevent the tracking of hazardous wastes/constituents out of the unit by personnel or by equipment used in handling the waste An area will be designated to decontaminate any equipment and personnel leaving the containment structure Any rinsate from these decontamination activities will be collected and properly managed

After cleaning, the surface of each component will be visually inspected to evaluate if the closure standard of a "clean debris surface" has been met A "clean debris surface" means

"the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area "

[6 CCR 1007-3, § 268 45, Table 1]

If a "clean debris surface" is achieved and the debris does not exhibit a characteristic of hazardous waste identified under Subpart C, Part 261, then that debris will be considered a non-hazardous solid waste and will be removed and managed as non-hazardous debris for subsequent disposal at an appropriate facility If a "clean debris surface" has not been achieved, the process will be repeated until the standard is met, or the piece will be managed as hazardous waste Following the completion of all CO₂

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CLOSURE PLAN
Building 889 T-4 and T-5 Series Waste Water Tank Systems

activities, the PermaCon® enclosure will be thoroughly cleaned of all waste materials by vacuuming or other means, and the exhaust pre-filters will be changed and managed appropriately as waste. Residuals will be characterized and managed as a waste in accordance with the general requirements identified in 6 CCR 1007-3, Part 268 45(d)(1)

If a clean surface cannot be achieved with additional cleaning, or the CO₂ system is unavailable, the tank pieces will be managed as hazardous waste

4.2.2 Ancillary Equipment

The ancillary equipment consists of pipes, valves, and pumps. The equipment will be removed and managed as either low-level mixed waste or hazardous waste, as appropriate

The ancillary equipment will be stripped out in a fashion that leaves the minimum of materials in place. Piping that enters the room from below grade locations, will be stripped back to the point of penetration into the room in a method that will allow capping, blanking or other durable method of isolation as close to the point of penetration as possible. Final removal of below grade piping will be completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future. If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning

4.2.3 Below Grade Piping

The below grade pipes will be physically isolated from the building and left in place. Final removal of below grade piping will be completed under other Rocky Flats Cleanup Agreement (RFCA) regulated cleanup activities in the future

4.2.4 Secondary Containment

Secondary containment located in Building 866 will be decontaminated in a manner to comply with the provisions of the following Closure Performance Standard

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Building 889 T-4 and T-5 Series Waste Water Tank Systems

The unit, unit equipment, or a portion thereof will be considered decontaminated upon removal of all visible waste residuals and when the final rinsate contains concentrations of priority pollutants (identified in section 3 of this plan as having been managed in the unit, including acetone, xylene, methylene chloride, toluene, trichloroethylene, 1,1,1-trichloroethane) and total concentrations of each of the following metals at less than the maximum contaminant levels for drinking water (as identified in RCRA, Attachment 5, Table 2) antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver and thallium. The pH of the final rinsate must be between 6 and 9.

The process will include decontaminating the surfaces using an appropriate decontamination solution (consisting of water and detergent which does not contain hazardous constituents) by manual application, followed by a final rinse with clean water. The final rinsate volume for external surfaces must not exceed two gallons per 100 square feet of surface area rinsed. It is possible that the surface area being rinsed is relatively small such that the maximum application rate of two gallons per 100 square feet does not produce adequate volumes for sampling and analysis. In this case, the final rinsate volume must not exceed the minimum amount necessary to collect an adequate sample volume for analysis, and to completely contact the surfaces that may have come into contact with hazardous waste. The rinsate solution will be collected and analytical tests will be conducted in accordance with the approved lab procedures that meet the requirements of SW-846. If the closure standards are not achieved, washing and rinsing will be repeated until the appropriate standards are achieved. If clean closure in place cannot be achieved, or if it is determined that clean closure should not be attempted, the system will be made RCRA stable, and closure will be deferred to building decommissioning.

5. Schedule

The initiation of closure activities for the Building 889 T-4 and T-5 series tanks will commence immediately upon approval of this Closure Plan. Funding has been secured for this activity and a subcontractor has been retained to provide the closure services. It is estimated that the total duration of closure activities will be approximately 60 working days from the approval date of the Closure Plan. If it is anticipated that the total closure activity will exceed 180 days, the Director of the CDPHE will be notified of the additional time necessary to complete the closure and the reason for the delay.

CLOSURE PLAN
Building 889 T-4 and T-5 Series Waste Water Tank Systems

6. Health and Safety Requirements

6.1 Work Control

6.1.1 Health and Safety Plan

Employee health and safety is paramount during the execution of the closure activities detailed in this Closure Plan. All activities for this closure will be conducted using a DOE Health and Safety Plan already approved as part of the National Conversion Pilot Project (NCP) at RFETS. Radiological activities will be conducted using a DOE Radiation Protection Plan (RPP) already approved as part of the NCP and that satisfies the requirements of 10 CFR 835. The control of the work to be performed will be provided by a stand alone work package which will be reviewed and approved by the management of the subcontractor tasked with responsibility for the closure activities, as well as the employees which will perform the hand-on work. All procedures and plans will be in compliance with the Occupational Health and Safety Administration (OSHA) requirements (29 CFR 1910.120) for workers at a hazardous waste site. Emergency response and spill response are covered in the Health and Safety Plan.

All personnel involved in the closure activities will be qualified in accordance with Part IX (Personnel Training), of the Rocky Flats Environmental Technology Site's RCRA Part 'B' permit and will have shown competence in the processes and techniques required to accomplish closure. In addition, all personnel will be trained and qualified as radiological workers per DOE approved requirements.

Industry standard techniques for limiting the spread of contamination (both chemical and radiological) will be instituted to assure both worker safety and to preclude releases of the contamination to the environment. Utilizing these techniques will also have the benefit of waste source reduction and is a key component to the waste minimization efforts that will take place during the performance of the closure activities.

6.1.2 Industrial Hygiene and Safety

The closure activities will be monitored by an on-site Certified Industrial Hygienist (CIH) who will be responsible for the day to day safety compliance, personnel sampling, environmental monitoring and accident / injury reporting requirements. All exposures to hazardous materials and wastes will be strictly controlled and documented. Personnel

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CLOSURE PLAN
Building 889 T-4 and T-5 Series Waste Water Tank Systems

Protective Equipment (PPE) requirements will be established prior to initiation of the closure activities, and routinely re-evaluated as phases of work change on the project

6.1.3 Radiological Safety

Since the equipment identified in this Closure Plan has the potential for radiological contamination, a project Radiation Safety Officer will be available during the performance of the closure activities. Pre-surveys for determination of radiological contamination levels will be performed prior to initiation of the closure activities as part of the initial sampling and characterization activities of the work control package. Specifically, 10% of all smear samples taken outside the tank system will be isotopically analyzed by gamma spectroscopy. Also, all samples taken inside the tank system will be isotopically analyzed by gamma spectroscopy.

7. Waste Generation

7.1 Characterization and Disposition

Wastes generated during performance of this closure activity include decontamination and rinsate solutions, residuals from the CO₂ blasting process including HEPA filters, stripped out ancillary equipment including pipe, valves and pumps, the tank shells, PPE, and contamination control plastic, wipes, and tape. Solutions will be batch sampled to ensure waste acceptance criteria are met before being transferred to the Building 374 Liquid Waste Operations for treatment. Metal from the tank shells which meets the debris standards will be disposed of as non-hazardous (but possibly low-level radioactive) waste.

Ancillary equipment will either be managed as low-level mixed waste or hazardous waste. Metals which do not meet these standards will be characterized appropriately and managed as low-level mixed hazardous waste. Residuals will be managed as indicated in Section 4 of this Closure Plan. Finally, PPE and other miscellaneous waste forms will be managed as low-level or low-level mixed waste as appropriate. Low-level mixed waste storage will be coordinated with the site to ensure proper management.

7.2 Waste Minimization

All activities will be performed with waste minimization in mind. The CO₂ blasting debris technology to be utilized has the benefit that no secondary waste is produced during use. As the CO₂ pellets hit the item being cleaned, the pellet instantly evaporates.

CLOSURE PLAN
Building 889 T-4 and T-5 Series Waste Water Tank Systems

leaving behind only the original contaminate. Extensive contamination control techniques will be used to minimize the spread of contamination resulting from the closure activities. Liquid effluent generation will be held to a minimum to reduce the resulting mixed-waste saltcrete produced from the Building 374 Liquid Waste Operations process. Finally, pre-planning and adequate and correct characterization of the wastes will assure proper management, packaging and storage of all containerized wastes originating from this closure activity.

8. Certification of Closure

Within 60 days after completion of closure activities, the Site will submit to the Colorado Department of Public Health and Environment certification that the tanks, piping, and ancillary equipment and secondary containment have been closed in accordance with this Closure Plan. The certification will be signed by an independent, Colorado-registered professional engineer. An independent, Colorado-registered professional engineer will also conduct inspections of any decontaminated hazardous debris that is determined to meet the "clean debris surface" closure performance standard. Documentation of these inspections will be prepared and certified by the independent, Colorado-registered professional engineer, and will be submitted to the Colorado Department of Public Health and Environment with the certification of closure.

9. Record Keeping

The Site will maintain the following closure records until final closure of the facility:

- Record of sampling activities (date, number and type)
- Analytical results
- Records of actions taken to decontaminate equipment or structures
- Work control packages governing the closure of this RCRA unit
- Other documentation which verifies that the Site followed the approved Closure Plan

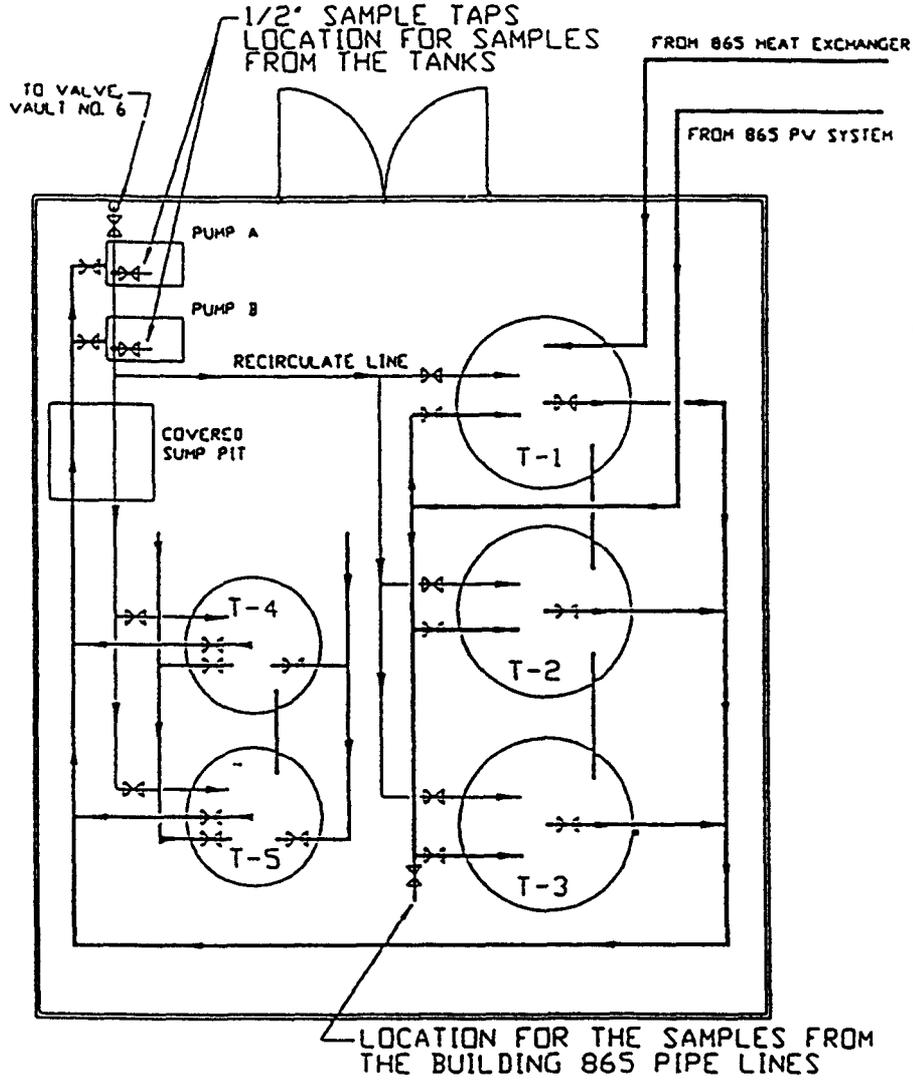
10. Amendment of the Closure Plan

In conducting the closure activities, unexpected events that occur during the implementation of the required closure activities may require an amendment of the existing Closure Plan. Any request for the modification of the Closure Plan will be made within 30 days of identification of the event that causes the modification to be necessary.

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CLOSURE PLAN
Building 889 T-4 and T-5 Series Waste Water Tank Systems

Figure 1 - Building 866 Piping and Instrumentation Diagram



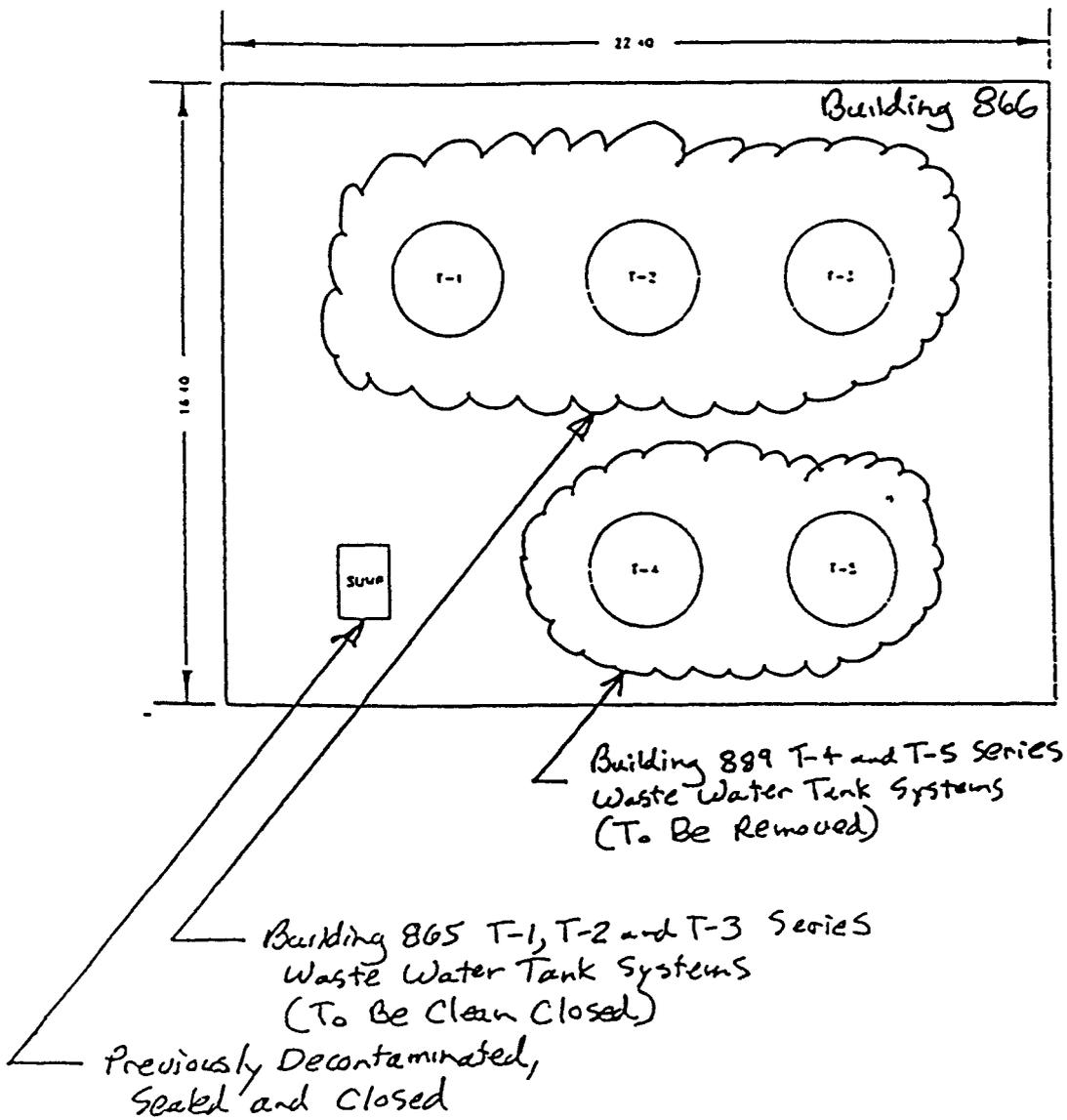
BLDG 866 PROCESS WASTE SYSTEM CLOSURE
SAMPLE LOCATIONS

CLOSURE DESCRIPTION DOCUMENT
Building 889 T-4 and T-5 Series Waste Water Tank Systems

Figure 2 - Secondary Containment Diagram

NOTES

1) SECONDARY CONTAINMENT IS A BERMED AREA OF APPROXIMATELY 367 SQ FT



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