DRAFT PERMIT

OAK RIDGE NATIONAL LABORATORY

OAK RIDGE, TENNESSEE

STORAGE AND TREATMENT

EPA ID NO.: TN1890090003

EXISTING PERMIT NUMBER: TNHW-145

DRAFT

FACT SHEET

INTENT TO REISSUE A HAZARDOUS WASTE MANAGEMENT PERMIT FOR DEPARTMENT OF ENERGY OAK RIDGE NATIONAL LABORATORY

Facility Name:	Oak Ridge National Laboratory
Facility Owner:	U.S. Department of Energy,
Facility Operator:	United Cleanup Oak Ridge LLC
Facility Location:	1 Bethel Valley Road, Oak Ridge, TN 37831
Facility Contact:	Emily M. Day Regulatory Strategy and Integration Manager UCOR P. O. Box 4699, MS 7240 Oak Ridge, TN 37831 505-379-3802
Type:	Transuranic (TRU) Storage Areas CH (Contact Handled) and (Remote Handled) RH Storage Areas in TRU Waste Processing Center (TWPC)
Units:	Storage RH-TRU Buildings 7572, 7855, 7860A, and 7883 CH-TRU Buildings 7574, 7879, and 7831F Flammable Storage Unit (FSU) TWPC-1 [Contact Handled Staging Area (CHSA)], TWPC-2 (Second Floor WPB), TWPC-3 [Drum Aging Criteria (DAC)], TWPC-4 (First Floor WPB), TWPC-5 [Container Storage Area (CSA)], TWPC-6 [Contact Handled Marshalling Building (CHMB)], TWPC-7 [Drum Venting Building (DVB)], and TWPC-8 [Multi-Purpose Building (MPB)] Treatment: T-1 Macroencapsulation, T-2 Amalgamation, T-3 Solidification/Stabilization, T-4 Groundwater Absorption, T-5 Size Reduction, T-6 Groundwater Filtration, T-7 Neutralization, T-8 Oxidation/Deactivation, and T-9 Puncturing Potentially Pressurized Containers
EPA ID Number:	TN1890090003
Existing Permit Number:	TNHW-145
Comment Period:	Begins: June 18, 2025 Ends: August 2, 2025

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PURPOSE

This fact sheet is prepared pursuant to Tennessee Rule 0400-12-01-.07(7)(d) for the draft permit developed by the Tennessee Department of Environment and Conservation (TDEC) Division of Solid Waste Management (DSWM). The purpose of this permitting process is to afford any interested persons the opportunity to evaluate the ability of the permittee to apply the applicable hazardous waste management requirements. The proposal is for the renewal permit to be reissued under the authority of the Tennessee Hazardous Waste Management Act of 1977, as amended, Tennessee Code Annotated, Section 68-212-101 et seq., and Tennessee Rule Chapter 0400-12-01, Hazardous Waste Management. The draft permit is prepared in accordance with the provisions of Tennessee Rule 0400-12-01-.07.

FACILITY DESCRIPTION

Oak Ridge National Laboratory (ORNL) is a multipurpose research and development (R&D) facility that focuses on technology development of national importance, including the identification and development of solutions to complex problems in energy-based technologies such as materials development, separation techniques, chemical processes, biological screening, and biotechnology. Hazardous wastes, radioactive wastes, and mixed wastes (both radioactive and hazardous) are generated as a result of this research.

The activities covered in this proposed permit includes the storage and treatment of hazardous waste that also contains transuranic (TRU) isotopes and other radioisotopes that require special handling. These activities are conducted at the ORNL site and at the TRU Waste Processing Center (TWPC). The TWPC encompasses portion of the ORNL site, and it is designed to repackage, treat, and certify radioactive and mixed waste generated by past and present ORNL activities before disposal.

DOE is the owner and operator of this facility and UCOR is the co-operator that operates and manages the facility.

PERMIT HISTORY

The current permit, TNHW-145, was issued on February 3, 2010, and was effective for ten years. DOE submitted its permit renewal application to DSWM on July 24, 2019, at least 180 days before the expiration date. DOE is allowed to continue operations under the current permit until a final decision is made on the application. As part of the pre-application process, DOE conducted a pre-application public meeting on May 28, 2019, as announced in a public notice published on April 10, 2019, in the editions of the The Oak Ridger and Roane County News. Oral comments were received from the public during the meeting and DOE addressed the comments at that time. No written comments were received.

The current permit, TNHW-145, allows the facility to store and treat hazardous wastes generated by DOE and its contractors prior to on or off-site treatment and disposal. The eight storage units in the Transuranic (TRU) storage areas and their capacities are: Buildings 7572 (220,000 gals), 7855 (96,433 gals), 7860A (46,612 gals), 7883 (96,433 gals), 7574 (94,800 gals), 7879 (114,708 gals), and 7831F (7,920 gals). The total storage capacity is 676,906 gallons.

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The eight storage areas at the TRU Waste Processing Centre (TWPC) and their capacities are: Contact Handled Staging Area (22,000 gals); Waste Processing Building, Second Floor (11,000 gals); Drum Aging Criteria and Drum Venting Building (11,000 gals); Waste Processing Building, First Floor (5,500 gals); Container Storage Area (72,600 gals); Contact Handled Marshalling Building (145,420 gals); and Multi-Purpose Building (141,240 gals). The total storage capacity is 408,760 gallons.

The nine treatment processes performed at TWPC are: Macroencapsulation (9,350 gals/year), Amalgamation (10 lbs/hour), Solidification/Stabilization (50 gals/hour of liquids and 55 gals/day of solids), Groundwater Absorption (825 gals/day), Size Reduction (2,255 gals/day), Groundwater Filtration (5,000 gals/year), Neutralization (5 gals/day), Oxidation/Deactivation (2.2 pounds/day), and Puncturing Potentially Pressurized Containers (55 gals/day).

Solid waste management units (SWMUs) and Areas of Concern (AOCs) at the Oak Ridge Reservation, including previous or ongoing investigations or corrective actions for all releases of hazardous wastes or hazardous constituents, are addressed separately in DOE's site-wide corrective action permit, TNHW-164, issued on September 15, 2015. The conditions of permit TNHW-164 require that any future and existing SWMUs or AOCs be evaluated for potential releases and remediation, as necessary. The conditions for both permits will require notification of imminent hazards, and when applicable, compliance with the requirements developed under land disposal restrictions and organic emission standards.

PROPOSED PERMIT

Based on DOE application, DSWM has drafted a permit for public review. The permit is proposed to be reissued under the authority of the Tennessee Hazardous Waste Management Act of 1977, as amended, Tennessee Code Annotated, Section 68-212-101 et seq., and Rule Chapter 0400-12-01, Hazardous Waste Management. In accordance with Rule 0400-12-01-.07(7)(e), this public notice requires a 45-day comment period, ending on **August 2, 2025**.

If the proposed permit is approved, the facility will continue operation of the current storage and treatment units. There will be no increase in the storage and treatment capacities.

PERMIT FORMAT:

The permit format consists of both permit conditions and attachments. The permit conditions located in the front of the permit consist of the standard, general, and specific requirements that DOE must meet based on the regulations. An outline with a summary of the requirements for the permit sections are as follows:

I. STANDARD CONDITIONS

This section provides the authorization and severability of the permit, definitions, general duties and requirements, document maintenance, maintenance fee, notices, precedence, and permit structure. The language in this section is consistent in all hazardous waste permits issued by the State of Tennessee.

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II. GENERAL FACILITY CONDITIONS

This section provides the general conditions that apply to permitted hazardous waste facilities in the State of Tennessee. This section addresses the following: waste analysis plan; site security; facility inspections; personnel training; recordkeeping and reporting; contingency plan; closure plan; special requirements for ignitable, reactive, and incompatible wastes; land disposal restrictions; organic air emission standards; and restriction on ownership of the facility.

III. SPECIFIC CONDITIONS FOR STORAGE IN CONTAINERS

This section provides the specific conditions related to storage in containers: waste identification; container condition; compatibility; container management; inspection; leaks and spill management; special requirements for ignitable, reactive, and incompatible wastes; final closure of the container storage unit; and air emission standards.

IV. SPECIFIC CONDITIONS FOR PHYSICAL AND CHEMICAL TREATMENT IN CONTAINERS

This section provides the specific conditions related to treatment in container: waste identification; general operating requirements; waste analysis and trial tests; inspections; closure; and special requirements for ignitable, reactive, and incompatible wastes.

V. SPECIFIC CONDITIONS FOR CORRECTIVE ACTION

This section provides the specific conditions that apply to solid waste management units and areas of concern, which are located on-site and off-site at the facility. The corrective action conditions describe the process that DOE shall follow in addressing any release to the environment, which includes the discovery, reporting requirements of a release, and the entire investigation/remediation process. The conditions for continued corrective action on all solid waste management units at the facility can be found in the permit number TNHW-164.

VI. SCHEDULE OF COMPLIANCE

This section provides the procedures for granting the request to renew the waivers and the effective period of the renewal.

The following are the attachments to the permit sections. The attachments provide more specific procedures and details as to how DOE shall comply with duties, conditions, and other requirements specified in those sections.

Attachment 1. Hazardous Wastes to Be Managed
Attachment 2. Waste Analysis Plan
Attachment 3. Security
Attachment 4. Inspections
Attachment 5. Personnel Training
Attachment 6. Contingency Plan

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Attachment 7. Closure Plan
Attachment 8. Container Management
Attachment 9. Physical And Chemical Treatment at the TRU Waste Processing Center (TWPC)

COMMENTS

The regulations under Rule 0400-12-01-.07(7)(e) require a 45-day comment period be instituted for each draft permit under the Hazardous Waste Management Act. The comment period will begin on June 18, 2025, and will end on August 2, 2025. It will be public noticed in The Oak Ridger and in the Roane County News on June 18, 2025.

Electronic copies of the draft permit and fact sheet are available online at tn.gov/environment/notices/doe-ornl. Digital copies are available for review at the DSWM Central Office, located at the Davy Crockett Tower 7th Floor, 500 James Robertson Parkway, Nashville, TN 37243 (615-532-0780) and at the TDEC Knoxville Environmental Field Office located at 3711 Middlebrook Pike, Knoxville, TN 37921 (865-594-6035). A paper copy of the draft permit is available for review at the Oak Ridge Public Library, 1401 Oak Ridge Turnpike, Oak Ridge, TN 37830 (865-425-3455).

To comment on the proposed permit renewal, contact Mr. Brett Harris, Hazardous Waste Permitting Manager, Division of Solid Waste Management, Tennessee Department of Environment and Conservation, Davy Crockett Tower, 7th Floor, 500 James Robertson Parkway, Nashville, Tennessee 37243 (615-393-9221), Brett.Harris@tn.gov. **Comments must be received by 4:30 p.m. CDT, August 2, 2025, to assure consideration.**

After considering all comments, DSWM will make a final decision to either issue or deny the permit. Notice will be given to the applicant and each person who has submitted written comments or requested notice of the final decision. At the time of a final permit decision is issued, a Response to Comments addressing all significant input received on the draft permit will be made available to the public. The final permit decision shall become effective upon signing by the Director of DSWM.

Persons who wish to be on the DSWM's mailing list should request a Mailing List Request form by calling or writing: Public Participation Officer, Division of Solid Waste Management; Tennessee Department of Environment and Conservation; Davy Crockett Tower, 7th Floor, 500 James Robertson Parkway, Nashville, TN 37243 (615-532-0780) or e-mailing Solid.Waste@tn.gov.

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STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Solid Waste Management
Davy Crockett Tower, 7th floor
500 James Robertson Parkway
Nashville, Tennessee 37243

June 16, 2025

John A. Mullis II, Manager
Oak Ridge Office of Environmental Management
U.S. Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831

CERTIFIED MAIL
 # 9589 0710 5270 2282 4762 28
RETURN RECEIPT REQUESTED

Emily M. Day
Regulatory Strategy and Integration Manager
UCOR
P. O. Box 4699, MS 7240
Oak Ridge, TN 37831

CERTIFIED MAIL
 # 9589 0710 5270 2282 4762 35
RETURN RECEIPT REQUESTED

RE: Completeness Determination
Facility: U.S. DOE, Oak Ridge National Laboratory
Location: Oak Ridge, Tennessee
Type: Container Storage and Treatment Units
Units: RH TRU Buildings: 7572, 7855, 7860A, and 7883
CH TRU Buildings: 7574, 7879, and 7831F Flammable Storage Unit (FSU)
Transuranic (TRU) Waste Processing Center (TWPC): TWPC-1 [Contact Handled Staging Area (CHSA)], TWPC-2 (Second Floor WPB), TWPC-3 [Drum Aging Criteria (DAC)], TWPC-4 (First Floor WPB), TWPC-5 [Container Storage Area (CSA)], TWPC-6 [Contact Handled Marshalling Building (CHMB)], TWPC-7 [Drum Venting Building (DVB)], and TWPC-8 [Multi-Purpose Building (MPB)]
Treatment: T-1 Macroencapsulation, T-2 Amalgamation, T-3 Solidification/Stabilization, T-4 Groundwater Absorption, T-5 Size Reduction, T-6 Groundwater Filtration, T-7 Neutralization, T-8 Oxidation/Deactivation, and T-9 Puncturing Potentially Pressurized Containers
EPA ID Number: TN1890090003
Existing TN Permit No.: TNHW-145

Dear Mr. Mullis and Ms. Day:

The Tennessee Department of Environment and Conservation (TDEC), Division of Solid Waste Management (DSWM) has completed its review of your Resource Conservation and Recovery Act (RCRA) Part A and Part B Permit Renewal Application received on July 24, 2019, with subsequent revisions received on January 31, 2020, June 12, 2024, and May 5, 2025.

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Based upon this review, which is authorized pursuant to Tennessee Rule 0400-12-01-07(7)(b)1, your renewal application has been determined to be complete.

Please note that, "After the application is completed, the Commissioner may request additional information from an applicant but only when necessary to clarify, modify, or supplement previously submitted material. Requests for such additional information will not render the application incomplete."

Once an application is complete, the Commissioner will tentatively decide to issue the permit by preparing a draft permit or to deny the permit. If a draft permit is prepared, it will include preparation of a fact sheet that describes the proposed permit. A copy of the fact sheet will be sent to the applicant and, on request, any other person.

Subsequent to these actions, a public notice will be given. The public notice will allow at least 45 days for public comment. During the public comment period, a public hearing will be held where the public may inspect and discuss the permit application, draft permit, fact sheet, plans, and other materials with the DSWM and with representatives of the applicant.

After the close of the public comment period, the Commissioner, as set forth in TCA § 68-212-108(a), shall issue a final permit decision. A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or terminate a permit.

After considering all public and applicant comments, DSWM will make a final decision to either issue or deny the renewal permit. Notice will be given to the applicant and each person who has submitted written comments or requested notice of the final decision. At the time of a final decision, a Response to Comments addressing all significant input received on the draft permit will be made available to the public. The final permit shall become effective upon signing by the Director of DSWM.

If a permit is denied in the final decision or issued subject to conditions with which the permit applicant disagrees, the applicant may appeal the decision to the Board, as set forth in T.C.A. § 68-212-113(a)2 and (b).

If you have any questions or comments, please contact me at Brett.Harris@tn.gov or call me at 615-393-9221.

Sincerely,

Brett Harris
Hazardous Waste Permitting Manager

cc: Lisa A. Hughey, Director, DSWM
Craig Almanza, Deputy Director of Central Office Operations, DSWM
Beverly Philpot, Hazardous Waste Program Manager, DSWM
Revendra Awasthi, Knoxville Environmental Field Office Manager, DSWM
Dilraj Mokha, Hazardous Waste Permitting, DSWM
Records.SWM@tn.gov
SWMHWP-TN1890090003-ORNL-PERMAPP-TNHW145 COMPLETENESS LETTER-20250616-%-CENTRAL-2203

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State of Tennessee
Department of Environment
and Conservation
Division of Solid Waste Management

Hazardous Waste Management Program
Davy Crocket Tower, 7th Floor
500 James Robertson Parkway
Nashville, Tennessee 37243

HAZARDOUS WASTE MANAGEMENT PERMIT

Permittee:	U.S. Department of Energy (DOE) and United Cleanup Oak Ridge LLC (UCOR)
Facility Name:	Oak Ridge National Laboratory (ORNL)
Owner and Operator:	U.S. Department of Energy
Co-Operator:	United Cleanup Oak Ridge LLC
EPA Identification Number:	TN1890090003
Permit Number:	TNHW-DRAFT
Type:	Transuranic (TRU) Storage Areas Contact Handled (CH) and Remote Handled (RH) Storage Areas in TRU Waste Processing Center (TWPC)
Units:	Storage RH TRU Buildings 7572, 7855, 7860A, and 7883 CH TRU Buildings 7574, 7879, and 7831F Flammable Storage Unit (FSU) TWPC-1 [Contact Handled Staging Area (CHSA)], TWPC-2 [Second Floor Waste Processing Building (WPB)], TWPC-3 [Drum Aging Criteria (DAC)], TWPC-4 (First Floor WPB), TWPC-5 [Container Storage Area (CSA)], TWPC-6 [Contact Handled Marshalling Building (CHMB)], TWPC-7 [Drum Venting Building (DVB)], and TWPC-8 [Multi-Purpose Building (MPB)] Treatment: T-1 Macroencapsulation, T-2 Amalgamation, T-3 Solidification/Stabilization, T-4 Groundwater Absorption, T-5 Size Reduction, T-6 Groundwater Filtration, T-7 Neutralization, T-8 Oxidation/Deactivation, and T-9 Puncturing Potentially Pressurized Containers

Pursuant to the Tennessee Hazardous Waste Management Act, as amended [Tennessee Code Annotated (T.C.A.) 68-212-101 et seq.] and regulations (Rule Chapter 0400-12-01] promulgated thereunder by the Underground Storage Tanks and Solid Waste Disposal Control Board, a permit is issued to U.S. Department of Energy (DOE) and United Cleanup Oak Ridge LLC (UCOR) (hereinafter called the permittee). The permittee shall be allowed to store hazardous waste at the facility located in ORNL site, Roane County, Tennessee at latitude 35° 55' 39" and longitude 84° 18' 48" and store and treat hazardous waste at the facility located on that portion of the ORNL site in Lenoir City, Roane County, Tennessee at latitude 35° 54' 38" and longitude 84° 19' 00". The permittee shall be allowed to store and treat hazardous waste in accordance with the terms of this permit.

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EPA ID Number: TN189000003
Permit Number: TNHW-DRAFT

This permit is issued under the authority of T.C.A. § 68-212-108. The permittee shall be required to investigate any releases of hazardous waste or hazardous constituents pursuant to this permit at the facility, regardless of the time at which waste was placed in a unit, and to take appropriate corrective action for any such releases. The permit also requires the permittee to comply with all land disposal restrictions and air emission standards applicable to this facility, to notify of imminent hazards, and to certify annually that on-site generation of hazardous waste is minimized to the extent practicable in accordance with the hazardous waste minimization plan referred in Attachment 2, Waste Analysis Plan.

The permittee must comply with all terms and conditions of this permit. This permit consists of the conditions contained herein (including those in any attachments) and the applicable regulations contained in Chapter 0400-12-01 or 0400-12-02, as specified in the permit. Applicable regulations in Chapter 0400-12-01 or 0400-12-02 are in effect on the date of the issuance of this permit and any subsequent modifications to those rules as they become effective.

Continuation, Transfer, Modification, Revocation and Reissuance, and Termination of this permit shall comply with and conform to Rule 0400-12-01-.07(9).

This permit is based on the premise that the information and reports submitted by the permittee prior to issuance of this permit or prior to any subsequent modification to this permit are accurate. Any inaccuracies found in this information or information submitted as required by this permit may be grounds for termination or modification of this permit in accordance with subparagraphs (9)(c) and (d) of Rule 0400-12-01-.07 and enforcement action.

The Commissioner may also modify this permit if information is received which was not available at the time of permit issuance and which would have justified the application of different permit conditions at the time of issuance. The permittee must notify the Commissioner of any deviation from or changes in the information in the application which would affect the permittee's ability to comply with the applicable regulations or permit conditions.

This permit is effective as of __DRAFT_____ and shall remain in effect until ____DRAFT_____, unless revoked and reissued, or terminated, or continued.

_____ DRAFT____
Lisa A. Hughey, CHMM Date
Director, Division of Solid Waste Management

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EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

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EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

I. STANDARD CONDITIONS

A. EFFECT OF PERMIT

The permittee is allowed to store and treat hazardous waste in accordance with the conditions of this permit. The permittee is also required to conduct corrective action for any release of hazardous waste or hazardous constituents in accordance with the conditions of this permit. Any receipt or handling of hazardous waste not authorized in this permit is prohibited, unless such management is not subject to a permit as set forth at Rule 0400-12-01-.07(1)(b), is operating under interim status, as set forth in Rule 0400-12-01-.07(3)(a) or is subject to a separate hazardous waste management permit issued by the Tennessee Department of Environment and Conservation (TDEC or the Department).

Pursuant to Rule 0400-12-01-.07(8)(g), compliance with this permit during its term constitutes compliance, for the purposes of enforcement, with the Tennessee Hazardous Waste Management Act of 1977, as amended, as it applies to the permitted activities, except for those requirements not included in the permit which: (1) become effective by statute, (2) are promulgated under Rule 0400-12-01-.10 restricting the placement of hazardous waste in or on the land, or (3) are promulgated under Rules 0400-12-01-.06(30), (31), or (32) limiting air emissions. However, this permit may be modified, revoked and reissued, or terminated during its term for cause as set forth in this permit and Rule 0400-12-01-.07(9).

Issuance of this permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local laws or regulations. The issuance of this permit does not convey any property rights of any sort or any exclusive privilege.

Compliance with the terms of this permit does not constitute a defense to any order issued or any action brought under Section 3013 or Section 7003 of the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C.A. 6901 et seq., commonly referred to as RCRA), Sections 104, 106(a), and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C.A. 9601 et seq., commonly known as CERCLA), Sections 68-212-206(a), 207, and 215(c) of the Tennessee Hazardous Waste Management Act of 1983, as amended, or any other law providing for protection of public health or the environment.

B. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

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C. DEFINITIONS

For the purpose of this permit, terms used herein shall have the same meaning as those in Rule Chapter 0400-12-01, 0400-12-02, and T.C.A. § 68-212-202 et seq., unless this permit or any attachment to this permit specifically provides otherwise. Where terms are not defined in the regulations, the permit, statute, or U.S. Environmental Protection Agency (EPA) or TDEC guidelines or publications generally accepted scientific or industrial meaning of the term, or the standard dictionary reference shall apply.

1. "Act" means the Tennessee Hazardous Waste Management Act, as amended, Tennessee Code Annotated (T.C.A.) §§ 68-212-101 et seq.

2. "Active life" of a facility means the period from the initial receipt of hazardous waste at the facility until the Commissioner receives certification of final closure.

3. "Active portion" means that portion of a facility where treatment, storage, or disposal operations are being or have been conducted after the date one or more of the hazardous wastes handled by the facility first became subject to regulation under rules promulgated under the Act and which is not a closed portion. (See also "closed portion" and "inactive portion.")

4. "Acute hazardous waste" means hazardous wastes that meet the listing criteria in Rule 0400-12-01-.02(2)(b)1(ii) and therefore are either listed in Rule 0400-12-01-.02(4)(b) with the assigned hazard code of (H) or are listed in Rule 0400-12-01-.02(4)(d)5.

5. "Administrator" means the Administrator of the Environmental Protection Agency, or his designee.

6. "Annual" means a period not to exceed 365 days.

7. "Application" means the EPA standards national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in approved States, including any approved modifications or revisions. Application also includes the information required by the Commissioner under Rule 0400-12-01-.07(5)(a) through Rule 0400-12-01-.07(6) (contents of Part B of the hazardous waste management permit application).

8. "Approved program" or "approved State" means a State which has been approved or authorized by EPA under 40 CFR Part 271.

9. "Area of concern" or "AOC" means any area having a probable release of a hazardous waste or hazardous constituent that is not from a solid waste management unit and is determined by the Commissioner to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial action as required by this permit and Rule 0400-12-01-.07(8)(b)2(ii), in order to ensure adequate protection of human health and the environment.

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10. "Area of contamination**"** is a discrete contiguous area of generally dispersed contamination that can be considered a solid waste management unit (SWMU). Because an area of contamination is equated to a solid waste management unit, consolidation and/or *in situ* treatment of hazardous wastes within that area do not create a new point of hazardous waste generation. An area of contamination allows wastes to be consolidated or treated *in situ* within the area of contamination without triggering land disposal restrictions or minimum technology requirements.

11. "At reasonable times" shall mean, for the purposes of this permit, at least but not limited to, any time the facility is in operation.

12. "Authorized representative" means the person responsible for the overall operation of a facility or an operational unit (i.e., part of a facility), e.g., the plant manager, superintendent, or person of equivalent responsibility.

13. "Board" means the Underground Storage Tanks and Solid Waste Disposal Control Board established by T.C.A. § 68-211-111.

14. "Certification" means a statement of professional opinion based upon knowledge and belief.

15. "CFR" means the Code of Federal Regulations.

16. "Closed portion" means that portion of a facility which an owner or operator has closed in accordance with the approved facility closure plan and all applicable closure requirements. (See also "active portion" and "inactive portion.")

17. "Commissioner" means the Commissioner of the Tennessee Department of Environment and Conservation (formerly the Tennessee Department of Health and Environment) or his authorized representative.

18. "Compatible" means that the commingling with other hazardous materials will not produce heat or pressure; fire or explosion; violent reaction; toxic dusts, mists, fumes, or gases; or flammable fumes or gases; or that the placement in a particular unit will not cause detectable corrosion or decay of containment materials (e.g., container inner liners or tank walls).

19. "Container" means any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled, and includes transport vehicles that are containers themselves (e.g., tank trucks, tanker-trailers, and rail tank cars), and containers placed on or in a transport vehicle.

20. "Contamination" refers to the presence of any hazardous constituent in a concentration which exceeds the naturally occurring concentration of that constituent in the immediate vicinity of the unit (i.e., having higher concentrations of a constituent as compared to nearby areas that have not been affected by the unit).

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21. "Contingency plan" means a document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten public health or the environment.

22. "Corrective action" shall be defined as all activities, including activities conducted beyond the facility boundary, that are proposed or implemented to facilitate assessment, monitoring, and active or passive remediation of releases of hazardous waste or hazardous constituents to soil, groundwater, surface water, or the atmosphere associated with solid waste management units and/or areas of concern and/or areas of contamination located at the facility or off-site, as required by Rule 0400-12-01-.06(6)(k) and (6)(l), or as otherwise required and specified by this permit.

23. "Daily" means once each calendar day not to exceed 24 hours.

24. "Department" means the Tennessee Department of Environment and Conservation (formerly Tennessee Department of Health and Environment).

25. "Designated facility" means a hazardous waste treatment, storage, or disposal facility which: has received a permit (or interim status) in accordance with the requirements of Rule 0400-12-01-.07 or 40 CFR 271; is regulated under Rule 0400-12-01-.02(1)(f)3(ii) or Rule 0400-12-01-.03(3)(a). Designated facility also means a generator site designated on the manifest to receive its waste as a return shipment from a facility that has rejected the waste in accordance with Rule 0400-12-01-.05(5)(c)6 or Rule 0400-12-01-.06. If a waste is destined to a facility in an authorized State which has not yet obtained authorization to regulate that particular waste as hazardous, then the designated facility must be a facility allowed by the receiving State to accept such waste.

26. "Division Director" or "Director" means the Director of the Division of Solid Waste Management of the Department, or his designee. This person also serves as the Technical Secretary to the Board, and functions as the chief of staff to both the Commissioner and the Board in matters relating to these rules and their implementation.

27. "DOT" means the U.S. Department of Transportation.

28. "Electronic manifest" or "e-Manifest" means the electronic format of the hazardous waste manifest that is obtained from EPA's national e-Manifest system and transmitted electronically to the system, and that is the legal equivalent of EPA Forms 8700-22 (Manifest) and 8700-22A (Continuation Sheet).

29. "Electronic manifest system" or "e-Manifest system" means EPA's national information technology system through which the electronic manifest may be obtained, completed, transmitted, and distributed to users of the electronic manifest and to regulatory agencies.

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30. "EPA" means the U.S. Environmental Protection Agency.

31. "EPA Identification Number" is synonymous with "Installation Identification Number."

32. "Existing hazardous waste management facility" or "existing facility" means a facility which was in operation, or for which construction had commenced, on or before the date on which one or more of the hazardous wastes handled or to be handled by the facility first became subject to regulation under rules promulgated under the Act. Construction has commenced if the owner or operator has obtained all necessary Federal, State, and local preconstruction approvals or permits; and either a continuous physical, on-site construction program has begun, or the owner or operator has entered into contractual obligations – which cannot be canceled or modified without substantial loss – for construction of the facility to be completed within a reasonable time.

33. "Extent of contamination" is defined as the horizontal and vertical area in which the concentrations of hazardous constituents in the environmental media are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Commissioner.

34. "Facility" means:

    (a) All contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste, or for managing hazardous secondary materials prior to reclamation. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combination them).

    (b) For the purposes of implementing corrective action under Rule 0400-12-01-.06(6)(l), all contiguous property under the control of the owner or operator seeking a permit under the Tennessee Hazardous Waste Management Act, T.C.A. §§ 68-212-101 et seq. This definition also applies to facilities implementing corrective action under T.C.A. §§ 68-212-111.

    (c) Notwithstanding subparagraph (b) of this definition, a remediation waste management site is not a facility that is subject to Rule 0400-12-01-.06(6)(I) but is subject to corrective action requirements if the site is located within such a facility.

35. "Facility mailing list" means the mailing list for a facility maintained by the Department in accordance with Rule 0400-12-01-.07(7)(e)3(i)(V).

36. "Federal agency" means any department, agency, or other instrumentality of the Federal Government, any independent agency or establishment of the Federal Government including any Government corporation, and the Government Printing Office.

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37. "Federal, State and local approvals or permits necessary to begin physical construction" means permits, and approvals required under Federal, State or local hazardous waste control statutes, regulations or ordinances.

38. "Final authorization" means approval by EPA of a State program which has met the requirements of Section 3006(b) of RCRA and the applicable requirements of 40 CFR Part 271, Subpart A.

39. "Final closure" means the closure of all hazardous waste management units at the facility in accordance with all applicable closure requirements so that hazardous waste management activities under Rules 0400-12-01-.05 and 0400-12-01-.06 are no longer conducted at the facility unless subject to the provisions in Rule 0400-12-01-.03(4)(e).

40. "Free Liquids" means liquids which readily separate from the solid portion of a waste under ambient temperature and pressure.

41. "Generator" means any person, by site, whose act or process produces hazardous waste identified or listed in Rule 0400-12-01-.02 or whose act first causes a hazardous waste to become subject to regulation.

42. "Ground water" means water below the land surface in a zone of saturation.

43. "Hazardous waste" means a hazardous waste as defined in Rule 0400-12-01-.02(1)(c).

44. "Hazardous waste code" or "Hazardous waste number" or "EPA hazardous waste number" means the code assigned by the Department or EPA to each hazardous waste listed in Rule 0400-12-01-.02(4) and to each characteristic identified in Rule 0400-12-01-.02(3), and any derivation of such codes or number which may be assigned by the Department or EPA to an individual waste or class of wastes.

45. "Hazardous waste constituent" means a constituent that caused the Board to list the hazardous waste in Rule 0400-12-01-.02(4), or a constituent listed in Table 1 of Rule 0400-12-01-.02(3)(e).

46. "Hazardous waste management unit" is a contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Examples of hazardous waste management units include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system, and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed.

47. "HWM facility" means Hazardous Waste Management facility.

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48. "Inactive portion" means that portion of a facility which is not operated after the date one or more of the hazardous wastes handled by the facility first became subject to regulation under rules promulgated under the Act. (See also "active portion" and "closed portion.")

49. "Incompatible waste" means a hazardous waste which is unsuitable for:

    (a) Placement in a particular device or facility because it may cause corrosion or decay of containment materials (e.g., container inner liners or tank walls); or

    (b) Commingling with another waste or material under uncontrolled conditions because the commingling might produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes, or gases, or flammable fumes or gases.

50. "In operation" refers to a facility which is treating, storing, or disposing of hazardous waste.

51. "Installation identification number" or "EPA identification number" means the number assigned to each generator, transporter, and treatment, storage, or disposal facility by the Department or EPA. For generators and facilities in Tennessee, and for transporters who pick up hazardous waste from, or deliver hazardous waste to, locations in Tennessee, references in these rules to their installation identification number or EPA identification number shall mean the number assigned by the Department. For other generators, transporters, and facilities, such references shall mean the number assigned by EPA or an authorized state program.

52. "Land disposal" when used in respect to a specified hazardous waste, shall be deemed to include, but not limited to any placement of such hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, or underground mine or cave.

53. "Management" or "waste management" or "hazardous waste management" means the orderly control of storage, transportation, treatment, and disposal of hazardous waste.

54. "Manifest" means the shipping document EPA Form 8700-22 (including, if necessary, EPA Form 8700-22A), or the electronic manifest originated and signed in accordance with the applicable requirements of Rule 0400-12-01-.03 through 0400-12-01-.06.

55. "Manifest tracking number" means the alphanumeric identification number (i.e., a unique three letter suffix preceded by nine numerical digits), which is pre-printed in Item 4 of the Manifest by a registered source.

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56. "Monthly" means recurring by the end of the same day of the following month. (If the monthly action required is conducted 1) on the 3rd of a month, then the action must be taken again by midnight ending the 3rd of the following month, or 2) on the last day of the month (for example the 31st one month), then the action must be taken again by midnight on the last day of the following month whether it is 28th through the 31st.)

57. "Off-site" means any site which is not on-site.

58. "Operating Day" means any 24-hour period during which at least a partial shift is worked by employees who process, treat, or place into storage hazardous waste at a facility.

59. "Operator" means the person responsible for the overall operation of a facility.

60. "On-site" means the same or geographically contiguous property which may be divided by public or private right-of-way, provided the entrance and exit between the properties is at a cross-roads intersection, and access is by crossing as opposed to going along the right-of-way. Non-contiguous properties owned by the same person but connected by a right-of-way which he controls and to which the public does not have access, are also considered on-site property.

61. "Partial closure" means the closure of a hazardous waste management unit in accordance with the applicable closure requirements of Rules 0400-12-01-.05 and 0400-12-01-.06 at a facility that contains other active hazardous waste management units. For example, partial closure may include the closure of a tank (including its associated piping and underlying containment systems), landfill cell, surface impoundment, waste pile, or other hazardous waste management unit, while other units of the same facility continue to operate.

62. "Permit" means an authorization, license, or equivalent control document issued by the Commissioner to implement the requirements of Rule 0400-12-01-.07. Permit includes permit-by-rule [Rule 0400-12-01-.07(1)(c)], and emergency permit [Rule 0400-12-01-.07(1)(d)]. Permit does not include interim status [Rule 0400-12-01-.07(3)], or any permit which has not been the subject of final agency action, such as a draft permit or a proposed permit.

63. "Person" means an individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, state, municipality, commission, political subdivision of a state, any interstate body, and governmental agency of this state and any department, agency, or instrumentality of this state and any department, agency, or instrumentality of the executive, legislative, and judicial branches of the federal government.

64. "Personnel" or "facility personnel" means all persons who work at, or oversee the operations of, a hazardous waste facility, and whose actions or failure to act may result in noncompliance with the requirements of Rules 0400-12-01-.05 or 0400-12-01-.06.

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65. "Pollution Prevention" means source reduction as defined under the Pollution Prevention Act (42 U.S.C. 13101-13109). This definition is as follows:

(a) Source reduction is any practice that:

(i) Reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment or disposal; and

(ii) Reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

(b) The term source reduction includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitutions of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.

(c) The term source reduction does not include any practice that alters the physical, chemical, or biological characteristics or the volume of a hazardous substance, pollutant, or contaminant through a process or activity which itself is not integral to and necessary for the production of a product or the providing of a service.

66. "Quarterly" means a period not to exceed 90 days.

67. "RCRA" means the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (Pub. L. 94-580, as amended by Pub. L. 95-609 and Pub. L. 96-482, 42 U.S.C 6901 et seq.)

68. "RCRA permit," "Part B permit," or "RCRA Part B permit" means a permit, as defined in this subparagraph, and includes an authorization, license, or equivalent control document issued by EPA or an authorized state pursuant to 40 CFR Parts 270 and 124 or comparable rules of an EPA authorized state.

69. "Regional Administrator" means the Regional Administrator for the EPA Region in which the facility is located, or his designee.

70. "Registered engineer" or "registered professional engineer" refers to a person authorized to perform engineering in Tennessee pursuant to Tennessee Code Annotated, Title 62, Chapter 2.

71. "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any hazardous waste or hazardous constituents.

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72. "Run-off" means any rainwater, leachate, or other liquid that drains over land from any part of a facility.

73. "Run-on" means any rainwater, leachate or other liquid that drains over land onto any part of the facility.

74. "Schedule of compliance" means a schedule or remedial measures included in a permit, including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the Act and regulations.

75. "Screening levels" are health-based concentrations of hazardous constituents determined to be indicators for the protection of human health and the environment.

76. "Semi-annual" means a minimum of two times per calendar year such that at least five (5) months and no more than seven (7) months have elapsed since the last semi-annual event.

77. "Solid waste" means a waste as defined in Rule 0400-12-01-.02(1)(b).

78. A "solid waste management unit" or "SWMU" means any unit that has been used for the treatment, storage, or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. Permitted or interim status hazardous waste management units are also solid waste management units. Solid waste management units include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities, e.g., product or process spills.

79. "State" means the State of Tennessee.

80. "State/EPA Agreement" means an agreement between the Regional Administrator and the State which coordinates EPA and State activities, responsibilities and programs.

81. "Storage" means the containment of hazardous waste in such a manner as not to constitute disposal of such hazardous waste.

82. "Sump" means any pit or reservoir that meets the definition of tank, and those troughs/trenches connected to it that serve to collect hazardous waste for transport to hazardous waste storage, treatment, or disposal facilities. When used in the landfill, surface impoundment, and waste pile rules, "sump" also refers to any lined pit or reservoir that serves to collect liquids drained from a leachate collection and removal system or leak detection system for subsequent removal from the system.

83. "T.C.A." means Tennessee Code Annotated.

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84. "Transportation" means the movement of hazardous waste by air, rail, highway, or water.

85. "Transporter" means any person engaged in the transportation of hazardous waste.

86. "User of electronic manifest system" means a hazardous waste generator, a hazardous waste transporter, an owner or operator of a hazardous waste treatment, storage, recycling, or disposal facility, or any other person that:

(a) Is required to use a manifest to comply with:

(i) Any federal or state requirement to track the shipment, transportation, and receipt of hazardous waste or other waste material that is shipped from the site of generation to an off-site designated facility for treatment, storage, recycling, or disposal; or

(ii) Any federal or state requirement to track the shipment, transportation, and receipt of rejected wastes or regulated container residues that are shipped from a designated facility to an alternative facility or returned to the generator.

(b) Elects to use the system to obtain, complete and transmit an electronic manifest format supplied by the EPA electronic manifest system.

(c) Elects to use the paper manifest from and submits to the system for data processing purposes a paper copy of the manifest (or data from such a paper copy), in accordance with Rule 0400-12-01-.06(5)(b)1(ii)(V). These paper copies are submitted for data exchange purposes only and are not the official copies of record for legal purposes.

87. "Waste" means a solid waste as defined in Rule 0400-12-01-.02(1)(b).

88. "Weekly" means recurring by the end of the same day of the following week (e.g., if an action required to be conducted weekly is taken on a Monday, then the action must be taken again by midnight ending the following Monday).

D. GENERAL DUTIES AND REQUIREMENTS

1. Duty to Comply: The permittee must comply with all conditions of this permit, except that the permittee need not comply with the conditions of the permit to the extent and for the duration such noncompliance is authorized in an emergency permit (see Rule 0400-12-01-.07(1)(d)). Any permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

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2. Duty to Reapply: If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The permittee must submit a new application at least 180-days before the expiration date of the effective permit, unless permission for a later date has been granted by the Commissioner. The Commissioner shall not grant permission for applications to be submitted later than the expiration date of the existing permit. The permittee must follow the procedural requirements of Rule 0400-12-01-.07(1)(m).

3. Need to Halt or Reduce Activity Not a Defense: It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to Mitigate: In the event of noncompliance with the permit, the permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

5. Proper Operation and Maintenance: The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

6. Permit Actions: This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any existing permit condition.

7. Property Rights: This permit does not convey any property rights of any sort, or any exclusive privilege.

8. Duty to Provide Information: The permittee shall furnish to the Commissioner, within a reasonable time, any relevant information which the Commissioner may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Commissioner, upon request, copies of records required to be kept by this permit.

9. Inspection and Entry: The permittee shall allow the Commissioner, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

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(a) Enter at reasonable times upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit;

(d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location; and

(e) Make photographs for the purpose of documenting items of compliance or noncompliance at waste management units, or where appropriate to protect legitimate proprietary interests, make such photographs for him or her. If the permittee makes a claim of proprietary information, then the permittee shall make the photographs and submit them to the inspector pursuant to Rule 0400-12-01-.01(7) within 15 days.

10. Monitoring and Records

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The permittee shall perform all monitoring in accordance with the methods described in this permit, including the attachments, or as follows. If not specified elsewhere in this permit, the methods used to obtain, pack, mark, label, and ship a representative waste or media sample to be analyzed must be the appropriate methods from Appendix I of Rule 0400-12-01-.02(30) and the EPA Region 4 Science and Ecosystem Support Division's Field Branches Quality System and Technical Procedures (most recent version), or an equivalent method approved by the Commissioner. Media include soil, sediment, water, wastewater, and tissue. If not specified elsewhere in this permit, the type and size of containers for each constituent/parameter, the methods of preservation, holding times, and other sample preparation requirements used to prepare and preserve representative samples to be analyzed, must be the appropriate methods from EPA Region 4 Science and Ecosystem Support Division's Laboratory Operations and Quality Assurance Manual (most recent version). If not specified elsewhere in this permit, the methods used to handle and manage samples and other types of evidence after their collection and during delivery to the laboratory must be the appropriate methods from EPA Region 4 Science and Ecosystem Support Division's Field Branches Quality System and Technical Procedures Sample and Evidence Management Operating Procedure (most recent version), or an equivalent method approved by the Commissioner. Methods for the

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collection and handling of air, gas, or vapor samples must receive prior approval by the Commissioner. If not specified elsewhere in this permit, laboratory methods must be those specified in the most recent edition of Test Methods for Evaluating Solid Waste: Physical/ Chemical Methods, SW-846, or an equivalent method approved by the Commissioner.

(b) As provided for under Rule 0400-12-01-.06 and .07, the permittee shall retain at the facility or other appropriate location as approved by the Commissioner, records of all monitoring information required under the terms of this permit and applicable monitoring and record keeping required for applicable requirements of Rules 0400-12-01-.01, .02, .06, .09, and .10; including all calibration and maintenance records, records of all data used to prepare documents required by this permit, copies of all reports and records required by this permit, the certification required by Rule 0400-12-01-.06(5)(d)2(ix), and records of all data used to complete any application for this permit for a period of at least three years from the date of the sample, measurement, report, certification or application, or until corrective action is completed, whichever date is later. As a generator of hazardous waste, the permittee shall retain a copy of all notices, certifications, demonstrations, waste analysis data, and other documentation produced pursuant to Rule 0400-12-01-.10 for at least three years from the date that the waste which is the subject of such documentation was last sent for on-site or off-site treatment, storage, or disposal, or until corrective action is completed, whichever date is later. The permittee shall maintain records from all surface water and groundwater monitoring, and associated groundwater surface elevations, throughout the life of the facility, and, for disposal facilities, for the post-closure care period, as well. These periods may be extended by request of the Commissioner at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.

(c) Records of monitoring information shall include:

(i) The date, exact place, and time of sampling or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) The date(s) analyses were performed;

(iv) The individual(s) who performed the analyses;

(v) The analytical techniques or methods used; and

(vi) The results of such analyses.

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11. Signatory Requirement: All applications, reports, or information submitted to the Commissioner shall be signed and certified. All signatures and certifications shall satisfy the requirements of Rule 0400-12-01-.07(2)(a).

12. Reporting Requirements

(a) Planned changes: The permittee shall give notice to the Commissioner as soon possible of any planned physical alterations or additions to the permitted facility. The notice shall include, at a minimum, a summary of the planned change, the reason for the planned change, a discussion of the impact(s) the planned change will have on the ability to investigate contamination at or from the SWMU or AOC, and a discussion of the impact(s) the planned change will have on the known or suspected contamination.

(b) Anticipated noncompliance: The permittee shall give advance notice to the Commissioner as soon as possible of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. For a new facility, the permittee may not commence treatment, storage, or disposal of hazardous waste; and for a facility being modified, the permittee may not treat, store, or dispose of hazardous waste in the modified portion of the facility except as provided in Rule 0400-12-01-.07(9)(c)5, until:

(i) The permittee has submitted to the Commissioner by certified mail or hand delivery a letter signed by the permittee and a registered professional engineer stating that the facility has been constructed or modified in compliance with the permit; and

(I) The Commissioner has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of the permit; or

(II) Within 15 days of the date of submission of the letter in Rule 0400-12-01-.07(8)(a)12(ii)(I), the permittee has not received notice from the Commissioner of his or her intent to inspect, prior inspection is waived, and the permittee may commence treatment, storage, or disposal of hazardous waste.

(c) Transfers: This permit is not transferable to any person except after notice to the Commissioner. The Commissioner may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act. (See Rule 0400-12-01-.07(9)(b); in some cases, modification or revocation and reissuance is mandatory.)

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(d) Monitoring reports: Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(e) Compliance schedules: Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(f) Twenty-four-hour reporting:

(i) The permittee shall report to the Commissioner any noncompliance or any imminent or existing hazard from a release of hazardous waste or hazardous constituent that may endanger health or the environment orally within 24 hours from the time the permittee becomes aware of the circumstances, including but not limited to:

(I) Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

(II) Any information of a release or discharge of hazardous waste, or of a fire or explosion from the hazardous waste management facility, which could threaten the environment or human health outside the facility.

(ii) The description of the occurrence and the cause shall include:

(I) Name, address, and telephone number of the owner or operator;

(II) Name, address, and telephone number of the facility;

(III) Date, time, and type of incident;

(IV) Name and quantity of material(s) involved;

(V) The extent of injuries, if any;

(VI) An assessment of actual or potential hazards to the environment and human health outside the facility, where this applicable; and

(VII) Estimated quantity and disposition of recovered material that resulted from the incident.

(iii) A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written

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submission shall contain a description of the noncompliance and its cause; the period of noncompliance including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Commissioner may waive the five-day written notice requirement in favor of a written report within fifteen days.

(g) Manifest discrepancy report: If a significant discrepancy in a manifest is discovered, the permittee must attempt to reconcile the discrepancy. If not resolved within fifteen days, the permittee must submit a letter report, including a copy of the manifest, to the Commissioner as outlined in Paragraph II.J.13(c).

(h) Unmanifested waste report: Such report must be submitted to the Commissioner within 15 days of receipt of unmanifested waste as outlined in Paragraph II.K.4.

(i) Annual report: An annual report must be submitted by March 1st of each calendar year covering facility activities during the previous calendar year, as outlined in Paragraph II.K.3.

(j) Other noncompliance: The permittee shall report all instances of noncompliance not reported under Subparagraph I.D.12(d), I.D.12(e), and I.D.12(f) at the time monitoring reports are submitted. The reports shall contain the information listed in Rule 0400-12-01-.07(8)(a)12(vi), as appropriate.

(k) Other information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any document to the Commissioner, it shall promptly submit such facts or information. In addition, upon request, the permittee shall furnish to the Commissioner any information related to compliance with this permit.

13. Information Repository: The Commissioner may require the permittee to establish and maintain an information repository at any time, based on the factors set forth in Rule 0400-12-01-.07(7)(e)4(v)(II). The information repository will be governed by the provisions in Rule 0400-12-01-.07(7)(e)4(v)(III) through (7)(e)4(v)(VI).

14. Continuation of Expiring Permit: When the permittee has made timely and sufficient application for a new permit, the existing permit shall not expire until the Commissioner has made a final determination on the application issuance or denial and, in case the application is denied, or the terms of the new permit limited, until the last day for seeking review of the Commissioner's order or a later date fixed by order of the reviewing court.

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15. Obligation for Corrective Action: Pursuant to the requirements of Section IV, "Specific Conditions for Corrective Action," the permittee is required to select and implement corrective actions as necessary to protect human health and the environment for all releases of hazardous waste or constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in such unit. The permittee is required to continue this permit for any period necessary to comply with the corrective action requirements of this permit. If corrective action is expected to continue beyond the expiration date of this permit, the permittee shall be required to comply with the reapplication requirement in Paragraph I.D.2.

E. PROPRIETARY INFORMATION

In accordance with Rules 0400-12-01-.01(7) and .07(1)(h), the permittee may assert a claim of confidentiality when submitting any proprietary information required by this permit.

F. DOCUMENTS TO BE MAINTAINED AT THE FACILITY

The permittee shall maintain at the facility, until closure is completed and certified by a qualified Professional Engineer, the following documents and amendments, revisions, and modifications to these documents:

1. A copy of this permit;

2. Personnel training documents and records required by this permit;

3. Contingency plan required by this permit;

4. Operating and other applicable administrative records as required by this permit and Chapter 0400-12-01; and

5. Inspection records required by this permit.

G. ANNUAL MAINTENANCE FEES

The permittee must submit to the Commissioner annual maintenance fees as required by Rule 0400-12-01-.08.

H. REQUIRED NOTICES

1. The permittee that is arranging or has arranged to receive hazardous waste subject to Rule 0400-12-01-.03(9) from a foreign source must submit the following required notices:

   (a) As per Rule 0400-12-01-.03(9)(e)2, for imports where the competent authority of the country of export does not regulate the waste as hazardous waste and, thus does not require the foreign exporter to submit to it a

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notification proposing export and obtain consent from EPA and the competent authorities for the countries of transit, the permittee, if acting as the importer, is required to provide notification in English to EPA of the proposed transboundary movement of hazardous waste at least 60 days before the first shipment is expected to depart the country of export. Notification submitted prior to the electronic import-export reporting compliance date must be mailed or hand delivered to EPA at the addresses specified in Rule 0400-12-01-.03(9)(c)5. Notification submitted on or after the electronic import-export reporting compliance date must be submitted electronically using EPA's Waste Import Export Tracking System (WIETS), or its successor system. The notification may cover up to one year of shipments of one or more hazardous wastes being sent from the same foreign exporter and must include the information found in Rule 0400-12-01-.03(9)(e)2(i)(I) through (9)(e)2(i)(XIII).

(b) As per Rule 0400-12-01-.03(9)(e)4(ii)(XV) and .03(9)(e)8, the receiving facility must send a copy of the signed movement document to confirm receipt within three working days of shipment delivery to the foreign exporter, to the competent authorities of the countries of export and transit, and for shipments received on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's Waste Import Export Tracking System (WIETS), or its successor system. The receiving facility shall keep a copy of each confirmation of receipt (i.e., the movement document) that the receiving facility sends to the foreign exporter for at least three years from the date it received the hazardous waste. The receiving facility shall keep a copy of each confirmation of recovery or disposal that the receiving facility sends to the foreign exporter for at least three years from the date that it completed processing the waste shipment. The permittee may satisfy these recordkeeping requirements by retaining electronically submitted documents in the facility's account on EPA's Waste Import Export Tracking System (WIETS), or its successor system, provided that copies are readily available for viewing and production if requested by any EPA or authorized state inspector. No permittee may be held liable for the inability to produce such documents for inspection under Rule 0400-12-01-.03(9)(e)8 if the permittee can demonstrate that the inability to produce the document is due exclusively to technical difficulty with EPA's Waste Import Export Tracking System (WIETS), or its successor system for which the permittee bears no responsibility.

(c) As per Rule 0400-12-01-.03(9)(e)6(iv), if the facility has physical control of the waste and it must be sent to an alternate facility or returned to the country of export, such permittee must inform EPA, using the allowable methods listed in Rule 0400-12-01-.03 (9)(e)2(i) of the need to return or arrange alternate management of the shipment.

(d) As per Rule 0400-12-01-.03(9)(e)7, the permittee must do the following:

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(i) Send copies of the signed and dated confirmation of recovery or disposal, as soon as possible, but no later than 30 days after completing recovery or disposal on the waste in the shipment and no later than one calendar year following receipt of the waste, to the foreign exporter, to the competent authority of the country of export, and for shipments recycled or disposed of on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's Waste Import Export Tracking System (WIETS), or its successor system.

(ii) If the facility performed any of recovery operations R12, R13, or RC16, or disposal operations D13 through D15, or DC17, the receiving facility shall promptly send copies of the confirmation of recovery or disposal that it receives from the final recovery or disposal facility within one year of shipment delivery to the final recovery or disposal facility that performed one of recovery operations R1 through R11, or RC14 to RC15, or one of disposal operations D1 through D12, or DC15 to DC16, to the competent authority of the country of export, and for confirmations received on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's Waste Import Export Tracking System (WIETS), or its successor system. The recovery and disposal operations are defined in Rule 0400-12-01-.03(9)(b).

2. If the permittee receives hazardous waste from an off-site source (except where the permittee is also the generator), he must inform the generator in writing that he has the appropriate permit(s) for, and will accept, the waste the generator is shipping. The permittee must keep a copy of this written notice as part of the operating record.

3. Before transferring ownership or operation of a facility during its operating life, or of a disposal facility during the post-closure care period, the permittee must notify the new owner or operator in writing of the requirements of this permit and Rules 0400-12-01-.06, .07, and .08.

(Comment: The permittee's failure to notify the new owner or operator of the requirements of this paragraph in no way relieves the new owner or operator of his obligation to comply with all applicable requirements.)

I. ORDER OF PRECEDENCE

In the event of any inconsistency between the permit conditions and the material contained in any attachment to this permit, the permit conditions shall take precedence.

J. PERMIT STRUCTURE

This permit is organized, numbered, and referenced according to the following outline form:

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I. Section

A. Subsection

1. Paragraph

(a) Subparagraph

(i) Part

(I) Subpart

(A) Item

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EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

II. GENERAL FACILITY CONDITIONS

A. HAZARDOUS WASTES TO BE MANAGED

The hazardous wastes to be managed in the unit(s) authorized by this permit are identified in Attachment 1. The permittee shall not manage any other hazardous wastes identified by Rule 0400-12-01-.02 in the unit(s) authorized by this permit, until this permit has been appropriately modified.

B. OPERATION AND MAINTENANCE OF THE FACILITY

The permittee must maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.

C. SAMPLING, ANALYSIS, AND MONITORING

1. General Waste Analysis: Before the permittee treats, stores, or disposes of any hazardous waste, they must obtain a detailed chemical and physical analysis of a representative sample of the waste. At a minimum, the analysis must contain all the information which must be known to manage the waste in accordance with this permit and Rule 0400-12-01-.10.

2. Waste Analysis Plan

   (a) The permittee shall follow the procedures described in the Waste Analysis Plan found in Attachment 2. The Permittee may change the format or style of the forms in Attachment 2. Additions may be made to the forms, if deemed necessary, to provide the information needed to properly manage the facility in the event that those additions do not change the intent of the required content. Deletions of any information from the forms must be approved in advance in writing by the Commission as a modification to this Permit. The permittee must keep this plan at the facility.

   (b) The permittee must ensure that the Waste Analysis Plan, required by Subparagraph II.C.2(a), at a minimum, specifies:

      (i) The parameters for which each hazardous waste will be analyzed and the rationale for the selection of these parameters.

      (ii) The test methods which will be used to test for these parameters.

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(iii) The sampling method which will be used to obtain a representative sample of the waste to be analyzed.

(iv) The frequency with which the initial analysis of the waste will be reviewed or repeated to ensure that the analysis is accurate and up to date.

(v) For off-site facilities, the waste analysis the hazardous waste generators have agreed to supply.

(vi) Where applicable, the methods that will be used to meet the additional waste analysis requirements for specific waste management methods as specified in Paragraph II.G.3 and Subsections II.O, II.P, II.Q, and II.R.

(c) For off-site facilities, the permittee shall also ensure that the Waste Analysis Plan, required by Subparagraph II.C.2(a) above, at a minimum, specifies the procedures to be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that it matches the identity of the waste designated on the accompanying manifest or shipping paper. At a minimum, the plan shall describe:

(i) The procedures which will be used to determine the identity of each movement of waste managed at the facility; and

(ii) The sampling method which will be used to obtain a representative sample of the waste to be identified, if the identification method includes sampling.

3. Frequency of Analysis: The analysis must be repeated as necessary to ensure that it is accurate and up to date. At a minimum, the analysis shall be repeated no less frequently than the frequency specified in Attachment 2 and must be repeated when:

(a) The permittee is notified, or has reason to believe, that the process or operation generating the hazardous waste has changed.

(b) For off-site facilities, when the results of the inspection required in Subparagraph II.C.4(a) below indicate that the hazardous waste received at the facility does not match the waste designated on the accompanying manifest or shipping paper.

4. Additional Analysis

(a) The permittee of an off-site facility must inspect and, if necessary, analyze each hazardous waste movement received at the facility to determine

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whether it matches the identity of the waste specified on the accompanying manifest or shipping paper. The procedure which shall be followed is described in the Waste Analysis Plan.

(b) The permittee shall inspect and, if necessary, analyze all standing liquid in the secondary containment system(s) prior to its release from the facility. Sampling and analysis shall be performed as necessary to determine whether the liquid is a hazardous waste and how to properly manage it.

5. Sampling and Monitoring: Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The permittee shall perform all monitoring in accordance with the methods described in this permit, including the attachments. If not specified in this permit, the method used to obtain a representative waste sample to be analyzed must be the appropriate method from Appendix I of Rule 0400-12-01-.02(30), the most recent version of the USEPA Region 4, Science and Ecosystem Support Division's (SESD) Field Branches Quality System and Technical Procedures, or an equivalent method approved by the Commissioner. If not specified in this permit, procedures for sampling media must be those identified in the latest edition of the Field Branches Quality System and Technical Procedures, or an equivalent method approved by the Commissioner. Laboratory methods must be those specified in the most recent edition of Test Methods for Evaluating Solid Waste Physical/Chemical Methods.

D. SECURITY

1. The permittee must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of the facility. The permittee shall maintain security for the facility as described in Attachment 3, Security.

2. The permittee must post a sign with the legend, "Danger - Unauthorized Personnel Keep Out," at each entrance to the active portion of the facility, and at other locations, in sufficient numbers to be seen from any approach to the active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility and must be legible from a distance of at least 25 feet.

E. GENERAL INSPECTION REQUIREMENTS

1. Inspections: At least weekly or as required in Attachment 4, the permittee shall inspect the units where low-activity MLLW containers are stored for malfunctions and deterioration, operator errors, and discharges which may be causing or may lead to (1) a release of hazardous waste or hazardous constituents to the environment or (2) a threat to human health. The permittee shall inspect each listed item on the inspection form(s) in Attachment 4.

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2. Remedies: The permittee must remedy any deterioration or malfunction of equipment or structures which the inspection reveals on a schedule which ensures the problem will not lead to an environmental or human health hazard. Where a hazard is imminent or has already occurred, remedial action must be taken immediately.

3. Inspection Records: The permittee must keep the written inspection schedule and records at the facility. The permittee must record inspections in an inspection log or summary. The permittee must keep these records for at least three years from the date of inspection. At a minimum, these records must include the date and time of the inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions. The permittee may change the format or style of the forms in Attachment 4. Additions may be made to the forms if deemed necessary to provide the information needed to properly manage the facility if those additions do not change the intent of the required content. Deletions shall be submitted to the Division as a modification.

F. PERSONNEL TRAINING

The permittee must ensure that facility personnel successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the permittee's compliance with this permit and the Tennessee Hazardous Waste Management Regulations. The permittee must ensure that the training program is directed by a person trained in hazardous waste management procedures, and must include instruction which teaches facility personnel hazardous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed.

1. Training Program: The training program shall at least conform to the personnel training included in this subsection and Attachment 5, Personnel Training Program. The permittee must ensure that the training program is, at a minimum, designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems, including, where applicable:

   (a) Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;

   (b) Key parameters for automatic waste feed cut-off systems;

   (c) Communications or alarm systems;

   (d) Response to fires or explosions;

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(e) Response to ground-water contamination incidents; and

(f) Shutdown of operations.

2. Timing: Facility personnel must successfully complete the program within six months after the effective date of these regulations or six months after the date of their employment or assignment to the facility, or to a new position at the facility, whichever is later. Employees hired after the effective date of these regulations must not work in unsupervised positions until they have completed the training requirements of this permit.

3. Annual Review: Facility personnel must take part in an annual review of the initial training required by this permit.

4. Training Documents and Records: The permittee must maintain the following documents and records at the facility:

(a) The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job;

(b) A written description for each position listed in Subparagraph II.F.4(a). This description may be consistent in its degree of specificity with descriptions for other similar positions in the same company location or bargaining unit, but must include the requisite skill, education, or other qualifications, and duties of employees assigned to each position;

(c) A written description of the type and amount of both introductory and continuing training that will be given to each person filling a position listed under Subparagraph II.F.4(a); and

(d) Records that document that the training or job experience required under Paragraphs II.F.1, II.F.2, and II.F.3 has been given to, and completed by, facility personnel.

5. Retention of Training Records: Training records on current personnel must be kept until closure of the facility; training records on former employees must be kept for at least three years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the same company.

G. GENERAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

1. The permittee must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated and protected from sources of ignition or reaction including but not limited to open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or

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mechanical), spontaneous ignition (e.g., from heat producing chemical reactions), and radiant heat. While ignitable or reactive waste is handled, the permittee must confine smoking and open flames to specially designated locations. "No Smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.

2. Where specifically required by this permit, the permittee that treats, stores, or disposes of ignitable or reactive waste, or mixes incompatible waste or incompatible wastes and other materials, must take precautions to prevent reactions which:

   (a) Generate extreme heat or pressure, fire or explosions, or violent reactions;

   (b) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;

   (c) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;

   (d) Damage the structural integrity of the device or facility;

   (e) Through other like means threaten human health or the environment.

3. When required to comply with Paragraph II.G.1 or II.G.2, the permittee must document that compliance. This documentation may be based on references to published scientific or engineering literature, data from trial tests (e.g., bench scale or pilot scale tests), waste analyses, (as specified in Rule 0400-12-01-.06(2)(d)), or the results of the treatment of similar wastes by similar treatment processes and under similar operating conditions.

H. PREPAREDNESS AND PREVENTION

1. Operation and Maintenance of the Facility: The permittee must maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.

2. Required Equipment: At a minimum, the permittee shall equip ORNL with the equipment listed in the contingency plan, Attachment 6, and with the following:

   (a) An internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to facility personnel;

   (b) A device, such as a telephone (immediately available at the scene of operations) or a hand-held two-way radio, capable of summoning

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emergency assistance from local police departments, fire departments, or State or local emergency response teams;

(c) Portable fire extinguishers, fire control equipment (including special extinguishing equipment, such as that using foam, inert gas, or dry chemicals), spill control equipment, and decontamination equipment; and

(d) Water at adequate volume and pressure to supply water hose streams, or foam producing equipment, or automatic sprinklers, or water spray systems.

3. Testing and Maintenance of Equipment: All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be tested and maintained as necessary to assure its proper operation in time of emergency.

4. Access to Communications or Alarm Systems: The permittee must ensure that:

(a) Whenever hazardous waste is being poured, mixed, spread, or otherwise handled, all personnel involved in the operation must have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee.

(b) If there is ever just one employee on the premises while the facility is operating, he must have immediate access to a device, such as a telephone (immediately available at the scene of operation) or a hand-held two-way radio, capable of summoning external emergency assistance.

5. Required Aisle Space: The permittee must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of the facility operation in an emergency. Aisle space shall also be provided between the containers and the limits (e.g., walls and containment curbs) of the container storage areas.

6. Arrangements with Local Authorities

(a) The permittee must attempt to make the following arrangements, as appropriate for the type of waste authorized to be managed by this permit and the potential need for the services of these organizations:

(i) Arrangements to familiarize police, fire departments, and emergency response teams with the layout of the facility, properties of hazardous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes;

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(ii) Where more than one police and fire department might respond to an emergency, agreements designating primary emergency authority to specific police and specific fire department, and agreements with any others to provide support to the primary emergency authority;

(iii) Arrangements with State emergency response teams, emergency response contractors, and equipment suppliers;

(iv) Arrangements to familiarize local hospitals with the properties of hazardous wastes handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility; and

(v) The permittee shall provide written information regarding waste quantities, types, and locations, to state and local authorities [including State Emergency Response Commissions (SERCs) and Local Emergency Response Commissions (LERCs)] and first responders for the purpose of emergency preparedness and prevention and shall place a copy of this information in the facility's operating record, as well as to update such information as necessary, and shall provide the updates to state and local authorities and first responders. This information shall contain the following:

(I) Waste types (ignitable, reactive etc.)/names;

(II) Approximate quantities of each waste type;

(III) General locations of waste at the facility;

(IV) The layout of the facility;

(V) General locations within the facility where personnel normally work; and

(VI) Entrances and roads inside the facility and possible evacuation routes.

The facility shall submit the emergency and contingency information using paper and electronic format and also have such information readily accessible during an emergency.

(b) Where State or local authorities decline to enter into such arrangements, the permittee must document this refusal in the operating record.

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7. Loading and Unloading Operations

Prevention of hazards at the container loading (storage) area shall be accomplished by several means.

(a) Containers of hazardous waste shall be checked for proper closure, labeling, and proper placement prior to unloading.

(b) Operational equipment (fork-lift trucks, straps, etc.) shall be properly maintained to prevent the occurrence of a spill or release of hazardous waste due to equipment malfunctions.

(c) The loading and unloading area shall be checked prior to use for potential hazards due to aisle space obstructions, for improper container management practices, and for cleanliness.

I. CONTINGENCY PLAN

The permittee must have a Contingency Plan for the facility.

1. Purpose of the Contingency Plan: The Contingency Plan, contained in this permit as Attachment 6, must be designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

2. Implementation of the Contingency Plan: The permittee must immediately carry out the provisions of the Contingency Plan, whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.

3. Content of the Contingency Plan

(a) The Contingency Plan must describe the actions facility personnel must take to comply with Paragraphs II.I.1 through II.I.7 in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water at the facility.

(b) The plan must describe arrangements agreed to by local police departments, fire departments, hospitals, contractors, and State and local emergency response teams to coordinate emergency services, pursuant to Paragraph II.H.6.

(c) The plan must list names, addresses, and phone numbers (office and home) of all persons qualified to act as emergency coordinator (see Paragraph II.I.6), and this list must be kept up to date. Where more than one person is

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listed, one must be named as primary emergency coordinator and others must be listed in the order in which they will assume responsibility as alternates.

(d) The plan must include a list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external), and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.

(e) The plan must include an evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This evacuation plan must describe signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes (in cases where the primary routes could be blocked by releases of hazardous waste or fires).

4. Copies of Plan: The permittee must maintain at the facility a copy of the Contingency Plan and its subsequent revisions. In addition, the Contingency Plan and all revisions to the plan must be submitted to all local police departments, fire departments, hospitals, and State and local emergency response teams that may be called upon to provide emergency services.

5. Amendments to Plan: The permittee must review and immediately amend the Contingency Plan whenever:

(a) This permit is revised;

(b) The Contingency Plan fails in an emergency;

(c) The facility changes – in its design, construction, operation, maintenance, or other circumstances -- in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous constituents, or changes the response necessary in an emergency;

(d) The list of emergency coordinators changes; or

(e) The list of emergency equipment changes.

6. Emergency Coordinator: There must be, at all times, at least one employee either on the facility premises or on call (i.e., available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator must be thoroughly familiar with all aspects of the facility's Contingency Plan, all operations and activities at the facility, the location and characteristics of waste handled, the location of all records within the facility, and the facility layout. In

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addition, this person must have the authority to commit the resources needed to carry out the Contingency Plan.

7. Emergency Procedures

(a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately:

(i) Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel; and

(ii) Notify appropriate Federal, State, and local agencies with designated response roles if their help is needed.

(b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials. He may do this by observation or review of facility records or manifests, and, if necessary, by chemical analysis.

(c) Concurrently, the emergency coordinator must assess possible hazards to human health or the environment that may result from the release, fire, or explosion. This assessment must consider both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water run-off from water or chemical agents used to control fire and heat-induced explosions).

(d) If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health, or the environment, outside the facility, he must report his findings as follows:

(i) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities. He must be available to help appropriate officials decide whether local areas should be evacuated; and

(ii) He must immediately notify the Tennessee Emergency Management Agency (using their 24-hour toll free number 800/262-3300) and/or the National Response Center (using their 24-hour toll free number 800/424-8802). The report must include:

(I) Name and telephone number of reporter;

(II) Name and address of facility;

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(III) Time and type of incident (e.g., release, fire);

(IV) Name and quantity of material(s) involved, to the extent known;

(V) The extent of injuries, if any; and

(VI) The possible hazards to human health, or the environment, outside the facility.

(e) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.

(f) If the facility stops operations in response to a fire, explosion, or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.

(g) Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.

[Comment: Unless the permittee can demonstrate, in accordance with Rule 0400-12-01-.02(1)(c)3 or 4, that the recovered material is not a hazardous waste, the permittee becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of Rules 0400-12-01-.03, .04 and .06.]

(h) The emergency coordinator must ensure that, in the affected area(s) of the facility:

(i) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and

(ii) All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed.

(i) The permittee must note in the operating record the time, date, and details of any incident that requires implementing the Contingency Plan. Within 15

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days after the incident, he must submit a written report on the incident to the Commissioner. The report must include:

(i) Name, address, and telephone number of the permittee;

(ii) Name, address, and telephone number of the facility;

(iii) Date, time, and type of incident (e.g., fire, explosion);

(iv) Name and quantity of material(s) involved;

(v) The extent of injuries, if any;

(vi) An assessment of actual or potential hazards to human health or the environment, where this is applicable; and

(vii) Estimated quantity and disposition of recovered material that resulted from the incident.

J. MANIFEST SYSTEM

1. Use of the Manifest System

(a) If the facility receives hazardous waste accompanied by a manifest, the permittee or his agent must sign and date the manifest as indicated in Subparagraph II.J.1(b) to certify that the hazardous waste covered by the manifest was received, that the hazardous waste was received except as noted in the Discrepancy space of the manifest, or that the hazardous waste was rejected as noted in the manifest Discrepancy space.

(b) If the facility receives a hazardous waste shipment accompanied by a manifest, the permittee or his agent must:

(i) Sign and date each copy of the manifest;

(ii) Note any discrepancies [as defined in Subparagraph II.J.13(a)] on each copy of the manifest;

(iii) Immediately give the transporter at least one copy of the manifest;

(iv) Within 30 days of delivery, send a copy (Page 2) of the manifest to the generator;

(v) Beginning June 30, 2021, the requirement to submit the top copy (Page 1) of the paper manifest and any paper continuation sheet to the e-Manifest system for purposes of data entry and processing may

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be met by the permittee only by transmitting to the EPA system an image file of Page 1 of the manifest and any continuation sheet, or by transmitting to the EPA system both a data file and the image file corresponding to Page 1 of the manifest and any continuation sheet, within 30 days of the date of delivery. Submissions of copies to the e-Manifest system shall be made to the electronic mail/submission address specified at the e-Manifest program website's directory of services; and

(vi) Retain at the facility a copy of each manifest for at least three years from the date of delivery.

(c) If the permittee receives hazardous waste subject to Rule 0400-12-01-.03(9) from a foreign source, he must:

(i) Additionally list the relevant consent number from consent documentation supplied by EPA to the facility for each waste listed on the manifest, matched to the relevant list number for the waste from block 9b. If additional space is needed, the permittee should use a Continuation Sheet(s) (EPA Form 8700-22A); and

(ii) Send a copy of the manifest within 30 days of delivery to EPA using the addresses listed in Rule 0400-12-01-.03(9)(c)5 until the facility can submit such a copy to the e-Manifest system per Part II.J.1(b)(v).

2. Bulk Shipments: If the facility receives, from a rail or water (bulk shipment) transporter, hazardous waste which is accompanied by a shipping paper containing all the information required on the manifest (excluding the Installation Identification Numbers, generator's certification, and signatures), the permittee, or his agent, must:

(a) Sign and date each copy of the manifest or shipping paper (if the manifest has not been received) to certify that the hazardous waste covered by the manifest or shipping paper was received;

(b) Note any significant discrepancies (as defined in Subparagraph II.J.13(a)) on each copy of the manifest or shipping paper on each copy of the manifest or shipping paper.

(Comment: The Department does not intend that the permittee, whose procedures under Subparagraph II.C.2(c) include waste analysis must perform that analysis before signing the shipping paper and giving it to the transporter. Subparagraph II.J.13(b), however, requires reporting an unreconciled discrepancy discovered during later analysis.)

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(c) Immediately give the rail or water (bulk shipment) transporter at least one copy of the manifest or shipping paper (if the manifest has not been received);

(d) Within 30 days after the delivery, send a copy of the signed and dated manifest or a signed and dated copy of the shipping paper (if the manifest has not been received within 30 days after delivery) to the generator; and

[Comment: Rule 0400-12-01-.03(3)(d)3 requires the generator to send three copies of the manifest to the facility when hazardous waste is sent by rail or water (bulk shipment).]

(e) Retain at the facility a copy of the manifest and shipping paper (if signed in lieu of the manifest at the time of delivery) for at least three years from the date of delivery.

3. Initiating a Shipment: Whenever a shipment of hazardous waste is initiated from the facility, the permittee must comply with the manifesting requirements of Rule 0400-12-01-.03. The provisions of Rule 0400-12-01-.03(1)(f), (1)(g), and (1)(h) are applicable to the on-site accumulation of hazardous wastes by generators. Therefore, the provisions of Rule 0400-12-01-.03(1)(f), (1)(g), and (1)(h) only apply to owners or operators who are shipping hazardous waste which they generated at that facility or operating as a large quantity generator consolidating hazardous waste from very small quantity generators under Rule 0400-12-01-.03(1)(h)6.

4. As per Rule 0400-12-01-.03(9)(e)4(ii)(XV), within three working days of the receipt of a shipment subject to Rule 0400-12-01-.03(9), the permittee must provide a copy of the movement document bearing all required signatures to the foreign exporter, to competent authorities of all other countries of export and transit that control the shipment as an export and transit of hazardous waste respectively; and on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's Waste Import Export Tracking System (WIETS), or its successor system. The original copy of the movement document must be maintained at the facility for at least three years from the date of signature. The permittee may satisfy this recordkeeping requirement by retaining electronically submitted documents in the facility's account on EPA's Waste Import Export Tracking System (WIETS), or its successor system, provided that copies are readily available for viewing and production if requested by any EPA or authorized state inspector. The permittee may not be held liable for the inability to produce the documents for inspection under this paragraph if the permittee can demonstrate that the inability to produce the document is due exclusively to technical difficulty with EPA's Waste Import Export Tracking System (WIETS), or its successor system, for which the permittee bears no responsibility.

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5. A facility must determine whether the consignment state for a shipment regulates any additional wastes (beyond those regulated federally) as hazardous wastes under its state hazardous waste program. The permittee must also determine whether the consignment state or generator state requires the facility to submit any copies of the manifest to these states.

6. Legal equivalence to paper manifests: Electronic manifests that are obtained, completed, and transmitted in accordance with Rule 0400-12-01-.03(3)(a)1(iii), and used in accordance with this paragraph in lieu of the paper manifest form are the legal equivalent of paper manifest forms bearing handwritten signatures, and satisfy for all purposes any requirement in this permit to obtain, complete, sign, provide, use, or retain a manifest.

   (a) Any requirement in this permit for the permittee to sign a manifest or manifest certification by hand, or to obtain a handwritten signature, is satisfied by signing with or obtaining a valid and enforceable electronic signature within the meaning of Rule 0400-12-01-.03(3)(f).

   (b) Any requirement in this permit to give, provide, send, forward, or to return to another person a copy of the manifest is satisfied when a copy of an electronic manifest is transmitted to the other person.

   (c) Any requirement in this permit for a manifest to accompany a hazardous waste shipment is satisfied when a copy of an electronic manifest is accessible during transportation and forwarded to the person or persons who are scheduled to receive delivery of the hazardous waste shipment.

   (d) Any requirement in this permit for the permittee to keep or retain a copy of each manifest is satisfied by the retention of the facility's electronic manifest copies in its account on the e-Manifest system, provided that such copies are readily available for viewing and production if requested by any EPA or authorized state inspector.

   (e) The permittee shall not be held liable for the inability to produce an electronic manifest for inspection under this permit if the permittee can demonstrate that the inability to produce the electronic manifest is due exclusively to a technical difficulty with the electronic manifest system for which the permittee bears no responsibility.

7. The permittee may participate in the electronic manifest system either by accessing the electronic manifest system from the permittee's electronic equipment, or by accessing the electronic manifest system from portable equipment brought to the permittee's site by the transporter who delivers the waste shipment to the facility.

8. Special procedures applicable to replacement manifests. If a facility receives hazardous waste that is accompanied by a paper replacement manifest for a

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manifest that was originated electronically, the following procedures apply to the delivery of the hazardous waste by the final transporter:

(a) Upon delivery of the hazardous waste to the designated facility, the permittee must sign and date each copy of the paper replacement manifest by hand in Item 20 (Designated Facility Certification of Receipt) and note any discrepancies in Item 18 (Discrepancy Indication Space) of the replacement manifest,

(b) The permittee must give back to the final transporter one copy of the paper replacement manifest,

(c) Within 30 days of delivery of the hazardous waste to the designated facility, the permittee must send one signed and dated copy of the paper replacement manifest to the generator, and send an additional signed and dated copy of the paper replacement manifest to the EPA e-Manifest system, and

(d) The permittee must retain at the facility one copy of the paper replacement manifest for at least three years from the date of delivery.

9. Special procedures applicable to electronic signature methods undergoing tests: If the permittee using an electronic manifest signs this manifest electronically using an electronic signature method which is undergoing pilot or demonstration tests aimed at demonstrating the practicality or legal dependability of the signature method, then the permittee shall also sign with an ink signature the facility's certification of receipt or discrepancies on the printed copy of the manifest provided by the transporter. Upon executing its ink signature on this printed copy, the permittee shall retain this original copy among its records for at least three years from the date of delivery of the waste.

10. Imposition of user fee for electronic manifest use

(a) As prescribed in 40 CFR § 264.1311, and determined in 40 CFR § 264.1312, the permittee who is a user of the electronic manifest system shall be assessed a user fee by EPA for the submission and processing of each electronic and paper manifest. EPA shall update the schedule of user fees and publish them to the user community, as provided in 40 CFR § 264.1313.

(b) The permittee subject to user fees under this paragraph shall make user fee payments in accordance with the requirements of 40 CFR § 264.1314, subject to the informal fee dispute resolution process of 40 CFR § 264.1316, and subject to the sanctions for delinquent payments under 40 CFR § 264.1315.

11. Electronic manifest signatures: Electronic manifest signatures shall meet the criteria described in Rule 0400-12-01-.03(3)(f).

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12. Post-receipt manifest data corrections: After facilities have certified to the receipt of hazardous wastes by signing Item 20 of the manifest, any post-receipt data corrections may be submitted at any time by any interested person (e.g., waste handler) shown on the manifest.

(a) Interested persons must make all corrections to manifest data by electronic submission, either by directly entering corrected data to the web-based service provided in e-Manifest for such corrections, or by an upload of a data file containing data corrections relating to one or more previously submitted manifests.

(b) Each correction submission must include the following information:

(i) The Manifest Tracking Number and date of receipt by the facility of the original manifest(s) for which data are being corrected;

(ii) The item number(s) of the original manifest that is the subject of the submitted correction(s); and

(iii) For each item number with corrected data, the data previously entered and the corresponding data as corrected by the correction submission.

(c) Each correction submission shall include a statement that the person submitting the corrections certifies that to the best of his or her knowledge or belief, the corrections that are included in the submission will cause the information reported about the previously received hazardous wastes to be true, accurate, and complete:

(i) The certification statement must be executed with a valid electronic signature; and

(ii) A batch upload of data corrections may be submitted under one certification statement.

(d) Upon receipt by the system of any correction submission, other interested persons shown on the manifest will be provided electronic notice of the submitter's corrections.

(e) Other interested persons shown on the manifest may respond to the submitter's corrections with comments to the submitter, or by submitting another correction to the system, certified by the respondent as specified in Subparagraph II.J.12(c), and with notice of the corrections to other interested persons shown on the manifest.

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13. Manifest Discrepancies

(a) Manifest discrepancies are:

(i) Significant differences [as defined by Subparagraph II.J.13(b)] between the quantity or type of hazardous waste designated on the manifest or shipping paper, and the quantity and type of hazardous waste the facility actually receives;

(ii) Rejected wastes, which may be a full or partial shipment of hazardous waste that the TSDF cannot accept; or

(iii) Container residues, which are residues that exceed the quantity limits for "empty" containers set forth in Rule 0400-12-01-.02(1)(g)2.

(b) Significant differences in quantity are: For bulk waste, variations greater than 10 percent in weight; for batch waste, any variation in piece count, such as a discrepancy of one drum in a truckload. Significant differences in type are obvious differences which can be discovered by inspection or waste analysis, such as waste solvent substituted for waste acid or toxic constituents not reported on the manifest or shipping paper.

(c) Upon discovering a significant difference in quantity or type, the permittee must attempt to reconcile the discrepancy with the waste generator or transporter (e.g., with telephone conversations). If the discrepancy is not resolved within 15 days after receiving the waste, the permittee must immediately submit to the Commissioner a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest or shipping paper at issue.

(d) Upon rejecting waste or identifying a container residue that exceeds the quantity limits for "empty" containers set forth in Rule 0400-12-01-.02(1)(g)2, the permittee must consult with the generator prior to forwarding the waste to another facility that can manage the waste. If it is impossible to locate an alternative facility that can receive the waste, the permittee may return the rejected waste or residue to the generator. The permittee must send the waste to the alternative facility or to the generator within 60 days of the rejection of the container residue identification.

(i) While the permittee is making arrangements for forwarding rejected wastes or residues to another facility under this paragraph, the permittee must ensure that either the delivering transporter retains custody of the waste, or the permittee must provide for secure, temporary custody of the waste, pending delivery of the waste to the

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first transporter designated on the manifest prepared under Paragraphs II.J.13(e) and II.J.13(f).

(e) Except as provided in Part II.J.13(e)(vii), for full or partial load rejections and residues that are to be sent off-site to an alternate facility, the facility is required to prepare a new manifest in accordance with Rule 0400-12-01-.03(3)(a) and the following instructions:

(i) Write the generator's Installation Identification Number in Item 1 of the new manifest. Write the generator's name and mailing address in Item 5 of the new manifest. If the mailing address is different from the generator's site address, then write the generator's site address in the designated space in Item 5.

(ii) Write the name of the alternate designated facility and the facility's Installation Identification Number in the designated facility block (Item 8) of the new manifest.

(iii) Copy the Manifest Tracking Number found in Item 4 of the old manifest to the Special Handling and Additional Information Block of the new manifest, and indicate that the shipment is a residue or rejected waste from the previous shipment.

(iv) Copy the Manifest Tracking Number found in Item 4 of the new manifest to the manifest reference number line in the Discrepancy Block of the old manifest (Item 18a).

(v) Write the DOT description for the rejected load or the residue in Item 9 (U.S. DOT Description) of the new manifest and write the container types, quantity, and volume(s) of waste.

(vi) Sign the Generator's/Offeror's Certification to certify, as the offeror of the shipment, that the waste has been properly packaged, marked and labeled and is in proper condition for transportation and mail a signed copy of the manifest to the generator identified in Item 5 of the new manifest.

(vii) For full load rejections that are made while the transporter remains present at the facility, the facility may forward the rejected shipment to the alternate facility by completing Item 18b of the original manifest and supplying the information on the next destination facility in the Alternate Facility space. The facility must retain a copy of this manifest for its records, and then give the remaining copies of the manifest to the transporter to accompany the shipment. If the original manifest is not used, then the facility must use a new

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manifest and comply with Parts II.J.13(e)(i), II.J.13(ii), II.J.13 (iii), II.J.13 (iv), II.J.13 (v), and II.J.13 (vi).

(f) Except as provided Part II.J.13(f)(vii), for rejected wastes and residues that must be sent back to the generator, the facility is required to prepare a new manifest in accordance with Rule 0400-12-01-.03(3)(a) and the following instructions:

(i) Write the facility's Installation Identification Number in Item 1 of the new manifest. Write the facility's name and mailing address in Item 5 of the new manifest. If the mailing address is different from the facility's site address, then write the facility's site address in the designated space for Item 5 of the new manifest.

(ii) Write the name of the initial generator and the generator's Installation Identification Number in the designated facility block (Item 8) of the new manifest.

(iii) Copy the Manifest Tracking Number found in Item 4 of the old manifest to the Special Handling and Additional Information Block of the new manifest and indicate that the shipment is a residue or rejected waste from the previous shipment.

(iv) Copy the Manifest Tracking Number found in Item 4 of the new manifest to the manifest reference number line in the Discrepancy Block of the old manifest (Item 18a).

(v) Write the DOT description for the rejected load or the residue in Item 9 (U.S. DOT Description) of the new manifest and write the container types, quantity, and volume(s) of waste.

(vi) Sign the Generator's/Offeror's Certification to certify, as offeror of the shipment, that the waste has been properly packaged, marked and labeled and is in proper condition for transportation.

(vii) For full load rejections that are made while the transporter remains at the facility, the facility may return the shipment to the generator with the original manifest by completing Item 18a and 18b of the manifest and supplying the generator's information in the Alternate Facility space. The facility must retain a copy for its records and then give the remaining copies of the manifest to the transporter to accompany the shipment. If the original manifest is not used, then the facility must use a new manifest and comply with Parts II.J.13(f)(i), II.J.13(f)(ii), II.J.13(f)(iii), II.J.13(f)(iv), II.J.13(f)(v), II.J.13(f)(vi) and II.J.13(f)(viii).

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(viii) For full or partial load rejections and container residues contained in non-empty containers that are returned to the generator, the facility must also comply with the exception reporting requirements in Rule 0400-12-01-.03(5)(c)1.

(g) If a facility rejects a waste or identifies a container residue that exceeds the quantity limits for "empty" containers set forth in Rule 0400-12-01-.02(1)(g)2 after it has signed, dated, and returned a copy of the manifest to the delivering transporter or to the generator, the facility must amend its copy of the manifest to indicate the rejected wastes or residues in the Discrepancy space of the amended manifest. The facility must also copy the Manifest Tracking Number from Item 4 of the new manifest to the Discrepancy space of the amended manifest, and must re-sign and date the manifest to certify to the information as amended. The facility must retain the amended manifest for at least three years from the date of amendment, and must within 30 days, send a copy of the amended manifest to the transporter and generator that received copies prior to their being amended.

K. RECORDKEEPING AND REPORTING

The permittee must keep a written operating record at the facility.

1. Operating Record: The following information must be recorded by the permittee, as it becomes available, and maintained in the operating record at the facility for three years unless noted as follows:

   (a) A description and the quantity of each hazardous waste received, and the method(s) and date(s) of its treatment, storage, or disposal at the facility as required by Rule 0400-12-01-.06(57), Appendix I. This information must be maintained in the operating record until closure of the facility;

   (b) The location of each hazardous waste within the facility and the quantity at each location. This information must include cross-references to specific manifest document numbers, if the waste was accompanied by a manifest. This information must be maintained in the operating record until closure of the facility;

   (c) Records and results of waste analysis and waste determinations performed as specified in Subsections II.C, II.G, II.O, and II.R;

   (d) Summary reports and details of all incidents that require implementing the Contingency Plan as required by Subparagraph II.I.7(i);

   (e) Records and results of inspections as required by Paragraph II.E.3;

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(f) Monitoring, testing or analytical data, where required by Sections III, IV, V, and Subsection II.R. This information must be maintained in the operating record for three years, except for records and results pertaining to groundwater monitoring and cleanup which must be maintained in the operating record until closure of the facility;

(g) For off-site facilities, notices to generators as required by Paragraph I.H.2;

(h) A certification by the permittee no less often than annually, that the permittee has a program in place to reduce the volume and toxicity of hazardous waste that he generates to the degree determined by the permittee to be economically practicable; and the proposed method of treatment, storage or disposal is that practicable method currently available to the permittee which minimizes the present and future threat to human health and the environment;

(i) For an off-site treatment facility, a copy of the notice, and the certification and demonstration, if applicable, required by the generator or the owner or operator under Rule 1200-1-11-.10(1)(g) or (h);

(j) For an on-site treatment facility, the information contained in the notice (except the manifest number), and the certification and demonstration if applicable, required by the generator or the owner or operator under Rule 1200-1-11-.10(1)(g) or (h);

(k) For an off-site storage facility, a copy of the notice, and the certification and demonstration if applicable, required by the generator or the owner or operator under Rule 0400-12-01-.10(1)(g) or (1)(h);

(l) For an on-site storage facility, the information contained in the notice (except the manifest number), and the certification and demonstration if applicable, required by the generator or the owner or operator under Rule 0400-12-01-.10(1)(g) or (1)(h);

(m) Any records required under Rule 0400-12-01-.06(1)(b)9(xiii);

(n) Certifications as required by Rule 0400-12-01-.06(10)(g)6 must be maintained in the operating record until closure of the facility; and

(o) All records pertaining to approved alternate standards for waivers must be documented and maintained until final closure of the facility.

2. <u>Availability, Retention, and Disposition of Records:</u>

(a) All records, including plans, required by this permit must be furnished upon request, and made available at all reasonable times for inspection, by any

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officer, employee, or representative of the Department who is duly designated by the Commissioner.

(b) The retention period for all records required under this permit is extended automatically during the course of any unresolved enforcement action regarding the facility or as requested by the Commissioner or Board.

3. Annual Report

(a) The permittee must prepare and submit a single copy of an annual report to the Commissioner by March 1 of each year.

(b) Annual reports must be submitted on forms provided by the Department and in accordance with the instructions accompanying the form.

(c) The annual report must cover facility activities during the previous calendar year and must include the following information:

(i) The installation identification number, name, and address of the facility;

(ii) The calendar year covered by the report;

(iii) For off-site facilities, the installation identification number of each hazardous waste generator from which the facility received a hazardous waste during the year; for imported shipments, the report must give the name and address of the foreign generator;

(iv) A description and the quantity of each hazardous waste the facility received during the year. For off-site facilities, this information must be listed by installation identification number of each generator;

(v) The method of treatment, storage, or disposal for each hazardous waste;

(vi) For generators who treat, store, or dispose of hazardous waste on-site, a description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated;

(vii) For generators who treat, store, or dispose of hazardous waste on-site, a description of the changes in volume and toxicity of waste actually achieved during the year in comparison to previous years to the extent such information is available for the years prior to 1984; and

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(viii) The certification signed by the permittee or his authorized representative.

4. Unmanifested Waste Report: If a facility accepts for treatment, storage, or disposal any hazardous waste from an off-site source without an accompanying manifest, or without an accompanying shipping paper as described in Rule 0400-12-01-.04(3)(a)5, and if the waste is not excluded from the manifest requirement by Rule 0400-12-01-.02(1)(e), then the permittee must prepare and submit a letter to the Commissioner within fifteen days after receiving the waste. The unmanifested waste report must be submitted on EPA Form 8700-13B. Such report must be designated "Unmanifested Waste Report" and include the following:

(a) The Installation Identification Number, name, and address of the facility;

(b) The date the facility received the waste;

(c) The Installation Identification Number, name, and address of the generator and the transporter, if available;

(d) A description and the quantity of each unmanifested hazardous waste the facility received;

(e) The method of treatment, storage, or disposal for each hazardous waste;

(f) The certification signed by the permittee or his authorized representative; and

(g) A brief explanation of why the waste was unmanifested, if known.

5. Additional Reports: In addition to submitting annual report and unmanifested waste reports required by Paragraphs II.K.3 and II.K.4, the permittee must also report to the Commissioner:

(a) Releases, fires, and explosions as specified by Subparagraph II.I.7(i) and in Attachment 6, Contingency Plan;

(b) Certifications of closures as required by Paragraph II.L.7; and

(c) As otherwise required by this Section and Sections III and IV.

L. CLOSURE

1. Performance Standard

(a) The permittee must close the facility in a manner that:

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(i) Minimizes the need for further maintenance;

(ii) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and

(iii) Complies with the closure requirements of Rule 0400-12-01-.06(7) and, as applicable, the requirements of Rule 0400-12-01-.06(9)(i), (10)(h), and (17).

(b) The permittee shall close the facility in accordance with the Closure Plan, in Attachment 8.

2. Amendment to Closure Plan: The permittee must submit a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved Closure Plan in accordance with the applicable procedures in Rule 0400-12-01-.07(9). The written notification or request must include four (4) paper copies and one electronic copy of the amended Closure Plan for review or approval by the Commissioner.

(a) The permittee may submit a written notification or request to the Commissioner for a permit modification to amend the Closure Plan at any time prior to the notification of partial or final closure of the facility.

(b) The permittee must submit a written notification of or request for a permit modification to authorize a change in the approved Closure Plan whenever:

(i) Changes in operating plans or facility design affect the Closure Plan, or

(ii) There is a change in the expected year of closure, if applicable, or

(iii) In conducting partial or final closure activities, unexpected events require a modification of the approved Closure Plan.

(iv) The permittee requests the Commissioner to apply alternative requirements to a regulated unit under Rule 0400-12-01-.06(6)(a)6, (7)(a)3, and/or (8)(a)4.

(c) The permittee shall submit a written request for a permit modification including at least four (4) copies of the amended Closure Plan for approval at least 60 days prior to the proposed change in facility design or operation, or no later than 60 days after an unexpected event has occurred which has affected the Closure Plan. If an unexpected event occurs during the partial

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or final closure period, the permittee must request a permit modification no later than 30 days after the unexpected event. The Commissioner will approve, disapprove, or modify this amended plan in accordance with the procedures in Rule 0400-12-01-.07. In accordance with Rule 0400-12-01-.07(8)(b), the approved Closure Plan will become a condition of any permit issued;

(d) The Commissioner may request modification to the plan under the conditions described in Subparagraph II.L.2(b). The permittee must submit the modified plan within 60 days of the Commissioner's request, or within 30 days if the change in facility conditions occurs during partial or final closure. Any modifications requested by the Commissioner will be approved in accordance with the procedures in Rule 0400-12-01-.07.

3. Notification of Partial and Final Closure

(a) The permittee must notify the Commissioner in writing at least 45 days prior to the date on which he expects to begin final closure of the facility;

(b) The date when the permittee "expects to begin closure" must be no later than 30 days after the date on which any hazardous waste management unit receives the known final volume of hazardous waste, or if there is a reasonable possibility that the hazardous waste management unit will receive additional hazardous waste, no later than one year after the date on which the unit received the most recent volume of hazardous wastes. If the permittee can demonstrate to the Commissioner that the hazardous waste management unit or facility has the capacity to receive additional hazardous wastes and he has taken all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, the Commissioner may approve an extension to this one-year limit.

(c) If the facility's permit is terminated, or if the facility is otherwise ordered, by judicial decree or final order under the Act, to cease receiving hazardous wastes or to close, then the requirements of this paragraph do not apply. However, the permittee must close the facility in accordance with the deadlines established in Paragraph II.L.5.

4. Removal of Wastes and Decontamination or Dismantling of Equipment: Nothing in this Subsection (II.L) shall preclude the permittee from removing hazardous wastes and decontaminating or dismantling equipment in accordance with the approved partial or final Closure Plan at any time before or after notification of partial or final closure.

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5. Time Allowed for Closure

(a) Within 90 days after receiving the final volume of hazardous wastes at a hazardous waste management unit or facility, the permittee must treat or remove from the unit or facility, all hazardous waste in accordance with the approved Closure Plan. The Commissioner may approve a longer period if the permittee complies with all applicable requirements for requesting a modification to the permit and demonstrates that:

(i) The activities required to comply with Subparagraph II.L.5(a) will, of necessity, take longer than 90 days to complete; or

(I) The hazardous waste management unit or facility has the capacity to receive additional hazardous wastes; and

(II) There is a reasonable likelihood that the permittee or another person will recommence operation of the hazardous waste management unit or the facility within one year; and

(III) Closure of the hazardous waste management unit or facility would be incompatible with continued operation of the site; and

(IV) The permittee has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements.

(b) The permittee must complete partial and final closure activities in accordance with Attachment 8, and within 180 days after receiving the final volume of hazardous wastes at the hazardous waste management unit or facility. The Commissioner may approve an extension to the closure period if the permittee complies with all applicable requirements for requesting a modification to the permit and demonstrates that:

(i) The partial or final closure activities will, of necessity, take longer than 180 days to complete; or

(I) The hazardous waste management unit or facility has the capacity to receive additional hazardous wastes; and

(II) There is a reasonable likelihood that the permittee or another person will recommence operation of the hazardous waste management unit or the facility within one year; and

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(III) Closure of the hazardous waste management unit or facility would be incompatible with continued operation of the site; and

(IV) The permittee has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed but not operating hazardous waste management unit or facility, including compliance with all applicable permit requirements.

(c) The demonstrations referred to in Parts II.L.5(a)(i) and II.L.5(b)(i) must be made as follows:

(i) The demonstration in Part II.L.5(a)(i) must be made at least 30 days prior to the expiration of the 90-day period in Subparagraph II.L.5(a); and

(ii) The demonstration in Part II.L.5(b)(i) must be made at least 30 days prior to the expiration of the 180-day period in Subparagraph II.L.5(b).

6. Disposal or Decontamination of Equipment, Structures and Soils: During the partial and final closure periods, all contaminated equipment, structures and soils must be properly disposed of or decontaminated unless otherwise specified in the approved Closure Plan. By removing any hazardous waste or hazardous constituents during partial or final closure, the permittee may become a generator of hazardous waste and must handle that hazardous waste in accordance with all applicable requirements of Rule 0400-12-01-.03.

7. Certification of Closure: Within 60 days of completion of closure of each hazardous waste management unit and within 60 days of the completion of final closure, the permittee must submit to the Commissioner, by registered mail, four copies of the certification that the hazardous waste management unit or facility, as applicable, has been closed in accordance with the specifications in the approved Closure Plan. The certification must be signed by the permittee and by a qualified Registered Professional Engineer as defined in Rule 0400-12-01-.01(2)(a). Documentation supporting the qualified Registered Professional Engineer's certification must be furnished to the Commissioner upon request until he releases the permittee from the financial assurance requirements for closure under Subsection II.M.

M. FINANCIAL REQUIREMENTS

Exemptions: States and the Federal government are exempt from the requirements of this subsection.

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N. CO-MANAGEMENT OF OTHER MATERIALS

The permittee may not treat, store, or dispose of other wastes or other materials along with hazardous waste in any hazardous waste management unit subject to the requirements of this permit unless:

1. The other waste or other material is labeled, marked, or otherwise clearly identifiable as to what it is;

2. The permittee is able to demonstrate that the other waste or other material is not a hazardous waste; and

3. The other waste or other material is managed in a manner that does not adversely impact compliance with the conditions of this permit.

O. LAND DISPOSAL RESTRICTIONS

1. Applicability

   (a) Land Disposal Restrictions (LDR): Rule 0400-12-01-.10 identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be land disposed. The permittee shall comply with all applicable requirements of Rule 0400-12-01-.10. Where the permittee has applied for an extension, exemption, waiver or variance under Rule 0400-12-01-.10, the permittee shall comply with all applicable restrictions of Rule 0400-12-01-.10 pending final approval of such application.

   (b) Dilution as a Substitute for treatment: Except as provided in Rule 0400-12-01-.10(1)(c)2, the Permittee shall not in any way dilute a restricted waste or the residual from the treatment of a restricted waste as a substitute for adequate treatment to achieve compliance with Rule 0400-12-01-.10(3), to circumvent the effective date of a prohibition in Rule 0400-12-01-.10(2), to otherwise avoid a prohibition in Rule 0400-12-01-.10(2), to otherwise avoid a prohibition in Rule 0400-12-01-.10(2)or to circumvent a land disposal prohibition imposed by T.C.A. § 68-212-107(d)9.

   (c) LDR testing, tracking, and recordkeeping: The Permittee shall comply with the requirements of Rule 0400-12-01-.10(1)(g).

   (d) Special Rules Regarding Wastes That Exhibit a Characteristic: The Permittee shall comply with the requirements of Rule 0400-12-01-.10(1)(i).

2. Treatment Standards: A restricted waste identified in Rule 0400-12-01-.10(2) may not be placed in a land disposal unit without further treatment unless the requirements of Rule 0400-12-01-.10(2) and/or Rule 0400-12-01-.10(3) are met.

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3. Prohibitions: The storage of hazardous waste restricted from land disposal under Rule 0400-12-01-.10 shall be in compliance when the requirements of Rule 0400-12-01-.10(4) are met.

P. AIR EMISSION STANDARDS FOR PROCESS VENTS

1. Applicability

Rule 0400-12-01-.06(30) contains emission standards for process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10 parts per million by weight (ppmw). Rule 0400-12-01-.06(30) also contains standards for closed-vent systems and control devices.

2. Notification of Modifications, Additions, or New Units

(a) The Permittee does not currently operate and is not currently authorized under this Permit to operate any process vents, closed-vent systems, or control devices at the Facility that are subject to Rule 0400-12-01-.06(30).

(b) Prior to installing or operating any process vents, closed-vent systems, or control devices subject to Rule 0400-12-01-.06(30), or modifying any existing equipment, procedure, or process such that the process vents, closed-vent systems, or control devices will become subject to Rule 0400-12-01-.06(30), the Permittee shall apply for a permit modification under Rule 0400-12-01-.07(9)(c), provide specific Part B permit application information required under Rule 0400-12-01-.07(5), as applicable, with the modification request, and shall obtain a permit modification in accordance with Rule 0400-12-01-.07(9)(c).

Q. AIR EMISSION STANDARDS FOR EQUIPMENT LEAKS

1. Applicability

The permittee shall comply with the air emission standards for equipment leaks as set forth in Rule 0400-12-01-.06(31) for all equipment that contains or contacts hazardous wastes with organic concentrations of at least ten (10) percent by weight that are managed in units that are subject to this permit or in any on-site hazardous waste recycling unit.

2. The Permittee does not currently operate and is not currently authorized under this Permit to operate ancillary equipment, subject to Rule 0400-12-01-.06(31), which contains or contacts hazardous waste with organic concentrations of more than ten (10) percent by weight, for greater than 300 hours per calendar year.

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3. Prior to installing or operating any new unit or equipment subject to Rule 0400-12-01-.06(31), or modifying any existing unit, equipment, procedure, or process such that the unit(s) or equipment will become subject to Rule 0400-12-01-.06(31), the Permittee shall apply for a permit modification under Rule 0400-12-01-.07(9)(c), provide specific Part B permit application information required under Rule 0400-12-01-.07(5), as applicable, with the modification request, and shall obtain a permit modification in accordance with Rule 0400-12-01-.07(9)(c).

R. AIR EMISSION STANDARDS FOR TANKS, SURFACE IMPOUNDMENTS AND CONTAINERS

1. Applicability

   (a) Rule 0400-12-01-.06(32) contains the air emissions standards for facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers that contact hazardous waste containing an average volatile organic concentration equal to or greater than 500 ppmw at the point of waste origination, as determined by the procedures outlined in Rule 0400-12-01-.06(32)(d), except as excluded by Rule 0400-12-01.06(32)(a)2 or specifically exempted by Rule 0400-12-01-.06(32)(d)3.

   (b) The Permittee operates container units which contact hazardous waste containing an average volatile organic concentration equal to or greater than 500 ppmw and are therefore subject to Rule 0400-12-01-.06(32). The requirements of Rule 0400-12-01-.06(32) apply to the hazardous waste management units, as well as their covers, closure devices, and control devices.

2. Notification of New Modifications, Additions, or New Units

   (a) The Permittee does not currently operate and is not currently authorized under this Permit to operate any tanks or surface impoundments that are subject to Rule 0400-12-01-.06(32).

   (b) Prior to installing or operating a tank, container unit, surface impoundment, miscellaneous unit, closed vent system, or control device subject to Rule 0400-12-01-.06(32), or modifying any existing unit, procedure, or process such that the unit(s) will become subject to Rule 0400-12-01-.06(32), the Permittee shall apply for a permit modification under Rule 0400-12-01-.07(9)(c), provide specific Part B permit application information required under Rule 0400-12-01-.07(5), as applicable, with the modification request, and shall obtain a permit modification in accordance with Rule 0400-12-01-.07(9)(c).

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3. Waste Determination Procedures

(a) The Permittee must follow the waste determination procedures of Rule 0400-12-01-.06(32)(d) and Attachment 2, Waste Analysis Plan of the Permit.

(b) The Permittee must conduct an annual re-characterization of the hazardous waste managed at the Facility at least once every 12 months pursuant to Attachment 2 of the Permit.

4. Excluded Units

The requirements of Rule 0400-12-01-.06(32) do not apply to the following waste management units at the facility:

(a) Containers that has a design capacity of less than or equal to 0.1 m^3.

(b) A waste management unit that is used solely for the on-site treatment or storage of hazardous waste that is placed in the unit as a result of implementing remedial activities required under the corrective action authorities of T.C.A. §§ 68-212-108(l), 68-212-111, or 68-212-201 et seq.

(c) A waste management unit that is used solely for the management of radioactive mixed waste in accordance with the applicable regulations under the Atomic Energy Act and the Nuclear Waste Policy Act.

(d) Wastewater treatment units as defined in Rule 0400-12-01-.01(2)(a).

5. Standards: Containers

(a) Container Level 1 Standards

The permittee must manage the containers with a design capacity greater than 0.1 m^3 (26 gallons) and less than or equal to 0.46 m^3 (119 gallons), and the containers with a design capacity greater than 0.46 m^3 (119 gallons) that are not in light material service, as defined in Rule 0400-12-01-.06(32)(g)3. When storing hazardous waste in Level 1 containers, the permittee must comply with the following requirements:

(i) A container using Container Level 1 controls is one of the following:

(I) A container that meets the applicable U.S. Department of Transportation (DOT) regulations on packaging hazardous materials for transportation as specified in Rule 0400-12-01-.06(32)(g)6.

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(II) A container equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in the closed position there are no visible holes, gaps, or other open spaces into the interior of the container. The cover may be a separate cover installed on the container (e.g., a lid on a drum or a suitably secured tarp on a roll-off box) or may be an integral part of the container structural design (e.g., a "portable tank" or bulk cargo container equipped with a screw-type cap).

(III) An open–top container in which an organic-vapor suppressing barrier is placed on or over the hazardous waste in the container such that no hazardous waste is exposed to the atmosphere as specified in Rule 0400-12-01-.06(32)(g)3(i)(III).

(ii) A container used to meet the requirements in Subparts II.R.5(a)(i)(II) and II.R.5(a)(i)(III) shall be equipped with covers and closure devices, as applicable to the container, that are composed of suitable materials to minimize exposure of the hazardous waste to the atmosphere and to maintain the equipment integrity, for as long as the container is in service. Factors to be considered in selecting the materials of construction and designing the cover and closure devices shall include Organic vapor permeability; the effects of contact with the hazardous waste or its vapor managed in the container; the effects of outdoor exposure of the closure device or cover material to wind, moisture, and sunlight; and the operating practices for which the container is intended to be used.

(iii) Whenever a hazardous waste is in a container using Container Level 1 controls, the permittee shall install all covers and closure devices for the container, as applicable to the container, and secure and maintain each closure devices in the closed position except as defined in Rule 0400-12-01-.06(32)(g)3(iii)(I) through (32)(g)3(iii)(V).

(iv) The permittee of containers using Container Level 1 controls shall inspect the containers and their covers and closure devices in accordance with Rule 0400-12-01-.06(32)(g)3(iv)(I) and (32)(g)3(iv)(II). When a defect is detected for the container, cover, or closure device, the permittee shall repair defects in accordance with Rule 0400-12-01-.06(32)(g)3(iv)(III).

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(v) The permittee shall maintain at the facility a copy of the procedure used to determine that containers with capacity of 0.46m^3 or greater, which do not meet applicable DOT regulations as specified in Rule 0400-12-01-.06(32)(g)6, are not managing hazardous waste in light material service, as specified in Rule 0400-12-01-.06(32)(g)3(v).

(b) Container Level 2 Standards

The permittee must manage the containers with a design capacity greater than 0.46 m^3 (119 gallons) that are in light material service, as defined in Rule 0400-12-01-.06(32)(b), with Container Level 2 standards as described at Rule 0400-12-01-.06(32)(g)4. When storing hazardous waste in Level 2 containers the permittee must comply with the following requirements:

(i) As specified in Rule 0400-12-01-.06(32)(g)4(i), a container using Container Level 2 controls is one of the following:

(I) A container that meets the applicable U.S. Department of Transportation (DOT) regulations on packaging hazardous materials for transportation as specified in Rule 0400-12-01-.06(32)(g)6.

(II) A container that operates with no detectable organic emissions as defined in Rule 0400-12-01-.05(29)(b) and determined in accordance with the procedure specified in Rule 0400-12-01-.06(32)(g)7.

(III) A container that has been demonstrated within the preceding 12 months to be vapor-tight by using 40 CFR Part 60, appendix A, Method 27 in accordance with the procedure specified in Rule 0400-12-01-.06(32)(g)8.

(ii) The permittee shall conduct the transfer of hazardous waste in or out of a container using Container Level 2 controls in such a manner as to minimize exposure of the hazardous waste to the atmosphere, to the extent practical, as specified in Rule 0400-12-01-.06(32)(g)4(ii). When transferring hazardous waste into or out of a container, the permittee shall conduct such transferring activity by opening only the bung portion of the container. The permittee shall not open entire top portion of the container to transfer hazardous waste into or out of a container at any time.

(iii) Whenever a hazardous waste is in a container using Container Level 2 controls, the permittee shall install all covers and closure devices for the container, and secure and maintain each closure devices in the closed position except during filling and removal operations as

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specified in Rule 0400-12-01-.06(32)(g)4(iii).

(iv) The permittee of containers using Container Level 2 controls shall inspect the containers and their covers and closure devices in accordance with Rule 0400-12-01-.06(32)(g)4(iv)(I) and (32)(g)4(iv)(II). When a defect is detected for the container, cover, or closure devices, the permittee shall repair the defect in accordance with Rule 0400-12-01-.06(32)(g)4(iv)(III).

(c) Container Level 3 Standards

The Permittee currently does not have any containers which are subject to Rule 0400-12-01-.06(32) with Container Level 3 standards.

S. RESTRICTION ON OWNERSHIP OF THE FACILITY

No person who has been convicted of any felony or has been convicted of a misdemeanor for the unlawful storage, treatment or disposal of hazardous waste may, at any time, be the legal or beneficial owner of ten percent (10%) or more of the stock of the facility.

T. PROHIBITION OF THE PLACEMENT OF TRANSFER FACILITY HAZARDOUS WASTE IN PERMITTED STORAGE UNITS

Hazardous waste containers with destination facilities other than this Facility listed on the manifest must be stored under Rule 0400-12-01-.04 for ten days or less and cannot be placed, accepted, or stored in any of the permitted storage units authorized in this permit and must be managed in a separate designated transfer facility area.

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III. SPECIFIC CONDITIONS FOR STORAGE IN CONTAINERS

A. WASTE IDENTIFICATION

The permittee may store hazardous wastes in containers in the unit(s), described in Attachment 8 and as shown in the following table, subject to the terms of this permit and Rule 0400-12-01-.06(9):

Remote Handled (RH) Transuranic (TRU) BUILDINGS	**Maximum Volume (Gallons)**
Building 7572	220,000
Building 7855	96,433
Building 7860A	46,612
Building 7883	96,433
Contact Handled (CH) Transuranic (TRU) BUILDINGS	**Maximum Volume (Gallons)**
Building 7574	94,800
Building 7879	114,708
Building 7831F Flammable Storage Unit (FSU)	7,920
TRU-WASTE PROCESSING CENTER (TWPC)	**Maximum Volume (Gallons)**
TWPC-1 Contact Handled Staging Area (CHSA)	22,000
TWPC-2 (Second Floor Waste Processing Building (WPB)	11,000
TWPC-3 Drum Aging Criteria (DAC) and TWPC-7 Drum Venting Building (DVB)	11,000
TWPC-4 First Floor (WPB)	5,500
TWPC-5 Container Storage Area (CSA)	72,600
TWPC-6 Contact Handled Marshalling Building (CHMB)	145,420
TWPC-8 Multi-Purpose Building (MPB)	141,240

The DVB capacity is included in the DAC area maximum volume, but the total DVB volume will not exceed 4000 gallons.

1. Wastes as listed in Attachment 1.

2. The individual storage capacity for each of the container storage unit shall not be exceeded. The maximum capacity for each of the container storage unit is listed in the table above.

3. The quantity of waste determined to be in an area will be based on container size and not dependent on quantity within container.

4. The Permittee is prohibited from storing in containers any hazardous waste that is not identified in Attachment 1.

B. CONDITION OF CONTAINERS

If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the permittee shall immediately transfer the hazardous waste from this container to a container that is in good condition or otherwise manage the waste in some other way that complies with the conditions of this permit.

C. COMPATIBILITY OF WASTE WITH CONTAINERS

The permittee shall use a container made of or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired.

D. MANAGEMENT OF CONTAINERS

1. Containers of hazardous waste shall be managed, and the units operated as described in Attachment 8.

2. The permittee shall assure that containers holding hazardous waste are always closed during storage, except when necessary to add or remove waste.

3. The permittee shall assure that a container holding hazardous waste shall not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

4. The permittee shall maintain aisle space within the container management units in a manner consistent with the requirements of Paragraph II.H.5 and as required by Attachment 8 regarding the dimensions of the aisles.

5. If a container storage unit is storing any quantity of hazardous waste which contains free liquids, the permittee shall place all containers on pallets or similar devices which elevate the containers above the floor or place the containers on a sloped floor to drain and remove liquids as defined in Paragraph III.F.2.

6. Where applicable, the permittee shall arrange palletized waste in rows to facilitate inspections of the containers and the base underlying the containers.

7. When ignitable or reactive hazardous wastes are stored, non-sparking tools and equipment shall be used. (See Subsection II.G for additional requirements.)

E. INSPECTION OF THE CONTAINER MANAGEMENT UNIT(S)

1. The permittee shall perform inspections as required in Attachment 4 and areas where containers are stored. The permittee must look for leaking containers and for deterioration of containers and the containment system caused by corrosion or other factors. See Rule 0400-12-01-.06(2)(f)3 for remedial action required if deterioration or leaks are detected.

   [Comment: In accordance with Rules 0400-12-01-.06(2)(d) and -.06(9)(b) remedial action is required if deterioration or leaks are detected. (See Subsection II.E for additional requirements.)]

2. The permittee shall inspect the containment system/unloading area(s) daily when in use for the presence of any release of hazardous waste or accumulated precipitation as described in the inspection checklist for each unit in Attachment 4. For the purpose of this permit condition, "each operating day" or "daily during use" is equivalent to "daily when in use" and means when wastes are being moved, loaded/unloaded and therefore, subject to spills. For the purpose of this permit condition, "weekly" shall be defined as a period not to exceed seven days.

F. CONTAINMENT, DETECTION, AND MANAGEMENT OF LEAKS OR SPILLS

1. The permittee shall ensure that the container storage areas have a containment system that is designed, operated, and maintained in accordance with Paragraph III.F.2, and is constructed and maintained as specified in the plans and specifications found in Attachment 8. When normal maintenance or replacement of equipment or minor piping rearrangements are necessary to properly operate the facility, the permittee shall use parts or items which meet or exceed the performance standards of those set forth in the attachments. If parts or items are to be used which do not meet or exceed the standards set forth in the attachments, prior approval from the Commissioner shall be required.

2. A containment system shall be designed, operated, and maintained as follows:

   (a) A base shall underlie the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed.

(b) The base shall be sloped or the containment system shall be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids.

(c) The containment system shall have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater. Containers that do not contain free liquids need not be considered in this determination.

(d) Run-on into the containment system shall be prevented unless the collection system has sufficient excess capacity in addition to that required in Subparagraph III.F.2(c) to contain any run-on which might enter the system.

(e) Spilled or leaked waste and accumulated precipitation shall be removed from the sump or collection area in as timely a manner as is necessary to prevent overflow of the collection system.

(Comment: If the collected material is a hazardous waste under Rule 0400-12-01-.02, it must be managed as a hazardous waste in accordance with all applicable requirements of Rules 0400-12-01-.03 through .07 and .09. If the collected material is discharged through a point source to waters of the United States, it is subject to the requirements of section 402 of the Clean Water Act, as amended.)

3. Storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system defined by Paragraph III.F.2, except as provided by Paragraph III.F.4 or provided that:

(a) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation, or

(b) The containers are elevated or are otherwise protected from contact with accumulated liquid.

4. Storage areas that store containers holding the wastes listed below that do not contain free liquids must have a containment system defined by Paragraph III.F.2:

(a) F020, F021, F022, F023, F026, and F027

(b) (Reserved)

5. In addition to the requirements of Subparagraph III.F.2(e), spilled or leaked waste and accumulated precipitation must be removed in as timely a manner as is possible and as is necessary to prevent overflow of the collection system, and wash waters must be removed from the containment system within 24 hours of discovery, or in as timely a manner as is possible to prevent harm to human health and the

environment if the permittee can demonstrate that removal of the released waste and/or accumulated waters could not be accomplished within 24 hours.

(a) The permittee shall have available at all times at least one portable pump (dedicated to the hazardous waste management units) and necessary appurtenances (e.g., hoses) for use in removing liquids from the containment systems. For hazardous waste container management units where ignitable wastes are stored, these pumps shall be of a type that will not generate heat or sparks that might result in ignitable vapors and shall be maintained in proper working order.

(b) The permittee shall determine if the collected materials are hazardous wastes in accordance with Rule 0400-12-01-.03(1)(b). Unless the permittee can demonstrate in accordance with Rule 0400-12-01-.02(1)(c)4 that the collected material removed from the containment system is not a hazardous waste, the permittee becomes a generator of hazardous waste and shall manage it in accordance with applicable requirements of Rules 0400-12-01-.03 through 0400-12-01-.10.

G. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTE

The permittee shall not locate containers holding ignitable or reactive waste within 15 meters (50 feet) of the facility's property line.

H. SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTES

The permittee must ensure that:

1. Incompatible wastes, or incompatible wastes and materials, are not placed into the same container, unless Paragraph III.H.3 is complied with.

2. Hazardous wastes are not placed in an unwashed container that previously held an incompatible waste or material.

   (Comment: As required by Rule 0400-12-01-.06(2)(d) the waste analysis plan requires wastes analyses, trial tests or other documentation to assure compliance place the results of each waste analysis and trial test, and any documented information, in the operating record of the facility.)

3. A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments is separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

   (Comment: The purpose of this part is to prevent fires, explosions, gaseous emission, leaching, or other discharge of hazardous waste or hazardous waste

constituents which could result from the mixing of incompatible wastes or materials if containers break or leak.)

I. CLOSURE OF THE CONTAINER MANAGEMENT UNIT(S)

1. At closure, the permittee shall remove all hazardous waste and hazardous waste residues from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with hazardous waste or hazardous waste residues shall be decontaminated or removed. Closure shall be accomplished in accordance with Attachment 7, Closure Plan.

2. At closure, as throughout the operating period, unless the permittee can demonstrate, in accordance with Rule 0400-12-01-.02(1)(c)4, that the wastes removed from the containment system is not a hazardous waste, the permittee becomes a generator of hazardous waste and shall manage it in accordance with all applicable requirements of Rule Chapter 0400-12-01-.03. through .07 and .09. See Subsection II.L for additional requirement regarding closure.

J. AIR EMISSION STANDARDS

The permittee shall manage all hazardous waste placed in containers in accordance with the applicable requirements of Rules 0400-12-01-.06(30), (31), and (32).

IV. SPECIFIC CONDITIONS FOR PHYSICAL AND CHEMICAL TREATMENT

A. WASTE IDENTIFICATION

The permittee may treat hazardous wastes at the TRU Waste Processing Center (TWPC) as described in Attachment 9, subject to the terms of this permit:

1. Wastes as listed in Attachment 1.

2. The maximum quantity of hazardous waste treated through:

Unit Identification	Capacity
T-1 - Macroencapsulation	9,350 gallons per year
T-2 - Amalgamation Treatment (in glove box, hot cell, CPE, or box breakdown area)	10 pounds per hour
T-3 - Solidification/Stabilization Treatment (in glove box, hot cell, CPE, or box breakdown area)	50 gallons of liquid per hour 55-gallon drum of material requiring stabilization in 24 hours
T-4 - Groundwater Absorption	825 gallons per 24 hours
T-5 - Size Reduction	2,255 gallons per 24 hours
T-6 - Groundwater Filtration	5,000 gallons per year
T-7 - Neutralization	5 gallons per 24 hours
T-8 - Oxidation/Deactivation	2.2 pounds in 24 hours
T-9 - Puncturing Potentially Pressurized Containers	55 gallons in 24 hours

B. GENERAL OPERATING REQUIREMENTS

1. Physical and chemical treatment of hazardous waste must comply with Rule 0400-12-01-.06(2)(h)2.

2. Hazardous wastes or treatment reagents must not be placed in the treatment process or equipment if they could cause the treatment process or equipment to rupture, leak, corrode, or otherwise fail before the end of its intended life.

3. Where hazardous waste is continuously fed into a treatment process or equipment, the process or equipment must be equipped with a means to stop this inflow (e.g., a waste feed cut-off system or by-pass system to a standby containment device).

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C. WASTE ANALYSIS AND TRIAL TESTS

1. In addition to the waste analysis required by Rule 0400-12-01-.06(2)(d), whenever a hazardous waste which is substantially different from waste previously treated in a treatment process or equipment at the facility is to be treated in that process or equipment or whenever a substantially different process from any previously used at the facility is to be used chemically to treat hazardous waste, before treating the different waste or using the different process or equipment, the permittee must:

   (a) Conduct waste analyses and trial treatment tests (e.g., bench scale or pilot plant scale tests); or

   (b) Obtain written, documented information on similar treatment of similar waste under similar operating conditions to show that this proposed treatment will meet all applicable requirements of Paragraphs IV.B.1 and IV.B.2 above.

2. The permittee must place the results from each waste analysis, or the documented information, in the operating record of the facility.

D. INSPECTIONS

1. The permittee must inspect and document, where present:

   (a) Discharge control and safety equipment (e.g., waste feed cut-off systems, by-pass systems, drainage systems, and pressure relief systems) at least once each day when waste is present, to ensure that it is in good working order;

   (b) Data gathered from monitoring equipment (e.g., pressure and treatment gauges) at least once each operating day, to ensure that the treatment process or equipment is being operated according to its design;

   (c) The construction materials of the treatment process or equipment, at least once each day when waste is present, to detect corrosion or leaking of fixtures or seams; and

   (d) The construction materials of, and the area immediately surrounding, discharge confinement structures (e.g., dikes), at least weekly, to detect erosion or obvious signs of leakage (e.g., wet spots or dead vegetation).

   These inspection items must be recorded in the inspection logs in Attachment 4.3.

2. The permittee shall install, maintain, calibrate, and operate equipment which monitors and records operating parameters. The permittee shall record the results of the required monitoring in the operating record.

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3. The permittee shall maintain a copy of the manufacturer's literature pertaining to installation, maintenance, operation, and calibration for all equipment in the operating record. The permittee shall calibrate the equipment in accordance with the manufacturer's recommendation.

4. The permittee shall record and maintain in the operating record all the calibrations, monitoring, and inspections required in this subsection. Written calibration, monitoring, and inspection records shall be a part of the operating record for this permit. At a minimum, the record shall include the following information:

   (a) The date that the calibration, monitoring, and inspection was completed;

   (b) The piece of equipment or instrumentation calibrated, monitored, or inspected, including the part number or other appropriate descriptive identifier;

   (c) The type of calibration, monitoring, or inspection;

   (d) The printed name and signature of the person(s) conducting the calibration, monitoring, or inspection;

   (e) Any other information associated with the calibration, monitoring, or inspection; and

   (f) Any follow-up activity conducted as a result of the calibration, monitoring, or inspection.

5. The operating record must be maintained until closure is completed and certified by a registered professional engineer.

E. CLOSURE

1. At closure all hazardous waste and hazardous waste residues must be removed from treatment processes or equipment, discharge control equipment, decontamination equipment, and discharge confinement structures. All wastes generated must have a waste determination and proper disposal.

F. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTES

1. Ignitable or reactive waste must not be placed in a treatment process or equipment unless:

   (a) The waste is treated, rendered, or mixed before or immediately after placement in the treatment process or equipment so that:

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(i) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under Rule 0400-12-01-.02(3)(b) or (d); and

(ii) Rule 0400-12-01-.06(2)(h)2 is complied with; or

(b) The waste is treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react.

G. SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTES

1. Incompatible wastes, or incompatible wastes and materials, must not be placed in the same treatment process or equipment, unless Rule 0400-12-01-.06(2)(h)2 is complied with.

2. Hazardous wastes are not placed in unwashed treatment equipment which previously held an incompatible waste or material, unless Rule 0400-12-01-.06(2)(h)2 is complied with.

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EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

V. SPECIFIC CONDITIONS FOR CORRECTIVE ACTION

The conditions for continued corrective action of solid waste management units (SWMUs) and areas of concern (AOCs) at the DOE Oak Ridge Reservation (ORR) are addressed in Corrective Action Permit Number TNHW-164, which was issued on September 15, 2015, for the three major complexes located on the ORR: the East Tennessee Technology Park (ETTP), the Oak Ridge National Laboratory (ORNL), and the Y-12 National Security Complex (Y-12). Please note that the Corrective Action Permit Number TNHW-164 will change if the Corrective Action Permit is renewed and the new Corrective Action Permit Number then applies. The Corrective Action Permit requires the permittees to conduct corrective action for any releases of hazardous waste or hazardous constituents in accordance with the conditions of the corrective action permit. Details, procedures, and schedules that the permittee must follow for reporting the discovery of newly identified SWMUs and AOCs and newly discovered releases from existing SWMUs or AOCs are included in the Corrective Action Permit.

Should any conflict of the standard or general facility conditions exist between this permit and the Corrective Action Permit, precedence shall be given to the permit to which a specific condition applies.

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EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

VI. SCHEDULE OF COMPLIANCE

WAIVERS

In the event that any waiver(s) granted per Tennessee Rule 0400-12 01-.06(1)(d) including the waiver standards or other procedures have changed or no longer apply, the permittee must notify the Division and request a modification to the permit. The permittee must submit descriptions necessary to meet the above rule(s) waiver.

Any waiver(s) granted per Tennessee Rule 0400-12 01-.06(1)(d) in this permit including the waiver standard(s) or other equivalent procedure(s) or mechanism(s) utilized are effective for a period of five years from the effective date of this permit. To renew the waiver(s) the permittee must reapply for the waiver under the above rule providing documentation that the conditions for the waiver granted still apply or request a new waiver, if applicable. Once the request for a new waiver is submitted in a timely manner with sufficient documentation, the existing waiver does not expire until the new waiver is issued.

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EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

ATTACHMENT 1: HAZARDOUS WASTES TO BE MANAGED

The hazardous waste codes listed below can be stored at the facility:

EPA Hazardous Waste Code	Contaminant	Hazard	Basis
D001	Ignitable Waste	Ignitability	Characteristic
D002	Corrosive Waste	Corrosivity	Characteristic
D003	Reactive Waste	Reactivity	Characteristic
D004	Arsenic	Toxicity	Characteristic
D005	Barium	Toxicity	Characteristic
D006	Cadmium	Toxicity	Characteristic
D007	Chromium	Toxicity	Characteristic
D008	Lead	Toxicity	Characteristic
D009	Mercury	Toxicity	Characteristic
D010	Selenium	Toxicity	Characteristic
D011	Silver	Toxicity	Characteristic
D012	Endrin	Toxicity	Characteristic
D013	Lindane	Toxicity	Characteristic
D014	Methoxychlor	Toxicity	Characteristic
D015	Toxaphene	Toxicity	Characteristic
D016	2,4-D	Toxicity	Characteristic
D017	2,4,5-TP (Silvex)	Toxicity	Characteristic
D018	Benzene	Toxicity	Characteristic
D019	Carbon tetrachloride	Toxicity	Characteristic
D020	Chlordane	Toxicity	Characteristic
D021	Chlorobenzene	Toxicity	Characteristic
D022	Chloroform	Toxicity	Characteristic
D023	o-Cresol	Toxicity	Characteristic
D024	m-Cresol	Toxicity	Characteristic
D025	p-Cresol	Toxicity	Characteristic
D026	Cresol	Toxicity	Characteristic
D027	1,4-Dichlorobenzene	Toxicity	Characteristic
D028	1,2-Dichloroethane	Toxicity	Characteristic
D029	1,1-Dichloroethylene	Toxicity	Characteristic
D030	2,4-Dinitrotoluene	Toxicity	Characteristic

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Contaminant	Hazard	Basis
D031	Heptachlor (and its epoxide)	Toxicity	Characteristic
D032	Hexachlorobenzene	Toxicity	Characteristic
D033	Hexachlorobutadiene	Toxicity	Characteristic
D034	Hexachloroethane	Toxicity	Characteristic
D035	Methyl ethyl ketone	Toxicity	Characteristic
D036	Nitrobenzene	Toxicity	Characteristic
D037	Pentachlorophenol	Toxicity	Characteristic
D038	Pyridine	Toxicity	Characteristic
D039	Tetrachloroethylene	Toxicity	Characteristic
D040	Trichloroethylene	Toxicity	Characteristic
D041	2,4,5-Trichlorophenol	Toxicity	Characteristic
D042	2,4,6-Trichlorophenol	Toxicity	Characteristic
D043	Vinyl chloride	Toxicity	Characteristic

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	Toxic	Listed Waste
F002	The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	Toxic	Listed Waste
F003	The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	Ignitable	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
F004	The following spent non-halogenated solvents: Cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	Toxic	Listed Waste
F005	The following spent non-halogenated solvents: Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	Ignitable, Toxic	Listed Waste
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.	Toxic	Listed Waste
F007	Spent cyanide plating bath solutions from electroplating operations.	Reactive, Toxic	Listed Waste
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	Reactive, Toxic	Listed Waste
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	Reactive, Toxic	Listed Waste
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	Reactive, Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	Reactive, Toxic	Listed Waste
F012	Quenching waste water treatment sludges from metal heat treating operations where cyanides are used in the process.	Toxic	Listed Waste
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process.	Toxic	Listed Waste
F020	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.)	Acute Hazardous	Listed Waste
F021	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.	Acute Hazardous	Listed Waste
F022	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions.	Acute Hazardous	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
F023	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol.)	Acute Hazardous	Listed Waste
F024	Process wastes, including but not limited to, distillation residues, heavy ends, tars, and reactor clean-out wastes, from the production of certain chlorinated aliphatic hydrocarbons by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution. (This listing does not include wastewaters, wastewater treatment sludges, spent catalysts, and wastes listed in Tennessee Rule 1200-01-11-.02(4)(b) or (c).)	Toxic	Listed Waste
F025	Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.	Toxic	Listed Waste
F026	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	Acute Hazardous	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing Hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.)	Acute Hazardous	Listed Waste
F028	Residues resulting from the incineration or thermal treatment of soil contaminated with Hazardous Waste Codes F020, F021, F022, F023, F026, and F027.	Toxic	Listed Waste
F032	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use or have previously used chlorophenolic formulations (except potentially cross-contaminated wastes that have had the F032 waste code deleted in accordance with Tennessee Rule 1200-01-11-.02(4)(f) or potentially cross-contaminated wastes that are otherwise currently regulated as hazardous wastes (i.e., F034 or F035), and where the generator does not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	Toxic	Listed Waste
F034	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
F035	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	Toxic	Listed Waste
F037	Petroleum refinery primary oil/water/solids separation sludge-Any sludge generated from the gravitational separation of oil/water/solids during the storage or treatment of process wastewaters and oily cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in: oil/water/solids separators; tanks and impoundments; ditches and other conveyances; sumps; and stormwater units receiving dry weather flow. Sludge generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges generated in aggressive biological treatment units as defined in Tennessee Rule 0400-01-11-.02(4)(b)2(ii) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and K051 wastes are not included in this listing. This listing does include residuals generated from processing or recycling oil-bearing hazardous secondary materials excluded under Tennessee Rule 0400-01-11-.02(1)(d)1(xii)(I), if those residuals are to be disposed of.	Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
F038	Petroleum refinery secondary (emulsified) oil/water/solids separation sludge-Any sludge and/or float generated from the physical and/or chemical separation of oil/water/solids in process wastewaters and oily cooling wastewaters from petroleum refineries. Such wastes include, but are not limited to, all sludges and floats generated in: induced air flotation (IAF) units, tanks and impoundments, and all sludges generated in DAF units. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges and floats generated in aggressive biological treatment units as defined in Tennessee Rule 0400-01-11-.02(4)(b)2(ii) (including sludges and floats generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and F037, K048, and K051 wastes are not included in this listing. This listing does include residuals generated from processing or recycling oil-bearing hazardous secondary materials excluded under Tennessee Rule 0400-01-11-.02(1)(d)1(xii)(I), if those residuals are to be disposed of.	Toxic	Listed Waste
F039	Leachate (liquids that have percolated through land disposed wastes) resulting from the disposal of more than one restricted waste classified as hazardous under Tennessee Rule 1200-01-11-.02(4). (Leachate resulting from the disposal of one or more of the following Hazardous Wastes and no other Hazardous Wastes retains its Hazardous Waste Code(s): F020, F021, F022, F026, F027, and/or F028.)	Toxic	Listed Waste

HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K001	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.	Toxic	Listed Waste
K002	Wastewater treatment sludge from the production of chrome yellow and orange pigments.	Toxic	Listed Waste
K003	Wastewater treatment sludge from the production of molybdate orange pigments.	Toxic	Listed Waste
K004	Wastewater treatment sludge from the production of zinc yellow pigments.	Toxic	Listed Waste
K005	Wastewater treatment sludge from the production of chrome green pigments.	Toxic	Listed Waste
K006	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).	Toxic	Listed Waste
K007	Wastewater treatment sludge from the production of iron blue pigments.	Toxic	Listed Waste
K008	Oven residue from the production of chrome oxide green pigments.	Toxic	Listed Waste
K009	Distillation bottoms from the production of acetaldehyde from ethylene.	Toxic	Listed Waste
K010	Distillation side cuts from the production of acetaldehyde from ethylene.	Toxic	Listed Waste
K011	Bottom stream from the wastewater stripper in the production of acrylonitrile.	Reactive, Toxic	Listed Waste
K013	Bottom stream from the acetonitrile column in the production of acrylonitrile.	Reactive, Toxic	Listed Waste
K014	Bottoms from the acetonitrile purification column in the production of acrylonitrile.	Toxic	Listed Waste
K015	Still bottoms from the distillation of benzyl chloride.	Toxic	Listed Waste
K016	Heavy ends or distillation residues from the production of carbon tetrachloride.	Toxic	Listed Waste
K017	Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.	Toxic	Listed Waste
K018	Heavy ends from the fractionation column in ethyl chloride production.	Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K019	Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.	Toxic	Listed Waste
K020	Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.	Toxic	Listed Waste
K021	Aqueous spent antimony catalyst waste from fluoromethanes production.	Toxic	Listed Waste
K022	Distillation bottom tars from the production of phenol/acetone from cumene.	Toxic	Listed Waste
K023	Distillation light ends from the production of phthalic anhydride from naphthalene.	Toxic	Listed Waste
K024	Distillation bottoms from the production of phthalic anhydride from naphthalene.	Toxic	Listed Waste
K025	Distillation bottoms from the production of nitrobenzene by the nitration of benzene.	Toxic	Listed Waste
K026	Stripping still tails from the production of methyl ethyl pyridines.	Toxic	Listed Waste
K027	Centrifuge and distillation residues from toluene diisocyanate production.	Reactive, Toxic	Listed Waste
K028	Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.	Toxic	Listed Waste
K029	Waste from the product steam stripper in the production of 1,1,1-trichloroethane.	Toxic	Listed Waste
K030	Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.	Toxic	Listed Waste
K031	By-product salts generated in the production of MSMA and cacodylic acid.	Toxic	Listed Waste
K032	Wastewater treatment sludge from the production of chlordane.	Toxic	Listed Waste
K033	Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.	Toxic	Listed Waste
K034	Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane.	Toxic	Listed Waste
K035	Wastewater treatment sludges generated in the production of creosote.	Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K036	Still bottoms from toluene reclamation distillation in the production of disulfoton.	Toxic	Listed Waste
K037	Wastewater treatment sludges from the production of disulfoton.	Toxic	Listed Waste
K038	Wastewater from the washing and stripping of phorate production.	Toxic	Listed Waste
K039	Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate.	Toxic	Listed Waste
K040	Wastewater treatment sludge from the production of phorate.	Toxic	Listed Waste
K041	Wastewater treatment sludge from the production of toxaphene.	Toxic	Listed Waste
K042	Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.	Toxic	Listed Waste
K043	2,6-Dichlorophenol waste from the production of 2,4-D	Toxic	Listed Waste
K044	Wastewater treatment sludges from the manufacturing and processing of explosives.	Reactive	Listed Waste
K045	Spent carbon from the treatment of wastewater containing explosives.	Reactive	Listed Waste
K046	Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.	Toxic	Listed Waste
K047	Pink/red water from TNT operations.	Reactive	Listed Waste
K048	Dissolved air flotation (DAF) float from the petroleum refining industry.	Toxic	Listed Waste
K049	Slop oil emulsion solids from the petroleum refining industry.	Toxic	Listed Waste
K050	Heat exchanger bundle cleaning sludge from the petroleum refining industry.	Toxic	Listed Waste
K051	API separator sludge from the petroleum refining industry.	Toxic	Listed Waste
K052	Tank bottoms (leaded) from the petroleum refining industry.	Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K060	Ammonia still lime sludge from coking operations.	Toxic	Listed Waste
K061	Emission control dust/sludge from the primary production of steel in electric furnaces.	Toxic	Listed Waste
K062	Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (SIC Codes 331 and 332).	Corrosive, Toxic	Listed Waste
K069	Emission control dust/sludge from secondary lead smelting. (Note: This listing is stayed administratively for sludge generated from secondary acid scrubber systems. The stay will remain in effect until further administrative action is taken. If EPA takes further action effecting this stay, EPA will publish a notice of the action in the Federal Register).	Toxic	Listed Waste
K071	Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.	Toxic	Listed Waste
K073	Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.	Toxic	Listed Waste
K083	Distillation bottoms from aniline production.	Toxic	Listed Waste
K084	Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.	Toxic	Listed Waste
K085	Distillation or fractionation column bottoms from the production of chlorobenzenes.	Toxic	Listed Waste
K086	Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.	Toxic	Listed Waste
K087	Decanter tank tar sludge from coking operations.	Toxic	Listed Waste
K088	Spent potliners from primary aluminum reduction.	Toxic	Listed Waste
K093	Distillation light ends from the production of phthalic anhydride from ortho-xylene.	Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K094	Distillation bottoms from the production of phthalic anhydride from ortho-xylene.	Toxic	Listed Waste
K095	Distillation bottoms from the production of 1,1,1-trichloroethane.	Toxic	Listed Waste
K096	Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.	Toxic	Listed Waste
K097	Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.	Toxic	Listed Waste
K098	Untreated process wastewater from the production of toxaphene.	Toxic	Listed Waste
K099	Untreated wastewater from the production of 2,4-D.	Toxic	Listed Waste
K100	Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.	Toxic	Listed Waste
K101	Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.	Toxic	Listed Waste
K102	Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.	Toxic	Listed Waste
K103	Process residues from aniline extraction from the production of aniline.	Toxic	Listed Waste
K104	Combined wastewater streams generated from nitrobenzene/aniline production.	Toxic	Listed Waste
K105	Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.	Toxic	Listed Waste
K106	Wastewater treatment sludge from the mercury cell process in chlorine production.	Toxic	Listed Waste
K107	Column bottoms from product separation from the production of 1,1-dimethyl-hydrazine (UDMH) from carboxylic acid hydrazines.	Corrosive, Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K108	Condensed column overheads from product separation and condensed reactor vent gases from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.	Ignitable, Toxic	Listed Waste
K109	Spent filter cartridges from product purification from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.	Toxic	Listed Waste
K110	Condensed column overheads from intermediate separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.	Toxic	Listed Waste
K111	Product washwaters from the production of dinitrotoluene via nitration of toluene.	Corrosive, Toxic	Listed Waste
K112	Reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.	Toxic	Listed Waste
K113	Condensed liquid light ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	Toxic	Listed Waste
K114	Vicinals from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	Toxic	Listed Waste
K115	Heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	Toxic	Listed Waste
K116	Organic condensate from the solvent recovery column in the production of toluene diisocyanate via phosgenation of toluenediamine.	Toxic	Listed Waste
K117	Wastewater from the reactor vent gas scrubber in the production of ethylene dibromide via bromination of ethene.	Toxic	Listed Waste
K118	Spent adsorbent solids from purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.	Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K123	Process wastewater (including supernates, filtrates, and washwaters) from the production of ethylenebisdithiocarbamic acid and its salt.	Toxic	Listed Waste
K124	Reactor vent scrubber water from the production of ethylenebisdithiocarbamic acid and its salts.	Corrosive, Toxic	Listed Waste
K125	Filtration, evaporation, and centrifugation solids from the production of ethylenebisdithiocarbamic acid and its salts.	Toxic	Listed Waste
K126	Baghouse dust and floor sweepings in milling and packaging operations from the production or formulation of ethylenebisdithiocarbamic acid and its salts.	Toxic	Listed Waste
K131	Wastewater from the reactor and spent sulfuric acid from the acid dryer from the production of methyl bromide.	Corrosive, Toxic	Listed Waste
K132	Spent absorbent and wastewater separator solids from the production of methyl bromide.	Toxic	Listed Waste
K136	Still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.	Toxic	Listed Waste
K141	Process residues from the recovery of coal tar, including, but not limited to, collecting sump residues from the production of coke from coal or the recovery of coke by-products produced from coal. This listing does not include K087 (decanter tank tar sludges from coking operations).	Toxic	Listed Waste
K142	Tar storage tank residues from the production of coke from coal or from the recovery of coke by-products produced from coal.	Toxic	Listed Waste
K143	Process residues from the recovery of light oil, including, but not limited to, those generated in stills, decanters, and wash oil recovery units from the recovery of coke by-products produced from coal.	Toxic	Listed Waste
K144	Wastewater sump residues from light oil refining, including, but not limited to, intercepting or contamination sump sludges from the recovery of coke by-products produced from coal.	Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K145	Residues from naphthalene collection and recovery operations from the recovery of coke by-products produced from coal.	Toxic	Listed Waste
K147	Tar storage tank residues from coal tar refining.	Toxic	Listed Waste
K148	Residues from coal tar distillation, including but not limited to, still bottoms.	Toxic	Listed Waste
K149	Distillation bottoms from the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups, (This waste does not include still bottoms from the distillation of benzyl chloride.).	Toxic	Listed Waste
K150	Organic residuals, excluding spent carbon adsorbent, from the spent chlorine gas and hydrochloric acid recovery processes associated with the production of alpha- (or methyl-) chlorinated toluenes, ringchlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups.	Toxic	Listed Waste
K151	Wastewater treatment sludges, excluding neutralization and biological sludges, generated during the treatment of wastewaters from the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups.	Toxic	Listed Waste
K156	Organic waste (including heavy ends, still bottoms, light ends, spent solvents, filtrates, and decantates) from the production of carbamates and carbamoyl oximes. (This listing does not apply to wastes generated from the manufacture of 3-iodo-2-propynyl n-butylcarbamate.)	Toxic	Listed Waste
K157	Wastewaters (including scrubber waters, condenser waters, washwaters, and separation waters) from the production of carbamates and carbamoyl oximes. (This listing does not apply to wastes generated from the manufacture of 3-iodo-2-propynyl n-butylcarbamate.)	Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K158	Bag house dusts and filter/separation solids from the production of carbamates and carbamoyl oximes. (This listing does not apply to wastes generated from the manufacture of 3-iodo-2-propynyl n-butylcarbamate.)	Toxic	Listed Waste
K159	Organics from the treatment of thiocarbamate wastes.	Toxic	Listed Waste
K161	Purification solids (including filtration, evaporation, and centrifugation solids), bag house dust and floor sweepings from the production of dithiocarbamate acids and their salts. (This listing does not include K125 or K126.)	Reactive, Toxic	Listed Waste
K169	Crude oil storage tank sediment from petroleum refining operations.	Toxic	Listed Waste
K170	Clarified slurry oil tank sediment and/or in-line filter/separation solids from petroleum refining operations.	Toxic	Listed Waste
K171	Spent Hydrotreating catalyst from petroleum refining operations, including guard beds used to desulfurize feeds to other catalytic reactors (this listing does not include inert support media).	Ignitable, Toxic	Listed Waste
K172	Spent Hydrorefining catalyst from petroleum refining operations, including guard beds used to desulfurize feeds to other catalytic reactors (this listing does not include inert support media).	Ignitable, Toxic	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K174	Wastewater treatment sludges from the production of ethylene dichloride or vinyl chloride monomer (including sludges that result from commingled ethylene dichloride or vinyl chloride monomer wastewater and other wastewater), unless the sludges meet the following conditions: (i) they are disposed of in a Subtitle C or nonhazardous landfill licensed or permitted by the state or federal government; (ii) they are not otherwise placed on the land prior to final disposal; and (iii) the generator maintains documentation demonstrating that the waste was either disposed of in an on-site landfill or consigned to a transporter or disposal facility that provided a written commitment to dispose of the waste in an off-site landfill. Respondents in any action brought to enforce the requirements of Subtitle C must, upon a showing by the government that the respondent managed wastewater treatment sludges from the production of vinyl chloride monomer or ethylene dichloride, demonstrate that they meet the terms of the exclusion set forth above. In doing so, they must provide appropriate documentation (e.g., contracts between the generator and the landfill owner/operator, invoices documenting delivery of waste to landfill, etc.) that the terms of the exclusion were met.	Toxic	Listed Waste
K175	Wastewater treatment sludges from the production of vinyl chloride monomer using mercuric chloride catalyst in an acetylene-based process.	Toxic	Listed Waste
K176	Baghouse filters from the production of antimony oxide, including filters from the production of intermediates (e.g., antimony metal or crude antimony oxide).	Toxicity Characteristic Waste	
K177	Slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide).	Toxic	Listed Waste

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EPA Hazardous Waste Code	Hazardous Waste	Hazard	Basis
K178	Residues from manufacturing and manufacturing-site storage of ferric chloride from acids formed during the production of titanium dioxide using the chloride-ilmenite process.	Toxic	Listed Waste
K181	Nonwastewaters from the production of dyes and/or pigments (including nonwastewaters commingled at the point of generation with nonwastewaters from other processes) that, at the point of generation, contain mass loadings of any of the constituents identified in part 3 of this subparagraph that are equal to or greater than the corresponding part 3 levels, as determined on a calendar year basis. These wastes will not be hazardous if the nonwastewaters are: (i) disposed in a Subtitle D landfill unit subject to the design criteria in 40 CFR 258.40, (ii) disposed in a Subtitle C landfill unit subject to either Rule 0400-12-01-.06(14)(b) or Rule 0400-12-01-.05(14)(b); (iii) disposed in other Subtitle D landfill units that meet the design criteria in 40 CFR 258.40, Rule 0400-12-01-.06(14)(b), or Rule 0400-12-01-.05(14)(b); or (iv) treated in a combustion unit that is permitted under Subtitle C, or an onsite combustion unit that is permitted under the Clean Air Act. For the purposes of this listing, dyes and/or pigments production is defined in subpart 2(i) of this subparagraph. Part 4 of this subparagraph describes the process for demonstrating that a facility's nonwastewaters are not K181. This listing does not apply to wastes that are otherwise identified as hazardous under subparagraphs (b) through (e) of paragraph (3) of this rule and subparagraphs (b) through (d) of paragraph (4) of this rule at the point of generation. Also, the listing does not apply to wastes generated before any annual mass loading limit is met.	Toxic	Listed Waste

HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
P001	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3% Warfarin, & salts, when present at concentrations greater than 0.3%	Acute Toxicity	Listed Waste
P002	Acetamide, N-(aminothioxomethyl)-1-Acetyl-2-thiourea	Acute Toxicity	Listed Waste
P003	Acrolein	Acute Toxicity	Listed Waste
	2-Propenal		
P004	Aldrin	Acute Toxicity	Listed Waste
	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a,-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-		
P005	Allyl alcohol	Acute Toxicity	Listed Waste
	2-Propen-1-ol		
P006	Aluminum phosphide	Reactivity, Toxicity	Listed Waste
P007	5-(Aminomethyl)-3-isoxazolol	Acute Toxicity	Listed Waste
	3(2H)-Isoxazolone, 5-(aminomethyl)-		
P008	4-Aminopyridine	Acute Toxicity	Listed Waste
	4-Pyridinamine		
P009	Ammonium picrate	Reactivity	Listed Waste
	Phenol, 2,4,6-trinitro-, ammonium salt		
P010	Arsenic acid H_3AsO_4	Acute Toxicity	Listed Waste
P011	Arsenic oxide As_2O_5	Acute Toxicity	Listed Waste
	Arsenic pentoxide		
P012	Arsenic oxide As_2O_3	Acute Toxicity	Listed Waste
	Arsenic trioxide		
P013	Barium cyanide	Acute Toxicity	Listed Waste
P014	Benzenethiol	Acute Toxicity	Listed Waste
	Thiophenol		
P015	Beryllium powder	Acute Toxicity	Listed Waste
P016	Dichloromethyl ether	Acute Toxicity	Listed Waste
	Methane, oxybis[chloro-		

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
P017	Bromoacetone 2-Propanone, 1-bromo-	Acute Toxicity	Listed Waste
P018	Brucine Strychnidin-10-one, 2,3-dimethoxy-	Acute Toxicity	Listed Waste
P020	Dinoseb Phenol, 2-(1-methylpropyl)-4,6-dinitro-	Acute Toxicity	Listed Waste
P021	Calcium cyanide Calcium cyanide $Ca(CN)_2$	Acute Toxicity	Listed Waste
P022	Carbon disulfide	Acute Toxicity	Listed Waste
P023	Acetaldehyde, chloro- Chloroacetaldehyde	Acute Toxicity	Listed Waste
P024	Benzenamine, 4-chloro- p-Chloroaniline	Acute Toxicity	Listed Waste
P026	1-(o-Chlorophenyl)thiourea Thiourea, (2-chlorophenyl)-	Acute Toxicity	Listed Waste
P027	3-Chloropropionitrile Propanenitrile, 3-chloro-	Acute Toxicity	Listed Waste
P028	Benzene, (chloromethyl)- Benzyl chloride	Acute Toxicity	Listed Waste
P029	Copper cyanide Copper cyanide Cu(CN)	Acute Toxicity	Listed Waste
P030	Cyanides (soluble cyanide salts), not otherwise specified	Acute Toxicity	Listed Waste
P031	Cyanogen Ethanedinitrile	Acute Toxicity	Listed Waste
P033	Cyanogen chloride Cyanogen chloride (CN)Cl	Acute Toxicity	Listed Waste
P034	2-Cyclohexyl-4,6-dinitrophenol Phenol, 2-cyclohexyl-4,6-dinitro-	Acute Toxicity	Listed Waste
P036	Arsonous dichloride, phenyl- Dichlorophenylarsine	Acute Toxicity	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
P037	Dieldrin 2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta, 7aalpha)-	Acute Toxicity	Listed Waste
P038	Arsine, diethyl- Diethylarsine	Acute Toxicity	Listed Waste
P039	Disulfoton Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	Acute Toxicity	Listed Waste
P040	O,O-Diethyl O-pyrazinyl phosphorothioate Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	Acute Toxicity	Listed Waste
P041	Diethyl-p-nitrophenyl phosphate Phosphoric acid, diethyl 4-nitrophenyl ester	Acute Toxicity	Listed Waste
P042	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)- Epinephrine	Acute Toxicity	Listed Waste
P043	Diisopropylfluorophosphate (DFP) Phosphorofluoridic acid, bis(1-methylethyl) ester	Acute Toxicity	Listed Waste
P044	Dimethoate Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	Acute Toxicity	Listed Waste
P045	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[(methylamino)carbonyl] oxime Thiofanox	Acute Toxicity	Listed Waste
P046	Benzeneethanamine, alpha,alpha-dimethyl- alpha,alpha-Dimethylphenethylamine	Acute Toxicity	Listed Waste
P047	4,6-Dinitro-o-cresol, & salts Phenol, 2-methyl-4,6-dinitro-, & salts	Acute Toxicity	Listed Waste
P048	2,4-Dinitrophenol Phenol, 2,4-dinitro-	Acute Toxicity	Listed Waste
P049	Dithiobiuret Thioimidodicarbonic diamide $[(H_2N)C(S)]_2NH$	Acute Toxicity	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
P050	Endosulfan	Acute Toxicity	Listed Waste
	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10- hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide		
P051	2,7:3,6-Dimethanonaphth [2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta, 7aalpha)-, & metabolites	Acute Toxicity	Listed Waste
	Endrin		
	Endrin, & metabolites		
P054	Aziridine	Acute Toxicity	Listed Waste
	Ethyleneimine		
P056	Fluorine	Acute Toxicity	Listed Waste
P057	Acetamide, 2-fluoro-	Acute Toxicity	Listed Waste
	Fluoroacetamide		
P058	Acetic acid, fluoro-, sodium salt	Acute Toxicity	Listed Waste
	Fluoroacetic acid, sodium salt		
P059	Heptachlor	Acute Toxicity	Listed Waste
	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-		
P060	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-	Acute Toxicity	Listed Waste
	Isodrin		
P062	Hexaethyl tetraphosphate	Acute Toxicity	Listed Waste
	Tetraphosphoric acid, hexaethyl ester		
P063	Hydrocyanic acid	Acute Toxicity	Listed Waste
	Hydrogen cyanide		
P064	Methane, isocyanato-	Acute Toxicity	Listed Waste
	Methyl isocyanate		
P065	Fulminic acid, mercury(2+) salt	Reactivity, Toxicity	Listed Waste
	Mercury fulminate		

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
P066	Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester	Acute Toxicity	Listed Waste
	Methomyl		
P067	Aziridine, 2-methyl-	Acute Toxicity	Listed Waste
	1,2-Propylenimine		
P068	Hydrazine, methyl-	Acute Toxicity	Listed Waste
	Methyl hydrazine		
P069	2-Methyllactonitrile	Acute Toxicity	Listed Waste
	Propanenitrile, 2-hydroxy-2-methyl-		
P070	Aldicarb	Acute Toxicity	Listed Waste
	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime		
P071	Methyl parathion	Acute Toxicity	Listed Waste
	Phosphorothioic acid, O,O,-dimethyl O-(4-nitrophenyl) ester		
P072	alpha-Naphthylthiourea	Acute Toxicity	Listed Waste
	Thiourea, 1-naphthalenyl-		
P073	Nickel carbonyl	Acute Toxicity	Listed Waste
	Nickel carbonyl $Ni(CO)_4$, (T-4)-		
P074	Nickel cyanide	Acute Toxicity	Listed Waste
	Nickel cyanide $Ni(CN)_2$		
P075	Nicotine, & salts	Acute Toxicity	Listed Waste
	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts		
P076	Nitric oxide	Acute Toxicity	Listed Waste
	Nitrogen oxide NO		
P077	Benzenamine, 4-nitro-	Acute Toxicity	Listed Waste
	p-Nitroaniline		
P078	Nitrogen dioxide	Acute Toxicity	Listed Waste
	Nitrogen oxide NO_2		
P081	Nitroglycerine	Reactivity	Listed Waste
	1,2,3-Propanetriol, trinitrate		
P082	Methanamine, N-methyl-N-nitroso-	Acute Toxicity	Listed Waste
	N-Nitrosodimethylamine		
P084	N-Nitrosomethylvinylamine	Acute Toxicity	Listed Waste
	Vinylamine, N-methyl-N-nitroso-		

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EPA Hazardous Waste Code	Substance	Hazard	Basis
P085	Diphosphoramide, octamethyl- Octamethylpyrophosphoramide	Acute Toxicity	Listed Waste
P087	Osmium oxide OsO_4, (T-4)- Osmium tetroxide	Acute Toxicity	Listed Waste
P088	Endothall 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	Acute Toxicity	Listed Waste
P089	Parathion Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	Acute Toxicity	Listed Waste
P092	Mercury, (acetato-O)phenyl- Phenylmercury acetate	Acute Toxicity	Listed Waste
P093	Phenylthiourea Thiourea, phenyl-	Acute Toxicity	Listed Waste
P094	Phorate Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	Acute Toxicity	Listed Waste
P095	Carbonic dichloride Phosgene	Acute Toxicity	Listed Waste
P096	Hydrogen phosphide Phosphine	Acute Toxicity	Listed Waste
P097	Famphur Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester	Acute Toxicity	Listed Waste
P098	Potassium cyanide Potassium cyanide K(CN)	Acute Toxicity	Listed Waste
P099	Argentate(1-), bis(cyano-C)-, potassium Potassium silver cyanide	Acute Toxicity	Listed Waste
P101	Ethyl cyanide Propanenitrile	Acute Toxicity	Listed Waste
P102	Propargyl alcohol 2-Propyn-1-ol	Acute Toxicity	Listed Waste
P103	Selenourea	Acute Toxicity	Listed Waste
P104	Silver cyanide Silver cyanide Ag(CN)	Acute Toxicity	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
P105	Sodium azide	Acute Toxicity	Listed Waste
P106	Sodium cyanide	Acute Toxicity	Listed Waste
	Sodium cyanide Na(CN)		
P108	Strychnidin-10-one, & salts	Acute Toxicity	Listed Waste
	Strychnine, & salts		
P109	Tetraethyldithiopyrophosphate	Acute Toxicity	Listed Waste
	Thiodiphosphoric acid, tetraethyl ester		
P110	Plumbane, tetraethyl-	Acute Toxicity	Listed Waste
	Tetraethyl lead		
P111	Diphosphoric acid, tetraethyl ester	Acute Toxicity	Listed Waste
	Tetraethyl pyrophosphate		
P112	Methane, tetranitro-	Reactivity	Listed Waste
	Tetranitromethane		
P113	Thallic oxide	Acute Toxicity	Listed Waste
	Thallium oxide Tl_2O_3		
P114	Selenious acid, dithallium(1+) salt	Acute Toxicity	Listed Waste
	Thallium(I) selenite		
P115	Sulfuric acid, dithallium(1+) salt	Acute Toxicity	Listed Waste
	Thallium(I) sulfate		
P116	Hydrazinecarbothioamide	Acute Toxicity	Listed Waste
	Thiosemicarbazide		
P118	Methanethiol, trichloro-	Acute Toxicity	Listed Waste
	Trichloromethanethiol		
P119	Ammonium vanadate	Acute Toxicity	Listed Waste
	Vanadic acid, ammonium salt		
P120	Vanadium oxide V_2O_5	Acute Toxicity	Listed Waste
	Vanadium pentoxide		
P121	Zinc cyanide	Acute Toxicity	Listed Waste
	Zinc cyanide $Zn(CN)_2$		
P122	Zinc phosphide Zn_3P_2, when present at concentrations greater than 10%	Reactivity, Toxicity	Listed Waste
P123	Toxaphene	Acute Toxicity	Listed Waste

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EPA Hazardous Waste Code	Substance	Hazard	Basis
P127	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate	Acute Toxicity	Listed Waste
	Carbofuran		
P128	Mexacarbate	Acute Toxicity	Listed Waste
	Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester)		
P185	1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O-[(methylamino)-carbonyl]oxime	Acute Toxicity	Listed Waste
	Tirpate		
P188	Benzoic acid, 2-hydroxy-, compd. with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a, 8-trimethylpyrrolo[2,3-b]indol-5-yl methylcarbamate ester (1:1)	Acute Toxicity	Listed Waste
	Physostigmine salicylate		
P189	Carbamic acid, [(dibutylamino)- thio]methyl-, 2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester	Acute Toxicity	Listed Waste
	Carbosulfan		
P190	Carbamic acid, methyl-, 3-methylphenyl ester	Acute Toxicity	Listed Waste
	Metolcarb		
P191	Carbamic acid, dimethyl-, 1-[(dimethyl-amino)carbonyl]- 5-methyl-1H-pyrazol-3-yl ester	Acute Toxicity	Listed Waste
	Dimetilan		
P192	Carbamic acid, dimethyl-, 3-methyl-1- (1-methylethyl)-1H- pyrazol-5-yl ester	Acute Toxicity	Listed Waste
	Isolan		
P194	Ethanimidothioc acid, 2-(dimethylamino)-N-[[(methylamino) carbonyl]oxy]-2-oxo-, methyl ester	Acute Toxicity	Listed Waste
	Oxamyl		
P196	Manganese, bis(dimethylcarbamodithioato-S,S')-	Acute Toxicity	Listed Waste
	Manganese dimethyldithiocarbamate		
P197	Formparanate	Acute Toxicity	Listed Waste
	Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[[(methylamino)carbonyl]oxy]phenyl]-		

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EPA Hazardous Waste Code	Substance	Hazard	Basis
P198	Formetanate hydrochloride	Acute Toxicity	Listed Waste
	Methanimidamide, N,N-dimethyl-N'-[3-[[(methylamino)-carbonyl]oxy]phenyl]-, monohydrochloride		
P199	Methiocarb	Acute Toxicity	Listed Waste
	Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate		
P201	Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate	Acute Toxicity	Listed Waste
	Promecarb		
P202	m-Cumenyl methylcarbamate	Acute Toxicity	Listed Waste
	3-Isopropylphenyl N-methylcarbamate		
	Phenol, 3-(1-methylethyl)-, methyl carbamate		
P203	Aldicarb sulfone	Acute Toxicity	Listed Waste
	Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino)carbonyl] oxime		
P204	Physostigmine	Acute Toxicity	Listed Waste
	Pyrrolo[2,3-b]indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3aS-cis)-		
P205	Zinc, bis(dimethylcarbamodithioato-S,S')-	Acute Toxicity	Listed Waste
	Ziram		

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
U001	Acetaldehyde Ethanal	Ignitability	Listed Waste
U002	Acetone 2-Propanone	Ignitability	Listed Waste
U003	Acetonitrile	Ignitability, Toxicity	Listed Waste
U004	Acetophenone Ethanone, 1-phenyl-	Toxicity	Listed Waste
U005	Acetamide, N-9H-fluoren-2-yl- 2-Acetylaminofluorene	Toxicity	Listed Waste
U006	Acetyl chloride	Corrosivity, Reactivity, Toxicity	Listed Waste
U007	Acrylamide 2-Propenamide	Toxicity	Listed Waste
U008	Acrylic acid 2-Propenoic acid	Ignitability	Listed Waste
U009	Acrylonitrile 2-Propenenitrile	Toxicity	Listed Waste
U010	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-,[1aS-(1aalpha, 8beta,8aalpha,8balpha)]- Mitomycin C	Toxicity	Listed Waste
U011	Amitrole 1H-1,2,4-Triazol-3-amine	Toxicity	Listed Waste
U012	Aniline Benzenamine	Ignitability, Toxicity	Listed Waste
U014	Auramine Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-	Toxicity	Listed Waste
U015	Azaserine L-Serine, diazoacetate (ester)	Toxicity	Listed Waste
U016	Benz[c]acridine	Toxicity	Listed Waste
U017	Benzal chloride Benzene, (dichloromethyl)-	Toxicity	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
U018	Benz[a]anthracene	Toxicity	Listed Waste
U019	Benzene	Ignitability, Toxicity	Listed Waste
U020	Benzenesulfonic acid chloride	Corrosivity, Reactivity	Listed Waste
	Benzenesulfonyl chloride		
U021	Benzidine	Toxicity	Listed Waste
	[1,1'-Biphenyl]-4,4'-diamine		
U022	Benzo[a]pyrene	Toxicity	Listed Waste
U023	Benzene, (trichloromethyl)-	Corrosivity, Reactivity, Toxicity	Listed Waste
	Benzotrichloride		
U024	Dichloromethoxy ethane	Toxicity	Listed Waste
	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-		
U025	Dichloroethyl ether	Toxicity	Listed Waste
	Ethane, 1,1'-oxybis[2-chloro-		
U026	Chlornaphazin	Toxicity	Listed Waste
	Naphthalenamine, N,N'-bis(2-chloroethyl)-		
U027	Dichloroisopropyl ether	Toxicity	Listed Waste
	Propane, 2,2'-oxybis[2-chloro-		
U028	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	Toxicity	Listed Waste
	Diethylhexyl phthalate		
U029	Methane, bromo-	Toxicity	Listed Waste
	Methyl bromide		
U030	Benzene, 1-bromo-4-phenoxy-	Toxicity	Listed Waste
	4-Bromophenyl phenyl ether		
U031	1-Butanol	Ignitability	Listed Waste
	n-Butyl alcohol		
U032	Calcium chromate	Toxicity	Listed Waste
	Chromic acid H_2CrO_4, calcium salt		
U033	Carbonic difluoride	Toxicity	Listed Waste
	Carbon oxyfluoride	Reactivity, Toxicity	

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
U034	Acetaldehyde, trichloro- Chloral	Toxicity	Listed Waste
U035	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]- Chlorambucil	Toxicity	Listed Waste
U036	Chlordane, alpha & gamma isomers 4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	Toxicity	Listed Waste
U037	Benzene, chloro- Chlorobenzene	Toxicity	Listed Waste
U038	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester Chlorobenzilate	Toxicity	Listed Waste
U039	p-Chloro-m-cresol Phenol, 4-chloro-3-methyl-	Toxicity	Listed Waste
U041	Epichlorohydrin Oxirane, (chloromethyl)-	Toxicity	Listed Waste
U042	2-Chloroethyl vinyl ether Ethene, (2-chloroethoxy)-	Toxicity	Listed Waste
U043	Ethene, chloro- Vinyl chloride	Toxicity	Listed Waste
U044	Chloroform Methane, trichloro-	Toxicity	Listed Waste
U045	Methane, chloro- Methyl chloride	Ignitability, Toxicity	Listed Waste
U046	Chloromethyl methyl ether Methane, chloromethoxy-	Toxicity	Listed Waste
U047	beta-Chloronaphthalene Naphthalene, 2-chloro-	Toxicity	Listed Waste
U048	o-Chlorophenol Phenol, 2-chloro-	Toxicity	Listed Waste
U049	Benzenamine, 4-chloro-2-methyl-, hydrochloride 4-Chloro-o-toluidine, hydrochloride	Toxicity	Listed Waste
U050	Chrysene	Toxicity	Listed Waste
U051	Creosote	Toxicity	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
U052	Cresol (Cresylic acid) Phenol, methyl-	Toxicity	Listed Waste
U053	2-Butenal Crotonaldehyde	Toxicity	Listed Waste
U055	Benzene, (1-methylethyl)- Cumene	Ignitability	Listed Waste
U056	Benzene, hexahydro- Cyclohexane	Ignitability	Listed Waste
U057	Cyclohexanone	Ignitability	Listed Waste
U058	Cyclophosphamide 2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide	Toxicity	Listed Waste
U059	Daunomycin 5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-	Toxicity	Listed Waste
U060	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro- DDD	Toxicity	Listed Waste
U061	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro- DDT	Toxicity	Listed Waste
U062	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester Diallate	Toxicity	Listed Waste
U063	Dibenz[a,h]anthracene	Toxicity	Listed Waste
U064	Benzo[rst]pentaphene Dibenzo[a,i]pyrene	Toxicity	Listed Waste
U066	1,2-Dibromo-3-chloropropane Propane, 1,2-dibromo-3-chloro-	Toxicity	Listed Waste
U067	Ethane, 1,2-dibromo- Ethylene dibromide	Toxicity	Listed Waste
U068	Methane, dibromo- Methylene bromide	Toxicity	Listed Waste

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EPA Hazardous Waste Code	Substance	Hazard	Basis
U069	1,2-Benzenedicarboxylic acid, dibutyl ester Dibutyl phthalate	Toxicity	Listed Waste
U070	Benzene, 1,2-dichloro- o-Dichlorobenzene	Toxicity	Listed Waste
U071	Benzene, 1,3-dichloro- m-Dichlorobenzene	Toxicity	Listed Waste
U072	Benzene, 1,4-dichloro- p-Dichlorobenzene	Toxicity	Listed Waste
U073	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro- 3,3'-Dichlorobenzidine	Toxicity	Listed Waste
U074	2-Butene, 1,4-dichloro- 1,4-Dichloro-2-butene	Ignitability, Toxicity	Listed Waste
U075	Dichlorodifluoromethane Methane, dichlorodifluoro-	Toxicity	Listed Waste
U076	Ethane, 1,1-dichloro- Ethylidene dichloride	Toxicity	Listed Waste
U077	Ethane, 1,2-dichloro- Ethylene dichloride	Toxicity	Listed Waste
U078	1,1-Dichloroethylene Ethene, 1,1-dichloro-	Toxicity	Listed Waste
U079	1,2-Dichloroethylene Ethene, 1,2-dichloro-, (E)-	Toxicity	Listed Waste
U080	Methane, dichloro- Methylene chloride	Toxicity	Listed Waste
U081	2,4-Dichlorophenol Phenol, 2,4-dichloro-	Toxicity	Listed Waste
U082	2,6-Dichlorophenol Phenol, 2,6-dichloro-	Toxicity	Listed Waste
U083	Propane, 1,2-dichloro- Propylene dichloride	Toxicity	Listed Waste
U084	1,3-Dichloropropene 1-Propene, 1,3-dichloro-	Toxicity	Listed Waste
U085	2,2'-Bioxirane	Toxicity	Listed Waste
	1,2:3,4-Diepoxybutane	Ignitability, Toxicity	

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
U086	N,N'-Diethylhydrazine Hydrazine, 1,2-diethyl-	Toxicity	Listed Waste
U087	O,O-Diethyl S-methyl dithiophosphate Phosphorodithioic acid, O,O-diethyl S-methyl ester	Toxicity	Listed Waste
U088	1,2-Benzenedicarboxylic acid, diethyl ester Diethyl phthalate	Toxicity	Listed Waste
U089	Diethylstilbesterol Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-	Toxicity	Listed Waste
U090	1,3-Benzodioxole, 5-propyl- Dihydrosafrole	Toxicity	Listed Waste
U091	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy- 3,3'-Dimethoxybenzidine	Toxicity	Listed Waste
U092	Dimethylamine Methanamine, N-methyl-	Ignitability	Listed Waste
U093	Benzenamine, N,N-dimethyl-4-(phenylazo)- p-Dimethylaminoazobenzene	Toxicity	Listed Waste
U094	Benz[a]anthracene, 7,12-dimethyl- 7,12-Dimethylbenz[a]anthracene	Toxicity	Listed Waste
U095	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl- 3,3'-Dimethylbenzidine	Toxicity	Listed Waste
U096	alpha,alpha-Dimethylbenzylhydroperoxide Hydroperoxide, 1-methyl-1-phenylethyl-	Reactivity	Listed Waste
U097	Carbamic chloride, dimethyl- Dimethylcarbamoyl chloride	Toxicity	Listed Waste
U098	1,1-Dimethylhydrazine Hydrazine, 1,1-dimethyl-	Toxicity	Listed Waste
U099	1,2-Dimethylhydrazine Hydrazine, 1,2-dimethyl-	Toxicity	Listed Waste
U101	2,4-Dimethylphenol Phenol, 2,4-dimethyl-	Toxicity	Listed Waste
U102	1,2-Benzenedicarboxylic acid, dimethyl ester Dimethyl phthalate	Toxicity	Listed Waste
U103	Dimethyl sulfate Sulfuric acid, dimethyl ester	Toxicity	Listed Waste
U105	Benzene, 1-methyl-2,4-dinitro- 2,4-Dinitrotoluene	Toxicity	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
U106	Benzene, 2-methyl-1,3-dinitro- 2,6-Dinitrotoluene	Toxicity	Listed Waste
U107	1,2-Benzenedicarboxylic acid, dioctyl ester Di-n-octyl phthalate	Toxicity	Listed Waste
U108	1,4-Diethyleneoxide 1,4-Dioxane	Toxicity	Listed Waste
U109	1,2-Diphenylhydrazine Hydrazine, 1,2-diphenyl-	Toxicity	Listed Waste
U110	Dipropylamine 1-Propanamine, N-propyl-	Ignitability	Listed Waste
U111	Di-n-propylnitrosamine 1-Propanamine, N-nitroso-N-propyl-	Toxicity	Listed Waste
U112	Acetic acid, ethyl ester Ethyl acetate	Ignitability	Listed Waste
U113	Ethyl acrylate 2-Propenoic acid, ethyl ester	Ignitability	Listed Waste
U114	Carbamodithioic acid, 1,2-ethanediylbis-, salts & esters Ethylenebisdithiocarbamic acid, salts & esters	Toxicity	Listed Waste
U115	Ethylene oxide Oxirane	Ignitability, Toxicity	Listed Waste
U116	Ethylenethiourea 2-Imidazolidinethione	Toxicity	Listed Waste
U117	Ethane, 1,1'-oxybis- Ethyl ether	Ignitability	Listed Waste
U118	Ethyl methacrylate 2-Propenoic acid, 2-methyl-, ethyl ester	Toxicity	Listed Waste
U119	Ethyl methanesulfonate Methanesulfonic acid, ethyl ester	Toxicity	Listed Waste
U120	Fluoranthene	Toxicity	Listed Waste
U121	Methane, trichlorofluoro- Trichloromonofluoromethane	Toxicity	Listed Waste
U122	Formaldehyde	Toxicity	Listed Waste
U123	Formic acid	Corrosivity, Toxicity	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
U124	Furan Furfuran	Ignitability	Listed Waste
U125	2-Furancarboxaldehyde Furfural	Ignitability	Listed Waste
U126	Glycidylaldehyde Oxiranecarboxyaldehyde	Toxicity	Listed Waste
U127	Benzene, hexachloro- Hexachlorobenzene	Toxicity	Listed Waste
U128	1,3-Butadiene, 1,1,2,3,4,4-hexachloro- Hexachlorobutadiene	Toxicity	Listed Waste
U129	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)- Lindane	Toxicity	Listed Waste
U130	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro- Hexachlorocyclopentadiene	Toxicity	Listed Waste
U131	Ethane, hexachloro- Hexachloroethane	Toxicity	Listed Waste
U132	Hexachlorophene Phenol, 2,2'-methylenebis[3,4,6-trichloro-	Toxicity	Listed Waste
U133	Hydrazine	Reactivity, Toxicity	Listed Waste
U134	Hydrofluoric acid Hydrogen fluoride	Corrosivity, Toxicity	Listed Waste
U135	Hydrogen sulfide Hydrogen sulfide H_2S	Toxicity	Listed Waste
U136	Arsinic acid, dimethyl- Cacodylic acid	Toxicity	Listed Waste
U137	Indeno[1,2,3-cd]pyrene	Toxicity	Listed Waste
U138	Methane, iodo- Methyl iodide	Toxicity	Listed Waste
U140	Isobutyl alcohol 1-Propanol, 2-methyl-	Ignitability, Toxicity	Listed Waste
U141	1,3-Benzodioxole, 5-(1-propenyl)- Isosafrole	Toxicity	Listed Waste

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EPA Hazardous Waste Code	Substance	Hazard	Basis
U142	Kepone 1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-	Toxicity	Listed Waste
U143	2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy- 2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*),7aalpha]]- Lasiocarpine	Toxicity	Listed Waste
U144	Acetic acid, lead(2+) salt Lead acetate	Toxicity	Listed Waste
U145	Lead phosphate Phosphoric acid, lead(2+) salt (2:3)	Toxicity	Listed Waste
U146	Lead, bis(acetato-O)tetrahydroxytri- Lead subacetate	Toxicity	Listed Waste
U147	2,5-Furandione Maleic anhydride	Toxicity	Listed Waste
U148	Maleic hydrazide 3,6-Pyridazinedione, 1,2-dihydro-	Toxicity	Listed Waste
U149	Malononitrile Propanedinitrile	Toxicity	Listed Waste
U150	Melphalan L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-	Toxicity	Listed Waste
U151	Mercury	Toxicity	Listed Waste
U152	Methacrylonitrile 2-Propenenitrile, 2-methyl-	Ignitability, Toxicity	Listed Waste
U153	Methanethiol Thiomethanol	Ignitability, Toxicity	Listed Waste
U154	Methanol Methyl alcohol	Ignitability	Listed Waste
U155	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)- Methapyrilene	Toxicity	Listed Waste
U156	Carbonochloridic acid, methyl ester Methyl chlorocarbonate	Ignitability, Toxicity	Listed Waste

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HAZARDOUS WASTES TO BE MANAGED (CONTINUED)

EPA Hazardous Waste Code	Substance	Hazard	Basis
U157	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl- 3-Methylcholanthrene	Toxicity	Listed Waste
U158	Benzenamine, 4,4'-methylenebis[2-chloro- 4,4'-Methylenebis(2-chloroaniline)	Toxicity	Listed Waste
U159	2-Butanone Methyl ethyl ketone (MEK)	Ignitability, Toxicity	Listed Waste
U160	2-Butanone peroxide Methyl ethyl ketone peroxide	Reactivity, Toxicity	Listed Waste
U161	Methyl isobutyl ketone 4-Methyl-2-pentanone Pentanol, 4-methyl-	Ignitability Toxicity	Listed Waste
U162	Methyl methacrylate 2-Propenoic acid, 2-methyl-, methyl ester	Ignitability, Toxicity	Listed Waste
U163	Guanidine, N-methyl-N'-nitro-N-nitroso- MNNG	Toxicity	Listed Waste
U164	Methylthiouracil 4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	Toxicity	Listed Waste
U165	Naphthalene	Toxicity	Listed Waste
U166	1,4-Naphthalenedione 1,4-Naphthoquinone	Toxicity	Listed Waste
U167	1-Naphthalenamine alpha-Naphthylamine	Toxicity	Listed Waste
U168	2-Naphthalenamine beta-Naphthylamine	Toxicity	Listed Waste
U169	Benzene, nitro- Nitrobenzene	Toxicity Ignitability, Toxicity	Listed Waste
U170	p-Nitrophenol Phenol, 4-nitro-	Toxicity	Listed Waste
U171	2-Nitropropane Propane, 2-nitro-	Ignitability, Toxicity	Listed Waste
U172	1-Butanamine, N-butyl-N-nitroso- N-Nitrosodi-n-butylamine	Toxicity	Listed Waste

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EPA Hazardous Waste Code	Substance	Hazard	Basis
U173	Ethanol, 2,2'-(nitrosoimino)bis- N-Nitrosodiethanolamine	Toxicity	Listed Waste
U174	Ethanamine, N-ethyl-N-nitroso- N-Nitrosodiethylamine	Toxicity	Listed Waste
U176	N-Nitroso-N-ethylurea Urea, N-ethyl-N-nitroso-	Toxicity	Listed Waste
U177	N-Nitroso-N-methylurea Urea, N-methyl-N-nitroso-	Toxicity	Listed Waste
U178	Carbamic acid, methylnitroso-, ethyl ester N-Nitroso-N-methylurethane	Toxicity	Listed Waste
U179	N-Nitrosopiperidine Piperidine, 1-nitroso-	Toxicity	Listed Waste
U180	N-Nitrosopyrrolidine Pyrrolidine, 1-nitroso-	Toxicity	Listed Waste
U181	Benzenamine, 2-methyl-5-nitro- 5-Nitro-o-toluidine	Toxicity	Listed Waste
U182	Paraldehyde 1,3,5-Trioxane, 2,4,6-trimethyl-	Toxicity	Listed Waste
U183	Benzene, pentachloro- Pentachlorobenzene	Toxicity	Listed Waste
U184	Ethane, pentachloro- Pentachloroethane	Toxicity	Listed Waste
U185	Benzene, pentachloronitro- Pentachloronitrobenzene (PCNB)	Toxicity	Listed Waste
U186	1-Methylbutadiene 1,3-Pentadiene	Ignitability	Listed Waste
U187	Acetamide, N-(4-ethoxyphenyl)- Phenacetin	Toxicity	Listed Waste
U188	Phenol	Toxicity	Listed Waste
U189	Phosphorus sulfide Sulfur phosphide	Reactivity	Listed Waste
U190	1,3-Isobenzofurandione Phthalic anhydride	Toxicity	Listed Waste
U191	2-Picoline Pyridine, 2-methyl-	Toxicity	Listed Waste

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EPA Hazardous Waste Code	Substance	Hazard	Basis
U192	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	Toxicity	Listed Waste
	Pronamide		
U193	1,2-Oxathiolane, 2,2-dioxide	Toxicity	Listed Waste
	1,3-Propane sultone		
U194	1-Propanamine	Ignitability, Toxicity	Listed Waste
	n-Propylamine		
U196	Pyridine	Toxicity	Listed Waste
U197	p-Benzoquinone	Toxicity	Listed Waste
	2,5-Cyclohexadiene-1,4-dione		
U200	Reserpine	Toxicity	Listed Waste
	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester, (3beta,16beta,17alpha,18beta,20alpha)-		
U201	1,3-Benzenediol	Toxicity	Listed Waste
	Resorcinol		
U202	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts	Toxicity	Listed Waste
	Saccharin, & salts		
U203	1,3-Benzodioxole, 5-(2-propenyl)-	Toxicity	Listed Waste
	Safrole		
U204	Selenious acid	Toxicity	Listed Waste
	Selenium dioxide		
U205	Selenium sulfide	Toxicity	Listed Waste
	Selenium sulfide SeS_2	Reactivity, Toxicity	
U206	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-	Toxicity	Listed Waste
	D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]-		
	Streptozotocin		
U207	Benzene, 1,2,4,5-tetrachloro-	Toxicity	Listed Waste
	1,2,4,5-Tetrachlorobenzene		
U208	Ethane, 1,1,1,2-tetrachloro-	Toxicity	Listed Waste
	1,1,1,2-Tetrachloroethane		

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EPA Hazardous Waste Code	Substance	Hazard	Basis
U209	Ethane, 1,1,2,2-tetrachloro- 1,1,2,2-Tetrachloroethane	Toxicity	Listed Waste
U210	Ethene, tetrachloro- Tetrachloroethylene	Toxicity	Listed Waste
U211	Carbon tetrachloride Methane, tetrachloro-	Toxicity	Listed Waste
U213	Furan, tetrahydro- Tetrahydrofuran	Ignitability	Listed Waste
U214	Acetic acid, thallium(1+) salt Thallium(I) acetate	Toxicity	Listed Waste
U215	Carbonic acid, dithallium(1+) salt Thallium(I) carbonate	Toxicity	Listed Waste
U216	Thallium(I) chloride Thallium chloride TlCl	Toxicity	Listed Waste
U217	Nitric acid, thallium(1+) salt Thallium(I) nitrate	Toxicity	Listed Waste
U218	Ethanethioamide Thioacetamide	Toxicity	Listed Waste
U219	Thiourea	Toxicity	Listed Waste
U220	Benzene, methyl- Toluene	Toxicity	Listed Waste
U221	Benzenediamine, ar-methyl- Toluenediamine	Toxicity	Listed Waste
U222	Benzenamine, 2-methyl-, hydrochloride o-Toluidine hydrochloride	Toxicity	Listed Waste
U223	Benzene, 1,3-diisocyanatomethyl- Toluene diisocyanate	Reactivity, Toxicity	Listed Waste
U225	Bromoform Methane, tribromo-	Toxicity	Listed Waste
U226	Ethane, 1,1,1-trichloro- Methyl chloroform	Toxicity	Listed Waste
U227	Ethane, 1,1,2-trichloro- 1,1,2-Trichloroethane	Toxicity	Listed Waste
U228	Ethene, trichloro- Trichloroethylene	Toxicity	Listed Waste

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EPA Hazardous Waste Code	Substance	Hazard	Basis
U234	Benzene, 1,3,5-trinitro-	Toxicity	Listed Waste
	1,3,5-Trinitrobenzene	Reactivity, Toxicity	
U235	1-Propanol, 2,3-dibromo-, phosphate (3:1)	Toxicity	Listed Waste
	Tris(2,3-dibromopropyl) phosphate		
U236	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis(azo)bis[5-amino-4-hydroxy]-, tetrasodium salt	Toxicity	Listed Waste
	Trypan blue		
U237	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	Toxicity	Listed Waste
	Uracil mustard		
U238	Carbamic acid, ethyl ester	Toxicity	Listed Waste
	Ethyl carbamate (urethane)		
U239	Benzene, dimethyl-	Ignitability, Toxicity	Listed Waste
	Xylene	Ignitability	
U240	Acetic acid, (2,4-dichlorophenoxy)-, salts & esters	Toxicity	Listed Waste
	2,4-D, salts & esters		
U243	Hexachloropropene	Toxicity	Listed Waste
	1-Propene, 1,1,2,3,3,3-hexachloro-		
U244	Thioperoxydicarbonic diamide $[(H_2N)C(S)]_2S_2$, tetramethyl-	Toxicity	Listed Waste
	Thiram		
U246	Cyanogen bromide (CN)Br	Toxicity	Listed Waste
U247	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-	Toxicity	Listed Waste
	Methoxychlor		
U248	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations of 0.3% or less	Toxicity	Listed Waste
	Warfarin, & salts, when present at concentrations of 0.3% or less		
U249	Zinc phosphide Zn_3P_2, when present at concentrations of 10% or less	Toxicity	Listed Waste

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EPA Hazardous Waste Code	Substance	Hazard	Basis
U271	Benomyl Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2- yl]-, methyl ester	Toxicity	Listed Waste
U278	Bendiocarb 1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate	Toxicity	Listed Waste
U279	Carbaryl 1-Naphthalenol, methylcarbamate	Toxicity	Listed Waste
U280	Barban Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester	Toxicity	Listed Waste
U328	Benzenamine, 2-methyl- o-Toluidine	Toxicity	Listed Waste
U353	Benzenamine, 4-methyl- p-Toluidine	Toxicity	Listed Waste
U359	Ethanol, 2-ethoxy- Ethylene glycol monoethyl ether	Toxicity	Listed Waste
U364	Bendiocarb phenol 1,3-Benzodioxol-4-ol, 2,2-dimethyl-	Toxicity	Listed Waste
U367	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl- Carbofuran phenol	Toxicity	Listed Waste
U372	Carbamic acid, 1H-benzimidazol-2-yl, methyl ester Carbendazim	Toxicity	Listed Waste
U373	Carbamic acid, phenyl-, 1-methylethyl ester Propham	Toxicity	Listed Waste
U387	Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester Prosulfocarb	Toxicity	Listed Waste
U389	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3,3-trichloro-2-propenyl) ester Triallate	Toxicity	Listed Waste
U394	A2213 Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester	Toxicity	Listed Waste
U395	Diethylene glycol, dicarbamate Ethanol, 2,2'-oxybis-, dicarbamate	Toxicity	Listed Waste

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EPA Hazardous Waste Code	Substance	Hazard	Basis
U404	Ethanamine, N,N-diethyl-	Toxicity	Listed Waste
	Triethylamine.		
U409	Carbamic acid, [1,2-phenylenebis (iminocarbonothioyl)]bis-, dimethyl ester	Toxicity	Listed Waste
	Thiophanate-methyl		
U410	Ethanimidothioic acid, N,N'-[thiobis[(methylimino)carbonyloxy]]bis-, dimethyl ester	Toxicity	Listed Waste
	Thiodicarb		
U411	Phenol, 2-(1-methylethoxy)-, methylcarbamate	Toxicity	Listed Waste
	Propoxur		

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EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

ATTACHMENT 2. WASTE ANALYSIS PLAN

This section of the application describes the physical and chemical characteristics of the mixed waste that will be accepted for management at the storage and treatment units, as required by TN Rule 0400-12-01.-07.

Physical and Chemical Characteristics of the Waste

General Description of the Waste:

The RCRA waste that will be stored in the units consists of (Transuranic) TRU waste with D004, D005, D006, D007, D008, D009, D010, and D011 metals, but may also contain sludges, aerosol cans, solvents, D001, D002, D003, D012, D013, D014, D015, D016, D017, D018, D019, D020, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, D036, D037, D038, D039, D040, D041,D042, D043, D044 organics, or listed waste.

TRU waste is defined in U.S. Department of Energy (DOE) Order 435.1 as a radioactive waste contaminated with radionuclides that exhibit the following characteristics:

- Atomic number greater than 92
- Emit alpha particles
- Half-life greater than 20 years
- Concentration greater than 100 nCi/g at the time of assay

Other waste that has similar radiation hazards but does not meet the DOE definition of TRU waste, may also be managed as TRU waste to ensure safe handling.

TRU waste is further subcategorized as contact handled (CH) TRU waste and remote handled (RH) TRU waste. CH TRU waste is TRU waste with a measured radiation dose rate not greater than 200 mrem/h at the container surface. RH TRU waste is TRU waste with a measured radiation dose rate 200 mrem/h or greater at the container surface.

Low Level Waste (LLW) is waste that contains radioactivity and is not classified as TRU waste, spent fuel, or by-product material. If the LLW also contains RCRA constituents and/or polychlorinated biphenyls (PCBs), it is managed as Mixed Low-Level Waste (MLLW). PCB wastes are managed in accordance with 40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions". TRU PCB liquids are prohibited from disposal at Waste Isolation Pilot Plant (WIPP). The TRU Waste Processing Center (TWPC) received from the U.S. Environmental Protection Agency (EPA) a Risk-Based Disposal Approval (RBDA) for the Storage and Processing of Liquid PCBs Containing TRU and Low-Level Radionuclides. All PCB/potential PCB liquids will be absorbed by an approved absorbent for PCB contaminated oil and liquids in accordance with the RBDA. Containers with absorbed PCB/potential PCB liquids that are TRU waste will be disposed at WIPP. Containers

with absorbed PCB/potential PCB liquids that fall out as non-TRU MLLW will be treated using macroencapsulation, an approved alternative treatment standard for hazardous debris, and will be managed as MLLW. After macroencapsulation treatment, each MLLW container is verified to not contain any free liquids prior to final certification. These containers will be subject to the PCB storage time-limit requirement of one year.

Most of the waste stored, or to be stored, in these units is generated at ORNL. Only small amounts of waste stored in these units will be received from DOE-owned offsite[1] facilities. The following language regarding offsite[1] waste stored on the Oak Ridge Reservation (ORR) was negotiated by counsel for TDEC, DOE, and Martin Marietta Energy Systems, Inc. (DOE's operating contractor at the time) on August 5, 1993:

(a) The permittee is only allowed to store hazardous waste generated by DOE onsite[1] and/or generated by DOE-owned offsite[1] facilities. Hazardous waste received from DOE owned offsite[1] facilities and placed in storage for more than thirty (30) days, may only be stored incidental to its treatment, and the volume of all waste in storage more than thirty (30) days may not exceed 10% of the total onsite permitted storage capacity.

(b) As used in paragraph (a) above, "onsite" means areas within the ORR, and "offsite" means all areas that are not within the ORR. Onsite reflects all hazardous waste generated under EPA ID Numbers associated with Oak Ridge National Laboratory (ORNL), Y-12 National Security Complex (Y-12) and East Tennessee Technology Park (ETTP). Offsite reflects all hazardous waste generated at federal DOE facilities not associated with EPA ID Numbers at ORNL, Y-12 and ETTP.

(c) The DSWM Director may authorize DOE's operating contractors to store hazardous waste generated at DOE owned offsite[1] facilities in excess of the limits set in paragraph (a). Any authorization pursuant to this paragraph must be in writing.

Table 2-1. contains a summary of the various types of wastes stored in the waste management units.

RH TRU Waste

The RH TRU waste is primarily solids such as metal, plastic, cloth, paper, and glass materials. Small amounts of free liquids (estimated at 0.05 to 1% of the total waste volume) could occasionally be present in the older casks. RH TRU waste is generated from operations and experiments conducted in hot cells using radioisotopes and is common to wet chemistry laboratories.

The RH TRU casks that were stored underground have been found to have groundwater infiltration. The groundwater will be pumped from the casks into totes, sampled, and managed based on the "no longer contains" determination agreed to with TDEC.

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[1]The definition provided in these paragraphs for onsite and offsite used above only apply to those terms accordingly footnoted. Throughout the remainder of this document, the applicable regulatory definitions apply to each of these terms.

Table 7-1. Waste codes for RCRA wastes stored in the permitted units

Waste code/designation	Hazard constituent or classification
D001	Ignitability
D002	Corrosivity
D003	Reactivity
D004–D043	Toxicity characteristic
F or K Series	Waste from non-specific and specific sources
P or U Series	Commercial chemical products, off-specification species, container residues, or spill residues

Basis for Designation of RH TRU Waste

Based on review of Rules 0400-12-01-.02(3) and (4) and 40 *CFR* Part 261, Subparts C and D, the following characteristic and listed waste will be stored in the waste management units:

- Ignitable (D001)
- Corrosive (D002)
- Reactive (D003)
- Toxic characteristic (TC) constituents (D004–D043)
- Waste from non-specific or specific sources (F or K series)
- Commercial chemical products, container residues, off-specification species, or spill residues (P or U series)

Waste acceptance criteria (WAC) for newly packaged RH TRU waste will *exclude* the following materials:

- Explosives or compressed gases as defined by 49 *CFR* 173, Subparts D and G
- Pyrophoric materials (excluding radionuclides) that have not been rendered safe by mixing with chemically stable materials or processed to remove the hazardous properties.
- Water-reactive waste

CH TRU Waste

The CH TRU waste is primarily solids such as metal, plastic, cloth, paper, and glass materials. Other waste forms include sludges, aerosol cans, gas cylinders, solvent wipes, or liquids.

WAC are in place for newly generated CH TRU wastes. Onsite generators submit waste disposal forms to the Waste Programs who then check the disposal forms to ensure that the WAC are met. Waste Programs staff may use real-time radiography equipment to verify that the WAC are met for ORNL's newly generated CH TRU wastes. Generators may list and estimate the weight or volume of all RCRA components placed in the containers, including underlying hazardous constituents (UHCs) where applicable.

Basis for Designation of CH TRU Waste

Based on review of Rules 0400-12-01-.02(3) and (4) and 40 *CFR* Part 261, Subparts C and D, the following characteristic and listed waste will be stored in the waste management units:

- Ignitable (D001)
- Corrosive (D002)
- Reactive (D003)
- TC constituents (D004–D043)
- Waste from non-specific or specific sources (F or K series)
- Commercial chemical products, container residues, off-specification sources, or spill residues (P or U series)

The CH TRU waste is contained in steel drums (e.g., 30-, 55-, 85-, or 110-gallon), overpack containers, cask overpack containers, or metal containers of varying sizes.

The CH TRU waste is compatible with the storage containers. Waste will be stored in steel drums. The drums are fabricated of either carbon or stainless steel. The individual generators determine the compatibility of material to be stored.

WAC for newly generated CH TRU waste stored in the waste management units currently *exclude* the following materials:

- Explosives or compressed gases as defined by 49 *CFR* 173, Subparts D and G
- Pyrophoric materials (excluding radionuclides) that have not been rendered safe by mixing with chemically stable materials or processed to remove the hazardous properties.
- Water-reactive wastes

Mixed Low-Level Waste

MLLW stored in the units includes RCRA-regulated waste oil, lab packs, soils, sludges, wastewater, spill residues, solvent wipes, aerosol cans, gas cylinders, and/or liquids from operations and experiments conducted in glove boxes or from other DOE processes. As a Best Management Practice MLLW container with a dose rate 10 mrem/hr or greater is considered to be high dose for 'as low as reasonably achievable' (ALARA) purposes. When stored in any of the permitted units, the high-dose MLLW will be stored in the same areas as the TRU waste and will be inspected on the same schedule.

WAC are in place for newly generated MLLW. Onsite generators submit waste disposal forms to the Waste Operations and Logistics Group who then check the disposal forms to ensure the WAC are met. Generators will also be required to list and estimate the weight or volume of all RCRA components placed in the containers, including UHCs to meet Land Disposal Restrictions.

Basis for Designation of the MLLW

The hazard designation for the MLLW waste is based on the onsite generator's process knowledge of the waste streams (known constituents, known chemical or physical properties, known processes, etc.), analysis of the waste stream, or a combination of both.

Based on review of Rule 0400-12-01-.02(3) and (4), and 40 *CFR* Part 261, Subparts C and D, the following characteristic and listed waste will be stored in the waste management units:

- Ignitable (D001)
- Corrosive (D002)
- Reactive waste (D003)
- Toxic constituents (D004–D043)
- Waste from non-specific or specific sources (F or K series)
- Commercial chemical products, container residues, off-specification sources, or spill residues (P or U series)

The MLLW is stored in drums (e.g., 30-, 55-, 85-, or 110-gallon), and/or overpack containers or metal containers of varying sizes.

The MLLW is compatible with the storage containers. The individual generators determine the compatibility of the containers with material to be stored.

WAC for newly generated MLLW stored in any of these units currently *exclude* the following materials:

- Explosives or compressed gases as defined by 49 *CFR* 173, Subparts D and G
- Pyrophoric materials (excluding radionuclides) that have not been rendered safe by mixing with chemically stable materials or processed to remove the hazardous properties
- Water-reactive waste

TWPC Waste Characterization Process

Waste will be transferred to TWPC from other units authorized in this permit for temporary storage while conducting activities to prepare the waste for offsite disposal. These activities include characterization by non-destructive examination (NDE), non-destructive assay (NDA), and visual examination, as required. Waste confirmed to be RH TRU and CH TRU waste will ultimately be disposed at the WIPP in New Mexico. Waste identified as MLLW will ultimately be disposed at

Nevada National Security Site (NNSS) or an approved commercial Treatment, Storage, and Disposal Facility (TSDF).

Waste disposed at WIPP is exempt from having to meet RCRA Land Disposal Restriction (LDR) criteria (note: Pub. L. 102-579; January 3, 1992). All waste management activities performed on RH TRU and CH TRU waste at TWPC aims to ensure compliance with the WAC standards for WIPP. The WIPP acceptance criteria require that the generator identify all processes and materials used in each facility where TRU waste has been generated and then conservatively apply all RCRA codes associated with those processes to all waste originating from that facility. The WIPP waste-acceptance group verifies whether the waste meets their criteria for "acceptable knowledge" (AK), for each candidate waste stream, by auditing the AK documentation prior to waste shipment. RCRA codes determined by this WIPP waste acceptance process will be applied to RH TRU and CH TRU waste containers at TWPC and subsequently managed accordingly.

The additional waste characterization, as well as the sorting and segregation processes, performed at TWPC are expected to identify MLLW. Appropriate RCRA codes will be applied to the MLLW containers at TWPC, and the containers will be managed accordingly.

Waste Analysis Plan

The purpose of the Waste Analysis Plan is to obtain all the information necessary to safely manage hazardous wastes in accordance with the hazardous waste management regulations. The Waste Analysis Plan is written so that all necessary information will be collected and evaluated for waste that is managed at these units. The following subsections describe requirements for:

- Generator characterization
- Test methods
- Sampling methods
- Frequency of analysis
- Packaging requirements
- Waste acceptance requirements for storage and disposition
- Waste verification
- Additional requirements for waste generated offsite

Generator Characterization

A program has been established on the ORR that includes the requirements and responsibilities for sanitary/industrial waste, hazardous waste, LLW, MLLW, and TRU waste generated by DOE and contractors and subcontractors on the ORR, which includes ORNL, Y-12, and ETTP. Typically, the generator will be knowledgeable of waste generated through knowledge of the generation process, use, or manufacturer's data—such as safety data sheets (SDSs) and chemical references. For wastes generated at other DOE sites, wastes are only accepted after generators provide adequate waste characterization data to meet the applicable WAC. The WAC are provided in the forms located at the end of this Section.

Identification of RCRA components in the RH TRU waste will be based on applied knowledge of the hazardous characteristics of the waste and/or knowledge of the materials or processes used.

Generator identification of CH TRU and MLLW will be based on applied knowledge of the hazardous characteristics of the waste and/or knowledge of the materials and processes used or analytical testing. Adequate documentation of the process knowledge is kept onsite at ORNL and TWPC in the operating records for the storage units and are maintained for three years after final disposition. TRU Waste Operations operating records are maintained onsite in the facility manager's office, and TWPC operating records are maintained onsite in the waste program manager's office. Waste analysis parameters are summarized in Tables 2-2 and 2-3.

Both onsite and offsite generators will provide information required for proper waste disposition including the following elements:

- Material description
- Characterization parameters and methodology
- Chemical constituent limitations
- Radiological constituent limitations
- Physical parameter limitations
- Prohibited items
- Packaging
- Additional requirements
- Required documentation

This information is required to ensure that the waste can be properly handled, managed, and stored in the permitted units. The data must be in compliance with the waste profiles or appropriate WAC. The WAC for each unit are comprised of the requirements in the waste profile and safety/radiological hazards. Figure 2-1 illustrates a flow process.

Table 7-2. Waste analysis parameters for RH TRU waste

Test parameter	Typically determined by*	Analytical methods
Radiation-alpha, beta, gamma, neutrons, isotopes	Knowledge, analysis	Varies by isotope
Flash point	Knowledge	NA
Reactivity	Knowledge	NA
Hazardous constituents	Knowledge	NA
Specific gravity	Knowledge	NA
Compatibility	Knowledge	NA
pH	Knowledge	NA
Cyanides, sulfides	Knowledge	NA
Source of waste	Knowledge	NA

*Parameters noted as typically determined by analysis may require only an initial analysis and may be determined by process knowledge thereafter.

Table 7-3. Waste analysis parameters of CH TRU and MLLW

Test parameter	Typically determined by*	Analytical methods**
Radiation-alpha, beta, gamma, neutrons, isotopes	Knowledge, analysis	Varies by isotope
Specific hazardous constituents and underlying hazardous constituents	Knowledge, analysis	The applicable method for testing the specified Constituent as published in *Testing Methods for Evaluating Solid Waste, Physical/Chemical Methods,* EPA Publication SW-846, (latest EPA-promulgated edition) as amended (SW-846)
Flash point	Knowledge, analysis	SW-846 Method Numbers: 1010, 1020, ASTM D92, ASTM D93
Reactivity	Knowledge	NA
Specific gravity (aqueous)	Knowledge, analysis	Method ASTM D 3142, "Test Method for Specific Gravity or API Gravity of Liquid Asphalts by Hydrometer Method"
Compatibility	Knowledge	NA
pH	Knowledge, analysis	SW-846 Method Number 9045
Cyanides	Knowledge, analysis	SW-846, Methods 9010, 9012, 9014
Sulfides	Knowledge, analysis	SW-846, Methods 9030, 9034

*Parameters typically determined by analysis may require only an initial analysis and may be determined by process knowledge thereafter, with retesting on a periodic basis.

**Upon approval by DSWM, other analytical methods may be allowed if they are substantially equivalent to the method stated.

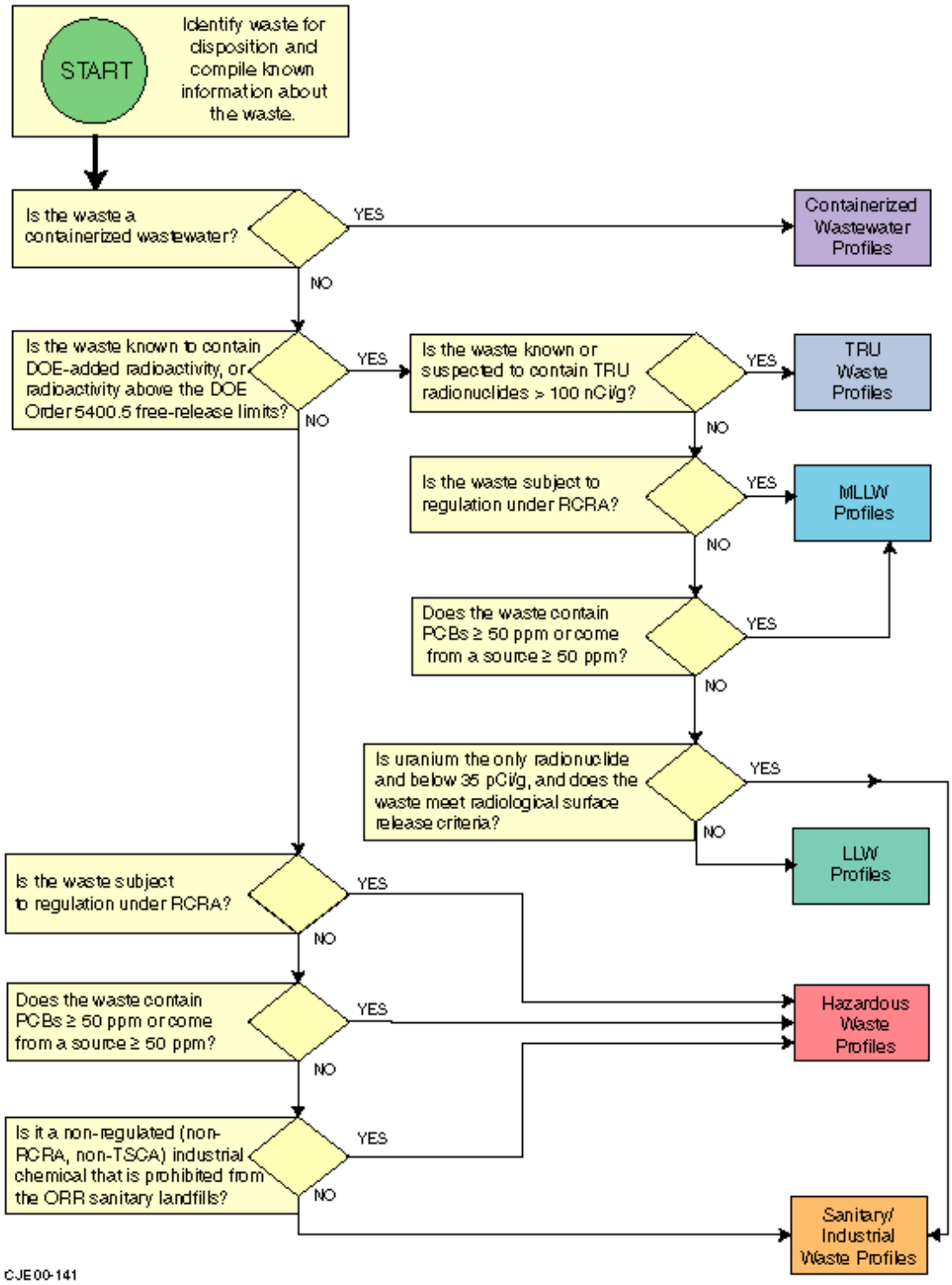

Fig. 2-1. Typical waste profile flow diagram.

Legacy Waste

Legacy waste is waste that was placed into storage prior to September 30, 2000. Legacy waste may not have been fully characterized prior to storage. Re-characterization of legacy waste will be completed, as necessary, to enable further treatment or disposal.

Secondary Waste Streams

Secondary waste generated from storage unit operators are stored in units based on process knowledge and may not be characterized using sampling and analysis until the waste is prepared for disposition, treatment, or disposal.

Test Methods

RH TRU Waste. Due to the radiological hazards involved with RH TRU waste handling for analysis, generator documentation requirements provide waste characterization based on the generator's knowledge of the process have been implemented. Therefore, testing is not performed.

CH TRU Waste and High-Dose MLLW. Due to radiological hazards involved with CH TRU and high-dose MLLW handling required for analysis, generator documentation requirements that provide waste characterization based on the generator's knowledge of the process have been implemented. Therefore, very limited testing is performed.

Low-Dose MLLW. When applicable, the waste will be sampled, prepared, and tested according to the appropriate protocols described in U.S. Environmental Protection Agency's (EPA's) *Test Methods for Evaluating Solid Waste*, SW-846 (latest EPA promulgated edition) or American Society of Testing and Materials (ASTM) methods. Alternative methods may be allowed if they are substantially equivalent to the EPA or ASTM methods (e.g., in-process methods). All quality assurance/quality control procedures are outlined in EPA QA/G-4, EPA Project Quality Assurance and Quality Control procedures, SW-846. After the data undergoes complete screening, and/or verification, and/or validation, summary descriptive statistics may be developed for the data to support decisions regarding waste classification and/or compliance with a TSDF WAC.

Sampling Methods

RH TRU Waste. Due to the radiological hazards involved with waste handling required for analysis, documentation requirements have been implemented for newly generated waste that provide waste characterization based on the generator's knowledge of the process. Therefore, sampling is not performed.

CH TRU Waste and High-Dose MLLW. Due to radiological hazards involved with CH TRU and high-dose MLLW handling required for sampling, generator documentation requirements that provide waste characterization based on the generator's knowledge of the process have been implemented. Very limited sampling is performed. Sampling is performed only when the generator cannot document the contents of the waste based upon his/her process knowledge.

Low-Dose MLLW. The contents of each unique waste stream will be characterized by either process knowledge or analysis before transfer to any of the waste management units covered by

this document. Sampling is performed when the generator cannot document the contents of the waste based upon his/her process knowledge.

The sample collection and handling methods used to obtain samples of the containerized waste will follow EPA-approved sampling protocols stated in EPA SW-846 (latest edition). Matrix sampling methods are listed in Table 2-4. An appropriate sampling method will be chosen such that a sample is obtained which can be expected to exhibit the average properties of the waste as a whole.

The Data Quality Objectives (DQOs) Process is used to develop performance and acceptance criteria (data quality objectives) to clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions. The DQO Process establishes protocols to be used when planning and conducting sampling, analysis, and data validation to characterize materials for acceptance at TSDF. The sampling and analysis plans are developed using the DQO process as described in Guidance on Systematic Planning Using the Data Quality Objectives Process EPA QA/G-4; or an equivalent process. In addition, managing sampling uncertainty is provided in procedures and specific project documentation (e.g., sampling analysis plans or DQO statements).

Frequency of Analyses

RH TRU Waste. Due to radiological hazards involved with waste handling, documentation requirements have been implemented for newly generated waste to provide waste characterization based on the generator's knowledge of the process. This documentation will accompany each shipment, and records will be maintained in the onsite operating record. TRU Waste Operations operating records are maintained onsite in the facility manager's office, and TWPC records are maintained onsite in the waste program manager's office.

CH TRU Waste and High-Dose MLLW. The contents of each unique batch of waste or waste stream will be characterized by knowledge of the process before transfer to a storage unit. Due to radiological hazards involved with waste handling, analysis of the waste will be limited. However, each shipment of newly generated waste will be accompanied by documentation that provides the waste characterization based on the generator's knowledge of the process and/or analysis.

Characterization is required to ensure safe handling, regulatory compliance, and compatibility before the waste is transferred to another permitted unit for storage prior to disposal or transferred off-site for final disposal. Containers of waste are characterized using process knowledge and laboratory analysis. Containers are characterized on an individual or batch basis using representative sampling.

Table 7-4. Sampling methods

Matrix	Sampling methods
Aqueous	Bailer, COLIWASA, dipper, pour, pump, thief, weighted bottle, sampling tap
Liquid	Bailer, COLIWASA, dipper, pour, pump, thief, weighted bottle, sampling tap
Oil	Bailer, COLIWASA, dipper, pour, pump, scoop, thief, sampling tap
Semi-solid	Auger, scoop, wipe sample, shovel, grab (hand, tongs, tweezers)
Solid	Auger, grab (hand, tongs, tweezers), scoop, tin snips, wipe sample

Low-Dose MLLW. The contents of each unique batch of waste or waste stream will be characterized by either analysis or by knowledge of the process before transfer to a storage unit. At a minimum, waste characterization necessary to ensure safe handling, regulatory compliance, compatibility, and waste acceptance will be required before a waste is transferred to one of these units. Characterization required for land disposal must be complete for the waste streams prior to offsite storage and/or disposal. A waste characterization will remain valid until the generating process changes Annual surveillance reviews of current waste generators are conducted to ensure compliance to the applicable waste acceptance profiles including processes and procedures to package and characterize waste for storage. Surveillance records will be maintained onsite in the operating record. TRU Waste Operations operating records are maintained onsite in the facility manager's office, and TWPC records are maintained onsite in the waste program manager's office.

The information submitted in the waste profile information regarding each hazardous waste to be managed at these units will, at all times, accurately reflect that waste. If, for any reason, the data no longer reflect the properties of the waste or constituent concentrations in the waste, the generator will re-supply or revalidate waste characterization data.

General Packaging Requirements

Waste received for storage shall be in containers of various sizes and types. Containers must be of sound integrity (no deformation, breaches, gouging, significant rusting, bulging, etc.) to ensure safe storage of hazardous materials.

Waste Acceptance Requirements for Storage and Disposition Requirements

Waste operations personnel will review and verify all waste characterization data packages in accordance with their waste acceptance requirements and the appropriate waste profile. All data packages will have the waste characterized by the generators prior to receipt into the unit. Waste acceptance forms are completed prior to receipt into the permitted units (attachments). In addition,

independent assessments are completed at TRU Waste Operations to document compliance prior to receipt of waste into the facility.

Once the stream has been properly characterized, the waste is then evaluated for disposition. If onsite waste management is not practical, the waste is evaluated for treatment at DOE-owned or commercially available offsite facilities. Waste operations personnel determine the treatability of candidate waste. After the waste is determined to meet the receiving facility's WAC and can be shipped in full compliance with DOT regulations, the waste is manifested and transported for treatment and/or disposal.

Waste Verification

To minimize exposure of personnel to radiation and hazardous waste, containers are not routinely resampled for purposes of verification.

For waste at TWPC, much of the waste verification falls under the WIPP acceptance group oversight. Non-Destructive Examination (NDE) using Real-time Radiography (RTR) i.e., x-ray of each container, is performed to verify the waste matches the AK description and to also look for any waste items prohibited from acceptance at WIPP. Visual Examination (VE), where an operator visually verifies all waste contents during repackaging activities, can also be performed in lieu of RTR. VE is only performed on a fraction of the CH TRU containers but is performed on all RH TRU containers. RTR and VE repeats are performed quarterly on one container as checks for program accuracy and verification. Any discrepancies receive a Non-Conformance Report (NCR) which may require corrective actions within the program. Non-Destructive Assay (NDA) determines if a waste container has the required CH TRU isotopes for disposal at WIPP. The NDA program is approved through an annual Performance Demonstration Program (PDP) which is a round-robin blind analysis of containers configured with varying matrices and source material. Passing the PDP program certifies the NDA unit for proper WIPP waste certification and verification. Because of the potential for waste containers to fall out from the TRU program to the MLLW program, the PDP program also supplements the MLLW program for waste characterization and verification. If any sampling is required to support the MLLW program (i.e., waste does not match waste description), matrix spikes and duplicates will be run on 10% of all samples for quality assurance/quality control.

At TRU Waste Operations, containers are accepted into storage with compliance verification by the generator, transporter, and storage facility. TRU Waste is not directly handled or repackaged at TRU Waste Operations permitted facilities.

Package certification checklists are completed for each container to confirm and document compatibility of containers and waste, absence of anomalous/prohibited items, physical properties of contents, and accurate labelling. Once containers are introduced into permitted storage areas at the TRU Waste Operations facilities, they undergo additional radiological surveys, are barcoded, and are tracked physically and electronically in the Waste Tracking and Reporting System. Rad surveys of stored containers are also performed prior to being moved to verify characterization data.

A combination of analytical data, generator-provided process knowledge, and radiological survey data are used to appropriately characterize waste and assign an appropriate waste profile prior to disposition. Waste packaging specialists, rad control technicians, and waste coordinators verify the physical contents of each

container agree with analytical data and process knowledge during the loading, sealing, and shipment of waste, both intra-site and offsite.

Additional Requirements for High-Dose Mixed Waste Generated Offsite

The generator is responsible for supplying all the information required for each parameter identified by this Waste Analysis Plan.

In order to minimize exposure of personnel to radiation in accordance with 10 CFR 20.1003 requirements of ALARA, the high-dose waste (e.g., CH TRU, RH TRU, high-dose MLLW, and/or controlled high-fissile CH TRU) containers will not be re-sampled for the purpose of complying with the waste analysis requirements after receipt of non-ORR waste at the facility. Tamper indication devices will be used to ensure that the waste has not been tampered with after sampling by the generator until received into the storage unit. The procedures for shipping and receiving offsite-generated waste include the following:

- Prior to accepting offsite waste at the permitted storage and treatment facilities, a thorough review of the offsite generator's waste characterization, sampling and analysis, and waste packaging procedures will be conducted. This will be done to ensure that procedures are in place to accept the waste without additional sampling upon receipt to minimize exposure of personnel to high-dose radiation and other hazardous materials.
- The generator will sample and analyze the waste for the appropriate verification parameter(s) previously specified in Table 2-3 prior to shipping the waste to the waste management units for management at the facility.
- The manifest will be given to the transporter. The transporter and generator will check the container identification (ID) number with the number recorded on the manifest to ensure that they are the same. Both the generator and transporter will check, sign, and date the manifest before the shipment and transporter depart the generator site. In lieu of a hard-copy manifest, the electronic manifest may be used.
- Upon arrival at the facility, the transporter will give the manifest, waste analysis sheet, and accompanying shipping papers to the waste operations supervisor or designee. The transporter and waste operations supervisor or designee will check the number on the waste analysis sheet and on the manifest to ensure that they are the same. A waste operations supervisor or designee will inspect the load and match the ID numbers of the waste containers to those recorded on the manifest. A waste operations supervisor or designee will then sign and date the manifest. Any manifest discrepancies will be noted.
- Waste manifests from offsite facilities will be reviewed by qualified waste operations personnel. Manifest discrepancies will be considered to be differences between the quantity and/or type of hazardous waste indicated on the manifest or shipping paper and the quantity and/or type of hazardous waste a unit actually receives. Significant differences in quantity are: For bulk waste, variations greater than 10 percent in weight; for batch waste, any variation in piece count, such as a discrepancy of one drum in a truckload. Significant differences in type are obvious differences which can be discovered by inspection or waste analysis, such as waste solvent substituted for waste acid or toxic constituents not reported on the manifest or shipping paper. Waste operations transportation personnel will attempt to reconcile any manifest

discrepancies with the generator or transporter. If not resolved within 15 days after receipt of the waste, a letter will immediately be submitted, along with a copy of the manifest or shipping paper, to TDEC describing the discrepancy and all steps taken to reconcile it.

- If any of the storage units accept for storage any hazardous waste from an offsite source without an accompanying manifest or without an accompanying shipping paper, and if the waste is not excluded from the manifest requirements by Rule 0400-12-01-.02(1)(e) or 40 *CFR* 261.5, then an un-manifested waste report will be submitted to TDEC within 15 days of receiving the waste.

- Wastes which are subject to a LDR of Rule 0400-12-01-.10 must be accompanied by a notification from the generator indicating that the waste contains prohibited constituents, identifies the appropriate treatment standard and/or applicable prohibitions which must be met.

- A copy of each manifest received from offsite facilities will be retained for at least three years from the date of delivery.

- For each offsite shipment received, a copy of the notice, and the certification and demonstration, if applicable, required by the generator or the owner or operator under Rule 0400-12-01-.10(1)(g) or (h) will be maintained in the operating record for three years from the date of delivery.

Air Emission Standards for Containers

Container sampling operations will comply with RCRA Subpart CC [Rule 0400-12-01-.06 (32)] requirements for controlling air emissions from containers. The following criteria are applied to container operations at the ORNL storage units and TWPC:

- Containers of waste are exempt if the container volume is smaller than 26 gals or the organic composition is known to be less than 500 ppm, by weight.
- Containers storing mixed waste are exempt from RCRA Subpart CC requirements. (note: all of the waste that will be sampled under this permit is expected to meet this condition)
- Containers between 26 and 119 gals follow Level 1 standards:
  - — Keep container closed except when adding or removing waste
  - — Inspect containers within 24 hours of waste acceptance or accumulation
  - — A visible hole or tear in a container is considered a leak and it will be patched within 24 hours of discovery and permanently repaired or replaced within 5 days.
- Containers larger than 119 gals, not in light material service (< 20% volatile organic compounds [VOCs]) follow Level 1 standards.
- Containers larger than 119 gals that are in light material service (> 20% VOCs) follow Level 2 standards:
  - — Keep container closed except when adding or removing waste
  - — Inspect containers within 24 hours of waste acceptance or accumulation

- A visible hole or tear in a container is considered a leak and it will be patched within 24 hours of discovery and permanently repaired or replaced within 5 days.

- Containers over 26 gals on will follow Level 3 standards when the hazardous waste is exposed to the atmosphere:
  - The containers will be vented inside an enclosure that is exhausted through a closed-vent system to a control device in accordance with TN Rule 0400-12-01-.06(32)(g)5(i)(II).
  - The containers vent directly through a closed vent system to a control device in accordance with TN Rule 0400-12-01-.06 (32)(g)5(i)(I).

UCOR
United Cleanup Oak Ridge LLC

Waste Approval Checklist

Container Record No.: _____

Master Profile No.: _____ **Revision No.:** _____

EVALUATION AGAINST MASTER PROFILE				
Complete the following checks based on a review of the Container Record and supporting documentation.				
No.	**Action**	**Yes**	**No**	**N/A**
1.	For the following items, does the information in the data package provide sufficient data to meet the requirements of the Master Profile?			
1a	Does the Material Description match the Profile?	☐	☐	☐
1b	Are the Chemical Constituent Limitations met?	☐	☐	☐
1c	Are the Radiological Constituent Limitations met?	☐	☐	☐
1d	Are the Physical Parameters met?	☐	☐	☐
1e	Are the Characterization Parameters and Methodologies consistent with the Profile?	☐	☐	☐
1f	Are Prohibited Items excluded from the waste?	☐	☐	☐
1g	Are Packaging Requirements met?	☐	☐	☐
1h	Are Additional Requirements (if any) met?	☐	☐	☐
2.	If fissile isotopes are present, has U^{235} fissile equivalent mass (FEM) been calculated?	☐	☐	☐
3.	If the U^{235} FEM exceeds 15 grams per container, is the waste packaged in a Type A container or is a fissile exemption provided?	☐	☐	☐
4.	Are radiological calculation sheets included in the data package?	☐		☐
5.	Is the Container Record form set entered in the Waste Tracking and Reporting System and has it been peer reviewed and QC Released?	☐	☐	☐

Name: *(Print)*			
Peer Reviewed		*Signature*	*Date*
Name: *(Print)*			
QC Released		*Signature*	*Date*

Comments:

Approved for Acceptance Based Upon Review Against Master Profile.

Name: *(Print)*			
Project Technical Staff		*Signature*	*Date*

Note: This form cannot be completed by the individual signing as the Container Record Waste Certifier.

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
1. Section A – Material Description Remote-handled (RH) transuranic (TRU) waste consists of TRU-contaminated waste items having an unshielded surface dose rate greater than 200 mrem/h. RH-TRU waste is primarily categorized by the waste matrix: • Debris Waste • Soils/Gravels • Homogeneous Solids All TRU wastes shall be segregated by the waste matrix categories listed above.				
2. Section A – Material Description All materials in the waste form must be inert (nonreactive), be in a nonreactive form, or have been rendered nonreactive.				
3. Section B – Chemical Constituent Limitations RH-TRU waste shall contain hazardous constituents only as co-contaminants with TRU. All RH-TRU mixed waste exhibiting corrosive, reactive, or ignitable characteristics shall be treated to remove the hazardous characteristic. NOTE: Mixed waste generators should consult with Environmental Compliance staff before treating Resource Conservation and Recovery Act (RCRA) wastes. If RCRA wastes are treated to remove a characteristic (as required above), then RCRA requirements must be met for the treatment process to avoid a violation of RCRA.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
4. Section B – Chemical Constituent Limitations Hazardous waste codes shall be limited to: F001, F002, F003, F004, F005, F006, F007, F009 D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D021, D022, D026, D027, D028, D029, D030, D032, D033, D034, D035, D036, D037, D038, D039, D040, D043 P015, P030, P098, P099, P106, P120 U002*, U003*, U019*, U037, U043, U044, U052, U070, U072, U078, U079, U103, U105, U108, U122, U133*, U134*, U151, U154*, U159*, U196, U209, U210, U220, U226, U228, U239*. *Acceptance of U-numbered wastes listed for reactivity, ignitability, or corrosivity characteristics is contingent upon a demonstration that the wastes no longer exhibit the characteristics of reactivity, ignitability, or corrosivity.				
5. Section B – Chemical Constituent Limitations RH-TRU mixed waste shall contain no chemicals that would cause adverse reactions with other contents in the container.				
6. Section B – Chemical Constituent Limitations Polychlorinated biphenyl (PCB)-contaminated TRU waste shall be limited to PCB bulk product waste and PCB remediation waste. PCB-contaminated liquids are prohibited.				
7. Section C – Radiological Constituent Limitations The content of TRU radionuclides (defined as ^{241}Am, ^{242m}Am, ^{243}Am, ^{247}Bk, ^{249}Cf, ^{251}Cf, ^{243}Cm, ^{245}Cm, ^{246}Cm, ^{247}Cm, ^{248}Cm,				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
^{250}Cm, ^{237}Np, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{244}Pu) in the waste shall be > 100 nCi per gram of waste matrix at the time of generation, or will become > 100 nCi per gram of waste matrix, due to decay during the expected time of interim storage prior to disposal. (The weight of the container [including any rigid liners] shall be subtracted prior to performing the nCi/g calculation.) The content of ^{241}Am, ^{238}Pu, ^{239}Pu, and ^{240}Pu shall be clearly quantified.				
8. Section C – Radiological Constituent Limitations Each cask shall not exceed 60 ^{239}Pu Plutonium Equivalent Curies (PE-Ci).				
9. Section C – Radiological Constituent Limitations The contact dose rate on any RH-TRU waste package shall be less than a total of 1 rem/h from all radiation emissions. Note: As low as reasonably achievable (ALARA) principles should be used when packaging all RH-TRU waste. Whenever possible, generators should package waste items such that the external dose rate from the container is ALARA. Generators needing to exceed the 1 rem/h dose rate must receive specific approval from the United Cleanup Oak Ridge LLC (UCOR) TRU Waste Project Manager prior to packaging a higher dose rate cask.				
10. Section C – Radiological Constituent Limitations The maximum activity concentration shall not exceed 23 Ci/liter averaged over the inner volume of the cask.				
11. Section C – Radiological Constituent Limitations The quantity of deuterium in a cask shall be limited to that which would be found in 20 gallons of heavy water.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
12. Section C – Radiological Constituent Limitations ^{235}U fissionable equivalent mass shall be limited to 125 g per cask.				
13. Section C – Radiological Constituent Limitations Generators must obtain Authorization to Ship from UCOR Nuclear Material Control and Accounting (NMC&A) prior to shipment of Nuclear Material to a UCOR facility. Generators must complete appropriate sections of the UCOR Form-557 and provide back-up documentation for the material amounts on the form to obtain this authorization when transferring Nuclear Materials meeting the UCOR reporting requirements below.				
14. Section C – Radiological Constituent Limitations Generators are required to report any Nuclear Material subject to Order 474.2 (latest revision), *Nuclear Material Control and Accountability,* requirements on a U.S. Department of Energy (DOE)/Nuclear Regulatory Commission Form-741 when shipments contain materials/waste at ≥ 0.5 of reporting unit for either isotope or element weights as identified in Attachment 2 (Table A. Special Nuclear Materials and Table B. Other Accountable Nuclear Materials) of DOE Order 474.2. If the generator has an approved exception to nuclear material reporting requirements, the approval documentation must be provided with the waste data package and to the UCOR NMC&A department.				
15. Section C – Radiological Constituent Limitations Generators are additionally required to report Nuclear Materials listed in Table I-1 of DOE Manual 474.1-1B (latest revision) requirements with masses ≥ 0.5 of the reporting unit for either isotope or element				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
weights. (UCOR NMC&A Program to meet DOE Order 474.2 [latest revision])				
16. Section D – Physical Parameter Limitations Wastes must not contain loose, fine powders. No more than 1 weight percent of less than 10-micron diameter particles, or 15 weight percent of less than 200-micron diameter particles is allowable.				
17. Section D – Physical Parameter Limitations Waste that is known to be in a fine particulate form or in a form that could mechanically or chemically be transformed to a particulate during handling and storage must be immobilized, or may be considered on a case-by-case basis with more restrictive nuclide limits.				
18. Section E – Characterization Parameters and Methodology The process knowledge package for RH-TRU waste shall include the following elements: - Areas and buildings where generated - Waste stream volume and time period of generation - Process descriptions, procedures, flow diagrams, as applicable - Information that identifies the chemical and radionuclide content of waste stream and physical waste form RCRA hazardous waste codes assignment, if applicable, and supporting documentation - Information from site personnel - Standard industry documents (where applicable) - Previous analytical data (where applicable) - Material Safety Data Sheets/Safety Data Sheets/product labels (where applicable) - Laboratory notebooks (where applicable) - Sampling and analysis (where applicable)				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
19. Section E – Characterization Parameters and Methodology Radiological characterization may include: (1) mass balance of material from NMC&A records, (2) gross radiation measurements (with documented and verified conversion/scaling factors to derive activity), or (3) direct measurement of specific radionuclides through nondestructive analysis or sampling and analysis.				
20. Section E – Characterization Parameters and Methodology If direct sampling and analytical data is used, samples taken shall be representative of the waste stream and shall be collected in accordance with the U.S. Environmental Agency (EPA)-approved or sampling protocols in the current collection of *Test Methods for Evaluating Solid Waste* (EPA SW846) industry standard protocols, or equivalent. For the radiochemical analyses, industry standard procedures shall be used.				
21. Section E – Characterization Parameters and Methodology The specific characterization method, procedure, or sampling and analysis plan that was used shall be referenced in the waste data package, and a copy of the referenced document(s) shall be provided to the UCOR Waste Generator Services waste acceptance group upon request.				
22. Section E – Characterization Parameters and Methodology Laboratory analyses should be conducted by a Sample Management Office (SMO)-approved and audited laboratory [DOE Oak Ridge Policy]. Laboratories that are currently included in the SMO audit program are listed at the SMO website at http://www.ornl.gov/smo.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
23. Section E – Characterization Parameters and Methodology As an alternative, data from a nonqualified laboratory may be used as process knowledge, but shall be confirmed by analysis at an SMO-audited laboratory periodically, or whenever the generation process changes sufficiently that the previous characterization data is no longer applicable. The periodic basis shall generally be annually, but may be extended (or reduced) on a case-by-case basis to a lesser (or higher) frequency for streams with low (or high) annual generation rates.				
24. Section E – Characterization Parameters and Methodology If analytical quantification limits exceed regulatory thresholds, the generator must provide documentation or rationale that lower levels of quantification are not possible.				
25. Section E – Characterization Parameters and Methodology Generators must have a demonstrable and documented means of ensuring that analytical data received from laboratories are reviewed, assessed, verified, or validated, to ensure that the data quality objectives of the sampling and analysis effort were achieved. While the exact nature and frequency of the data review remains flexible, a data review/assessment process must be documented and evident in practice.				
26. Section E – Characterization Parameters and Methodology For establishing whether the waste is defense TRU waste versus nondefense TRU waste, the generator shall establish via an evidence file that addresses whether or not the waste was generated by an atomic energy defense activity.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
27. Section F – Prohibited Items RH-TRU waste shall not contain the following prohibited items: • Classified Waste • Free Liquids (total residual liquid shall not exceed 1% by volume of the cask) • Pyrophoric materials • Explosives (defined per 49 *CFR* 173.50) • Corrosives (defined per 40 *CFR* 261.22 and/or 49 *CFR* 173.136) • Compressed gases (defined per 49 *CFR* 173.115) • Pressurized containers • Sealed containers > 4 liters in size • PCB-contaminated liquids • PCB wastes other than PCB bulk product waste or PCB remediation waste • Waste containing pathogens, infectious waste, or other etiological agents (defined per 42 *CFR* 72.3) • Animal carcasses or other biological waste • Reactive wastes (40 *CFR* and/or 49 *CFR*) • Ignitable wastes (40 *CFR* and/or 49 *CFR*) • Spent nuclear fuel • High-level radioactive waste • Chemicals or materials (e.g., absorbents) that would cause an adverse reaction with other contents in the cask • Powders (as described in Section D of the profile)				
28. Section G – Packaging Requirements Depending on radiation levels, the waste shall be loaded into either a 6-in. wall cask (with a 54 in. outside diameter [OD]) or a 12-in. wall cask (with a 51 in. OD), as described in drawings X3E118160003 and X3E118160004, respectively. The concrete				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
of the casks shall be ≥ 4 in. on top, bottom, and all sides. Generators desiring to package waste in other than these casks must receive prior approval from the UCOR TRU Waste Project Manager.				
29. Section G – Packaging Requirements The total weight of a loaded cask shall be limited to 18,200 lb.				
30. Section G – Packaging Requirements The actual weight of each waste cask shall be measured. Estimated weights are not acceptable.				
31. Section G – Packaging Requirements The cask shall be lined with 10-mil PVC material.				
32. Section G – Packaging Requirements Void space shall be minimized to the extent reasonably achievable.				
33. Section G – Packaging Requirements Vents or other mechanisms to prevent pressurization of containers or generation of flammable or explosive concentrations of gases shall be installed on containers of newly generated waste at the time the waste is packaged [DOE Order 435.1 Manual III.L(1)(b)].				
34. Section G – Packaging Requirements Packages must not contain incompatible chemicals that could react during storage, shipping, or handling.				
35. Section G – Packaging Requirements Only waste that is similar in material, physical form, radiological properties, and hazardous constituents (i.e., from similar processes) should be packaged together.				
36. Section G – Packaging Requirements Generators must demonstrate traceability of the waste package from the point of generation to the point of waste transfer. Methods must be employed to ensure that the integrity of the in-process waste				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
package is not compromised (i.e., prohibited items are not introduced into the waste package).				
37. Section G – Packaging Requirements Once the waste package certification activities have been completed and the packages have been sealed, the packages must be stored in a secure, protected area to prevent deterioration and unauthorized intrusion. Tamper-indicating devices, clips, or banding may be used to indicate that the package has not been opened.				
38. Section G – Packaging Requirements Internal containers (e.g., bottles, cans) shall be well drained and contain only residual liquids (i.e., contain as little residual liquid as is reasonably achievable by pouring, pumping, and/or aspirating). In all cases, there must be less than 1 in. of residual liquid in the bottom of each container, and the total residual liquid volume in the waste package (i.e., the sum of the residual liquids in all internal containers) must not exceed 1% by volume containers.				
39. Section G – Packaging Requirements The package closure must be sturdy enough that it will not be breached under normal handling conditions.				
40. Section G – Packaging Requirements Removable surface contamination (dpm/100 cm^2) for the exterior of the waste container shall be limited to the Waste Isolation Pilot Plant waste acceptance criteria: • ≤ 20 dpm/100 cm2 alpha • ≤ 200 dpm/100 cm2 beta-gamma				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
1. Section A – Material Description All transuranic (TRU) wastes shall be segregated by the waste matrix categories: • Debris Waste • Soils/Gravels • Homogenous Solids				
2. Section A – Material Description All materials in the waste form must be inert (nonreactive), be in a nonreactive form, or have been rendered nonreactive.				
3. Section B – Chemical Constituent Limitations All contact-handled (CH)-TRU mixed waste exhibiting corrosive, reactive, or ignitable characteristics shall be treated to remove the hazardous characteristic.				
4. Section B – Chemical Constituent Limitations Hazardous waste codes shall be limited to *allowable as specified in Profile TRU-CH-7.*				
5. Section B – Chemical Constituent Limitations Acceptance of U-numbered wastes *(i.e., U002, U003, U019, U133, U134, U154, U159, and U239)* listed for reactivity, ignitability, or corrosivity characteristics is contingent upon a demonstration that the wastes no longer exhibit the characteristics of reactivity, ignitability, or corrosivity.				
6. Section B – Chemical Constituent Limitations CH-TRU mixed waste shall contain no chemicals that would cause adverse reactions with other contents in the container.				
7. Section B – Chemical Constituent Limitations Polychlorinated biphenyl (PCB)-contaminated TRU waste shall be limited to PCB bulk product waste and PCB remediation waste.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
8. Section B – Chemical Constituent Limitations PCB-contaminated liquids are prohibited.				
9. Section C – Radiological Constituent Limitations Each 55-gal drum shall not exceed 80 ^{239}Pu Plutonium Equivalent Curies (PE-Ci).				
10. Section C – Radiological Constituent Limitations The contact dose rate on any CH-TRU waste package shall be less than or equal to a total of 200 mR/hr from all radiation emissions, and no inner item shall exceed a total of 200 mR/hr at 30 centimeters from the unshielded surface.				
11. Section C – Radiological Constituent Limitations The content of TRU radionuclides in the waste shall be > 100 nCi per gram of waste matrix at the time of generation, or will become > 100 nCi per gram of waste matrix due to decay during the expected time of interim storage prior to disposal.				
12. Section C – Radiological Constituent Limitations The weight of the container (including any rigid liners) shall be subtracted prior to performing the nCi/g calculation.				
13. Section C – Radiological Constituent Limitations The content of ^{241}Am, ^{238}Pu, ^{239}Pu, and ^{240}Pu shall be clearly quantified.				
14. Section C – Radiological Constituent Limitations ^{235}U fissionable equivalent mass shall be limited to 150 g per 55-gal drum.				
15. Section C – Radiological Constituent Limitations Generators are required to report any Nuclear Material subject to DOE Manual Order 474.2 (latest revision), *Nuclear Material Control and Accountability,*				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
requirements on a U.S. Department of Energy (DOE)/Nuclear Regulatory Commission Form-741 when shipments contain materials/waste ≥ 0.5 of reporting unit for either isotope or element weights as identified in Attachment 2 (Table A. Special Nuclear Materials and Table B. Other Accountable Nuclear Materials) of DOE Order 474.2. If the generator has an approved exception to nuclear material reporting requirements, the approval documentation must be provided with the waste data package.				
16. Section C – Radiological Constituent Limitations Generators are additionally required to report Nuclear Materials listed in Table I-1 of DOE Manual 474.1-1B (latest revision) requirements with masses ≥ 0. 5 of the reporting unit for either isotope or element weights.				
17. Section D – Physical Parameter Limitations Wastes must not contain loose, fine powders. No more than 1 weight percent of less than 10-micron diameter particles, or 15 weight percent of less than 200-micron diameter particles is allowable. Waste that is known to be in a fine particulate form, or in a form that could mechanically or chemically be transformed to a particulate during handling and storage must be immobilized, or may be considered on a case-by-case basis with more restrictive nuclide limits.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
18. Section E – Characterization Parameters and Methodology The process knowledge package (United Cleanup Oak Ridge LLC [UCOR] Form-398, or equivalent) for CH-TRU waste shall include the following elements: – Areas and buildings where generated – Waste stream volume and time period of generation – Process descriptions, procedures, flow diagrams, as applicable – Information that identifies the chemical and radionuclide content of waste stream and physical waste form – Resource Conservation and Recovery Act (RCRA) hazardous waste codes assignment, if applicable, and supporting documentation – Information from site personnel – Standard industry documents (where applicable) – Previous analytical data (where applicable) – Material Safety Data Sheets/Safety Data Sheets/product labels (where applicable) – Laboratory notebooks (where applicable) – Sampling analysis (where applicable)				
19. Section E – Characterization Parameters and Methodology Generators must have a demonstrable and documented means of ensuring that analytical data received from laboratories are reviewed, assessed, verified, or validated, to ensure that the data quality objectives of the sampling and analysis effort were achieved. While the exact nature and frequency of the data review remains flexible, a data review/assessment process must be documented and evident in practice.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
20. Section F – Prohibited Items CH-TRU waste shall not contain the following prohibited items: • Classified Waste • Free Liquids (total residual liquid shall not exceed 1% by volume of the container) • Pyrophoric materials • Explosives (defined per 49 *CFR* 173.50) • Corrosives (defined per 40 *CFR* 261.22 and/or 49 *CFR* 173.136) • Compressed gases (defined per 49 *CFR* 173.115) • Pressurized containers • Sealed (un-vented) containers > 4 liters in size (Waste Isolation Pilot Plant [WIPP] waste acceptance criteria [WAC]) • PCB-contaminated liquids • PCB wastes other than PCB bulk product waste or PCB remediation waste • Waste containing pathogens, infectious waste, or other etiological agents (defined per 42 *CFR* 72.3) • Animal carcasses or other biological waste • Reactive wastes (40 *CFR* and/or 49 *CFR*) • Ignitable wastes (40 *CFR* and/or 49 *CFR*) • Spent nuclear fuel • High-level radioactive waste • Internal shielding or deliberate waste placement to provide shielding for high radiation items (WIPP WAC) • Machine compacted waste • Nested configuration (e.g., 6M, 3013, 9975) • Powders (as described in Section D of the profile)				
21. Section G – Packaging Requirements Wastes shall be packaged in 55-gal metal (carbon steel, stainless steel, or galvanized steel) open-head drums with bung lids meeting Department of Transportation (DOT) Specification 7A, Type A, packaging requirements. The outside				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
diameter of the drum (including the drum ring, but not the drum ring bolt) shall not exceed 24 in., and the overall height of the drum shall not exceed 35 in. (CH-TRAMPAC)				
22. Section G – Packaging Requirements The WIPP-approved vents with sample ports (as identified in WIPP WAC), shall be installed on containers of newly generated waste at the time the waste is packaged to prevent pressurization of containers or accumulation of flammable or explosive concentrations of gases. [DOE Order 435.1 Manual III.L(1)(b)]				
23. Section G – Packaging Requirements All waste containers must be in good and unimpaired condition. A container is determined to be in good and unimpaired condition if it: 1) Does not have significant rusting 2) Does not have significant dents or deformation 3) Container lid gasket is present and undamaged 4) WIPP-approved vent with sample ports is installed, undamaged, and operating properly (not clogged) 5) Is of sound structural integrity 6) Does not show signs of leakage				
24. Section G – Packaging Requirements Use 90-mil polyethylene drum liners inside the 55-gal steel drum when directly packaging homogeneous solids or soil and gravel. Use a fiberboard rigid liner when packaging debris (or co-packaged homogeneous solids/soil/gravel with debris when debris volume is > 50% by volume) in lieu or rigid polyethylene drum liner (WIPP WAC).				
25. Section G – Packaging Requirements Except for off-the-shelf DOT spec containers (e.g., UN-stamped, non-bulk performance-oriented packaging), the				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
container-design specification number, "stores" catalog number, or purchase order number shall be referenced within the waste data package or be identifiable by markings on the container. [10 *CFR* 830.122(f)]				
26. Section G – Packaging Requirements Evidence of supplier evaluations and receipt inspection of waste containers shall be provided upon request. [10 *CFR* 830.122(g)(2) and (h)(1)]				
27. Section G – Packaging Requirements Internal bags containing the waste shall be closed by one of the following methods: a. Twist-and-tape closure b. Fold-and-tape closure c. Heat-seal closure: Heat sealed bags must meet one of the following criteria (WIPP WAC): • < 4 liters internal volume • > 4 liters internal volume with a WIPP-approved filter vent capable of a minimum total hydrogen diffusivity of 1.075e-5 mol/s/mol fraction at 25^0C • > 4 liters internal volume with > 390 in^2 of surface area The use of wire or plastic ties to aid twist-and-tape or fold-and-tape closures are allowable, but the use of supplemental sealing devices (such as clamps or mechanical closures) shall not be used. If heat-sealed bags are used, controls shall be in place to verify that the heat-sealed bags meet the venting and/or size requirements stated above. Evidence of the controls used to verify the heat-sealed bag requirements shall be provided.				
28. Section G – Packaging Requirements Packages must not contain incompatible chemicals that could react during storage, shipping, or handling.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
29. Section G – Packaging Requirements Void space shall be minimized to the extent reasonably achievable.				
30. Section G – Packaging Requirements All waste shall be packaged so that the absence of prohibited items can be verified by non-destructive examination (NDE). Items that could potentially be identified as prohibited items during NDE of the container (e.g., empty and punctured aerosol cans or compressed gas cylinders) and impenetrable objects should be packaged in such a way that the absence of prohibited items can be verified.				
31. Section G – Packaging Requirements Internal containers (e.g., bottles, cans) shall be well drained and contain only residual liquids (i.e., contain as little residual liquid as is reasonably achievable by pouring, pumping, and/or aspirating). In all cases, there must be less than 1 in of residual liquid in the bottom of each container, and the total residual liquid volume in the waste package (i.e., the sum of the residual liquids in all internal containers) must not exceed two liters in a 55-gal drum or 1% by volume for other containers.				
32. Section G – Packaging Requirements Containers shall not be filled to exceed the design gross weight capacity of the container, and 55-gal drums shall not exceed a maximum gross weight of 1000 lb. The actual weight of each container shall be measured using a calibrated scale with evidence of calibration provided. Estimated weights are not acceptable.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
33. Section G – Packaging Requirements A unique barcode identification number label shall be placed on the exterior of each container. Containers shall be marked "Caution Radioactive Material" using yellow and magenta labels [10 *CFR* 835]. Containers whose contents are also RCRA-regulated (mixed-TRU), shall be additionally marked "Hazardous Waste" with RCRA Start Date, as specified in 40 *CFR* 262.32.				
34. Section G – Packaging Requirements The package closure must be sturdy enough that it will not be breached under normal handling conditions. In addition, generators are responsible for loading containers in a manner in which they will not be breached during subsequent handling or transport. This may include wrapping sharp edges, placing protective barriers inside the box to prevent direct contact with the container surfaces (i.e., plywood or metal sheet), and cribbing of components to prevent load shifting. [DOE-HQ Lessons Learned Memo from R. Card, 12/07/01]				
35. Section G – Packaging Requirements Generators must demonstrate traceability of the waste package from the point of generation to the point of waste transfer. Methods must be employed to ensure that the integrity of the in-process waste package is not compromised (i.e., prohibited items are not introduced into the waste package).				
36. Section G – Packaging Requirements Once the waste package certification activities have been completed and the packages have been sealed, the packages must be stored in a secure, protected area to prevent deterioration and unauthorized intrusion. Tamper-indicating devices, clips, or banding may be used to indicate that the package has not been opened.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
37. Section G – Packaging Requirements Waste containers being used as a communal receptacle (i.e., filled by multiple individual generators over time) or containing multiple distinct waste items, shall be accompanied by a container log sheet (UCOR Form-384 or equivalent).				
38. Section G – Packaging Requirements Radioactive sealed sources that meet the criteria for CH-TRU waste shall be packaged separately from other wastes. The sealed radioactive source consists of a known or estimated quantity of radioactive material contained within a sealed capsule, sealed between layer(s) of nonradioactive material, or firmly fixed to a nonradioactive surface by electroplating or other means intended to prevent leakage or escape of the radioactive material.				
39. Section G – Packaging Requirements Removable surface contamination (dpm/100cm^2) for the exterior of the waste container shall be limited to (WIPP WAC): • $\leq$ 20 dpm/100cm^2 alpha • $\leq$200 dpm/100cm^2 beta-gamma. Fixatives shall not be used to meet the removable surface contamination criteria. (WIPP WAC)				

F = Finding
NA = not applicable
O = Observation
S = Satisfactory

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	YES	NO	NA	Comments
1. Section A – Material Description The Removable Lid Canister (RLC) Overpack (ROP) configuration consists of: a) Remote-handled (RH) transuranic (TRU) waste packaged into 55-gal drums, 30-gal drums, or 15-gal drums. (Note: The designation on RLC designed for 30- and 15-gal drums are the NS-30 and NS-15, respectively) b) Three drums of RH-TRU waste are packaged in to a single RLC c) One loaded RLC is placed into a ROP.				
2. Section A – Material Description The RH-TRU waste loaded into the drums and then placed in the RLC must be compliant with Waste Isolation Pilot Plant (WIPP) waste acceptance criteria (WAC) requirements.				
3. Section B – Chemical Constituent Limitations TRU-ROP waste may contain hazardous constituents only as co-contaminants with TRU isotopes. All TRU-ROP mixed waste exhibiting corrosive, reactive, or ignitable characteristics shall be treated to remove the hazardous characteristic.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	YES	NO	NA	Comments
4. Section B – Chemical Constituent Limitations Hazardous waste codes shall be limited to: F001, F002, F003, F004, F005, F006, F007, F009 D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D021, D022, D026, D027, D028, D029, D030, D032, D033, D034, D035, D036, D037, D038, D039, D040, D043 P015, P030, P098, P099, P106, P120 U002*, U003*, U019*, U037, U043, U044, U052, U070, U072, U078, U079, U103, U105, U108, U122, U133*, U134*, U151, U154*, U159*, U196, U209, U210, U220, U226, U228, U239*. *Acceptance of U-numbered wastes listed for reactivity, ignitability, or corrosivity characteristics is contingent upon a demonstration that the wastes no longer exhibit the characteristics of reactivity, ignitability, or corrosivity.				
5. Section B – Chemical Constituent Limitations TRU-ROP mixed waste shall contain no chemicals that would cause adverse reactions with other contents in the container.				
6. Section C – Radiological Constituent Limitations The content of TRU radionuclides (defined as ^{241}Am, ^{242m}Am, ^{243}Am, ^{247}Bk, ^{249}Cf, ^{251}Cf, ^{243}Cm, ^{245}Cm, ^{246}Cm, ^{247}Cm, ^{248}Cm, ^{250}Cm, ^{237}Np, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{244}Pu) in the waste shall be > 100 nCi per gram of waste matrix at the time of generation, or will become > 100 nCi per gram of waste matrix due to decay during the expected time of interim storage prior to disposal. (The tare weights of the ROP, RLC, and the three				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	YES	NO	NA	Comments
drums shall be subtracted prior to performing the nCi/g calculation.)				
7. Section C – Radiological Constituent Limitations Each ROP shall not exceed 240 ^{239}Pu Plutonium Equivalent Curies (PE-Ci). Note: Total measurement Uncertainty is reported, but not included in PE-Ci determination.				
8. Section C – Radiological Constituent Limitations The contact dose rate on any TRU-ROP container shall be less than a total of 1 Rem/hour (R/hr) from all radiation emissions. Note: As low as reasonably achievable (ALARA) principles should be used when packaging all RH-TRU-ROP waste. Whenever possible, the TRU Waste Processing Center (TWPC) should package waste items such that the external dose rate from the ROP is ALARA. In the event that TWPC needs to exceed the 1 Rem/hr dose rate for the ROP, TWPC must receive specific approval from the UCOR TRU Waste Project Manager prior to shipping a higher dose rate ROP.				
9. Section C – Radiological Constituent Limitations The ^{235}U fissionable equivalent mass (FEM) shall be limited to 491 grams per ROP (315 ^{239} Pu fissile gram equivalent [FGE]) loaded with standard 55-gal drums. The ^{235}U FEM shall be limited to 382 grams per ROP (245 ^{239}Pu FGE) loaded with NS-30 or NS-15 RLC. The ^{235}U FEM shall be limited to maximum of 312 grams in a drum (200 ^{239}Pu FGE) loaded in the RLC.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	YES	NO	NA	Comments
10. Section D – Characterization Parameters and Methodology TRU-ROP wastes must be characterized in compliance with WIPP WAC requirements for chemical and radiological characterization.				
11. Section E – Prohibited Items TRU-ROP waste shall not contain the following prohibited items: • Classified Waste • Observable Liquids shall be less than 1 percent by volume of the outermost container at the time of radiography or visual examination, and internal containers shall not contain more than 60 milliliters or 3 percent by volume, whichever is greater. Containers with Hazardous Waste Number U134 assigned shall have no observable liquid. • Pyrophoric materials • Explosives (defined per 49 *CFR* 173.50) • Corrosives (defined per 40 *CFR* 261.22 and/or 49 *CFR* 173.136) • Compressed gases (defined per 49 *CFR* 173.115) • Pressurized containers • Sealed containers > 4 liters in size • Polychlorinated biphenyl (PCB)-contaminated liquids • PCB wastes other than PCB bulk product waste or PCB remediation waste • Waste containing pathogens, infectious waste, or other etiological agents (defined per 42 *CFR* 72.3) • Animal carcasses or other biological waste • Reactive wastes (40 *CFR* and/or 49 *CFR*) • Ignitable wastes (40 *CFR* and/or 49 *CFR*)				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	YES	NO	NA	Comments
• Spent nuclear fuel • High-level radioactive waste • Chemicals or materials (e.g., absorbents) that would cause an adverse reaction with other contents in the cask • Machine-compacted waste (excludes light compaction with hand or manipulator arm)				
12. Section F – Packaging Requirements ROP waste shall be packaged in WIPP-compliant 55-, 30-, or 15-gal drums placed within a steel canister with removable lid (RLC) within a concrete over-pack (ROP).				
13. Section F – Packaging Requirements The TRU ROP containers must be in good and unimpaired condition. A ROP container is determined to be in good and unimpaired condition if it is of sound structural integrity and does not show sign of leakage.				
14. Section F – Packaging Requirements The total (gross) weight of a ROP (MK-II or MK-III) shall not exceed 22,000 lb.				
15. Section F – Packaging Requirements ROPs shall not be filled to exceed the design gross weight capacity of the ROP. The actual weight of each loaded ROP shall be measured or calculated by adding up the weight of the components of the ROP. The weight of each component (loaded drums, RLC, and empty ROP) shall be measured using certified measurement and testing equipment devices, such as scales, dynamometer, etc.				
16. Section F – Packaging Requirements Generators are responsible for loading containers in a manner in which they will not be breached during subsequent handling or transport.				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
1. Section A – Material Description The Shielded Overpack Package (SOP) consists of one 30- to 90-gal metal drum of Remote Handled (RH) Transuranic (TRU) waste packaged inside the cavity of the SOP.				
2. Section A – Material Description The internal drum is lidded, vented, and of sound integrity.				
3. Section A – Material Description The waste inside the drum typically consists of debris.				
4. Section B – Chemical Constituent Limitation TRU-SOP waste may contain hazardous constituents only as co-contaminants with TRU isotopes.				
5. Section B – Chemical Constituent Limitation All TRU-SOP mixed waste exhibiting corrosive, reactive, or ignitable characteristics shall be treated to remove the hazardous characteristic.				
6. Section B – Chemical Constituent Limitation Hazardous waste codes shall be limited to: F001, F002, F003, F004, F005, F006, F007, F009 D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D021, D022, D026, D027, D028, D029, D030, D032, D033, D034, D035, D036, D037, D038, D039, D040, D043 P015, P030, P098, P099, P106, P120 U002*, U003*, U019*, U037, U043, U044, U052, U070, U072, U078, U079, U103, U105, U108, U122, U133*, U134*, U151,				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
U154*, U159*, U196, U209, U210, U220, U226, U228, U239*. *Acceptance of U-numbered wastes listed for reactivity, ignitability, or corrosivity characteristics is contingent upon a demonstration that the wastes no longer exhibit the characteristics of reactivity, ignitability, or corrosivity.				
7. Section B – Chemical Constituent Limitation TRU-SOP mixed waste shall contain no chemicals that would cause adverse reactions with other contents in the container.				
8. Section C –Radiological Constituent Limitation The content of TRU radionuclides (defined as ^{241}Am, ^{242m}Am, ^{243}Am, ^{247}Bk, ^{249}Cf, ^{251}Cf, ^{243}Cm, ^{245}Cm, ^{246}Cm, ^{247}Cm, ^{248}Cm, ^{250}Cm, ^{237}Np, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{244}Pu) in the waste shall be > 100 nCi per gram of waste matrix at the time of generation, or will become > 100 nCi per gram of waste matrix due to decay during the expected time of interim storage prior to disposal. (The tare weights of the SOP and the drums shall be subtracted prior to performing the nCi/g calculation.)				
9. Section C –Radiological Constituent Limitation Each SOP shall not exceed 80 ^{239}Pu Plutonium Equivalent Curies (PE-Ci). Note: Total measurement Uncertainty (TMU) is reported, but not included in PE-Ci determination.				
10. Section C –Radiological Constituent Limitation The ^{235}U fissionable equivalent mass (FEM) shall be limited to 312 Grams per SOP (200 ^{239} Pu fissile gram equivalent (FGE). (NCSE-OR-WIPP-1603).				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
11. Section C –Radiological Constituent Limitation The contact dose rate on any TRU-SOP container shall be less than 200 mRem/hour from all radiation emissions.				
12. Section D –Characterization Parameters and Methodology The RH TRU Waste shall be verified by the Waste Isolation Pilot Plant (WIPP) Central Characterization Project as not containing WIPP-prohibited items and chemically incompatible materials.				
13. Section D –Characterization Parameters and Methodology The associated radiological characterization will be generated and certified by the Oak Ridge National Laboratory (ORNL) using the quality assurance program requirements of the ORNL Waste Certification Program Plan, which defines the requirements to safely and compliantly disposition ORNL waste.				
14. Section D –Characterization Parameters and Methodology Characterization of all radioactive waste from ORNL is performed using a Data Quality Objective process, approved procedures, and peer reviewed results.				
15. Section D –Characterization Parameters and Methodology All records for characterization of TRU waste is maintained and available for verification and audit.				
16. Section E –Prohibited Items TRU-SOP waste shall not contain the following prohibited items: • Classified Waste • Observable Liquids shall be less than 1 percent by volume of the outermost container at the time of radiography or visual examination and internal containers shall not				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
contain more than 60 milliliters or 3 percent by volume, whichever is greater. Containers with Hazardous Waste Number U134 assigned shall have no observable liquid. • Pyrophoric materials • Explosives (defined per 49 *CFR* 173.50) • Corrosives (defined per 40 *CFR* 261.22 and/or 49 *CFR* 173.136) • Compressed gases (defined per 49 *CFR* 173.115) • Pressurized containers • Sealed containers > 4 liters in size • Polychlorinated biphenyl (PCB)-contaminated liquids • PCB wastes other than PCB bulk product waste or PCB remediation waste • Waste containing pathogens, infectious waste, or other etiological agents (defined per 42 *CFR* 72.3) • Animal carcasses or other biological waste • Reactive wastes (40 *CFR* and/or 49 *CFR*) • Ignitable wastes (40 *CFR* and/or 49 *CFR*) • Spent nuclear fuel • High-level radioactive waste • Chemicals or materials (e.g., absorbents) that would cause an adverse reaction with other contents in the cask • Machine-compacted waste (Excludes light compaction with hand or manipulator arm)				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
17. Section F – Packaging Requirements The SOP is a metal-clad concrete overpack that consists of the following configuration: • The innermost layer is a vented carbon-steel drum ranging from 30 to 90 gal • The second layer is the SOP, which consists of the following: — Inner and outer cylinders, base, and lid constructed with nominal 3/8-in-thick carbon steel — The steel annulus and base are filled with > 4.5-in-thick concrete — A base platform of nominal 54-in square — A vented lid filled with > 4-in-thick concrete and secured with eight ASTM A-307/SAE Grade 1 or higher strength steel bolts spaced at approximately 45 degrees				
18. Section F – Packaging Requirements The TRU SOP containers must be in good and unimpaired condition. A SOP container is determined to be in good and unimpaired condition if it is of sound structural integrity and does not show sign of leakage.				
19. Section F – Packaging Requirements The total (gross) weight of a SOP package shall not exceed 12,000 pounds. The package includes the fully loaded waste drum, SOP, and the base platform (skid). This gross weight does not include any tie down hardware (i.e., top plate).				
20. Section F – Packaging Requirements SOPs shall not be filled to exceed the design gross weight capacity of the SOP. The actual weight of each loaded SOP shall be measured or calculated by adding				

EXAMPLE

Generator Name:
Date(s) of Review:

REQUIREMENTS	S	O/F	NA	Comments
up the weight of the components of the SOP. The weight of each component (loaded drum and empty SOP) shall be measured using certified measurement and testing equipment (M&TE) devices, such as scales, dynamometer, etc. The component weights and calibration records shall be provided with the container data package.				
21. Section F – Packaging Requirements A unique barcode identification number label shall be placed on the exterior of each SOP. SOPs shall be marked "Caution Radioactive Material" using yellow and magenta labels [10 *CFR* 835]. SOPs whose contents are also RCRA regulated (mixed-TRU), shall be additionally marked "Hazardous Waste" with the Resource Conservation and Recovery Act (RCRA) Start Date as specified in 40 *CFR* 262.32.				
22. Section F – Packaging Requirements The TRU SOP package closure must be sturdy enough that it will not be breached under normal handling conditions. Also, generators are responsible for loading containers in a manner in which they will not be breached during subsequent handling or transport.				
23. Section F – Packaging Requirements Removable surface contamination (dpm/100 cm^2) for the exterior of the waste container shall be limited to (WIPP Waste Acceptance Criteria [WAC]): • $\leq$ 20 dpm/100 cm^2 alpha • $\leq$ 200 dpm/100 cm^2 beta-gamma				

F = Finding
NA = not applicable
O = Observation
S = Satisfactory

EXAMPLE

Attachment B: Waste Acceptability Review Checklist

(Page 1 of 4)

Container Number: _____ **Date:** _____

Acceptance Criteria

AK/PK Characterization Support or Waste Programs Manager		**Acceptable**	**Unacceptable**
List AK/PK waste stream:			
Containers are identifiable as part of a waste stream described by approved AK or PK, and appropriate hazardous waste codes are assigned. (If the container is not on an approved list, the container is approved on case-by-case review of generator documents.)			
RTR Tapes reviewed, if available, for drum acceptability. (If no RTR tape is available for review, container *may* still be acceptable.)			
Liquid Indicated:	☐ Yes ☐ No		
Pressurized Gas/Aerosol Can Indicated:	☐ Yes ☐ No		
Asbestos Indicated: ☐ Yes ☐ No If Yes: ☐ Friable ☐ Non-Friable ☐ Unknown			
Beryllium Indicated: ☐ Yes ☐ No If Yes: ☐ Acceptable: Sealed Sources ☐ Acceptable: H&S Approved AND ≤ 1 wt.% of waste **<NCSE 1>** ☐ Reject (If additional approvals are required, ensure approvals are attached)			
Machine Compacted Waste Indicated **<NCSE 1>**:	☐ Yes ☐ No	If Yes: ☐ Reject	
Graphite > 1 wt.% of Waste Indicated **<NCSE 1>**:	☐ Yes ☐ No	If Yes: ☐ Reject	
PCBs Indicated: ☐ Yes ☐ No If Yes: ☐ Article ☐ Bulk Product ☐ Liquid ☐ Remediation			

AK/PK Characterization Support or WPM Print _____ Sign _____ Date _____

Attachment B: Waste Acceptability Review Checklist

(Page 2 of 4)

Container Number: _____ **Date:** _____

Acceptance Criteria

Energetic Material SME **Oxide Material SME**				
PYROPHORIC WASTE identified:	☐ Yes	☐ No	SP HANDLING CODE NO OPEN	
If potential PYROPHORIC WASTE discovered, then Att. B completed in accordance with CM-P-WP-016	☐ Yes	☐ N/A	SME SP HANDLING CODE _____	
Lithium hydride solids or spent media traps Indicated:	☐ Yes	☐ No	SP HANDLING CODE _____	
OXIDE WASTE identified:	☐ Yes	☐ No	SP HANDLING CODE NO OPEN	
OXIDE container configuration:	Inner nested container SINGLE OVERPACK DOUBLE OVERPACK		☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	☐ N/A
NON-OXIDE WASTE identified:	☐ Yes	☐ No		
If potential OXIDE WASTE discovered, then Att. B completed in accordance with CM-P-WP-016:	☐ Yes	☐ N/A	SME SP HANDLING _____	

Energetic Material SME Oxide Material SME	Sign	Date

Attachment B: Waste Acceptability Review Checklist

(Page 3 of 4)

Container Number: _____ **Date:** _____

Acceptance Criteria

Waste Programs Manager (OXIDE WASTE)		
Overpacking of container required upon receipt	☐ Yes ☐ No	☐ N/A
SINGLE OVERPACK required	☐ Yes ☐ No	☐ N/A
DOUBLE OVERPACK required	☐ Yes ☐ No	☐ N/A

WPM Print _____ Sign _____ Date _____

EP	**Acceptable**	**Unacceptable**
Container is not known to contain dangerous constituents such as explosives, etiologic agents, beryllium, or biological waste (Exception: Sealed sources containing beryllium are allowable. Waste containing beryllium that is ≤ 1wt. % of the waste mass AND approved by H&S is allowed.)		
List RCRA accumulation start date and/or PCB out of service date		
Contents Description:		
Primary Hazard: ☐ Ignitable ☐ Corrosive ☐ Reactive ☐ Toxic ☐ Listed ☐Pending Analysis		
RCRA codes assigned per available information	☐ Yes	☐ N/A
Asbestos assigned per available information	☐ Yes	☐ N/A
Beryllium assigned per available information	☐ Yes	☐ N/A
PCBs assigned per available information	☐ Yes	☐ N/A

EP Print _____ Sign _____ Date _____

FRPM	**Acceptable**	**Unacceptable**
Container Plutonium Equivalent Curies (PE-Ci) within TWPC WAC limits		
Container Fissile Gram Equivalent (FGE) within TWPC WAC limits		
Container contact dose rate within TWPC WAC limits		

FRPM Print _____ Sign _____ Date _____

Attachment B: Waste Acceptability Review Checklist

(Page 4 of 4)

Container Number: _____ **Date:** _____

Acceptance Criteria

PS	Acceptable	Unacceptable
Container meets TWPC WAC requirements for acceptable size configuration. (If additional approvals are required, ensure approvals are attached)		
Container meets the TWPC WAC requirements for VOC and H2 limits, when required.		
If a POC, container is configured with a securely installed WIPP-compliant filter-vent (e.g., UltraTech 9424S or other equivalent identified in DOE/WIPP-11-3384, CBFO Approved Filter Vents) on the 55-gal drum and a WIPP-compliant sintered metal filter vent on the inner pipe component. **OR** container is listed on Attachment B, TWPC Documented Safety Analysis Table 3-12, of CM-X-AD-060, TWPC Waste Acceptance Criteria. (N/A if not a POC)		
WIPP compliant vent installed per form WDF-0580 or equivalent document.		
Container is acceptable for Nondestructive Assay or Nondestructive Examination (applies to 55 to 85 gallon drums only) (If N/A, Explain)		
Container is acceptable for receipt.		
Processing or Disposition Notes:		

PS Print _____ Sign _____ Date _____

Waste Acceptance	Acceptable	Unacceptable
Waste is acceptable for transfer to TWPC?		

Waste Acceptance Print _____ Sign _____ Date _____

WASTE CONTAINER(S) ARE ACCEPTABLE FOR TRANSFER TO TWPC

FM Approval:

Print _____ **Signature** _____ **Date** _____

Comments: _____

NOTE: Other selected waste acceptance criteria are reviewed for compliance during the receipt process in accordance with CH-UET-OP-001, Receipt of Contact Handled Solid Waste, RH-UET-OP-015, Remote Handled Cask Receipt, or RH-UET-OP-017, Receipt of Remote Handled Waste Containers.

Distribution: Original to Incoming Container Traveler

EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

ATTACHMENT 3. SECURITY, PREPAREDNESS AND PREVENTION

The information provided in this section is submitted in accordance with the requirements of TN Rule 0400-12-01-.07(8)(a)4 and 5. Other regulations addressed in this section include TN Rule 0400-12-01-.06(3)(b), (c), (d), (e), (f) and (h).

Security Procedures and Equipment

The ORNL complex, within which the units covered in this permit application are located, is a controlled-access site with security measures to prevent unknowing entry and minimize the possibility of unauthorized entry of persons or livestock into the active portion of the unit. This includes a 24-hour surveillance system and one or more barriers to control entry effectively. Such security features contribute to unit safety and security.

Access to the waste storage units at ORNL is controlled by locked access doors. Figure 6.1-20 in Attachment 6.1 shows the locations of the various storage and treatment units. This figure also shows the locations of guarded portals, fences, and gates that serve to restrict public access. Administrative and security control procedures are implemented to minimize unauthorized personnel from entry into these units. Personnel are allowed entry into the storage units storing CH TRU waste only if escorted by authorized personnel with the proper training.

TWPC has a comprehensive security system to prevent unauthorized contact with the hazardous waste management units located at the facility. The security system consists of a combination of physical barriers, equipment, and surveillance procedures that are designed to control the entry of employees, contractors, and visitors to the facility. Personnel authorized to access RCRA units are limited to TWPC personnel who have a minimum of 24 hours or equivalent Hazardous Waste Operations and Emergency Response (HAZWOPER) training, RCRA basic training, Radiation Worker training, and have assigned responsibilities for operating the units at TWPC. Other personnel can obtain limited authorization but must be escorted in order to enter a waste storage or treatment unit. Figure 6.1-20 in Attachment 6.1 shows the location of the TWPC fences and gates that serve to restrict public access.

The TWPC site is completely within a controlled-access area of the U.S. Department of Energy (DOE) Oak Ridge Reservation (ORR). The only point of access to the Facility via a public roadway (i.e., State Route [SR] 95) is at the intersection of the gated, restricted-access road and SR 95.

24-Hour Security Surveillance System

Employees are required to show identification badges to security guards when entering all primary gates to ORNL. Plant roads that connect to public roads are posted and gated to limit traffic to official use only. Visitors and contractors entering the ORNL complex must sign a log sheet and obtain a visitor pass at the east (main) gate Visitor Control. Security at ORNL is maintained by a staff of trained security guards on a 24-hr basis. Routine patrols of areas outside the main complex help provide continuous surveillance. All security guards are equipped with two-way radios and/or

cell phones and have direct communication with Laboratory Protection Personnel (LPP) such as the Fire Department, Laboratory Shift Superintendent (LSS), Laboratory Communications Center (LCC), and waste operations personnel.

ORNL is also equipped with closed-circuit video TV cameras at selected perimeter locations. The LCC and the LSS are provided with monitors that allow each organization to monitor activities at the facility 24 hours per day. Protective (security) personnel routinely patrol the ORNL fences.

TWPC limits access to the site through a series of gates that includes a Limited Access Gate (LAG) and a Routine Access Gate (RAG). The LAG is located near the entrance of the site at SR 95 and consists of a mechanized fence gate with postings stating "Danger – Unauthorized Personnel Keep Out." This gate will be kept closed and locked during non-routine work hours. The RAG is located on WIPP Road approximately 0.5 miles from LAG and consists of a gate equipped with a radio frequency identification (RFID) system. The RAG will remain closed at all times and personnel authorized to access the TWPC site will be issued RFID access cards. Postings are also located at the RAG. Accountability of site personnel will be maintained electronically through the RFID system. Visitors and contractors are required to stop at the Visitor Control Access Support Center for accountability and site access. Direct communication with the LPP, such as the Fire Department, LSS, and LCC is through the TWPC Facility Manager.

The TWPC barriers and equipment inspected by facility personnel include the facility perimeter fence, fence gates, area security lights, and communication devices such as the internal plant telephone, paging, and alarm system. The facility perimeter fence and fence gates are inspected for damage or deterioration that would allow unauthorized entry into the facility. These inspections are documented and maintained in the operating record at the facility in the waste program manager's office.

Barrier and Means to Control Entry

The perimeter of ORNL is patrolled at intervals day and night via a system of patrol roads. During remedial actions in these areas, the status and location of locked gates and fences may be altered to expedite the clean-up process. To protect the storage units from unauthorized entry from individuals within ORNL, the storage units are marked with signs depicting required information to alert personnel to the area boundaries. Entry to this area may be affected when remedial actions are taking place.

Buildings 7855 and 7879 in SWSA 5 are equipped with locks on the doors, and only authorized personnel are allowed the key. The buildings are locked at all times when authorized personnel are not present. Only authorized personnel with an approved badge access are able to enter the buildings. Visitors with required access training will be escorted by authorized personnel in waste storage areas. The locked buildings serve to restrict unauthorized entry.

Buildings 7572 and 7574 in SWSA 7 are equipped with locks on the doors, and only authorized personnel are allowed a key. The CH buildings are locked at all times when authorized personnel are not present. Only authorized personnel with an approved badge access are able to enter the buildings. Access is not allowed on weekends and during holidays, except during specially

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approved operating hours and by prearranged approval. The locked buildings serve to restrict unauthorized entry.

Buildings 7883 and 7860A are located off of Melton Branch Road. Only authorized personnel with an approved badge access are able to enter the buildings. In addition, Bldgs. 7883 and 7860A are equipped with locks on the doors, and only authorized personnel are allowed a key. The locked buildings serve to restrict unauthorized entry.

The active portion of TWPC is surrounded by chain-link fence or barriers to control access. The TWPC overall fence height is nominally 8-ft including 7-ft of fencing plus three strands of barbed wire supported by 45-degree extension arms. Fence gates are locked when not in use. Vehicular traffic passes through a series of gates to access the TWPC site. Waste shipments between TWPC and the other permitted units are conducted through a gate that is locked unless waste is actively being transferred. Only authorized personnel with an approved site badge have access to the waste storage and treatment areas. Visitors will be escorted by a site representative in waste storage areas.

Warning Signs

Signs bearing the legend "Danger - Unauthorized Personnel Keep Out," which are legible from a distance of 25 ft and visible from all angles of approach, are posted at each entrance to the unit (i.e., each entrance to a location where mixed waste is stored) and at the locations to be visible from all approaches to the unit. Signs also indicate when buildings are regulated radiation areas. No languages other than English are necessary for signs at the facility. Existing signs with a legend other than "Danger - Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter and that entry onto the active portion can be dangerous. Appropriate warning signs, including "No Smoking" and "Safety Glasses Required," are posted on all entrances of the buildings where ignitable waste or reactive wastes are stored.

Warning signs at TWPC are displayed prominently at each building entrance to an active portion of the unit and at the active facility entrance. Signs are placed in sufficient numbers so that they are visible from any approaches to the unit. The signs contain the phrase "Danger - Unauthorized Personnel Keep Out" and are legible and visible from a distance of 25 ft.

Preparedness and Prevention Requirements

Communications

In an emergency situation, effective and rapid communication is maintained among all elements of the emergency response and control organization and throughout the facility. The four forms of communications that may be available at the facility are:

a. Emergency Telephone System – Telephones are located at most buildings, operation areas, and some of the TRU waste management units.

   An emergency situation can be reported by dialing 911 on a land line or by dialing (865)574-6606 on a land line or a cellular telephone. Emergency calls are answered in Bldg. 4512, the Laboratory Emergency Response Center (LERC). These

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telephones are also used to communicate information during incident control procedures.

b. Radios – Radios are used by appropriate personnel, such as the Laboratory Emergency Director (LED), the LSS, fire department, Environmental Compliance, waste operations, and security for emergency communications. All radio communications are monitored by the LED and at the LERC. The radios are the first line of communication in areas where telephones are unavailable.

c. The ORNL Public Address (PA) System – The PA system is used to communicate emergency instructions to ORNL personnel. The LED is in charge of all announcements made on this PA system. The PA system speakers are located throughout ORNL, both inside and outside of buildings, operations areas, TWPC, and hazardous waste management units at ORNL.

d. TWPC Emergency Communication Systems – TWPC has a PA system that can be used to communicate emergency instructions to TWPC personnel. The TWPC Shift Superintendent/Facility Manager is in charge of local announcements made on the PA system at TWPC, which are not limited to emergency instructions. Local TWPC PA announcements can be broadcast from 15–20 satellite handheld stations strategically located on the site. The TWPC PA system speakers, shared by the ORNL PA system, are located throughout TWPC, both inside and outside of buildings and operations areas. In areas of TWPC where announcements on the PA system cannot be heard (such as hazardous waste management units), either the Emergency Notification System GAI-Tronic (site PA) system or radios will be used to communicate emergency instructions. An emergency situation can be reported by dialing 911 on a land line or by dialing (865)574-6606 on a landline or a cellular telephone.

In the event of an emergency, emergency assistance is summoned in accordance with the Contingency Plan in Attachment 6.

Emergency Equipment

Emergency equipment stored at or near the waste management units includes coveralls, shoe covers, gloves, and respirators. Buildings 7666 and 7668 serve as the primary storage areas for emergency response equipment. Refer to Figure 6.1-20 in Attachment 6.1 to identify the locations of ORNL's general supplies of emergency equipment. A detailed list of onsite emergency equipment can be found in the Contingency Plan (Attachment 6.2). A large supply of emergency response equipment and supplies are maintained in Buildings 7666 and 7668, consisting of the following items:

- Absorbent, vacuum cleaner, clay absorbent, vermiculite, absorbent boom bails, absorbent pads, safety glasses, gloves, tape, wooded stakes (for oil booms), ropes, pH paper, rubber boots, shoe covers, plastic bags, paper coveralls, ball-peen hammer, drum liners (for 55-gal), 55-gal drums (open and bung top), 30-gal drums (open and bung top), 85-gal overpack drum, oil booms, absorbent pigs, sand bags, and fire extinguishers

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Onsite firefighting and other emergency vehicles have easy access to the units. ORNL Fire Department personnel will be dispatched to the scene of an emergency with special extinguishing equipment, including those using foam and dry chemicals.

An extensive supply of equipment is maintained at ORNL to respond to hazardous materials releases. Several well-equipped mobile units are available. An emergency spill response van is stationed at the Hazardous Waste Management Area. This vehicle is equipped with items necessary to make the first response to a spill. Items in the van include fire extinguishers, absorbent materials, rags, protective clothing, tools, non-sparking tools, generator, exhaust fan, spill kits, floodlights, emergency eyewash, rope, wedge and plug kit, and hoods.

The TWPC units (except for the CHSA, DAC, CHMB, MPB, and CSA) are equipped with a high-efficiency particulate air (HEPA) filtration ventilation system, a fire suppression system, and fire extinguishers in (or near) the units. The CHSA, DAC, and CSA are equipped with fire extinguishers in (or near) the units. All units at TWPC have access to spill kits that include, at minimum, protective clothing (safety glasses, gloves, boots, etc.). Absorbents, brooms or shovels, buckets, and drums are located strategically at TWPC.

Water for Fire Control

Ample water at adequate pressure is available for emergency fire-fighting use (supplied by the ORNL Fire Department pumper trucks). The ORNL Fire Department maintains three pumper trucks equipped with standard emergency equipment at the ORNL Fire Station (Bldg. 2500). Fire hydrants are located throughout ORNL and provide water to processing areas, buildings, and storage units for use during fire situations.

All fires at TWPC will be responded to by the ORNL Fire Department. If there is a fire in the vicinity of the WPB, there is a fire hydrant on the ORNL site that will be used to provide water during a fire situation. If there is a fire at one of the support buildings, the ORNL Fire Department will bring a tanker to provide water during a fire situation.

Alarm System

The emergency alarm system consists of alarm boxes, alarm bells, sirens, and a PA system. Alarm bells and boxes and PA speakers are located throughout ORNL, and the boxes are used to activate the alarm signal in an affected area. Emergency alarm switches and automatic sprinklers are connected to control display boards located at the LERC and the Fire Department. This signal illuminates a light on the control display board and shows the exact location of the activated system. The emergency alarm can be activated from the LERC by the LED.

At TWPC, the emergency alarm system consists of alarm boxes, alarm bells, sirens, and a PA system. Alarm bells and boxes and PA speakers are located throughout TWPC, and the boxes are used to activate the alarm signal in an affected area. Emergency alarm switches and automatic sprinklers for the WPB are connected to control display boards located in the Access Control Point of the Personnel Building. This signal illuminates a light on the control display board and shows the exact location of the activated system. If an alarm on this system is activated, it automatically notifies the LERC.

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Preventive Procedures, Structures, and Equipment

Loading/Unloading Operations

At ORNL, precautions have been taken to reduce the potential for hazard during loading/unloading operations at the storage units. Refer to Attachment 8.1 for more information.

Run-off

The probability of a release of RCRA-contaminated liquids is very small. Refer to Attachment 8.1 for more information.

Water Supplies

Groundwater and surface water contamination will be prevented by safe handling procedures during loading and unloading operations. Refer to Attachment 8.1 for more information.

Equipment and Power Failure

Electrical pumping or waste handling systems will not be used during the power outage in these units. Refer to Attachment 8.1 for more information.

Personal Protective Equipment

Protective equipment will be used during emergency response situations. Refer to Attachment 8.1 for more information.

Prevention of Reaction of Ignitable, Reactive, or Incompatible Wastes

Precautions to Prevent Ignition or Reaction of Stored Waste

Reactive, ignitable, and incompatible waste may be stored at the permitted units. All container storage areas are located more than 50 ft from the property line. Refer to Attachment 8.1 for handling of these types of waste.

General Precautions for Handling Ignitable or Reactive Wastes or Accidentally Mixing Incompatible Wastes

The waste management units may be used to store reactive, ignitable, or incompatible wastes. Refer to Attachment 8.1 for handling of these types of waste.

Management of Ignitable or Reactive Waste in Containers

Waste materials will not be placed or stored in containers that contain any wastes or waste residues with which they would adversely react. Refer to Attachment 8.1 for handling of these types of waste.

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Management of Incompatible Waste in Containers

Waste materials will not be placed or stored in containers that contain any wastes or waste residues with which they are incompatible. Refer to Attachment 8.1 for handling of these types of waste.

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ATTACHMENT 4. INSPECTIONS

Attachment 4 consists of three separate sections as follows:

- Attachment 4.1 Inspections
- Attachment 4.2 Inspection Schedules
- Attachment 4.3 Inspection Logs

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ATTACHMENT 4.1. INSPECTIONS

The information provided in this section is submitted in accordance with the requirements of TN Rule 0400-12-01-.07(5)(a)1(v).

Inspection Schedule

The inspection schedules for the storage and treatment units are shown in Attachment 4.2. Qualified personnel will inspect each of these units weekly when waste is present. In addition to inspecting waste containers and treatment equipment for integrity and operability, the storage and treatment units will also be inspected for structural deterioration and discharges that could cause or lead to the release of hazardous waste constituents, threaten human health, or adversely affect the environment.

DSWM has approved ORNL's waiver of the weekly inspection requirements for containers [40 *CFR* 264.174 and Rule 0400-12-01-.05(9)(e)] based on the *As Low as Reasonably Achievable* (ALARA) standards adopted by DOE. These standards are intended to minimize the radiation dose received by employees. This waiver is based on the high dose workers would receive by having to perform weekly inspections on these containers. In this permit, the waiver is approved for the weekly container inspection requirement for RH TRU, CH TRU, high-dose MLLW, controlled high-fissile CH TRU, and inaccessible low-dose MLLW waste containers. Many of the low-dose MLLW containers are commingled with higher dose containers at TWPC and as such, are not safely accessible for weekly inspections. The waivers for weekly inspection requirements remain effective for 5 years upon issuance and will have to be renewed or the permittee will be required to submit a modification to this permit. Waiver renewal shall be required to be submitted at least 90 days prior to the waiver ending.

DSWM has approved ORNL's waiver of the aisle space requirement [40 *CFR* 264.35 as referenced by Rule 0400-12-01-.06(3)] for RH TRU and controlled high-fissile CH TRU waste:

> The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency; unless it can be demonstrated to the Commissioner that aisle space is not needed for any of these purposes.

The waivers for aisle space requirement remain effective for 5 years upon issuance and will have to be renewed or the permittee will be required to submit a modification to this permit. Waiver renewal shall be required to be submitted at least 90 days prior to the waiver ending.

The waiving for the weekly inspection of containers requirements is justified given the design of the units (for radiation controls), the restricted access to the units when storing these wastes (due to radiation levels inside the units), and that the stored wastes are mostly solids with a low flammability and spill potential. Personnel access is limited because of high radiation levels and the need to keep radiation exposures to ALARA levels. The wastes are predominantly solids, have multiple layers of containment, and are not expected to be flammable. The outer container (i.e., cask) is made of concrete and is designed for long-term compatibility of the wastes or a B-25 box

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with multiple layers of containment. To date, ORNL has not experienced a spill/release of hazardous wastes in a storage unit that was caused by a deteriorating cask or B-25 box.

A waiver is not requested from the weekly inspection requirements for accessible containers of low-dose MLLW. Regularly scheduled inspections of the low-dose MLLW stored at these units will be performed according to the schedule in Attachment 4.2.

All storage units will have regularly scheduled inspections performed by trained and qualified personnel. Inspection logs are presented Attachment 4.3.

Inspection records will be maintained as part of the operating record for these units for at least three years. Inspections will not be conducted if the conditions of the facility (or unit) are such that the health and safety of personnel may be threatened. Such conditions may be present during emergency situations, or due to severe weather conditions (e.g., ice on walkways in or around storage areas). If portions of inspections are not conducted for health and/or safety reasons, the reason the inspection could not be completed, and the portion(s) of the facility inspection not completed, will be documented on the inspection form.

The inspection records will be maintained as part of the operating record required by the permit.

The term monthly means recurring by the end of the same day of the following month (if the action required to be conducted monthly is taken 1) on the 3rd of a month, then the action must be taken again by midnight ending the 3rd of the following month or 2) on the last day of the month (for example the 31st one month), then the action must be taken again by midnight on the last day of the following month whether it is 28th through the 31st).

Types of Problems

The inspection schedules for the units are shown in Attachment 4.2. The types of problems that may be encountered during the inspection of the storage units are listed on the inspection schedules.

The items listed on the inspection schedule sheets are important because of their role in detecting and remedying conditions to prevent situations that could affect human health and the environment.

Frequency of Inspection

The unit inspection frequency and each inspection item noted are listed on the inspection schedule sheets. The storage units are inspected as shown in Attachment 4.2. “Weekly” means recurring by the end of the same day of the following week (e.g., if an action required to be conducted weekly is taken on a Monday, then the action must be taken again by midnight ending the following Monday).

Accessible empty storage units, or empty portions of storage units (i.e., empty cells/bays; excluding the portable transport containers), will be inspected weekly.

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Specific Process Inspection Requirements

Unit inspections will be conducted according to the inspection schedules and the results recorded on the inspection log sheet examples shown in Attachment 4.3. Information requested on the log sheets includes the inspector's name, date and time of inspection, types of problems encountered, and may include the status of the item, observations, and date and nature of repairs and corrective actions. The date, type, and nature of repairs or corrections will be included either in the inspection log, in the computer database, or in an inspector's logbook. Inspection logs will be maintained in the operating record for at least three years from the date of inspection in the UCOR Document Management Center. Typical problems encountered with each item on the inspection schedule are listed on the log sheet to serve as a reminder to the inspector and to ensure a complete inspection. The inspector is required to check the status of each item and indicate whether its condition is acceptable or unacceptable. During the inspection of a unit that contains more than one of a particular item, each item is inspected before the inspector completes that item on the log sheet. If the status of a particular item is unacceptable, then appropriate and complete information will be recorded, including the date and nature of repairs and corrective actions. Evaluation and/or correction of unacceptable items will be initiated immediately, but no later than 24 hours after discovery, as long as corrective actions can be performed safely.

Container Inspection

Inspections of the waste containers and the units will be conducted according to the inspection schedule and frequency as indicated on the inspection schedule in Section 4.1.

At the ORNL units, RCRA inspections of the RH TRU and/or high-dose MLLW, and/or controlled high-fissile CH TRU waste containers at 7855 and 7883 are conducted during use[1] and are directed primarily at checking for integrity of the containers of newly generated wastes. The integrity of the storage units that are storing RH containers is monitored indirectly via checks of the external sumps of the buildings. Technicians take contamination smears and direct radiation surveys periodically to detect the loss of radioactive containment of the stored casks. The surveys occur as containers are moved in and out of storage, monthly, and quarterly. For the units storing mixed CH TRU waste and high-activity MLLW, technicians take these readings when the drums are moved to detect the loss of radioactive containment of the containers. The resulting information is maintained in a computer database. Low-activity MLLW containers are inspected at least weekly at 7879 and 7831F. Other containers are inspected monthly at 7572, 7574, 7860A, and accessible portions of 7883. All mixed waste containers are inspected quarterly at TWPC. The weekly container inspection requirements have been requested to be waived at TWPC and at RH units to reduce high doses to personnel (ALARA) and/or because of limited access due to security controls. Observations and activities of each inspection are recorded on the inspection log sheets in Section 4.2.

All CH TRU, RH TRU, and MLLW waste units at TWPC will have regularly scheduled inspections performed in accordance with the schedule in Attachment 4.2. Based on the ALARA standards, containers stored in the waste management units will be inspected quarterly to reduce

[1] "During use" is defined as when wastes are present..

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high doses to personnel. Labels are applied to drums and verified prior to storage in the sealands. All sealand doors containing hazardous waste will be labeled with the words "Hazardous Waste."

Due to the orientation of containers stored in sealands at TWPC, labels and accumulation start dates may not be visually verified during inspections but are tracked in the Waste Inventory Control System (WICS) database. Each container is assigned a barcode ID, while each sealand is designated a storage location ID. During quarterly inspections, the WICS database is updated via a move authorization by barcode scanner as containers are added or removed from sealands to track their locations. Within WICS, the users can access information on container assignments in each sealand container, along with RCRA indicators, accumulation start dates, and assigned waste codes.

Treatment

Treatment Inspection Log Sheets found in Attachment 6.3 are used as a tracking mechanism to total each treatment for inclusion in the end of year Annual Report. The permittee pays treatment fees to the State of Tennessee on an annual basis. Due to the nature of the TRU waste streams, the frequency of each treatment varies. All treatment log records are maintained onsite in the waste program manager's office.

Operating Record

The management of waste at the storage units is clearly documented in the operating record. Operating records will be maintained for a minimum of three years after certified closure of the units. A copy of each manifest is retained at the facility for at least three years from the date of delivery. The operating record shall also include all data regarding intake of offsite waste from DOE owned facilities or other offsite facilities to ensure the exclusion from the definition of Commercial Facility found in TN Rule 0400-12-02-.01(2) is met.

Records Availability, Retention, and Disposition

The operating records and annual/biannual reports are prepared and maintained by various organizations at ORNL. The records will be furnished to DSWM upon request and are available for inspection at reasonable times. As required in TN Rule 0400-12-01-.06(5)(d)2, operating records include waste acceptance documentation, waste analysis results, summary reports of all incidents requiring implementation of the Contingency Plan, inspection records and results, notices to generators, and waste minimization certifications.

Incident Reports

Any incident requiring implementation of the Contingency Plan will be reported as described in Attachment 6. A detailed, written report will be submitted to DSWM within 15 days of the incident, and a copy will be maintained in the operating record in accordance with TN Rule 0400-12-01-.06(5)(d)2(iv).

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Inspection Records

Inspection records are maintained as part of the operating record as per TN Rule 0400-12-01-.06(5)(d)2(v). Inspection logs are completed according to applicable procedures. The emergency and safety equipment are inspected at least monthly when waste is present. An inspection log is completed for each storage unit inspection and retained as part of the operating record.

Maintenance

The storage units are maintained to ensure the facilities' structural integrity and protection of waste in storage. If inspections reveal that non-emergency maintenance is needed, it will be completed as soon as possible to preclude further damage and reduce the need for emergency repairs.

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4.2. INSPECTION SCHEDULES

General Inspection Schedule for RH TRU, High-Dose MLLW, Controlled High-Fissile CH TRU Waste stored in ORNL Units 7855 and 7883

Area/equipment	Specific item	Frequency of inspection
Building/area security	Warning signs in poor condition, not readable, or missing; Security fence, gates, doors are not locked	Weekly
Interior base/foundation	Cracks, wet spots	Daily during use[1]
Loading/unloading areas/ramps	Spills, leaks, or unnecessary items	Daily during use[1]
Building integrity	Roof leaks	Daily during use[1] at 7855 and 7883; monthly at accessible portions of 7883[2]
Roll-up door	Maintenance overdue	Monthly
Exterior sump	Cracks, spalling, liquid present >6 in.	Weekly
Containers	Structural defects, corrosion, deterioration, leaking, or bulging; containers are open	Daily during use[1] at 7855 and 7883; monthly at accessible portions of 7883[2]
Container placement	Stacked containers are not level; third tier not banded; Pallets are in poor condition; Aisle spacing is inadequate[3]; Storage of incompatible wastes in the same area	Daily during use[1] at 7855 and 7883; monthly at accessible portions of 7883[2]
Container labeling	Incomplete or improper labeling; Labeling not intact or not readable	Daily during use[1] at 7855 and 7883; monthly at accessible portions of 7883[2]
Secondary containment (where applicable)	Dikes, curbing, floor pan are damaged; Liquid present	Daily during use[1] at 7855 and 7883; monthly at accessible portions of 7883[2]
Emergency and safety equipment	Spill control equipment[4] tamper seal is not intact; spill control equipment not present; mobile eyewash[5] has been checked	Weekly and semi-annual
Fire Suppression/Alarm Equipment	Extinguisher not present or system testing not completed	Monthly, semi-annual, and annual

[1]"Daily during use" is defined as when wastes are present.

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[2] Waivers were approved for monthly inspections due to ALARA concerns and limited aisle spacing. These containers are secured in a restricted area, protected from weather, forklift and other heavy equipment activities, and unauthorized access.
[3]Aisle spacing requirements are waived for RH TRU waste container and controlled high-fissile CH TRU waste containers.
[4]Located at 7574 and 7831.
[5]Located at 7824 and 7831.

General Inspection Schedule for CH TRU, High-Dose MLLW, Controlled High-Fissile CH TRU Waste stored in ORNL Waste Units

Area/equipment	Specific item	Frequency of inspection
Building/area security	Warning signs in poor condition, not readable, or missing; Security fence, gates, doors are not locked	Weekly
Interior base/foundation	Cracks, wet spots	Monthly and daily during use[1]
Building integrity	Roof leaks	Monthly
Roll-up door	Maintenance overdue	Monthly
Loading/unloading areas/ramps	Spills, leaks, or unnecessary items	Daily during use
Containers	Structural defects, corrosion, deterioration, leaking, or bulging; Containers are open	Monthly and daily during use
Container placement	Stacked containers are not level; third tier not banded; Pallets are in poor condition; Aisle spacing is inadequate (<24 in.); Storage of incompatible wastes in the same area	Monthly and daily during use[1]
Container labeling	Incomplete or improper labeling; Labeling not intact or not readable	Monthly and daily during use[1]
Secondary containment (where applicable)	Dikes, curbing, floor pan are damaged; liquid present	Monthly and daily during use[1]
Emergency and safety equipment	Spill control equipment[2] tamper seal is not intact; spill control equipment not present; mobile eyewash[3] has been checked	Weekly and semi-annual
Fire Suppression/Alarm Equipment	Extinguisher not present or system testing not completed	Monthly, semi-annual, and annual

[1]"Daily during use" is defined as when wastes are present.
[2] Located at 7574 and 7831.
[3] Located at 7824 and 7831.

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- **General Inspection Schedule for Low-Dose MLLW and Non-Mixed Hazardous Waste Stored in ORNL Waste Units**

Area/equipment	Specific item	Frequency of inspection
Building/area security	Warning signs in poor condition, not readable, or missing; Security fence, gates, doors are not locked	Weekly
Interior base/foundation	Cracks, wet spots	Weekly and daily during use[1]
Building integrity	Roof leaks	Weekly
Roll-up door	Maintenance overdue	Weekly
Loading/unloading areas/ramps	Spills, leaks, or unnecessary items	Daily during use
Containers	Structural defects, corrosion, deterioration, leaking, or bulging; Containers are open	Weekly and daily during use[1]
Container placement	Stacked containers are not level; third tier not banded; Pallets are in poor condition; Aisle spacing is inadequate (<24 in.); Storage of incompatible wastes in the same area	Weekly and daily during use[1]
Container labeling	Incomplete or improper labeling; Labeling not intact or not readable	Weekly and daily during use[1]
Secondary containment (where applicable)	Dikes, curbing, floor pan are damaged; Liquid present	Weekly and daily during use[1]
Emergency and safety equipment	Spill control equipment[2] tamper seal is not intact; spill control equipment not present; mobile eyewash[3] has been checked	Weekly and semi-annual
Fire Suppression/Alarm Equipment	Extinguisher not present or system testing not completed	Monthly, semi-annual, and annual

[1]"Daily during use" is defined as when wastes are present.
[2] Located at 7574 and 7831.
[3] Located at 7824 and 7831.

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General Inspection Schedule for TWPC storage and treatment units

Area/equipment	Specific item	Frequency of inspection
Building/area security	Warning signs in place and in good condition; gates locked; communication systems working, and building locked during non-operations	Weekly
Area security	Security fence in good condition	Monthly
Base/foundation/berms	Cracks, uneven settlement, wet spots, erosion, liquid present	Quarterly, daily during use[3]
Building Integrity	Roof damage, leaking Metal rolling doors	Monthly Quarterly
Containers	Integrity (leaking, bulging, heavy corrosion, etc.), incomplete or improper labeling, containers closed[1]	Quarterly, daily during use[3]
Container Placement	Containers properly stacked, secure to pallets	Quarterly, daily during use[3]
Aisle Space	Adequate for inspection, emergency response	Quarterly, daily during use[3]
Secondary containment	Cracks, wet spots, liquid present, containers with liquids greater than 1 gallon stored on secondary containment.	Quarterly, daily during use[3]
Emergency and safety equipment	Spill kits present and intact, eyewash stations are operational and decon supplies are available.	Weekly
Weigh Scales	Operational	Monthly
Emergency equipment	Fire extinguishers, lighting	Monthly
Emergency equipment	Lighting	Quarterly
Emergency equipment	Fire alarm, spill kit inventory	Semi-annually
Emergency equipment	Sprinkler system and smoke detectors	Annually
Treatment units	Container, spills or releases, reactions, labeling, proper treatment and packaging, secondary containment[2]	Daily during use[3]
Loading/Unloading Operations	Spills, leaks, or unnecessary items	Daily during use[3]

[1]Due to the orientation of containers loaded in the sealands, labels and accumulation start dates may not be visually verified during inspections, but are tracked in the Waste Inventory Control System (WICS) database.

[2]If secondary containment is required for treatment unit.

[3] Daily during use" is defined as when wastes are present.

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ATTACHMENT 4.3. INSPECTION LOGS

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Weekly Inspection Form
Circle One: 7572 7574 7831F 7855 7860A 7879 7883

Inspection Item	Types of Problems	Sat [S] Unsat [U] Not App [NA][1]	Describe Problem	Solution/Remedy Date Corrected
Building/area security[2]	• Warning signs in poor condition, not readable, or missing • Security fence, gates, doors not locked			
Spill kit	• Spill kit not properly maintained at 7574/7831 • Tamper seal not intact			
Portable eyewash at 7824 and 7831	• Failed or missed inspection			
Exterior sumps located at 7883 and 7885	• Cracks, spalling, liquid present >6 in.			
Interior base/foundation[3]	• Cracks, wet spots			
Building integrity[3]	• Roof leaks			
Secondary containment[3]	• Dikes, curbing, floor pan damaged • Liquid present			
Containers[3]	• Structural defects, corrosion, deterioration, leaking, or bulging • Containers open			
Container labeling[3]	• Incomplete or improper labeling[4] • Labeling not intact or not readable			
Container placement[3]	• Stacked containers not level; third tier not banded • Pallets in poor condition • Aisle spacing inadequate (<24 in.) • Storage of incompatible wastes in same area[4]			

Inspection Items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT, or N/A								
Base/Foundation/Berms	Cracks or gaps									
	Uneven settlement, erosion									
	Wet spots									
Containers	"Hazardous Waste" label missing									
	Incomplete or improper labeling, labeling not intact or not legible									
	Not closed as required/not sealed									
	Structural defects, corrosion, deterioration, leaking, or bulging									

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Weekly TWPC Non-Mixed Hazardous Waste Container Storage Area Inspection Log Sheet

Inspection Items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT or N/A								
Container Placement	Stacked containers are not secured adequately (containers are not level, are off center, securing straps are not tight)									
Aisle Space	Aisles are obstructed preventing container movement and emergency response.									
Secondary Containment	Containment is in poor condition or liquids present.									
	Containers with liquids greater than 1 gal are not stored on required secondary containment.									
Emergency/ Safety Equipment	Emergency lighting not operable (i.e., battery failure or burned-out bulbs).									

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Weekly TWPC Non-Mixed Hazardous Waste Container Storage Area Inspection Log Sheet

Corrective Actions for Deficiencies: Description of corrective actions, including date of completion. Use continuation sheet as necessary.

_____

_____

_____

_____

_____

Inspector: _____ _____ _____ _____
Print Sign Date Time

EP[4] Reviewer: _____ _____ _____
Print Sign Date

[1]TWPC-3 includes the 30-Ton Crane Bay, and CPE.

[2]TWPC-5 includes MEB.

[3]TWPC-6 and TWPC-8 units include portable storage units, and any loaded TRUPACTII, HALFPACT, or 72-B Cask containers, or portable transport unit in the parking area of the CHMB or MPB.

[4]Environmental Programs

Forward original to Records Center.

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[1] = IMMEDIATELY notify the Facility Manager if problems are found.
Sat [S] no problems found
Unsat [U] problems found
Not App [NA] not applicable

[2] = The building area/security is checked weekly for all permitted units.

[3] = Low-dose MLLW containers and any non-mixed hazardous waste containers and their storage areas are inspected weekly. Empty storage units are also inspected weekly.

[4] = Waste labels and compatibility are verified when waste is received into storage.

Additional Details:

Inspector:				
Print Name	Signature	Badge No.	Date	Time

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Monthly Inspection Form
Circle One: 7572 7574 7831F 7855 7860A 7879 7883

Inspection Item	Types of Problems	Sat [S] Unsat [U] Not App [NA][1]	Describe Problem	Solution/Remedy Date Corrected
Fire extinguisher[2]	• Not present			
Roll-up door[2]	• Annual maintenance overdue			
Interior base/foundation[3]	• Cracks, wet spots			
Building integrity[3]	• Roof leaks			
Secondary containment[3]	• Dikes, curbing, floor pan damaged • Liquid present			
Containers[3]	• Structural defects, corrosion, deterioration, leaking, or bulging • Containers open			
Container labeling[3]	• Incomplete or improper labeling[4] • Labeling not intact or not readable			
Container placement[3]	• Stacked containers not level; third tier not banded • Pallets in poor condition • Aisle spacing is inadequate (< 24 in.)[5] • Storage of incompatible wastes in same area[4]			

[1] = IMMEDIATELY notify the Facility Manager if problems are found.
Sat [S] no problems found
Unsat [U] problems found
Not App [NA] not applicable

[2] = The fire extinguishers and roll-up door items are checked monthly for all permitted units.

[3] = Accessible high-dose MLLW, RH TRU and CH TRU waste containers and their storage areas are inspected monthly.

[4] = Waste labels and compatibility are verified when waste is received into storage.

[5] = Adequate aisle spacing requirement is waived for controlled high-fissile CH TRU and RH TRU waste containers.

Additional Details:

Inspector:

Print Name	Signature	Badge No.	Date	Time

Daily When In Use Inspection Form
Circle One: 7572 7574 7831F 7855 7860A 7879 7883

Inspection Item	Types of Problems	Sat [S] Unsat [U] Not App [NA][1]	Describe Problem	Solution/Remedy Date Corrected
Loading/unloading areas/ramps	• Spills, leaks, unnecessary items			
Interior base/foundation	• Cracks, wet spots			
Building integrity	• Roof leaks			
Secondary containment	• Dikes, curbing, floor pan damaged • Liquid present			
Containers	• Structural defects, corrosion, deterioration, leaking, or bulging • Containers open			
Container labeling	• Incomplete or improper labeling[2] • Labeling not intact or not readable			
Container placement	• Stacked containers not level; third tier not banded • Pallets in poor condition • Aisle spacing is inadequate (<24 in.)[3] • Storage of incompatible wastes in same area[2]			

[1] = IMMEDIATELY notify the Facility Manager if problems are found.
Sat [S] no problems found
Unsat [U] problems found
Not App [NA] not applicable

[2] = Waste labels and compatibility are verified when waste is received into storage.

[3] = Adequate aisle spacing requirement is waived for controlled high-fissile CH TRU and RH TRU waste containers.

Additional Details:

Inspector:

Print Name	Signature	Badge No.	Date	Time

a

Inspection Checklist for 7572, 7574 and 7831F Fire Suppression Systems/Alarms[1]

INSPECTION TYPE (CHECK): ANNUAL ☐ SEMI-ANNUAL ☐

INSPECTION PERFORMED ON (CIRCLE): 7572 7574 7831F

Inspection Observed	NA	Items Checked	Types of Problems	Sat [S] Unsat [U] Not App [NA][2]	Describe Problem	Solution/Remedy Date Corrected	Acceptance Criteria Met?[3]
☐		Fire Alarms	Not functioning correctly				NA
☐		Fire Suppression System	Not functioning correctly				
☐	☐	Fire Water Flow[4]	Flow not within acceptable limits				

Comments: _____

Observed by
UCOR Personnel: _____ (Print Name) _____ (Signature) _____ (Badge No.) _____ (Date) _____ (Time)

[1]Fire suppression and alarm systems are managed exclusively by the ORNL Fire Department or their approved third-party contractor. This checklist provides UCOR confirmation that ORNL completed routine testing/surveillance and made any required repairs in a timely manner.
[2] IMMEDIATELY notify the Facility Manager if problems are found.
Sat [S] no problems found
Unsat [U] problems found
Not App [NA] not applicable
[3]Inspection acceptance criteria defined and documented by ORNL Fire Dept personnel/Trained Performer on respective inspection forms.
[4]Building 7831F is a Dry Chemical Fire Suppression System.

DRAFT

☐ Weekly Inspection ☐ Semi-Annual Inventory Inspection[1]

Inspection Checklist for 7574 and 7831 Spill Control Equipment

SPILL CONTROL EQUIPMENT at 7574			
Equipment Description	**Quantity**	**Condition Sat [S] Unsat [U] Not App [NA][2]**	**Problems, if any**
Diapers	• 1 pack		
Absorbent	• 2 bags		
Absorbent pigs	• 3		
Leather gloves	• 1 pair		
Nitrile gloves	• 1 pack		
SPILL CONTROL EQUIPMENT at 7831			
Coveralls	• 3 cotton • 4 paper		
Cotton gloves	• 12/pair liners • 6/pair canvas		
Rubber gloves	• 12/pair		
Mop & bucket	• 1/each		
Squeegees	• 1/each		
Plastic bags	• 4/each		
Garbage can	• 1/each		
Absorbent	• 4 bags		
Overpack drum	• 1/each		

☐ Weekly Inspection ☐ Semi-Annual Inventory Inspection[1]

[1] = Supplies that may lose effectiveness with age should be replaced during the semi-annual inspection.
[2] = IMMEDIATELY notify the Facility Manager if problems are found.
Sat [S] no problems found
Unsat [U] problems found
Not App [NA] not applicable

Comments: _____

_____

Inspector: _____ _____ _____ _____ _____
Print Name | Signature | Badge No. | Date | Time

DRAFT

Annual TWPC RCRA Inspection Items Log Sheet

Corrective Actions for Deficiencies: Description of corrective actions, including date of completion. Use continuation sheet as necessary.

Inspection items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT, or N/A								
Sprinklers	• Damage/Leaks • Obstruction • Loss of fluid in heat-response glass bulb									
Piping	• Damage/Leaks • Corrosion • Obstruction									
Smoke Detector	• Fail functional test									
Alarm Panel	• No audible alarms									

DRAFT

Inspector: _____ _____ _____ _____
Print Sign Date Time

EP[4] Reviewer: _____ _____ _____
Print Sign Date

[1]TWPC-3 includes the 30-Ton Crane Bay, and CPE.

[2]TWPC-5 includes MEB.

[3]TWPC-6 and TWPC-8 units include portable storage units, and any loaded TRUPACTII, HALFPACT, or 72-B Cask containers, or portable transport unit in the parking area of the CHMB or MPB.

[4]Environmental Programs

Forward original to Records Center.

DRAFT

TWPC Daily in Use Inspection Log Sheet

Inspection items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT, or N/A								
Base/Foundation	Cracks or gaps in the floor									
	Uneven settlement/erosion									
	Wet spots									
Loading/Unloading Operations	Spills, leaks, or unnecessary items									
Aisle Spacing	Aisles are obstructed for container movement and emergency response. Inadequate (Storage areas < 24 in., Sealands < 20 in.)									
Secondary Containment	Containment is in poor condition or liquids present.									
	Containers with liquids greater than 1 gal are not stored on secondary containment.									

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TWPC Daily in Use Inspection Log Sheet

Inspection Items	Types of Issues	ALL STORAGE AREAS CAB RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT or N/A								
Containers	"Hazardous Waste" label missing									
	Incomplete or improper labeling, labeling not intact or not legible									
	Not closed as required/not sealed									
	Structural defects, corrosion, deterioration, leaking, or bulging									
Container Placement	Stacked containers are not secured adequately (containers are not level/off center and/or securing straps are not tight)									

DRAFT

TWPC Daily in Use Inspection Log Sheet

Corrective Actions for Deficiencies: Description of corrective actions, including date of completion. Use continuation sheet as necessary.

Inspector: _____ _____ _____ _____
Print Sign Date Time

EP[4] Reviewer: _____ _____ _____
Print Sign Date

[1]TWPC-3 includes the 30-Ton Crane Bay, and CPE.

[2]TWPC-5 includes MEB.

[3]TWPC-6 and TWPC-8 units include portable storage units, and any loaded TRUPACTII, HALFPACT, or 72-B Cask containers, or portable transport unit in the parking area of the CHMB or MPB.

[4]Environmental Programs

Forward original to Records Center.

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Monthly TWPC RCRA inspection Items Log Sheet

Inspection Item	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT, or N/A								
Emergency Equipment	Lights not operable									
	Fire extinguishers are not properly charged									
Building Integrity	Roof damage, leaking									
Weigh Scales	Weigh scales are not operable and/or past calibration date									
Area Security	Security fence not in good condition									

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Monthly TWPC RCRA Inspection Items Log Sheet

Corrective Actions for Deficiencies: Description of corrective actions, including date of completion. Use continuation sheet as necessary.

Inspector:	_____	_____	_____	_____
	Print	Sign	Date	Time
EP[4] Reviewer:	_____	_____	_____	
	Print	Sign	Date	

[1]TWPC-3 includes the 30-Ton Crane Bay, and CPE.

[2]TWPC-5 includes MEB.

[3]TWPC-6 and TWPC-8 units include portable storage units, and any loaded TRUPACTII, HALFPACT, or 72-B Cask containers, or portable transport unit in the parking area of the CHMB or MPB.

[4] Environmental Programs

Forward original to Records Center.

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Quarterly TWPC RCRA Waste Container Storage Area Inspection Log Sheet

Inspection Items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT, or N/A								
Base/Foundation/ Berms	Cracks or gaps									
	Uneven settlement, erosion									
	Wet spots									
Containers	"Hazardous Waste" label missing									
	Incomplete or improper labeling, labeling not intact or not legible									
	Not closed as required/not sealed									
	Structural defects, corrosion, deterioration, leaking, or bulging									

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Quarterly TWPC RCRA Waste Container Storage Area Inspection Log Sheet

Inspection Items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT or N/A								
Container Placement	Stacked containers are not secured adequately (containers are not level, are off center, securing straps are not tight)									
Aisle Space	Aisles are obstructed for container movement and emergency response. Inadequate (Storage areas < 24 in., Sealands < 20 in.)									
Secondary Containment	Containment is in poor condition or liquids present.									
	Containers with liquids greater than 1 gal are not stored on required secondary containment.									
Emergency/ Safety Equipment	Emergency lighting not operable (i.e., battery failure or burned-out bulbs).									

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Quarterly TWPC RCRA Waste Container Storage Area Inspection Log Sheet

Corrective Actions for Deficiencies: Description of corrective actions, including date of completion. Use continuation sheet as necessary.

Inspector: _____ _____ _____ _____
Print Sign Date Time

EP[4] Reviewer: _____ _____ _____
Print Sign Date

[1]TWPC-3 includes the 30-Ton Crane Bay, and CPE.

[2]TWPC-5 includes MEB.

[3]TWPC-6 and TWPC-8 units include portable storage units, and any loaded TRUPACTII, HALFPACT, or 72-B Cask containers, or portable transport unit in the parking area of the CHMB or MPB.

[4]Environmental Programs

Forward original to Records Center.

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Semi-Annual TWPC RCRA Inspection Items Log Sheet

Inspection Items			Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
				Location								
				TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
				SAT, UNSAT, or N/A								
				West	R-231	30-Ton Crane Bay	R-134, R-122	Use spill kit in CHSA	North, South	West	South	
Spill Kit Inventory	Latex gloves	1 box	Damaged or missing									
	Chemical resistant gloves	2 pair	Damaged or missing									
	Absorbent snakes	5 each	Damaged or missing									
	Absorbent material	1 bag	Damaged or missing									
	Dustpan & whisk broom	1 each	Damaged or missing									
	Shoe covers/booties	2 pair	Damaged or missing									
	Absorbent Pads	10 each	Damaged or missing									

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Semi-Annual TWPC RCRA Inspection Items Log Sheet

Inspection Items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT, or N/A								
Fire Detection/Alarm System	• No detection in the panel • No audible alarm									
Metal Rolling Doors	• Damaged • Does not close properly • Not functional • Preventative maintenance has not been performed.									

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Semi-Annual TWPC RCRA Inspection Items Log Sheet

Corrective Actions for Deficiencies: Description of corrective actions, including date of completion. Use continuation sheet as necessary.

Inspector: _____ _____ _____ _____
Print Sign Date Time

EP[4] Reviewer: _____ _____ _____
Print Sign Date

[1]TWPC-3 includes the 30-Ton Crane Bay, and CPE.

[2]TWPC-5 includes MEB.

[3]TWPC-6 and TWPC-8 units include portable storage units, and any loaded TRUPACTII, HALFPACT, or 72-B Cask containers, or portable transport unit in the parking area of the CHMB or MPB.

[4]Environmental Programs

Forward original to Records Center.

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Weekly TWPC Non-Mixed Hazardous Waste Container Storage Area Inspection Log Sheet

Inspection Items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW								Deficiency
		Location								
		TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	
		SAT, UNSAT, or N/A								
Base/Foundation/ Berms	Cracks or gaps									
	Uneven settlement, erosion									
	Wet spots									
Containers	"Hazardous Waste" label missing									
	Incomplete or improper labeling, labeling not intact or not legible									
	Not closed as required/not sealed									
	Structural defects, corrosion, deterioration, leaking, or bulging									

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Weekly TWPC Non-Mixed Hazardous Waste Container Storage Area Inspection Log Sheet

Inspection Items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW Location TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	Deficiency
		SAT, UNSAT or N/A								
Container Placement	Stacked containers are not secured adequately (containers are not level, are off center, securing straps are not tight)									
Aisle Space	Aisles are obstructed for container movement and emergency response. Inadequate (Storage areas < 24 in., Sealands < 20 in.)									
Secondary Containment	Containment is in poor condition or liquids present.									
	Containers with liquids greater than 1 gal are not stored on required secondary containment.									
Emergency/ Safety Equipment	Emergency lighting not operable (i.e., battery failure or burned-out bulbs).									

DRAFT

Weekly TWPC Non-Mixed Hazardous Waste Container Storage Area Inspection Log Sheet

Corrective Actions for Deficiencies: Description of corrective actions, including date of completion. Use continuation sheet as necessary.

Inspector: _____ _____ _____ _____
Print Sign Date Time

EP[4] Reviewer: _____ _____ _____
Print Sign Date

[1]TWPC-3 includes the 30-Ton Crane Bay, and CPE.

[2]TWPC-5 includes MEB.

[3]TWPC-6 and TWPC-8 units include portable storage units, and any loaded TRUPACTII, HALFPACT, or 72-B Cask containers, or portable transport unit in the parking area of the CHMB or MPB.

[4]Environmental Programs

Forward original to Records Center.

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Weekly TWPC RCRA Inspection Items Log Sheet

Inspection Items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW Location TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	Deficiency
		SAT, UNSAT, or N/A								
Building/Area Security	Malfunctioning communications systems									
	Warning signs on perimeter fence not in place/not legible									
	Gates not locked									
	"Danger-Unauthorized Personnel Keep Out" signs are not in place, not in good condition, not legible									
	Building areas unsecure									

DRAFT

Weekly TWPC RCRA Inspection Items Log Sheet

Inspection Items	Types of Issues	ALL STORAGE AREAS CAN RECEIVE RH TRU, CH TRU, MLLW, LLW, and HW Location TWPC-1 (CHSA)	TWPC-2 (2nd Flr WPB)	TWPC-3 (DAC)[1]	TWPC-4 (1st Flr WPB)	TWPC-5 (CSA)[2]	TWPC-6 (CHMB)[3]	TWPC-7 (DVB)	TWPC-8 (MPB)[3]	Deficiency
		SAT, UNSAT, or N/A								
Emergency & Safety Equipment		**East, West**	**R-231**	**30-ton Crane Bay, CPE**	**R-122, R-134, R-136**	**Use eyewash in CHSA,**	**North, South**	**7880VV,**	**South**	
	Eyewashes leaking, draining, or inadequate pressure (< 90psi)									
Spill Response Kits		**West**	**R-231**	**30-ton Crane Bay**	**R-134, R-122**	**Use spill kit in CHSA**	**North, South**	**West**	**South**	
	Spill Kit is not maintained in/at a nearby location									
	Spill Kit tamper seal is not intact									

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Weekly TWPC RCRA Inspection Items Log Sheet

Corrective Actions for Deficiencies: Description of corrective actions, including date of completion. Use continuation sheet as necessary.

Inspector:	_____	_____	_____	_____
	Print	Sign	Date	Time
EP[4] Reviewer:	_____	_____	_____	
	Print	Sign	Date	

[1]TWPC-3 includes the 30-Ton Crane Bay, and CPE.

[2]TWPC-5 includes MEB.

[3]TWPC-6 and TWPC-8 units include portable storage units, and any loaded TRUPACTII, HALFPACT, or 72-B Cask containers, or portable transport unit in the parking area of the CHMB or MPB.

[4]Environmental Programs

Forward original to Records Center.

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Macroencapsulation Inspection Log Sheet

Macro Box Container #:_____ Location: _____

Container Type/Size: ☐ 110 gallon Drum ☐ 6-pack Box ☐ Other_____

Date of Treatment: _____ Time of Treatment: _____

Inspection Item	Before Treatment Y/N	After Treatment Y/N	Details of Inspection, as needed. A detailed description of the deficiency must be included.
Macroencapsulation container and lid in good condition?			
Lid and compression weight installed correctly?			
Any spills or releases observed?			
Waste appropriately treated and packaged?			
Is waste container appropriately labeled?			

Waste Container #s Treated:

_____

_____

Corrective Actions

Description of CA including date and number of corrective action request and date of completion. Use continuation sheet as necessary.

_____

_____

	Print Name	Sign Name	Date
Performer:			
WO[1] Reviewer:			
EP[2] Reviewer:			

[1]WO: Waste Operations

[2]EP: Environmental Programs

DRAFT

Miscellaneous Treatment Inspection Log Sheet

Parent
Container# _____

Daughter
Container# _____

Location: _____ Time of Treatment: _____ Date: _____

Inspection Item	Before Treatment Y/N	After Treatment Y/N	Size, Amount, Type
Does the liquid/mercury exceed maximum treatment quantity? If "yes" divide liquid/mercury as appropriate[1.]			
Total amount of liquid/mercury treated?			
Amount of stabilization agent used for liquid/mercury?			
Liquid remaining after treatment? If "yes" – retreat.			
Any spills or releases observed?			
Any unanticipated reactions?			
Waste appropriately treated, packaged, and labeled as hazardous waste?			
Secondary containment pan wiped clean either before or after use?			

Comments: _____

_____

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Miscellaneous Treatment Inspection Log Sheet (cont.)

Corrective Actions

Description of CA including date and number of corrective action request and date of completion. Use continuation sheet as necessary.

_____

_____

	Print Name	Sign Name	Date
Performer:			
WO[2] Reviewer:			
EP[3] Reviewer:			

[1]One (1) liter max/batch liquid and 50 gallon maximum per hour

[2]WO: Waste Operations

[3]EP: Environmental Programs

DRAFT

Saturated Waste Treatment

Parent Container Number: _____ Location: _____
Time Start/Stop of Treatment: _____
Date Start/Stop: _____ Daughter Container Number:_____

Inspection Item	Before Treatment Y/N	After Treatment Y/N	Size, Amount, Type
Volume of debris (i.e., 55 gallon equivalent)			
Amount of stabilization agent used for treatment?			
Is waste container appropriately labeled[1] as hazardous waste?			
Processing Area wiped clean after use? (i.e. all waste treated from container)			

Corrective Actions

Description of CA including date and number of corrective action request and date of completion. Use continuation sheet as necessary.

_____

_____

Performer: _____ _____ _____
Print Name Sign Name Date

WO[2] Reviewer: _____ _____ _____
Print Name Sign Name Date

EP[3] Reviewer: _____ _____ _____
Print Name Sign Name Date

[1]For RH waste, the label will be applied to the 72-B canister and verified correct prior to loading into the 72-B cask.

[2]WO: Waste Operations.

[3]EP: Environmental Programs

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Size Reduction Inspection Log Sheet

Parent Container #: _____ Location: _____

Date Treatment Started: _____ Time Treatment Started: _____

Date Treatment Ended: _____ Time Treatment Ended: _____

Inspection Item	Yes	No	Details of Inspection, as needed. A detailed description of the deficiency must be included.
Item Description			
Any spills, releases, or unanticipated reactions?			
Waste appropriately treated and packaged?			
Is waste container appropriately labeled as hazardous waste or PCBs, if applicable?			

Daughter Container #s

_____

_____

Corrective Actions

Description of CA, including date and number of corrective action request and date of completion. Use continuation sheet as necessary.

_____

_____

	Print Name	Sign Name	Date
Performer:			
WO[1] Reviewer:			
EP[2] Reviewer:			

[1]WO: Waste Operations

[2]EP: Environmental Programs

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Groundwater Filtration Log

Parent Container No: _____ Location: _____

Daughter Container No: _____

Date/Time Started: _____

Date/Time Finished: _____

Amount Filtered (gallons): _____

Comments: _____

_____

_____

	Print Name	Sign Name	Date
Performer:	_____	_____	_____
WO[1] Reviewer:	_____	_____	_____
EP[2]:	_____	_____	_____

[1]WO: Waste Operations

[2]EP: Environmental Programs

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Stabilization Treatment Log of CH TRU and RH TRU Waste

Parent Container Number - _____

Location: _____

Time Start/Stop of Treatment: _____

Date Start/Stop: _____

Inspection Item		
Estimated volume (gallons) of non-conforming waste material to be treated?		
How much cementitious material is needed to stabilize non-conforming waste material?		
A minimum of 1-3 inches of headspace was allowed to readily detect excess water in mixed cementitious media.	☐ Yes	☐ No (If "No" complete **Corrective Actions**)
Visual evaluation is complete, and the cementitious material is properly mixed (i.e., no signs of layering or stratification).	☐ Yes	☐ No (If "No" complete **Corrective Actions**)
Cementitious media was allowed to dry for **at least** 24 hours and there is no evidence of free liquid. **NOTE:** If free liquid present, then incrementally add dry cementitious media until no free liquid is present.	☐ Yes	☐ No (If "No" complete **Corrective Actions**)
Was waste appropriately treated to meet WIPP WAC (i.e., waste is fully encapsulated and exists without cracks or gaps)?	☐ Yes	☐ No (If "No" complete **Corrective Actions**)
Waste appropriately packaged?	☐ Yes	☐ No (If "No" complete **Corrective Actions**)
What is the daughter container number?		
Is daughter container appropriately labeled?	☐ Yes	☐ No (If "No" complete **Corrective Actions**)

Corrective Actions

Description of corrective action, including date, number of corrective action request, and date of completion. Use continuation sheet as necessary.

	Print Name	Sign Name	Date
Performer:			
Waste Operations Reviewer:			
Environmental Programs Reviewer:			

DRAFT

Oxidation/Deactivation Treatment

Parent Container Number - _____

Location: _____

Time Start/Stop of Treatment: _____

Date Start/Stop: _____

Inspection Item		
Volume of metal material to be treated		
Is furnace set at correct temperature in order to completely oxidize or deactivate metal material?		
Has metal material been placed in ceramic furnace vessel per procedure?		
Is oxygen flow at required setting?		
Was metal material appropriately treated?	_____Yes	_____No (If "No" complete Corrective Actions)
Was metal material appropriately packaged?	_____Yes	_____No (If "No" complete Corrective Actions)
What is the daughter container number?		
Is daughter container appropriately labeled?		

Corrective Actions

Description of corrective action, including date, number of corrective action request, and date of completion. Use continuation sheet as necessary.

_____

_____

	Print Name	Sign Name	Date
Performer:	_____	_____	_____
Waste Operations Reviewer:	_____	_____	_____
Environmental Programs Reviewer:	_____	_____	_____

DRAFT

Neutralization Treatment

Parent Container Number: _____

Location: _____

Time Start/Stop of Treatment: _____

Date Start/Stop: _____

Inspection Item	
Volume of solution to be treated	
pH test strip result **prior** to treatment	
If an acid, how much base is being added to neutralize?	
If a base, how much acid is being added to neutralize?	
pH test strip result **after** treatment	
If subsequent absorption is to occur, has Attachment O, Miscellaneous Treatment Inspection Log Sheet, CM-P-EN-013, been initiated?	

Corrective Actions

Description of corrective action, including date, number of corrective action request, and date of completion. Use continuation sheet as necessary.

_____

	Print Name	Sign Name	Date
Performer:			
Waste Operations Reviewer:			
Environmental Programs Reviewer:			

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Potentially Pressurized Containers (PPC) Puncturing Log Sheet

Parent Container #_____

Parent Container RCRA Start Date: _____

Liquid Collection Container #_____ Date of Puncturing _____

PPC Item ID # (if available)	Known / Unknown Substance	SDS Available Y/N	Compatibility Check Y/N	Contents Drained Y/N	Approximate Amount Drained (ounces)	Acceptable Puncture Verified Y/N	Daughter Container # the Punctured PPC Is Placed In

Comments

_____

_____

Performer _____ _____ _____

Print Name Sign Name Date

WO[2] Reviewer _____ _____ _____

Print Name Sign Name Date

EP[1] Reviewer _____ _____ _____

Print Name Sign Name Date

[1] Environmental Programs
[2] Waste Operations

DRAFT

EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

ATTACHMENT 5. PERSONNEL TRAINING

All personnel who participate in hazardous and/or mixed waste management and handling participate in a specified training program. This program is designed to ensure that unit personnel can competently perform their tasks, understand the hazards associated with the waste they are handling, and understand the potential environmental impact of the materials. Personnel are trained to take proper safety precautions and to minimize the environmental impact in the event of an emergency.

Outline of Training Program

Employees involved in waste operation activities receive environmental, safety, and health training, as well as performance-based operations training appropriate for their job functions. Objectives of the training effort are to:

(1) ensure that employees have sufficient knowledge and skills to manage hazardous and/or mixed wastes as needed to perform their job duties;

(2) familiarize trainees with emergency procedures and associated communications and alarm systems;

(3) ensure appropriate response to emergencies involving fires, explosions, or uncontrolled releases of hazardous substances;

(4) inform employees of hazards associated with hazardous and/or mixed waste operations and work practices to minimize those hazards;

(5) provide instruction on the use of respiratory protection and other forms of personal protection equipment (PPE), noting the limitations involved;

(6) minimize the potential for damage or harm to the unit or the environment; and

(7) ensure compliance with requirements of federal and state regulations pertaining to waste operations. The training program is designed to comply with the Occupational Safety and Health Administration (OSHA) regulation, *Certain Operations Conducted Under the Resource Conservation and Recovery Act of 1976 (RCRA)* [29 *CFR* §1910.120(p)].

References to Occupational Safety and Health Administration (OSHA)-specific training courses (e.g., Hazardous Waste Operations Emergency Response [HAZWOPER]) are meant to imply the specific topics that are required for RCRA Treatment, Storage and Disposal Facilities (TSDFs).

Job Titles and Duties

Experienced and trained staff perform waste operations activities at ORNL and TWPC. Key personnel include the Facility Manager, Supervisor, Waste Operator, Waste Management and

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Environmental Compliance Support Staff. The Facility or General Manager has overall responsibility for the facilities that are under his/her control. Job descriptions and examples of duties for personnel assigned to waste operations are summarized under Job Descriptions below.

The actual job titles may vary between ORNL and TWPC, but the positions will be functionally equivalent to those described under Job Descriptions below. Each facility will maintain an up-to-date organizational chart that identifies personnel responsible for the proper management and handling of waste, along with permit-driven training requirements they must meet.

Training Content, Frequency, and Techniques

Training of waste operations personnel emphasizes the regulatory requirements applicable to hazardous and/or mixed waste operations. This training includes HAZWOPER topics for TSDFs, waste handling, equipment usage, and safety. Retraining is conducted in response to changes in operating procedures or regulations to comply with periodic retraining requirements, as outlined in Table 5-1. Hours spent on procedural and regulatory-based training vary according to the job duties and progress of the trainee. Hazardous/mixed waste operations personnel must initially complete a 24-hour training course and renew it annually through an 8-hour refresher course.

Retraining is provided, as needed, to correct any identified compliance problems or to prevent recurrence of any significant incidents.

Employees involved in hazardous/mixed waste operations receive training through various methods or settings, including:

(1) Classroom instruction

This method is used for presentation of fundamental and basic knowledge and may incorporate lectures, demonstrations, exercises, guided discussion, and audiovisual programs.

Elements of personnel training covered in classroom instruction include:

- Safety, health, and other hazards
- Work practices minimizing risks from hazards
- Use and limitations of PPE
- Regulatory requirements
- Emergency response procedures and systems

(2) Self-paced or computer-based study

This form of instruction does not require the presence of an instructor at the training site and allows flexibility in implementation; however, feedback is a requirement. Retraining in significant procedural or regulatory changes also uses this approach. Self-paced instruction may also utilize required reading or computer-assisted instruction.

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(3) On-the-Job Training

A Performance Documentation Checklist (PDC) is utilized as a performance-based training tool for some job tasks. The PDC chronologically outlines the tasks that are elements of a given job duty, such as safety procedures, equipment usage, etc., and allows the supervisor and/or trainer to check and document the satisfactory performance of each task by the trainee. The trainee must demonstrate satisfactory performance of the tasks before being allowed to work unsupervised in that area. TWPC uses on-the-job training guides and qualification cards (similar to PDCs) for Operations and Technical Staff/Support personnel.

The positions (title), amount, and frequency of training for each job are outlined in Tables 5-1 and 5-2. The content of each course follows.

Training Content

General Employee Training – Parkworker and Consolidated Annual Training (CAT) are courses which describe essential information necessary for employees to prevent or respond to emergency situations in the workplace. It includes training on security protocols, emergency alarms, emergency communications, basic spill or emergency response techniques, basic radiation safety, and outlines employee responsibilities. Parkworker and CAT are mandatory courses required upon hire. Parkworker is repeated biennially, and CAT is repeated annually.

24-Hour HAZWOPER Training – This course describes the fundamentals for personnel who will work in the vicinity of hazardous substances and may occasionally be exposed to such materials but will not be faced with the daily hazards of handling or cleaning up hazardous materials. A minimum of one day of field experience with a trained and experienced supervisor is required to cover on-the-job specifics. This training is offered initially with an annual refresher.

40- Hour HAZWOPER Training - This course describes the fundamentals of industrial hygiene so that employees can assume responsibility for their own safety and health protection. The following topics are covered: overview of regulations, types of hazards, sources of hazard information, toxicology, and respiratory protection. A minimum of three days of field experience with a trained and experienced supervisor is required to cover on-the-job specifics. This training is offered initially with an annual refresher.

HAZWOPER Refresher - This retraining course provides a basic review of health and safety hazards and describes methods to protect personnel from such hazards. The course includes health and physical hazards posed by the chemicals, radiation, and confined spaces. Personal protective clothing and equipment, site characterization, waste area control, decontamination, and spill response are also covered. Any regulatory changes issued after the first course are highlighted. This training is offered annually.

HAZWOPER Training for Managers/Supervisors – The 24-Hour HAZWOPER course is a prerequisite for this course. This course provides additional information on selection of personal protective clothing and equipment, emergency response and community right-to-know, and legal aspects of supervising waste operations. This training is offered initially only.

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Hazardous Waste Operations Training - The curriculum involves an overview of the regulations and requirements of RCRA and emergency response and equipment. Topics are specific to job/tasks being performed and may include all or part of the following: regulatory overview; treatment, storage, disposal requirements; hazardous waste characterization; accumulation area requirements/forms; LDRs; emergency procedures, communication or alarm systems, responses to fires or explosions, response to hazardous material spills, and shutdown of operations.

Table 5-1. Regulatory Training Frequency

Course title	Approximate training time[1]	Retraining frequency
General Employee Training for Park worker	2	Biennial
General Employee Training for Consolidated Annual Training	2	Annual
HAZWOPER	24	Not applicable
HAZWOPER 8 Hr Refresher	8	Annual[2]
Hazardous Waste Operations Training (TSDF, Characterization, Satellite and 90-Day Area, LDR)	1[1]	Annual[2]
On-the-job operations	10	Periodic

All training times are in hours.

[1]Completion time for courses will vary due to diverse delivery methods (classroom, computer-based, self-study, etc.) and individual differences in student knowledge and capabilities.

[2]Annual training should be performed within the same month of initial training.

Training Program

The training program is based on a graded approach to ensure employees are trained and qualified commensurate with their job responsibilities.

In general, the training coordinator's credentials include a bachelor's degree in education, industrial training, or a technical field. However, a combination of specialized training and experience equivalent to a degree may satisfy the educational background requirement. At least two years of in-field training experience is required. In addition, a demonstrated knowledge of DOE Orders and State and Federal Regulations relating to the transportation, storage, and disposal of hazardous wastes is desirable.

Relevance of Training to Job Position

The supervisor working with the training coordinator determines the training requirements for each job position. This determination is based on regulatory requirements. The training program is tiered to provide training to personnel at levels that are relevant to their positions.

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Implementation and Documentation of Training Program

Implementation

All waste operations personnel shall complete the described training program within six months of assignment. No employee assigned to perform a hazardous/mixed waste job will work unsupervised prior to completion of the training program.

Record Keeping

Training records on current personnel will be kept the duration of employment. The training records of former employees will be maintained for a minimum of three years from the date the employee last worked at the facility.

Training records for each waste operations employee, together with records documenting job titles and job descriptions, are maintained onsite. Records of participation in training are maintained in electronic databases or paper copies, which provide a ready review of the employee's training history and identify the need for retraining.

Table 5-2. Positional Training

Course title	Facility Manager	Supervisor	Waste Operator	Waste Management Support	Environmental Compliance Support
General Employee Training (Parkworker and Consolidated Annual Training)	X	X	X	X	X
HAZWOPER 24 Hr	X	X	X	X	X
HAZWOPER 8 Hr Refresher	X	X	X	X	X
Hazardous Waste Operations Training (Characterization, Satellite Area, 90-Day Area, LDR, TSDF)	X	X	X	X	X
On-the-job Operations	X	X	X	X	X

X = Required

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JOB DESCRIPTIONS

Position: Facility Manager

Required Skills:

1. Knowledge of relevant regulations and standards to ensure facility compliance authorizing all maintenance, testing or inspection activities performed on Active Safety Systems and credited Design Features.

2. Knowledge of facility boundaries and interface management responsibilities, including those for shared site systems and infrastructure.

Required Education:

College degree in a technical field or demonstrated equivalent combination of education and experience.

Job Duties:

1. Implements safeguards and security requirements associated with materials and other security matters.

2. Establishes controls to ensure that authorized personnel may safely gain access to facilities, including rooftops.

3. Maintains up-to-date awareness of facility status and provides oversight of all authorized activities to ensure compliance with Safety Basis (SB) and procedural requirements.

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Job Description

Position: Supervisor

Required Skills:

1. Experience in supervising personnel.

2. Knowledge of hazardous and/or mixed waste operations and management.

3. Knowledge of RCRA requirements (40 CFR 260-272, TN Rule 0400-12-01) and DOT regulations (49 *CFR*).

Required Education:

College degree in engineering, chemistry, or a science-related field, or equivalent experience and/or specialized training.

Job Duties:

1. Plans and organizes work to accomplish the organization's goals efficiently and effectively.

2. Prepares/provides input for development/revision of Operational assessments, standard operating procedures, and/or safety management plans, when applicable.

3. Maintains flexibility to change and promote and/or support Continuous Process Improvement activities.

4. Supervises/supports activities for the management of hazardous and/or mixed waste in accordance with current site, DOE, state, and other applicable policies, procedures, orders, and/or regulations.

5. Maintains knowledge of safety policies and procedures and performs assigned duties in a safe manner and has responsibility for the safety of those being supervised; and ensures they comply with established safety policies and procedures and practice safe work habits.

6. Supervises/assists with spill response activities, when applicable.

7. Investigates, evaluates, and develops occurrence reports, when required.

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Job Description

Position: Waste Operator

Required Skills:

Knowledge of RCRA requirements (40 *CFR* 260-272, TN Rule 0400-12-01) and DOT regulations (49 *CFR*), and/or DOE orders for mixed wastes, as appropriate.

Required Education:

College degree in engineering, chemistry, or a science-related field, or equivalent experience and/or specialized training.

Job Duties:

1. Provides technical assistance to generators on waste documentation, packaging, classification, characterization, and other waste acceptance functions/activities.

2. Prepares/provides input and guidance for development/revision of Waste Operations assessments; standard operating procedures; waste management plans, when applicable; and/or corrective actions.

3. Prepares/generates internal reports, such as inventory of hazardous/mixed wastes, wastes generated by division, and/or off-site shipping reports, when required.

4. Reviews Request for Disposal (RFD) form sets and performs Quality Assurance/Quality Control checks on RFDs and the waste tracking system.

5. Interfaces with applicable organizations (i.e., Radiation Protection, Environmental Compliance, Industrial Hygiene, Quality Assurance) concerning hazardous and/or mixed waste operations.

6. Manages activities related to assigned facility(s) (i.e., building maintenance, improvements), where applicable.

7. Assists with shipments of hazardous and/or mixed wastes.

8. Investigates, evaluates, and develops occurrence reports, when required.

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Job Description

Position: Waste Management Support

Required Skills:

Knowledge of RCRA requirements (40 *CFR* 260-272, TN Rule 0400-12-01) and DOT regulations (49 *CFR*).

Required Education:

College degree in a technical field pertinent to engineering, hazardous waste management, operations, or equivalent experience and/or specialized training.

Job Duties:

1. Provides day-to-day support to projects and operations to ensure compliance with waste management policies, requirements, and procedures.

2. Performs self-assessments and routine inspections of activities and facilities.

3. Notifies the Facility Manager of planned changes in waste-related operations.

4. Practice and promote sustainable principles through resources and the reuse and recycling of materials that otherwise are discarded.

5. Assists, as necessary, with shipment of hazardous wastes.

6. Assists with providing information for generators on chemical waste disposal problems.

7. Assists field operations in resolving classification questions.

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Job Description

Position: Environmental Compliance (EC) Support

Required Skills:

Knowledge of RCRA requirements (40 *CFR* 260-272, TN Rule 0400-12-01) and DOT regulations (49 *CFR*).

Required Education:

College degree in a technical field pertinent to engineering, hazardous waste management, operations, or equivalent experience and/or specialized training.

Job Duties:

1. Provides day-to-day support to projects and operations to ensure compliance with environmental policies, requirements, and procedures.

2. Provides technical assistance and guidance to assigned engineers, specialists, and waste management.

3. Keeps Management advised as to status of assignment(s) with respect to schedule, budgets, delays, and adverse problems.

4. Conducts surveillances, management assessments, and compliance inspections, as assigned.

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EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

ATTACHMENT 6. CONTINGENCY PLAN

Attachment 6 consists of two separate sections as follows:

- Attachment 6.1 Contingency Plan
- Attachment 6.2 Summary of Emergency Response Equipment At The Hazardous And Mixed Waste Management Unit

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ATTACHMENT 6.1. CONTINGENCY PLAN

CONTINGENCY PLAN

Purpose

The purpose of this contingency plan is to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

This contingency plan will be continually reviewed and immediately revised if any of the following occur: (1) the facility's RCRA Permit is revised, (2) the plan is inadequate in an emergency, (3) the procedures herein can be improved, (4) the facility's operations change in a way that alters the plan, (5) the emergency coordinator information changes, or (6) the emergency equipment summary for the hazardous waste facilities/units changes.

Scope

This contingency plan describes the actions that facility personnel will take to comply with and implement the plan, including emergency procedures. This contingency plan describes all the hazardous and mixed waste management units managed by United Cleanup Oak Ridge LLC (UCOR) at Oak Ridge National Laboratory (ORNL) and the TRU Waste Processing Center, which is referred to as TWPC.

This contingency plan is prepared to satisfy the RCRA requirements in 40 *CFR* Part 264 Subpart D and Part 265 Subpart D and TN Rule 0400-12-01-.06(4) and 0400-12-01-.05(4), which require that all hazardous waste facilities develop a contingency plan designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water. This document ensures that units used to store hazardous wastes have established the necessary planned procedures to follow during an emergency situation. This plan addresses emergency response actions for the RCRA treatment, storage, and disposal (TSD) units managed by UCOR at ORNL and TWPC (see list of units in Section 6.1).

This contingency plan does not include specific guidance for compliance with the requirements of 40 *CFR* 112, *Oil Pollution Prevention*, or for compliance with 49 *CFR* 130, *Oil Spill Prevention and Response Plans*, since these requirements are published in the Spill Prevention, Control, and Countermeasure (SPCC) Plan for UCOR operations at ORNL.

The ORNL Emergency Management System is documented in the *Oak Ridge National Laboratory Emergency Plan*, herein the "*Site Emergency Plan*."[1] ORNL uses a "Lead" and "Event" contractor concept of operations for emergency response. UT-Battelle, LLC (UT-Battelle), the Managing and Operating Contractor for ORNL is the Lead Contractor. UCOR, the Managing and Integrating Contractor responsible for the Environmental Management Program at ORNL and permittee/co-operator of TRU waste management units and TWPC, is an Event Contractor. Some facilities located at ORNL are managed and operated by other contractors (Event Contractors). Successful response to an emergency situation requires strict adherence to the *Site Emergency Plan* and site procedures and coordination between the Lead and Event Contractor(s).

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UT-Battelle, as Lead Contractor, is responsible for overall emergency response and for staffing the majority of the Emergency Response Organization (ERO) positions.

The Lead Contractor provides the 24/7 notification point, who is the Laboratory Shift Superintendent (LSS). The Lead Contractor develops and implements the *Site Emergency Plan*. The Lead Contractor provides funding and maintains response resources for ORNL based on the hazards identified in hazard surveys and assessments. UT-Battelle maintains overall sitewide responsibility for emergency response and will retain the basic equipment, facilities, and staff to perform this activity. UT-Battelle will respond to fire and medical emergencies at all ORNL facilities, regardless of operating contractor. UT-Battelle ERO staff respond to fire, medical emergencies, security, and hazardous material releases at all ORNL facilities regardless of the operating contractor.

UCOR is responsible for the emergency programs within their respective operated facilities. These facilities' emergency programs are integrated with the ORNL Emergency Management Program. The Event Contractor immediately notifies UT-Battelle by contacting the LSS Office of any events that may cause harm to site personnel or property. During an event at the Event Contractor's facility, an Event Contractor Representative is activated and reports to the Emergency Operations Center (EOC), whether the event is classified or not. The Event Contractor supports the incident command and site response with event classification, worker protection, mitigation, and technical support to the EOC. The Lead Contractor will provide only immediate mitigation or containment of a release to the Event Contractor. Follow-on clean-up and recovery will be the sole responsibility of the particular Event Contractor.

Any emergency notification to the Tennessee Emergency Management Agency (TEMA) will be made by the site LSS in accordance with the *Site Emergency Plan* and this contingency plan. In the event of a release from an Event Contractor facility, the LSS will make the immediate notification, which includes releases of Comprehensive Emergency Response and Compensation Liability Act reportable quantities to the National Response Center (NRC), U.S. Environmental Protection Agency (EPA), and the Local Emergency Planning Committees.

The Event contractor is responsible for any subsequent follow-up reports or updates resulting from emergency events at their facilities.

General Information

Description of Site and Environs

ORNL, located 40 km (25 miles) west of Knoxville, Tennessee, began operating in 1943. Initially part of the Manhattan Project, post-World War II research has continued in the area of atomic energy and in other nuclear products applications. TWPC began operations in 2002 to characterize, treat, and repackage (as necessary) ORNL waste for offsite disposal. The facility (EPA ID No. TN1 890 090 003), owned and operated by the U.S. Department of Energy (DOE), is part of the DOE Oak Ridge Reservation (ORR). Other major facilities located within the boundaries of the reservation include East Tennessee Technology Park (ETTP) (formerly known as the K-25 Site) and Y-12 National Security Complex (Y-12).

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White Oak Creek (WOC) drains the Bethel Valley portion of the ORNL complex. The creek flows south of ORNL through Bethel Valley, passes through a gap in Haw Ridge to the southwest, crosses Melton Valley, and enters White Oak Lake (WOL) approximately 1.24 km (1 mile) south of ORNL. Additional ORNL experimental facilities are located south of the main ORNL complex in Melton Valley. These additional facilities include two former demonstration reactors, the High Flux Isotope Reactor, two bare reactors (reactors operated without shielding), and process plants. Melton Valley is drained by Melton Branch, a tributary of WOC, and the combined flow then drains to WOL.

Water released from WOL is controlled by White Oak Dam. These waters enter the Clinch River at mile 20.8, which is below Melton Hill Dam. The Clinch River flows into the Tennessee Valley Authority Watts Bar Lake. The Clinch River is a navigable waterway for barge traffic and serves as a water supply for several facilities and communities, the closest of which are ETTP and the city of Kingston. The Clinch River is also used for commercial fishing, sport fishing, and other recreational purposes. WOL is on the ORR and is not used for any recreation purposes.

General Facility Information

The facility identification number for ORNL is TN1 890 090 003.

The facility address is:

Oak Ridge National Laboratory
1 Bethel Valley Road
Oak Ridge, TN 37830

The owner/operator's address is:

U.S. DOE
Post Office Box 2001
Oak Ridge, TN 37831-8620

The co-operator's address is:

United Cleanup Oak Ridge LLC
Post Office Box 4699
Oak Ridge, TN 37831

The overall layout of ORNL and the location of the waste units are shown in Fig. 6.1-20. The section below under ORNL Hazardous Waste Unit Description and Drawings, provides a list of RCRA TSDs managed by UCOR and describes each unit's operations and design. Locations of entrances, roads inside the facility, main storage buildings for emergency equipment, and possible evacuation routes are also provided in Fig. 6.1-20. The LSS will determine and direct all personnel to the appropriate evacuation routes.

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ORNL Emergency Management System

The ORNL Emergency Management System follows a three-tier approach. These three tiers are on-scene response (i.e., emergency squad, incident command), site-level response, and offsite level response (i.e., DOE-Headquarters (DOE-HQ), and state and local governments).

On-Scene Response

Incident Command is operated under the National Incident Management System. The Incident Commander (IC) applies the necessary resources (i.e., hazardous material [HAZMAT], security, emergency medical, health and safety, and facility/operations managers) to mitigate the event at the scene. If the event is security related, the IC is provided by Protective Forces Security Services (Proforce). If the event is non-security related, the IC is provided by the ORNL Fire Department.

Site-Level Response

The site response is initially directed by the LSS. When an emergency situation occurs at ORNL, personnel notify the LSS. The LSS is the 24-hour point of contact. The LSS implements the *Site Emergency Plan* and procedures through the activation of the ERO. The LSS performs the initial categorization of the incident and determines the proper emergency class in accordance with the Laboratory's Emergency Action Levels. The LSS becomes the Laboratory Emergency Director (LED) when the event has been categorized as an Operational Emergency and remains in this role until relieved by the ORNL Crisis Manager as part of the ORNL EOC.

If the event is categorized as an Operational Emergency, the EOC is activated by the LED. Once the EOC is operational, the onsite and offsite activities and responses transition to the EOC. The EOC activities include:

- Coordination with onsite response forces
- Timely update to the site workforce
- Developing potential onsite and offsite consequences and protective actions and protective action recommendations
- Coordination with the state, local governments, and federal government agencies (DOE-HQ, EPA, Federal Bureau of Investigation, etc.).

Offsite Response

Response outside of the Laboratory Emergency Response Boundary is the domain of the DOE HQ, and state and local governments. This response is documented in their respective emergency plans and procedures.

EMERGENCY RESPONSE ORGANIZATION

Emergency management requires an organization with specific emergency responsibilities that are separate from those of the normal operating structure. ORNL emergency management personnel are able to make effective transition from a normal operations organization to an ERO. The ERO

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establishes control at the event scene and integrates the onsite and offsite response services, as well as communications with offsite governmental oversight agencies.

The LSS on duty is the Emergency Coordinator, as required by Rule 0400-12-01-.06(4)(f) and 40 *CFR* 264.55. The LSS on duty has the responsibility and authority to commit the resources needed to carry out this contingency plan. Specific responsibilities of the LSS are described below. However, the main responsibility of the LSS is to initiate and coordinate emergency response efforts. The LSS office, located in the Laboratory Emergency Response Center (LERC), Bldg. 4512, is manned 24 hours/day, 7 days/week. The LERC is centrally located within the ORNL complex so that the LSS on duty can reach any unit in a short time.

The on-duty LSS can be reached at the ORNL Operations Center by calling (865) 574-6606. The primary point of contact is the person serving on that designated 8-hour shift.

ORNL LSS PERSONNEL LIST

See the Control Document Officer for Possible Access to this "Controlled Unclassified Information (CUI)".

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The mailing address for the emergency coordinators is:

Oak Ridge National Laboratory
Laboratory Shift Superintendent
P.O. Box 2008
Oak Ridge, Tennessee 37831-6352

LED is a generic term for the one person in charge of ORNL emergency response at a given time. During most emergencies (and the initial stages of all emergencies), the LSS is the LED. For serious events in which the ORNL EOC is activated, the Crisis Manager, who heads the ORNL EOC, becomes the LED when the ORNL EOC is operationally ready. In this contingency plan, the term, *Laboratory Emergency Director*, always refers to the person in charge of emergency response at a given time, whether it is the LSS or the Crisis Manager.

The LED will activate both ORNL-wide and local emergency squads, as necessary, when an emergency occurs. The Incident Command System (ICS) Operations Support Group consists of an industrial hygiene (IH) technician; radiological control technician; steam plant operator; electrician; waste operator; waste operations foreman; and heating, ventilating, and air conditioning (HVAC) mechanic who respond in addition to the fire and security sectors during an emergency or event. All group members are available around-the-clock (the IH technician is on-call, all others are onsite) to the LED to assist in the resolution of any abnormal event occurring in or around the Laboratory.

The ICS Operations Support Group members respond to all emergencies and perform duties, as directed, by the LED or the on-scene IC. Individually, they provide the services of their respective crafts. Collectively, they work as a team or teams to assist in the initial mitigation of hazardous material releases, scene management, resource accountability, communication, and/or other duties for which they have been trained.

Each major ORNL building has a Local Emergency Squad made up of employees who are familiar with their building and its operations. The number of members assigned to each Local Emergency Squad varies with the size, population, and complexity of each facility. Members are normally available during regular day-shift hours only, Monday through Friday. They respond to all emergencies at their particular facility and perform duties as directed by the Local Emergency Supervisor.

Laboratory Emergency Director

The LSS shall assume the role of the ORNL LED until such time as he or she is relieved of that responsibility by the Crisis Manager. The LED shall ensure that the Crisis Manager is promptly notified of an emergency condition.

The LED will (1) provide continuous sitewide emergency direction; (2) direct the overall effort to respond to operational events and emergencies; (3) assess the event to determine the hazard and its consequences and make an initial classification based on emergency action levels; and (4) alert and mobilize sufficient response forces, including technical assistance, to respond to the requirements of the emergency.

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The LED will direct a team response effort. Emergency functions and responsibilities of key personnel on each shift have been designated. These functions include emergency response for fire, hazardous materials events, radiological emergencies, security events, energy and utility interruptions, medical assistance, rescue, environmental monitoring, and damage control. Individual emergency response duties and regularly assigned responsibilities are correlated wherever possible.

Other functional responsibilities of the LED include the following:

- Activate alarms or communication systems to notify emergency units.
- Initiate appropriate notifications as shown in Fig. 6-1 and protective action.
- Make recommendations to offsite organizations.
- Appoint emergency management response personnel from qualified on-shift personnel for assistance with current and continuing emergency control but assume those responsibilities until the positions are filled.
- Augment the ORNL emergency response organization with emergency call-list personnel and other available staff members, as appropriate.
- Continue assessment of emergency status and make appropriate protective action recommendations to offsite organizations.
- Ensure that information to be released is accurate and released through the proper channels.
- Request outside assistance, if applicable.
- Remain alert to radiological conditions and other hazards with the potential for significant effect on the health and/or safety of onsite ORNL personnel and, where necessary, implement appropriate protective measures, including emergency exposure limits, sheltering-in-place, and partial or full-site evacuation.
- Authorize all rescue efforts requiring re-entry into an evacuated area.
- Ensure that the IC at the scene of the emergency directs emergency service units and local emergency squads.
- Ensure that the IC at the scene of the emergency evaluates:
  - Radiation and general safety situations as they affect the immediate and adjacent areas
  - Need for interrupting utility services such as process water, ventilation, oxygen, and electricity
  - Need for operational changes
- Consider the need for and arrange for any large-scale alert, evacuation, general alert, invocation of mutual assistance agreements, and procurement of additional emergency personnel or emergency equipment.
- Keep management and appropriate staff informed.
- Determine when the emergency is over and order the “all clear” signal.

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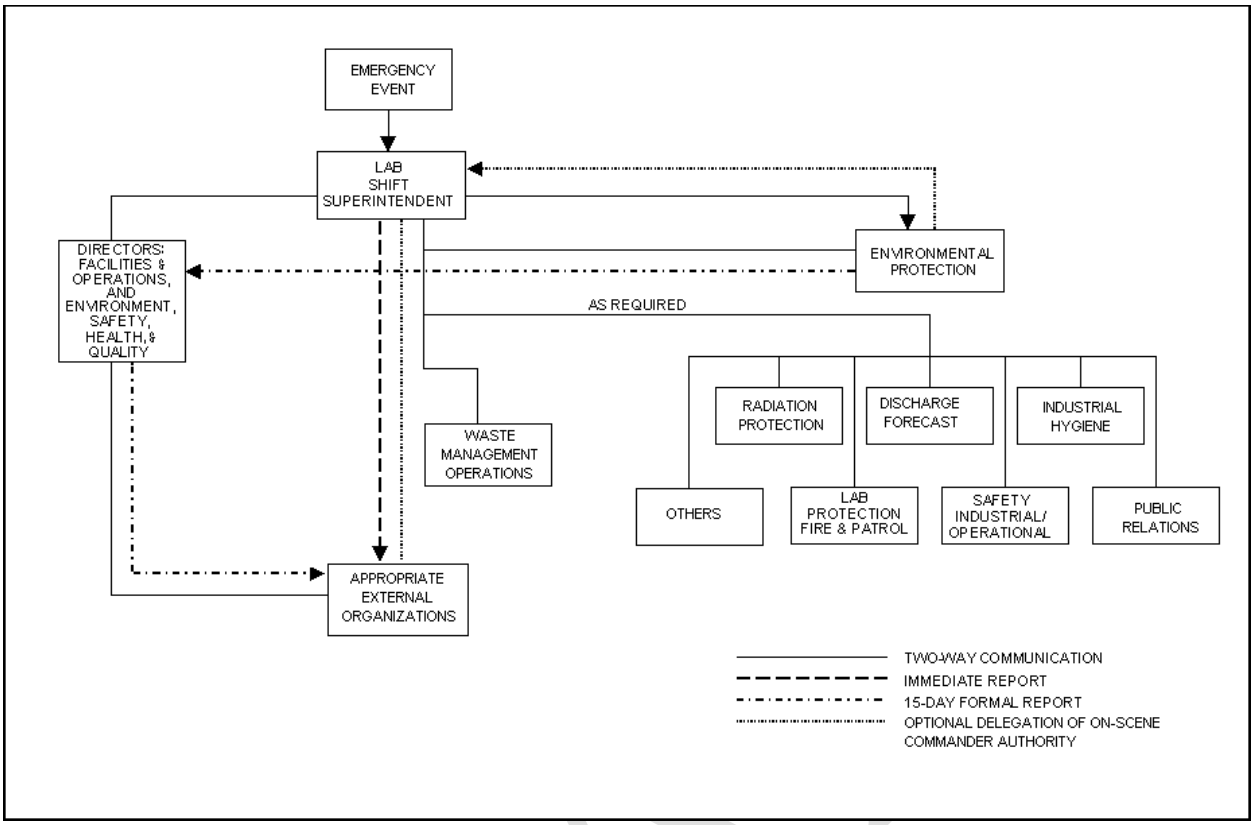

Fig. 6-1. Emergency Response Notification Flow Chart*

*The following organizations may include multiple prime contractors (UT-Battelle, UCOR, and other prime contractors): Directors; Facilities & Operations and Environment, Safety, Health and Quality; Waste Management Operations; Environmental Protection; Radiation Protection; and Public Relations.

The LED may delegate some of his or her assigned functional responsibilities to appropriately qualified ORNL personnel. The LED is the only individual authorized to declare an emergency condition and/or authorize emergency personnel radiation exposures greater than those allowed in 10 *CFR* 835. The LED is the only individual authorized to recommend offsite protective actions to state, local, and county governmental authorities on behalf of ORNL and retains overall responsibility for the implementation and administration of the *Site Emergency Plan* at ORNL.

Specific emergency response responsibilities of groups or individuals at ORNL are contained in the latest revision of the *Site Emergency Plan*.

The LED or delegate will provide the time, date, and details of any incident that requires implementing the contingency plan to UCOR/DOE so this information can be recorded in the operating record.

Person Discovering an Emergency Incident

The person discovering a potential emergency incident will immediately notify the LSS at 911, or if using a cell phone, dial (865) 574-6606, and notify his or her immediate supervisor. Individuals with radio communication can contact the LERC on the ORNL-wide area radio system (WARS).

The radio dispatcher will notify the LSS, who will dispatch the necessary emergency service units to the scene and will notify others, as necessary. The individual may also pull the nearest fire alarm box to summon assistance.

When a call is received by the LERC, the dispatcher immediately notifies the LSS and dispatches the emergency service units needed (fire, medical, ambulance, protective force, radiation survey, waste management, environmental protection, safety, and health protection, etc.).

All Employees

One of the most critical factors in combating emergencies is the ability of the person discovering an emergency to act immediately with knowledge of what to do and where to get prompt help. Each employee should notify the LSS and be thoroughly familiar with the following:

- Responsibilities of a person discovering an emergency
- Location and use of fire-fighting and other emergency equipment in the immediate area
- Assembly points for local and ORNL-wide evacuations
- Local and ORNL-wide alarms and signals (fire, evacuation, etc.)
- Names of local emergency personnel in the immediate area

In an emergency, employees should follow directions of local emergency squad personnel and/or instructions over the public-address system.

When instructed to evacuate by alarm or voice, employees should:

- Shut down equipment, if practicable
- Quickly leave the building or immediate area
- Proceed to the local assembly point
- Remain at the local assembly point until otherwise instructed

Implementation of the Contingency Plan

The decision to implement this contingency plan as part of the *Site Emergency Plan* depends upon whether an imminent or actual incident at a TSD could threaten health or the environment. The plan will be implemented whenever there is a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste constituents to the air, soil, or surface water at a RCRA unit that could threaten human health or the environment. The plan will be carried out immediately when any such fire, explosion, release, etc., occurs.

This contingency plan will be implemented by the LSS in the following situations.

A fire and/or an explosion occurs at a RCRA TSD unit, such that

- Potential for human injury exists
- Toxic fumes could be generated
- Spreading of fire could cause heat-induced explosions or could ignite materials at other locations

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- Water or chemicals used in firefighting could result in contaminated runoff
- Explosion could cause a safety hazard from flying fragments or shock waves
- Other hazardous wastes could be ignited from an explosion
- Toxic material could be released as a result of explosion

A material release or spill occurs at a RCRA TSD unit, such that

- Fire hazard or gas explosion hazard could result from flammable liquids or vapors from a spill
- Toxic fumes or liquids could be released that would endanger human health or the environment
- Release could result in soil contamination and/or groundwater or surface water pollution that could endanger human health or the environment
- A spill that cannot be contained could result in offsite ground or surface water pollution and/or soil contamination

See section titled, "Emergency Response Procedures for Spills, Hazardous Material Release, Fire, or Explosion—Emergency Coordinator," for additional information.

Control Procedures—Incident Commander

The initial response to a facility emergency may be provided by the Local Emergency Supervisor/local emergency squad or the first arriving emergency response officer. Once the ICS is established, the command and control of the emergency squad is transferred to the IC. Command and control begins with the IC at the event scene. The IC has the authority to implement protective and mitigative actions within the event scene designated by the LSS. Incident Command may be transferred between the ORNL Fire Department and Protective Force based on the type (non-security vs. security event) of emergency situation. Incident Command may be transferred to representatives of other Federal Agencies (i.e., Federal Bureau of Investigation or EPA) in accordance with the *National Response Plan*. The IC is responsible for assuming command and control of emergency response at the scene of the incident until such time that the area is determined to no longer be in a state of emergency. At that time, the IC will turn the area over to the area supervisor. The IC is responsible for the following:

- Initiate evacuation of area, if required.
- Conduct initial evaluation of nature and magnitude of problem.
- Establish control and set up an Incident Command Post, and if necessary, a Staging Area for emergency response.
- Restrict entry to properly equipped personnel.
- Ensure responder accountability is maintained throughout the event.
- Account for all personnel in affected area or building.
- Develop and implement an Incident Action Plan.

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- If a liquid or gaseous release occurs, call IH personnel to take atmospheric samples to determine the concentration (vapors from unknown liquid spills can be extremely hazardous to responding personnel).
- If a radiation release occurs, call Radiation Protection to take samples to determine the extent of contamination.
- Initiate cleanup and properly manage wastes generated during the cleanup.
- Obtain medical attention for any injured persons.
- Notify environmental protection organization(s) of emergency event and report any information known at this point.
- Contact other emergency service units, as required.
- Arrange for assembly, organization, and briefing of emergency response personnel who have been summoned.
- Continue to provide incident control and updated status reports on situation until relieved.

The following additional actions will be taken at TSD units affected by a fire or explosion. Note: water will not be used on reactive or TRU wastes.

- Shut down work in the affected areas immediately.
- Shut down feedlines and additional equipment, as necessary and practical.
- Clear all personnel not actively involved in fighting the fire from the area. These persons are to report to the designated assembly points for accountability.

Emergency Response Procedures for Spills, Hazardous Material Release, Fire, or Explosion—Emergency Coordinator

Internal Notifications

The person discovering a potential emergency incident will immediately notify the LSS at 911, or if using a cell phone, dial (865)574-6606, and notify his or her immediate supervisor. Individuals with radio communication can contact the LERC on the ORNL WARS. The radio dispatcher will notify the LSS, who will dispatch the necessary emergency service units to the scene and will notify others, as necessary. The individual may also pull the nearest fire alarm box to summon assistance.

The LSS will immediately activate the emergency pager notification system to notify response personnel and communicate protective action/emergency information using the sitewide public-address system. A duplicate announcement will be made on the WARS. The LSS will notify all appropriate facility personnel including other DOE contractors, co-owners and co-operators, and outside agencies, according to the *Site Emergency Plan* (see "Offsite Notification and Evacuation").

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Identification of Hazardous Materials

Once an emergency situation has been reported, the LSS will determine the extent, cause, and characteristics of the release (amount and area extent) and contact the appropriate staff for cleanup operations. The methods that can be utilized in the identification of character, source, amount, and extent of release include direct observation, a review of unit operating records, inventories, log sheets, manifests and other tracking records, and chemical analysis results. Information sources to support the identification process are available at the LSS office, the hazardous waste organization, and the environmental protection organization and include facility drawings, Safety Data Sheets (SDSs), the SPCC Plan, chemical reference books, and sewer and water-line drawings.

Hazard Assessment

Assessment of possible hazards to human health or the environment will be made using the following methods:

- Process knowledge (i.e., knowledge of the nature of the waste materials released)
- Review of SDSs, if available
- Chemical analysis and/or monitoring data
- Results of modeling for releases to air, surface water, or groundwater
- Specific health-based and environmental criteria or limits, which may be exceeded

Based on the hazard assessment, evacuation of the immediate unit area, entire facility, or local areas outside the facility may be necessary.

The LED will consult with various support organizations, as necessary, to evaluate the potential hazards of the emergency event.

Offsite Notification and Evacuation

If a release of hazardous constituents has occurred that could threaten human health or the environment offsite, the LED will initiate steps to notify appropriate local and government authorities. That notification should indicate whether evacuation of local areas is recommended and should assist local officials in decisions regarding evacuation of local areas. Individuals or groups that may be notified include, but are not limited to, the following:

- DOE HQ EOC
- TEMA
- NRC
- DSWM
- Local emergency planning councils
- Affected county notification points
- City of Oak Ridge (Anderson County)
- Regional EPA
- Other agencies as required by regulatory guidance

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Evacuation of nonessential personnel is ordered by the LED if it is determined that a threat to the safety of personnel exists.

When notifying the NRC, the report must include the following:

- Name and telephone number of reporter
- Name and address of facility
- Time and type of incident (e.g., release, fire)
- Name and quantity of material(s) involved, to the extent known
- Extent of injuries, if any
- Possible hazards to human health or the environment outside the facility

More information is available in the *Site Emergency Plan*.

Prevention of Recurrence or Spread of Fires, Explosions, and Releases

The LED is responsible for ensuring that fires, explosions, or releases do not occur, recur, or spread to other hazardous waste at the unit. The LED will, as appropriate, arrange to survey and monitor the affected area to establish protective boundaries, shut down and monitor processes, collect, and contain released wastes, and remove and isolate any damaged containers.

The LED is responsible for ensuring that provisions are made to monitor for leaks, pressure buildup, gas generation, or ruptures, as appropriate, if operations at the unit are stopped in response to a release, fire, or explosion.

Storage and Treatment of Released Material

Any hazardous materials that result from a release, fire, or explosion at ORNL will be contained, removed, and placed in appropriate containers or tanks. Leaking or damaged containers will be placed in overpack containers so they can be stored until treatment or disposal arrangements are finalized.

Contaminated absorbent materials, protective clothing, and other disposable material used in remediation of the emergency and subsequent decontamination activities will be placed in containers and stored at a RCRA storage unit pending treatment or disposal. These items will be handled with the same degree of caution as the wastes themselves so that public health and the environment are not further threatened. Emergency equipment available at ORNL is identified in "General ORNL Emergency Equipment."

Incompatible Wastes

Waste management personnel will ensure that any wastes that may be incompatible with any spilled or released material are moved to a safe storage location until all cleanup operations have been completed.

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Post-Emergency Equipment Maintenance

All emergency response teams will ensure that team equipment is properly decontaminated according to the type and level of contamination, that supplies are restocked, and that equipment and supplies are returned to pre-emergency readiness.

Notification will be made by the LED in consultation with the Recovery Manager to the state commissioner and local authorities that (1) no waste that was incompatible with the released material was treated, stored, or disposed of until cleanup procedures had been completed and (2) post-emergency equipment maintenance has been completed and operations will be resumed.

Container Spills and Leakage

In the event of a hazardous material spill or release, the following general procedures will be used for rapid and safe response and control of the situation. Spills or releases and impending spills or releases discovered during routine inspections will be handled in the same manner as described below for spill and release emergencies. These are general guidelines, however, and circumstances may dictate some alterations to these procedures.

The person discovering a potential emergency incident will immediately notify the ORNL LSS by calling 911 from a landline, or by calling (865) 574-6606 if using a cell phone, and immediately notify his or her immediate supervisor. Individuals with radio communication can contact the LERC on the ORNL WARS. The radio dispatcher will notify the LSS, who will dispatch the necessary emergency service units to the scene and activate the Site Emergency Plan, as necessary. Individuals observing an emergency event or environmental release may also pull the nearest fire alarm box to summon assistance.

The area supervisor or the employee will provide the following information, if known:

- The material spilled or released
- The location and source of the release or spillage of hazardous material
- An estimate of the quantity released and the rate at which it is being released
- The direction in which the spill, vapor, or smoke release is heading
- Any injuries involved
- Fire and/or explosion or the possibility of such events

This information will help the LSS to assess the magnitude and potential seriousness of the spill or release. The LSS will contact and deploy the necessary personnel. If additional assistance is required, the LSS will respond in accordance with the ORNL Site Emergency Plan. The LSS response may also contact Y-12, which has agreed to provide assistance and, if necessary, the agencies discussed in "Coordination Agreements—Arrangements with Local Authorities" of this plan.

The initial response to any emergency will be to protect human health and safety and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary responses. Offsite notifications of the release will be made when applicable.

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Medical assistance and support shall be provided in accordance with the ORNL Site Emergency Plan and for injured persons will be obtained from the medical staff and/or the Methodist Medical Center of Oak Ridge.

Cleanup personnel will don the appropriate protective clothing and equipment. If a flammable waste is involved, all ignition sources will be removed, and spark and explosion-proof equipment and clothing will be used for containment and cleanup activities. If possible, emergency response personnel will try to stop the leak. All surrounding materials that could be reactive with the waste materials will be removed. The major components of the waste will be determined.

Absorbent pads, booms, earth, sandbags, sand, and other inert materials will be used to contain, divert, and clean up a spill if it has not been contained by a dike or sump. Spills contained within a dike or sump may be pumped back into the appropriate storage tank or drum if it is structurally sound. All containment and cleanup materials will be placed in drums for proper disposal. All recovered liquid wastes and contaminated soil that cannot be returned to their original storage tanks or containers will be containerized within 24 hours.

If, for some reason, a chemical spill is not contained within a dike or sump area, an appropriately sized area of isolation will be established around the spill. The size of the area will generally depend on the size of the spill and the materials involved. When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If possible, the area will be roped or otherwise blocked off. All persons not actively involved in managing the spill will be kept upwind.

All emergency equipment used for spill management must be cleaned or replaced by the responsible personnel so that it is fit for use prior to resumption of plant operations in the affected areas.

General ORNL Emergency Equipment

ORNL maintains equipment for earth moving, decontamination, rescue team, transportation, personnel protection, monitoring, sanitation and survival, damage containment, firefighting, and emergency power.

Emergency equipment and instrumentation are located in ORNL facilities, in separate facilities near where the potential for a serious accident exists, and in the emergency and alternate control centers. Such equipment consists of protective clothing, respirators, medical supplies, various types of portable radiation-detection equipment, and equipment for analyzing various chemicals.

Mobile units are available for emergency use (some have radio communications capability). These units are equipped with various types of respirators, radiation-detection equipment, protective clothing, medical supplies, and various other types of life-saving equipment.

In addition, numerous DOE-owned vehicles are onsite and available for emergency use. These consist primarily of sedans, station wagons, buses, and trucks. Included in the group are special-purpose vehicles, a mobile change house, a mobile counting laboratory, and two ambulances equipped with medical supplies and capable of handling low-level irradiated and/or contaminated

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persons. (A list of the individuals or organizations assigned to each vehicle is available from the LSS.)

The Fire Department at ORNL is well equipped with vehicles and fire-fighting equipment. ORNL has an extensive fixed fire protection system, including automatic sprinkler systems, heat and smoke detectors, and fire alarms.

Personnel involved in responding to emergency situations at ORNL, including TWPC, are aware of the locations of emergency equipment and vehicles. One of the responsibilities of the Local Emergency Supervisor is to organize and train individuals in his/her squad. A part of this training deals with the location of equipment.

The emergency equipment stored at the hazardous waste units is maintained by the appropriate contractor's waste management organization. All technical personnel in these groups are well versed in the use and location of this equipment as part of their initial on-the-job training. Locations of emergency equipment storage maintained at the storage/treatment areas are provided in Attachment 6.2.

Spill response materials and equipment (lime, soda ash, absorbent materials, oil pads/booms, tanker trucks for spilled material and decontamination solutions, hand tools, heavy equipment, etc.) are maintained by the maintenance staff.

Emergency Equipment at Hazardous Waste Facilities

(DSWM) has approved ORNL's request for a waiver for the storage of emergency supplies at the TRU storage facilities because of the radiation levels in these units. The waivers remain effective for 5 years upon issuance and will have to be renewed or the permittee will be required to submit a modification to this permit. Waiver renewal shall be required to be submitted at least 90 days prior to the waiver ending.

Limited emergency supplies are located at ORNL's other hazardous waste management units because general supplies of emergency response equipment are maintained primarily at another ORNL location: Bldgs. 7666 and 7668. Refer to Fig. 6.1-20. to identify the locations of ORNL's general supplies of emergency equipment. Attachment 6.2 provides examples of the response equipment located at the hazardous and mixed-waste management units.

Hazardous Material Spill Response Team

ORNL has onsite assets capable of responding to emergencies, including Fire Department, Emergency Medical Services (EMS), Health Services, security events and a Hazardous Material Spill Response (HAZMAT) Team, and would be able to adequately address emergencies until mutual aid could arrive. The HAZMAT Team is equipped with spill response and decontamination equipment.

Additional Emergency Response Equipment

Because the equipment needs during an emergency can be so varied, a comprehensive list of available emergency facilities and equipment is maintained in accordance with LPD-EM-ADM-1110, Preparing and Maintaining the Emergency Facilities and Equipment List. For equipment

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and supplies maintained by the ORNL EMT, a detailed procedure has been developed documenting the required checks to ensure operability during an emergency: LPD-EM-ADM-1120, ORNL Emergency Facilities Readiness.

The ORNL Fire Department also maintains the following emergency response equipment at the Research Operations Support Center, Building 7130:

- Two pumpers equipped with standard emergency equipment and foam (100 gal per vehicle)
- Extra foam, approximately 50 to 60 gal

Coordination Agreements—Arrangements with Local Authorities

Memoranda of Agreements, Mutual Aid Agreements, and Memoranda of Understanding for the three Oak Ridge sites have been negotiated by DOE Oak Ridge Office. Copies of the agreements are included in Volume 4 of the ORR Emergency Plan. This contingency plan is submitted to the agencies that may be called upon to provide emergency services. Records of those submittals are maintained in ORNL operating records. Copies of the agreements are kept by the ORNL Emergency Management Team and are retained as needed. Agreements that contain security related information are considered Official Use Only (OUO) documents, a category of information that is intended to identify and protect sensitive unclassified information. As such, OUO Letters of Agreement are identified in the Current List of Agreements and are not provided as a part of this contingency plan. OUO Letters of Agreement are maintained on file and are readily available for review. Familiarization training is conducted with local agencies that could be called on to provide assistance.

ORR organizations that may respond to assist ORNL include the ORNL Protective Force, Y-12 Protective Force, ORNL Fire Department, Y-12 Fire Department, and ORNL HAZMAT Team, and site Emergency Medical Services may respond as requested, as outlined in the ORR Multi-Site Response Plan and operating protocols. In addition to the above-mentioned organizations, if a fire, explosion, or hazardous material(s) release occurs, the following outside agencies may also respond:

Security Memoranda of Agreements—Anderson County Sheriff's Department, Knox County Sheriff's Department, Loudon County Sheriff's Department, Oak Ridge Police Department, Roane County Sheriff's Department, and TEMA.

Mutual Aid Agreements—Emergency Ambulance Service East Tennessee Region, Anderson County Emergency Medical Services, and Fire Protection Agreement City of Oak Ridge.

Evacuation Plan—ORNL-Wide Alerts and Movements to Points of Safety

If the entire ORNL area or a major portion thereof is in jeopardy or judged unsafe for any reason, an ORNL-wide alert is sounded. The dispatcher at the ORNL communications center reports this information immediately to the LED and to all emergency service units affected.

The LED evaluates the situation and selects an appropriate course of action. Instructions are to be given over the public-address system by the LED or his/her designated representative. If an explosion, fire, spill, or release of a volume of hazardous waste sufficient to threaten human health

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occurs, personnel are evacuated. Additionally, if the release exceeds the threshold limit value or an accurate determination of the concentration cannot be accurately determined, personnel are evacuated.

Local Emergency Supervisors and their emergency squads take steps to ensure that all employees in their areas are aware of the alert and that appropriate action is initiated to place building and equipment shutdown plans in effect.

Local Emergency Supervisors and squads assist personnel in moving to the local assembly point or specified points of safety and complying with instructions from the LED.

The ORNL Protective Force (ProForce) or Fire Department establishes radio communications from the principal assembly points and maintains contact with the other Oak Ridge installations and DOE.

The public-address system, ORNL radio system, LSS Alert System and/or public warning system sirens may be used for alerts or instructions when this is deemed advisable by the LED. The ORNL *Site Emergency Plan* provides description of the standard protective actions and additional precautionary measures. The standard protective actions are Evacuation, Shelter-in-Place, and Take Cover. Additional precautionary measures to be considered include Limited Movement, Security Situation Lockdown, decontamination of people, ad hoc respiratory protection, control of access, shielding, control of foodstuffs and water, decontamination of land and equipment, and medical care.

Protective action instructions are announced over the PA system, immediately preceded by the standard alternating tone. This emergency alarm signal with an alternating high-low tone indicates that an important announcement is about to be made regarding emergency response or actions.

The Central Alarm Station Operators provide continuous monitoring of Security and Emergency Systems and dispatch ProForce personnel to security and/or emergency alarms/situations.

Evacuation routes from hazardous waste management units are shown in Fig. 6.1-20.

Required Reports

The LSS will note in the operating record the time, date, and details of any incident that requires implementation of this contingency plan. Internal reports will be filed as required.

After the incident, the appropriate contractor's personnel will submit a written report on the incident that required implementation of this contingency plan to the DOE staff for review and transmittal to the Commissioner of TDEC, as required by Tennessee Rule 0400-12-01-.06(4)(g)(9). The report will include

- Name, address, and telephone number of the owner or operator
- Name, address, and telephone number of the facility
- Date, time, and type of incident (e.g., fire, explosion)

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- Name and quantity of material(s) involved
- Extent of injuries, if any
- Assessment of actual or potential hazards to public health or the environment, where this is applicable
- Estimated quantity and disposition of recovered material that resulted from the incident

This report may also be used to notify the regulators that emergency equipment has been cleaned and is fit for its intended use before resuming operations in the affected areas and that no incompatible waste was treated or disposed of in the affected area.

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ORNL HAZARDOUS WASTE UNIT DESCRIPTIONS AND DRAWINGS

Units/treatments at the Oak Ridge National Laboratory for management of hazardous and mixed wastes

Building No.	Facility name	Radioactive wastes accepted?
7855	TRU Waste Storage Facility	Yes
7860A	TRU Waste Storage Facility	Yes
7574	Drum Storage Facility	Yes
7883	RH TRU Waste Storage Bunker	Yes
7879	TRU Waste Storage/Staging Facility	Yes
7572	RH TRU Waste Storage Facility	Yes
TWPC-1	CH Waste Staging Area	Yes
TWPC-2	Waste Processing Building Second Floor	Yes
TWPC-3	Drum Aging Criteria Area	Yes
TWPC-4	Waste Processing Building First Floor	Yes
TWPC-5	Container Storage Area	Yes
TWPC-6	CH Marshalling Building	Yes
TWPC-7	Drum Venting Building	Yes
TWPC-8	Multi-Purpose Building	Yes
7831F	Flammable Storage Unit	Yes
Treatment	**Type of Treatment**	
T-1	Macroencapsulation Treatment	Yes
T-2	Amalgamation Treatment	Yes
T-3	Solidification/Stabilization Treatment	Yes
T-4	Groundwater Absorption	Yes
T-5	Size Reduction	Yes
T-6	Groundwater Filtration	Yes
T-7	Neutralization	Yes
T-8	Oxidation/Deactivation	Yes
T-9	Puncturing Potentially Pressurized Containers	Yes

SPECIFIC INFORMATION ON HAZARDOUS WASTE UNITS

Information on the specific hazardous waste units is provided in the following sections. The figures follow the unit descriptions.

TRU Waste Storage Facility, Bldg. 7855 (see Fig. 6.1-1.)

Building 7855 is a concrete-block structure on a reinforced concrete slab with a reinforced concrete roof. This building stores concrete casks or boxes containing RH TRU waste; and CH TRU waste, hazardous waste, mixed low-level waste (MLLW), and low-level waste (LLW) in drums (e.g., 30-, 55-, 85- or 110-gallon), overpacked containers, and metal containers. The structure is primarily below grade, except for the bay access side. The structure is divided into four bays by concrete block walls that extend from the floor to the roof. Each bay of the unit is approximately 15 ft × 45 ft. The building is approximately 60 ft × 45 ft. Some of the casks contain limited amounts of RCRA constituents, primarily lead and mercury.

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Drum Storage Facility, Bldg. 7574 (see Fig. 6.1-2.)

Building 7574 is constructed of metal siding and roof over a concrete pad. The metal Butler-type building has inside dimensions of approximately 83 ft × 50 ft. This building stores RH TRU waste, CH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85- or 110-gallon), overpacked containers, and metal containers. RCRA metals are the primary contaminants in the CH TRU waste.

RH TRU Waste Storage Bunker, Bldg. 7883 (see Fig. 6.1-3.)

Building 7883 is a concrete-block structure on a reinforced concrete slab with a reinforced concrete roof. The structure is primarily below grade, except for the bay access side. The structure is divided into four bays by concrete-block walls that extend from the floor to the roof. Each bay of the unit is approximately 18 ft × 55 ft. Overall, the unit is approximately 78 ft × 59 ft. This building stores concrete casks containing RH TRU waste, CH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85- or 110-gallon), overpacked containers, and metal containers. In the unused bays within the unit. Some of the containers contain lead, mercury, or other RCRA metals and PCBs.

TRU Waste Storage/Staging Facility, Bldg. 7879 (see Fig. 6.1-4.)

Building 7879 is constructed of metal siding and roof with a rigid frame over a concrete pad. The metal Butler-type building has inside dimensions of approximately 50 ft × 83 ft. The TRU Waste Storage/Staging Facility stores CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85- or 110-gallon), overpacked containers, and metal containers. Some of the containers store small amounts of lead, mercury, or other RCRA metals. Other RCRA wastes include sludges, and aerosol cans. RCRA-regulated mixed waste is separated from waste that is radioactive only.

RH TRU Waste Storage Facility, Bldg. 7572 (see Fig. 6.1-5.)

This unit is constructed of a metal roof and walls over a concrete pad. Overall dimensions are approximately 140 ft × 50 ft. This unit is used to store RH TRU waste, hazardous waste, and RH TRU mixed waste. Wastes are stored in shielded overpacks (SOPs), metal boxes, or concrete casks. Some of the drums or boxes, SOPs, or casks may contain small amounts of lead, mercury, cadmium, or other RCRA wastes. Other RCRA wastes may include sludges and aerosol cans.

TRU Waste Storage Facility, Bldg. 7860A (see Fig. 6.1-14.)

Building 7860A is a RUBB Tent structure with gravel floors and without secondary containment. This building stores concrete casks containing RH TRU waste; CH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85- or 110-gallon), overpacked containers, and metal containers. Non-overpacked containers with free liquid are stored in this building on secondary containment pallets, and non-overpacked containers without free liquid will be elevated off of the floor. This unit has an open floor plan with dimensions of approximately 80 ft × 100 ft.

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7831F FSU (see Fig. 6.1-19.)

This storage unit is modular in design with an approximate storage area of 576 sq ft, and maximum storage capacity of 7920 gal. The Flammable Storage Unit (FSU) has interior dimensions of 48 ft × 12 ft and is constructed of noncombustible material and heavy-gauge steel, but has no fire-resistance rating and no explosion vents. The FSU has floor grating to prevent the waste containers from contacting accumulated liquids. The FSU has a built-in 6-in.-deep sump beneath the floor grating constructed of noncombustible materials. The unit is equipped with dry chemical fire-suppression systems. The FSU stores CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85- or 110-gallon), overpacked containers, and metal containers.

TRU TWPC (see Figs. 6.1-6. thru 6.1-11., 6.1-13., 6.1-15., 6.1-16., 6.1-17., and 6.1-18.)

The project involves a single, compact Waste Processing Building (WPB) approximately 120 ft west of the Melton Valley Storage Tank Vault at ORNL. Waste storage and bench scale treatment of CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW occurs in the WPB. The waste will be stored in drums (e.g., 30-, 55-, 85-, 110-gallon), overpacked containers, and metal containers.

There are three prefabricated metal support facilities constructed to store the containerized CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW (the CHSA, the MPB, and the CHMB). The waste will be stored in drums (e.g., 30-, 55-, 85-, 110-gallon), overpacked containers, and metal containers.

The Drum Aging Criteria (DAC) Area consists of portable waste transport containers, the covered/enclosed 30-ton crane bay, the Cask Processing Enclosure (CPE), and tented structures. These facilities store containerized CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW. The waste will be stored in drums (e.g., 30-, 55-, 85-, 110-gallon), overpacked containers, and metal containers. Treatment and storage of containers will be utilized in the CPE.

The Container Storage Area (CSA) consists of portable waste transport containers and the Macrooencapsulation Building (MEB) stores CH TRU waste, RH TRU waste, hazardous waste, LLW, and MLLW. The MEB is used for the treatment of MLLW. The waste will be stored in drums (e.g., 30-, 55-, 85-, 110-gallon), overpacked containers, and metal containers.

The DVB is a pre-fabricated metal building utilized for the storage of RH TRU waste, CH TRU waste, hazardous waste, LLW, and MLLW containers. The waste will be stored in drums (e.g., 30-, 55-, 85-, 110-gallon), overpacked containers, and metal containers.

Waste Treatment System

Macroencapsulation (T-1) will be used as waste treatment for MLLW debris by completely encapsulating the debris within the container. Macroencapsulation will be performed in the Waste Processing Building (WPB), in the parking lot of the Contact-Handled Marshalling Building (CHMB), in the CPE located in the Drum Aging Criteria (DAC) area, or in the MEB.

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Small amounts of mercury such as that in thermometers, manometers, or switches may be identified during waste processing. Mercury amalgamation (T-2) (bench-scale operations) will be conducted in the WPB or the CPE as waste treatment for stabilizing elemental mercury.

Solidification/Stabilization (T-3) (bench-scale operations) will be conducted in the WPB to treat wastes containing RCRA-regulated liquids. Solidification/Stabilization of CH TRU waste will be performed in either the glove box or box breakdown area of the WPB, while operations associated with treatment of RH TRU waste will be performed in the hot cell of the WPB or in the CPE.

Groundwater Absorption (T-4) will be conducted to treat debris waste that has become saturated due to coming in direct contact with groundwater that has infiltrated the waste container. Groundwater Absorption of saturated CH TRU, RH TRU, or MLLW will be performed in either the glove box, box breakdown area, or hot cell area of the WPB, or the CPE.

Size Reduction (T-5) will be conducted in the WPB to treat CH TRU or RH TRU RCRA waste. Size Reduction of CH TRU waste will be performed in either the glove box or box breakdown area of the WPB, while operations associated with RH TRU waste will be performed in the hot cell or CPE of the WPB.

Groundwater Filtration (T-6) will be conducted, if needed, in the WPB, CPE, or the DVB to treat environmental media (e.g., groundwater).

Neutralization (T-7) will be conducted, if needed, in the WPB to treat corrosive liquid wastes to a pH above 2.0 and below 12.5.

Oxidation/Deactivation (T-8) will be conducted, if needed, in the WPB to oxidize potentially pyrophoric metals from the TRU legacy inventory so they are not capable of future energetic reactions.

Puncturing Potentially Pressurized Containers (T-9) will be conducted in the WPB or CPE resulting in a stable, non-ignitable and non-reactive waste in compliance with repository facility waste acceptance criteria. Residual liquids will be collected and sent to an off-site treatment facility.

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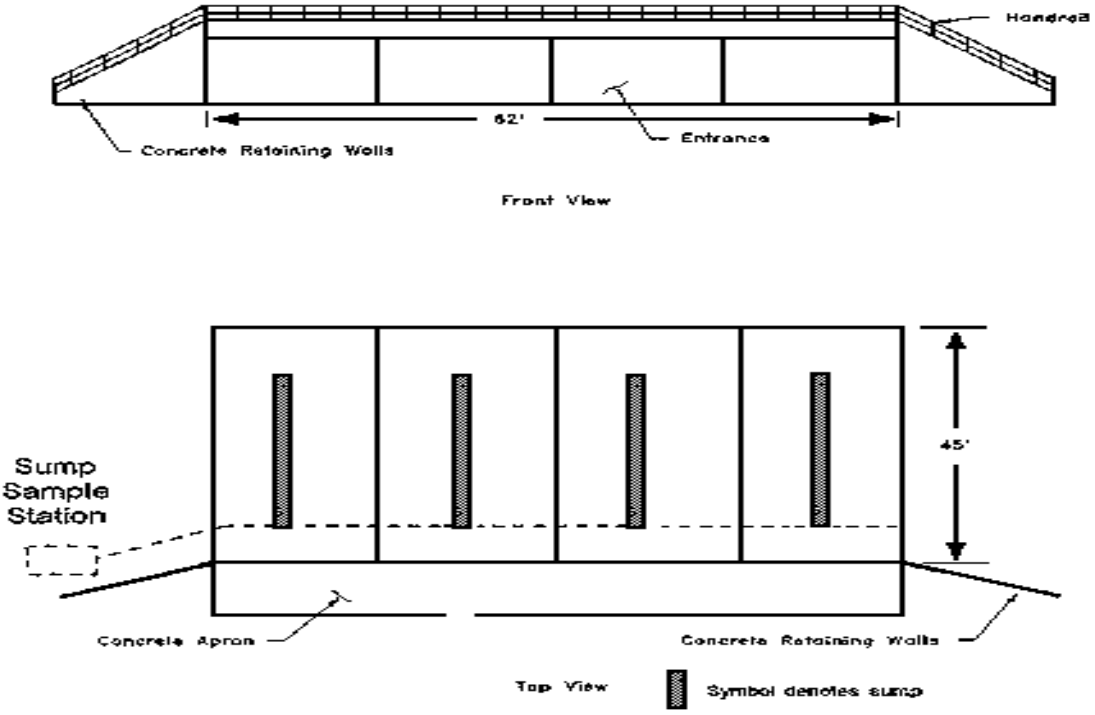

Fig. 6.1-1. TRU Waste Storage Facility, Bldg. 7855.

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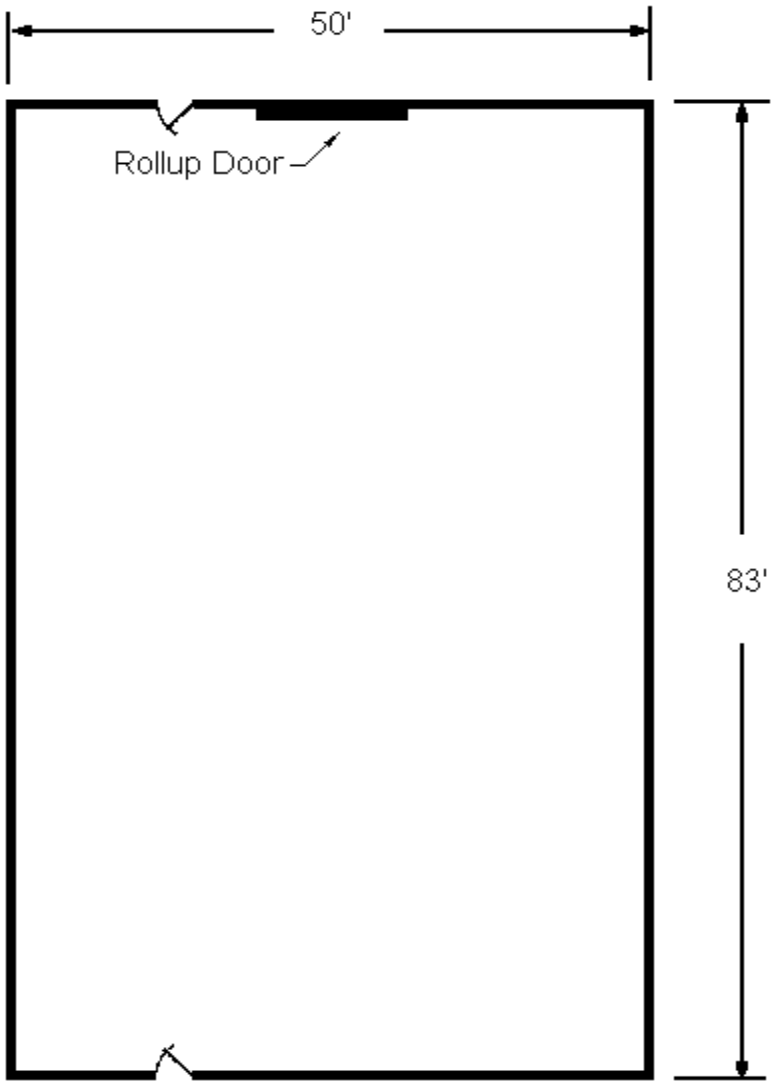

Fig. 6.1-2. Drum Storage Facility, Bldg. 7574.

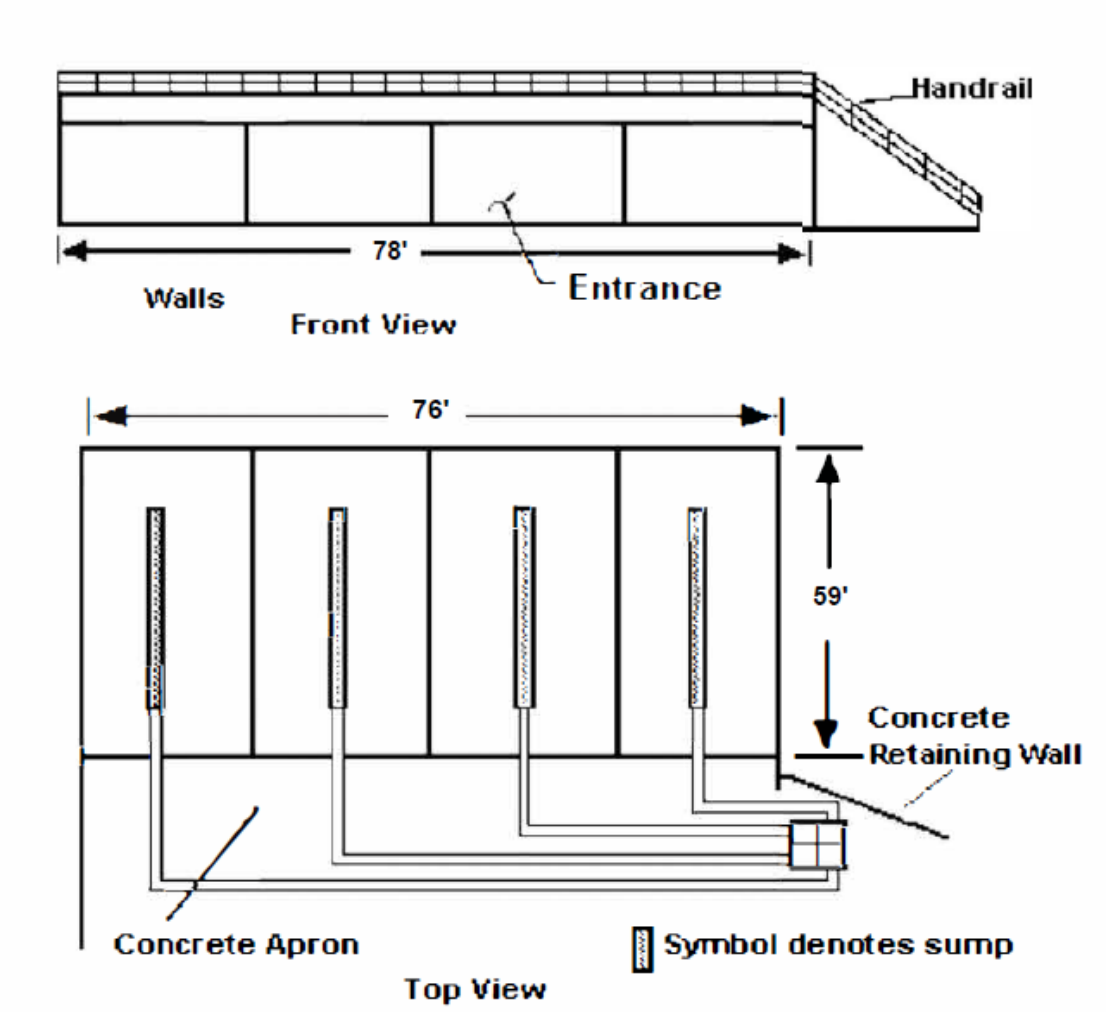

Fig. 6.1-3. RH TRU Waste Storage Bunker, Bldg. 7883.

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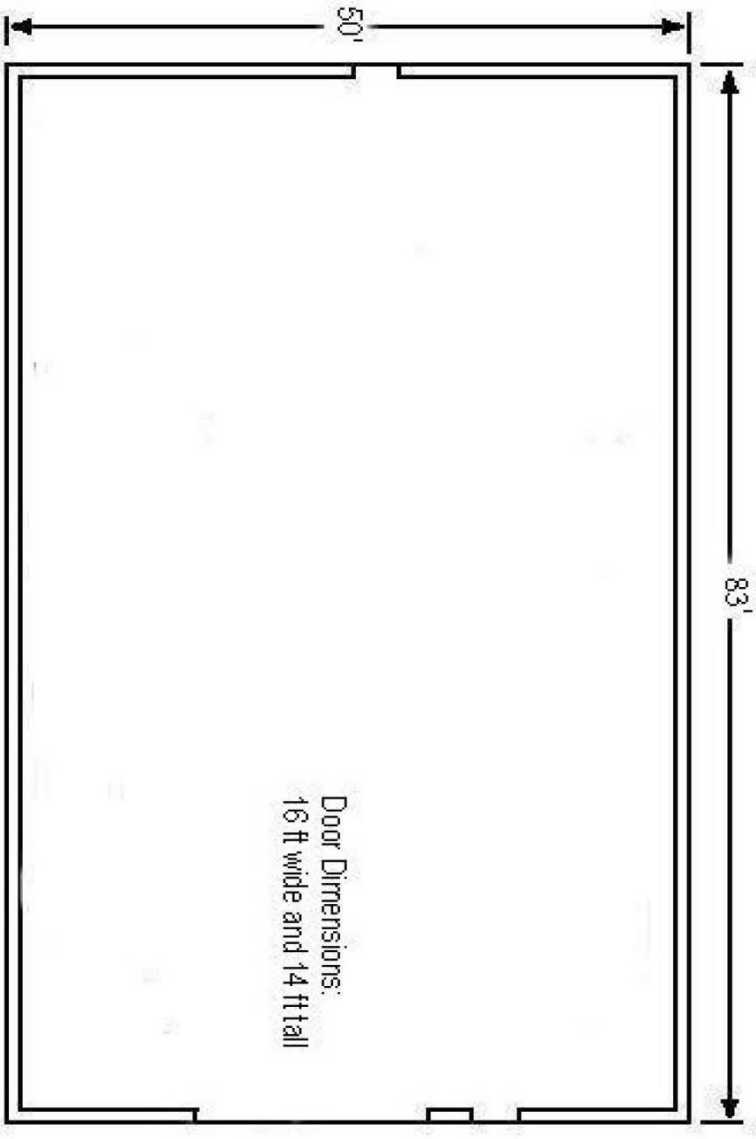

Fig. 6.1-4. TRU Waste Storage/Staging Facility, Bldg. 7879.

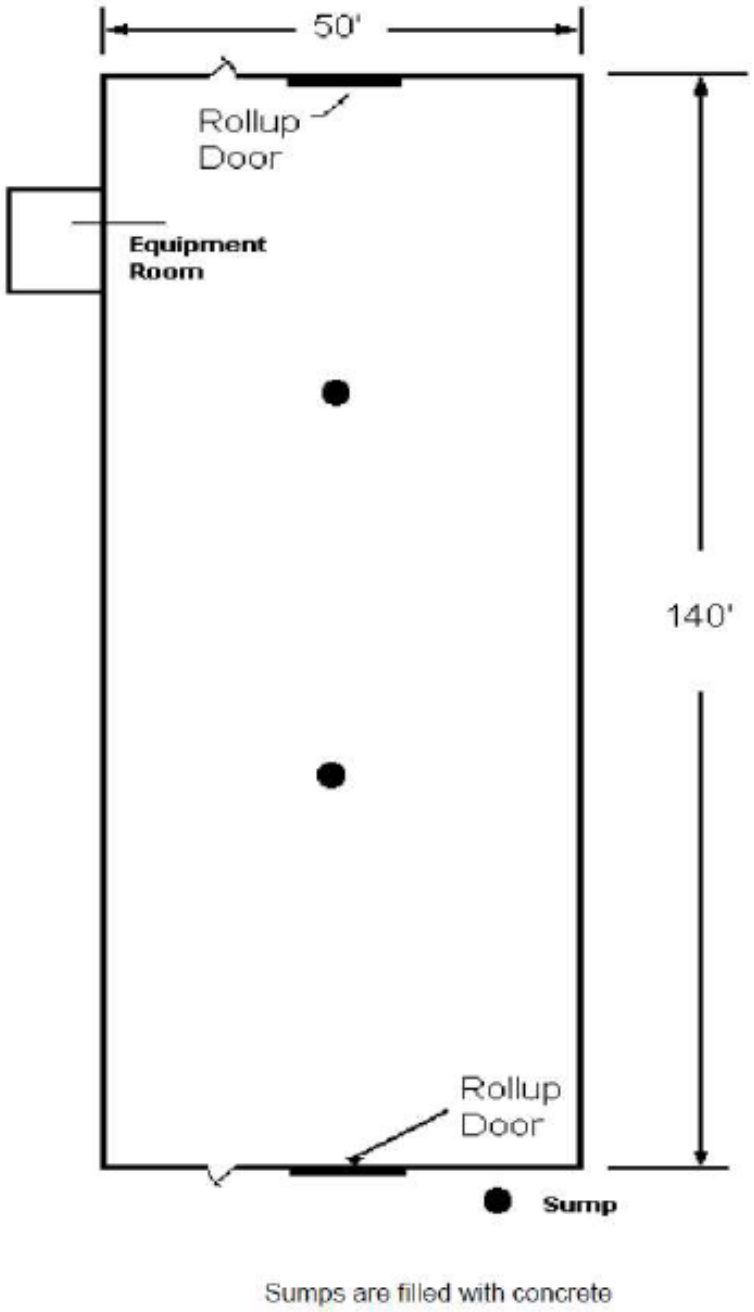

Fig. 6.1-5. RH TRU Waste Storage Facility, Bldg. 7572.

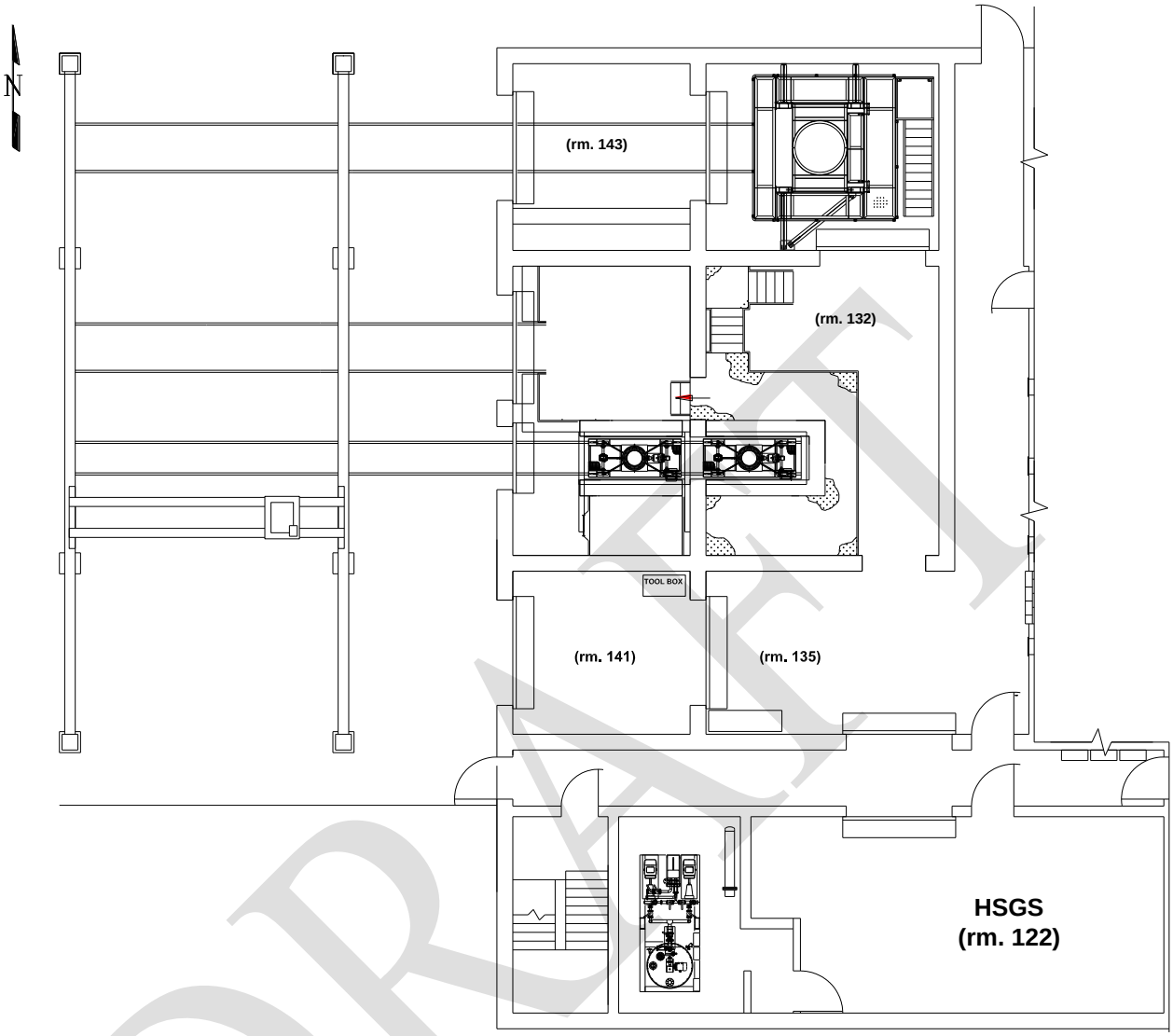

Fig. 6.1-6. TWPC Waste Process Bldg. 1st Floor.

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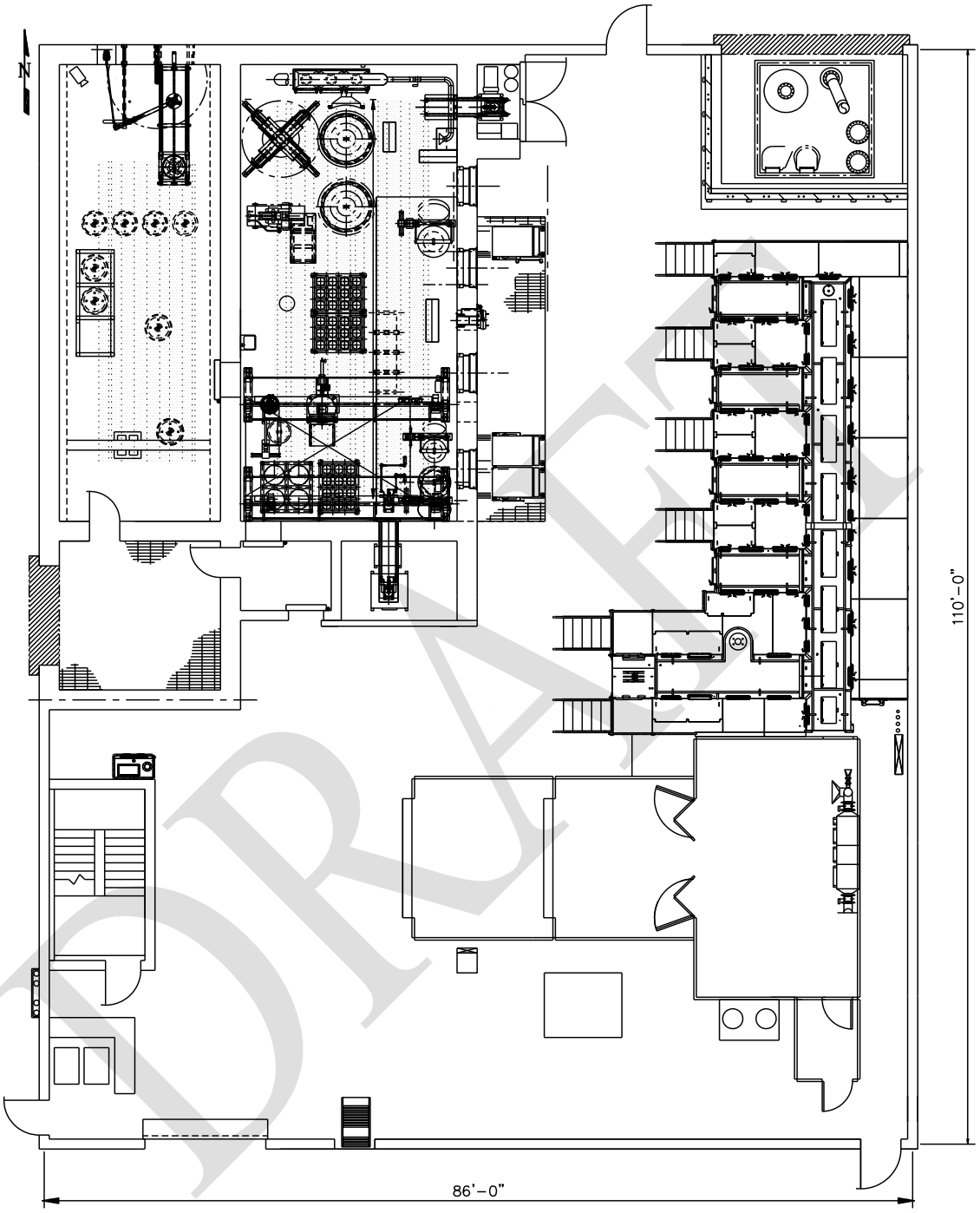

Fig. 6.1-7. TWPC Waste Process Bldg. 2nd Floor.

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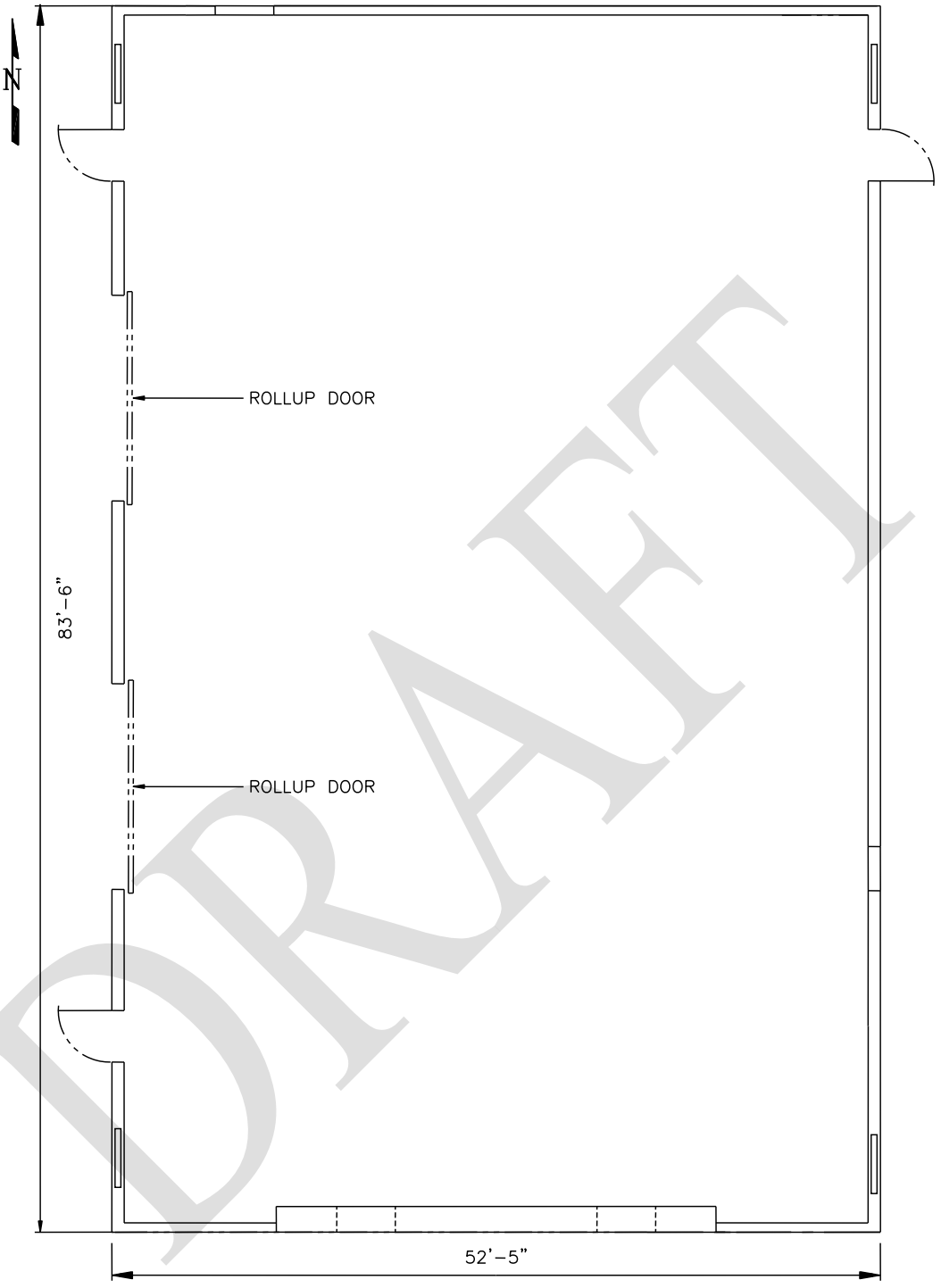

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Fig. 6.1-8. TWPC Contact Handled Staging Area (CHSA).

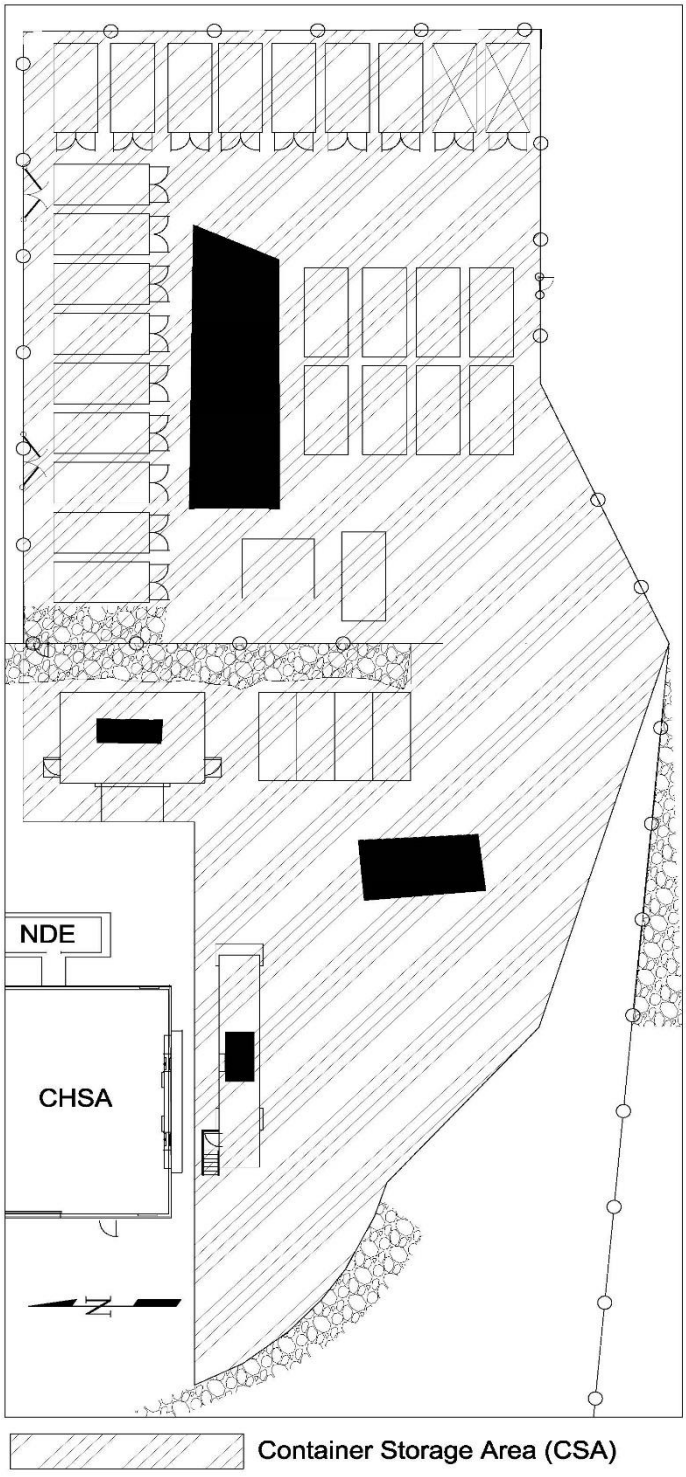

Fig. 6.1-9. TWPC Container Storage Area (CSA).

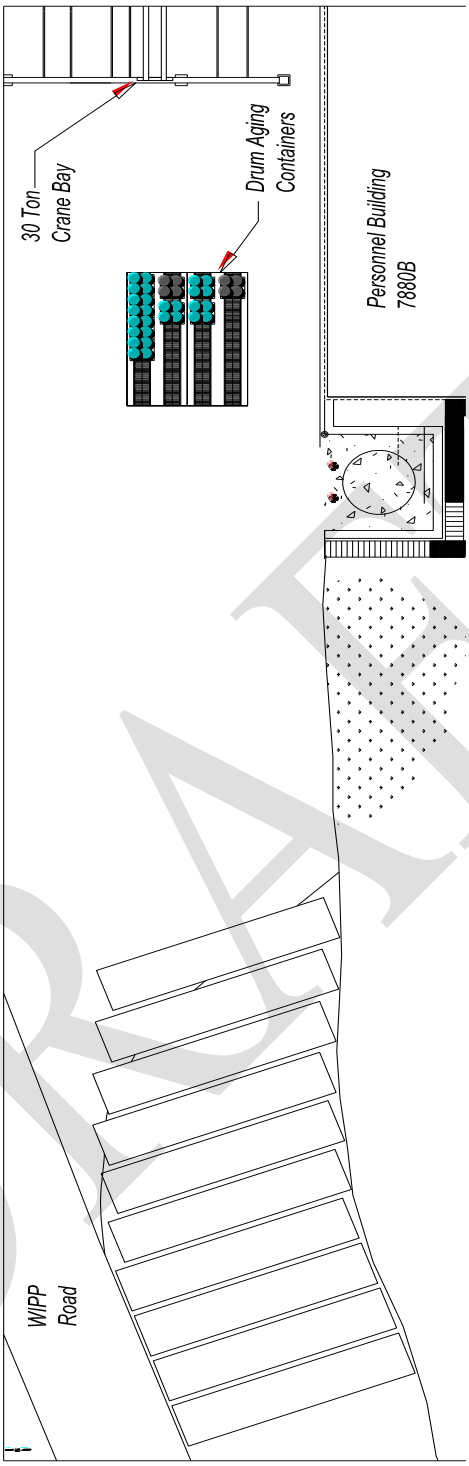

Fig. 6.1-10. TWPC Drum Aging Criteria (DAC) Area.

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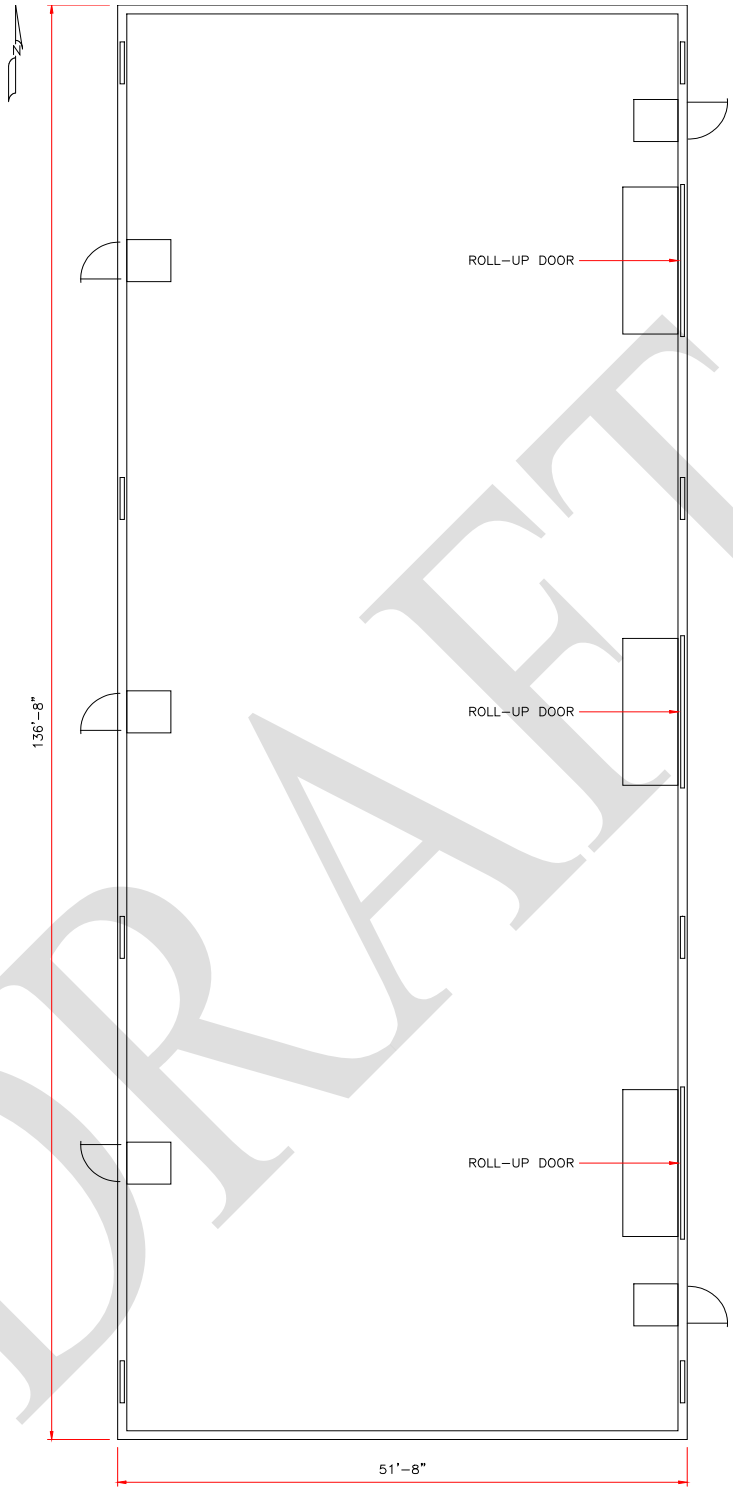

Fig. 6.1-11. TWPC Contact Handled Marshalling Bldg. (CHMB).

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Deleted - **Fig. 6.1-12. Portable Unit 1**

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Fig. 6.1-13. TWPC Drum Venting Building (DVB).

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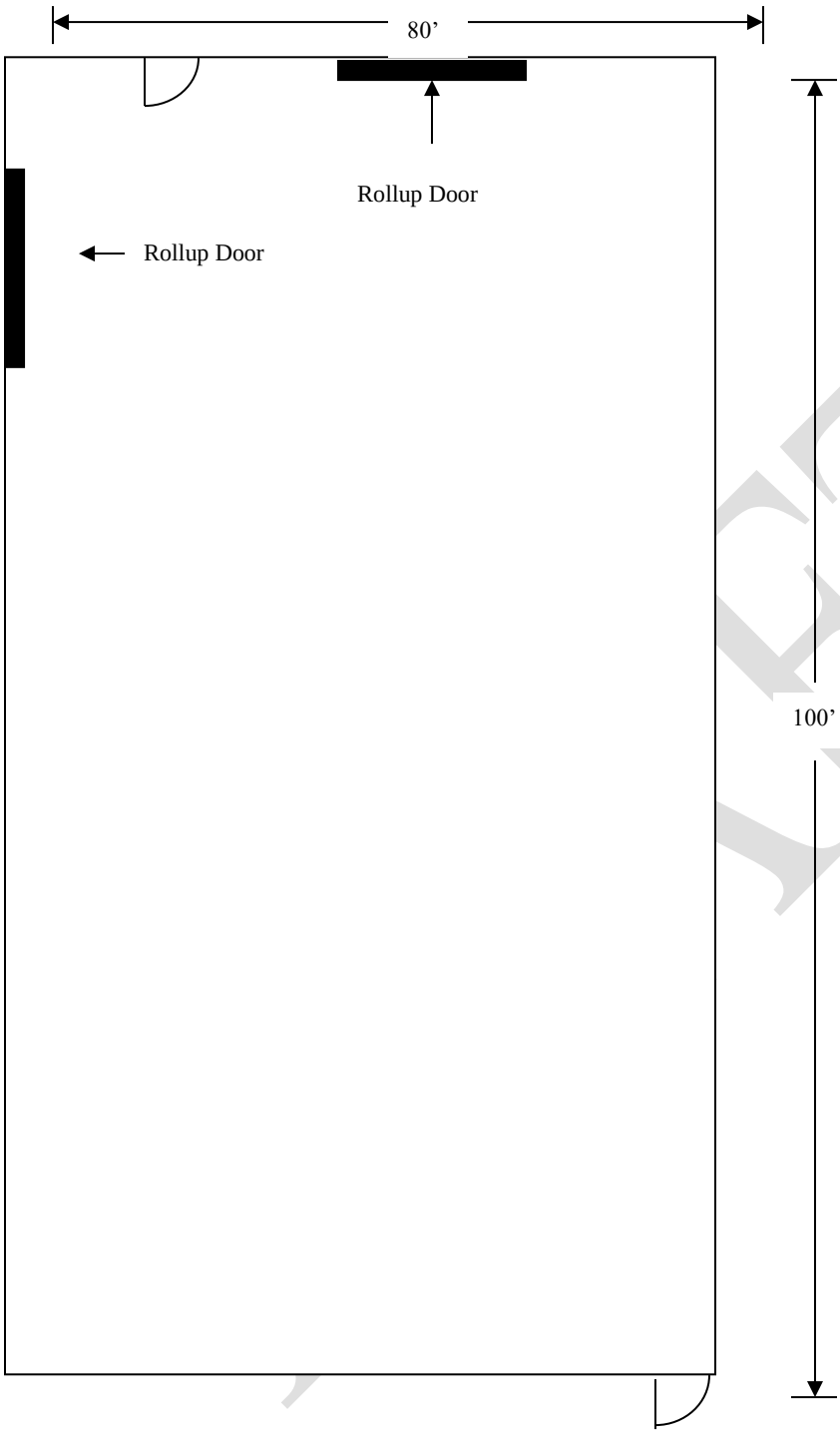

Fig. 6.1-14. TRU Waste Storage Facility, Bldg. 7860A.

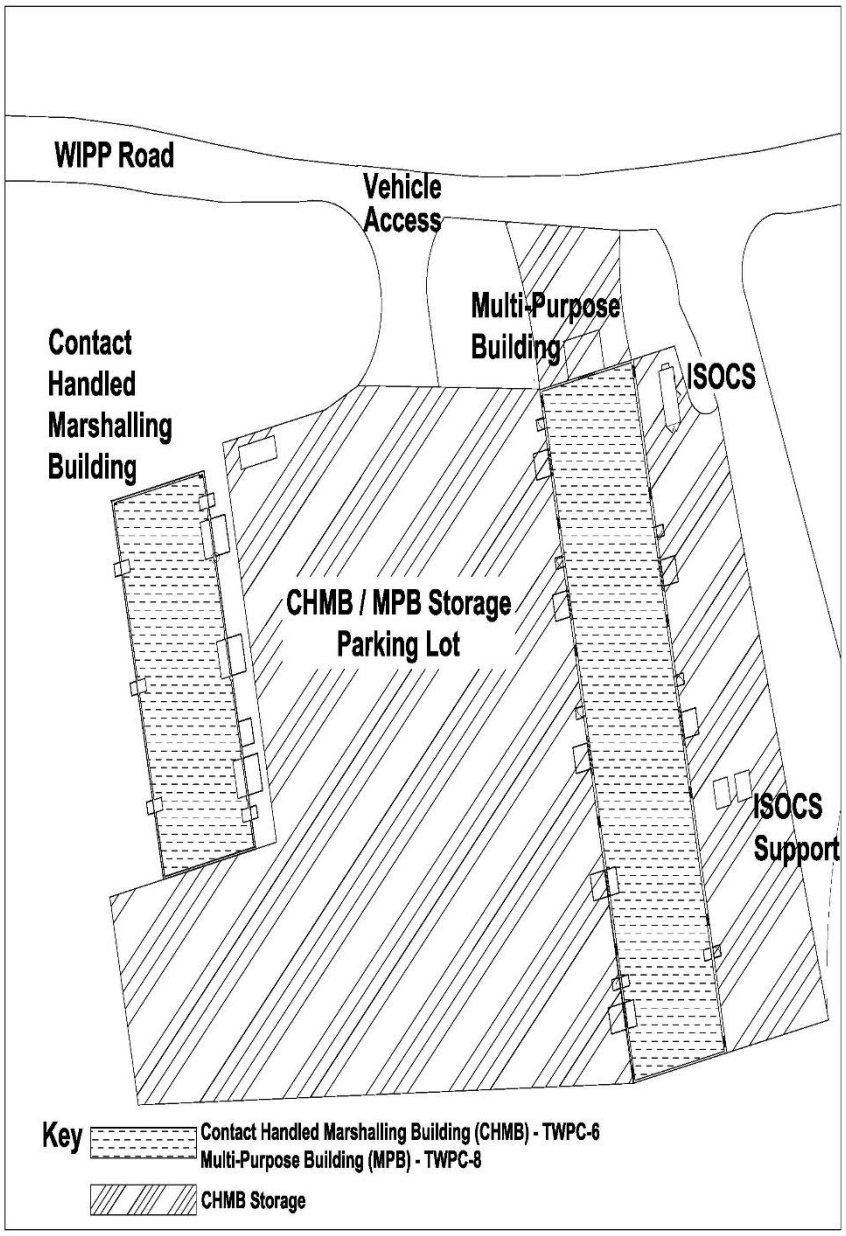

Fig. 6.1-15. TWPC Contact Handled Marshalling Building (CHMB) and parking areas.

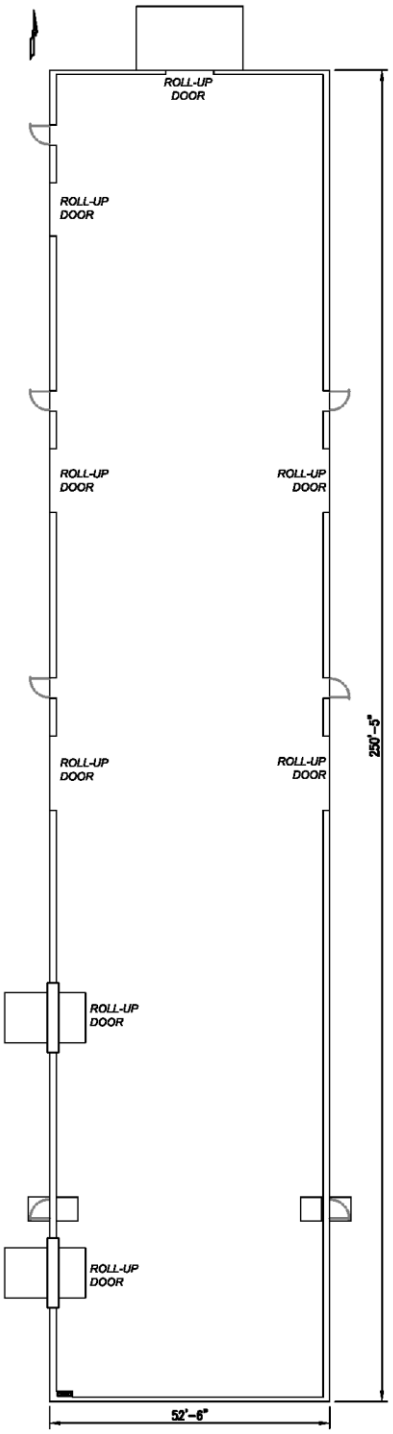

Fig. 6.1-16. TWPC Multi-Purpose Building (MPB).

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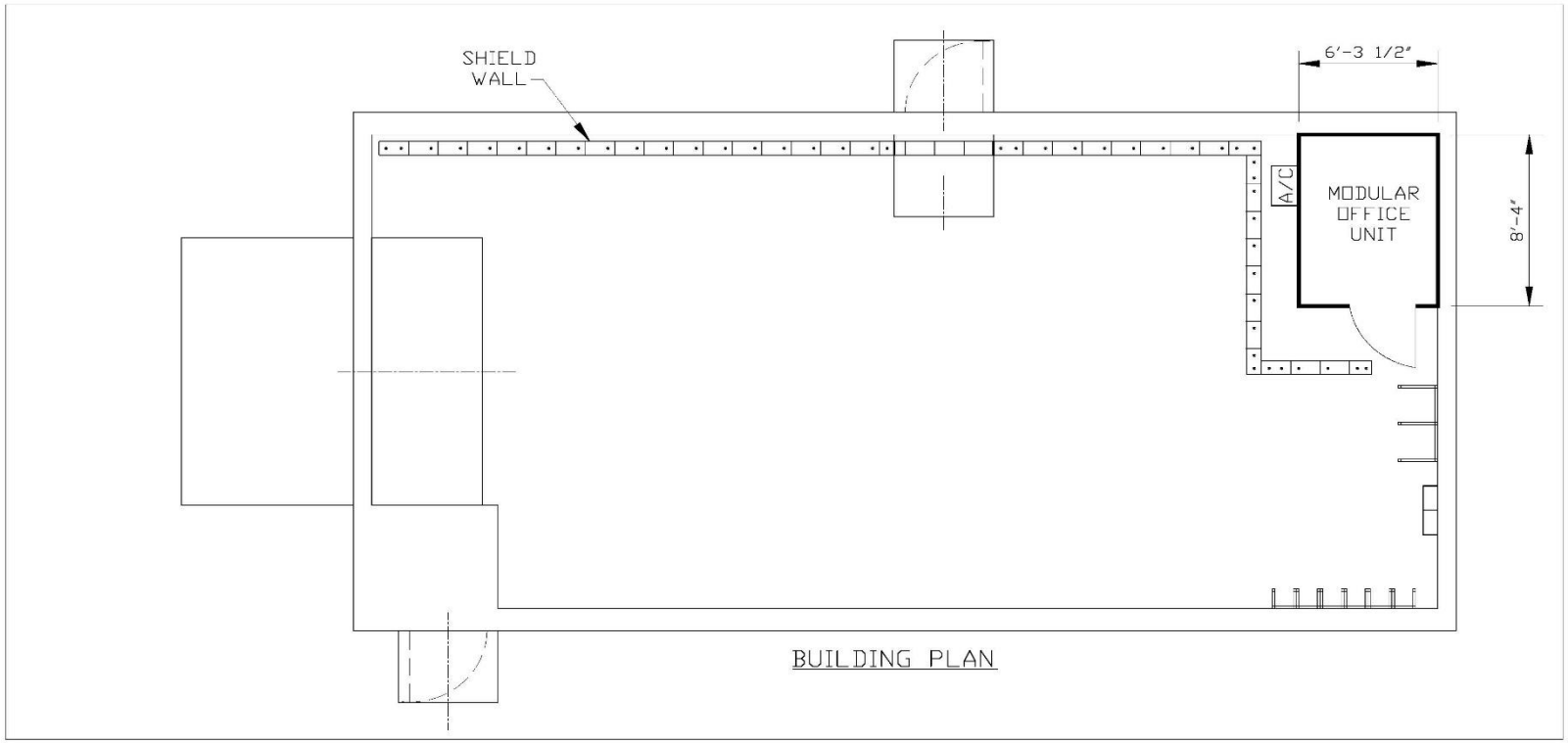

Fig. 6.1-17. TWPC DVB Building Plan.

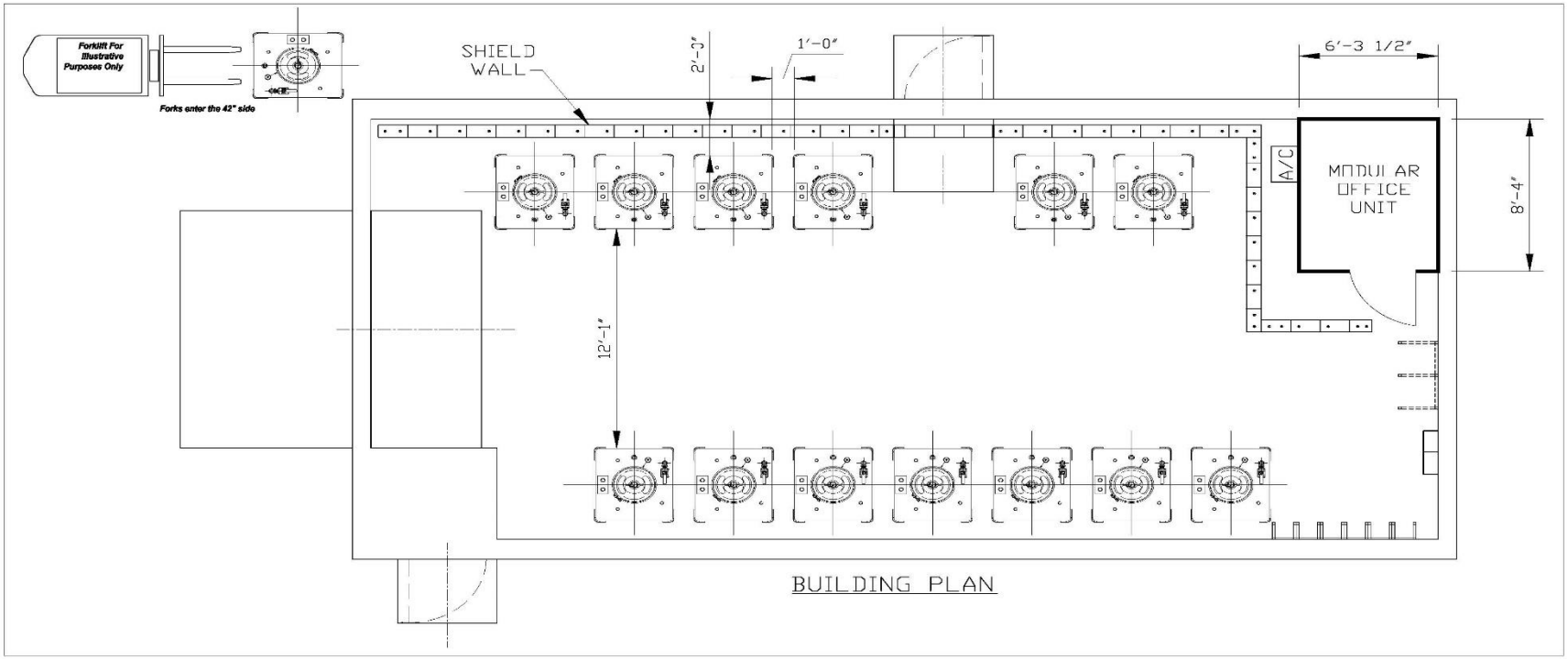

Fig. 6.1-18. TWPC Drum Venting Building storage layout for totes.

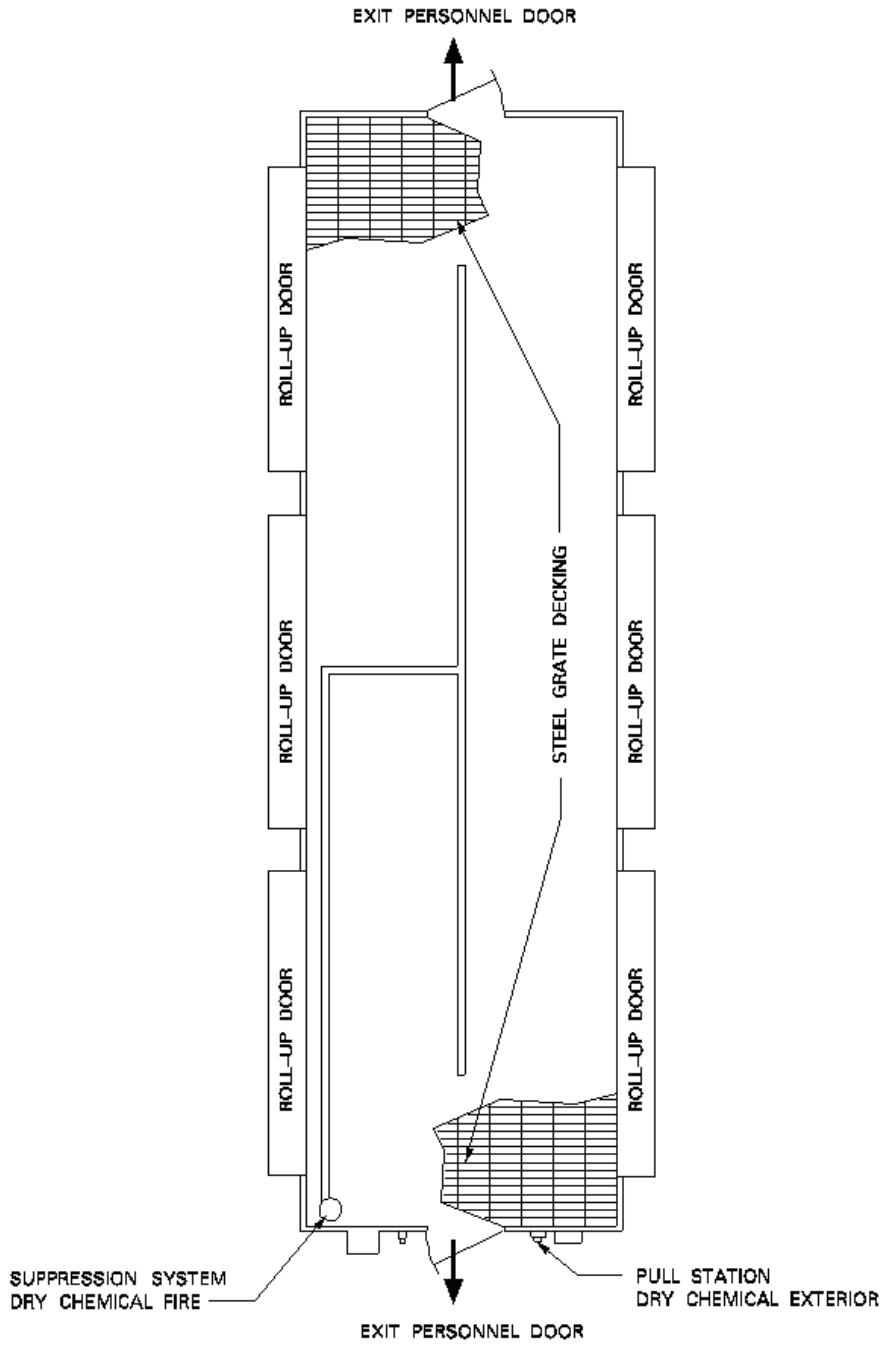

Fig. 6.1-19. 7831F FSU.

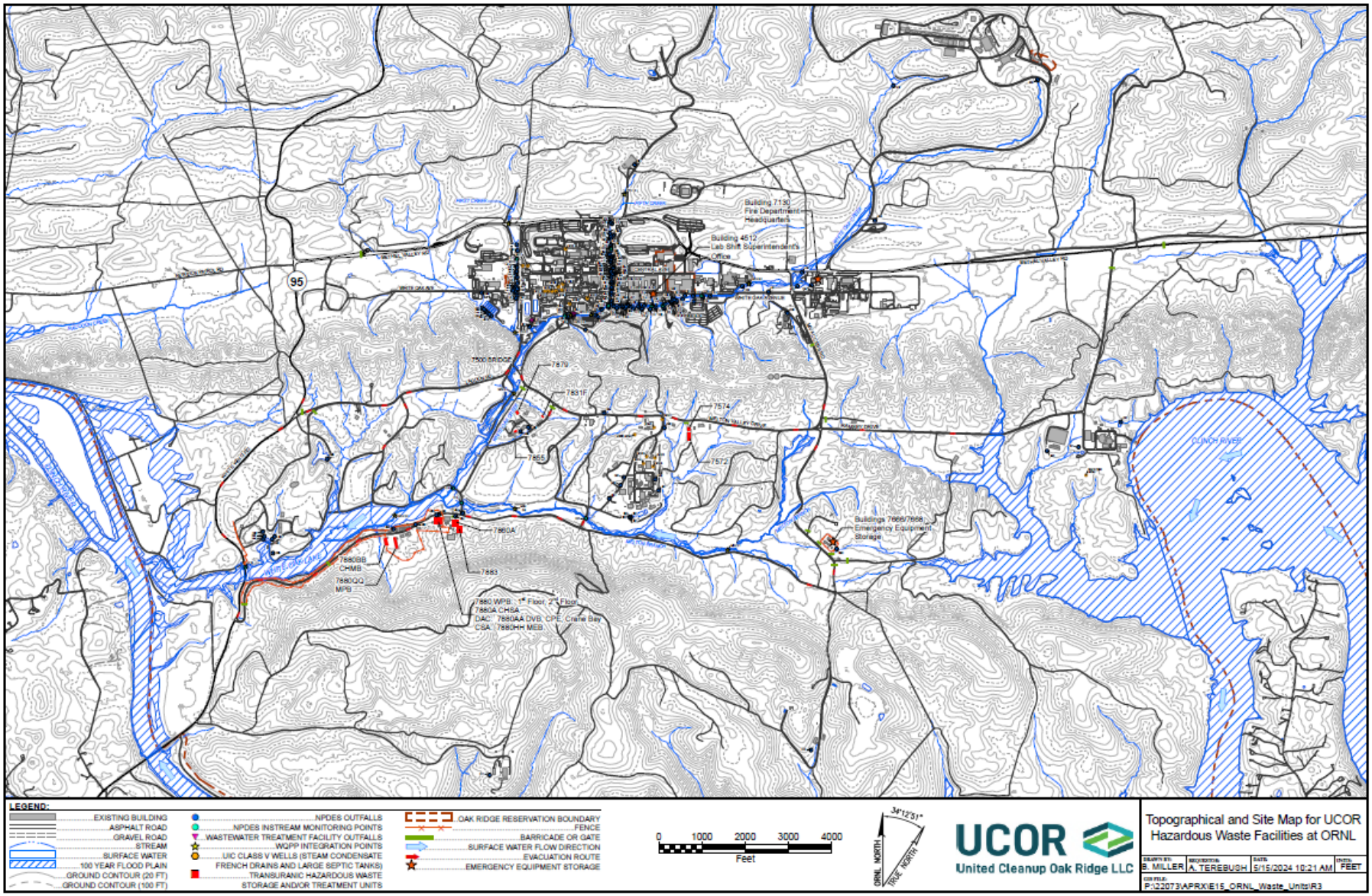

Fig. 6.1-20. Topographical and Site Map for UCOR Hazardous Waste Facilities at ORNL

ATTACHMENT 6.2. SUMMARY OF EMERGENCY RESPONSE EQUIPMENT AT THE HAZARDOUS AND MIXED WASTE MANAGEMENT UNITS[1]

	Spill Kit[2]	Overpack	Absorbent	Broom, Shovel	Gloves, Shoe covers, Goggles	Fire Extinguisher[3]	Other
7855						X	X[4]
7860A						X	X[4]
7574	X					X	X[4, 5]
7883						X	X[4]
7879						X	X[4, 5]
7572						X	X[4, 5]
TRU Waste Processing Facility (TWPC)	X	X	X	X	X	X	X[6]
7831F	X	X	X	X		X	X[5]

[1]ORNL Buildings 7666 and 7668 serve as the primary storage area for emergency response equipment.

[2]The following are examples of emergency equipment: 5-gal bucket, broom, shovel, absorbent, gloves, shoe covers, goggles/face shields/safety glasses.

[3]Or sprinkler system.

[4]For higher dose wastes (CH TRU, RH TRU, etc.), additional emergency response equipment is stored in Bldg. 7831. Examples of equipment are coveralls, shoe covers, gloves, respirators, etc.

[5]These units contain their own built-in fire-suppression systems. However, 7879 fire-suppression system has been deactivated due to the material being stored in the facility.

[6]Stored in central location in the WPB.

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ORNL Operations Spill Kit Inventory

7574 Spill Kit Inventory	
Equipment Description	**Quantity**
Diapers	• 1 pack
Absorbent	• 2 bags
Absorbent pigs	• 3
Leather gloves	• 1 pair
Nitrile gloves	• 1 pack
7831 Spill Kit Inventory	
Equipment Description	**Quantity**
Coveralls	• 3 cotton • 4 paper
Cotton gloves	• 12/pair liners • 6/pair canvas
Rubber gloves	• 12/pair
Mop & bucket	• 1/each
Squeegees	• 1/each
Plastic bags	• 4/each
Garbage can	• 1/each
Absorbent	• 4 bags
Overpack drum	• 1/each

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TWPC Spill Kit Locations and Inventory

Item	Quantity	7880A CHSA	7880 PB R-231	7880 PB R-132	7880 PB 30-Ton Crane Bay	7880 AA DVB	7880QQ MPB South End	7880BB CHMB North End	7880BB CHMB South End
Safety goggles	2 pair	X	X	X	X	X	X	X	X
Latex gloves	1 box	X	X	X	X	X	X	X	X
Chemical resistant gloves	2 pair	X	X	X	X	X	X	X	X
Spill pads	Min 5	X	X	X	X	X	X	X	X
Absorbent snakes	5	X	X	X	X	X	X	X	X
Absorbent material/ Nochar, Solidasorb, etc.	1 bag	X	X	X	X	X	X	X	X
Heavy weight plastic bags for collection of solid material	Min 3	X	X	X	X	X	X	X	X
Duct tape	1 roll	X	X	X	X	X	X	X	X
Dust pan & whisk broom	1 each	X	X	X	X	X	X	X	X
Shoe covers/booties	2 pair	X	X	X	X	X	X	X	X
Shovel (optional except in miscellaneous waste unit)	1	NA	NA	NA	X	NA	NA	X	X
Face shield (for miscellaneous waste unit & fuel tank area)	1	NA	NA	NA	NA	NA	NA	NA	NA
Portable pump (for miscellaneous waste unit only) (baster adequate)	1	NA	NA	NA	NA	NA	NA	NA	NA
Mercury spill kit (miscellaneous unit only)	1	NA	NA	NA	NA	NA	NA	NA	NA

X = Supplies Present
NA = Not Applicable

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Portable Eyewash Locations

TWPC Areas
CHSA #1
CHSA #2
PB Room 122
PB Room 134
PB Room 231
CHMB North
CHMB South
MPB South
MPB North
CPE
30-Ton Crane Bay
Room 136W
ORNL Areas*
7824
7831
*These locations are not permitted units

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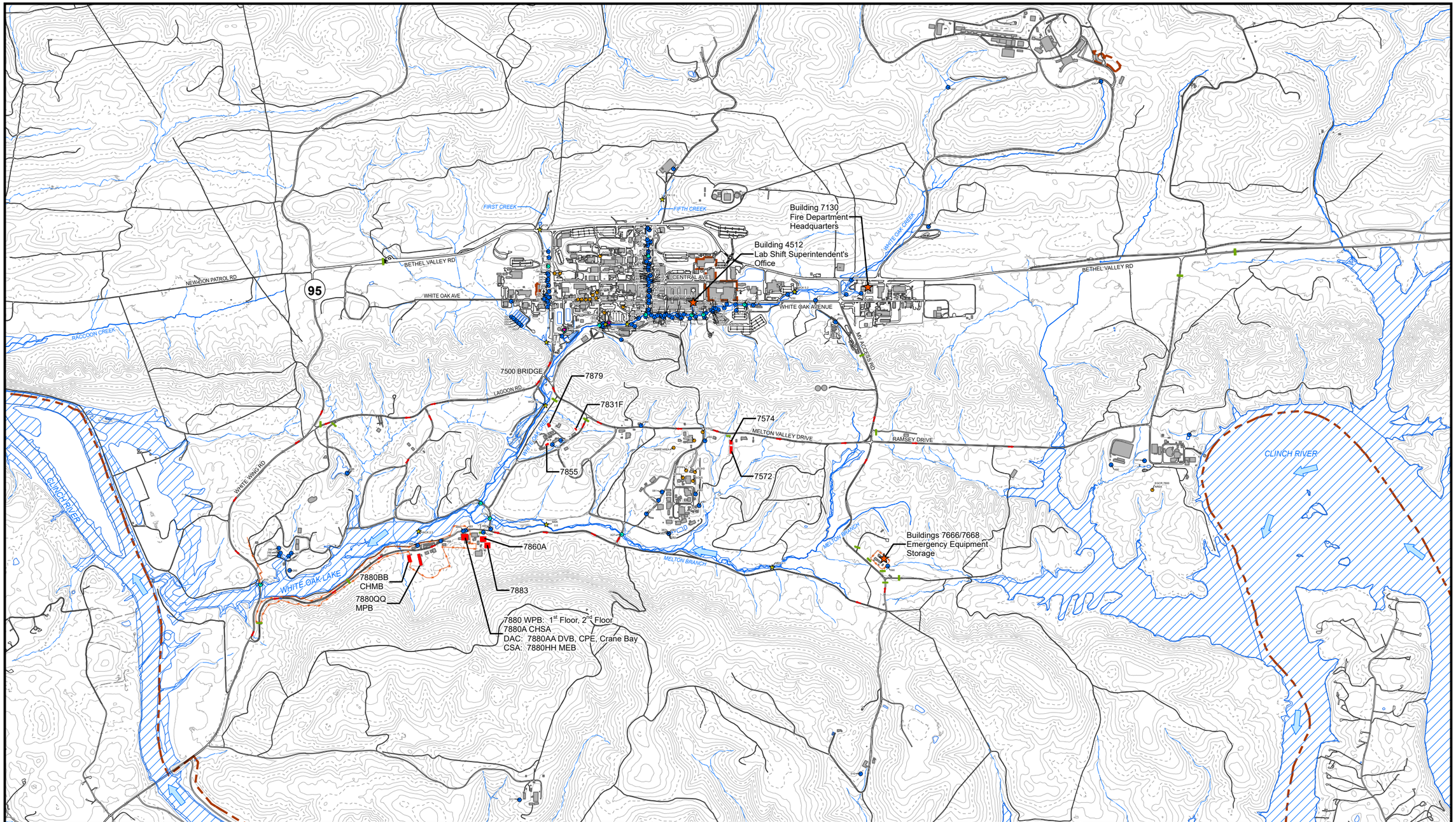

LEGEND:

- EXISTING BUILDING
- ASPHALT ROAD
- GRAVEL ROAD
- STREAM
- SURFACE WATER
- 100 YEAR FLOOD PLAIN
- GROUND CONTOUR (20 FT)
- GROUND CONTOUR (100 FT)
- NPDES OUTFALLS
- NPDES INSTREAM MONITORING POINTS
- WASTEWATER TREATMENT FACILITY OUTFALLS
- WQPP INTEGRATION POINTS
- UIC CLASS V WELLS (STEAM CONDENSATE FRENCH DRAINS AND LARGE SEPTIC TANKS)
- TRANSURANIC HAZARDOUS WASTE STORAGE AND/OR TREATMENT UNITS
- OAK RIDGE RESERVATION BOUNDARY
- FENCE
- BARRICADE OR GATE
- SURFACE WATER FLOW DIRECTION
- EVACUATION ROUTE
- EMERGENCY EQUIPMENT STORAGE

UCOR
United Cleanup Oak Ridge LLC

Topographical and Site Map for UCOR Hazardous Waste Facilities at ORNL

DRAWN BY:	REQUESTOR:	DATE:	UNITS:
B. MILLER	A. TEREBUSH	5/15/2024 10:21 AM	FEET

GIS FILE: P:\22073\APRX\E15_ORNL_Waste_Units\R3

Figure 6.1-20

EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

ATTACHMENT 7. CLOSURE PLAN

This plan has been prepared in accordance with the requirements of Tennessee Rules 0400-12-01-.07(5)(a)1(xiii) and 0400-12-01-.06(7). This plan identifies all steps that will be necessary to close these waste storage and treatment units at the end of their operating life or to partially close them at any point during their intended operating life.

This closure plan has been prepared for the TRU waste storage and treatment units at the facility addressed in this permit. The facility is located in Anderson and Roane Counties, Tennessee, and co-operated (under RCRA) by United Cleanup Oak Ridge LLC (UCOR) for the DOE.

The facility mailing addresses are:

Oak Ridge National Laboratory/DOE-OREM
Post Office Box 2001
Oak Ridge, Tennessee 37831-8620

United Cleanup Oak Ridge LLC
P.O. Box 4699
Oak Ridge, TN 37831

Closure Performance Standard

The closure of these units will minimize the need for future maintenance after closure by removal of all waste residue, structures, and equipment contaminated with waste, and/or removal or decontamination of contaminated containment system components; will protect human health and environment by the use of proper health and safety procedures; and will prevent the escape of hazardous/mixed waste, hazardous/mixed waste constituents, leachate, contaminated rainfall, or waste decomposition products to the groundwater, surface water, or atmosphere through removal of all waste residues, contaminated soils, structures and equipment contaminated with wastes, and/or removal or decontamination of contaminated containment system components, and through the use of proper handling and disposal techniques for any contaminated materials.

This standard will be accomplished through the removal of all hazardous and mixed radioactive wastes stored at the units. These wastes will be transferred to an appropriately permitted on-site unit or off-site facility for storage, treatment, and disposal. Once all containers have been removed, the units will be decontaminated, and samples will be taken to verify the effectiveness of the decontamination procedure. Those samples will be analyzed as described below under Closure Procedures. The buildings will not be demolished as part of these closure activities. Facility closure records will be maintained for 10 years following closure of the units.

Partial Closure and Final Closure Activities

Whenever partial or final closure becomes necessary, the closure procedures appropriate to the type of unit(s) being closed will be followed, which are described in this section. All TRU wastes, including mixed TRU waste, will be transported offsite to WIPP in New Mexico (the national repository for radioactive TRU waste) or another approved disposal unit. The remaining waste will be sent to an approved storage or disposal unit. After closure, these units may be reused for non-RCRA activities.

Final closure of the units will consist of the removal of all hazardous wastes and hazardous waste residues remaining at the unit and the decontamination or disposal of the containment structure components and auxiliary equipment. All hazardous wastes and residues will be containerized and transported to an approved permitted facility for storage or treatment as described below under Closure Procedures.

Maximum Waste Inventory

Table 7-1 represents the maximum inventory of wastes that will be in storage at any time during the life of these units. The combined maximum inventory that is authorized for storage at these container storage units listed in Table 7-1 is a combined 1,085,666 gallons.

All mixed waste will be removed at closure and will be taken to another RCRA-permitted unit/facility for repackaging and certification. All TRU waste must be certified to meet stringent WAC prior to offsite disposal at WIPP.

The procedures for removing, transporting, treating, and/or storing the remaining hazardous/mixed waste from the unit(s) and the decontamination procedures are described later in this section in the paragraph entitled "Closure Procedures."

Schedule for Closure

The proposed schedule for final closure is included in Table 7-2. The same schedule can be followed for each individual unit, with the caveats for units containing TRU and high-dose MLLW wastes discussed below. There are no expected closures during the period of this permit.

Time Allowed for Closure

- TRU and high-dose MLLW Wastes - Because of high radiation levels, TRU and high- dose MLLW cannot be removed, treated, and transported offsite or stored onsite within 90 days from receipt of the final volume of waste at the unit. The strict handling requirements and limited disposal options for TRU waste and high-dose MLLW do not allow for offsite shipment to occur within 90 days from receipt of final volume of waste. Similarly, all closure activities are likely to be completed within 180 days from receipt of final volume of waste at the units.

- Low-dose MLLW – The closure schedule shown in Table 7-2 will be followed for low-dose MLLW. All hazardous wastes will be treated, removed from the unit and transported to an appropriately permitted unit for storage, treatment, or disposal. Closure activities will be completed within 180 days beyond the date that closure begins.

Extensions to Time Allowed for Closure

If closure cannot be completed within the specified time because of potential delays with transporting TRU and high-dose MLLW wastes from the permitted unit, a request for an extension of closure time will be submitted to the Commissioner in accordance with Tennessee Rule 0400-12-01-.06(7)(d). In the event an extension is required, the permittees will demonstrate that all steps

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have been and will be taken to prevent threats to human health and the environment from an unclosed, but inactive, unit.

Closure Procedures

Before closure activities begin, facility records, including spill reports, will be researched to determine the RCRA wastes stored and the areas of potential contamination. Interviews will be conducted with personnel who have knowledge of waste streams entering the building when it was in use.

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Table 7-1. Maximum Waste Inventory

Building number	Maximum Waste Inventory (gallons)
7572	220,000
7574	94,800
7855	96,433
7879	114,708
7860A	46,612
7883	96,433
7831F (FSU)	7,920
TWPC – 1 (CHSA)	22,000
TWPC – 2 (2^{nd} Floor WPB)	11,000
TWPC – 3 (DAC) and TWPC – 7 (DVB)	11,000
TWPC – 4 (1^{st} Floor WPB)	5,500
TWPC – 5 (CSA)	72,600
TWPC – 6 (CHMB)	145,420
TWPC – 8 (MPB)	141,240
	Total – 1,085,666

The Drum Venting Building (DVB) capacity is included in the Drum Aging Criteria (DAC) area maximum volume, but the total DVB volume will not exceed 4000 gallons.

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Table 7-2. Closure schedule for the ORNL TRU Waste Storage and Treatment Units

Action	Expected Completion[a]
Notify TDEC of intent to initiate closure	-45
Receipt of final volume of hazardous waste	0
Initiate closure activities	0
Removal/disposal of waste inventory	90
Cleaning/decontamination or removal of containment system components	125
Inspect storage and treatment units and collect verification samples	135
Repeat building and/or treatment unit decontamination, verification sampling, and sample analysis [b]	
Decontamination of closure equipment	180
PE's inspection [c]	180
Completion of closure activities and closure certification by independent PE, DOE, and co-operators [d]	TBD
Submit closure certification to TDEC commissioner	240

a Number of days following initiation of closure.
b If decontamination must be repeated, extension of the closure schedule beyond the maximum of 180 days will be requested.
c The PE will periodically evaluate the progress of the closure activities.
d Within 60 days of completion of final closure.

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Inventory Removal, Disposal, and Decontamination of Equipment

Before beginning any inventory removal or disposal work at the unit(s) being closed, access and contamination controls will be established for the unit(s). The necessary equipment to perform the closure will be mobilized to the unit(s). The following closure procedure will be followed:

1. All hazardous waste present at the time of closure will be removed and transferred to an appropriately permitted on-site storage area or on-site wastewater treatment unit until a final disposition for the waste can be determined. For container storage units, this will be accomplished by transporting the TRU waste containers and containers of low-dose MLLW to an authorized hazardous/mixed waste management facility. Attachment 2 details describe the physical and chemical characteristics of the mixed waste that will be accepted for management at the storage and treatment units, as required by TN Rule 0400-12-01-.07.

2. The unit will be inspected for evidence of leaks or spills (i.e., discoloration or residues) and for structural integrity.

3. Radiological surveys may be conducted if required by the Radiological Control organization.

4. Structures and portable transfer equipment, such as storage racks and drum dollies, will be removed and disposed.

5. The floor of the containment structure will be swept of any loose dust or debris.

6. Structures, such as fixed storage racks that are not removed, will be washed with water and detergent. The floor of the containment structure will be washed or mopped using water and detergent. If evidence of contamination is present, methods to decontaminate may include, but are not limited to, sweeping/vacuuming, high-pressure water jet, washing/mopping with detergents, steam cleaning, or partial removal of the gravel floor in 7860A if it is found to be contaminated with radionuclides or RCRA constituents. Care will be taken to minimize the amount of radioactive wastewater generated during the decontamination process.

7. Wash water and mop water will be collected by wringing out decontamination mops and cleaning rags and pumping sumps. Wash/mop water will be collected in containers and transferred to an appropriately permitted on-site storage area prior to being transferred and treated at an on-site wastewater treatment facility or shipped off-site to a commercial or DOE-owned facility.

8. The washing/mopping step will be repeated as part of a double-wash-rinse decontamination process. New mop heads and cleaning rags will be used for each wash and rinse step.

9. Structures and the floor of the containment structure will be rinsed with potable water. Rinse water will be collected by wringing out decontamination mops and cleaning rags and pumping sumps. The rinse water will be collected in containers and transferred to an appropriately permitted on-site storage area prior to being treated at an on-site wastewater treatment facility or shipped to an off-site commercial or DOE-owned facility, depending on the analytical results of the wastewater and the waste acceptance criteria (WAC) of the receiving facilities.

10. Representative samples will be collected from each container of wash water and rinse water in accordance with an approved Sampling and Analysis Plan (SAP), which will be developed in accordance with *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA QA/G-4). The SAP will specify the use of *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (SW-846) for characterization of RCRA and PCB constituents. Samples may be composited for containers from the same cleaning area/step. Analytical processing will be performed in accordance with The SAP details sample collection methods, targeted parameters, and analytical methods. The data quality objective (DQO) process will be used to determine whether the wastewater meets the WAC for final disposition.

11. A sample of unused potable water will be collected as a background sample. The background sample will be analyzed for the same constituents as the final rinse water for comparison purposes.

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12. Samples collected for the purpose of characterization will be preserved and transported under chain of custody, in accordance with the SAP to a laboratory accredited by the Department of Energy Consolidated Audit Program or equivalent organization (e.g., State of Utah certification) for analysis. Analysis will be performed by a laboratory certified by the designated state authority that specifically certifies SW-846 methods.

13. A total of two additional attempts to decontaminate the unit by washing/cleaning will be initiated if analyses indicate that decontamination is not complete. Decontamination will be considered complete if the concentrations of hazardous waste constituents of concern are less than the published limits in any of the following risk-based standards:
    - EPA Maximum Contaminant Levels for Drinking Water – EPA 816-F-09-0004, current edition;
    - EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites – Residential Tap Water; or,
    - Universal Treatment Standard value(s) for wastewater.

14. If RCRA contamination exists above regulatory levels after the third washing, the area will be sandblasted or scarified until decontamination is achieved. The resulting debris will be collected and stored pending treatment or disposal, based on the level of RCRA contamination present in the waste. For decontamination verification, a composite concrete sample will be collected from each area requiring this additional decontamination step. Decontamination will be considered complete if the concentrations of hazardous waste constituents are less than the RCRA-regulated levels.

15. All wastes generated as a result of the decontamination of the waste storage and treatment units (e.g., mop heads, rags, plastic sheeting, personal protective equipment, floor sweepings) will be packaged and managed in a RCRA accumulation area or an authorized hazardous waste storage facility until proper disposition for these wastes can be determined. Characterization of these non-liquid wastes will be performed in accordance with the approved SAP in order to determine whether they meet the WAC for final disposition.

Decontamination will be verified by analyzing the final rinse water for the hazardous constituents listed in Tennessee Rule 0400-12-01-.02(5), Appendix VIII, and those that could be present in the unit based on the wastes stored including the following constituents in Table 7-3.

Removal of Equipment and Structures - Floors and secondary containment systems from the units identified to be left in place will be cleaned and decontaminated. Equipment and structures may be identified for reuse in other permitted facilities (i.e., repackaging tables, hoods, racks) and will be removed/transported to the existing facility. Equipment and structures left in place that meet the closure performance standard will be considered clean closed for future use or disposition.

Soil Assessment - Soil contamination from the operation of these units is not anticipated. If major cracks (excludes hairline fractures) not been previously reported, are discovered in the containment area at the time of closure, and the possibility exists for contamination to have exited the containment area, a revised closure plan to address potential soil contamination will be submitted for approval.

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Procedures for Decontaminating Closure Equipment - During demolition and removal activities and during clean-up and decontamination activities, every consideration will be taken to provide appropriate and adequate personal protection where contact or exposure to TRU and/or hazardous/mixed waste may occur. All available resources to identify the contaminant will be utilized to ensure proper personal protection and the use of the proper decontamination materials. The equipment used during closure of any TRU and hazardous/mixed waste management unit may include:

- PPE (e.g., face shields, acid/solvent resistant coveralls, head protection, gloves, and boots)
- Hand tools (e.g., brushes, squeegees)
- Pump(s) and hoses
- Pressure washer or steam cleaning unit(s)
- Air-powered jackhammers (or equivalent) to break the concrete
- 2-ton truck
- Forklift
- Crane
- Excavator or backhoe

If contaminated, disposable PPE used during the closure activities will be containerized and managed as hazardous/mixed waste. Non-disposable PPE and all other equipment will be decontaminated using appropriate methods for the contaminants and contaminated media. All wash water generated from this decontamination will be collected in containers, transported, and treated at the ORNL Process WasteTreatment Complex. If the plant cannot accept this wash water, it will be managed as hazardous waste (if applicable) in a RCRA accumulation area or an authorized hazardous waste management facility until a final disposition can be determined.

Post-Closure Plan

A post-closure plan is not anticipated to be required since the facility intends to achieve a clean closure. However, if clean closure cannot be attained, a post-closure plan will be prepared. If warranted, a post-closure plan will be developed and submitted for review and approval within 60 days after closure activities. This post-closure plan will include a description of the post-closure care mechanisms that will be used to ensure that performance standards established in Tennessee Rule 0400-12-01-.06(7) will be maintained through the post-closure period. Information provided will include the maintenance, monitoring and inspection procedures and frequencies for the unit, and a description of the post-closure notices that will be filed.

Closure Certification

Within 60 days of completing partial or final closure of this facility, DOE will submit in writing, by registered mail, a closure certification to the Commissioner. The certification will verify that the unit was closed in accordance with the specification of the approved closure plan. The certification will be signed by DOE and a Registered Professional Engineer.

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Table 7-3. Hazardous Underlying Constituents

Hazardous Constituent	CAS No.	EPA Hazardous Waste Code
Acenaphthylene	208-96-8	
Acetone	67-64-1	F003, U002
Acetonitrile	75-05-8	U003
Acrylonitrile	107-13-1	U009
Anthracene	120-12-7	
Benzene	71-43-2	D018, F005, U019
Benz(a)anthracene	56-55-3	
Benzo(b)fluoranthene	205-99-2	
Benzo(g,h,i)perylene	191-24-2	
Benzo(a)pyrene	50-32-8	U022
Bromodichloromethane	75-27-4	
Bromomethane/Methyl Bromide	74-83-9	
n-Butvl alcohol	71-36-3	
Butyl benzyl phthalate	85-68-7	
Carbon disulfide	75-15-0	F005, P022
Carbon tetrachloride	56-23-5	D019, F001, U211
Chlordane (alpha and gamma isomers)	57-74-9	D020, U036
Chlorobenzene	108-90-7	D021, F002, U037
Chloroform	67-66-3	D022, U044
Chloromethane/Methyl chloride	74-87-3	U045
2-Chlorophenol	95-57-8	
Chrysene	218-01-9	U050
o-Cresol	95-48-7	D023, F004
m-Cresol	108-39-4	D024, F004

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Table 7-3. Hazardous Underlying Constituents (continued)

Hazardous Constituent	CAS No.	EPA Hazardous Waste Code
p-Cresol	106-44-5	D025, F004
Cyclohexanone	108-94-1	F003, U057
1,2-Dibromomethane/Ethylene dibromide	106-93-4	U067
Dibromomethane/Methylene bromide	74-95-3	U068
o-Dichlorobenzene	95-50-1	F002, U070
1,1-Dichloroethylene	75-35-4	D029
trans-1,2-Dichloroethylene	156-60-5	U079
2,4-Dichlorophenol	120-83-2	U081
Dieldrin	60-57-1	P037
Diethyl phthalate	84-66-2	U088
2,4-Dinitrophenol	51-28-5	P048
2,4-Dinitrotoluene	121-14-2	U105
Di-n-octyl phthalate	117-84-0	U107
1,4-Dioxane	123-91-1	U108
Endosulfan II	33213-65-9	P050
Endrin	72-20-8	D012, P051
Ethyl acetate	141-78-6	F003, U112
Ethylbenzene	100-41-4	F003
Fluoranthene	206-44-0	U126
Fluorene	86-73-7	
Heptachlor	76-44-8	D031, P059
Hexachlorobenzene	118-74-1	D032, F022, F026, U127
Hexachloroethane	67-72-1	D034, U131
Hexachloropropylene	1888-71-7	

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Table 7-3. Hazardous Underlying Constituents (continued)

Hazardous Constituent	CAS No.	EPA Hazardous Waste Code
lsobutyl alcohol	78-83-1	
Methanol	67-56-1	F003, U154
Methoxychlor	72-43-5	D014, U247
Methylene chloride	75-09-2	F001, F002, U080
Methyl ethyl ketone	78-93-3	D035, F005, U159
Methyl isobutyl ketone	108-10-1	F003, U161
Naphthalene	91-20-3	U165
Nitrobenzene	98-95-3	D036, F004, U169
o-Nitrophenol	88-75-5	
p-Nitrophenol	100-02-7	U170
Total PCBs (sum of all PCB isomers or all Aroclors)	1336-36-3	
Pentachlorophenol	87-86-5	D037, F021, F027, F032, F034, F035
Phenanthrene	85-01-8	
Phenol	108-95-2	U188
Pyrene	129-00-0	
Pyridine	110-86-1	D038, F005, U196
1,1,2,2-Tetrachloroethane	79-34-5	U209
Tetrachloroethylene	127-18-4	D039, F001, F002, U210
Toluene	108-88-3	F005, U220
2,4,6-Tribromophenol	118-79-6	
1,2,4-Trichlorobenzene	120-82-1	
1,1,1-Trichloroethane	71-55-6	F001, F002

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Table 7-3. Hazardous Underlying Constituents, continued.

Hazardous Constituent	CAS No.	EPA Hazardous Waste Code
1,1,2-Trichloroethane	79-00-5	F002, U227
Trichloroethylene	79-01-6	D040, F001, F002, U228
Trichloromonofluoromethane	75-69-4	U121
2,4,5-Trichlorophenol	95-95-4	D041, F020, F023, F027
Xylenes - mixed isomers (sum of o- m- and o-xvlene	1330-20-7	F003, U239
Antimony	7440-36-0	
Beryllium	7440-41-7	P015
Cyanides (Total)	57-12-5	F008, F009, F010, F012, P030
Nickel	7440-02-0	
Vanadium	7440-62-2	
Zinc	7440-66-6	F006

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EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

ATTACHMENT 8. CONTAINER MANAGEMENT

Attachment 8 consists of three separate sections as follows:

- Attachment 8.1 Container Management
- Attachment 8.2 Professional Engineering Structural Certification
- Attachment 8.3 Building Drawings

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ATTACHMENT 8.1. CONTAINER MANAGEMENT

This following section discusses practices that will be used to manage the waste management units, and includes specific information about secondary containment, leak detection, and collection systems. The information provided in this section is submitted in accordance with the requirements of TN Rule 0400-12-01-.07(5). The storage capacities for each unit are represented in Table 8-1.

Table 0-1. Areal and Volumetric Capacities for Storage Units

Building Number	Maximum Area (ft^2)	Maximum Volume (gal)
7572	7,000	220,000
7574	4,000	94,800
7855	2,700	96,433
7879	3,744	114,708
7860A	8,000	46,612
7883	3,960	96,433
7831F (FSU)	576	7,920
TWPC-1 (CHSA)[5]	4,000	22,000
TWPC-2 (2nd Floor WPB)	Varies (see footnote 1)	11,000
TWPC-3 (DAC)	Varies (see footnote 2)	11,000
TWPC-4 (1st Floor WPB)	Varies (see footnote 1)	5,500
TWPC-5 (CSA)[5]	Varies (see footnote 2)	72,600
TWPC-6 (CHMB)[3]	Varies (see footnote 2)	145,420
TWPC-7 (DVB)	1,250	(see footnote 4)
TWPC-8 (MPB)[3]	Varies (see footnote 2)	141,240
		Total - 1,085,666

[1]The maximum area of the Waste Processing Building (WPB) available for storage is dependent on waste processing activities within the building.
[2]The TWPC utilizes a combination of portable storage units for storage of waste that is awaiting treatment, and for waste that has already undergone treatment. The maximum area of these storage units is based on the logistical maximum number of portable units that are staged in the units.
[3]The TWPC will manage the Contact Handled Marshalling Building (CHMB) and Multi-Purpose Building (MPB) as one radiological control area with a total storage volume of 286,660 gallons (e.g., CHMB volume + MPB volume will not exceed 286,660 gal).
[4]The Drum Venting Building (DVB) capacity is included in the Drug Aging Criteria (DAC) area maximum volume, but the total volume will not exceed 4000 gal.
[5]The TWPC will manage the Contact Handled Staging Area (CHSA) and Container Storage Area (CSA) as one radiological control area with a total storage volume of 94,600 gal (e.g., CHSA volume + CSA volume will not exceed 94,600 gal).

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The maximum area and volumetric capacities reflect the maximum volume of wastes that can be stored in a given unit. The units described in this permit will store containers of various sizes and types. Because each unit may store containers of varying sizes, it is not feasible to estimate the number of containers that may be stored in any of the units. However, the volumetric capacities for the storage units will not exceed the maximum volume limits outlined in the section.

The types of containers to be stored in permitted units include drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers (e.g., drums, concrete casks, or shielded overpacks [SOPs]), and metal containers (e.g., boxes or cargo containers). Certified engineering drawings for the units are included in Attachment 8.3. TN Rule 0400-12-01-.07(5) states that certain technical data, such as design drawings and specifications, and engineering studies shall be certified by a Registered Professional Engineer. Uncertified engineering drawings may be submitted for buildings constructed prior to 1988, provided that certain conditions are met[1]. The engineering drawings for Building 7855 meet these conditions.

Waste Unit Descriptions

Building 7855 (Figure 8.1-6) –This TRU Waste Storage Facility is located in Solid Waste Storage Area (SWSA) 5. This building stores concrete casks containing Remote Handled (RH) TRU waste; Contact Handled (CH) TRU waste, hazardous waste, mixed low-level waste (MLLW), and low-level waste (LLW) in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers.

The structure is primarily below grade, except for the bay access side. The structure is divided into four bays by concrete block walls that extend from the floor to the roof. Each bay of the unit is approximately 15 ft by 45 ft. The building is approximately 60 ft by 45 ft.

Building 7883 (Figures 8.1-9 and 8.1-10) – This RH TRU Waste Storage Bunker is located off of Melton Branch Road. Building 7883 stores concrete casks containing RH TRU waste, CH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers in the unused bays within the unit. It is a concrete-block structure on a reinforced concrete slab with a reinforced concrete roof. The structure is primarily below grade, except for the bay access side. The structure is divided into four bays by concrete block walls that extend from the floor to the roof. Each bay of the unit is approximately 18 ft by 55 ft. Overall the unit is approximately 78 ft by 59 ft.

Building 7860A (Figures 8.1-19, 8.1-42, 8.1-43, 8.1-44, and 8.1-45) – This TRU Waste Storage Facility is in an area off Melton Branch Road. Building 7860A is a RUBB Tent that stores overpacked concrete casks containing RH TRU waste, CH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers. The manufacturer, RUBB Building Systems, uses processes and systems that are based on ISO 9001 quality protocols in the construction of the structure.

[1](1)the design drawings of the units predate the TDEC applicability of Tennessee Code Annotated 62-2-103(4) to such drawings; (2) the original drawings and specifications were not, nor were they required to be, certified by a registered PE; and (3) good engineering practices appear to have been utilized with respect to the units reflected by the signatures of the building engineers (40 CFR 270.14(a) [TN Rule 0400-12-01-.07(5)])

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All RUBB building products are engineered strictly in accordance with building code requirements for wind, snow, and seismic loads. Structures sold in the United States meet ANSI A58.1 (Minimum Design Loads for Buildings and Other structures) and apply design loads to the steel framework based upon accepted engineering principles.

This unit is an engineered building with a roof and walls that are constructed of fire retardant, ultraviolet stabilized, PVC-coated fabric tensioned over zinc-coated steel frames. The unit has a packed gravel floor with steel plates in some areas to accommodate forklift traffic. Portable containment systems are used to provide secondary containment for drums and containers with free liquids.

Building 7879 (Figures 8.1-7 and 8.1-8) – This TRU Waste Storage/Staging Facility is located in SWSA 5. The facility stores CH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers. RCRA-regulated mixed waste is separated from waste that is radioactive only.

The building is constructed of metal siding and roof with a rigid frame over a concrete pad. The metal, Butler-type building has inside dimensions of approximately 50 ft by 83 ft.

Building 7572 (Figures 8.1-1 and 8.1-2) – This RH TRU Waste Storage Facility is located off of Melton Valley Drive. This unit is used to store RH TRU and/or RH TRU mixed waste in SOPs or concrete casks, or metal boxes.

This unit is constructed of a metal roof and walls over a concrete pad. Overall dimensions are approximately 140 ft by 50 ft.

Building 7574 (Figures 8.1-3 and 8.1-4) – This Drum Storage Facility is located off of Melton Valley Drive. This building stores CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers.

Building 7574 is constructed of metal siding and roof over a concrete pad. The metal Butler-type building has inside dimensions of approximately 83 ft by 50 ft.

7831F FSU (Figure 8.1-49) – This Flammable Storage Unit (FSU) is modular in design with an approximate storage area of 576 sq ft., and the maximum storage capacity is 7,920 gallons. This unit was constructed offsite by a commercial company and delivered ready-to-use. The FSU stores CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85, or 110-gallon), overpacked containers, and metal containers.

TWPC-1 (CHSA) (Figure 8.1-50) – The CHSA, an enclosed 50 ft by 80 ft metal structure with concrete floor, is located next to the WPB. The CHSA building receives CH TRU waste, RH TRU waste, MLLW, hazardous waste, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers and, metal containers. The containers will be externally inspected and surveyed prior to acceptance and will be sorted and moved to the appropriate staging area in preparation of waste processing.

TWPC-2 (Second Floor WPB) (Figure 8.1-13) – The second floor of the WPB is where drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers will enter either the

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glove box lines, the box breakdown area (BBA), or the hot cell through airlocks. In the glove box line, waste will be tipped or removed from drums manually through ports. This area receives CH TRU waste, RH TRU waste, MLLW, hazardous waste, and LLW. A drum tipper will aid operators in emptying contents onto a sort table. Waste will be manually removed from containers in the BBA. Material will be manually sorted and segregated within the glove boxes and/or BBA to segregate items that require further processing such as aerosol cans, liquids, or liquid mercury. RH TRU waste will be sorted and segregated in the hot cell using robotics. Waste will be moved to a worktable for sorting/segregation and, using robotics, repackaged into 55-gal drums. Groundwater discovered in the RH TRU waste casks will be pumped into totes or drums and may be filtered to remove high dose rate particles from the environmental media (groundwater).

TWPC-3 (DAC) (Figures 8.1-17, 8.1-18, Figures 8.1-22 thru 8.1-41, Figures 8.1-47 and 8.1-48) – The DAC storage area includes any or all of the following: portable storage units, transport units, the covered/enclosed 30-ton crane bay, the CPE, the DVB, or tented structures. This area stores CH TRU waste, RH TRU waste, MLLW, hazardous waste, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers. Groundwater discovered in RH TRU waste casks will be pumped into totes or drums and may be filtered to remove high dose rate particles from the environmental media (groundwater).

TWPC-4 (First Floor WPB) (Figures 8.1-12 and 8.1-46) – The first floor of the WPB is where CH TRU waste, RH TRU waste, MLLW, hazardous waste, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers will be stored and where drums will enter the glove box lines. Material will be manually sorted and segregated within the glove box to segregate items that require further processing such as aerosol cans, liquids, or liquid mercury. The RH TRU waste casks will enter the first floor of the WPB via the RH TRU Waste Cask Bay. The RH TRU waste cask will be moved to the RH TRU Waste Airlock where it will be connected to a bag-in/bag-out portal on the underside of the Hot Cell.

TWPC-5 (CSA) (Figures 8.1-50 and 8.1-51) – The CSA has multiple portable waste management units. These containers, which are stationary during the CH TRU waste campaign, are used to store CH TRU waste, RH TRU waste, MLLW, hazardous waste, and LLW to facilitate preparation for processing or offsite waste shipment. Additionally, as part of the CSA, the MEB, an enclosed metal building (30.5 ft by 20 ft), will be used for storage of drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers of CH TRU waste, RH TRU waste, MLLW, and LLW. Macroencapsulation treatment will occur in the MEB.

TWPC-6 (CHMB) (Figures 8.1-15 and 8.1-16) – The CHMB includes an enclosed metal building, 55 ft wide by 140 ft long, and the parking lot outside of the CHMB. This unit will be used to store CH TRU waste, RH TRU waste, MLLW, hazardous waste, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers to facilitate processing or in preparation for shipment of waste offsite to an approved Treatment, Storage and Disposal Facility (TSDF). Additionally, this unit may include portable waste management units, TRUPACT IIs, HALFPACTS, 72-B Casks, and portable transport units.

TWPC-7 (DVB) (Figures 8.1-17 and 8.1-18) – The DVB is a metal sided building 25 ft wide by 50 ft long (1250 ft^2) previously utilized for the drum-venting process. The drum-venting process is complete, and the building will be used to store CH TRU waste, RH TRU waste, MLLW,

hazardous waste, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers. The DVB capacity is included in the DAC area maximum volume, but the total volume will not exceed 4000 gal.

TWPC-8 (MPB) (Figures 8.1-20A, 8.1-20B, 8.1-20C, and 8.1-21) – The MPB includes an enclosed metal building 55 ft wide by 250 ft long and the parking lot outside of the MPB. This unit will be used to store CH TRU waste, RH TRU waste, MLLW, hazardous waste, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers. The purpose of the MPB is to facilitate processing or in preparation for shipment of waste offsite to an approved TSDF. Additionally, this unit may include portable waste management units, TRUPACT IIs, HALFPACTS, 72-B Casks, and portable transport units.

Containment System

The section below describes the storage capabilities of each of the waste management units.

Basic Design Parameters, Dimensions, and Materials of Construction

The dimensions and basic design parameters of the secondary containment structures are provided below. The storage units are constructed with concrete floors that will support the weight of the stored containers. The concrete floors and diking in Bldgs. 7572, 7574, 7883, and 7879 are free of cracks and gaps and during the early operations an epoxy coating was in place on the floors when waste with free liquids was accepted. However, storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system (e.g., epoxy coating or sealant in good condition) provided that the storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation, or the containers are elevated or are otherwise protected from contact with liquids. The floors and diking in Bldg. 7855, are not free of cracks and gaps, so hazardous waste containers that contain liquids will be stored in portable containment systems, or in an overpack container. Construction materials used in the floors, portable containment systems, cask overpacks, and/or overpack liners are compatible with the materials stored at the units.

Building 7572 has been evaluated to ensure that the floor loading is adequate to accommodate the shielded overpack containers and the container-handling equipment. Prior to using any other container handling equipment that has not been identified in the Engineering Evaluation CAS-027572-H921, a licensed structural engineer will evaluate the container-handling equipment to ensure the floor loading properties are not compromised.

Building 7860A is a RUBB tent with a packed gravel floor. There is no permanent containment berm in this facility. The concrete casks used to store RH TRU waste have a poly, KRENE, or a substantially equivalent outer liner and have been overpacked in steel outer containers. This provides three layers of containment. None of the concrete casks are expected to contain > 1% free liquids. Other RH TRU waste containers may have four layers of containment: primary container(s) placed inside (1) a Removable Lid Canister Overpack (ROP), which is then placed inside (2) a thermoplastic liner in (3) a five-inch-thick concrete-lined overpack which is clad with (4) a steel outer layer ≥0.328 inches thick (see Figures. 8.1-42, 8.1-43, 8.1-44, and 8.1-45). The wastes in the containers to be stored inside the ROP are certified to WIPP requirements and contain

< 1% free liquids. All containers of waste with free liquid that have not been overpacked, including RH TRU waste, CH TRU waste, MLLW, and LLW will be stored on portable spill containment pallets. The RUBB tent measures 100 ft by 80 ft. Construction materials used in the floors, portable containment systems, concrete casks, and/or overpack liners are compatible with the materials stored at the units.

The 7831F FSU has exterior dimensions of 48.6 ft by 12.5 ft and interior dimensions of 48 ft by 12 ft, noncombustible material, heavy-gauge steel. The roof and walls will prevent precipitation from entering or collecting in the FSU, and the floor grating will prevent the waste containers from contacting accumulated liquids. The FSU is designed and operated to exclude or prevent run-on and run-off from entering. The FSU has a built-in 6-in.-deep secondary containment sump beneath the floor grating. The sump is constructed of noncombustible materials. The sump walls are 10-gauge steel plate, seam welded to the sump floor. The FSU is designed to store 7920 gal and has a secondary containment of 2154 gal, which is 27% of the maximum storage capacity. An engineering drawing of the 7831F FSU is provided in Attachment 8.3.

The permitted units at the TWPC are used for storage of CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW. They are used to support processing, including characterization, and repackaging of waste for disposal offsite. The base of the storage areas for waste containers (except for portable storage units in the DAC Area, CSA units, CHMB Parking Lot, and MPB parking lot) is a reinforced concrete slab, free of cracks or gaps, and covered with a sealant impervious to leaks, spills, and accumulated liquids. However, storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system (e.g., epoxy coating or sealant in good condition) provided that the storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation, or the containers are elevated or are otherwise protected from contact with liquids. The slab is designed to withstand dead loads and live loads from containers, pallets, overpacked casks, and container-handling equipment. Containers that are known or suspected of containing liquids greater than one gallon are placed on pallets with built-in secondary containment, or other secondary containment systems such as spill pans, that are free of cracks and gaps. Construction materials of the floors, portable containment systems, and cask overpacks are or will be compatible with materials stored at the units.

Portable waste storage units designated as part of the CSA are stationary during the CH TRU waste campaign, and are used to store CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW to facilitate onsite processing and offsite waste shipment. As part of the CSA, the MEB (an enclosed 31 ft by 20 ft metal building) will be used to store CH TRU waste, RH TRU waste, MLLW, and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers. The MEB is used to support the macroencapsulation treatment unit. Additionally, the portable waste storage units may include transport units, referred to as flatbed trucks, that will be used to ship the waste.

The portable waste storage units designated as part of the DAC Area store CH TRU waste, RH TRU waste, hazardous waste, MLLW, and LLW to facilitate on-site treatment and offsite waste shipment. The portable waste storage units may include transport units, referred to as flatbed trucks, that will be used to ship the waste. The DAC Area also includes the covered/enclosed 30-ton crane bay outside the first floor of the WPB and the DVB. The DAC and CSA units will be

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equipped with portable containment systems, as required. The secondary containment systems will be compatible with materials stored at the units.

The DVB is a 25 ft by 50 ft (1250 ft^2) enclosed metal building used for container storage of RH TRU waste, CH TRU waste, hazardous waste, MLLW and LLW in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers. The DVB has been evaluated to ensure that the floor loading is adequate to accommodate storage of heavy containers (e.g., casks, overpacked containers, etc.) and the container handling equipment. Prior to using any other container handling equipment that has not been identified in the Engineering Evaluation CAS-027880-I528, a licensed structural engineer will evaluate the container handling equipment to ensure the floor loading properties are not compromised.

Containment Design and Prevention of Run-on and Run-off

Building 7855. The containment design involves both liquid containment systems and unit design to prevent run-on. The unit has both an internal and an external liquid containment system. The internal containment system is designed and operated to drain and remove any accumulated liquids (i.e., seepage and/or condensate). The internal drainage system consists of four 10-in.-wide trenches with galvanized grating (one trench in each bay) that lead to two 2-in.-diameter polyvinyl chloride PVC pipe drains that end at an external sump. The external sump contains two small sampling stations that allow testing of accumulated liquids from each piping unit. The capacity of the internal drainage system is 49.4 ft^3. Additionally, the stored casks are placed on steel pallets that elevate casks approximately 7 in. above the floor, which also serves to protect the casks from contact with any accumulated liquids. The external system collects run-off from the earth-covered roof and sides of the building. It consists of a 4-in.-diameter concrete pipe leading into a concrete catch basin. In addition, the open face of the building is designed to prevent run-on from entering the unit. The building's apron and roadway are sloped away from the entrance to eliminate problems caused by run-on.

Building 7883. The containment design involves both the use of liquid containment systems and unit design to prevent run-on. Each unit has two liquid containment systems: an internal system and an external system. Internally, the base of each unit is constructed with 10-in.-minimum thickness of reinforced concrete and during the early operations, an epoxy coating was in place on the floors when waste with free liquids was accepted. Continuous water stops are used in all construction joints below grade.

The detection sump contains concrete partitions separating the sump into separate sampling zones corresponding to each of the storage bays. The sampling stations allow for the testing of accumulated liquids from each piping unit. The capacity of the internal drainage system is approximately 2100 gal.

The stored containers are placed on steel pallets that elevate them approximately 7 in. above the floor, which also serves to protect the casks from contact with any accumulated liquids. Waste stored in boxes is elevated approximately 4 in. above the floor by the legs of the boxes.

An external system collects and diverts run-off from the earth-covered roof and sides of the building. Rainfall onto the roof drains down the sloped earthen sides of the building and flows into

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an earthen drainage feature sloping to either side of the building, past the front, and down-slope away from the structure. A trench drain is installed around the perimeter of the building to prevent the accumulation of groundwater against the building.

Construction details of the drain are shown in Attachment 8.3. The metal track-mounted doors prevent run-on from entering the unit. The building's aprons and roadway are sloped away from the entrance to eliminate problems caused by run-on.

Building 7572. The building floor and surface drains have downward gradients of 1/8-in./ft. The slope of this building and the secondary containment area base are adequate to allow liquids resulting from leaks or spills to flow rapidly toward depressions and away from containers. The SOPs and casks are elevated approximately 4 in. above the floor by the forklift openings. The operation and design of the storage units ensure that the containers are protected from contact with accumulated liquids.

Buildings 7574 and 7879. For each of these units, the floors have downward gradients of 1/8 in./ft. The secondary containment areas have been filled with concrete or concrete blocks for radiation configuration control. The stored containers will be placed on pallets that elevate the containers approximately 4 in. above the floor and also serve to protect the containers from contact with any liquids. Waste that is stored in boxes or SOPs will be elevated approximately 4 in. above the floor by the design of the containers. The operation and design of the storage units ensure that the containers are protected from contact with accumulated liquids.

Building 7860A. This unit provides enclosed storage areas with roofs and walls such that precipitation does not fall within the area. Run-on is minimized by the slope of the floor surfaces, and diversionary drainage patterns on the surface surrounding the unit. Overpacked casks have built-in channels to assist in transport and to elevate the casks off the ground. Non-overpacked containers with free liquid will be stored on secondary containment pallets, and overpacked containers without free liquid will be elevated off of the floor to prevent any contact with incidental precipitation run-on.

TWPC Units. Any waste containers that are known to contain liquid greater than one gallon or have liquid identified during non-destructive examination (NDE) greater than one gallon will be placed on secondary containment pallets or similar structures that elevate the containers above the base surface to prevent liquid from being released to the unit. Since secondary containment pallets are being used, sloping of the base is not required. Waste items in odd-shaped containers (e.g., concrete casks) are typically contained in smaller inner containers. The odd-shaped containers will be placed in steel overpacks prior to receipt at the facility.

Capacity of the Containment System Relative to the Number and Volume of Containers to be Stored

As noted previously, Bldgs. 7855 and 7860A do not have fixed secondary containment; therefore, portable secondary containment structures and overpacking will be the primary means of providing secondary containment for containers that contain free liquids. Portable containment systems will have the capacity to contain a minimum of 10% of the total volume of the liquid wastes stored in that system or the volume of the largest container (whichever is greater). The storage buildings

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and containment structures will be inspected, as required, to ensure they remain impervious and in good condition.

Buildings 7572 and 7883 were originally designed to have a containment system that will contain at least 10% of the total volume of the liquid wastes stored in the unit or the total volume of the largest container (whichever is greater). Any portable containment system used (i.e., metal pallets with built-in containment capacity) will also have the capacity to contain a minimum of 10% of the total volume or the total volume of the largest container (whichever is greater) of the liquid wastes stored in that system. These two storage units only store wastes without free liquid and the volume of the containment system is not applicable.

The TWPC utilizes portable containment systems (e.g., pallets with built-in secondary containment systems or equivalent) that have the capacity to contain a minimum of 10% of the total volume or the volume of the largest container stored in the system (whichever is greater). These systems are readily available from commercial vendors and are warranted to meet the secondary containment requirements of TN Rule 0400-12-01-.06(9)(f). Odd-shaped containers (e.g., concrete casks) will be placed in steel overpacks prior to receipt at TWPC.

These steel overpacks are designed to contain any liquids that may be present in the container, as well as to facilitate container handling within TWPC.

Containment systems, except for the cask overpacks, will be inspected regularly to ensure they remain impervious and in good condition. Routine inspections of the container storage areas will promote early spill detection and cleanup, thereby preventing the buildup of spill residues. Secondary containment calculations are shown below.

Container Management

Container Information

Hazardous waste is packaged in drums (e.g., 30-, 55-, 85-, or 110-gallon), overpacked containers, and metal containers. RH TRU waste is typically stored in concrete casks to provide shielding. The 6-in.-walled casks have a capacity of approximately 57.7 ft^3, and the 12-in.-walled casks have a capacity of approximately 23.2 ft^3 of waste material. Casks are approximately 4.5 ft in diameter and 7 ft in height. Other types of shielded containers are used to store RH TRU waste, depending upon the container's suitability for the type of waste being stored, and the ability of the container to reduce worker exposure to radiation. CH TRU waste, MLLW, and LLW will be packaged in the aforementioned containers. Smaller containers may be overpacked into drums varying from 30-gallon to 110-gallon. Large pieces of debris or machinery are typically stored in metal containers or similar structures of varying sizes.

Movement of Containers

Hazardous waste containers are transported on flatbed or lowboy tractor trailers. Ancillary equipment (e.g., forklifts, pallet jacks) is used to move containers within the storage unit and between units at TWPC. Specially designed fixtures and attachments are used to grasp and carry

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odd-shaped containers (e.g., concrete casks) so that the possibility of damaging the container is minimized during transport.

While in permitted storage, containers are stacked no more than three rows vertically and are only moved when necessary. Container stacking may be limited by other safety factors but will never exceed three rows high. The number of containers per pallet is based on container size and is limited to the maximum number that can be safely stacked, staged, or moved by forklift. Unless containers are known to contain liquid, they do not need to be staged on secondary containment pallets.

Management Practices

All waste containers will have an identifying marking such as a bar code sticker with the identification number on the container for tracking purposes. Most information is stored electronically, and redundancy is accomplished through the use of the waste profile documents described in Attachment 2. Containers are maintained in a closed condition unless wastes are being sampled, added, treated, or transferred. Containers may also be vented prior to movement if there is reason to suspect a buildup of pressure in the headspace. Venting will be closely monitored and will only be performed if the risk to human health and the environment is minimal. A waiver of marking containers under TN Rule 0400-12-01-.10(4)(a)1(ii)(I) with the words "Hazardous Waste", with an indication of the hazards, has been approved for RH TRU waste containers due to the inaccessibility of the RH TRU waste already placed in the concrete storage containers and special handling requirements for newly generated RH TRU waste. The waivers remain effective for 5 years upon issuance and will have to be renewed or the permittee will be required to submit a modification to this permit. Waiver renewal shall be required to be submitted at least 90 days prior to the waiver ending.

General information about the hazardous waste constituents that may be present in the RH TRU containers is available through historical records. All other hazardous waste containers will be labeled with the words "Hazardous Waste" and an indication of the hazards as required and marked with the accumulation start date.

Once the containers are placed in the storage units, personnel access is limited because of the radiation levels. Containers are stored in sealands at TWPC and access is also limited because of radiation levels. Labels are applied to drums and verified prior to storage in the sealands. All sealand doors containing hazardous waste will be labeled with the words "Hazardous Waste" with an indication of the hazards. Due to the orientation of containers once loaded in the sealands, labels and accumulation start dates may not be visually verified during quarterly inspections, but container information is verified and tracked in the WICS database. Each container is assigned a barcode ID, while each sealand is designated a storage location ID. During quarterly inspections, the WICS database is updated via a move authorization by Barcode scanner as containers are added or removed from sealands to track their locations. Within WICS, the users can access information on container assignments in each sealand, along with RCRA indicators, accumulation start dates, and assigned waste codes. Inside the sealands, a minimum of 20-inch aisle space will be maintained to allow for container inspections and emergency response personnel access. At storage units, a minimum of 24-inch aisle space will be maintained, except for RH TRU waste and controlled high-fissile CH TRU waste containers, a waiver for the aisle spacing requirement has

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been approved due to as low as reasonably achievable (ALARA) concerns. The waivers remain effective for 5 years upon issuance and will have to be renewed or the permittee will be required to submit a modification to this permit. Waiver renewal shall be required to be submitted at least 90 days prior to the waiver ending.

CH TRU Waste

NDE and non-destructive assay (NDA) will be performed on each 55-gallon drum (and drum overpacks up to 85-gal capacity) received at the TWPC. Incoming boxes and 110-gallon drums will not be assayed upon receipt but will be moved to the CHSA or to the box breakdown section in the waste processing area and queued for further processing. NDA and NDE will be performed in mobile systems located adjacent to the CHSA and MPB. This initial assay is used to determine the isotopes and activity present in the containers, as well as screening for liquids and other items that may be considered non-conforming (e.g., compressed gas cylinders). Containers may require extended count times to accurately determine the isotopes and activities; therefore, containers may remain secured in the NDA units until the count has been completed. Containers identified as containing liquids greater than one gallon by NDE will be placed on portable containment structures, placed into one of the permitted storage units at TWPC, and queued for further processing and/or treatment. Waste will be sorted/segregated/or treated (in accordance with methods approved in Attachment 9) in the glove box, BBA, or CPE and will be placed in appropriate containers that are compatible with the waste that is placed in them and staged in permitted storage units to await offsite shipment. The CPE will primarily sort/segregate/treat waste from RH TRU waste casks that have been determined to contain CH TRU waste.

The transport units in the DAC, CHMB, MPB, and CSA units are enclosed or have a roll-back cover that will ensure that the containers are covered unless waste is being added or removed from the storage unit. The transport units will only be used for waste that is packaged in DOT-compliant containers ready for shipment.

The loading operation for CH TRU waste will typically occur in the center bay of the MPB or in the paved area in front of the CHMB or the MPB or in the center bay of the MPB. The containers are inspected prior to being loaded in the TRUPACT II or HALFPACT. These containers have no liquids present at this point. These containers may contain waste characterized and certified for shipment to WIPP, or it may contain TRU waste that will be shipped to other sites for characterization and/or certification activities. CH TRU waste packaged in containers will be loaded into the inner containment vessel of the TRUPACT II or HALFPACT shipping container. Each inner containment vessel typically holds fourteen or seven 55-gal containers, respectively, and the inner containment vessel is packaged into an outer containment vessel. Each inner containment vessel will be wrapped in shrink wrap before loading into the outer containment vessel, and then loaded into the TRUPACT II or HALFPACT. The TRUPACT II and HALFPACT have a steel skin and therefore, once sealed, the waste has multiple levels of containment.

Loading operations will not occur outdoors on the paved area during inclement weather and the TRUPACT IIs and HALFPACTs will be sealed prior to the end of the work shift. Loaded and sealed TRUPACT IIs, HALFPACTs, 72-B Casks, or transport units may be stored in the CHMB or MPB parking area. If the TRUPACT, HALFPACT, 72-B Cask, or transport unit is stored, it will be externally inspected every seven days before being shipped from TWPC.

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RH TRU Waste

The RH TRU waste casks will enter the first floor of the WPB via the RH TRU Waste Cask Bay. The RH TRU waste cask will be moved to the RH TRU waste Airlock where it will be connected to a bag-in/bag-out portal on the underside of the Hot Cell. RH TRU waste will be sorted, segregated, or treated (in accordance with methods approved in Attachment 9) in the hot cell using robotics. Waste will be moved to a worktable for sorting/segregation/treatment and, using robotics, repackaged in 55-gallon drums. Three 55-gallon drums will be loaded into a removable lid canister (RLC). The RLC will be loaded directly into the 72-B Cask, which will be shipped to WIPP.

Processed RH TRU waste will be characterized and certified in accordance with appropriate disposal site Waste Acceptance Criteria. The loading operation for RH TRU waste will occur in the 30-ton crane bay. The RLC will be loaded directly into the 72-B Cask and sealed providing the waste with multiple levels of containment. The RH TRU waste 72-B Cask will be sealed prior to the end of the work shift. Loaded and sealed 72-B Casks may also be stored in the CHMB or MPB parking lot.

RH TRU waste casks that are known to contain CH TRU waste will enter the CPE through the 30-ton crane bay and be sorted, segregated, or treated (in accordance with methods approved in Attachment 9) in a structure similar to the BBA and repackaged in 55-gal drums.

CSA and DAC Units

The concrete casks are in steel overpacks lined with a 6-ml polyethylene bag, which will provide two layers of secondary containment for the contents of the casks. The packaged 72-B canister waste will have no liquids and be packaged into 55-gal DOT-compliant drums within the 72-B canister, which is ¼-in. steel.

Drum Venting Building

The DVB stores containers of CH TRU waste, RH TRU waste, MLLW, and LLW prior to shipment offsite or movement into any other TWPC-permitted storage unit. If loads (container plus the fork truck) are greater than 8,000 pounds where the existing floor slab is not adequate to support heavy fork truck axle loads, then containers will first be off-loaded from the conveyance to caster dollies at the facility's entrance. The dollies will be used to move containers (e.g., casks and/or overpacks) while on the 8-inch floor slab inside of the DVB to prevent exceeding the slab floor loading. If loads are less than 8,000 pounds, then a fork truck will be used to transfer containers into the DVB for storage.

Storage of Incompatible, Ignitable, and Reactive Waste

Waste materials will not be placed or stored in containers that contain any wastes or waste residues with which they would adversely react. Precautions will be taken to manage containers of ignitable wastes to prevent the generation of fires and explosions. These precautions will include, but will not be limited to, placement of "No Smoking" signs at units used to store ignitable wastes. Portable fire extinguishers are maintained at or near all of the storage units.

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At TWPC, waste materials will not be placed or stored in containers that contain any wastes or waste residues with which they would adversely react. Precautions will be taken to manage containers of ignitable wastes to prevent the generation of fires and explosions. These precautions will include, but will not be limited to, placement of "No Smoking" signs at units used to store ignitable wastes**.** The TWPC units are equipped with a fire suppression system (except for the CSA and DAC), and fire extinguishers are at or near all TWPC units. The covered 30-ton crane bay and CPE, which are part of the DAC, are equipped with a fire suppressant system.

Waste materials will not be placed or stored in containers that contain any wastes or waste residues with which they are incompatible. The operators of the units will be trained in the proper handling of hazardous waste, including the importance of not adding an incompatible waste to a partially filled container. Wastes will be characterized in accordance with the Waste Analysis Plan discussed in Attachment 2. The use of decontaminated used containers and knowledge of waste compatibilities prevents the placement of waste into a container that held incompatible wastes or waste residues. Wastes that are not compatible with other wastes in these units will be stored in separate secondary containment such as diked areas, portable secondary containment systems, spill pallets, or overpack containers.

Co-Management with Other Wastes and Materials

Other wastes and material will not be stored in the permitted units unless: (1) the other waste or material is labeled, marked, or otherwise clearly identifiable as to what it is; (2) site personnel are able to demonstrate that the other waste or material is not a hazardous waste; and (3) the other waste or material is managed in a manner that does not adversely impact compliance with TN Rule 0400-12-01-.06. Examples of the types of waste or materials that may be stored in the permitted units include LLW, PCBs, non-RCRA solid waste, and cleaning and decontamination supplies and equipment.

Compliance with Air Emission Standards

Container storage operations will comply with RCRA Subpart CC [TN Rule 0400-12-01-.06 (32)] requirements for controlling air emissions from containers. The following criteria are applied to container operations at the ORNL storage units and TWPC:

- Containers of waste are exempt if the container volume is smaller than 26 gals or the organic composition is known to be less than 500 ppm, by weight.
- Containers storing mixed waste are exempt from RCRA Subpart CC requirements. (note: all of the waste that will be stored and treated under this permit is expected to meet this condition)
- Containers between 26 and 119 gals follow Level 1 standards:
  - — Keep container closed except when adding or removing waste
  - — Inspect containers within 24 hrs of waste acceptance or accumulation
  - — A visible hole or tear in a container is considered a leak and it will be patched within 24 hrs of discovery and permanently repaired or replaced within 5 days.

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- Containers larger than 119 gals, not in light material service (< 20% volatile organic compounds [VOCs]) follow Level 1 standards.
- Containers larger than 119 gals that are in light material service (> 20% VOCs) follow Level 2 standards:
  - — Keep container closed except when adding or removing waste
  - — Inspect containers within 24 hrs of waste acceptance or accumulation
  - — A visible hole or tear in a container is considered a leak and it will be patched within 24 hrs of discovery and permanently repaired or replaced within 5 days.
  - — Containers being filled will be done so using an approved system that minimizes air emissions.
- Containers over 26 gals that are used for the treatment of hazardous waste by stabilization or amalgamation will follow Level 3 standards when the hazardous waste is exposed to the atmosphere:
  - — The containers will be vented inside an enclosure that is exhausted through a closed-vent system to a control device in accordance with TN Rule 0400-12-01-.06(32)(g)5(i)(II).
  - — The containers vent directly through a closed vent system to a control device in accordance with TN Rule 0400-12-01-.06 (32)(g)5(i)(I).

Preventive Procedures, Structures, and Equipment

Loading/Unloading Operations

At ORNL, precautions have been taken to reduce the potential for hazard during loading/unloading operations at the storage units. During loading and unloading at a unit, if a portable ramp is used, it will be secured and anchored to the transport vehicle. Containers on pallets will be loaded/unloaded with a forklift, drum dolly, or other appropriate means of handling containers. Any containers received without pallets or other means to keep the containers elevated above the floor will be unloaded with a forklift equipped with container handling implements, or by some other appropriate means, and placed on pallets or otherwise stored in a manner that keeps the containers elevated above the floor.

Casks of RH TRU waste are placed on steel pallets to keep them off the floor and remove any potential to contact accumulating liquids. The cask and pallet are moved into the storage building using a forklift with the cask-handling fixture attached. Special care is exercised to ensure that containers are not damaged during placement into the unit. Once inside the unit, casks are rarely (if ever) moved.

At TWPC, precautions have been taken to reduce the potential for hazard during loading/unloading operations at the storage units. Containers on pallets will be loaded/unloaded with a forklift, drum dolly, or other appropriate means of handling containers. Any containers received without pallets will be unloaded with a forklift equipped with container-handling implements, or by some other appropriate means.

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The concrete casks of RH TRU or CH TRU waste will be delivered to TWPC inside of a carbon-steel RH TRU waste cask overpack. The cask overpack will be received in the 30-ton crane bay (which has a roof and is enclosed), removed from the transport vehicle and loaded onto the RH TRU waste bogie (a cask-moving device), and moved into the first floor of the WPB, or staged in the 30-ton crane bay.

Exterior loading and unloading areas for these hazardous storage units are not protected by secondary containment systems; therefore, these operations are strictly controlled. Containers of mixed waste are unloaded and transported inside by forklifts or drum dolly near the entrance or dock of the storage unit. A forklift or container dolly is used to move waste containers into the storage units over an entrance ramp to the secondary containment systems, if present. Smaller sized containers will be moved into the appropriate storage unit by either a dolly or hand carried by waste operations personnel. Loading and unloading of containers will not be conducted during inclement weather.

In the event that an accident or spill occurs during unloading operations, the spilled material will be contained with an appropriate absorbent such as sandbags, absorbent diapers, or booms. The spilled liquid will be pumped or poured into tankers, containers, or a tank. However, the waste containers have minimal amounts of liquids (i.e., less than 1%), so there is little potential for a release. Any contaminated absorbents or other solid materials will be containerized, labeled properly, and transported to the appropriate storage unit.

Run-off

The probability of a release of RCRA-contaminated liquids is very small. Since all the wastes are packaged, sealed, and generally overpacked with two or three levels of containment, the likelihood of a leak from a container is very low. Additionally, these wastes are mostly solids with potentially only small amounts of liquids (< 1% by volume). At ORNL, storage units' run-off from spills, leaks, or precipitation at the storage units will be contained within the dikes of the secondary containment system.

The storage units and their secondary containment calculations are shown below. In the unlikely event of a release, liquid wastes will be removed, and spill residues, absorbents, and other cleanup wastes will be containerized and managed compliantly in storage until final disposition of the waste is determined and the waste is prepared for transport.

At TWPC, storage units' run-off from containers with liquids that might spill and leak will be contained within portable containment systems (e.g., pallets with built-in secondary containment systems or equivalent). These containment systems will have the capacity to contain a minimum of 10% of the total volume of CH TRU waste containers stored in that system or the volume of the largest amount of liquid in a container stored in the system (whichever is greater). These systems are readily available from commercial vendors and are warranted to meet the secondary containment requirements of TN Rule 0400-12-01-.06(9)(f).

Any liquids and/or wastes will be removed from TWPC's portable secondary containment systems by means of an appropriate absorbent material and/or cleaning solution. Spill residues, absorbents,

and other cleanup wastes will be containerized and managed compliantly in storage until final disposition of the waste is determined and the waste is prepared for off-site treatment and/or disposal.

Water Supplies

Groundwater and surface water contamination will be prevented by safe handling procedures during loading and unloading operations. The container storage units are constructed on a concrete base and are provided with concrete diking or internal liquid containment systems to contain leaks and spills, or the containers have multiple layers of containment. The units are covered by a roof to minimize the entry of precipitation. Temporary outdoor staging of uncovered containers will be limited to solid waste and no more than 10 hours.

Equipment and Power Failure

In the event of a power outage in these units, no electrical pumping or waste handling systems will be used. In the event of a failure of waste transportation or handling equipment, such as tankers, trucks or forklifts, backup equipment is available at the site for use.

Personal Protective Equipment (PPE)

General information on the major chemical components of the wastes stored in these units will be available in the operating record. IH and radiological control personnel will specify the appropriate PPE for employee protection at these units. The waste profile data, waste analytical data, SDSs, and radiological information will be used to compile background information on the characteristics of the various chemical and radiological constituents such as toxicity data, ignitability, reactivity, corrosivity, radioactive isotopes, routes of entry, exposure data, and other information. A listing of the general emergency and safety equipment that is centrally located at the facility is provided in Attachment 6.2 of the Contingency Plan. Protective equipment used during emergency response situations is addressed in Attachment 6.2 of the Contingency Plan. The use of protective equipment will be addressed in the initial personnel training and the periodic updates, as discussed in Attachment 5, “Personnel Training.”

Waste operations and radiological control personnel will provide the PPE necessary to perform the activities in these units; however, the PPE will be stored at central locations and not at each unit. The PPE provided may include safety shoes and glasses, respirators, neoprene and/or nitrile gloves, and disposable coveralls or suits.

Prevention of Reaction of Ignitable, Reactive, or Incompatible Wastes

Precautions to Prevent Ignition or Reaction of Stored Waste

Reactive, ignitable, and incompatible waste may be stored at the permitted units. All container storage areas are located more than 50 ft from the property line. The separation of incompatible wastes will prevent reactions in the event of a waste spill or leak. If a spill or leak occurs in a diked area, the waste material will be contained within the appropriate secondary containment system;

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therefore, preventing accidental mixing of incompatible waste. Warning signs are posted in conspicuous locations (upon the entrance doorways or installed on all sides of approach) clearly marked (in English) with the legends "Danger-Unauthorized Personnel Keep Out" or an equivalent warning. "No Smoking" signs are installed at the units where ignitable or reactive waste is stored. After considering the data collected concerning the waste, as addressed in the Waste Analysis Plan, Attachment 2, the wastes will be stored in containers with which they are compatible; therefore, no unanticipated reactions will occur, and the only source of ignition will be external to the containers. Non-sparking tools and equipment will be used in or on all of these units when handling ignitable waste. Cutting, welding, and other operations in which a potential ignition source of hazard exists will not be permitted in these units unless a special work permit has been issued and all personnel understand associated hazards. In addition, special work permits will list precautions necessary to prevent ignition or reaction of the waste.

General Precautions for Handling Ignitable or Reactive Wastes or Accidentally Mixing Incompatible Wastes

The waste management units may be used to store reactive, ignitable, or incompatible wastes. Accurate identification and characterization ensure that wastes are managed so as to prevent reactions, fires, or releases of waste constituents. No incompatible wastes will be placed in the same secondary containment. No hazardous waste will be placed in a container that previously held an incompatible waste or material, unless it has been decontaminated. A container holding hazardous waste that is incompatible with any waste or other material stored nearby will be managed in separate secondary containment, such as a dike, secondary containment pallet, or overpack container.

Non-sparking tools and equipment are used in buildings that store ignitable wastes, and personnel use non-sparking clothing and PPE. Sources of ignition (including open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks, and spontaneous ignition) are prohibited in the area. "No Smoking" signs are conspicuously placed outside the buildings and at all entries. Cutting, welding, or other operations in which a potential hazard exists will only be permitted in this area if a special work permit has been issued. The special work permit will list all precautions necessary to prevent ignition of the waste.

Management of Ignitable or Reactive Waste in Containers

Waste materials will not be placed or stored in containers that contain any wastes or waste residues with which they would adversely react. Precautions will be taken to manage containers of ignitable wastes to prevent the generation of fires and explosions. These precautions will include, but will not be limited to, placement of "No Smoking" signs at units used to store ignitable or reactive waste**.** Portable fire extinguishers are maintained at or near all of the storage units.

At TWPC, waste materials will not be placed or stored in containers that contain any wastes or waste residues with which they would adversely react. Precautions will be taken to manage containers of ignitable and reactive wastes to prevent the generation of fires and explosions. These precautions will include, but will not be limited to, placement of "No Smoking" signs at units used

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to store ignitable or reactive wastes. TWPC units are equipped with a fire suppression system (the WPB, the CHMB, and the DVB), and fire extinguishers at or near all of the units.

Management of Incompatible Waste in Containers

Waste materials will not be placed or stored in containers that contain any wastes or waste residues with which they are incompatible. The operators of the units will be trained in the proper handling of hazardous waste, including the importance of not adding an incompatible waste to a partially filled container. Waste will be characterized in accordance with the Waste Analysis Plan discussed in Attachment 2. The use of decontaminated used containers and knowledge of waste compatibilities prevents the placement of waste into a container that held incompatible wastes or waste residues. Wastes that are not compatible with other wastes in these units will be stored in separate secondary containment such as diked areas, portable secondary containment systems, spill pallets, or overpack containers.

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SECONDARY CONTAINMENT CALCULATIONS

Building 7879

Total Available Diked Storage Area:

Dike Capacity = 48 ft × 78 ft × .25 ft	=	936 ft^3

Maximum Diked Storage Capacity:

936 ft^3 × 7.48 gal/ft^3	=	7,001 gal
Minus 104 pallets @ 12 gal/pallet	=	(1,248 gal)
	=	5,753 gal

Total Available Containment per Pallet:

(4.125 ft × 4.375 ft × 0.4583 ft^*)	=	8.2709 ft^3
or		or
(8.2709 ft^3 × 7.48 gal/ft^3)	=	62 gal per pallet

Maximum Containment Capacity Based on Containment Pallets:

Maximum Number of Pallets for Building 7879	=	312 pallets
(312 pallets × 62 gal/pallet)	=	19,344 gal

Building 7572

Total Available Diked Storage Area:

Dike Capacity = 140 ft × 50 ft × 0.5 ft	=	3,500 ft^3

Maximum Diked Storage Capacity:

3500 ft^3 × 7.48 gal/ft^3	=	26,180 gal
Minus 119 pallets @ 12 gal/pallet	=	(1,428 gal)
Minus 50 boxes @ 12 gal/pallet	=	(600 gal)
		24,152 gal

Building 7574

Total Available Diked Storage Area:

Dike Capacity = 80 ft × 50 ft × 0.5 ft	=	2,000 ft^3

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Maximum Dike Storage Capacity:

2,000 ft^3 × 7.48 gal/ft^3	=	14,960 gal
Minus 95 boxes @ 12 gal/pallet	=	(1,140 gal)
		13,820 gal

Contact Handled Marshalling Building (CHMB)*

Total Available Diked Storage Area:

Dike Capacity = 55 ft × 140 ft × 0.5 ft = 3,850 ft^3

Maximum Dike Containment Capacity:

3850 ft^3 × 7.48 gal/ft^3 = 28,798 gal

Building 7860A

Storage Area

108 concrete cask equivalents × 57.7 ft^3/cask	= 6,231.6 ft^3
6,231.6 ft^3 × 7.48 gal/ft^3	= 46,612 gal

7831F FSU*

1. Reference Drawing C-5 MCC14NC48

2. Abbreviations:

ft = foot/feet	cf = cubic feet
sf = square feet	gal = gallon

3. Gross area of building dimension within curb (ft)

Width	Length
12.00	48.00

4. Gross area within curb (sf): [width × length = area]

Width	Length	Area
12.00	48.00	576.00

5. Less unusable floor space area - N/A

6. Net Usable Floor Area (sf) - 576.00

7. Estimate maximum no. of pallets (based on manufacturer's specifications)

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Pallets = 36 total

8. Pallet height (ft): N/A

9. Gross secondary containment vol. (cf) - 287.9 (based on manufacturer's specifications of 2,154 gal)

10. Displacement volume (cf) associated with estimated maximum number of pallets. (Estimated maximum no. of pallets × 3.5 cf displacement volume/pallet.) - N/A

11. Net secondary containment volume - 287.90 cf = 2,154 gal

12. Theoretical maximum waste storage capacity - 21,540 gal

13. Maximum stored volume

Total pallets (double stacked)	Drums per pallet	Gal per drum	Total gallons stored	Gal. required containment
36.00	4.00	55.00	7,920.00	792.00

Multi-Purpose Building (MPB)*

Total Available Containment per Pallet (gallons):

$(54 \text{ in} \times 50 \text{ in} \times 10 \text{ in})(4.329 \times 10^{-3} \text{ gal/in}^3)$ = 116.88 gal

Maximum Containment Capacity Based On Containment Pallets:

Maximum Number of Pallets for the Multi-Purpose Building = 182
(182 pallets × 116.88 gal/pallet) = 21,272 gal

Cask Processing Enclosure (CPE)/Drum Aging Criteria (DAC) Area

Liquid storage consists of groundwater infiltration from concrete casks being processed. All groundwater media will be stored in 350-gallon totes on 385-gallon secondary containment pallets. The maximum number of secondary containment pallets will be based on physical dimensions of the CPE/DAC area.

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* Secondary containment pans will be used for containers known to contain liquids greater than 1 gal

DRAFT

ATTACHMENT 8.2. PROFESSIONAL ENGINEERING STRUCTURAL CERTIFICATION

DRAFT

UCOR
an AECOM-led partnership with Jacobs
P.O. Box 4699 ◆ Oak Ridge, TN 37831

PROFESSIONAL ENGINEERING STRUCTURAL CERTIFICATION

A professional engineering structural review was performed for buildings 7574, Portable Unit 1, and 7860A currently permitted in the Oak Ridge National Laboratory hazardous waste Part B Permit TNHW-145 and as listed in the 10-year permit renewal application.

Building 7574 – (Figures 8.1-3 and 8.1-4) the structural review consisted of a visual inspection of the condition of the steel framing, metal siding, roofing, and concrete floor.

Portable Unit 1 – (Figure 8.1-11) the structural review consisted of a visual inspection of the condition of the internal steel framing, metal walls and roof, and the metal flooring.

Building 7860A – (Figure 8.1-19) the structural review consisted of a visual inspection of the condition of the internal steel framework, fabric walls and roof, and the compacted gravel floor.

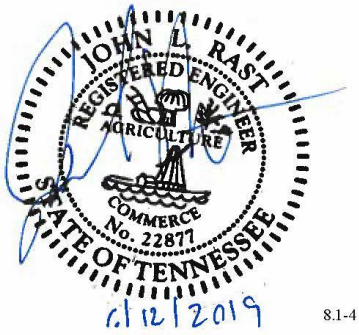
Summary - Based on findings of this review, the structures are in good condition with no signs of structural damage or distress. No further actions are necessary to allow continued use of these storage facilities. Additional materials may be stored in each facility as defined in the permit provided all other storage limitations are considered.

Certified by:

John L. Rast, P.E.
Tennessee Registration Number 22877
Edgewater-TFE LLC.
62 Mitchell Rd
Oak Ridge TN 37830

6/12/2019
Date Signed

Seal:



6/12/2019

UCOR
an AECOM-led partnership with Jacobs

P.O. Box 4699 ◆ Oak Ridge, TN 37831

PROFESSIONAL ENGINEERING STRUCTURAL CERTIFICATION

A professional engineering structural review was performed for buildings 7855, 7883, 7572, 7831F, and 7879 currently permitted in the Oak Ridge National Laboratory hazardous waste Part B Permit TNHW-145 and as listed in the 10-year permit renewal application.

Building 7855 (Figure 8.1-6) - The structure is primarily below grade, except for the bay access side. The structure is divided into four bays by concrete block walls that extend from the floor to the roof. Each bay of the unit is approximately 15 ft by 45 ft. The building is approximately 60 ft by 45 ft. The concrete vault floors, walls, ceilings, sumps, and rollup doors were visually inspected for bays A, B, C, and D.

Building 7883 (Figure 8.1-9) – The structure is a concrete-block structure on a reinforced concrete slab with a reinforced concrete roof. The structure is primarily below grade, except for the bay access side. The structure is divided into four bays by concrete block walls that extend from the floor to the roof. Each bay of the unit is approximately 18 ft by 55 ft. Overall the unit is approximately 72 ft by 55 ft. The concrete vault floors, walls (concrete and masonry block), ceilings, sumps, and rollup doors were visually inspected for bays 1, 2, 3, and 4.

Building 7572 (Figures 8.1-1 and 8.1-2) - This unit is constructed of a metal roof and walls over a concrete pad. Overall dimensions are approximately 140 ft by 50 ft. The steel framing, metal exterior panels, concrete floors, sumps, and berm were visually inspected.

Building 7831F (Figure 8.1-49) – This storage unit is modular in design and the approximate storage area is 576 sq. ft. This unit was constructed offsite by a commercial company and delivered ready-to-use. The steel frame, floor grating, and metal exterior were visually inspected.

Building 7879 (Figure 8.1-8.) - The building is constructed of metal siding and roof with a rigid frame over a concrete pad. The metal, Butler-type building has inside dimensions of approximately 50 ft by 83 ft. The steel framing, metal exterior panels, concrete floors, sumps, and berm were visually inspected.

Summary of results: The reviews of these buildings yielded passing results. The building superstructures are in good condition with no signs of structural damage or distress. All structural elements and containment systems are adequate to perform their function. No further actions are necessary to allow continued storage in these facilities.

Certified by:

1-13-20

James Ryan Smith, P.E
Tennessee Registration Number 113710
AECOM
105 Mitchell Road
Oak Ridge, TN 37830

Date Signed

Seal:

1-13-20

NORTHWIND TWPC

TRU Waste Processing Center

Memorandum

Date: January 15, 2020

To: Thomas Barton, Environmental Programs Manager

From: John Eschuk, P.E.

Subject: **Professional Engineer Structural Certification**

A structural integrity and coatings assessment of storage and containment facilities at TRU Waste Processing Center (TWPC) was performed for buildings TWPC - 1 (Contact Handled Staging Area (CHSA)), TWPC - 2 (Second Floor Waste Processing Building (WPB)), TWPC - 3 (Drum Aging Criteria (DAC)), TWPC - 4 (First Floor WPB), TWPC - 5 (Container Storage Area (CSA)), TWPC - 6 (Contact Handled Marshalling Building (CHMB)), TWPC - 7 (Drum Venting Building (DVB aka 7880AA)), and TWPC - 8 (Multi-Purpose Building (MPB)). An assessment of the Liquid Impediment for the MPB was also performed.

TWPC - 1 (CHSA) - The structural inspection of the metal structure and the concrete slab that serves as a weather barrier for staged waste containers consisted of a visual inspection for cracks or other observable signs of structural deterioration. Visual inspection of coatings was performed for cracks or other observable signs of coatings damage. The inspections were performed in accordance with site procedures and inspection results were recorded. These inspections are performed semi-annually.

TWPC - 2 (Second Floor WPB) - The structural inspection of the concrete floor, concrete walls and concrete ceiling consisted of a visual inspection for cracks or other observable signs of structural deterioration. Visual inspection of coatings was performed for cracks or other observable signs of coatings damage. The inspections were performed in accordance with site procedures and inspection results were recorded. These inspections are performed of semi-annually.

TWPC - 3 (DAC) - The structural inspection of the concrete floor, concrete walls and concrete ceiling of the 30T Crane Bay located on the first floor of the WPB consisted of a visual inspection for cracks or other observable signs of structural deterioration. The structural inspection of the metal structure and the concrete slab of the DVB (aka 7880AA) also consisted of a visual inspection for cracks or other observable signs of structural deterioration. Visual inspection of coatings was performed for both structures for cracks or other observable signs of coatings damage. The inspections were performed in accordance with site procedures and inspection results were recorded. These inspections are performed semi-annually.

TWPC - 4 (First Floor WPB) - The structural inspection of the concrete floor, concrete walls and concrete ceiling consisted of a visual inspection for cracks or other observable signs of structural deterioration. Visual inspection of coatings was performed for cracks or other observable signs of coatings damage. The inspections were performed in accordance with site procedures and inspection results were recorded. These inspections are performed semi-annually.

TWPC - 5 (CSA) - The structural inspection of the Macro-Encapsulation Building (MEB) metal structure and the concrete slab that serves as a weather barrier for foaming and macro-encapsulation waste containers consisted of a visual inspection for cracks or other observable signs of structural deterioration. Visual inspection of coatings was performed for cracks or other observable signs of coatings damage. The inspections were performed in accordance with site procedures and inspection results were recorded. These inspections are performed semi-annually.

TWPC - 6 (CHMB) - The structural inspection of the metal structure and the concrete slab that serves as a weather barrier for staged waste containers consisted of a visual inspection for cracks or other observable signs of structural deterioration. Visual inspection of coatings was performed for cracks or other observable signs of coatings damage. The inspections were performed in accordance with site procedures and inspection results were recorded. These inspections are performed semi-annually.

TWPC - 7 (DVB aka 7880AA) - The structural inspection of the metal structure and the concrete slab that serves as a weather barrier for fire resistant Foam Storage Control Areas consisted of a visual inspection for cracks or other observable signs of structural deterioration. Visual inspection of coatings was performed for cracks or other observable signs of coatings damage. The inspections were performed in accordance with site procedures and inspection results were recorded. These inspections are performed semi-annually.

TWPC - 8 (MPB) - The structural inspection of the metal structure and the concrete slab that serves as a weather barrier for maintenance area, staged waste containers, and TRUPACT-II loading consisted of a visual inspection for cracks or other observable signs of structural deterioration. Visual inspection of coatings was performed for cracks or other observable signs of coatings damage. The inspections were performed in accordance with site procedures and inspection results were recorded. These inspections are performed semi-annually.

MPB Liquid Impediment - The structural inspection of the concrete slab consisted of a visual inspection for gouging, cracking, shrinkage or other observable signs of damage. The inspection was performed in accordance with site procedures and inspection results were recorded. These inspections are performed weekly.

Summary of Inspection Results – Storage and Containment facilities at TWPC are inspected for structural integrity and coatings integrity semi-annually and MPB Liquid Impediment is inspected weekly in accordance with site procedures. Based upon the most recent inspections, as well as historical data, the structures and floor coatings are in satisfactory condition with no signs of structural damage or distress and therefore have the ability to physically withstand design loads. No actions in addition to those currently performed are necessary to allow continued storage in these facilities. Minor cracks in Room 231 concrete ceiling (general location near column lines A-1/6) that do not adversely affect structural integrity and cracks in the roof coating at Elevation 805 were noted. The Corrective Maintenance log shows documentation has been issued to perform Corrective Maintenance to seal and recoat these ceiling and roof defects as necessary in accordance with site procedures. Furthermore, based upon the most recent inspections, the Liquid Impediment is in satisfactory condition.

Certified by:

John Eschuk, P.E. — JANUARY 15, 2020

John Eschuk, P.E. — Date Signed

Tennessee Registration Number 100219
North Wind Solutions, LLC
TRU Waste Processing Center (TWPC)
100 WIPP Road
Lenoir City, TN 37771

ATTACHMENT 8.3. BUILDING DRAWINGS

Figure Number	Building Number	Building Name	Drawing Title
8.1-1	7572	RH TRU Waste Storage Facility	RH-TRU Storage Facility – Building Plan
8.1-2	7572	RH TRU Waste Storage Facility	RH-TRU Storage Facility – Building Slab & Foundation Plan
8.1-3	7574	Drum Waste Storage Facility	NFS Waste Storage Facility – Building Slab & Foundation Plan
8.1-4	7574	Drum Waste Storage Facility	NFS Waste Storage Facility – Foundation Sections & Details - Sheet 1
8.1-5	Deleted		
8.1-6	7855	TRU Waste Storage Facility	Oak Ridge National Laboratory TRU Retrievable Storage Facilities – Building 7855
8.1-7	7879	TRU Waste Storage/Staging Facility	ORNL Bldg. 7879, Building Floor Plan, Door & Apron Modifications
8.1-8	7879	TRU Waste Storage/Staging Facility	TRU/SLLW Staging Fac. – SWSA 5 – Foundation Plan, Sections and Details
8.1-9	7883	RH TRU Waste Storage Bunker	RH TRU Waste Storage Bunker - Foundation & Floor Plan
8.1-10	7883	RH TRU Waste Storage Bunker	RH TRU Waste Storage Bunker Floor Plan – Piping
8.1-11	Deleted		
8.1-12	7880	WPB	TRU Waste Processing Center 1st Floor Plan, General Arrangement
8.1-13	7880	WPB	TRU Waste Processing Center. 2nd Floor Plan, General Arrangement
8.1-14	7880	WPB	TRU/ALPHA Waste Treat. Proj. Site Grading Plan Second Stage Construction
8.1-15	7880 BB	CHMB	TRU/ALPHA Waste Treat. Proj. Contact Handled Marshalling Building
8.1-16	7880 BB	CHMB	TRU/ALPHA Waste Treat. Proj. Contact Handled Marshalling Building Foundation Mat. at EL-777'-9"
8.1-17	7880 AA	DVB	TRU/Alpha Waste Treat. Proj Drum Venting Building General Arrangement
8.1-18	7880 AA	DVB	TRU/Alpha Waste Treat. Proj. Drum Venting Building Foundation Plan
8.1-19	7860A	TRU Waste Storage Facility	RCRA Part A Permit Oak Ridge National Laboratory TRU Storage Facilities – Building 7860A

DRAFT

BUILDING DRAWINGS (CONT'D)

Figure Number	Building Number	Building Name	Drawing Title
8.1-20A	7880 QQ	MPB	TRU Waste Processing Center Multi-Purpose Building Foundation-with TP-II Crane (Sheet 1)
8.1-20B	7880 QQ	MPB	TRU Waste Processing Center Multi-Purpose Building Foundation-with TP-II Crane (Sheet 2)
8.1-20C	7880 QQ	MPB	TRU Waste Processing Center Multi-Purpose Building Foundation-with TP-II Crane (Sheet 3)
8.1-21	7880 QQ	MPB	TRU Waste Processing Center Multi-Purpose Building General Arrangement
8.1-22	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure General Area Layout
8.1-23	CPE	CPE	TRU Waste Processing Center 1st Floor Plan General Arrangement
8.1-24	CPE	CPE	TR/ALPHA Waste Treat. Proj. Process Building and Aux. Equip. North Elevation
8.1-25	CPE	CPE	TRU Waste Processing Center Process Building and Aux. Equip. West Elevation
8.1-26	CPE	CPE	Cask Processing Enclosure HVAC System Design (Sheet 1 of 6)
8.1-27	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure HVAC System Design (Sheet 2 of 6)
8.1-28	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure HVAC System Design (Sheet 3 of 6)
8.1-29	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure HVAC System Design (Sheet 4 of 6)
8.1-30	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure HVAC System Design (Sheet 5 of 6)
8.1-31	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure HVAC System Design (Sheet 6 of 6)
8.1-32	CPE	CPE	TRU Waste Processing Center Piping & Instrument Diagram Tank W-1A Motive Air Interface
8.1-33	CPE	CPE	TRU Waste Processing Center Cask Process Enclosure Partial Lay-Flat Diagram

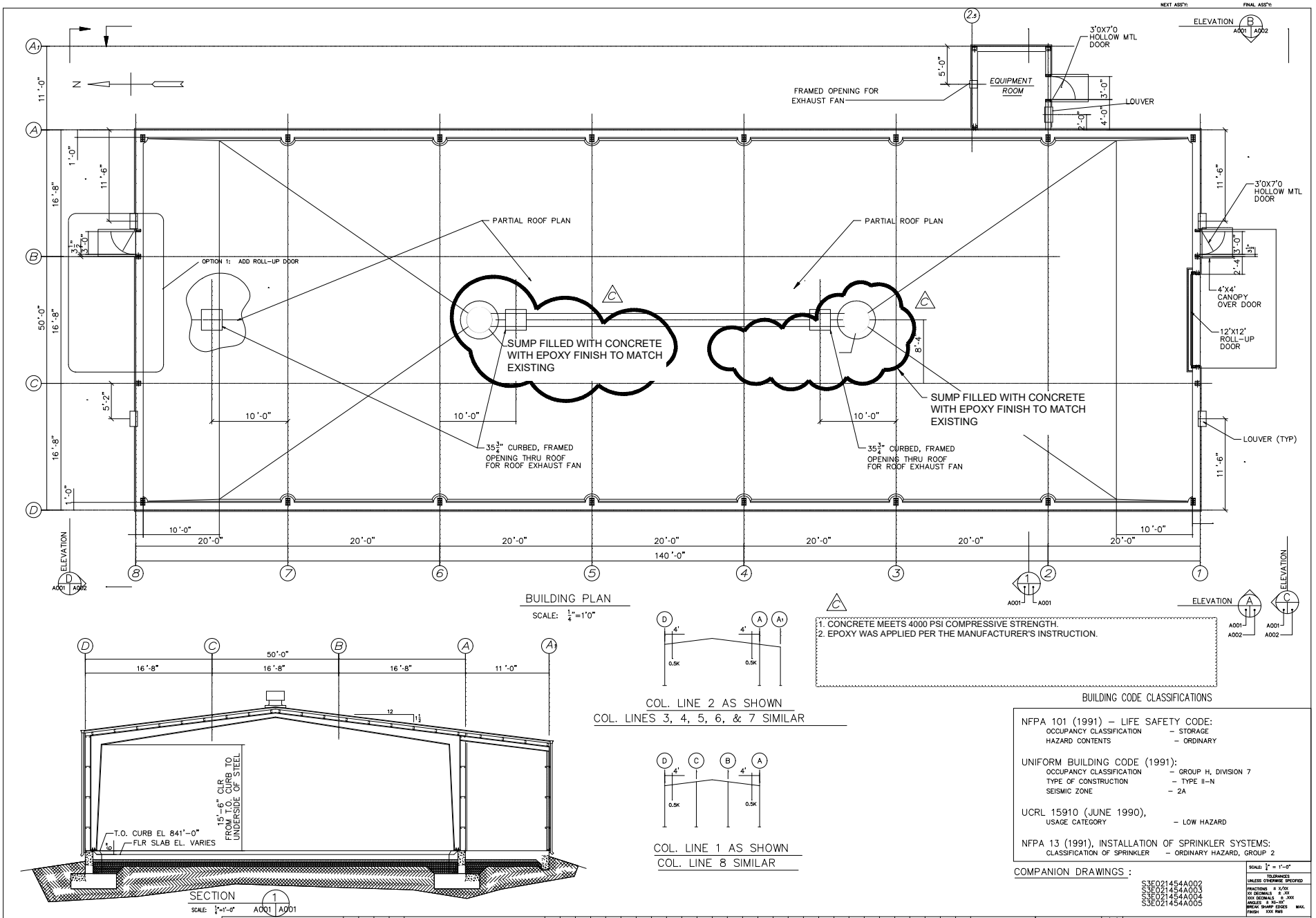
DRAFT

BUILDING DRAWINGS (CONT'D)

DRAFT

Figure Number	Building Number	Building Name	Drawing Title
8.1-34	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure Liquid Handling System (Sheet 1)
8.1-35	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure Liquid Handling System (Sheet 2)
8.1-36	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure Liquid Handling System (Sheet 3)
8.1-37	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure Liquid Handling System (Sheet 4)
8.1-38	CPE	CPE	Fire Protection Plan TRU Waste Processing Center (Sheet 1)
8.1-39	CPE	CPE	Fire Protection Plan TRU Waste Processing Center (Sheet 2)
8.1-40	CPE	CPE	Fire Protection Piping Plan &Details TRU Waste Processing Center
8.1-41	CPE	CPE	TRU Waste Processing Center CPE Liquid Handling System 350 Gallon Container
8.1-42	7860A	TRU Waste Storage Facility	NS30 Neutron Shielded Canister
8.1-43	7860A	TRU Waste Storage Facility	NS15 Neutron Shielded Canister
8.1-44	7860A	TRU Waste Storage Facility	TRU Waste Processing Center MK III Removable Lid Canister, Steel and Concrete Overpack, Details/Notes
8.1-45	7860A	TRU Waste Storage Facility	TRU Waste Processing Center Removable Lid Canister, Steel and Concrete Overpack, Details/Notes
8.1-46	7880	WPB	TRU Waste Processing Center Metal Oxidation Process Glove Box Block Diagram
8.1-47	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure Liquid Handling System (Sheet 5)
8.1-48	CPE	CPE	TRU Waste Processing Center Cask Processing Enclosure Liquid Handling System (Sheet 6)
8.1-49	7831F	Flammable Storage Unit	7831F FSU
8.1-50	CSA	CSA	TRU/ALPHA Waste Treat. Proj. Contact Handled Staging Area Structure
8.1-51	CSA	CSA	TRU Waste Processing Center Contact Handled Staging Area Foundation Mat EL. 790’-0”

DRAFT



BUILDING PLAN

SCALE: $\frac{1}{4}$"=1'0"

SECTION 1 A001

SCALE: $\frac{1}{4}$"=1'-0"

COL. LINE 2 AS SHOWN
COL. LINES 3, 4, 5, 6, & 7 SIMILAR

COL. LINE 1 AS SHOWN
COL. LINE 8 SIMILAR

C

1. CONCRETE MEETS 4000 PSI COMPRESSIVE STRENGTH.
2. EPOXY WAS APPLIED PER THE MANUFACTURER'S INSTRUCTION.

BUILDING CODE CLASSIFICATIONS

NFPA 101 (1991) – LIFE SAFETY CODE:
- OCCUPANCY CLASSIFICATION – STORAGE
- HAZARD CONTENTS – ORDINARY

UNIFORM BUILDING CODE (1991):
- OCCUPANCY CLASSIFICATION – GROUP H, DIVISION 7
- TYPE OF CONSTRUCTION – TYPE II-N
- SEISMIC ZONE – 2A

UCRL 15910 (JUNE 1990),
- USAGE CATEGORY – LOW HAZARD

NFPA 13 (1991), INSTALLATION OF SPRINKLER SYSTEMS:
- CLASSIFICATION OF SPRINKLER – ORDINARY HAZARD, GROUP 2

COMPANION DRAWINGS :
S3E021454A002
S3E021454A003
S3E021454A004
S3E021454A005

S3E021454A001

SCALE: 1" = 1'-0"
TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS ± X/XX
XX DECIMALS ± .XX
XXX DECIMALS ± .XXX
ANGLES ± 5'-0"
BREAK SHARP EDGES MAX. FINISH XXX RMS

NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS TAKEN
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN
SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE EP-C-18

REV	DESCRIPTION	BY	CHK	SECT	DEPT	DATE	PE	REQ	DATE	MMES	DATE	RPE	RPE NO	DATE	SS-O-34	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	FPE
C	RECORD DRAWINGS–FILLING OF SUMPS	NB	AM			4/24/23 CT																				
B	TRANSLATE FROM CADAM TO INTERGRAPH																									
A	AS CONSTRUCTED																									
0	ADDED ROOF CURB & INCREASED LOUVER SIZE	BBK	RMC	BKM	JDH	8/30/93	RMC	N.J.L.	8/4/93	BDM	8/23/93				JDH	8/30/93		RMC		BDN	CLE					
	ISSUED APPROVED	MG	RMC	JDH	JDH	9/29/93	RMC	N.J.L.	8/4/93	BDM	8/4/93							RMC		WKT	CLE	BGS				SDC

REVISION OR ISSUE PURPOSE | REVISION APPROVALS | SQUAD CHECK | DRAWING APPROVALS

DES	R.M. COLLINS	09/09/92
DRW	M. OAKLEY	09/09/92
CHK	R.M. COLLINS	12/22/92
SECT	J.D. HUGGINS	04/29/93
DEPT	J.D. HUGGINS	04/29/93
PE	R.M. COLLINS	06/04/93
PJ	L.C. COX	06/08/93
REQ	N.J. LOWE	06/04/93
MMES	B.C. MCCELLAND	06/04/93

MARTIN MARIETTA ENERGY SYSTEMS, INC.
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contracts DE-AC-05-84OR21400 and DE-AD-05-76OR00001
Oak Ridge, Tennessee ■ Paducah, Kentucky ■ Portsmouth, Ohio

PROJECT NAME: RH TRU STORAGE FACILITY

BUILDING PLAN

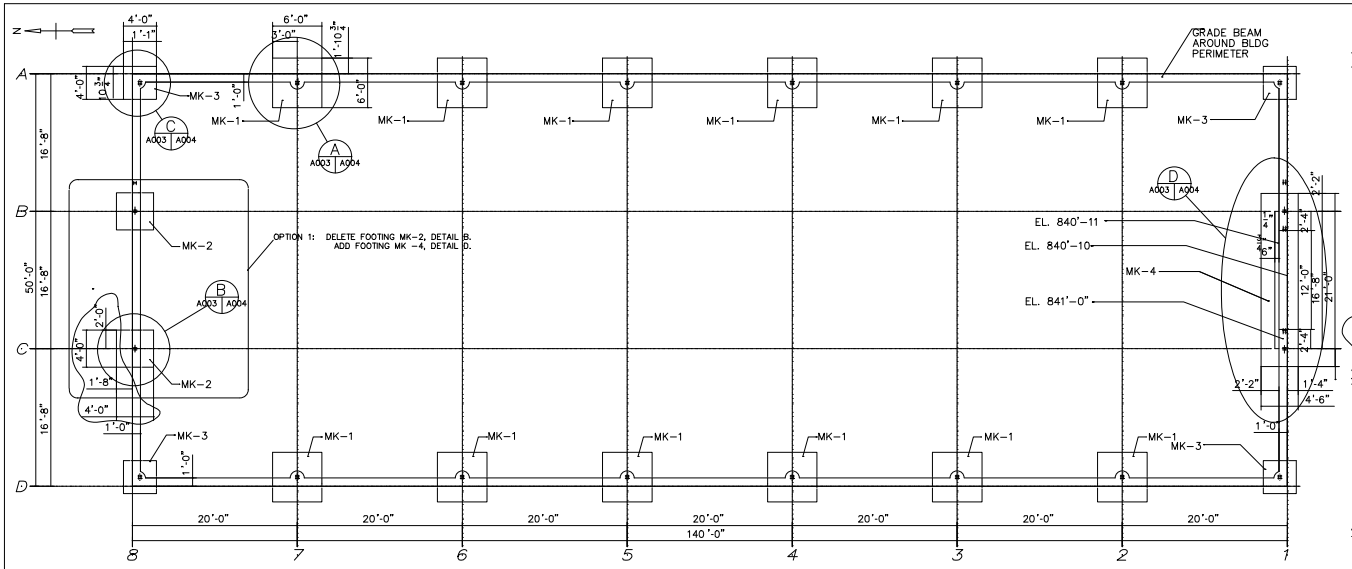
PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
X-10	7572	1	01	01	P	U

3 C	48 S	49 S	50 X-10	51 CC	52 RC	53 AR

S3E021454A001 REV A

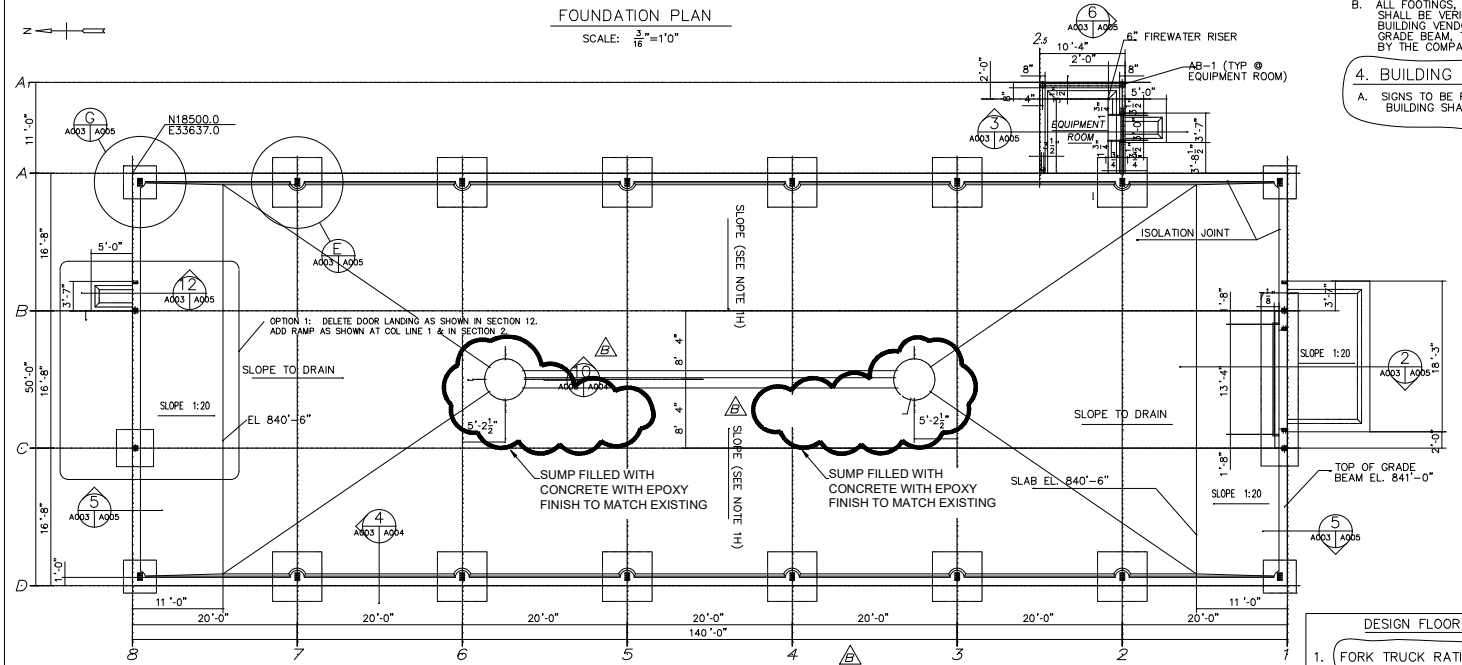
PLOT DATE: 4/25/23 NUMBER OF MODELS IN THIS DRAWING= 1

Figure 8.1-1



FOUNDATION PLAN

SCALE: $\frac{3}{16}$"=1'0"



FLOOR SLAB PLAN

SCALE: $\frac{3}{16}$"=1'0"

1. CONCRETE MEETS 4000 PSI COMPRESSIVE STRENGTH.
2. EPOXY WAS APPLIED PER THE MANUFACTURER'S INSTRUCTION.

GENERAL NOTES

1. CONCRETE:

A. CONCRETE SHALL BE SUPPLIED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-03000 AND GPW-03310 AND DEVELOP A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.

B. CONCRETE INTERIOR FLOOR, SUMP AND CURB FACES SHALL BE COATED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-09900.

C. GROUT SHALL BE PREMIXED, NON-SHRINKING TYPE HAVE A COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS SUCH AS "EMBCO" AS MANUFACTURED BY THE MASTER BUILDERS CO. OR "5-STAR" AS MANUFACTURED BY THE U.S. GROUT CO.

D. CONCRETE REINFORCEMENT SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-03200 AND DEVELOP A MINIMUM YIELD OF 60 KSI.

E. LAP SPLICES IN GRADE BEAM REINFORCEMENT SHALL NOT BE WITHIN 4' OF CORNERS.

F. FORMWORK FOR STRUCTURAL CAST-IN-PLACE CONCRETE SHALL BE PROVIDED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-03110.

G. WATER STOPS EMBEDDED IN STRUCTURAL CAST-IN-PLACE CONCRETE SHALL BE INSTALLED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-03253.

2. SITE WORK:

A. STRUCTURAL EXCAVATION, BACKFILL AND COMPACTION SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-02223.

B. SAND CUSHION UNDER SLAB SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-02230.

C. STABILIZED AGGREGATE BASE COURSE FILL UNDER SLAB SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-02505.

D. VAPOR BARRIER UNDER SAND CUSHION SHALL BE INSTALLED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-02515.

3. FOUNDATIONS:

A. FOOTINGS SHALL BE CARRIED TO SOIL HAVING AN ALLOWABLE BEARING CAPACITY OF 2500 PSF.

B. ALL FOOTINGS, GRADE BEAMS AND SLAB DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED WITH CERTIFIED BUILDING DRAWINGS FURNISHED BY THE BUILDING VENDOR. PRIOR TO THE CONSTRUCTION OF SLAB, FOOTINGS AND GRADE BEAM, THE ADEQUACY OF THE FOUNDATION DESIGN SHALL BE VERIFIED BY THE COMPANY USING CERTIFIED DESIGN LOADS FROM THE BUILDING VENDOR.

4. BUILDING SIGNS:

A. SIGNS TO BE PROVIDED BY FACILITY MANAGER. SIGNS ON EXTERIOR OF BUILDING SHALL READ:

BUILDING CODE CLASSIFICATIONS

NFPA 101 (1991) – LIFE SAFETY CODE:
- OCCUPANCY CLASSIFICATION – STORAGE
- HAZARD CONTENTS – ORDINARY

UNIFORM BUILDING CODE (1991):
- OCCUPANCY CLASSIFICATION – GROUP H, DIVISION 7
- TYPE OF CONSTRUCTION – TYPE II-N
- SEISMIC ZONE – 2A

UCRL 15910 (JUNE 1990),
- USAGE CATEGORY – LOW HAZARD

NFPA 13 (1991), INSTALLATION OF SPRINKLER SYSTEMS:
- CLASSIFICATION OF SPRINKLER – ORDINARY HAZARD, GROUP 2

THE EXHAUST FANS IN THIS BUILDING ARE DESIGNED TO ACCOMMODATE THE FOLLOWING FORKTRUCKS

1. DIESEL POWERED – 152 HP MAXIMUM
2. PROPANE POWERED – 140 HP MAXIMUM
3. GASOLINE POWERED – 87 HP MAXIMUM
4. ELECTRIC POWERED

SIGN ON INTERIOR OF BUILDING @ SAME LOCATION SHALL READ:

NO FLAMMABLE LIQUIDS

DESIGN FLOOR LOADS

1. FORK TRUCK RATING 18,000# CAPACITY (PNEUMATIC TIRES)
2. TRUCK LOADING ASSHTO HS-20-44
3. UNIFORM FLOOR LOAD 1300PSF

SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE EP-C-18

REV	DESCRIPTION	BY	CHK	SECT	DEPT	DATE	PE	REQ	DATE	MMES	DATE	RPE	RPE NO	DATE	ES-D-3	DATE	ST	CV	EC	EE	EM	E	M	PD	SE	RPE	REV.	DATE
B	RECORD DRAWINGS-FILLING OF SUMPS	NB	AM			6/23/93 CT																						
A	INCREASED FORK TRUCK CAPACITY & UNIFORM FLOOR LOAD	EBK	RMC	EKM	JDH	6/30/93	RMC	N.J.L.	6/4/93	BCM	6/4/93				JDH	6/30/93						BDN	CLE			RMC		
0	ISSUED APPROVED	MO	RMC	JDH	JDH	6/29/93	RMC	N.J.L.	6/4/93	BCM	6/4/93						RMC					WKT	CLE	BGS				

RPE

DES	R.M. COLLINS	09/09/92
DRW	M. OAKLEY	09/09/92
CHK	R.M. COLLINS	12/22/92
SECT	J.D. HUGGINS	04/29/93
DEPT	J.D. HUGGINS	04/29/93
PE	R.M. COLLINS	06/04/93
PJ	L.C. COX	06/08/93
REQ	N.J. LOWE	06/04/93
MMES	B.C. MCCLELLAND	06/04/93

DRAWING APPROVALS

MARTIN MARIETTA ENERGY SYSTEMS, INC.
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contracts DE-AC-05-84OR21400 and DE-AC-05-76OR00033
Oak Ridge, Tennessee•Paducah, Kentucky•Portsmouth, Ohio

PROJECT NAME: RH TRU STORAGE FACILITY

BUILDING SLAB & FOUNDATION PLAN

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	S	S	X-10	7572	1	01	01	P	U

51	52	53	REV
CC	RC	AR	A

S3E021454A003

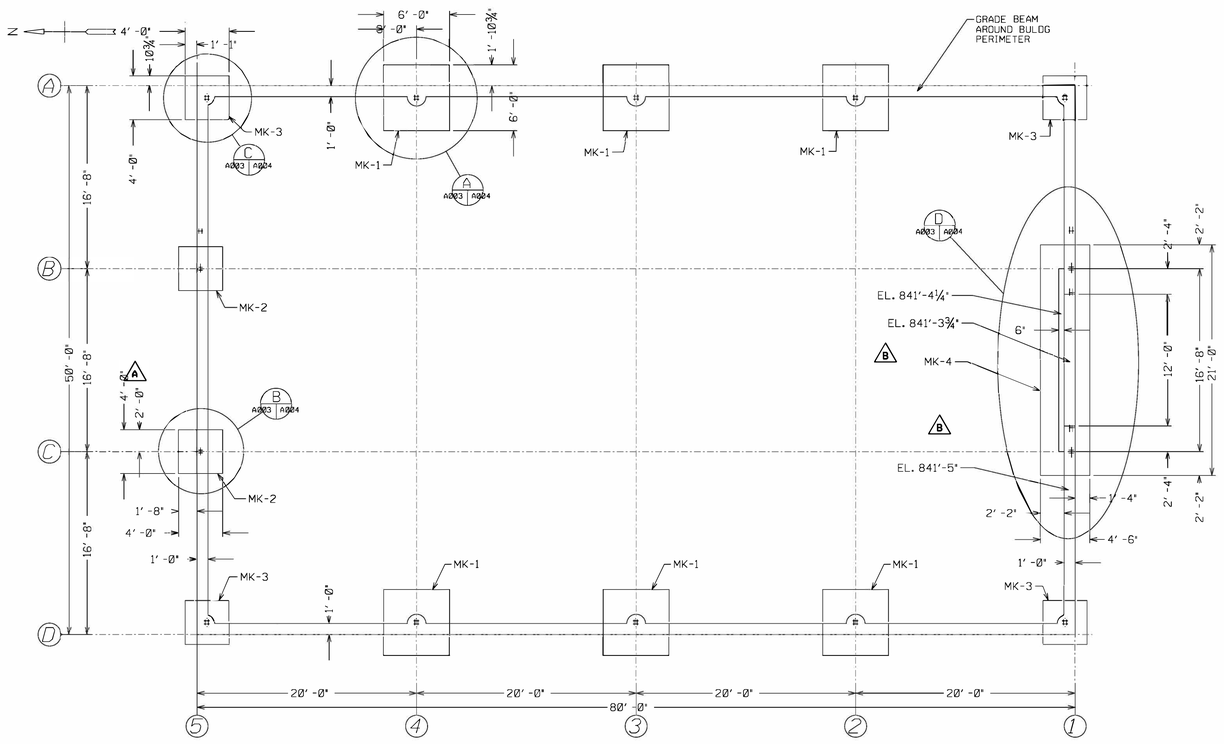
SCALE: $\frac{1}{4}$" = 1'-0"

TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS ± X/XX
XX DECIMALS ± .XX
XXX DECIMALS ± .XXX
ANGLES ± X0-'00"
BREAK SHARP EDGES MAX.
FINISH XXX RMS

PLOT DATE: 6/30/93 NUMBER OF MODELS IN THIS DRAWING= 1

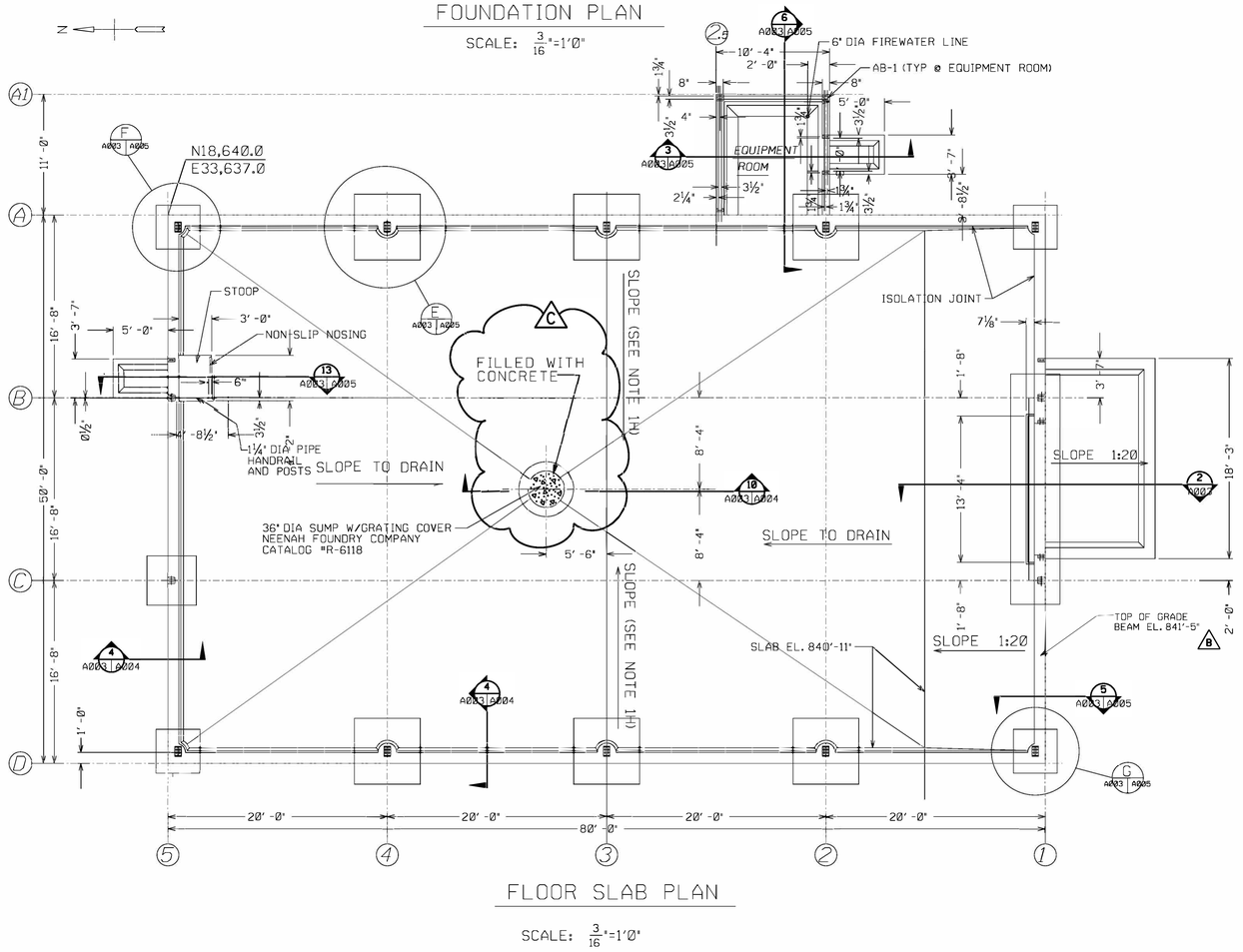
S3E021454A003

Figure 8.1-2



FOUNDATION PLAN

SCALE: $\frac{3}{16}$"=1'Ø"



FLOOR SLAB PLAN

SCALE: $\frac{3}{16}$"=1'Ø"

GENERAL NOTES

1. CONCRETE:

A. CONCRETE SHALL BE SUPPLIED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-03000 AND GPW-03310 AND DEVELOP A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.

B. CONCRETE INTERIOR FLOOR, SUMP AND CURB FACES SHALL BE COATED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-09900.

C. GROUT SHALL BE PREMIXED, NON-SHRINKING TYPE HAVE A COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS SUCH AS "EMBCO" AS MANUFACTURED BY THE MASTER BUILDERS CO. OR "5-STAR" AS MANUFACTURED BY THE U.S. GROUT CO.

D. CONCRETE REINFORCEMENT SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-03200 AND DEVELOP A MINIMUM YIELD OF 60 KSI.

E. LAP SPLICES IN GRADE BEAM REINFORCEMENT SHALL NOT BE WITHIN 4' OF CORNERS.

F. FORMWORK FOR STRUCTURAL CAST-IN-PLACE CONCRETE SHALL BE PROVIDED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-03110.

G. WATER STOPS EMBEDDED IN STRUCTURAL CAST-IN-PLACE CONCRETE SHALL BE INSTALLED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-03253.

2. SITE WORK:

A. STRUCTURAL EXCAVATION, BACKFILL AND COMPACTION SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-02223.

B. SAND CUSHION UNDER SLAB SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-02230.

C. STABILIZED AGGREGATE BASE COURSE FILL UNDER SLAB SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-02505.

D. VAPOR BARRIER UNDER SAND CUSHION SHALL BE INSTALLED IN ACCORDANCE WITH TECHNICAL SPECIFICATION GPW-02515.

3. FOUNDATIONS:

A. FOOTINGS SHALL BE CARRIED TO SOIL HAVING AN ALLOWABLE BEARING CAPACITY OF 2500 PSF.

B. ALL FOOTINGS, GRADE BEAMS AND SLAB DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED WITH CERTIFIED BUILDING DRAWINGS FURNISHED BY THE BUILDING VENDOR. PRIOR TO THE CONSTRUCTION OF SLAB, FOOTINGS AND GRADE BEAM, THE ADEQUACY OF THE FOUNDATION DESIGN SHALL BE VERIFIED BY THE COMPANY USING CERTIFIED DESIGN LOADS FROM THE BUILDING VENDOR.

DESIGN FLOOR LOADS

1. FORK TRUCK RATING — 18,000# CAPACITY (PNEUMATIC TIRES)
2. TRUCK LOADING — ASSHTO HS-20-44
3. UNIFORM FLOOR LOAD — 1300PSF

REV			
C	ADDED NOTE "FILLED SUMP WITH CONCRETE"	LM	
B	AS CONSTRUCTED	MO	
A	INCREASED FORK TRUCK CAPACITY & UNIFORM FLOOR LOAD	BBK RMC BKM JDH 8/30/93	RMC NJL 6/4/93 BCM/LCC 9/23/93 JDH 7583 8/30/93 RMC BDN CLE
Ø	ISSUED APPROVED	MØ RMC JDH JDH 4/27/93	RMC NJL 6/4/93 BCM 6/4/93 RMC WKT CLE BGS SDC

EP-C-18

SCALE: $\frac{1}{4}$" = 1'-Ø"

TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS ± X/XX
XX DECIMALS ± .XX
XXX DECIMALS ± .XXX
ANGLES ± X°-XX'
BREAK SHARP EDGES MAX.
FINISH XXX RMS

R.M. COLLINS	09/09/92
M. OAKLEY	09/09/92
R.M. COLLINS	12/22/92
B.K. MILES	04/27/93
J.D. HUGGINS	04/27/93
R.M. COLLINS	06/04/93
L.C. COX	06/08/93
N.J. LOWE	06/04/93
B.C. MCCELLAND	06/04/93

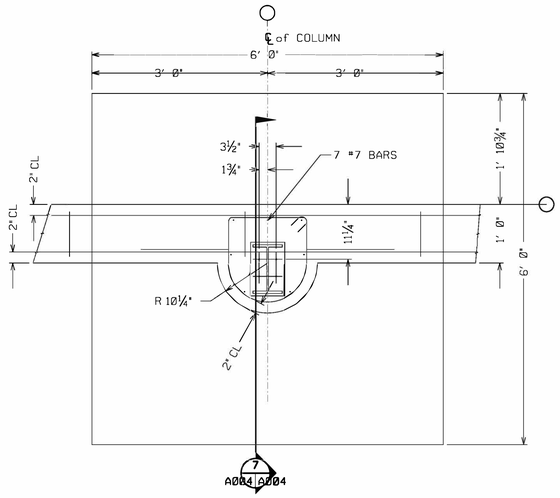
NFS WASTE STORAGE FACILITY BUILDING
SLAB & FOUNDATION PLAN

3 C S S X-10 7574 1 1 1 P U
CC RC AR S3E021464A003 C

S3E021464A003

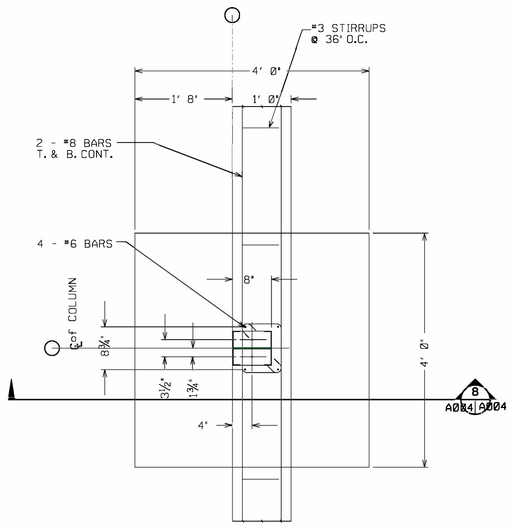
WESKEM-03\S3E021464A003C.DGN

Figure 8.1-3



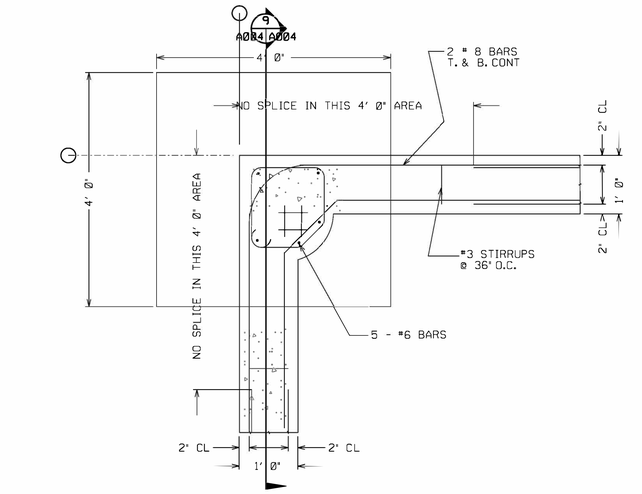
MK-1

DETAIL A
SCALE: 1"=1'-0" * A004



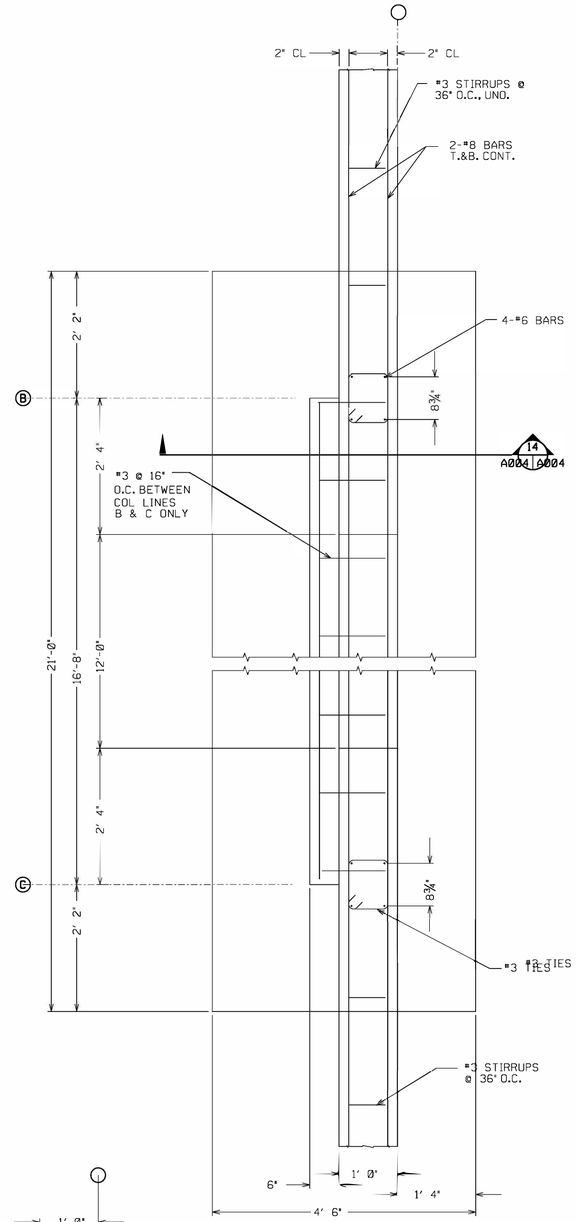
MK-2

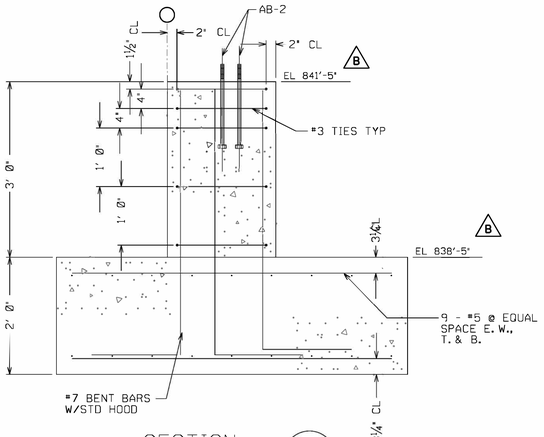
DETAIL B
SCALE: 1"=1'-0" * A004



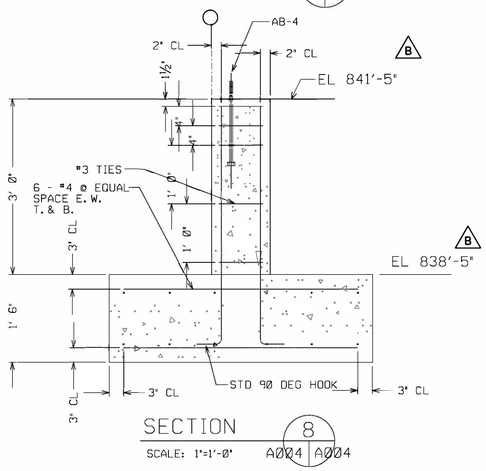
MK-3

DETAIL C
SCALE: 1"=1'-0" * A004

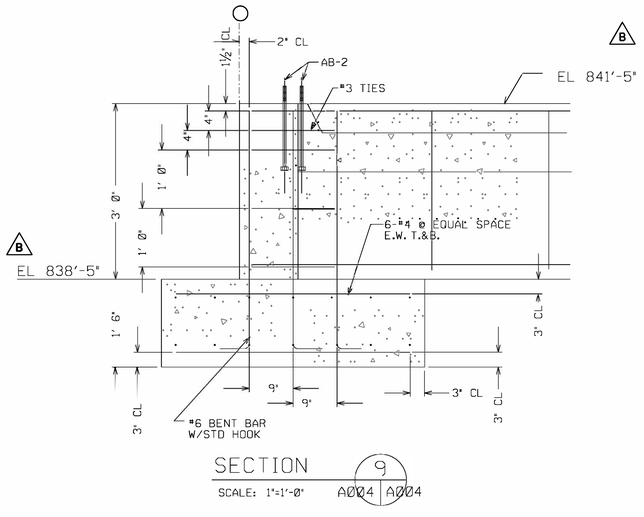




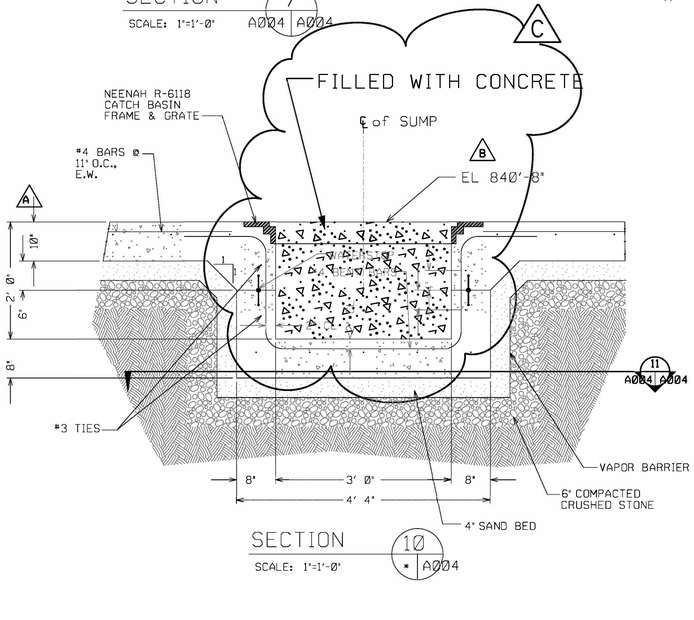
SECTION 7
SCALE: 1"=1'-0" A004 A004



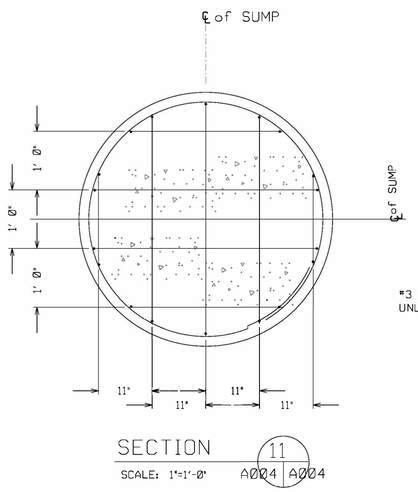
SECTION 8
SCALE: 1"=1'-0" A004 A004



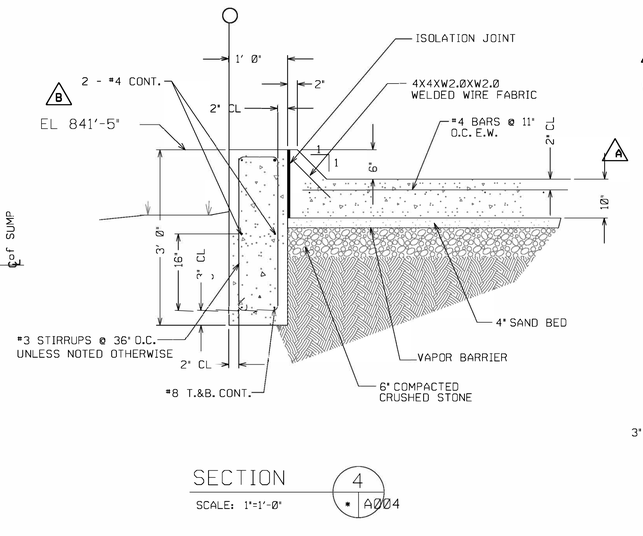
SECTION 9
SCALE: 1"=1'-0" A004 A004



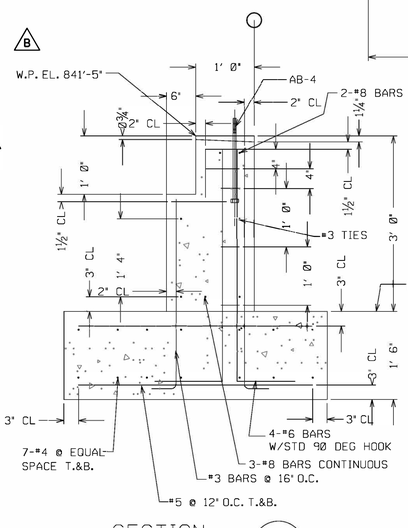
SECTION 10
SCALE: 1"=1'-0" * A004



SECTION 11
SCALE: 1"=1'-0" A004 A004



SECTION 4
SCALE: 1"=1'-0" * A004



MK-4

DETAIL D
SCALE: 1"=1'-0" * A004

NOTE:

* SECTIONS TAKEN ON THE FOLLOWING DRAWING:

S3E021464A003

S3E021464A004

SCALE: ¼" = 1'-0"

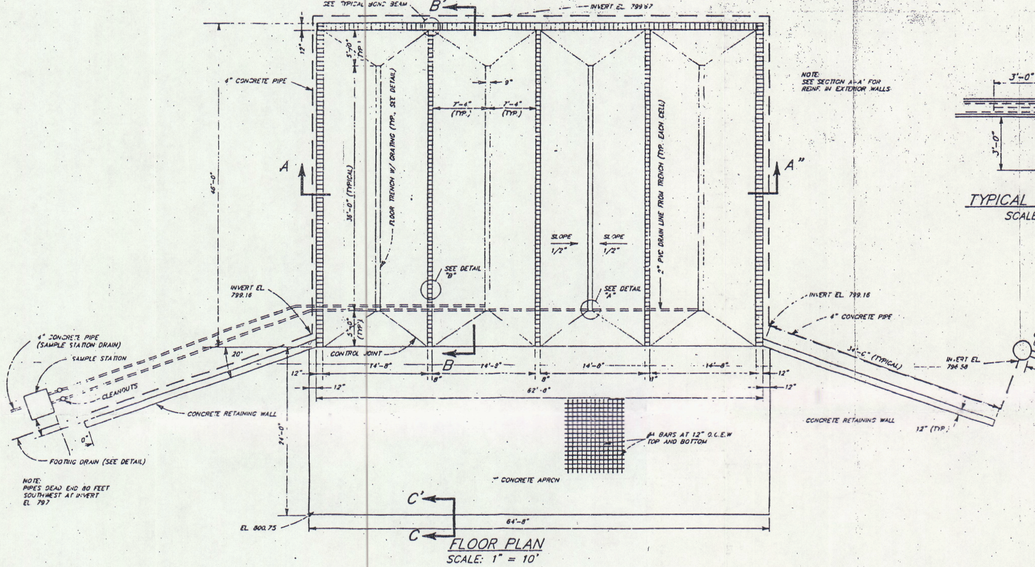
TOLERANCES
UNLESS OTHERWISE SPECIFIED

FRACTIONS ± X/XX
XX DECIMALS ± .XX
XXX DECIMALS ± .XXX
ANGLES ± X± XX'
BREAK SHARP EDGES MAX.
FINISH XXX RMS

| | | |

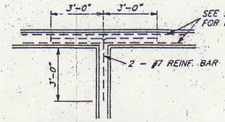
REMOVED

FIGURE 8.1-5

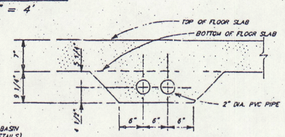


FLOOR PLAN
SCALE: 1" = 10'

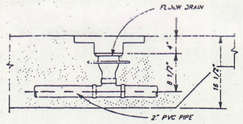
NOTE: SEE SECTION A-A' FOR REINF. IN EXTERIOR WALLS



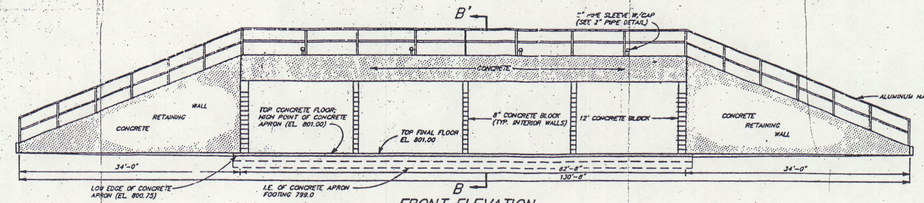
TYPICAL BOND BEAM
SCALE: 1" = 4'



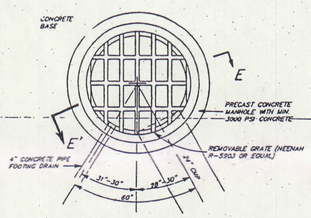
DETAIL "B"
NOT TO SCALE



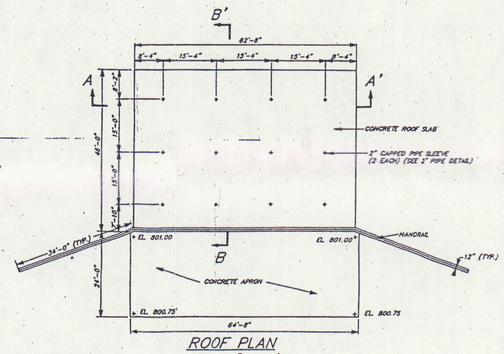
DETAIL "A"
NOT TO SCALE



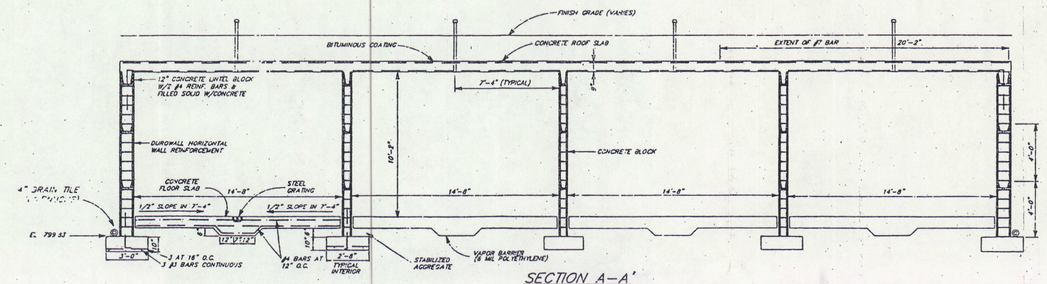
FRONT ELEVATION
SCALE: 1" = 10'



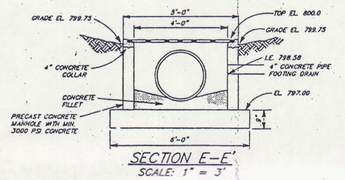
CATCH BASIN PLAN
NOT TO SCALE



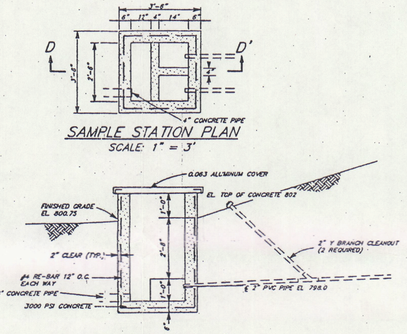
ROOF PLAN
SCALE: 1" = 20'



SECTION A–A'
SCALE: 1" = 5'

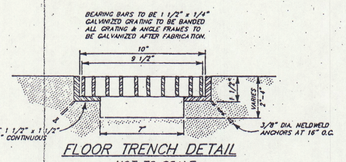


SECTION E–E'
SCALE: 1" = 3'

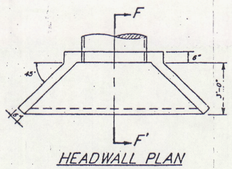


SAMPLE STATION PLAN
SCALE: 1" = 3'

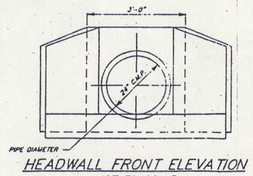
SECTION D–D'
SCALE: 1" = 3'



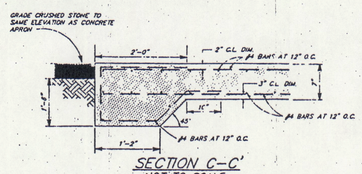
FLOOR TRENCH DETAIL
NOT TO SCALE



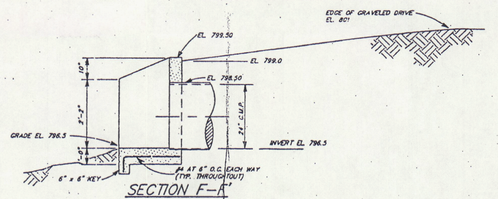
HEADWALL PLAN
NOT TO SCALE



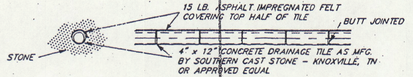
HEADWALL FRONT ELEVATION
NOT TO SCALE



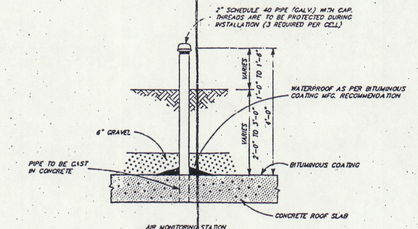
SECTION C–C'
NOT TO SCALE



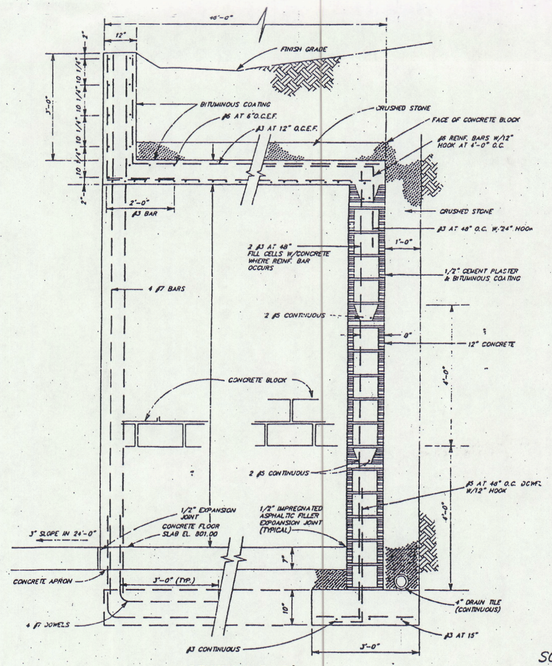
SECTION F–F'
NOT TO SCALE



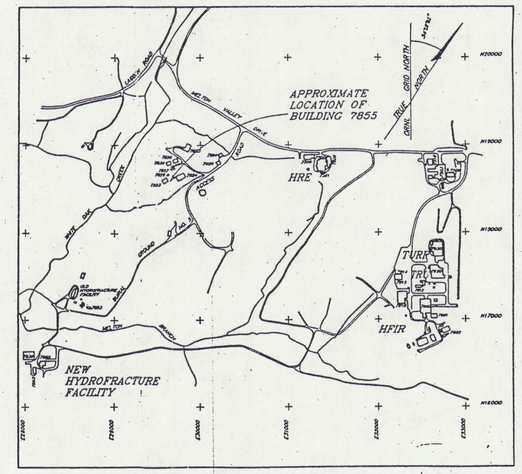
FOOTING DRAIN PIPE DETAIL
NOT TO SCALE



2" PIPE DETAIL
NOT TO SCALE



SECTION B–B'
SCALE: 1" = 2'



LOCATION MAP
SCALE: 1" = 800'

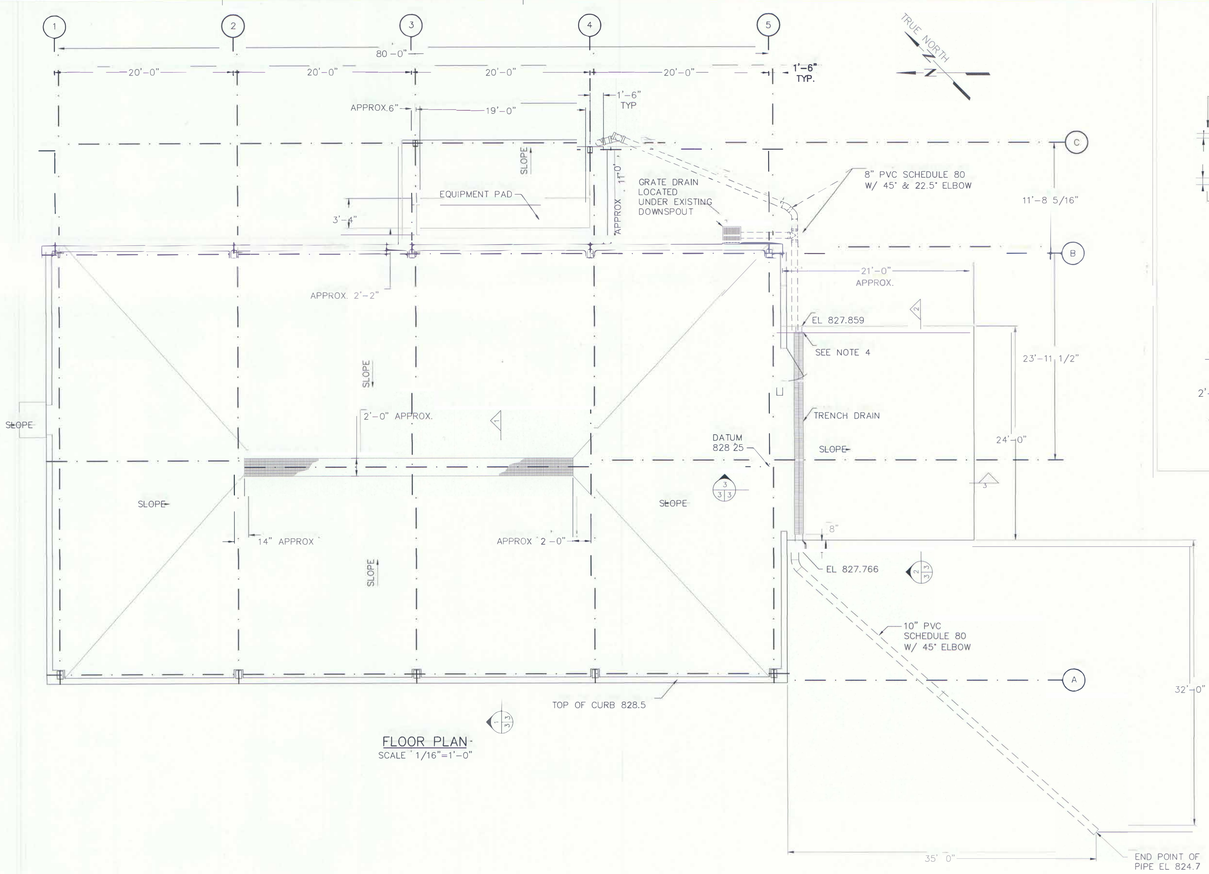
METRIC CONVERSION FACTORS: 1 FOOT = .3048 METER, 1 INCH = 2.54 CENTIMETER

SOURCE: ORNL DRAWING NOS. A3E-21270-B005, C3E-21270-B006, A3E-21270-B007, A3E-21270-B008 &A3E-21270-B009.

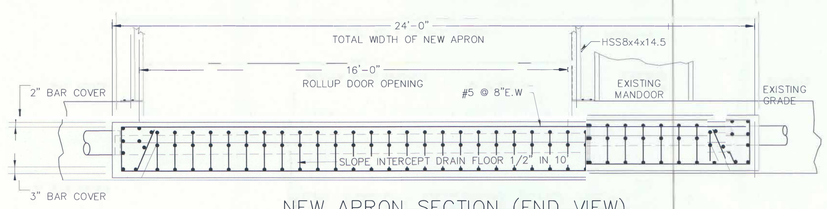
PREPARED BY:
ENGINEERING DESIGN & GEOSCIENCE GROUP, INC.
PELLISSIPPI CENTER
225 PELLISSIPPI PARKWAY
KNOXVILLE, TENNESSEE 37922
AND
PEER CONSULTANTS P.C.
575 OAK RIDGE TURNPIKE
OAK RIDGE, TENNESSEE 37830

OAK RIDGE NATIONAL LABORATORY
TRU RETRIEVABLE STORAGE FACILITIES
BUILDING 7855

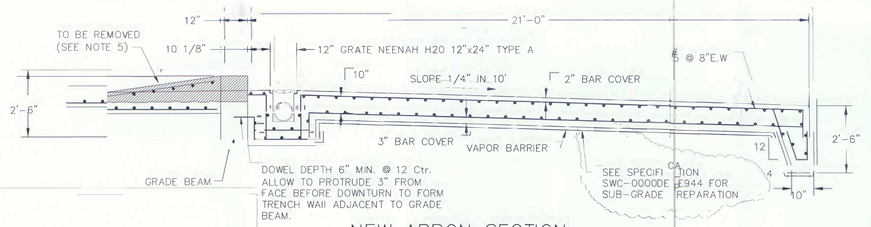
FIGURE 8.1-6



FLOOR PLAN
SCALE: 1/16"=1'-0"



NEW APRON SECTION (END VIEW)
SECTION 2/2
SCALE: 3/8"=1'-0"



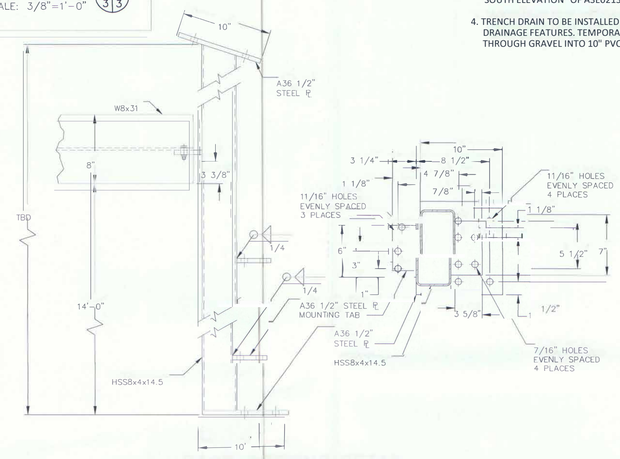
NEW APRON SECTION-SECTION 3/3
SCALE: 3/8"=1'-0"

NOTES: FOR APRON MODIFICATIONS

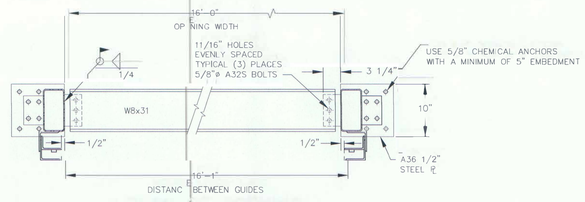
1. MINIMUM 28 DAY BREAK STRENGTH 5000 PSI MAX W/C RATIO 0.45. AIR CONTENT PER TABLE 19.3.3.1 FOR EXPOSURE F2, ACI 318-14.
2. #5 BAR LAP SPLICE LENGTH 28 INCHES MINIMUM, PER ACI.
3. REBAR DOWELS TO BE BONDED TO EXISTING GRADE BEAM USING EPOXY IN NOTE 4.
4. USE AN EPOXY BONDING AGENT FOR REBAR DOWELS WITH A MINIMUM COMPRESSIVE YIELD OF 12,000 PSI AND A TENSILE ULTIMATE YIELD OF 28,000 PSI.
5. GRIND GRADE BEAM AT DOOR THRESHOLD SUCH THAT NEW THRESHOLD WILL BE 3 INCHES DOWN EVEN WITH THE INSIDE FLOOR ELEVATION AT THE ROLL UP DOOR OPENING. THIS WILL REQUIRE THE GRINDING TO BE A MINIMUM OF 3 INCHES INTO THE OLD FLOOR TO ALLOW LAPPING OF THE TOP LAYER OF REBAR AND REPOURING OF THIS FLOOR WHERE GRINDING HAS OCCURRED.
6. USE INTRALOK BONDING AGENT OR EQUIVALENT BETWEEN OLD AND NEW CONCRETE AT GRIND JOINT INSIDE BUILDING.

NOTES FOR REFERENCE DRAWINGS:

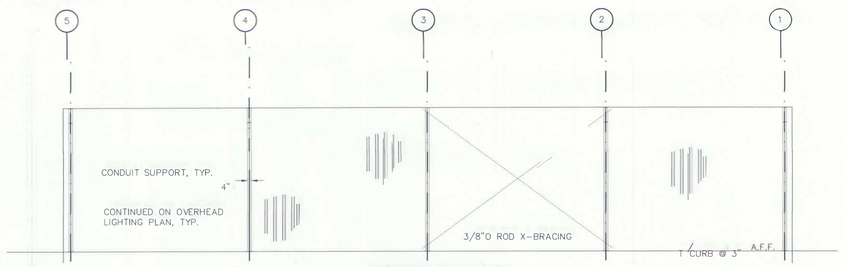
1. NEW FLOOR PLAN SHOWN ON THIS DRAWING, A3D021353A003, HAS BEEN CHANGED TO REFLECT A DOOR OPENING OF 16 FEET WIDE, AND REPLACES THE FLOOR PLAN ON A3E021353A001 AND S3E021353A001 SHOWING AN OLD DOOR OPENING OF 12 FEET WIDE.
2. NEW DRAWING A3D021353A003 SECTIONS 2 & 3 REPLACES SECTION 4 OF S3E021353A001. THE NEW SECTIONS SHOW THE FRONT AND SIDE APRON DETAILS WITH THE NEW "INTERCEPT RENCH" WITH H20 NEENAH 12" X 24" TYPE A.
3. NEW DRAWING A3D021353A003 SHOWS THE REVISED "FRONT ELEVATION" WHICH DETAILS LOCATIONS FOR THE 16 FOOT WIDE X 14 FOOT HIGH ROLLUP DOOR AND REVISED EXTERIOR LIGHT LOCATION, AND DETAILS OF THE OF THE NEW DOOR OPENING FRAMING STRUCTURE AND "FRONT SECTION" WHICH REPLACE "SOUTH ELEVATION" OF A3E021353A002.
4. TRENCH DRAIN TO BE INSTALLED AFTER ALL OTHER DRAINAGE FEATURES. TEMPORARILY PLACE 8" PVC THROUGH GRAVEL INTO 10" PVC EXIT DRAIN.



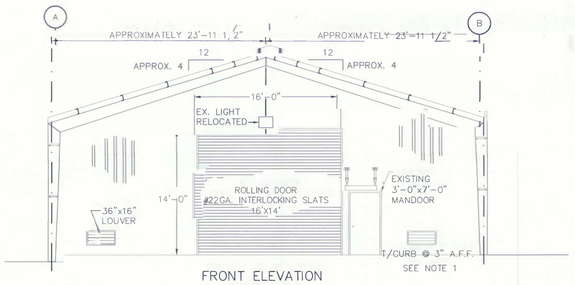
DOOR OPENING DETAIL
SCALE: 1-1/2"=1'-0"



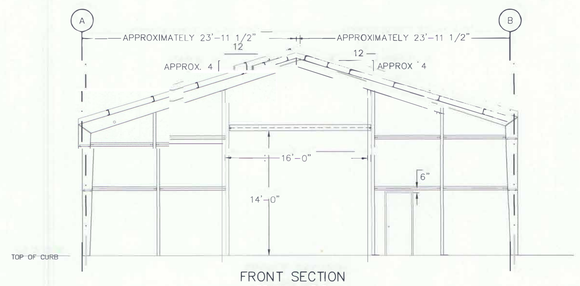
PLAN OF OPENING
SCALE: NTS



INTERIOR ELEVATION
COLUMN LINE A
SCALE: 1/16"=1'-0"



FRONT ELEVATION
COLUMN LINE 5
SCALE: 1/16"=1'-0"



FRONT SECTION
COLUMN LINE 5
SCALE: 1/16"=1'-0"

JOHN RAST (Affiliate) 12/17/2018
Digitally signed by JOHN RAST (Affiliate)
Date: 2018.12.17 07:01:24 -05'00'

DRW	William T. McMurray	Digitally signed by William T. McMurray Date: 2018.12.16 11:52:13 -05'00'
CHK	Douglas Jamieson	Digitally signed by Douglas Jamieson Date: 2018.12.16 12:09:36 -05'00'
ENGR	JOHN RAST (Affiliate)	Digitally signed by JOHN RAST (Affiliate) Date: 2018.12.16 12:14:12 -05'00'
PROJ ENGR	GERALD GAULDEN (Affiliate)	Digitally signed by GERALD GAULDEN (Affiliate) Date: 2018.12.17 05:25:51 -05'00'

ELECTRONIC SIGNATURES

REV	DATE	DESCRIPTION	DRW	CHK	ENGR	PROJ ENGR
2	12/16/18	REVISED TO UPDATE TO CODE ACI-318(2014)	WTM	DBJ	JLR	GMG
1	10/16/18	REVISED ROUTE & ELEVATIONS OF DRAIN LINE	JAT	DBJ	JLR	GMG
0	09/10/18	ISSUED FOR CONSTRUCTION	JAT	DBJ	JLR	GMG

REVISIONS RECORD

UCOR URS | CH2M Oak Ridge LLC

OAK RIDGE RESERVATION
MANAGED FOR THE DEPARTMENT OF ENERGY
UNDER CONTRACT DE-SC-0004645

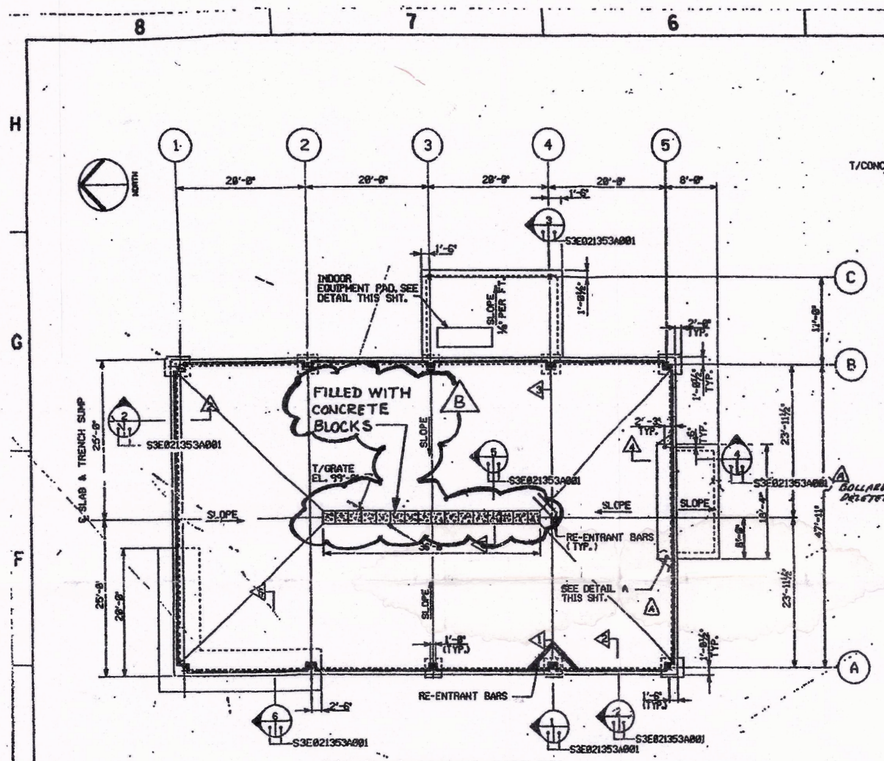
PROJECT RECORD NUMBER	CONFIGURATION MANAGEMENT LEVEL
N/A	3

PROJECT NAME
ORNL BLDG 7879

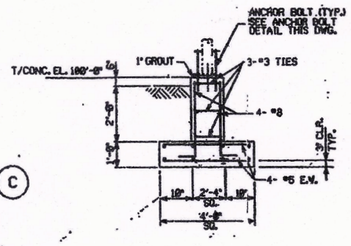
TITLE
BUILDING FLOOR PLAN, DOOR & APRON MODIFICATIONS

CAD FILENAME	BUILDING	SITE	CLASS
A3D021353A003	7879	ORNL	U
SCALE	TYPE	DRAWING NUMBER	REV
AS NOTED	1N	A3D021353A003	2

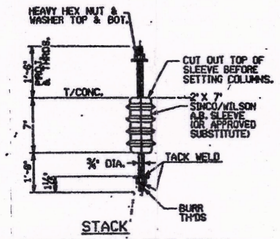
FIGURE 8.1-7



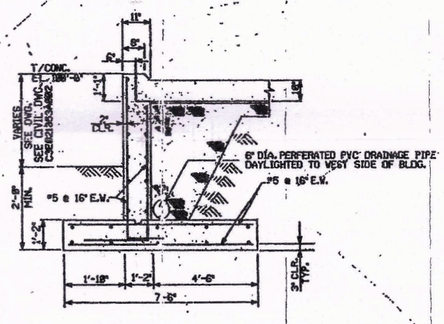
TRU/SLLW STAGING FACILITY
FOUNDATION AND SLAB PLANS
N.T.S. T/CONC. GRADE BEAM EL. 100'-0"



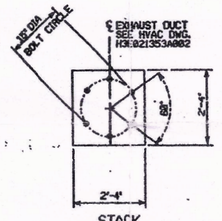
TYPICAL STACK FOUNDATION
N.T.S. NOTE: FOR STACK LOCATION, SEE CIVIL DWG. C3E021353A002 AND HVAC DWG. H3E021353A002



STACK
ANCHOR BOLT W/SLEEVE DETAIL
N.T.S.



SECTION
N.T.S.
NOTE: FOR REINF. NOT SHOWN SEE SECT. 1



STACK
ANCHOR BOLT SETTING PLAN
N.T.S. (6 BOLTS REQ'D)

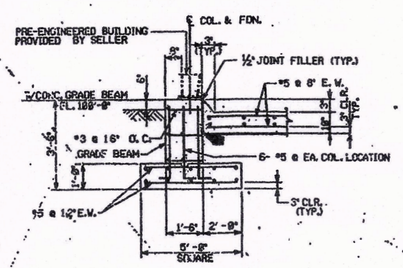
GENERAL NOTES - CONCRETE:

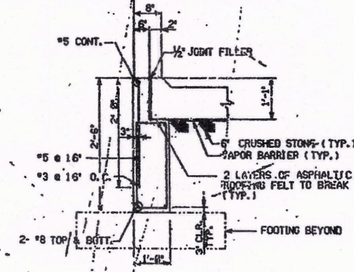
1. ALL NOTES LISTED BELOW ARE APPLICABLE EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
2. DETAILING, FABRICATION AND PLACING OF REINFORCING STEEL SHALL CONFORM TO THE MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI-SP-66, LATEST EDITION).
3. FOOTINGS AND FOUNDATIONS ARE DESIGNED FOR MINIMUM SOIL BEARING PRESSURE OF 2000 PSF. FOOTINGS SHALL BEAR ON UNDISTURBED SOIL OR ENGINEERED FILL.
4. CONCRETE SHALL BE PLACED ONLY ON A BASE FREE OF ANY STANDING WATER.
5. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI FOR FOOTINGS, SLABS AND RETAINING WALL IN 28 DAYS. SEE SPECIFICATIONS FOR MORE DEFINITION.
6. FORM ALL EXPOSED EXTERNAL CORNERS OF CONCRETE WITH 3/4" X 45 DEGREE CHAMFER.
7. REINFORCING STEEL SHALL BE GRADE 60, DEFORMED BARS, CONFORMING TO ASTM A615.
8. BAR SPLICES SHALL BE CLASS "B" TENSION LAP SPLICES.
9. PROVIDE TWO #4 X 4'-0" DIAGONAL BARS IN THE TOP FACE OF SLAB ON GRADE AT ALL RE-ENTRANT CORNERS. EXTEND REINFORCING BARS PAST RE-ENTRANT CORNERS A MINIMUM OF TENSION DEVELOPMENT LENGTH (LD.).
10. REFERENCE VENDOR DRAWINGS FOR EMBEDDED ITEMS AND RECESSES NOT SHOWN ON THE STRUCTURAL DRAWINGS.
11. BOLLARDS SHALL BE ASTM A36 (FY=36 KSI). △ BOLLARDS DELETED
12. SPLICE TOP BARS AT CENTER OF SPAN AND BOTTOM BARS AT THE FOOTING SUPPORT FOR GRADE BEAMS.
13. REINFORCING BAR HOOKS SHOWN ON THE DRAWINGS SHALL BE ACI STANDARD 90 DEGREE HOOKS.
14. CONCRETE KEYS SHALL BE 1-1/2" X 3-1/2".
15. CONSTRUCTION JOINTS IN GRADE BEAMS SHALL BE MADE AT MID-SPAN. ANY STOP IN CONCRETE WORK MUST BE MADE WITH A KEYED VERTICAL FORM AND CONTINUOUS REINFORCING THROUGH THE JOINT.
16. GRADE SLAB CONSTRUCTION SHALL BE MONOLITHIC WITHOUT CONSTRUCTION JOINTS, EXCEPT AS NOTED ON PLAN.
17. T/CONC. GRADE BEAM ELEVATION 100'-0" = 822'-0" MSL.
18. ANCHOR BOLT SIZE, MATERIAL, EMBEDMENT AND LOCATION TO BE PROVIDED BY PRE-ENGINEERED BLDG. MANUFACTURER.
19. SELLER SHALL VERIFY DIMENSIONS OF PRE-ENGINEERED BUILDING FROM CERTIFIED BLDG. DRAWINGS. MODIFY FOUNDATIONS AS REQUIRED TO ACCOMMODATE, AFTER CONSULTING WITH COMPANY.
20. SELLER SHALL VERIFY LOADS FROM CERTIFIED BUILDING DRAWINGS. IF LOADS EXCEED THOSE LISTED BELOW, SELLER SHALL NOTIFY COMPANY IMMEDIATELY.
21. WATERSTOP SHALL BE RIBBED PVC, NO. R9-38, 9" WIDE, AS MANUFACTURED BY VINYLEX CORPORATION, OR APPROVED SUBSTITUTE.
22. VAPOR BARRIER SHALL BE SUPER SAMPSON, 4 MIL. HIGH DENSITY, 3 LAYER POLYETHYLENE AS SOLD BY E-CO MATERIALS, OR APPROVED SUBSTITUTE.
23. COMPACTED CRUSH STONE SHALL CONFORM TO ASTM D-448.
24. STACK ANCHOR BOLTS SHALL BE ASTM A-36.

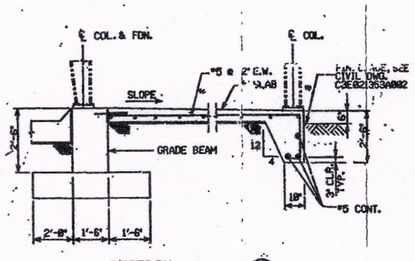
DESIGN LOADS:
GRADE SLAB DEAD LOAD = 125 PSF
GRADE SLAB LIVE LOAD = 600 PSF OR 22 KIP AXLE LOAD

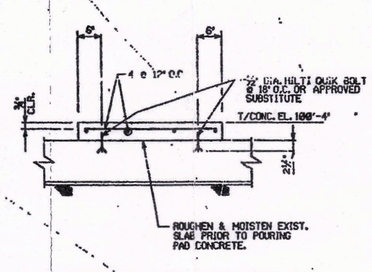
PRE-ENGINEERED BLDG. FOOTING LOADS (SEE NOTE 20.)
ASSUMED DEAD PLUS LIVE LOAD = 14 KIP
ASSUMED DEAD PLUS WIND LOAD = 5.5 KIP
ASSUMED BASE SHEAR = 6.9 KIP

RELATED DRAWINGS:
C3E021353A001
A3E021353A001
S3E021353A001
C3E021353D001
PSE021353A001







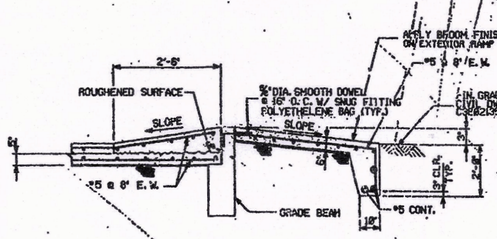


SECTION
N.T.S.
S3E021353A001

SECTION
N.T.S.
NOTE: FOR REINF. NOT SHOWN SEE SECT. 1
S3E021353A001

SECTION
SCALE: ½" = 1'-0"
NOTE: FOR REINF. NOT SHOWN SEE SECT. 1
S3E021353A001

INDOOR EQUIPMENT PAD (TYP.)
N.T.S.
NOTE: SEE HVAC DWG. H3E021353A002 FOR LOCATION & SIZE OF PAD.



SECTION
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NOTE: FOR REINF. NOT SHOWN SEE SECT. 2
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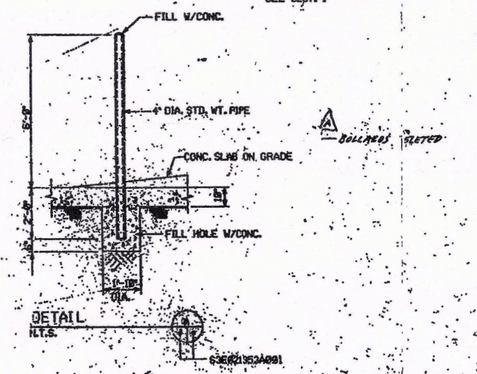
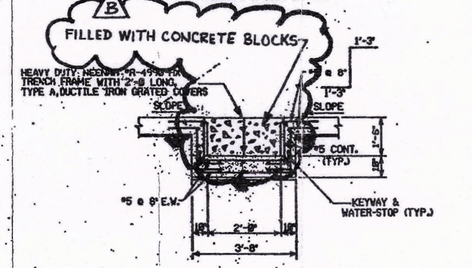


DETAIL
N.T.S.
S3E021353A001



SECTION
SCALE: ½" = 1'-0"
NOTE: FOR REINF. NOT SHOWN SEE SEC. 1
S3E021353A001

SECTION & DETAIL KEY

THIS DOCUMENT CONTROLLED BY CHANGE CONTROL SYSTEM 2 ENGINEERING PROCEDURE EP-C-18

REV	DESCRIPTION	REVISION OR ISSUE PURPOSE
B	ADDED NOTE "FILLED WITH CONCRETE BLOCKS" AS BUILT	LM

| REVISION APPROVALS | | |

GENERAL NOTES

1. DESIGN LOADS

A. DESIGN LIVE LOADS

ROOF	200 PSF
FLOOR SLAB	4,000 PSF

B. CONCENTRATED LIVE LOADS

LIFT TRUCK	40,000 LB. CAPACITY (64,000 LB. AXLE)

C. WIND LOAD

UNIFORM BUILDING CODE, 1988 EDITION: BASIC WIND SPEED = 70 MPH

TORNADO FASTEST MILE WINDSPEED = 113 MPH

ATMOSPHERIC PRESSURE DROP = 40 PSF

TORNADO DESIGN MISSILE 2 x 4 TIMBER PLANK 15 LB. @ 50 MPH HORIZONTAL

D. SEISMIC LOAD

UNIFORM BUILDING CODE, 1988 EDITION; ZONE 2 A

E. LATERAL EARTH PRESSURE

WALLS RETAINING EARTH ARE DESIGNED FOR AN EQUIVALENT FLUID PRESSURE OF:

1. BUILDING WALLS = 89 PCF
2. RETAINING WALLS = 72 PCF

II. CONCRETE

A. CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.

B. MAXIMUM COARSE AGGREGATE SIZE SHALL BE 1-1/4" FOR SLABS ON GRADE, 3/4" FOR ALL OTHER.

C. COARSE AGGREGATE FOR ALL CONCRETE EXPOSED TO WEATHER SHALL BE CRUSHED LIMESTONE.

D. CONCRETE SLUMP SHALL BE 2" MINIMUM, 4" MAXIMUM FOR SLABS, BEAMS, AND WALLS AND 2" MINIMUM, 5" MAXIMUM FOR FOOTINGS.

E. CONCRETE EXPOSED TO WEATHER SHALL BE AIR-ENTRAINED WITH AN AIR CONTENT OF 6% ± 1 %.

F. ALL ADMIXTURES SHALL BE SUBJECT TO THE APPROVAL OF THE COMPANY.

G. ADMIXTURES SHALL NOT CONTAIN CHLORIDES.

H. EXCEPT WHERE SHOWN OTHERWISE, PROVIDE A 1-1/2" DEEP KEYWAY AT ALL CONSTRUCTION JOINTS.

I DO NOT CAST ANY SECTION OF SLAB UNTIL ADJACENT SECTION HAS CURED FOR AT LEAST 48 HOURS.

J. SUBMIT DRAWINGS SHOWING LOCATION OF PROPOSED CONSTRUCTION JOINTS. SPACING OF VERTICAL CONSTRUCTION JOINTS SHALL NOT EXCEED 25 FEET AND SHALL NOT BE CLOSER THAN 8 FEET TO A WALL INTERSECTION. NO CONSTRUCTION JOINTS ARE ALLOWED IN THE FLOOR SLABS.

K A TREMIE SHALL BE USED TO PLACE ALL WALL CONCRETE.

L EXCEPT WHERE SHOWN OTHERWISE, CHAMFER ALL EXPOSED CONCRETE EDGES 3/4".

III. REINFORCING STEEL

A. REINFORCING BARS EXCEPT TIES AND STIRRUPS SHALL CONFORM TO ASTM A615-82, GRADE 60, INCLUDING SUPPLEMENTARY REQUIREMENT S1. TIES AND STIRRUPS SHALL CONFORM TO ASTM A615-82, GRADE 40 INCLUDING SUPPLEMENTARY REQUIREMENT S1. PLAIN BARS SHALL CONFORM TO ASTM A-306, GRADE 45.

B. PROVIDE BAR SUPPORTS, SPACERS, AND OTHER ACCESSORIES AS REQUIRED BY THE LATEST C.R.S.I. MANUAL OF STANDARD PRACTICE.

C. UNLESS SHOWN OTHERWISE, LAP SPLICE LENGTHS FOR REINFORCING BARS SHALL BE 30 BAR DIAMETERS OR 12 INCHES MINIMUM.

D. UNLESS SHOWN OTHERWISE, PROVIDE DOWELS TO MATCH CONTINUING REINFORCING.

E. UNLESS SHOWN OTHERWISE, PROVIDE CORNER BARS TO MATCH HORIZONTAL REINFORCING AT ALL WALL INTERSECTIONS.

F. REINFORCING BARS SHALL NOT BE WELDED.

IV. EXCAVATION, FILL AND BACKFILL

A. FILL UNDER STRUCTURES SHALL BE PLACED AND COMPACTED IN SIX TO EIGHT INCH LOOSE LIFTS. PROVIDE SATISFACTORY REPORTS OR FIELD DENSITY TESTS FOR EACH LIFT. FIELD DENSITY TESTS SHALL BE PERFORMED BY THE COMPANY.

A.1 ANTICIPATED QUANTITY OF RIPPABLE MATERIAL 2800 yd

B. COHESIVE FILL UNDER STRUCTURES SHALL BE COMPACTED TO AT LEAST 95% OF MODIFIED PROCTOR DENSITY, ASTM D1557.

C. BACKFILL ON OPPOSITE SIDES OF STRUCTURES SHALL BE PLACED ON BOTH SIDES SIMULTANEOUSLY.

D. EACH LIFT OF BACKFILL ON TOP OF STRUCTURE SHALL BE PLACED UNIFORMLY ON ENTIRE STRUCTURE.

E. PROVIDE TEMPORARY BRACING OF STRUCTURES TO RECEIVE BACKFILL UNTIL PERMANENTLY SUPPORTED.

V. FOUNDATIONS

A. FOUNDATIONS ARE DESIGNED FOR ALLOWABLE BEARING PRESSURE OF 3000 PSF.

B. PROTECT FOUNDATION EXCAVATIONS FROM SURFACE DRAINAGE. WHERE DAMAGE TO EXCAVATION OCCURS, REMOVE SOFT OR LOOSE MATERIAL.

C. WHERE FOUNDATIONS ARE OVER-EXCAVATED FOR ANY REASON, BACKFILL WITH FOUNDATION CONCRETE, COMPACTED GRANULAR MATERIAL, OR SELECT EARTH AS DIRECTED BY THE COMPANY.

D. CLEAN LOOSE SOIL FROM TRENCHES BEFORE PLACING REINFORCING STEEL.

E. FOUNDATIONS SHALL BEAR ON FIRM UNDISTURBED NATURAL SOIL OR COMPACTED FILL.

F. FOUNDATION EXCAVATIONS AND REINFORCING STEEL SHALL BE INSPECTED AND ACCEPTED BY THE COMPANY PRIOR TO PLACING FOUNDATION CONCRETE.

VI. DRAINAGE AND WATERPROOFING

A. PROVIDE CONTINUOUS WATERSTOPS IN ALL CONSTRUCTION JOINTS BELOW GRADE.

B. WATERSTOPS SHALL BE TIED AT 12 INCHES ON CENTER TO PREVENT DISPLACEMENT DURING CONCRETE PLACING.

VII. MASONRY

A. CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90, GRADE N-I LIGHT WEIGHT (105 PCF MAXIMUM).

B. MORTAR FOR CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C270, TYPE S.

C. GROUT FOR CONCRETE MASONRY UNITS SHALL BE PEA-GRAVEL CONCRETE AND SHALL CONFORM TO ASTM C476. MINIMUM 28-DAY COMPRESSIVE STRENGTH OF GROUT SHALL BE 2,000 PSI.

D. CONCRETE MASONRY UNIT CELLS CONTAINING REINFORCING SHALL BE GROUTED SOLID.

VIII. GENERAL

A. PROTECTIVE COATINGS:

1. CONCRETE FLOOR SLABS, TRENCH DRAINS AND INTERIOR SURFACES OF THE MONITORING PIT SHALL BE COATED WITH A HIGH-BUILD POLYAMIDE CURED EPOXY COATING AS MANUFACTURED BY AMERON PROTECTIVE COATINGS, OR APPROVED SUBSTITUTE. THE COATING SHALL MEET THE REQUIREMENT OF ANSI N101 2-1972 FOR RESISTANCE TO NUCLEAR RADIATION.

2. THE COATING SHALL CONSIST OF ONE PRIMER COAT AND ONE INTERMEDIATE COAT OF AMERCOAT 351 (EACH 8-10 MILS DFT) WITH ONE FINISH COAT WASSER MC SHIELD COAT (2 MILS DFT)

3. DRY FILM THICKNESS OF THE COATINGS SHALL BE MEASURED USING A TOOKE GAUGE. AFTER TESTING IS COMPLETE, SAMPLE AREAS SHALL BE REPAIRED AS RECOMMENDED BY THE COATINGS MANUFACTURER TO ACHIEVE THE SPECIFIED DRY FILM THICKNESS. THE NUMBER AND LOCATIONS FOR SAMPLE AREAS SHALL BE AS DIRECTED BY THE COMPANY.

4. ADDITIVES, HARDENERS OR SURFACE CURING COMPOUNDS SHALL NOT BE USED IN CONCRETE THAT IS TO RECEIVE PROTECTIVE COATINGS.

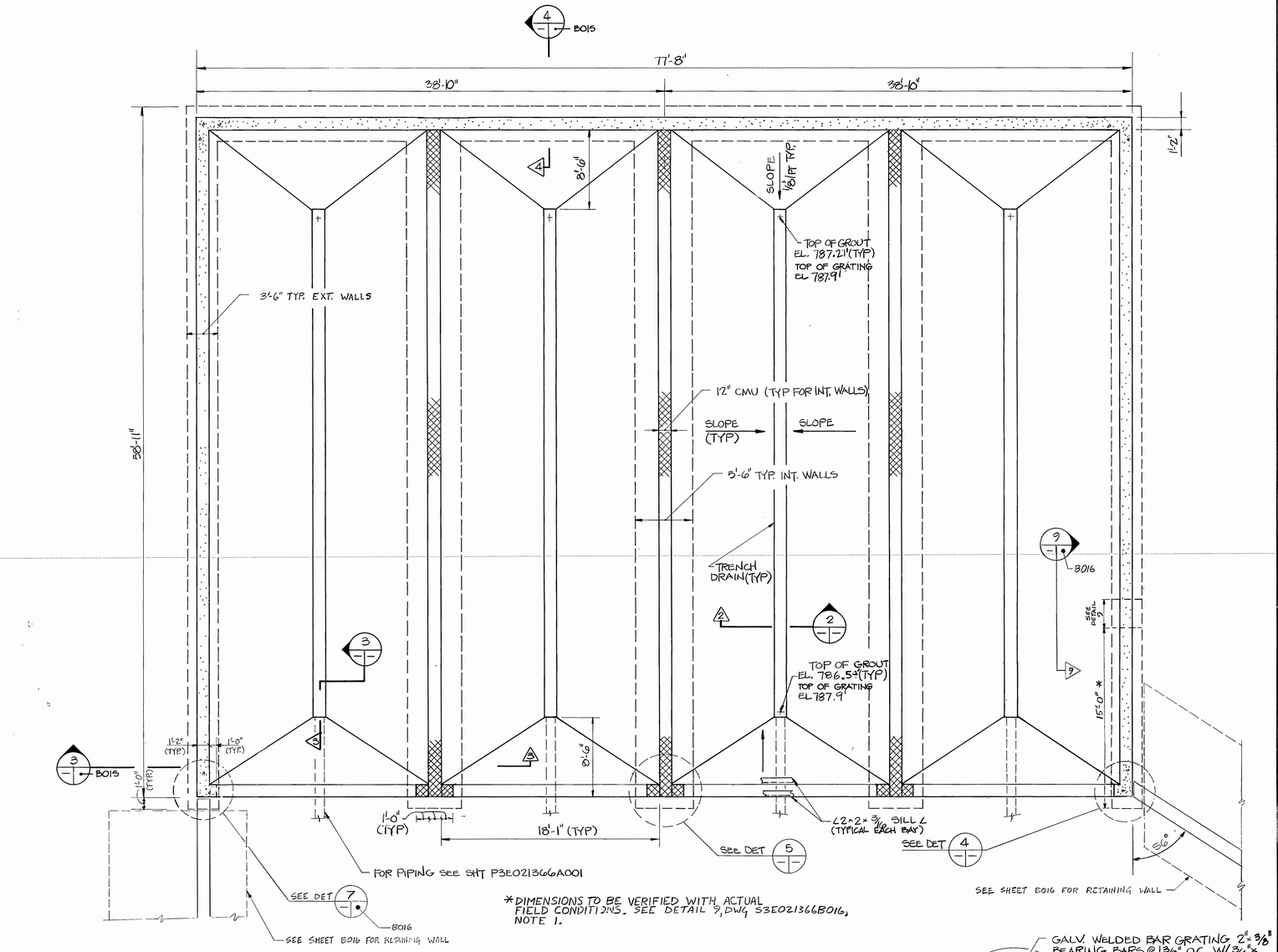
5. AFTER CURING, CONCRETE SURFACES SHALL BE ABRASIVE BLASTED USING 16-30 MESH SAND. ACID ETCHING SHALL NOT BE USED. SMALL HOLES AND VOIDS IN CONCRETE SHALL BE FILLED WITH NU-KLAD 114 FILLER COMPOUND BEFORE COATINGS ARE APPLIED.

6. PRIMER, FINISH COATS AND ALL OTHER MATERIALS REQUIRED FOR THE COATINGS APPLICATION SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED APPLICATION INSTRUCTIONS. COATINGS APPLICATOR SHALL BE EXPERIENCED IN THE APPLICATION OF SIMILAR COATINGS AND SHALL BE APPROVED BY THE COATINGS MANUFACTURER.

7. AFTER THE PROTECTIVE COATINGS HAVE BEEN APPLIED, THE COMPANY WILL LEAK TEST THE TRENCH DRAINS AND MONITORING PIT IN ACCORDANCE WITH 40 CFR 264.191. IF THE TRENCH DRAINS AND/OR MONITORING PIT FAIL TO PASS THIS TEST, THE SELLER SHALL MAKE REPAIRS AS REQUIRED TO PASS THE TEST. FINAL ACCEPTANCE BY THE COMPANY OF CONSTRUCTION THAT HAS RECEIVED PROTECTIVE COATINGS WILL NOT BE MADE UNTIL THESE TEST RESULTS HAVE BEEN SUBMITTED TO AND ACCEPTED BY THE COMPANY.

8. ALL TESTING SHALL BE DONE IN THE PRESENCE OF AN AUTHORIZED REPRESENTATIVE OF THE COMPANY.

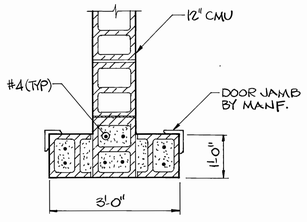
B. MISCELLANEOUS STEEL ANGLES SHALL CONFORM TO ASTM A36.



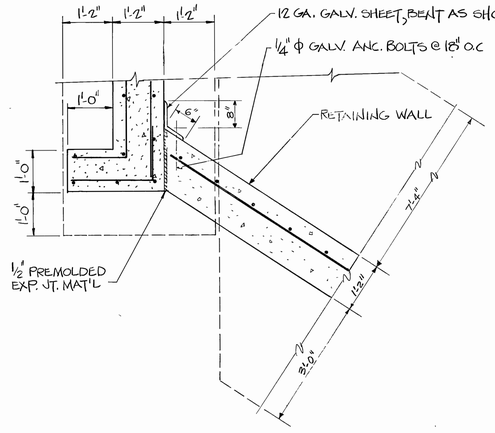
FOUNDATION & FLOOR PLAN

SCALE: 1/4" = 1'-0" FIN FLR EL 788'

NOTE: INSIDE USEABLE SPACE OF EACH CELL IS 56'-7"L x 18'-1"W x 13'-10"H FILL WITH GROUT TO ACHIEVE INDICATED SLOPE. SEE PLAN FOR ELEVATION. MINIMUM THICK. OF GROUT SHALL BE 1½"

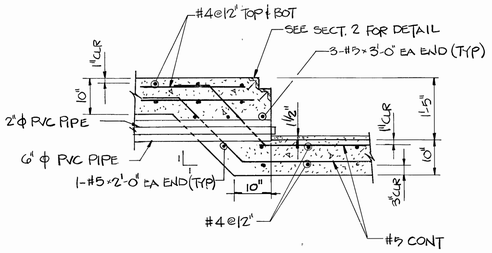


TYP. INTERIOR JAMB



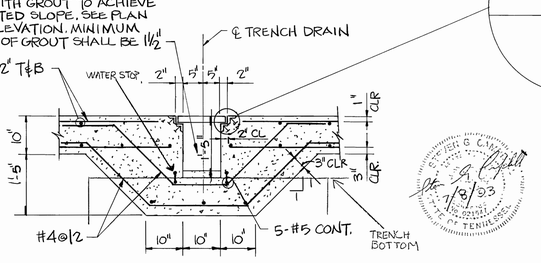
DETAIL

SCALE: 3/4" = 1'-0"



SECTION

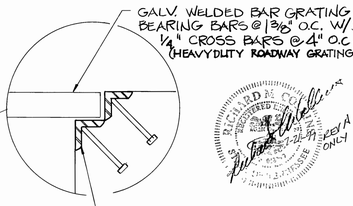
SCALE: 3/4" = 1'-0"



NOTE:
DO NOT FILL TRENCH WITH GROUT UNTIL THE CONTAINMENT PIPING SYSTEM HAS BEEN TESTED AND THE COMPANY HAS ACCEPTED THE TEST RESULTS.

SECTION

SCALE: 3/4" = 1'-0"



QUALITY VERIFICATION

STRUCTURAL -53E021366B014
REFERENCE ORNL QV-001

QA CLAUSE	DOCUMENT REQUIRED	APPLICABLE TO PART NO. *
100	DOCUMENTATION	✓
318	DEVIATION REQUESTED BY SELLER	✓
319	CONTROL OF NONCONFORMANCES	✓
325	MATERIAL SELLER CERTIFICATE	✓
328	INSTALLATION INSPECTION REPORT	✓

*SYMBOL ✓ INDICATES APPLICABLE TO ALL PARTS.

J.P. Lamarat for MTM — QA COORDINATOR — 2-13-90 DATE

PROCUREMENT BY SELLER

INSTALLATION BY SELLER

ALLEN & HOSHALL
ENGINEERS ARCHITECTS CONSULTANTS
9641 Executive Park Drive P.O. Box 60245 Knoxville TN 37950

NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS TAKEN
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

THIS DOCUMENT CONTROLLED BY CHANGE CONTROL SYSTEM 2
ENGINEERING PROCEDURE EP-C-18

REV	DESCRIPTION	A-E	BY	CHK	SECT	DEPT	DATE	PE	REQ	DATE	MM ES	DATE	DOE	DATE	STRUC	CA	EC	EE	EM	IE	M	PD	SE	XAD
	REVISION OR ISSUE PURPOSE					REVISION APPROVALS									SQUAD CHECK									
A	AS CONSTRUCTED		LML	RJHC	–	JWD	7/97	RJHC			HJC	7/97												
1	REVISED RETAINING WALL AND SITE	sig	SGC	MJA	SGC	GDH	7/8/97	RJHC	JBF	7/8/97	HJC	7/8/97												
#0	CFC			RJHC				CPE		2/9/90	DOT	2/9/90			CCH									
															JRD	QEC			7/12/90					

TOLERANCES UNLESS OTHERWISE SPECIFIED			
FRACTIONS ±	DES. J. DOUGAN		2-8-90
XX DECIMALS ±	DRW B. DALIMONTE		2-8-90
XXX DECIMALS ±	CHK. J. DOUGAN		2-8-90
ANGLES	SECT		
BREAK SHARP EDGES MAX	DEPT & PLANT		
FINISH			
		A.E.	2-9-90
DOE	MM ES		2/12/90

MARTIN MARIETTA ENERGY SYSTEMS, INC
operated for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE AC 05-840R21400
OAK RIDGE, TENNESSEE ● PADUCAH, KENTUCKY

RH TRU WASTE STORAGE BUNKER FOUNDATION & FLOOR PLAN

FOUNDATION & FLOOR PLAN — TYPE P

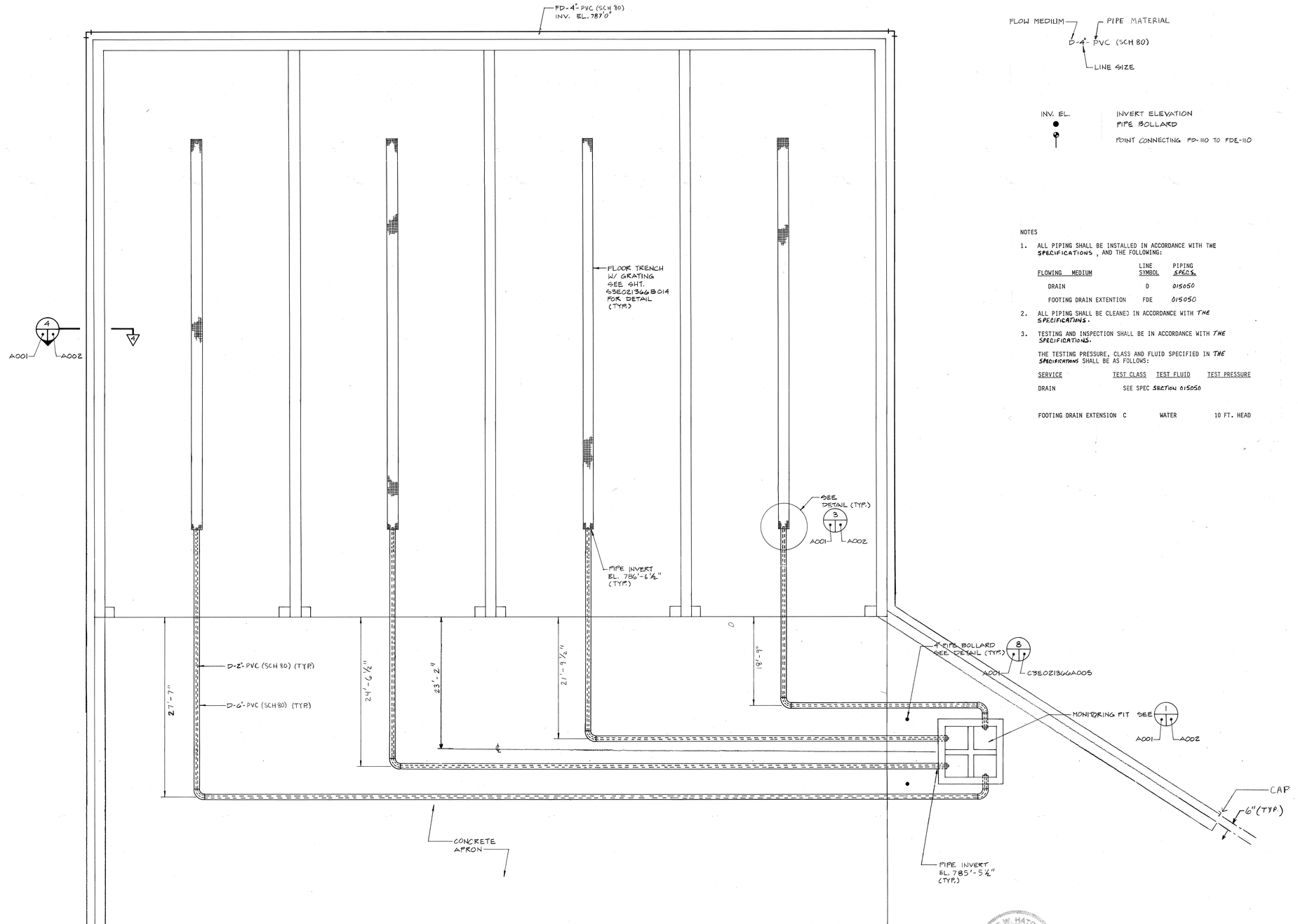
.1	AB	49	50	PLANT	BLDG	FL	SHT	OF	CLASS
3	C	(S	C	X-10	7883	1			

SCALE	ID	REV
AS NOTED	K-4499	53E021366B014 A

FIGURE 8.1-9

53E021366B014

NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, IS MADE AS TO THE ACCURACY, COMPLETENESS OR USEFULNESS OF THE INFORMATION OR STATEMENTS CONTAINED IN THESE DRAWINGS, OR THAT THE USE OR DISCLOSURE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS MAY NOT INFRINGE PRIVATE RIGHTS OF OTHERS NO LIABILITY IS ASSUMED WITH RESPECT TO THE USE OF, OR FOR DAMAGES RESULTING FROM THE USE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS DRAWINGS MADE AVAILABLE FOR INFORMATION TO BIDDER ARE NOT TO BE USED FOR OTHER PURPOSES, AND ARE TO BE RETURNED UPON REQUEST OF THE FORWARDING CONTRACTOR



LEGEND

FLOW MEDIUM — PIPE MATERIAL
D-4"-PVC (SCH 80)
LINE SIZE

INV. EL. — INVERT ELEVATION
PIPE BOLLARD
POINT CONNECTING FD-110 TO FDE-110

NOTES

1. ALL PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS, AND THE FOLLOWING:

FLOWING MEDIUM	LINE SYMBOL	PIPING SPECS.
DRAIN	D	015050
FOOTING DRAIN EXTENTION	FDE	015050

2. ALL PIPING SHALL BE CLEANED IN ACCORDANCE WITH THE SPECIFICATIONS.
3. TESTING AND INSPECTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

THE TESTING PRESSURE, CLASS AND FLUID SPECIFIED IN THE SPECIFICATIONS SHALL BE AS FOLLOWS:

SERVICE	TEST CLASS	TEST FLUID	TEST PRESSURE
DRAIN	SEE SPEC SECTION 015050		
FOOTING DRAIN EXTENSION	C	WATER	10 FT. HEAD

N — I — FLOOR PLAN - PIPING
FLOOR EL. 788'-0"
A001

QUALITY VERIFICATION PIPING - P3E021366A001 REFERENCE ORNL QV-001		
QA CLAUSE	DOCUMENT REQUIRED	APPLICABLE TO PART NO. *
100	DOCUMENTATION	✓
310	PRESSURE OR LEAK TEST REPORTS	✓
315	CLEANING CERTIFICATION	✓
318	DEVIATION REQUESTED BY SELLER	✓
319	CONTROL OF NONCONFORMANCES	✓

*SYMBOL ✓ INDICATES APPLICABLE TO ALL PARTS.

L. V. Dennett for MRW — QA COORDINATOR — 2-13-90 DATE

DALE W. HATCH, REGISTERED ENGINEER, NO. 014139, STATE OF TENNESSEE — 7/25/97 Rev. A only

ROLAND JOHNSON, REGISTERED ENGINEER, NO. 11961, STATE OF TENNESSEE — 7/93

ERNEST H. HUDGINS, REGISTERED ENGINEER, AGRICULTURE, No. 18318, STATE OF TENNESSEE

PROCUREMENT BY SELLER
INSTALLATION BY SELLER

DRAWING ON WHICH SECTION OR DETAIL IS TAKEN — NUMBER OF SECTION OR DETAIL; DRAWING ON WHICH SECTION OR DETAIL IS SHOWN
IF DWG. NO. PREFIX IS OMITTED PREFIX IS SAME AS THIS SHEET.

P3E0213660A001

ALLEN & HOSHALL
ENGINEERS ARCHITECTS CONSULTANTS
9641 Executive Park Drive, P.O. Box 90345, Knoxville, TN 37990

REV	DESCRIPTION	BY	CHK	SECT	DEPT	DATE	PE	REQ	DATE	MM-ES	DATE	DOE	DATE	STRUCT	CA	EC	EE	EM	IE	M	PD	SE	XAD
A	AS CONSTRUCTED	LML	JRC	DWH	DWH	9/97	EMC			HNC	7/97	—	—	EMC				JRC					
1	REVISED RETAINING WALL AND SITE	RCH	WHC	JRS		7/25/97	EMC		7/25/97		7/25/97			MJA									
0	CFC		DWB			2/9/90	SLH		2/9/90	SLH	2/9/90			JRD	CEC			11/7X					

REVISION OR ISSUE PURPOSE — REVISION APPROVALS — SQUAD CHECK

TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS ±
XX DECIMALS ±
XXX DECIMALS ±
ANGLES
BREAK SHARP EDGES MAX.
FINISH

DOE

DES	H.L. KARTER	1-15-90
DRW	G.D. TAYLOR	1-15-90
CHK	E.H. Hudgins	2-8-90
SECT		
DEPT & PLANT		
	L.L. Williams	2-9-90
A/E	Richard Bracewell 2-9-90	
MM-ES	Simon Hsu 2/9/90	

DRAWING APPROVALS — DATE

MARTIN MARIETTA ENERGY SYSTEMS, INC.
operated for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-84OR21400
OAK RIDGE, TENNESSEE ● PADUCAH, KENTUCKY

RH TRU WASTE STORAGE BUNKER
FLOOR PLAN - PIPING

FLOOR PLAN-PIPING — TYPE P

1	48	49	50	PLANT	BLDG	FL	SHT	OF	CLASS
3	P	D	X	X-10	7883	1	1	1	U

SCALE N.T.S. — ID K-4499 — P3E 0213 66A A001 — REV A

FIGURE 8.1-10

NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, IS MADE AS TO THE ACCURACY, COMPLETENESS OR USEFULNESS OF THE INFORMATION OR STATEMENTS CONTAINED IN THESE DRAWINGS, OR THAT THE USE OR DISCLOSURE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS MAY NOT INFRINGE PRIVATE RIGHTS OF OTHERS. NO LIABILITY IS ASSUMED WITH RESPECT TO THE USE OF, OR FOR DAMAGES RESULTING FROM THE USE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS. DRAWINGS MADE AVAILABLE FOR INFORMATION TO BIDDER ARE NOT TO BE USED FOR OTHER PURPOSES, AND ARE TO BE RETURNED UPON REQUEST OF THE FORWARDING CONTRACTOR.

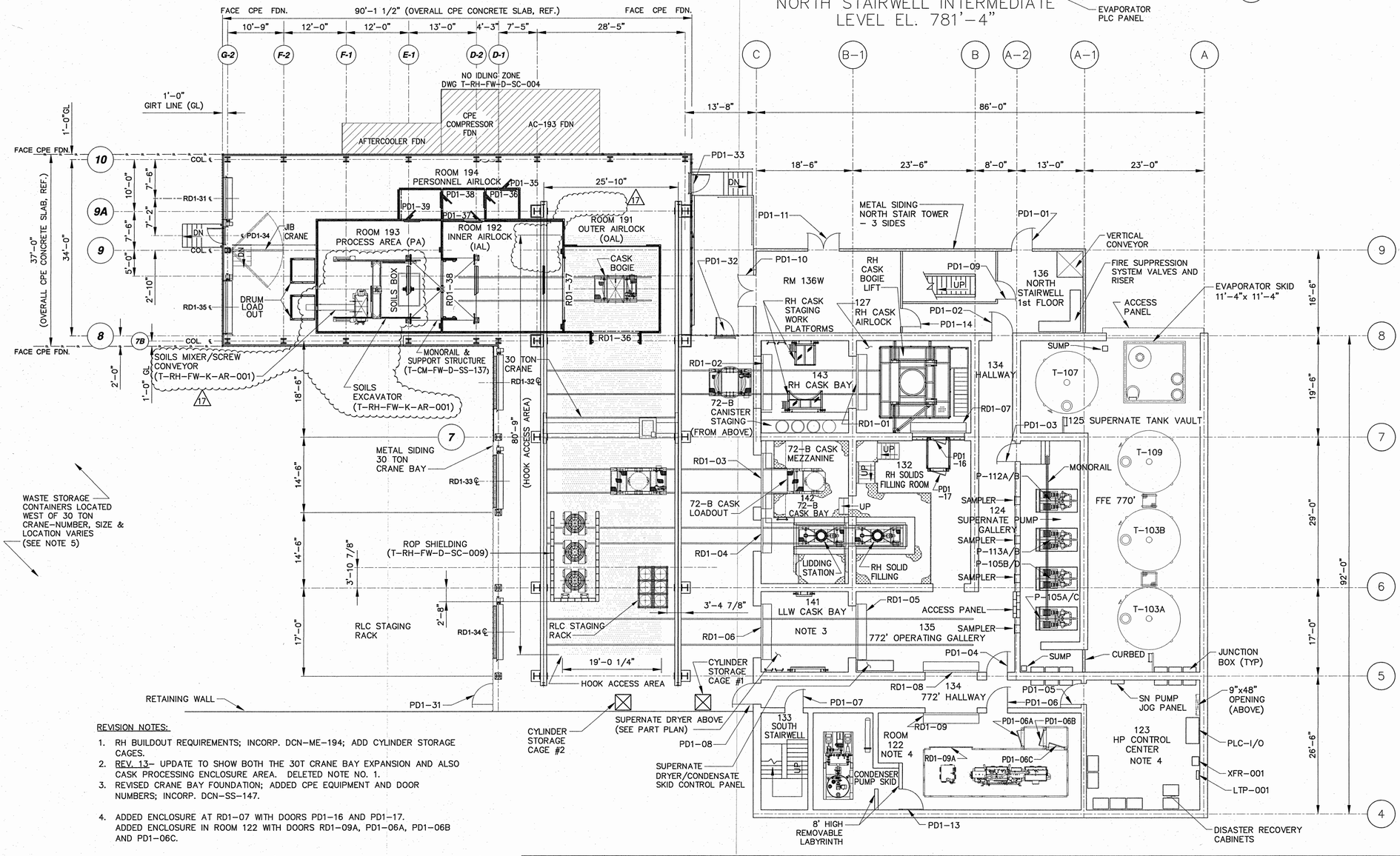
THIS DOCUMENT CONTROLLED BY CHANGE CONTROL SYSTEM 2
ENGINEERING PROCEDURE EP-C-18

REMOVED

FIGURE 8.1-11

NOTE:

1. DELETED
2. WOVEN WIRE PARTITION.
3. BOGIE REMOVED FROM RM. 141 DURING CH SOLID WASTE OPERATIONS.
4. ROOM 122 AND ROOM 123 (TAKE COVER AREA) LAYOUTS FOR ILLUSTRATIVE PURPOSES ONLY.
5. MINOR OR INCIDENTAL EQUIPMENT MAY NOT BE SHOWN ON THE DRAWING OR MAY BE RELOCATED.



REVISION NOTES:

1. RH BUILDOUT REQUIREMENTS; INCORP. DCN-ME-194; ADD CYLINDER STORAGE CAGES.
2. REV. 13- UPDATE TO SHOW BOTH THE 30T CRANE BAY EXPANSION AND ALSO CASK PROCESSING ENCLOSURE AREA. DELETED NOTE NO. 1.
3. REVISED CRANE BAY FOUNDATION; ADDED CPE EQUIPMENT AND DOOR NUMBERS; INCORP. DCN-SS-147.
4. ADDED ENCLOSURE AT RD1-07 WITH DOORS PD1-16 AND PD1-17. ADDED ENCLOSURE IN ROOM 122 WITH DOORS RD1-09A, PD1-06A, PD1-06B AND PD1-06C.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
17	10/3/17	JAL	EB	GW	INCORP. DCN-ME-413 R2; ADDED TANK W-1A PROCESS FEATURES
16	8/18/15	JAL	NG	GW	INCORP. DCN-SC-109 R1 & DCN-ME-393 R1
15	5/13/14	JGM	NG	GW	SEE REV. NOTE NO. 4
14	3/27/11	JGM	NG	GW	SEE REV. NOTE NO. 3
13	3/27/11	JGM	NG	GW	SEE REV. NOTE NO. 2
12	1/12/09	JAL	NG	GW	DELETED CYLINDER STORAGE CAGE #3

RPE

DRAWN BY	J. A. TABLER	DATE 12/1/00
DESIGNED BY	J. G. WAGNER	DATE 12/1/00
CHECKED BY	N. GHASSABIAN	DATE 12/1/00
APPROVED BY	J. G. WAGNER	DATE 12/1/00
APPROVED BY		DATE

NORTHWIND WPC

TITLE
TRU WASTE PROCESSING CENTER
1ST FLOOR PLAN
GENERAL ARRANGEMENT

SIZE	SCALE:	DWG. NO.	REV
D	3/32"=1'-0"	T-CM-FW-D-AR-001	17
	SHEET: 1 OF 1		

FILENAME: T-CM-FW-D-AR-001

Figure 8.1-12

SEE DOCUMENT CONTROL AND RECORDS MANAGER FOR POSSIBLE ACCESS TO THIS OFFICIAL USE ONLY (OUO) DOCUMENT

FIGURE 8.1-13

CIVIL LEGEND:

EXISTING		PROPOSED
800	CONTOURS	800
X 850.50	SPOT ELEVATION	X 850.50
	BUILDING	
X X	FENCE	NA
N 1000.00 / E 1000.00	COORDINATES	N 1000.00 / E 1000.00
	CONTROL MONUMENT	NA
	CONTROL POINT	NA
	GRAVEL ROAD	NA
NA	LIMITS OF GEOTEXTILE	
NA	SANITARY SEWER LINE	4"-SS
	WATER LINE VALVE	
12"-WL	WATER LINE	2"-W
2" LLLW	LIQUID LOW LEVEL WASTE LINE	NA
NA	BOLLARDS	
MW	MONITORING WELLS	NA
B-1	BORE HOLES	NA
	LIGHT POLES	NA
	UTILITY POLES	NA
NA	END WALL	
	STORM DRAIN LINE	
	DITCH LINE	
	STORM DRAIN LINE W/ FLARED END	
NA	PERCENTAGE OF SLOPE	1%
	ELECTRICAL LINE	NA
IPS	IRON PIN SET	
NA	FIRE WATER LINE	4"-FW
NA	PROCESS WATER LINE	2"-PRW

CENTER LINE EARTHEN BERM, FOLLOW EXISTING ELEV. 758, TOP ELEV. = 763.5; SEE DETAIL ON DRAWING T-CM-FW-D-CE-006

AREA BEHIND BERM 0.25 AC±

SILT FENCE (TYP.)

RIP RAP 1738± SQ. FT.

CONTROL PK-51
N=16676.294 (ORNL GRID)
E=27823.791 (ORNL GRID)
N=1070.070 (SITE GRID)
E=981.345 (SITE GRID)
EL=768.60

TURNOUT GATE VALVE MATCH EXIST 24"ø CMP INV 761.93 (SEE DETAIL DRAWING NO. T-CM-FW-D-CE-012)

APPROX. 100-YEAR FLOOD PLAIN AT ELEV 756

12"ø CMP-88.5' TOTAL W/ 12"ø SLOTTED DRAIN-55.0', 12"ø TURNOUT GATE VALVE AT EAST END AND FLARED END SECTION AT WEST END, INV IN 763.20 INV OUT 762.12 (SEE "SLOTTED DRAIN DETAIL", "TURNOUT GATE VALVE DETAIL", AND "METAL FLARED END SECTION" DRAWING NO. T-CM-FW-D-CE-012)

RIP RAP 221± SQ. FT.-13'±x17'±; FIELD LOCATE AT ELEV. 763

SEE NOTE 15

EXISTING ROAD

(2) 36"ø CMP - 269.7' INV IN 771.13 MATCH EXIST. INV OUT 763.04± (SEE NOTE 26, DWG. NO. T-CM-FW-D-CE-005)

EXISTING WATER METER BOX - SEE DRAWING T-UT-FW-D-ME-124 FOR RECONFIGURATION DETAILS

MVST VAULT BLDG 7830

EXIST OVERHEAD ELECTRICAL LINES

+784 T.O.C.

BACKUP AIR COMPRESSOR

LLLW SECONDARY CONTAINMENT N2 PURGE STATION - SEE DRAWING T-CM-FW-D-CE-008 FOR RECONFIGURATION DETAILS

BLDG 7860

BLDG 7877

BLDG 7863

DIESEL GEN

(2) 36"ø CMP-47.2' INV IN 783.00 INV OUT 778.54 (SEE NOTE 26, DWG. NO. T-CM-FW-D-CE-005)

PROCESS BUILDING FFE = 790.0

WATER LINE BACK FLOW PREVENTER HOT BOX

CONCRETE TRUCK APRON

ASPHALT PAVING

DRUM AGING CONTAINERS

EDGE OF PAVEMENT NOTE 28

RETAINING WALL

SANITARY SEWER HOLDING TANK

PERSONNEL BUILDING

CE-005

CE-006

A/C

BOILER

CONTROL ROOM

CHST

ELEC. EQUIP. BLDG.

CHSA BUILDING

NDE

NDA TRAILER

ASPHALT PAVING

END WALL

RIP RAP 741± SQ. FT.

CE-007

CE-005

REMOVE EXIST. 24"ø CMP

APPROX. WETLAND BOUNDARY AREA = 0.036 ACRES

INV. 758.26

CONTROL PK-50
N=16377.468 (ORNL GRID)
E=27177.601 (ORNL GRID)
N=840.432 (SITE GRID)
E=307.464 (SITE GRID)
EL=764.94

WIPP ROAD

MW #785 EL=762.18

MW #784 EL=761.27

INV. 758.38

24"ø TURNOUT GATE VALVE, MATCH EXIST. INV IN 758.38

RIPRAP CHECK DAM (TYP.)

NOTE 24

DITCH BLOCK (TYP.) (SEE NOTE 23)

NOTE 27

14' WIDE ACCESS DRIVE

CIP TANKS BLDG 7856

N 1200 E 600

N 1200 E 1000

N 1200 E 1200

N 1000

N 800

N 800 E 200

N 600 E 1400

N 1200 E 1200

NOTES:

1. SEE DRAWING T-CM-FW-D-CE-014 FOR SITE UTILITY PLAN - SECOND STAGE CONST.
2. SEE DRAWING T-CM-FW-D-CE-015 FOR SANITARY SEWER PROFILE AND DETAILS.
3. SEE DRAWING T-CM-FW-D-CE-011 FOR STORM WATER PROFILES.
4. SEE DRAWING T-CM-FW-D-CE-012 FOR STORM WATER DETAILS.
5. CONTRACTOR WILL BE RESPONSIBLE FOR VERIFYING EXISTING UTILITIES BEFORE BEGINNING EXCAVATION.
6. SEE DRAWING T-CM-FW-D-CE-004 FOR SITE EXCAVATION PLAN.
7. SEE DRAWING T-CM-FW-D-CE-007 FOR SITE CROSS SECTION.
8. SEE DRAWING T-CM-FW-D-CE-009 FOR SITE PROFILE.
9. SEE DRAWING T-CM-FW-D-CE-013 FOR RETAINING WALL PROFILE AND SECTION.
10. EROSION CONTROL MEASURES WILL BE INSTALLED AT THE BEGINNING OF EXCAVATION AND MAINTAINED AS NECESSARY. TEMPORARY SILT FENCING MAY BE REMOVED WHEN NO LONGER NEEDED OR AN ACCEPTABLE STAND OF GRASS IS ESTABLISHED; REFER TO SPECIFICATION SECTION 02370 FOR SLOPE PROTECTION AND EROSION CONTROL.
11. AREAS DISTURBED BY EXCAVATION ACTIVITIES ARE TO BE SEEDED AND MULCHED AS SOON AS PRACTICAL; REFER TO SPECIFICATION SECTION 02924.
12. REFER TO SPECIFICATION SECTION 02300 FOR EARTHWORK.
13. GEOTEXTILE SEPARATION FABRIC SHALL BE MIRAFI 180 N OR EQUIVALENT. REFER TO SPECIFICATION SECTION 02373.
14. REFER TO SPECIFICATION SECTIONS 02722 FOR AGGREGATE AND 02731 FOR AGGREGATE SURFACE COURSE.
15. EXISTING PIPES TO BE PLUGGED AND ABANDONED IN PLACE; REFER TO SPECIFICATION SECTION 02220.
16. CONTRACTOR RESPONSIBLE FOR LOCATING EXISTING FEATURES.
17. EXISTING MONITORING WELLS, #785, #1204 AND #1980 TO BE PROTECTED DURING ALL PHASES OF EXCAVATION WITH A 2' HAND EXCAVATION AREA AROUND RISER PIPE.
18. SEE DRAWING T-CM-FW-D-CE-001 FOR SITE LAYOUT PLAN.
19. SEE DRAWING T-CM-FW-D-CE-002 FOR SITE STAKING PLAN, FIRST STAGE CONSTRUCTION.
20. SEE DRAWING T-CM-FW-D-CE-003 FOR SITE STAKING PLAN, SECOND STAGE CONSTRUCTION.
21. SEE DRAWING T-CM-FW-D-CE-016 FOR WATER LINE PROFILES AND DETAILS.
22. CONTRACTOR TO REINFORCE SILT FENCE WITH STRAW BALES, AS NECESSARY.
23. RIP RAP IN DITCH NOT SHOWN FOR CLARITY. RIP RAP FROM HIGH POINT IN DITCH, WESTERLY TO EXISTING DITCH. SEE DETAIL DRAWING T-CM-FW-D-CE-012; STORM WATER DETAILS.
24. GRADING FOR BUILDING 7880R NOT SHOWN.
25. FINISHED PAVING GRADE SOUTH SIDE OF PERSONNEL BUILDING AND SOUTH SIDE OF PROCESS BUILDING TO BE 789.5, EXCEPT AT VEHICLE INGRESS/EGRESS AREAS. FINISHED GRADE AT VEHICLE INGRESS/EGRESS AREAS TO MATCH FINISHED FLOOR AS-BUILT ELEVATIONS AND SLOPE AT 12:1 FROM BUILDINGS. IN ALL INSTANCES, POSITIVE DRAINAGE FROM BUILDINGS SHALL BE MAINTAINED.
26. CORRUGATED PLASTIC PIPE (CPP) MAY BE USED FOR TEMPORARY STREAM DIVERSION, AND MAY BE USED IN FINAL CONFIGURATION SHOWN AS DIRECTED BY FOSTER WHEELER ENVIRONMENTAL CORP. FIELD PERSONNEL.
27. RIP RAP EROSION CONTROL NEAR SOUTH FENCE LINE NOT SHOWN.
28. EDGE OF PAVEMENT AND GRADING WEST OF SEWER HOLDING TANK APPROXIMATE.

REVISION NO. 4 NOTES:

REVISIONS IMPACT ENTIRE DRAWING.
ADDED CHSA STRUCTURE, FIRE & PROCESS WATER LINES.
RELOCATED BERM & WATER LINES.
REMOVED CHECKDAM AND 12" CPP NEAR END WALL.

INCORPORATED FCR CE-014.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
6	6/18/19	JMH	CSW	GSW	ADDED NORTH ARROW
5	7/27/05	JGM	NG	GW	ADDED AS BUILT CHSA, NDE, NDA, CHST, AND DAC; REV. NOTE 24, AND ADDED NOTES 27 AND 28
4	8/2/04	JGM	NG	NG	REVISIONS IMPACT ENTIRE DRAWING
3	4/16/01	WVM	CS	GW	SHORTENED RETAINING WALL, REVISED GRADING, MOVED SECTION"A-A", REVISED INVERTS
2	03/16/01	WVM	GW	GW	GENERAL REVISION

PE No. 20543 STATE OF TENNESSEE

DRAWN BY / DATE	D.JONES 12/4/00
DESIGNED BY / DATE	M.HUGHES 4/16/01
CHECKED BY / DATE	C. STANFIELD 12/4/00
APPROVED BY / DATE	G.WAGNER 12/4/00
APPROVED BY / DATE	

NORTHWIND TWPC

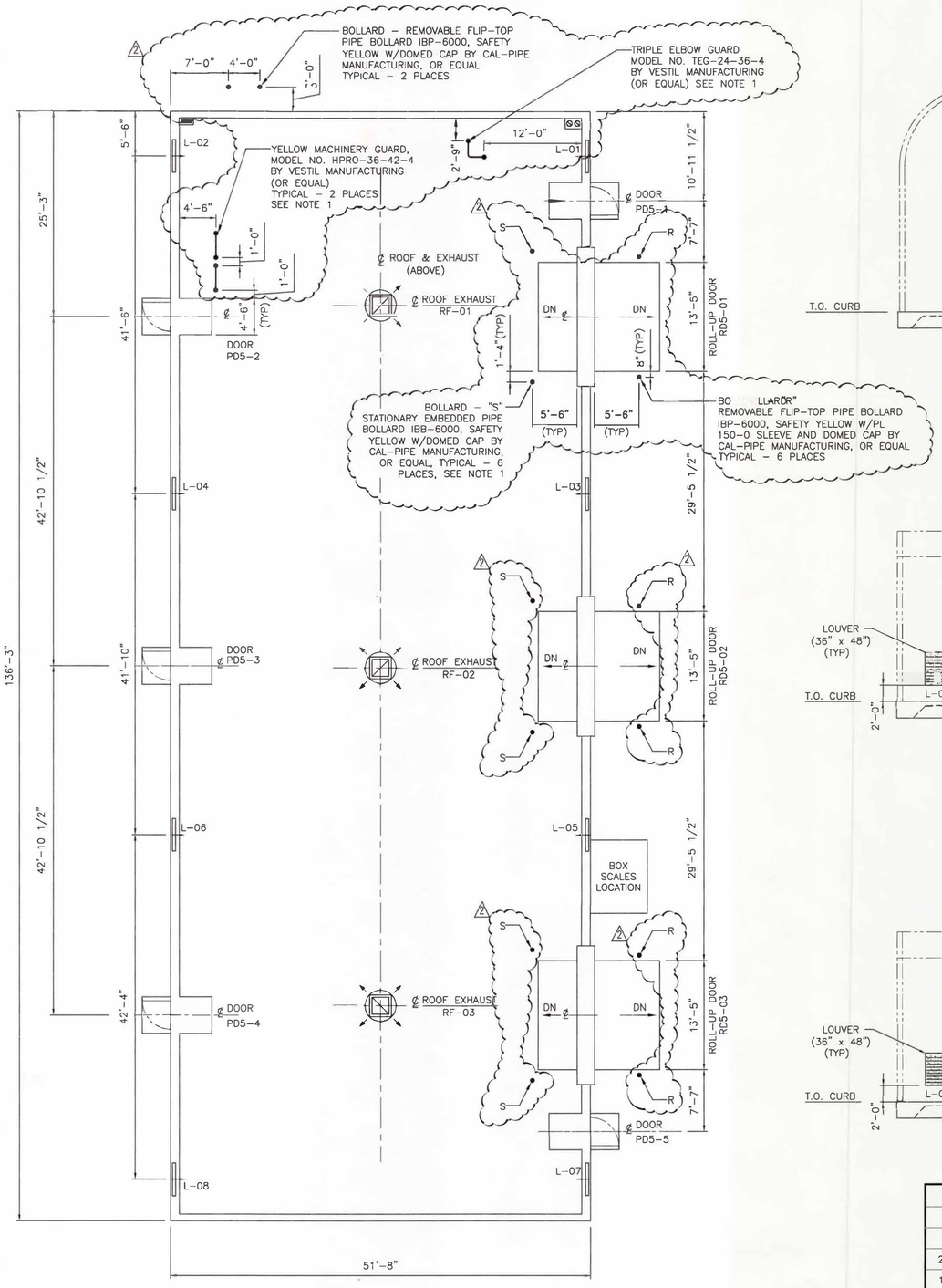
TITLE: TRU/ALPHA WASTE TREAT. PROJ. SITE GRADING PLAN SECOND STAGE CONSTRUCTION

SIZE: D | SCALE: 1"=40' | SHEET: 1 OF 1 | DWG. NO. T-CM-FW-D-CE-005 | REV 6

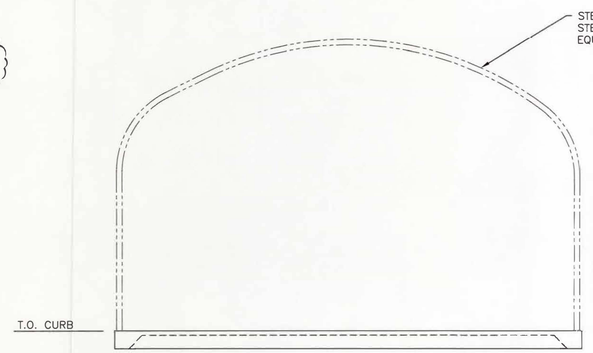
XREF DRAWINGS: PH2_BASE TOPOBASE_04

FILENAME: T-CM-FW-D-CE-005

Figure 8.1-14



BUILDING PLAN

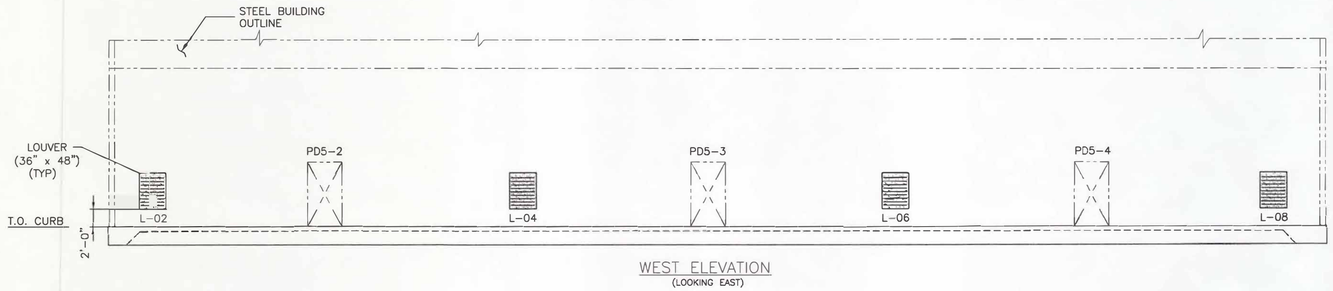


ELEVATION

(LOOKING NORTH OR SOUTH)

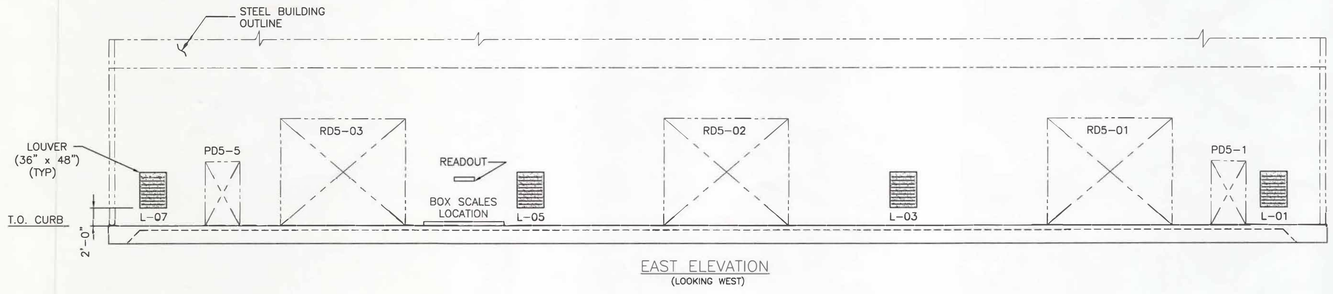
NOTE:

1. ANCHOR BASE PLATES USING (4) ø1/2" HILTI KWIK BOLT III EXPANSION ANCHORS (3 1/2" MIN. EMBED), SHIM AS REQUIRED.



WEST ELEVATION

(LOOKING EAST)



EAST ELEVATION

(LOOKING WEST)

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	12/29/15	BA	NG	GW	AS BUILT DIMENSIONS & INCORP. FCR-AR-004 R1
1	12/20/07	JGM	NG	GW	INCORPORATED NCR-2007-012
0	4/23/07	JGM	NG	GW	INITIAL ISSUE

NASSER GHASSABIAN — REGISTERED ENGINEER — AGRICULTURE — No. 22315 — STATE OF TENNESSEE — 1/7/16

DRAWN BY: J. G. MCSORLEY	DATE: 4/23/07	
DESIGNED BY: N. GHASSABIAN	DATE: 4/23/07	
CHECKED BY: N. GHASSABIAN	DATE: 4/23/07	
APPROVED BY: J. G. WAGNER	DATE: 4/23/07	
APPROVED BY	DATE	

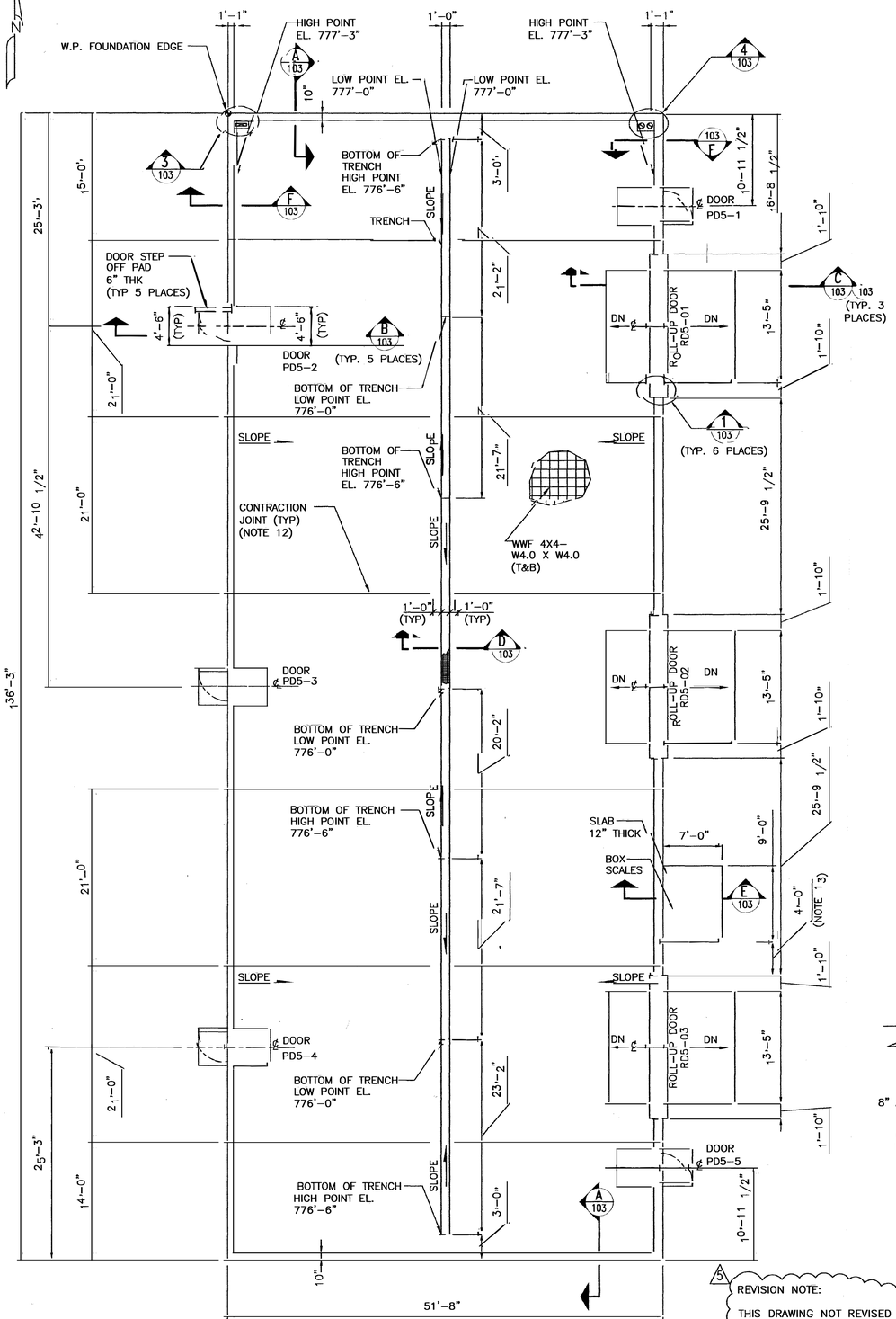
WPC WAI Team

TITLE: TRU/ALPHA WASTE TREAT. PROJ. CONTACT HANDLED MARSHALLING BUILDING

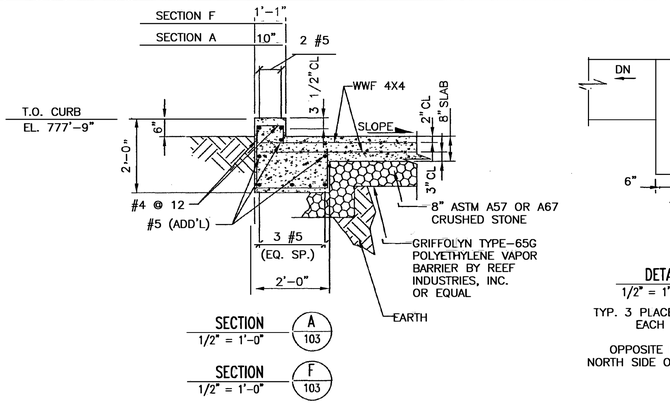
SIZE	SCALE: 1/8"=1'-0"	DWG. NO. T-CH-FW-D-AR-014	REV 2
D	SHEET: 1 OF 1		

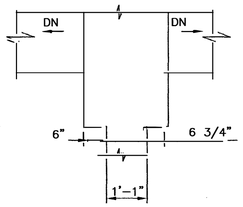
FILENAME: T-CH-FW-D-AR-014

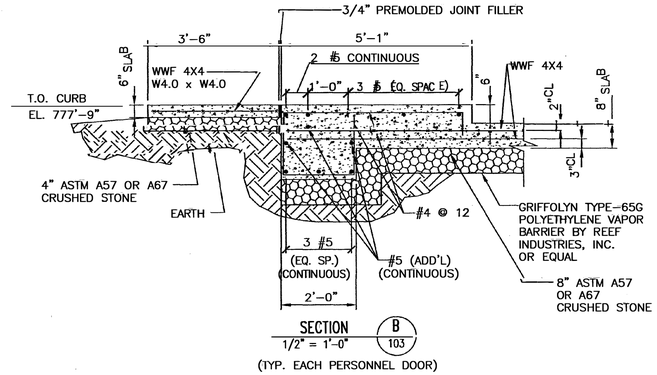
Figure 8.1-15

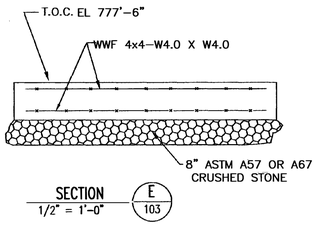


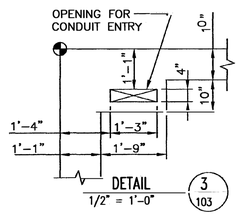
PLAN AT EL. 777'-9"
(UNLESS NOTED)

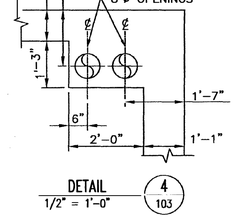


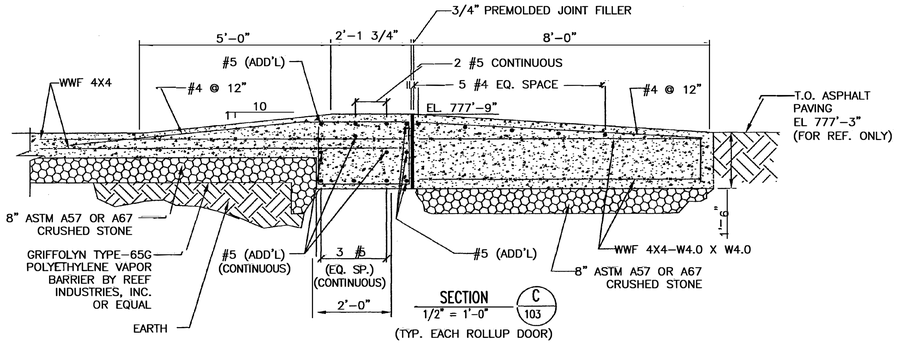






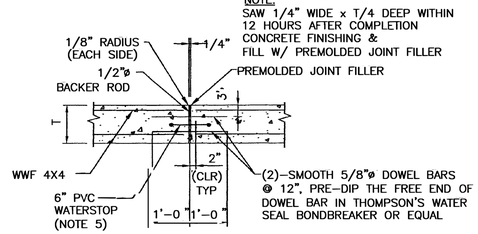




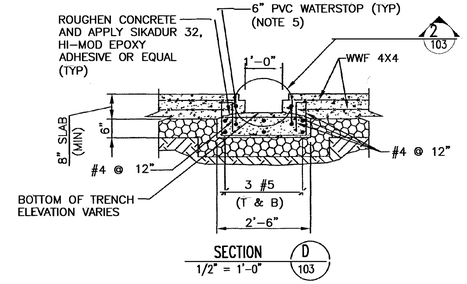


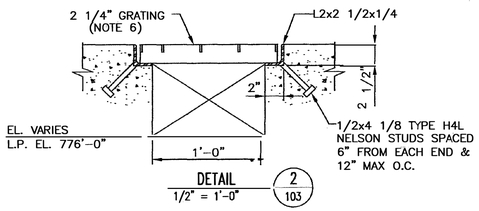
NOTES

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS.
2. REINFORCING STEEL SHALL BE GRADE 60 DEFORMED BARS CONFORMING TO ASTM A615.
   REINFORCING STEEL SHALL BE CLASS 'B' TENSION LAP SPLICES. ALL EMBEDMENT LENGTH TO BE TENSION DEVELOPMENT LENGTH.
3. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. WIRE TIES SHALL BE 16 GAUGE (OR HEAVIER), BLACK, ANNEALED STEEL WIRE.
   LAP SPLICES FOR WELDED WIRE SHALL BE MADE IN SUCH A WAY THAT THE OVERLAP EQUALS TWO SQUARES. LAPS SHALL BE STAGGERED TO AVOID CONTINUOUS LAPS IN EITHER DIRECTION. FABRIC SHALL BE WIRED AT LAPS IN INTERVALS NOT TO EXCEED 4 FEET.
4. PREMOLDED JOINT FILLER SHALL CONFORM TO ASTM D1751.
5. WATERSTOPS SHALL BE 6 IN. WIDE BY 3/8 INCH THICK AT CENTER, DUMBBELL ON SERRATED TYPE. SPLICE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. INSTALL WATERSTOP IN CENTER OF THE JOINT WITH ONE-HALF OF WATERSTOP WIDTH EMBEDDED IN THE CONCRETE ON EACH SIDE OF THE JOINT.
6. TRENCH GRATING: BY IKG INDUSTRIES OR APPROVED EQUAL.
   STYLE: 22W4, HEAVY DUTY, CARBON STEEL WELDED BAR GRATING.
   BEARING BARS: 2 1/4" x 1/4" @ 1-3/8" C/C.
   CROSS BARS: 3/8" DIAMETER @ 4" C/C.
   GALVANIZED FINISH, LOAD BANDING/SMOOTH FULL DEPTH.
   (43) PIECES, 3' WIDE X 1'-2 7/8" SPAN.
   (1) PIECES, 14" WIDE X 1'-2 7/8" SPAN.
   GAPS BETWEEN GRATING SECTIONS AND BETWEEN GRATING AND ENDS OF THE TRENCH SHALL BE BETWEEN ZERO AND 1/8" MAX.. FIELD TRIM CROSSBARS AND BANDING BARS FLUSH WITH A BEARING BAR AS NEEDED FOR FIT DUE TO ACCUMULATION OF PERMITTED GAPS.
7. ALL ELEVATIONS SHOWN ON DRAWING ARE HIGH POINTS, UNLESS OTHERWISE NOTED.
8. TOLERANCE FOR SURFACE FLATNESS WITHIN +/- 1/8"
9. SHIFT OR BEND BARS TO CLEAR DRAINS, PIPE SLEEVES, ELECTRICAL AND EMBEDDED ITEMS.
10. PLACING DIMENSIONS ARE GIVEN TO CENTER OF BARS UNLESS OTHERWISE NOTED.
11. CONCRETE COVER SHALL BE 3" WHERE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH. 2" FOR OTHER LOCATIONS.
12. CONTRACTION JOINT LOCATIONS MAY BE CHANGED AS APPROVED BY ENGINEER.
13. LOCATION OF BOX SCALES MAY VARY AS APPROVED BY ENGINEER.
14. FORM ALL EXPOSED EXTERNAL CORNERS OF CONCRETE WITH 3/4" x 45° CHAMFER, EXCEPT CURBS.



TYPICAL DOWELED CONTRACTION JOINT
SCALE: NONE





5 REVISION NOTE:
THIS DRAWING NOT REVISED FOR FCR-SC-037. REFER TO CLOSED FCR'S FOR DOCUMENTED CHANGE INFORMATION.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
5	4/23/07	BA	JGE	GW	SEE REVISION NOTE
4	9/27/21	JAL	JGE	GW	INCORP. DCN-SC-116
3	12/20/07	JGM	NG	GW	INCORP. FCR-SC-035, -036 AND NCR-2007-012
2	8/21/07	JGM	NG	GW	REDUCED OVERALL LENGTH & REV. DIMS. BASED ON BLDG. DWG.
1	6/18/07	JGM	NG	GW	REVISED WELDED WIRE FABRIC SIZE
0	4/23/07	JGM	NG	GW	INITIAL ISSUE

RPE

DRAWN BY: J. G. MCSORLEY	DATE: 4/23/07
DESIGNED BY: N. GHASSABIAN	DATE: 4/23/07
CHECKED BY: N. GHASSABIAN	DATE: 4/23/07
APPROVED BY: J. G. WAGNER	DATE: 4/23/07
APPROVED BY:	DATE:

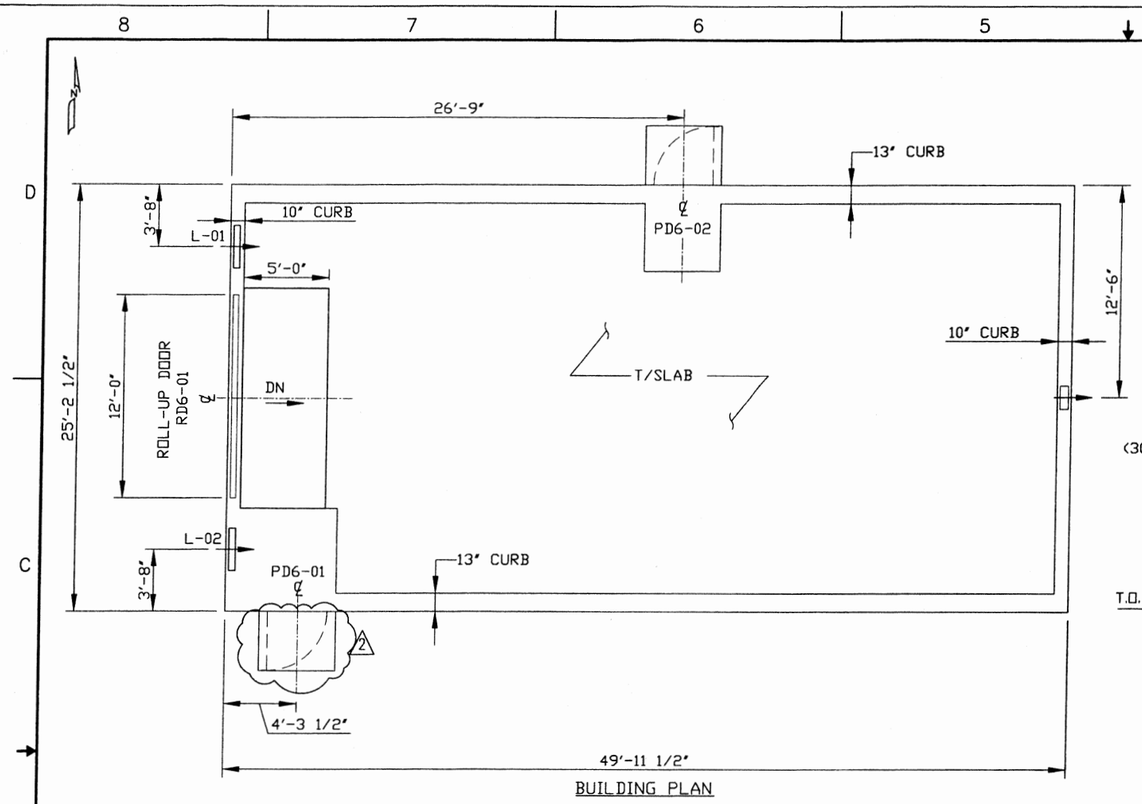
UCOR
United Cleanup Oak Ridge LLC

TITLE
TRU WASTE PROCESSING CENTER
CONTACT HANDLED MARSHALLING BLDG.
FOUNDATION MAT AT EL 777'-9"

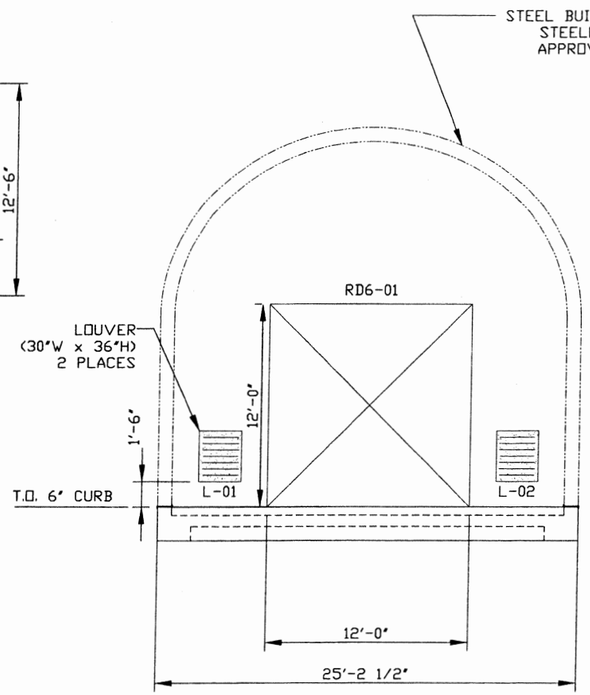
SIZE	SCALE:	DWG. NO.	REV
D	1/8"-1'-0"	T-CH-FW-D-SC-103	5
	SHEET: 1 OF 1		

FILENAME: T-CH-FW-D-SC-103

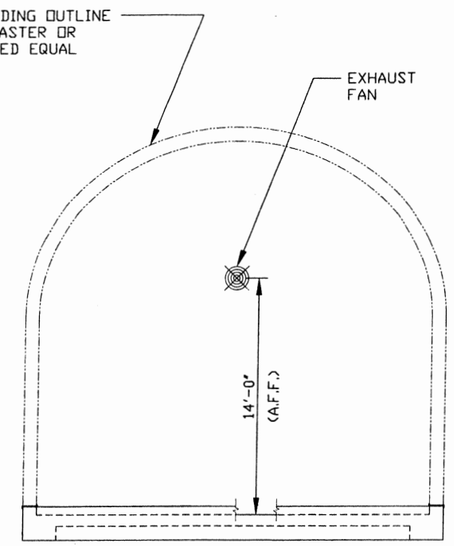
Figure 8.1-16



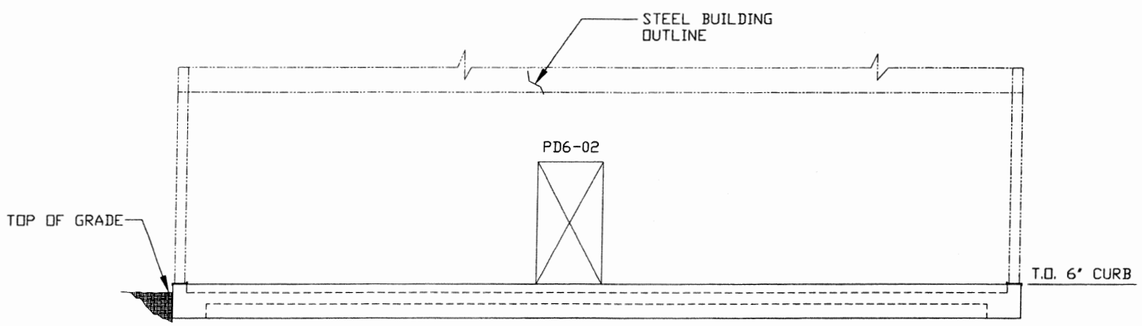
BUILDING PLAN



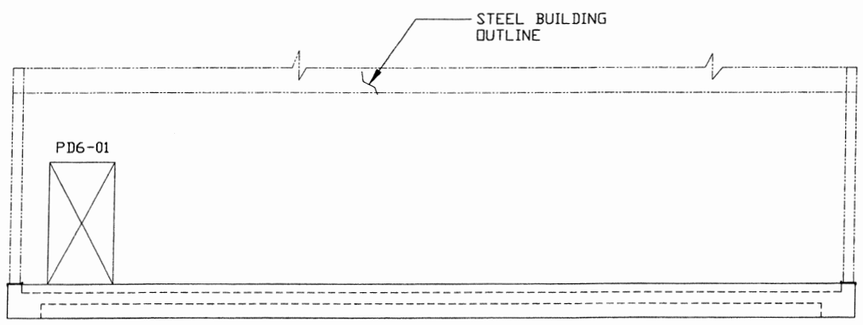
WEST ELEVATION
(LOOKING EAST)



EAST ELEVATION
(LOOKING WEST)



NORTH ELEVATION
(LOOKING SOUTH)



SOUTH ELEVATION
(LOOKING NORTH)

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	12/10/07	JGM	NG	GW	INCORPORATED NCR-2007-013
1	9/13/07	JGM	NG	GW	REVISED BLDG. DIMENSIONS, PERSONNEL DOOR LOCATIONS & ADDED SHEET 2
0	7/17/07	JGM	NG	GW	ISSUED FOR CONSTRUCTION

NASSER GHASSABIAN — REGISTERED ENGINEER — STATE OF TENNESSEE — 12/10/07

DRAWN BY	J. G. MCSORLEY	DATE 7/17/07
DESIGNED BY	N. GHASSABIAN	DATE 7/17/07
CHECKED BY	N. GHASSABIAN	DATE 7/17/07
APPROVED BY	J. G. WAGNER	DATE 7/17/07
APPROVED BY		DATE

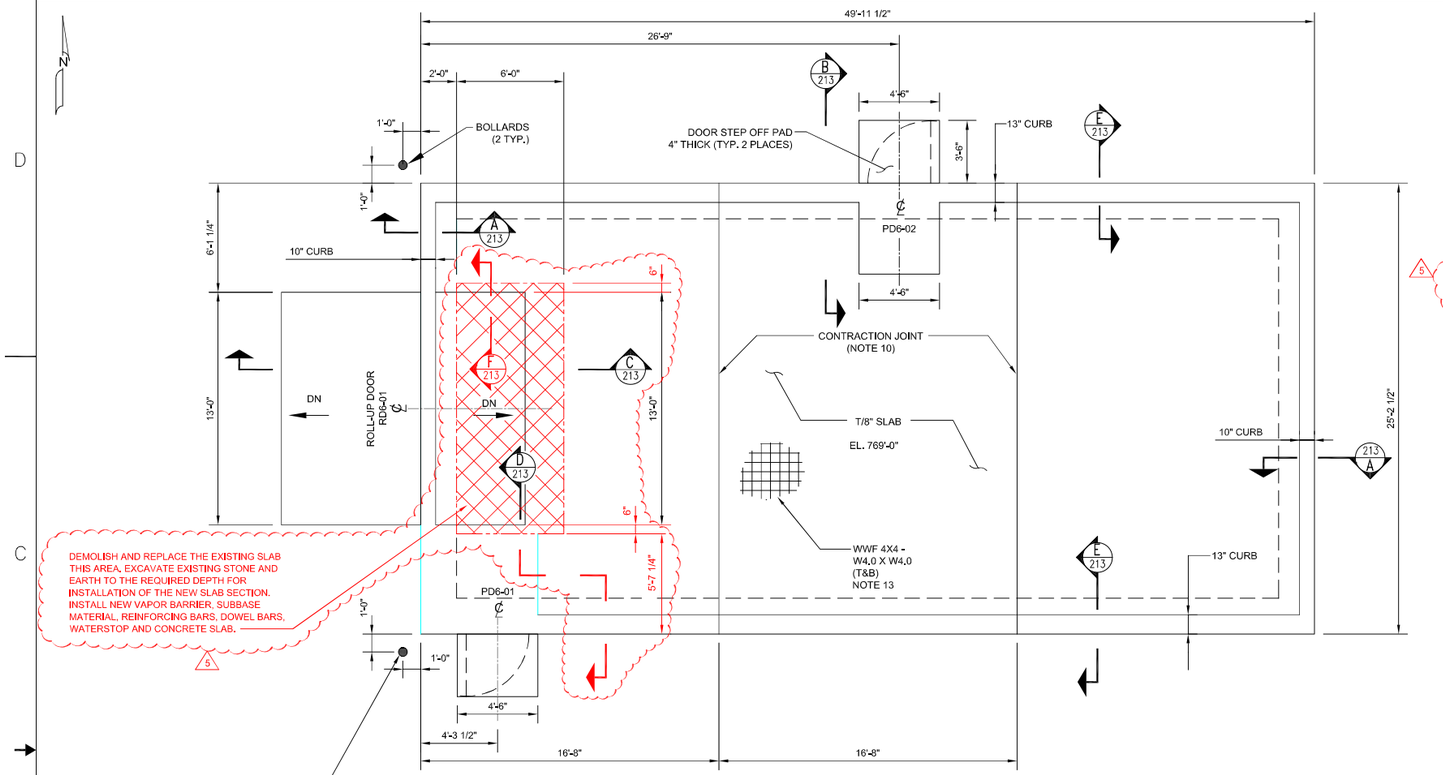
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRU/ALPHA WASTE TREAT. PROJ.
DRUM VENTING BUILDING
GENERAL ARRANGEMENT

SIZE	SCALE:	DWG. NO.	REV
D	1/4"=1'-0"	T-CH-FW-D-AR-015	2
	SHEET: 1 OF 2		

FILENAME: T-CH-FW-D-AR-015

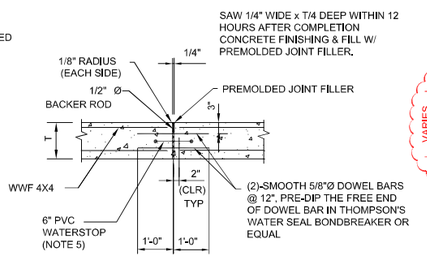
FIGURE 8.1-17



STATIONARY EMBEDDED PIPE BOLLARD
IBR-150F-A SAFETY YELLOW W/DOMED CAP
BY CAL-PIPE MANUFACTURING,
OR EQUAL, (TYPICAL 2 PLACES)

NOTE: ADDITIONAL BOLLARDS MAY BE ADDED TO SUIT FIELD CONDITIONS.

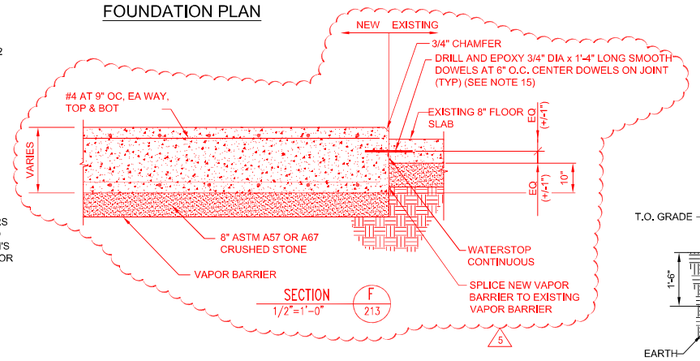
FOUNDATION PLAN

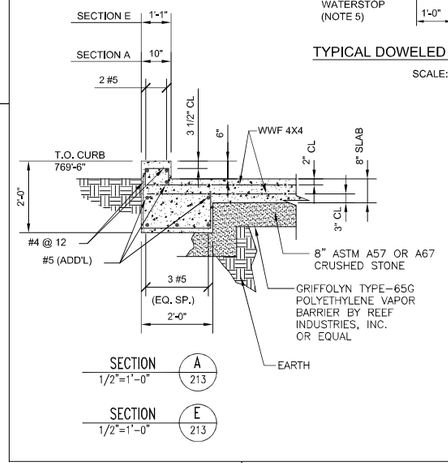


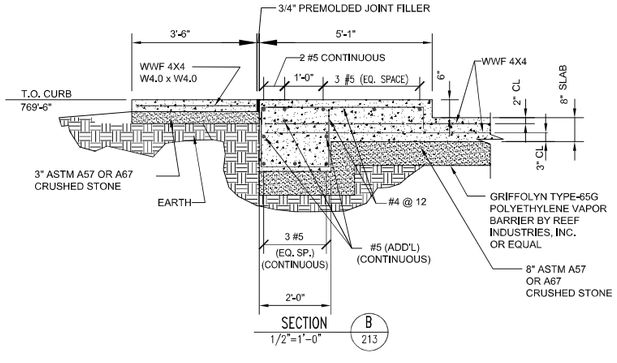
SAW 1/4" WIDE x T/4 DEEP WITHIN 12 HOURS AFTER COMPLETION CONCRETE FINISHING & FILL W/ PREMOLDED JOINT FILLER.

TYPICAL DOWELED CONTRACTION JOINT

SCALE: NONE

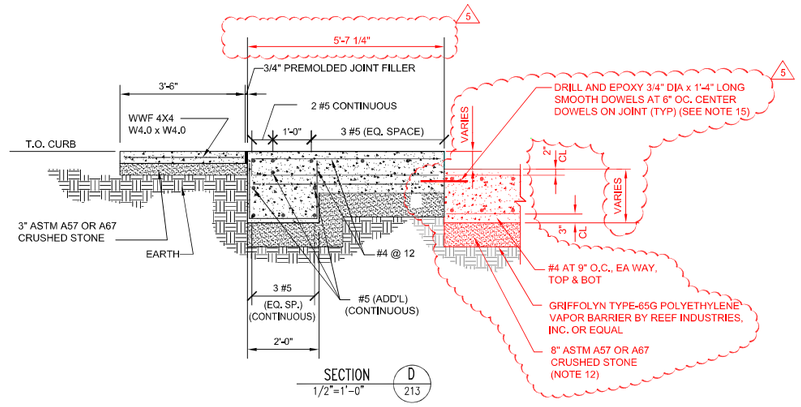


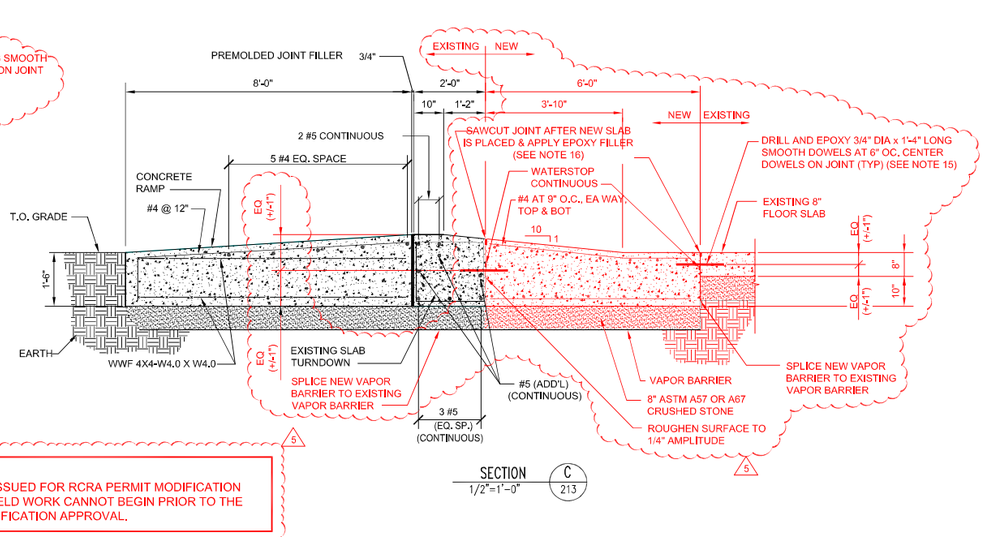




NOTES

1. FORM ALL EXPOSED EXTERNAL CORNERS OF CONCRETE WITH 3/4" X 45° CHAMFER, EXCEPT CURBS.
2. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT 28 DAYS.
3. REINFORCING STEEL SHALL BE GRADE 60 DEFORMED BARS CONFORMING TO ASTM A615. REINFORCING STEEL SHALL BE CLASS 'B' TENSION LAP SPLICES. ALL EMBEDMENT LENGTH TO BE TENSION DEVELOPMENT LENGTH.
4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. WIRE TIES SHALL BE 16 GAUGE (OR HEAVIER), BLACK, ANNEALED STEEL WIRE. LAP SPLICES FOR WELDED WIRE SHALL BE MADE IN SUCH A WAY THAT THE OVERLAP EQUALS TWO SQUARES. LAPS SHALL BE STAGGERED TO AVOID CONTINUOUS LAPS IN EITHER DIRECTION. FABRIC SHALL BE WIRED AT LAPS IN INTERVALS NOT TO EXCEED 4 FEET.
5. PREMOLDED JOINT FILLER SHALL CONFORM TO ASTM D1751.
6. TOLERANCE FOR SURFACE FLATNESS WITHIN +/- 1/8".
7. SHIFT OR BEND BARS TO CLEAR DRAINS, PIPE SLEEVES, ELECTRICAL AND EMBEDDED ITEMS.
8. PLACING DIMENSIONS ARE GIVEN TO CENTER OF BARS UNLESS OTHERWISE NOTED.
9. CONCRETE COVER SHALL BE 3" WHERE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH, 2" FOR OTHER LOCATIONS.
10. CONTRACTION JOINT LOCATIONS MAY BE CHANGED AS APPROVED BY ENGINEER.
11. WATERSTOPS SHALL BE 6 IN. WIDE BY 3/8 INCH THICK AT CENTER, DUMBBELL ON SERRATED TYPE. SPLICE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. INSTALL WATERSTOP IN CENTER OF THE JOINT WITH ONE-HALF OF WATERSTOP WIDTH EMBEDDED IN THE CONCRETE ON EACH SIDE OF THE JOINT.
12. CRUSHED STONE MAY BE OMITTED BASED ON EXISTING FIELD CONDITION AS APPROVED BY ENGINEER.
13. WWF 6X6-W5.5XW5.5 MAY BE SUBSTITUTED.
14. WATERSTOP INSTALLED BETWEEN NEW AND EXISTING CONCRETE SHALL BE SIKA "HYDROTITE CJ-1020-2K OR EQUIVALENT.
15. SMOOTH DOWEL BARS SHALL BE UNFINISHED, ASTM A36. INSTALL DOWELS WITH HILTI HIT-HY 200 A/R V3 ADHESIVE OR APPROVED EQUIVALENT.
16. EPOXY JOINT FILLER SHALL BE "EUCO 700" BY EUCLID, "MM-80P" BY METZGER-MCGUIRE, OR APPROVED EQUIVALENT.





NOTE:
REVISION 5 ISSUED FOR RCRA PERMIT MODIFICATION REQUEST, FIELD WORK CANNOT BEGIN PRIOR TO THE PERMIT MODIFICATION APPROVAL.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
5					INCORP. DCN-23-1607-7880AA
4	12/20/07	JGM	NG	GW	INCORP. DCN-SC-099 AND NCR-2007-013
3	10/25/07	JGM	NG	GW	REVISED ELEVATION OF SLAB AND CURBS
2	9/13/07	JGM	NG	GW	REVISED PERSONNEL DOOR LOCATIONS
1	8/27/07	JGM	NG	GW	FOR BID PURPOSES ONLY
0	7/25/07	JGM	NG	GW	FOR BID PURPOSES ONLY

REV 5 ONLY

BRIAN H. WOOD
REGISTERED ENGINEER
AGRICULTURE
No. 119091
STATE OF TENNESSEE

Digitally signed by Brian Wood
Date: 2023.07.28 15:31:58-05'00'

DRAWN BY	J. G. MCSORLEY	DATE 7/25/07
DESIGNED BY	N. GHASSABIAN	DATE 7/25/07
CHECKED BY	N. GHASSABIAN	DATE 7/25/07
APPROVED BY	J. G. WAGNER	DATE 7/26/07
APPROVED BY		DATE

UCOR
United Cleanup Oak Ridge LLC

TITLE
TRU/ALPHA WASTE TREAT. PROJ.
DRUM VENTING BUILDING
FOUNDATION PLAN

SIZE	SCALE:	DWG. NO.	REV
D	1/4"=1'-0" (U.N.O.)	T-CM-FW-D-SC-213	5
	SHEET: 1 OF 1		

FILENAME: T-CM-FW-D-SC-213

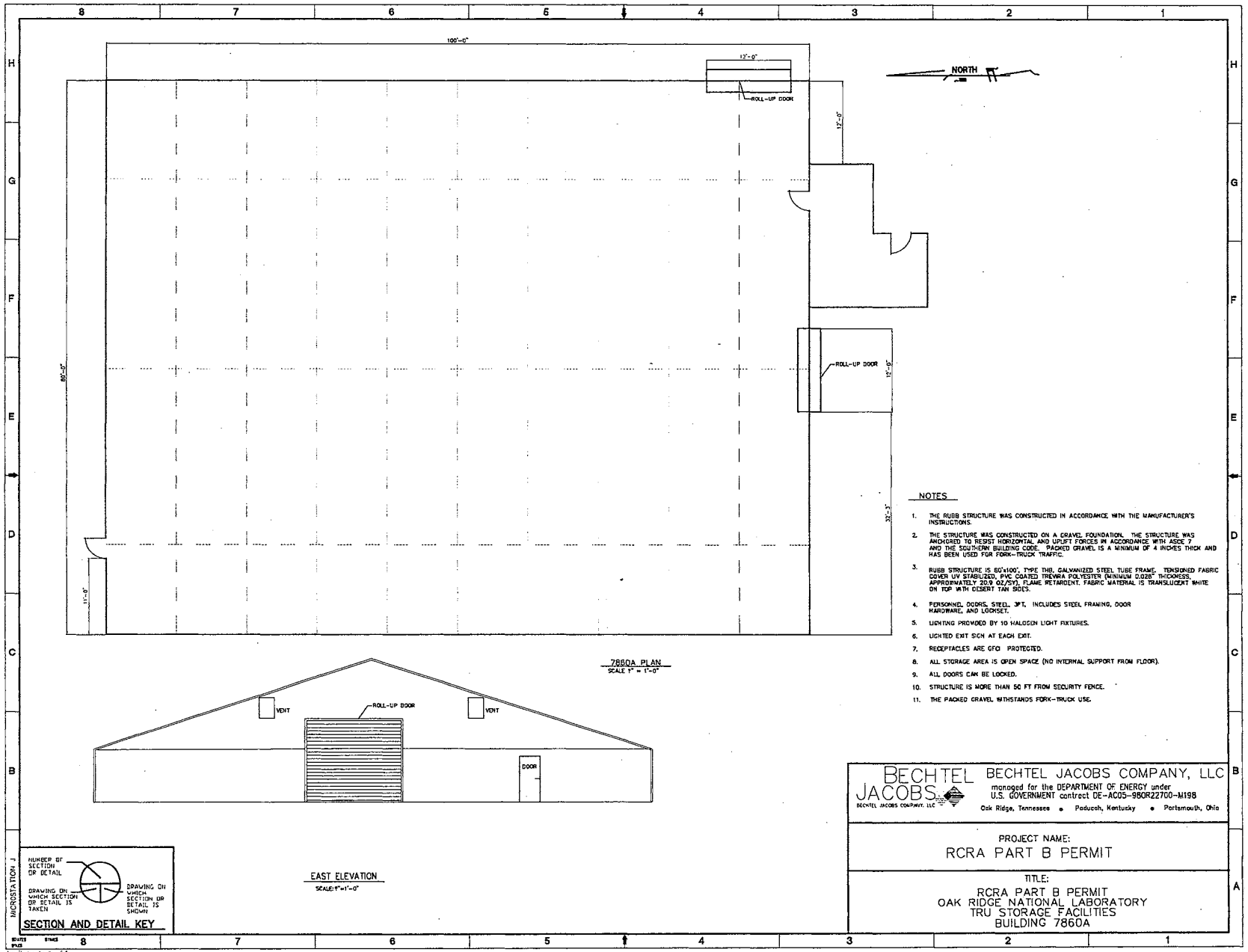
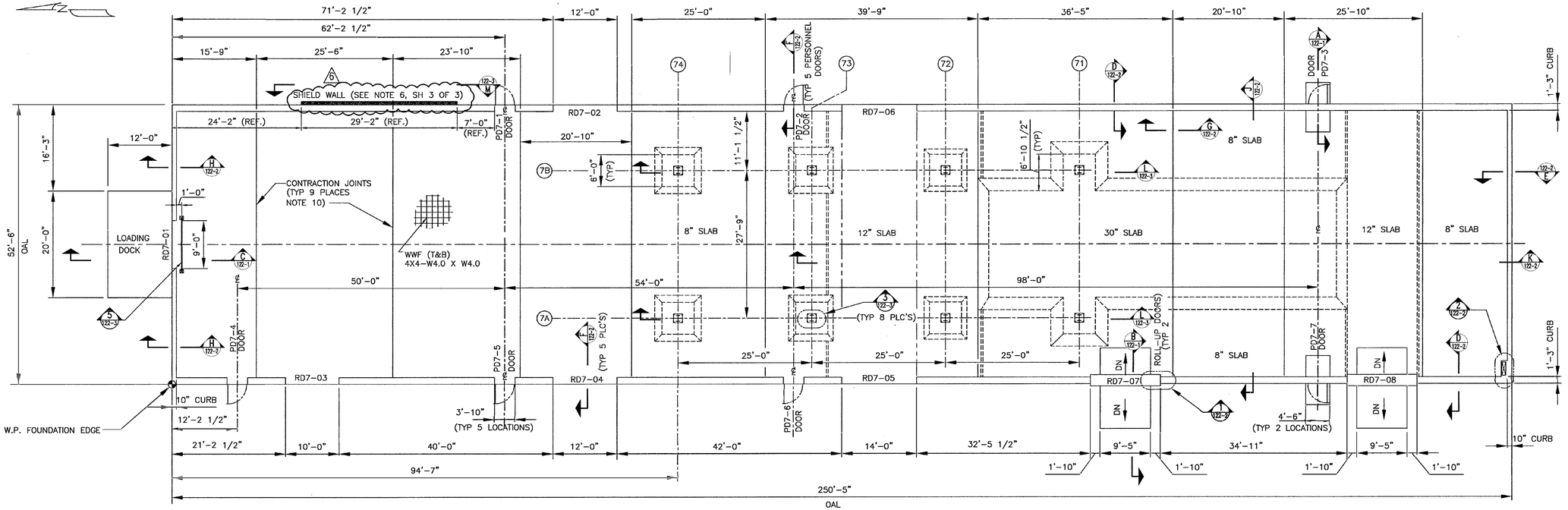
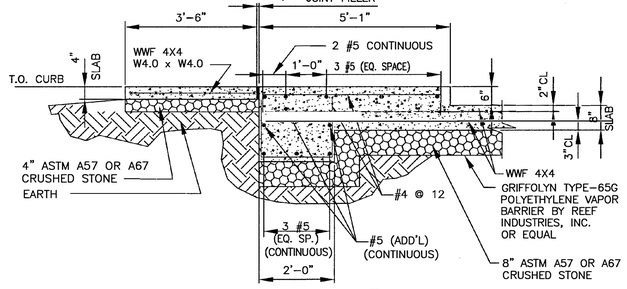

100'-0"
12'-0"
ROLL-UP DOOR
NORTH
12'-0"
80'-0"
ROLL-UP DOOR
12'-0"
32'-3"
11'-0"
7860A PLAN
SCALE 1" = 1'-0"
VENT
ROLL-UP DOOR
VENT
DOOR
EAST ELEVATION
SCALE: 1"=1'-0"
NOTES
1. THE RUBB STRUCTURE WAS CONSTRUCTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
2. THE STRUCTURE WAS CONSTRUCTED ON A GRAVEL FOUNDATION. THE STRUCTURE WAS ANCHORED TO RESIST HORIZONTAL AND UPLIFT FORCES IN ACCORDANCE WITH ASCE 7 AND THE SOUTHERN BUILDING CODE. PACKED GRAVEL IS A MINIMUM OF 4 INCHES THICK AND HAS BEEN USED FOR FORK-TRUCK TRAFFIC.
3. RUBB STRUCTURE IS 80'x100', TYPE TH8, GALVANIZED STEEL TUBE FRAME. TENSIONED FABRIC COVER UV STABILIZED, PVC COATED TREVIRA POLYESTER (MINIMUM 0.028" THICKNESS, APPROXIMATELY 20.9 OZ/SY), FLAME RETARDENT. FABRIC MATERIAL IS TRANSLUCENT WHITE ON TOP WITH DESERT TAN SIDES.
4. PERSONNEL DOORS, STEEL, 3FT. INCLUDES STEEL FRAMING, DOOR HARDWARE, AND LOCKSET.
5. LIGHTING PROVIDED BY 10 HALOGEN LIGHT FIXTURES.
6. LIGHTED EXIT SIGN AT EACH EXIT.
7. RECEPTACLES ARE GFCI PROTECTED.
8. ALL STORAGE AREA IS OPEN SPACE (NO INTERNAL SUPPORT FROM FLOOR).
9. ALL DOORS CAN BE LOCKED.
10. STRUCTURE IS MORE THAN 50 FT FROM SECURITY FENCE.
11. THE PACKED GRAVEL WITHSTANDS FORK-TRUCK USE.
NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS TAKEN
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN
SECTION AND DETAIL KEY
BECHTEL JACOBS
BECHTEL JACOBS COMPANY, LLC
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-98OR22700-M198
Oak Ridge, Tennessee • Paducah, Kentucky • Portsmouth, Ohio
PROJECT NAME:
RCRA PART B PERMIT
TITLE:
RCRA PART B PERMIT
OAK RIDGE NATIONAL LABORATORY
TRU STORAGE FACILITIES
BUILDING 7860A

FIGURE 8.1-19



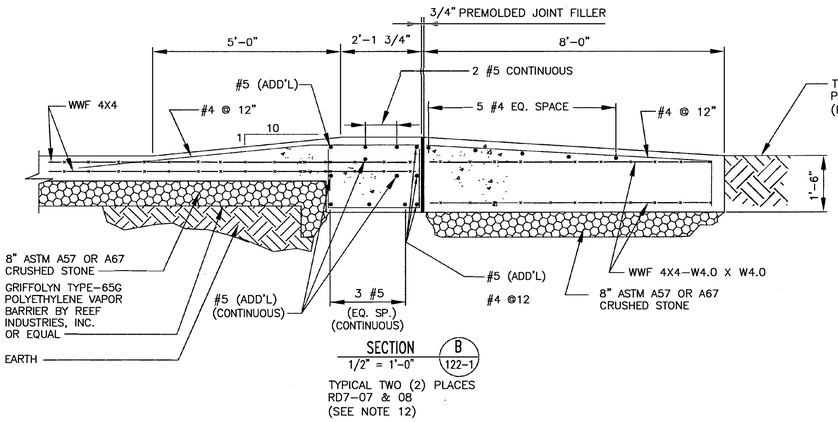
FOUNDATION PLAN

T.O.C. SLAB EL. 776'-0"
SCALE: 3/32=1'-0"
NOTE 11



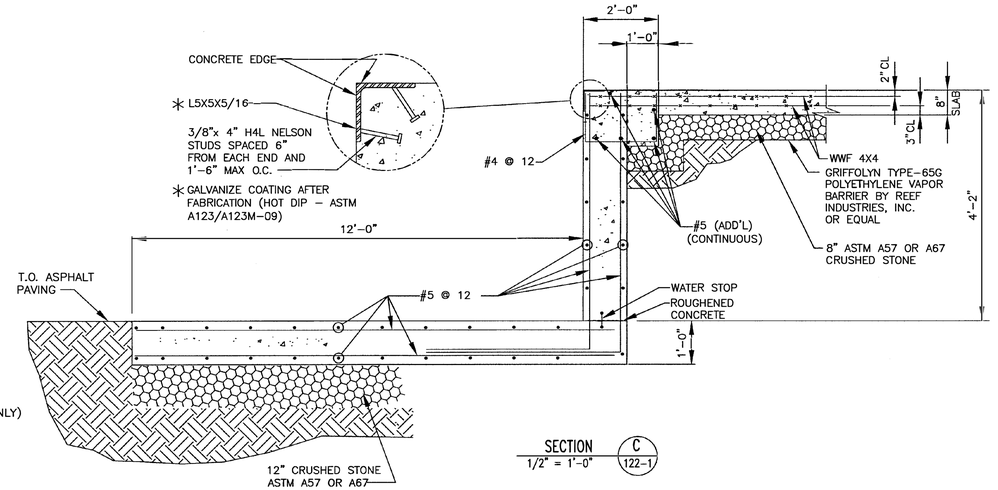
SECTION A 1/2" = 1'-0" (122-1)

PERSONNEL DOORS
TYPICAL TWO (2) PLACES
PD7-3 & PD7-7
1 AS SHOWN – 1 OPP. HAND
(SEE NOTE 12)



SECTION B 1/2" = 1'-0" (122-1)

TYPICAL TWO (2) PLACES
RD7-07 & 08
(SEE NOTE 12)



SECTION C 1/2" = 1'-0" (122-1)

NOTES

1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS.
2. REINFORCING STEEL SHALL BE GRADE 60 DEFORMED BARS CONFORMING TO ASTM A615. REINFORCING STEEL SHALL BE CLASS 'B' TENSION LAP SPLICES. ALL EMBEDMENT LENGTH TO BE TENSION DEVELOPMENT LENGTH.
3. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. WIRE TIES SHALL BE 16 GAUGE (OR HEAVIER), BLACK, ANNEALED STEEL WIRE. LAP SPLICES FOR WELDED WIRE SHALL BE MADE IN SUCH A WAY THAT THE OVERLAP EQUALS TWO SQUARES. LAPS SHALL BE STAGGERED TO AVOID CONTINUOUS LAPS IN EITHER DIRECTION. FABRIC SHALL BE WIRED AT LAPS IN INTERVALS NOT TO EXCEED 4 FEET.
4. PREMOLDED JOINT FILLER SHALL CONFORM TO ASTM D1751.
5. WATERSTOPS SHALL BE 6 IN. WIDE BY 3/8 INCH THICK AT CENTER, DUMBBELL ON SERRATED TYPE. SPLICE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. INSTALL WATERSTOP IN CENTER OF THE JOINT WITH ONE–HALF OF WATERSTOP WIDTH EMBEDDED IN THE CONCRETE ON EACH SIDE OF THE JOINT.
6. FORM ALL EXPOSED EXTERNAL CORNERS OF CONCRETE WITH 3/4" x 45° CHAMFER, EXCEPT CURBS.
7. SHIFT OR BEND BARS TO CLEAR DRAINS, PIPE SLEEVES, ELECTRICAL AND EMBEDDED ITEMS.
8. PLACING DIMENSIONS ARE GIVEN TO CENTER OF BARS UNLESS OTHERWISE NOTED.
9. CONCRETE COVER SHALL BE 3" WHERE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH. 2" FOR OTHER LOCATIONS.
10. CONTRACTION JOINT LOCATIONS MAY BE CHANGED AS APPROVED BY ENGINEER.
11. ALL ANCHOR BOLTS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR. ALL ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH BUILDING MANUFACTURER'S REQUIREMENTS. ALL ANCHOR BOLTS SHALL BE APPROVED BY ENGINEER PRIOR TO INSTALLATION.
12. ADJUST DEPTH OF CRUSHED STONE FROM 0" TO 8" BASED ON FINAL DEPTH OF ROCK EXCAVATION.
13. PROVIDE ADEQUATE CLEARANCE FOR 3" CONDUIT BELOW CONCRETE.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
6	4/20/16	BA	JE	BH	INCORPORATED FCR–SC–145 R1
5	12/31/15	BA	NG	GW	INCORPORATED DCN–SC–103 & DCN–SC–106 R2
4	6/7/10	JAL	NG	GW	ADDED CONTRACTION JTS. THRU 30" SLAB; DELETED NOTE 14
3	6/2/10	JAL	GW	GW	REVISED CONTRACTION JOINTS; DIMENSIONS & ADDED NOTE 14
2	5/5/10	JAL	NG	GW	REVISED TO REFLECT FIELD CONDITIONS
1	3/16/10	JAL	NG	GW	CERTIFIED FOR CONSTRUCTION

JOHN G. ESCHUK REGISTERED ENGINEER No. 100219 STATE OF TENNESSEE

DRAWN BY J. A. LALONDE	DATE 9/15/09
DESIGNED BY N. GHASSABIAN	DATE 9/15/09
CHECKED BY N. GHASSABIAN	DATE 9/15/09
APPROVED BY J. G. WAGNER	DATE 9/16/09
APPROVED BY	DATE

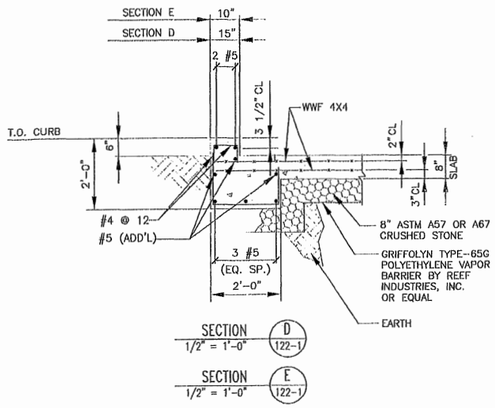
NORTHWIND WPC

TITLE
TRU WASTE PROCESSING CENTER
MULTI–PURPOSE BUILDING
FOUNDATION – WITH TP–II CRANE

SIZE	SCALE:	DWG. NO.	REV
D	AS NOTED	T–CH–FW–D–SC–122	6
	SHEET: 1 OF 3		

FILENAME:

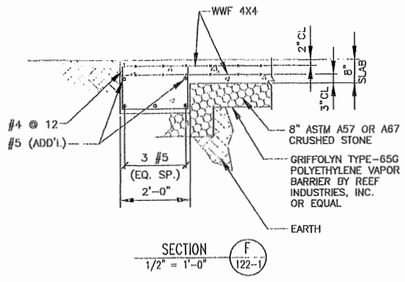
Figure 8.1-20A



SECTION D 1/2" = 1'-0" (122-1)

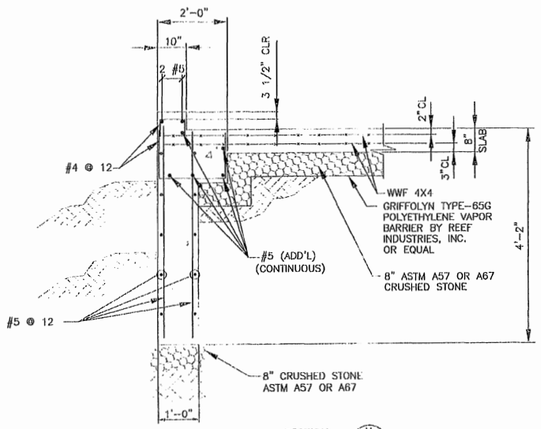
SECTION E 1/2" = 1'-0" (122-1)

(SEE NOTE 12)

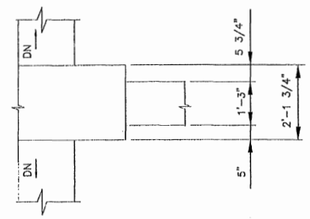


SECTION F 1/2" = 1'-0" (122-1)

TYPICAL 10 PLACES
RD7-02, 03, 04, 05 & 06
PD7-1, 2, 4, 5 & 6



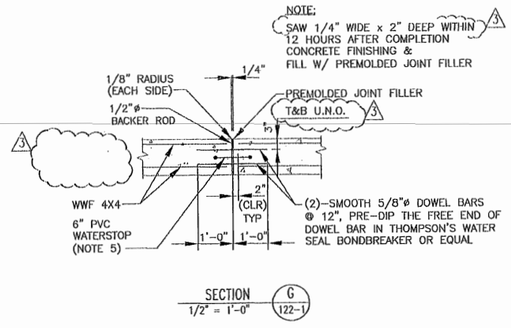
SECTION H 1/2" = 1'-0" (122-1)



DETAIL 1 1/2" = 1'-0" (122-1)

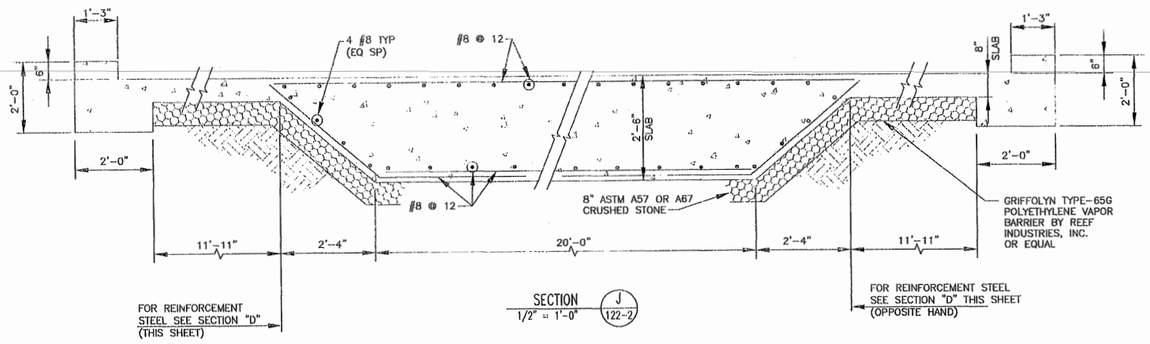
TYP. 2 PLACES – SOUTH SIDE OF EACH ROLLUP DOOR RD7-07 & RD7-08

OPPOSITE HAND 2 PLACES – NORTH SIDE OF EACH ROLLUP DOOR RD7-07 & RD7-08



SECTION G 1/2" = 1'-0" (122-1)

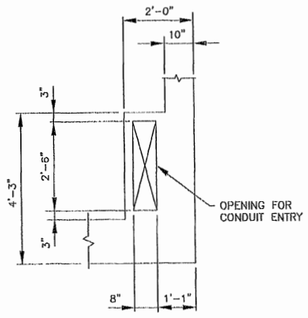
TYPICAL DOWELED CONTRACTION JOINT



FOR REINFORCEMENT STEEL SEE SECTION "D" (THIS SHEET)

SECTION J 1/2" = 1'-0" (122-2)

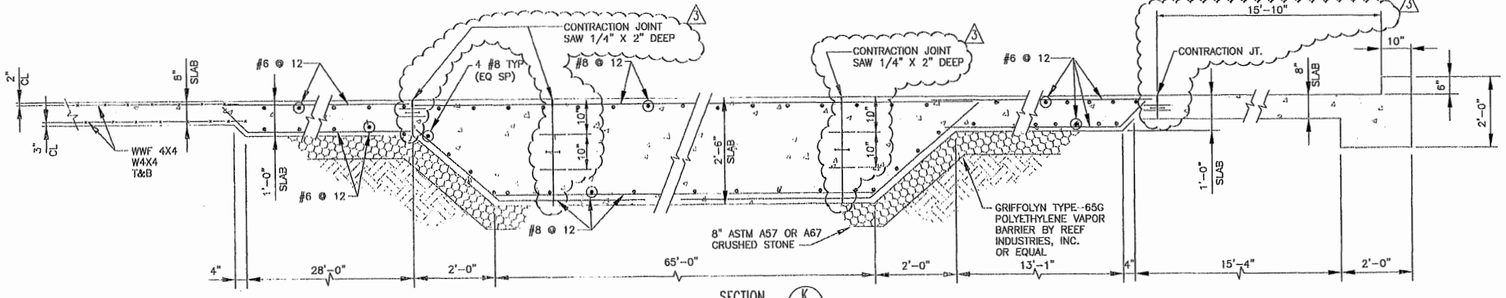
FOR REINFORCEMENT STEEL SEE SECTION "D" THIS SHEET (OPPOSITE HAND)



DETAIL 2 1/2" = 1'-0" (122-1)

FILL WITH PEA GRAVEL AFTER CONDUIT INSTALLATION (SEE NOTE 13)

(SEE NOTE 12)



SECTION K 1/2" = 1'-0" (122-2)

(SEE NOTE 12)

FOR REINFORCEMENT STEEL SEE SECTION "E" THIS SHEET (OPPOSITE HAND)

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
3	6/1/10	JAL	NG	GW	REVISED TYP SECTION "G" & SECTION "K" TO SHOW
					SHOW CONTRACTION JOINTS
2	5/5/10	JAL	NG	GW	REVISED TO REFLECT FIELD CONDITIONS
1	3/16/10	JAL	NG	GW	CERTIFIED FOR CONSTRUCTION
0	8/27/09	JAL	NG	GW	ISSUED FOR BID PURPOSES ONLY

NASSER GHASSABIAN REGISTERED ENGINEER No. 85501 STATE OF TENNESSEE

DRAWN BY: J. A. LALONDE	DATE: 8/27/09
DESIGNED BY: N. GHASSABIAN	DATE: 8/27/09
CHECKED BY: N. GHASSABIAN	DATE: 8/27/09
APPROVED BY: J. G. WAGNER	DATE: 9/14/09
APPROVED BY	DATE

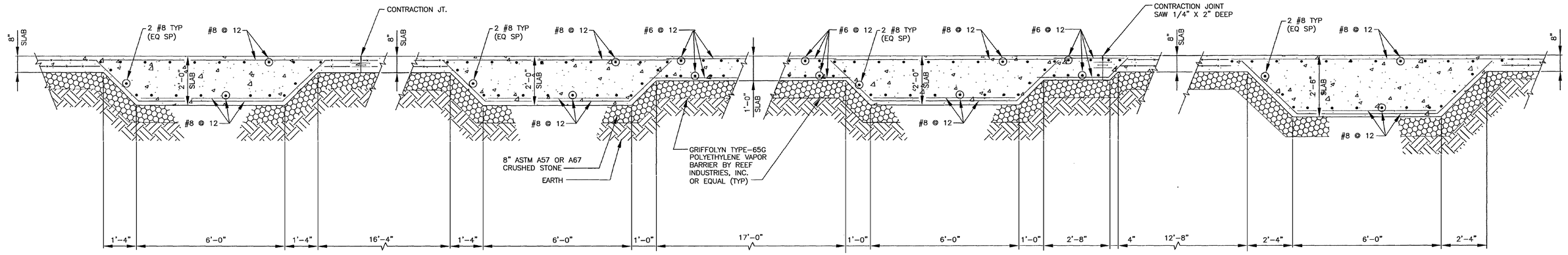
WPC WAI Team

TITLE: TRU WASTE PROCESSING CENTER MULTI-PURPOSE BUILDING FOUNDATION – WITH TP-II CRANE

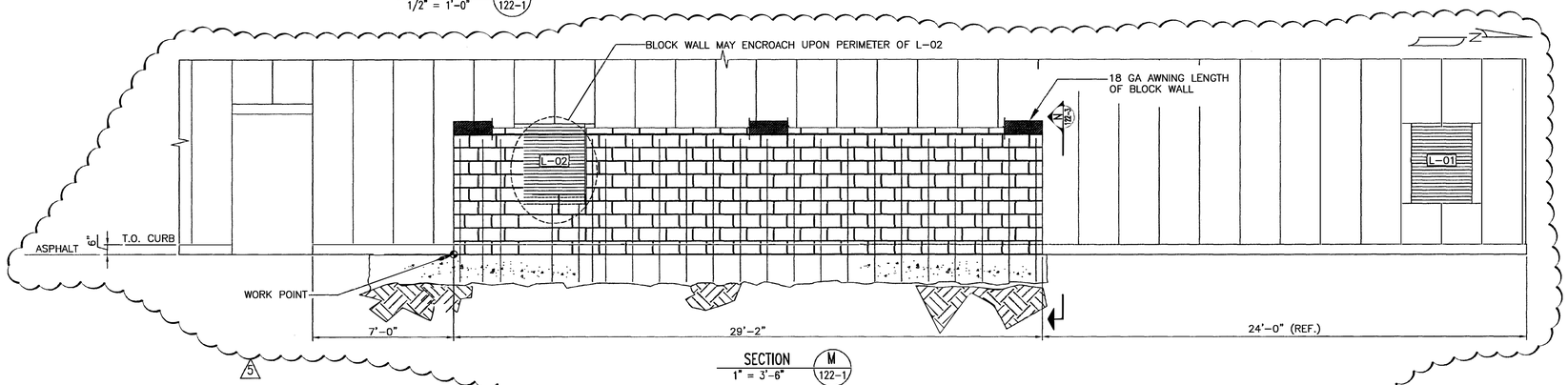
SIZE	SCALE:	DWG. NO.	REV
D	1/2"=1'-0"	T-CH-FW-D-SC-122	3
	SHEET: 2 OF 3		

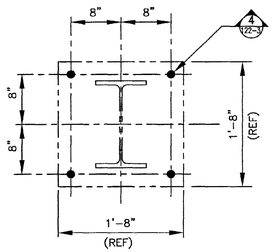
FILENAME:

FIGURE 8.1-20B



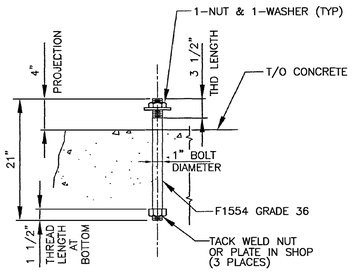
SECTION L
1/2" = 1'-0"
122-1





DETAIL 3
1" = 1'-0"
122-1

ANCHOR BOLT LOCATIONS – 4 PER BASE PLATE, 32 EMBEDMENTS REQUIRED



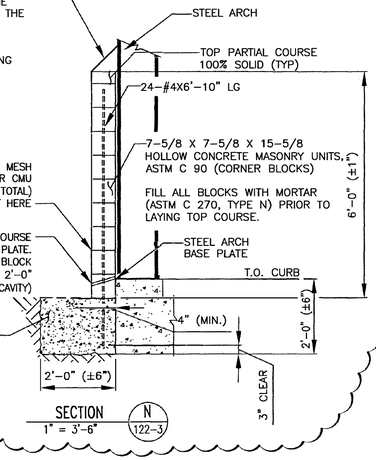
DETAIL 4
1" = 1'-0"
122-1

TYP ANCHOR BOLT DETAIL

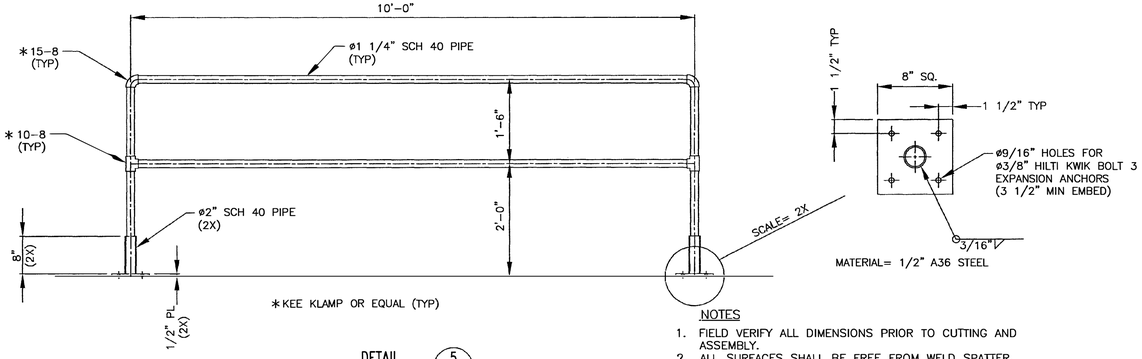
SECTION M
1" = 3'-6"
122-1

INSTALL 18 GA AWNING LENGTH OF BLOCK WALL TO MINIMIZE WATER COLLECTING BETWEEN THE BLOCK WALL AND THE STEEL ARCH WALL OF THE MPB.

AWNING SHAPED TO FIT THE ARCH CAVITIES, ATTACHED TO THE ARCHES WITH SELF-TAPPING SCREWS AND SEALED WITH SILICONE.



SECTION N
1" = 3'-6"
122-3



*KEE KLAMP OR EQUAL (TYP)

DETAIL 5
1"=1'
122-1

NOTES

1. FIELD VERIFY ALL DIMENSIONS PRIOR TO CUTTING AND ASSEMBLY.
2. ALL SURFACES SHALL BE FREE FROM WELD SPATTER, NICKS, SHARP EDGES, ETC.
3. ALL CUT EDGES SHALL BE GROUND SMOOTH.
4. WELDING OF STEEL SHALL BE IN ACCORDANCE WITH AWS D1.1.
5. STEEL SHALL BE HAND TOOL CLEANED PER SSPC-SP2 AND COATED WITH 2 PART EPOXY (OR APPROVED ALT.) IN ACCORDANCE WITH MFR'S RECOMMENDATIONS. COLOR OF TOPCOAT SHALL BE SAFETY YELLOW (OR APPROVED ALT.) OR APPLY SAFETY TAPE.
6. BLOCK SHIELD WALL WAS REMOVED DUE TO WEATHER DETERIORATION.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
5	4/2014	BA	SE	BH	INCORPORATED FCR-SC-145 R1
4	1/4/16	BA	NG	GW	INCORPORATED DCN-SC-103 & DCN-SC-106 R2
3	6/7/10	JAL	NG	GW	REVISED SECTION "L" TO SHOW CONTRACTION JOINTS;
					CHANGED BASE PLATE BOLT HOLE LOCATIONS
2	5/5/10	JAL	NG	GW	REVISED TO REFLECT FIELD CONDITIONS
1	3/11/10	JAL	NG	GW	CERTIFIED FOR CONSTRUCTION

JOHN G. ESCHUK REGISTERED ENGINEER STATE OF TENNESSEE NO. 100219 — 4/20/22

DRAWN BY J. A. LALONDE	DATE 8/27/09
DESIGNED BY N. GHASSABIAN	DATE 8/27/09
CHECKED BY N. GHASSABIAN	DATE 8/27/09
APPROVED BY J. G. WAGNER	DATE 9/16/09
APPROVED BY	DATE

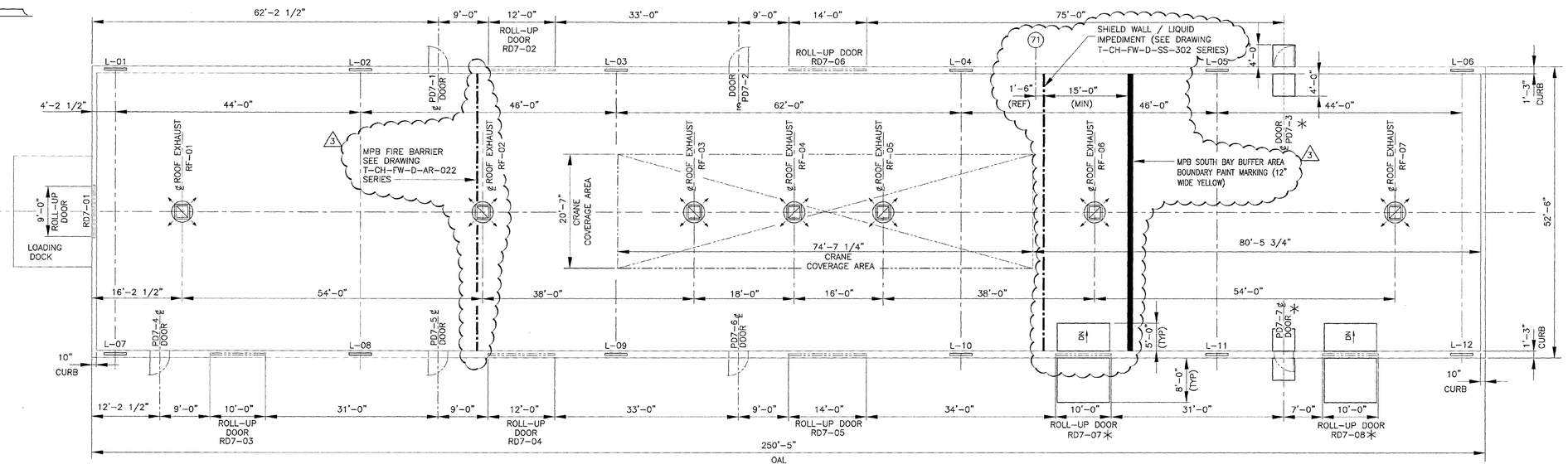
NORTHWIND TWPC

TITLE
TRU WASTE PROCESSING CENTER
MULTI-PURPOSE BUILDING
FOUNDATION – WITH TP-II CRANE

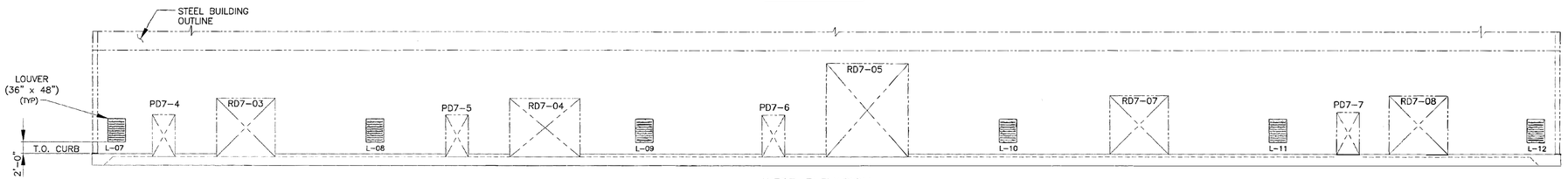
SIZE	SCALE: 1/2"=1'-0"	DWG. NO.	REV
D	SHEET: 3 OF 3	T-CH-FW-D-SC-122	5

FILENAME:

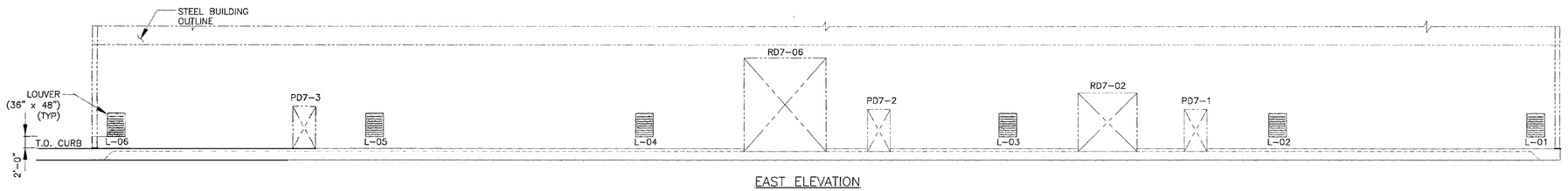
Figure 8.1-20C



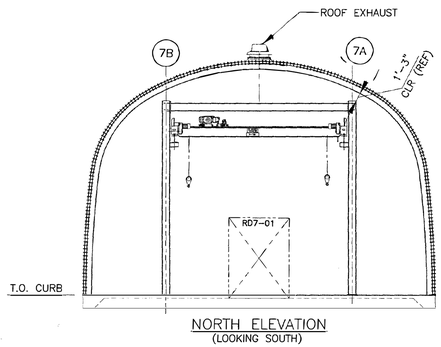
BUILDING PLAN



WEST ELEVATION
(LOOKING EAST)



EAST ELEVATION
(LOOKING WEST)



NORTH ELEVATION
(LOOKING SOUTH)

ROLL-UP DOOR SCHEDULE

	W	X	H
RD7-01	9'	X	10'
RD7-02	12'	X	10'
RD7-03	10'	X	10'
RD7-04	12'	X	10'
RD7-05	14'	X	16'
RD7-06	14'	X	16'
* RD7-07	10'	X	10'
* RD7-08	10'	X	10'

PERSONNEL DOOR SCHEDULE

ALL	3'-6" X 7'-0"

* THRESHOLD THESE DOORS AT TOP OF CURB

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
3	3/29/21	[illegible]	GW	GW	INCORPORATED DCN-AR-012 RO
2	3/15/10	JAL	NG	GW	CERTIFIED FOR CONSTRUCTION
1	9/16/09	JAL	NG	GW	ISSUED FOR BUILDING DESIGN; ADDED CRANE COVERAGE,
					ROOF EXHAUSTERS; REV. DOOR SIZES & RELOCATED L-03
0	7/20/09	JAL	NG	GW	ISSUED FOR BID PURPOSES ONLY

RPE
John Gregorie Wagner
Registered Engineer
No. 20545
STATE OF TENNESSEE
Rev. 3

DRAWN BY / DATE	J. A. LALONDE 7/20/09
DESIGNED BY / DATE	N. GHASSABIAN 7/20/09
CHECKED BY / DATE	N. GHASSABIAN 7/20/09
APPROVED BY / DATE	J. G. WAGNER 7/20/09
APPROVED BY / DATE	

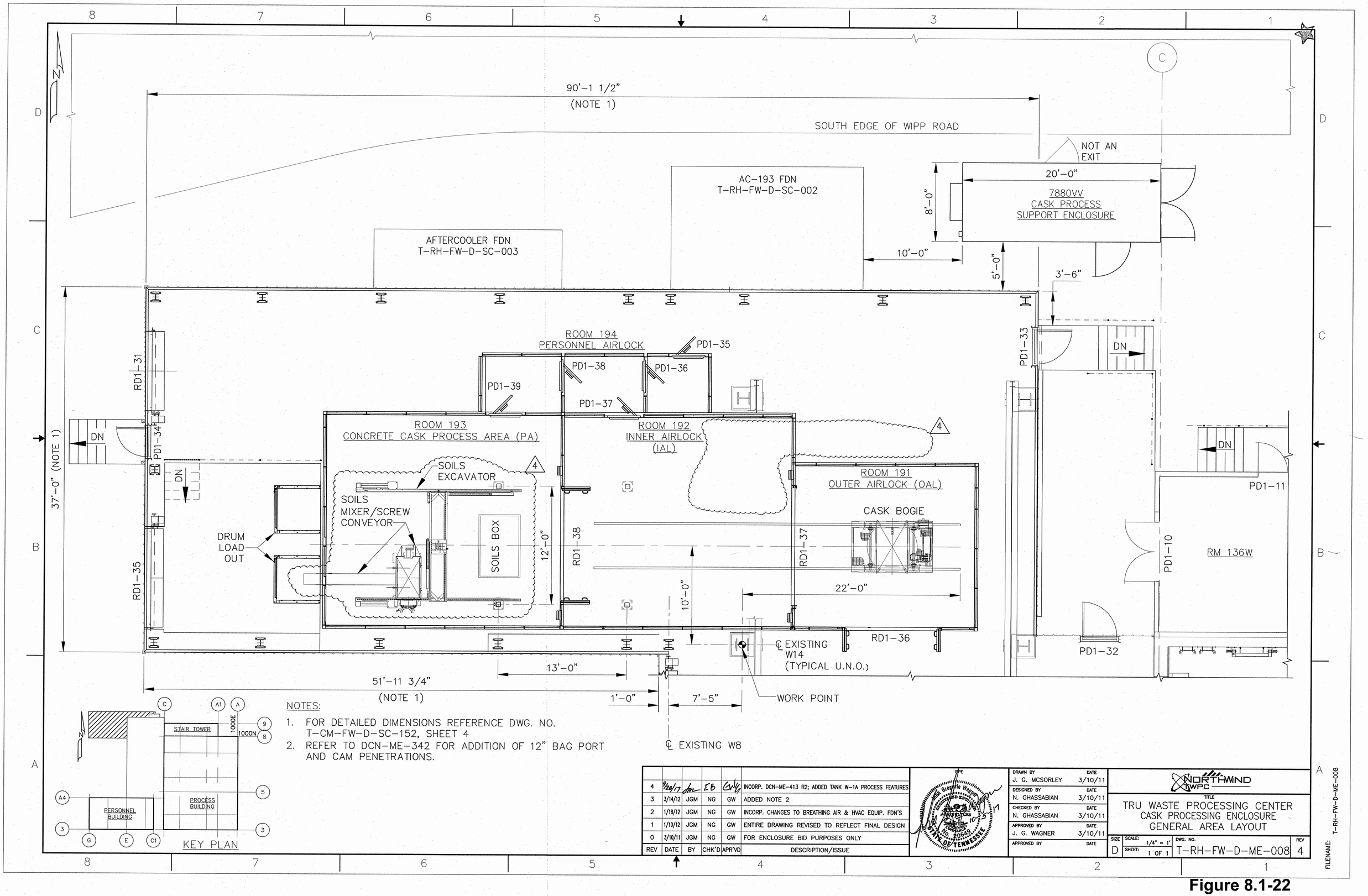
NORTHWIND WPC

TITLE
TRU WASTE PROCESSING CENTER
MULTI-PURPOSE BUILDING
GENERAL ARRANGEMENT

SIZE	SCALE	DWG. NO.	REV
D	3/32"=1'-0"	T-CH-FW-D-AR-021	3
	SHEET: 1 OF 1		

FILENAME: T-CH-FW-D-AR-014

Figure 8.1-21



NOTES:

1. FOR DETAILED DIMENSIONS REFERENCE DWG. NO. T-CM-FW-D-SC-152, SHEET 4
2. REFER TO DCN-ME-342 FOR ADDITION OF 12" BAG PORT AND CAM PENETRATIONS.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
4	9/28/17	JGM	EB	GW	INCORP. DCN-ME-413 R2; ADDED TANK W-1A PROCESS FEATURES
3	3/14/12	JGM	NG	GW	ADDED NOTE 2
2	1/18/12	JGM	NG	GW	INCORP. CHANGES TO BREATHING AIR & HVAC EQUIP. FDN'S
1	1/10/12	JGM	NG	GW	ENTIRE DRAWING REVISED TO REFLECT FINAL DESIGN
0	3/10/11	JGM	NG	GW	FOR ENCLOSURE BID PURPOSES ONLY

DRAWN BY J. G. MCSORLEY	DATE 3/10/11
DESIGNED BY N. GHASSABIAN	DATE 3/10/11
CHECKED BY N. GHASSABIAN	DATE 3/10/11
APPROVED BY J. G. WAGNER	DATE 3/10/11
APPROVED BY	DATE

NORTHWND WPC

TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
GENERAL AREA LAYOUT

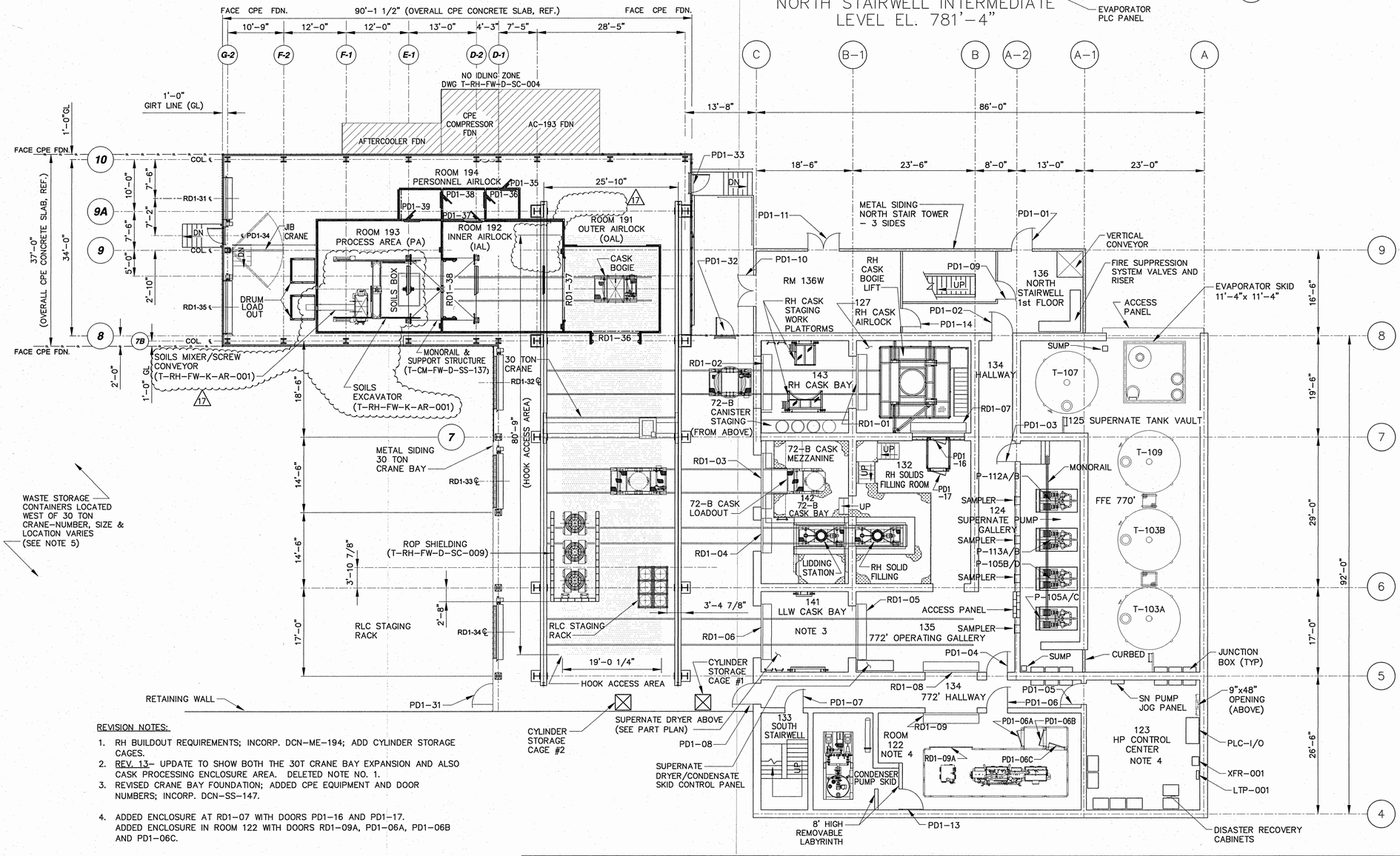
SIZE	SCALE:	DWG. NO.	REV
D	1/4" = 1'	T-RH-FW-D-ME-008	4
	SHEET: 1 OF 1		

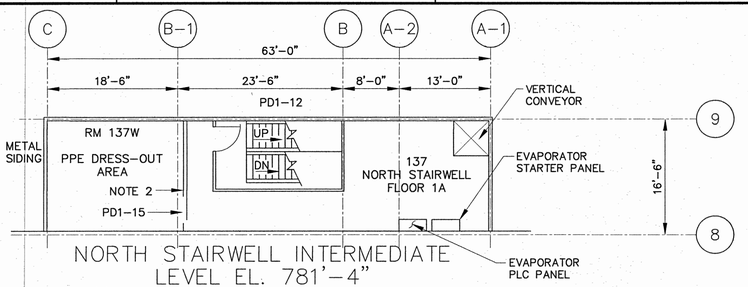
FILENAME: T-RH-FW-D-ME-008

Figure 8.1-22

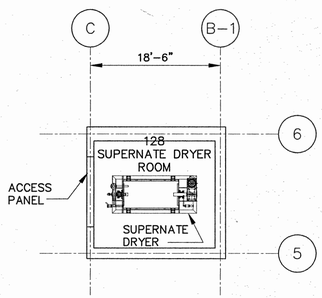
NOTE:

1. DELETED
2. WOVEN WIRE PARTITION.
3. BOGIE REMOVED FROM RM. 141 DURING CH SOLID WASTE OPERATIONS.
4. ROOM 122 AND ROOM 123 (TAKE COVER AREA) LAYOUTS FOR ILLUSTRATIVE PURPOSES ONLY.
5. MINOR OR INCIDENTAL EQUIPMENT MAY NOT BE SHOWN ON THE DRAWING OR MAY BE RELOCATED.





NORTH STAIRWELL INTERMEDIATE LEVEL EL. 781'-4"



PART PLAN – EL. 785'-0"

WASTE STORAGE CONTAINERS LOCATED WEST OF 30 TON CRANE–NUMBER, SIZE & LOCATION VARIES (SEE NOTE 5)

REVISION NOTES:

1. RH BUILDOUT REQUIREMENTS; INCORP. DCN–ME–194; ADD CYLINDER STORAGE CAGES.
2. REV. 13– UPDATE TO SHOW BOTH THE 30T CRANE BAY EXPANSION AND ALSO CASK PROCESSING ENCLOSURE AREA. DELETED NOTE NO. 1.
3. REVISED CRANE BAY FOUNDATION; ADDED CPE EQUIPMENT AND DOOR NUMBERS; INCORP. DCN–SS–147.
4. ADDED ENCLOSURE AT RD1–07 WITH DOORS PD1–16 AND PD1–17. ADDED ENCLOSURE IN ROOM 122 WITH DOORS RD1–09A, PD1–06A, PD1–06B AND PD1–06C.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
17	10/23/17	JAL	EB	GW	INCORP. DCN–ME–413 R2; ADDED TANK W–1A PROCESS FEATURES
16	8/18/15	JAL	NG	GW	INCORP. DCN–SC–109 R1 & DCN–ME–393 R1
15	5/13/14	JGM	NG	GW	SEE REV. NOTE NO. 4
14	3/27/11	JGM	NG	GW	SEE REV. NOTE NO. 3
13	3/27/11	JGM	NG	GW	SEE REV. NOTE NO. 2
12	1/12/09	JAL	NG	GW	DELETED CYLINDER STORAGE CAGE #3

RPE
Gregorie Warren Wagner
10/23/17
20645
STATE OF TENNESSEE

DRAWN BY / DATE	J. A. TABLER / 12/1/00
DESIGNED BY / DATE	J. G. WAGNER / 12/1/00
CHECKED BY / DATE	N. GHASSABIAN / 12/1/00
APPROVED BY / DATE	J. G. WAGNER / 12/1/00
APPROVED BY / DATE	

NORTHWIND WPC

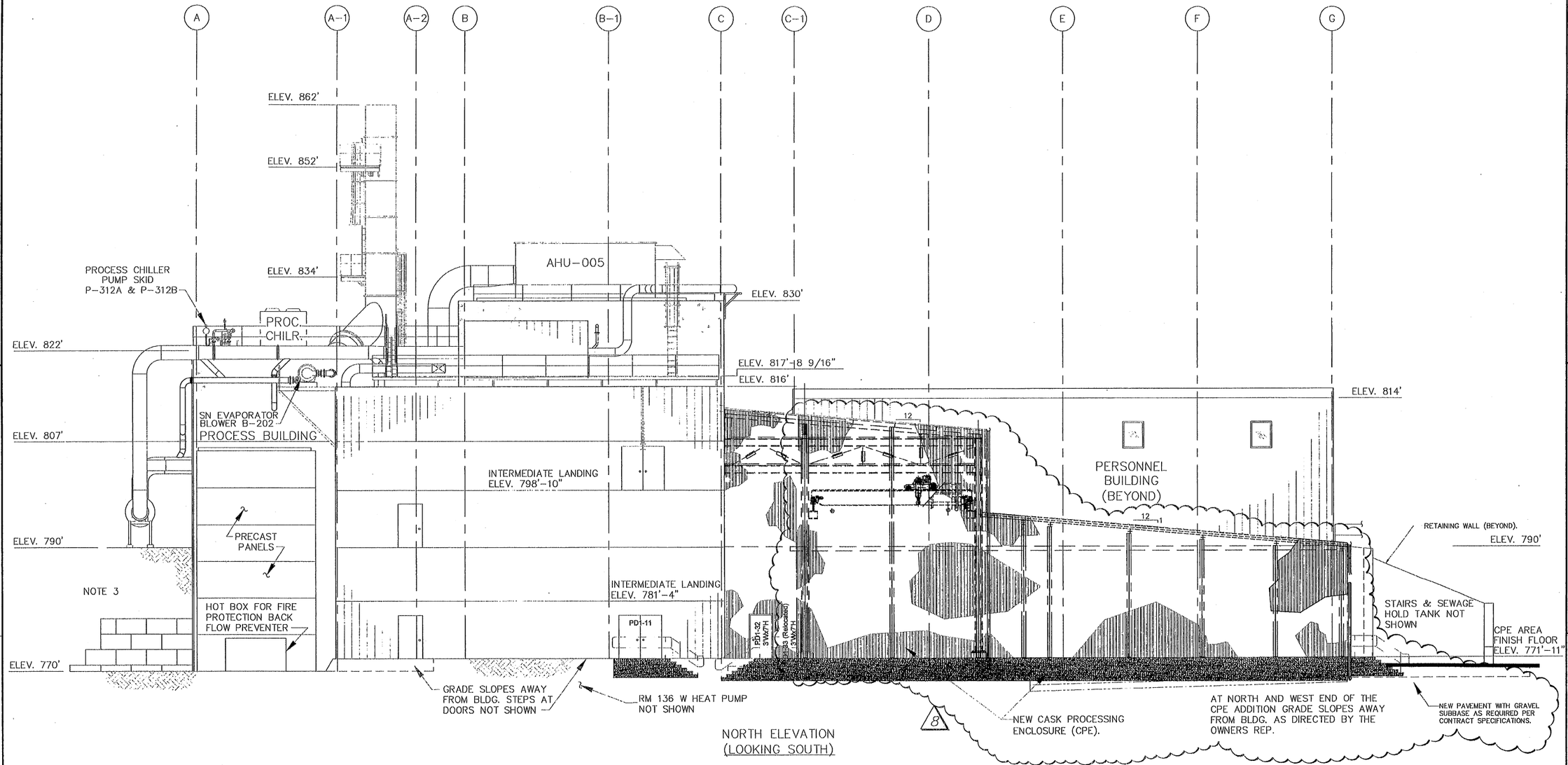
TITLE
TRU WASTE PROCESSING CENTER
1ST FLOOR PLAN
GENERAL ARRANGEMENT

SIZE	SCALE:	DWG. NO.	REV
D	3/32"=1'-0"	T–CM–FW–D–AR–001	17
	SHEET: 1 OF 1		

FILENAME: T-CM-FW-D-AR-001

Figure 8.1-23

NOTES:
1. [redacted]
2. HANDRAIL ON NORTH STAIR TOWER NOT SHOWN FOR CLARITY.
3. TRANSFER PIPE TRENCH NOT SHOWN.



NORTH ELEVATION
(LOOKING SOUTH)

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
8	3/28/11	GM	KS	GW	ADD CASK PROCESSING ENCLOSURE (CPE); DELTE NOTE NO. 1
7	10/30/08	JWY	NG	GW	ADD CRANE BAY ADDITION
6	10/8/08	JG	NG	GW	ADDED RLC STAGING RACKS & CRANE
5	4/18/05	JGM	NG	GW	ADDED REFERENCE TO HSGS CONTAINERS
4	1/30/04	JAT	GW	GW	GENERAL REVISION
3	6/30/03	EC	JAL	GW	REV TO REFLECT PLANT FEATURES & AS BUILT COND
2	7/29/02	JAT	BAR	GW	REVISED TO REFLECT PURCHASED EQUIPMENT AND AS INSTALLED CONDITIONS, CLOSED NCR-020
1	4/30/01	JAT	BAR	GW	REV. N. STAIR TOWER, ADDED STAIR TOWER DOORS ELEV. 790

NASSER GHASSAEIAN — No. 22860 — STATE OF TENNESSEE — 3/29/11

DRAWN BY J. TABLER	DATE 3/5/01
DESIGNED BY J. G. WAGNER	DATE 3/5/01
CHECKED BY W.T. REED	DATE 3/5/01
APPROVED BY J. C. WAGNER	DATE 3/5/01
APPROVED BY	DATE

TWPC WAI Team

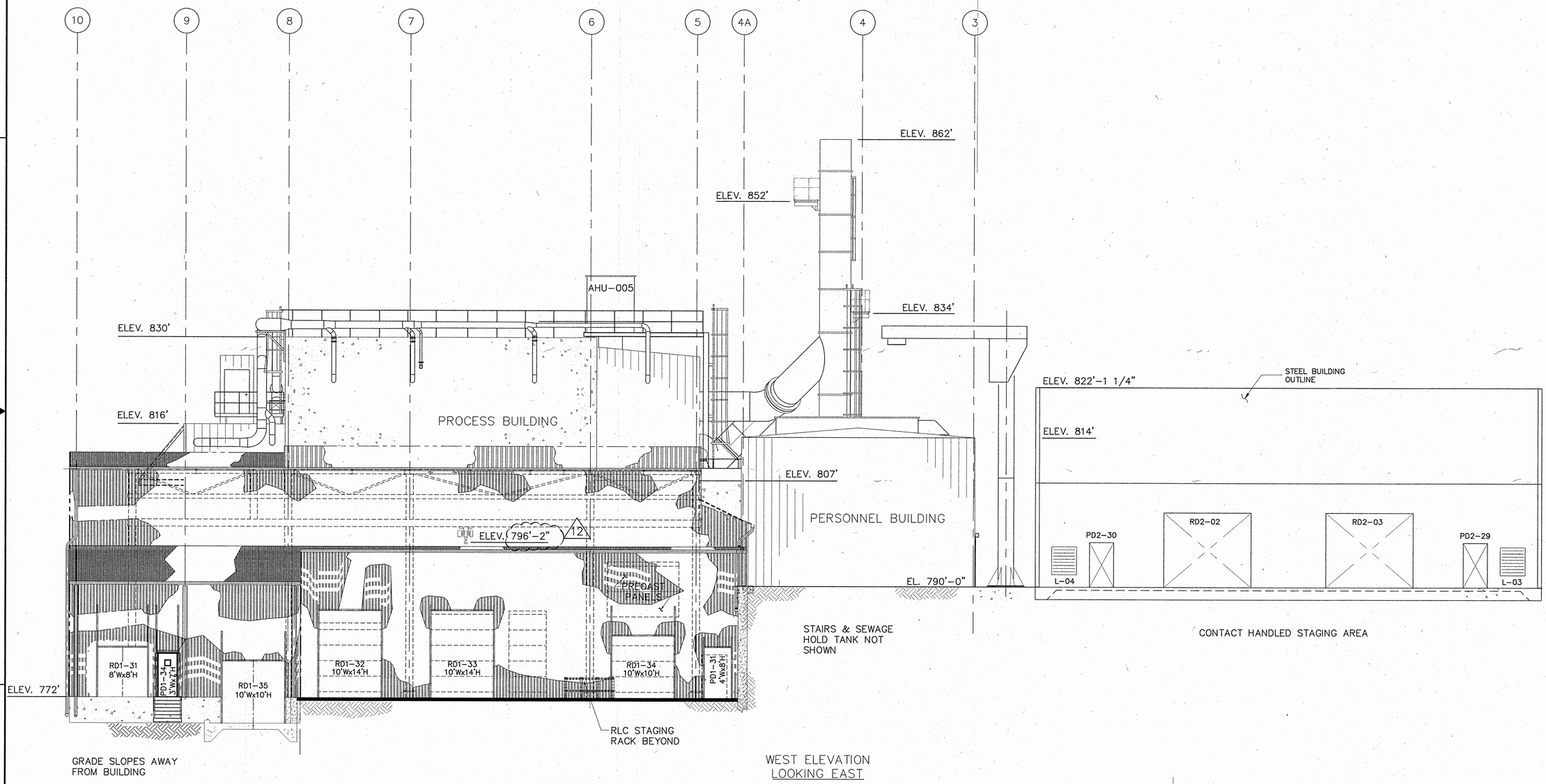
TITLE
TRU/ALPHA WASTE TREAT. PROJ.
PROCESS BUILDING AND AUX. EQUIP.
NORTH ELEVATION

SIZE	SCALE:	DWG. NO.	REV.
D	1/8"=1'-0"	T-CM-FW-D-AR-004	8
	SHEET: 1 OF 1		

FILENAME: T-CM-FW-D-AR-004

FIGURE 8.1-24

NOTES:
1. NDA/NDE EQUIP. NOT SHOWN FOR CLARITY.



REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
12	6/7/12	JM	SDC	GW	INCORPORATED DCN-ME-323 R0
11	3/14/12	JGM	NG	GW	INCORP. DCN-SS-147; REMOVED CONVEYOR BETWEEN PROCESS BUILDING AND CHSA; ADDED JIB CRANE
10	3/28/11	JGM	NG	GW	ADD CASK PROCESSING ENCLOSURE; DELETE NOTE NO. 2

RPE
John Gregorie Wagner
No. 29649
STATE OF TENNESSEE

DRAWN BY J. TABLER	DATE 3/5/01
DESIGNED BY J. G. WAGNER	DATE 3/5/01
CHECKED BY W. T. REED	DATE 3/5/01
APPROVED BY J. G. WAGNER	DATE 3/5/01
APPROVED BY	DATE

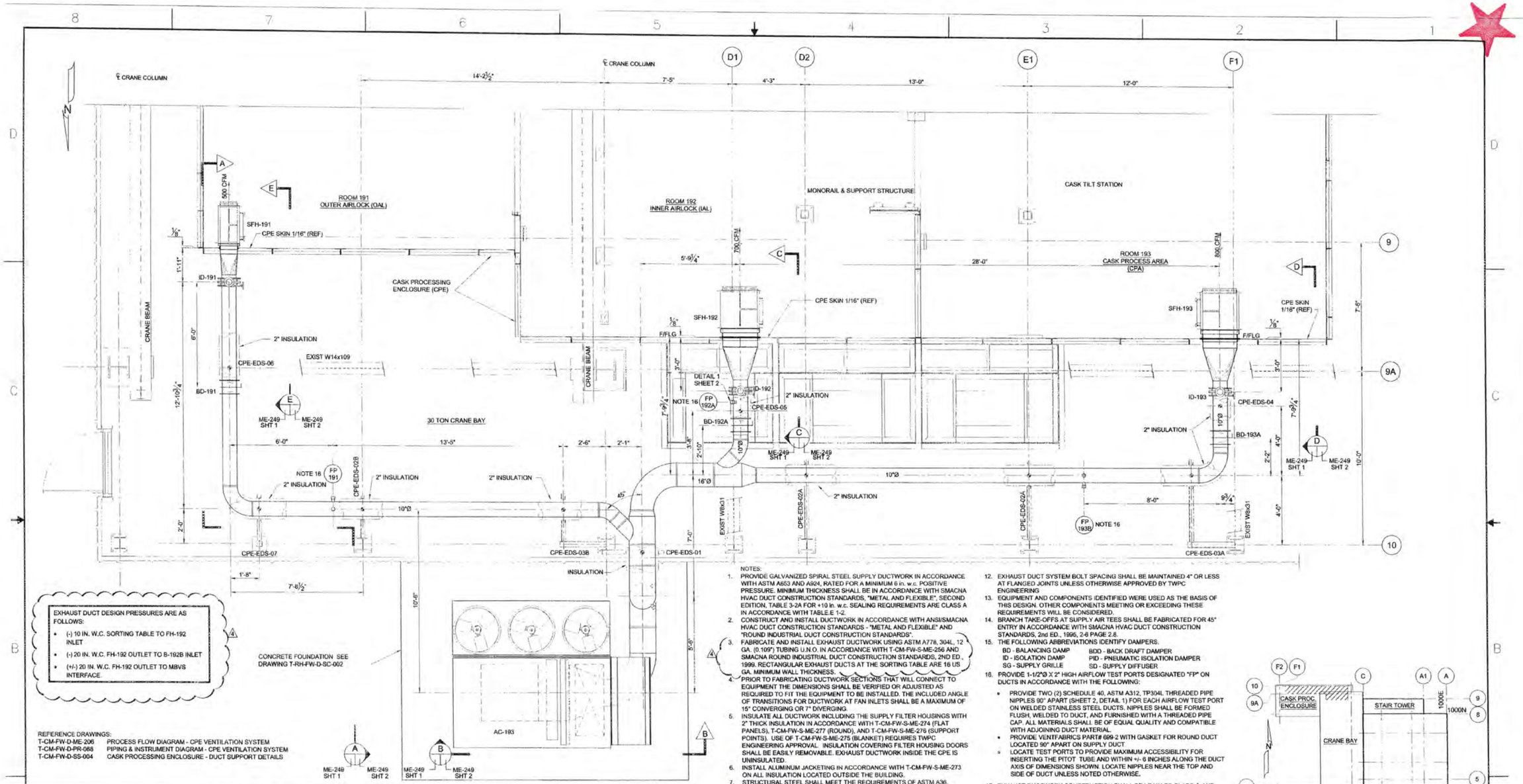
NORTHWIND WPC

TITLE
TRU WASTE PROCESSING CENTER
PROCESS BUILDING AND AUX. EQUIP.
WEST ELEVATION

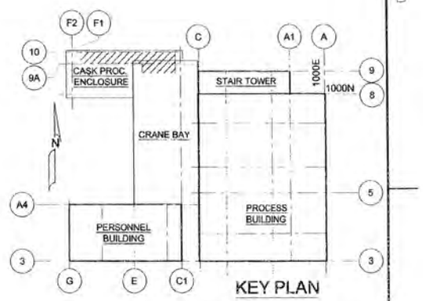
SIZE	SCALE:	DWG. NO.	REV
D	1/8"=1'-0"	T-CM-FW-D-AR-007	12
	SHEET: 1 OF 1		

FILENAME: T-CM-FW-D-AR-007

Figure 8.1-25



NOTES:
1. PROVIDE GALVANIZED SPIRAL STEEL SUPPLY DUCTWORK IN ACCORDANCE WITH ASTM A653 AND A924, RATED FOR A MINIMUM 6 in. w.c. POSITIVE PRESSURE. MINIMUM THICKNESS SHALL BE IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS, "METAL AND FLEXIBLE", SECOND EDITION, TABLE 3-2A FOR +10 in. w.c. SEALING REQUIREMENTS ARE CLASS A IN ACCORDANCE WITH TABLE E 1-2.
2. CONSTRUCT AND INSTALL DUCTWORK IN ACCORDANCE WITH ANSI/SMACNA HVAC DUCT CONSTRUCTION STANDARDS - "METAL AND FLEXIBLE" AND "ROUND INDUSTRIAL DUCT CONSTRUCTION STANDARDS".
3. FABRICATE AND INSTALL EXHAUST DUCTWORK USING ASTM A778, 304L, 12 GA. (0.109") TUBING U.N.O. IN ACCORDANCE WITH T-CM-FW-S-ME-256 AND SMACNA ROUND INDUSTRIAL DUCT CONSTRUCTION STANDARDS, 2ND ED., 1999. RECTANGULAR EXHAUST DUCTS AT THE SORTING TABLE ARE 16 US GA. MINIMUM WALL THICKNESS.
4. PRIOR TO FABRICATING DUCTWORK SECTIONS THAT WILL CONNECT TO EQUIPMENT THE DIMENSIONS SHALL BE VERIFIED OR ADJUSTED AS REQUIRED TO FIT THE EQUIPMENT TO BE INSTALLED. THE INCLUDED ANGLE OF TRANSITIONS FOR DUCTWORK AT FAN INLETS SHALL BE A MAXIMUM OF 15° CONVERGING OR 7° DIVERGING.
5. INSULATE ALL DUCTWORK INCLUDING THE SUPPLY FILTER HOUSINGS WITH 2" THICK INSULATION IN ACCORDANCE WITH T-CM-FW-S-ME-274 (FLAT PANELS), T-CM-FW-S-ME-277 (ROUND), AND T-CM-FW-S-ME-276 (SUPPORT POINTS). USE OF T-CM-FW-S-ME-275 (BLANKET) REQUIRES TWPC ENGINEERING APPROVAL. INSULATION COVERING FILTER HOUSING DOORS SHALL BE EASILY REMOVABLE. EXHAUST DUCTWORK INSIDE THE CPE IS UNINSULATED.
6. INSTALL ALUMINUM JACKETING IN ACCORDANCE WITH T-CM-FW-S-ME-273 ON ALL INSULATION LOCATED OUTSIDE THE BUILDING.
7. STRUCTURAL STEEL SHALL MEET THE REQUIREMENTS OF ASTM A36. CARBON STEEL COMPONENTS NOT OTHERWISE COATED OR COVERED (MANUFACTURER'S STANDARD COATING OR INSULATED) SHALL BE POWER TOOL CLEANED PER SSPC-SP3 AND COATED WITH 2 PART EPOXY IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. COLOR OF TOPCOAT SHALL BE MACHINE GRAY (OR APPROVED ALT.)
8. INSTRUMENTATION, CONTROL TUBING AND WIRING TO BE FURNISHED AND INSTALLED BY OTHERS, UNLESS NOTED OTHERWISE. IN-LINE CONTROL ELEMENTS (E.G. DAMPERS, FLOW METERS) SHALL BE FURNISHED AS NOTED AND INSTALLED BY DUCTWORK CONTRACTOR.
9. AIR SYSTEM TESTING, ADJUSTING, AND BALANCING SHALL BE IN ACCORDANCE WITH T-CM-FW-S-ME-281.
10. SEAL PENETRATIONS THROUGH WALLS AS NOTED.
11. FLANGED JOINTS IN EXHAUST DUCTWORK SHALL BE MINIMIZED. PROVIDE FLANGED INLET AND OUTLETS AT BLOWER B-192B, PUNCHED WITH COMPANION ANGLE OR PLATE FLANGES AS DEPICTED ON DRAWINGS.
12. EXHAUST DUCT SYSTEM BOLT SPACING SHALL BE MAINTAINED 4" OR LESS AT FLANGED JOINTS UNLESS OTHERWISE APPROVED BY TWPC ENGINEERING
13. EQUIPMENT AND COMPONENTS IDENTIFIED WERE USED AS THE BASIS OF THIS DESIGN. OTHER COMPONENTS MEETING OR EXCEEDING THESE REQUIREMENTS WILL BE CONSIDERED.
14. BRANCH TAKE-OFFS AT SUPPLY AIR TEES SHALL BE FABRICATED FOR 45° ENTRY IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS, 2nd ED., 1995, 2-6 PAGE 2.6.
15. THE FOLLOWING ABBREVIATIONS IDENTIFY DAMPERS.
BD - BALANCING DAMP — BDD - BACK DRAFT DAMPER
ID - ISOLATION DAMP — PID - PNEUMATIC ISOLATION DAMPER
SG - SUPPLY GRILLE — SD - SUPPLY DIFFUSER
16. PROVIDE 1-12"Ø X 2" HIGH AIRFLOW TEST PORTS DESIGNATED "FP" ON DUCTS IN ACCORDANCE WITH THE FOLLOWING:
- PROVIDE TWO (2) SCHEDULE 40, ASTM A312, TP304L THREADED PIPE NIPPLES 90° APART (SHEET 2, DETAIL 1) FOR EACH AIRFLOW TEST PORT ON WELDED STAINLESS STEEL DUCTS. NIPPLES SHALL BE FORMED FLUSH, WELDED TO DUCT, AND FURNISHED WITH A THREADED PIPE CAP. ALL MATERIALS SHALL BE OF EQUAL QUALITY AND COMPATIBLE WITH ADJOINING DUCT MATERIAL.
- PROVIDE VENTFABRICS PART# 699-2 WITH GASKET FOR ROUND DUCT LOCATED 90° APART ON SUPPLY DUCT.
- LOCATE TEST PORTS TO PROVIDE MAXIMUM ACCESSIBILITY FOR INSERTING THE PITOT TUBE AND WITHIN +/- 6 INCHES ALONG THE DUCT AXIS OF DIMENSIONS SHOWN. LOCATE NIPPLES NEAR THE TOP AND SIDE OF DUCT UNLESS NOTED OTHERWISE.
17. EXHAUST DUCTWORK CONSTRUCTION SHALL BE LEAKAGE CLASS 1 AND SHALL DEMONSTRATE A LEAKAGE RATE LESS THAN OR EQUAL TO 0.1% OF THAT SPECIFIED IN ACCORDANCE WITH ASME AG-1-2009, TABLE SA-B-1310.
18. PROVIDE FULL FACE 1/8-INCH THICK RED NEOPRENE RUBBER GASKETS FOR SUPPLY DUCTWORK FLANGED CONNECTIONS UNLESS OTHERWISE APPROVED BY TWPC ENGINEERING. GASKETS SHALL HAVE A DUROMETER SHORE A READING OF 60 ± 5.
19. PROVIDE VENTLON BY VENTFABRICS, INC. FLEXIBLE CONNECTION MATERIAL RATED FOR A MINIMUM OF 10 IN. W.C., UL LISTED AND NFPA 90A APPROVED AT THE CONNECTION TO AIR CONDITIONER AC-193.
20. CONTRACTOR TO FABRICATE AND INSTALL SUPPORTS IN ACCORDANCE WITH T-RH-FW-D-SS-004-SERIES DRAWINGS.
21. CONTRACTOR TO INSTALL ALL EQUIPMENT BOTH CONTRACTOR AND BUYER SUPPLIED, UNLESS NOTED OTHERWISE.



ELEVATIONS SHOWN ON THIS DRAWING ARE BASED ON FINISHED FLOOR ELEVATIONS ON THE FIRST FLOOR OF +768' AND +770'. REFERENCE FWENC DWGS T-CM-FW-D-CE-004 & -005

SCHEDULE - DUCTWORK COMPONENTS (CONTRACTOR SUPPLIED)

MARK NO.	DWG LOCATION	QUANTITY	DEVICE TYPE	MANUFACTURER	MODEL	SIZE	FINISH	SPECIFICATION
ID-191	SHT 1	1	BUTTERFLY VALVE	THERMOPLASTIC VALVES, INC	102-BFV	10" DIA.	PVC	NA
ID-192	SHT 1	1	BUTTERFLY VALVE	THERMOPLASTIC VALVES, INC	102-BFV	10" DIA.	PVC	NA
ID-193	SHT 1	1	BUTTERFLY VALVE	THERMOPLASTIC VALVES, INC	102-BFV	10" DIA.	PVC	NA
BD-191	SHT 1	1	BALANCING DMPR	RUSKIN	CDR92	10" DIA.	ALUMINUM PAINT/GALV	NA
BD-192A	SHT 1	1	BALANCING DMPR	RUSKIN	CDR92	10" DIA.	ALUMINUM PAINT/GALV	NA
BD-192B	SHT 5	1	BALANCING DMPR	RUSKIN	CDR92	8" DIA.	STAINLESS STEEL	NA
BD-193A	SHT 1	1	BALANCING DMPR	RUSKIN	CDR92	10" DIA.	ALUMINUM PAINT/GALV	NA
BD-193B	SHT 3	1	BALANCING DMPR	SELECTED BY SELLER	—	4"W X 7"H BLAST GATE	STAINLESS STEEL	NA
BD-193C	SHT 3	1	BALANCING DMPR	SELECTED BY SELLER	—	4"W X 7"H BLAST GATE	STAINLESS STEEL	NA
BD-193D	SHT 5	1	BALANCING DMPR	RUSKIN	CDR92	4" DIA.	STAINLESS STEEL	NA
BD-193E	SHT 2	1	BALANCING DMPR	RUSKIN	CDR92	10" DIA.	STAINLESS STEEL	NA
FC-1	SHT 4	1	FLEXIBLE CONN.	GENERAL RUBBER	1094	SIZE TO ACCOMODATE 1/2" BLOWER MOVEMENT. MATCH DRILL CONNECTOR AND BACKING FLANGES TO FIT BLOWER	MFR. STD.	NA
FC-2	SHT 4	1	FLEXIBLE CONN.	GENERAL RUBBER	1094		MFR. STD.	NA

SCHEDULE - EQUIPMENT (OWNER SUPPLIED)

AC-193	SHT 1	1	HEAT/COOLING UNIT	—	—	—	—	T-RH-FW-S-ME-812
B-192B	SHT 4	1	CENTRIFUGAL BLOWER	—	—	—	—	T-RH-FW-S-ME-813
SFH-191	SHT 1	1	FILTER HOUSING					T-RH-FW-S-ME-810
SFH-192	SHT 1	1	FILTER HOUSING	—	—	—	—	T-RH-FW-S-ME-811
SFH-193	SHT 1	1	FILTER HOUSING					T-RH-FW-S-ME-811
FH-192	SHT 3, 4	1	HEPA FILTER HOUSING	—	—	—	—	T-RH-FW-S-ME-804

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
4	8/31/11	JAL	JWW	GW	REV. NOTE 3; ADDED EXH. DUCT DESIGN PRESSURES
3	10/3/11	JAL	JWW	GW	REV BD-193B, BD-193C & BD-193E DMPR. SIZES
2	9/23/11	JAL	JWW	GW	CHANGED SFH-192 ORIENTATION; REV MK. NO. & SHEET REFERENCES
1	8/15/11	JAL	JWW	GW	REV DUCT FILTER HOUSING INTERFACE DET'S & ENCLOSURE BACKGROUND
0	7/11/11	JAL	JWW	GW	FOR HVAC BID PURPOSES ONLY

JUNIE W. WEEKS JR. REGISTERED ENGINEER 0 STATE OF TENNESSEE

DRAWN BY	J. A. LALONDE	DATE 7/11/11
DESIGNED BY	J. A. LALONDE	DATE 7/11/11
CHECKED BY	JUNIE WEEKS JR.	DATE 7/11/11
APPROVED BY	J. G. WAGNER	DATE 7/11/11
APPROVED BY		DATE

WPC WAI Team

TITLE
4
CASK PROCESSING ENCLOSURE
HVAC SYSTEM DESIGN

SIZE	SCALE:	DWG. NO.	REV
D	3/8"=1'-0"	T-CM-FW-D-ME-249	4
	SHEET: 1 OF 6		

FILENAME: T-CM-FW-D-ME-249_SHT 1

FIGURE 8.1-26

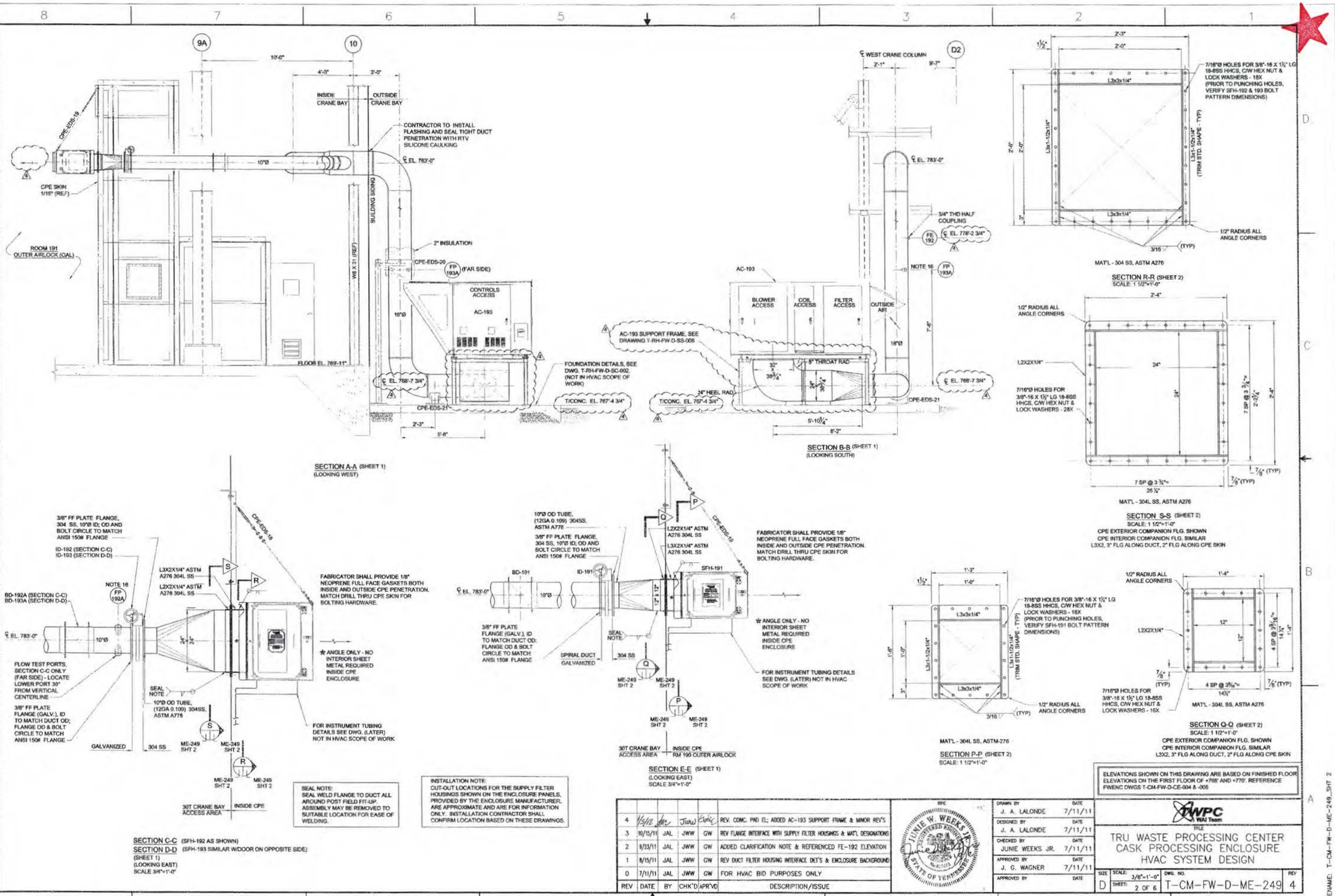
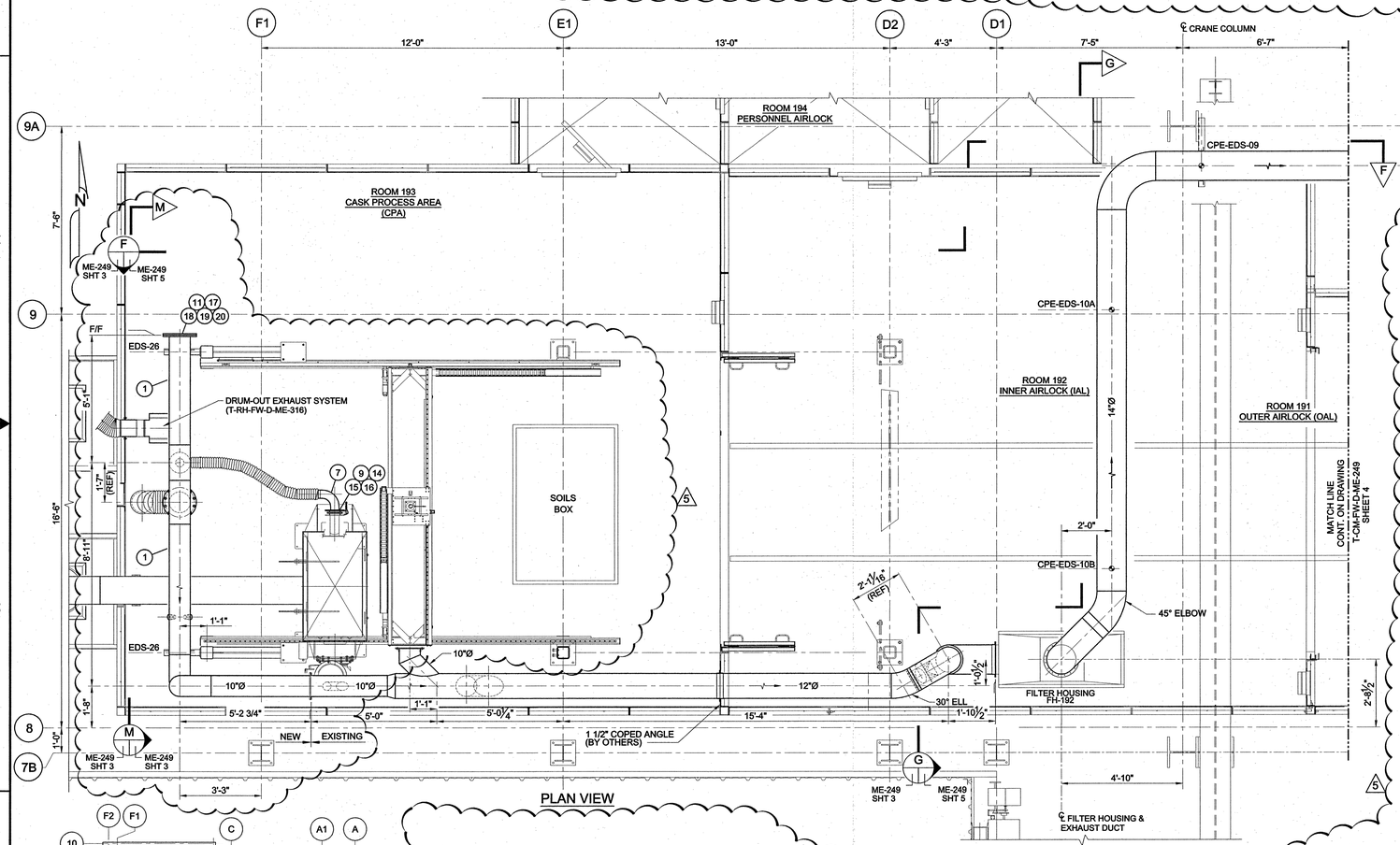

SECTION A-A (SHEET 1)
(LOOKING WEST)
SECTION B-B (SHEET 1)
(LOOKING SOUTH)
SECTION R-R (SHEET 2)
SCALE: 1 1/2"=1'-0"
SECTION S-S (SHEET 2)
SCALE: 1 1/2"=1'-0"
CPE EXTERIOR COMPANION FLG. SHOWN
CPE INTERIOR COMPANION FLG. SIMILAR
L3X2, 3" FLG ALONG DUCT, 2" FLG ALONG CPE SKIN
SECTION C-C (SFH-192 AS SHOWN)
SECTION D-D (SFH-193 SIMILAR W/DOOR ON OPPOSITE SIDE)
(SHEET 1)
(LOOKING EAST)
SCALE 3/4"=1'-0"
SECTION E-E (SHEET 1)
(LOOKING EAST)
SCALE 3/4"=1'-0"
SECTION P-P (SHEET 2)
SCALE: 1 1/2"=1'-0"
SECTION Q-Q (SHEET 2)
SCALE: 1 1/2"=1'-0"
CPE EXTERIOR COMPANION FLG. SHOWN
CPE INTERIOR COMPANION FLG. SIMILAR
L3X2, 3" FLG ALONG DUCT, 2" FLG ALONG CPE SKIN
MAT'L - 304 SS, ASTM A276
MAT'L - 304L SS, ASTM A276
MAT'L - 304L SS, ASTM-276
MAT'L - 304L SS, ASTM A276
SEAL NOTE:
SEAL WELD FLANGE TO DUCT ALL AROUND POST FIELD FIT-UP. ASSEMBLY MAY BE REMOVED TO SUITABLE LOCATION FOR EASE OF WELDING.
INSTALLATION NOTE:
CUT-OUT LOCATIONS FOR THE SUPPLY FILTER HOUSINGS SHOWN ON THE ENCLOSURE PANELS, PROVIDED BY THE ENCLOSURE MANUFACTURER, ARE APPROXIMATE AND ARE FOR INFORMATION ONLY. INSTALLATION CONTRACTOR SHALL CONFIRM LOCATION BASED ON THESE DRAWINGS.
ELEVATIONS SHOWN ON THIS DRAWING ARE BASED ON FINISHED FLOOR ELEVATIONS ON THE FIRST FLOOR OF +768' AND +770'. REFERENCE FWENC DWGS T-CM-FW-D-CE-004 & -005
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
HVAC SYSTEM DESIGN
T-CM-FW-D-ME-249
4
2 OF 6
FILENAME: T-CM-FW-D-ME-249_SHT 2

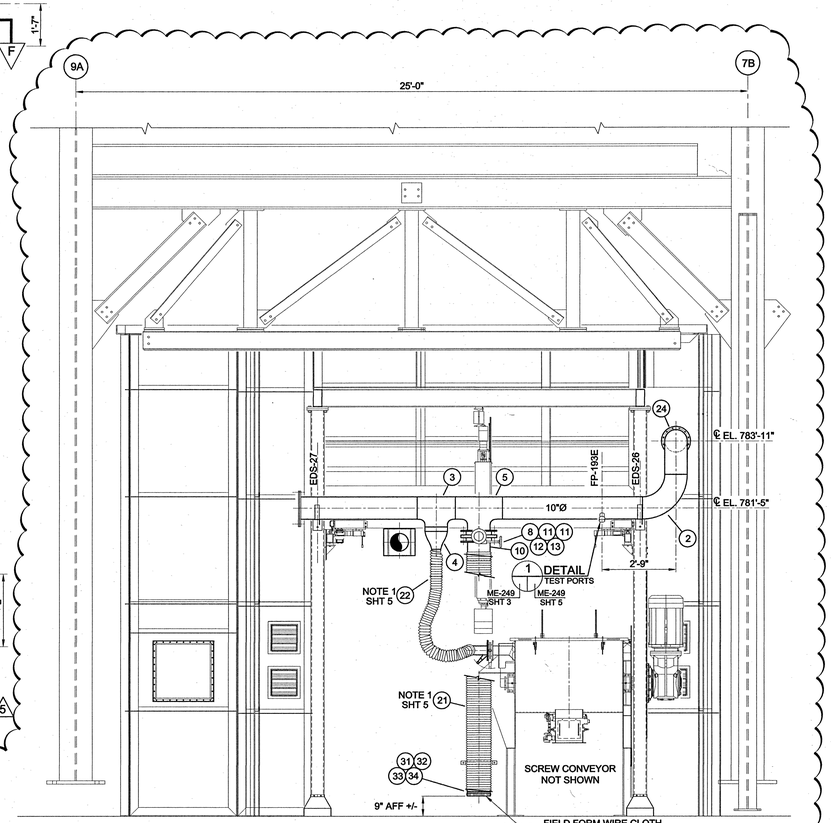
FIGURE 8.1-27

BILL OF MATERIALS			
ITEM	QUAN	SIZE	DESCRIPTION
1	20 FT	10" OD	TUBE - 12 GA. (0.109), 304L SS, ASTM A778 OR A-269
2	2	10" OD	90° ELBOW - TUBE, 12 GA. (0.109), 304L SS, ASTM A774
3	1	10" OD	TEE - TUBE, 12 GA. (0.109), 304L SS, ASTM A774
4	1	10" OD X 4" OD	TANGENT REDUCER - TUBE, 12 GA. (0.109), 304L SS, ASTM A774
5	1	10" OD	TANGENT TEE - TUBE, 12 GA. (0.109), 304L SS, ASTM A774
7	1	4" OD	90° LONG TANGENT ELL - TUBE, 12 GA. (0.109), 304L SS, ASTM A774
8	1	10"	BUTTERFLY VALVE - THERMOPLASTIC WAFER STYLE, GEAR TYPE, PVC BODY SS SHAFT, 4.37" OAL, TVI THERMOPLASTIC VALVE, INC. OR APPROVED EQUAL
9	1	4"	BUTTERFLY VALVE - THERMOPLASTIC WAFER STYLE, HAND LEVER, PVC BODY SS SHAFT, 1.85" OAL, TVI THERMOPLASTIC VALVE, INC. OR APPROVED EQUAL
10	1	10" OD X 8" LG	TUBE - 12 GA. (0.109), 304L SS, ASTM A778 OR A-269
11	3	16" OD X 10.03 ID	10" TUBE SIZE PLATE FLANGE - 304L SS, 0.63 IN THK, 150# CLASS DRILLING
12	12	7/8" X 8" LG	STUD BOLTS - ASTM A193 GR B7, FULL THD
13	24	7/8"	HEAVY HEX NUTS - ASTM A193 GR 2H

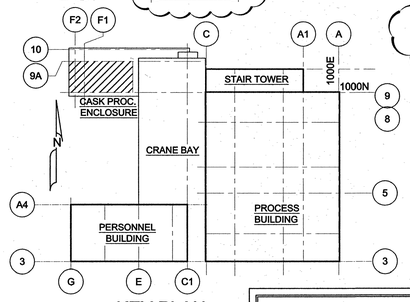
BILL OF MATERIALS (CONT.)			
ITEM	QUAN	SIZE	DESCRIPTION
14	1	9" OD X 4.03 ID	4" TUBE SIZE PLATE FLANGE - 304L SS, 0.50 IN THK, 150# CLASS DRILLING
15	8	5/8" X 4 1/2" LG	STUD BOLTS - ASTM A193 GR B7, FULL THD
16	16	5/8"	HEAVY HEX NUTS - ASTM A193 GR 2H
17	1	10"	BLIND FLANGE - FLAT FACE, 304L SS, 150# CLASS DRILLING
18	12	7/8" X 3" LG	STUD BOLTS - ASTM A193 GR B7, FULL THD
19	24	7/8"	HEAVY HEX NUTS - ASTM A193 GR 2H
20	1	10"	GASKET - 1/8" RED RUBBER, ASTM D2000, FULL FACE, TO FIT 150# CLASS FLANGE
21	1	10"	FLEX HOSE - VINYL LAMINATE POLYESTER FABRIC W/ENCLOSED SPRING STEEL WIRE & VINYL WEARSTRIP, PLAIN ENDS, HI-TECH Q MODEL TD-HS (UL94V-0), C/W TWO (2) BRIDGE CLAMPS (1 EA. END)
22	1	4"	FLEX HOSE - VINYL LAMINATE POLYESTER FABRIC W/ENCLOSED SPRING STEEL WIRE & VINYL WEARSTRIP, PLAIN ENDS, HI-TECH Q MODEL TD-HS (UL94V-0), C/W TWO (2) BRIDGE CLAMPS (1 EA. END)
23	1	4"	WING NUT EXPANSION PLUG - 4" PIPE SIZE (3.78 - 4.5 IN), McMASTER-CARR P/N 2613K27
24	1	10"	TUBE SIZE PLATE FLANGE - 304L SS, 0.50 IN THK, 13" OD X 10.03 ID, W/ 12 - 1/2"Ø HOLES ON 11 1/2" BC. (NOTE 3, SHT 5)

BILL OF MATERIALS (CONT.)			
ITEM	QUAN	SIZE	DESCRIPTION
25	1	1/4"	BLANK-OFF PLATE - 304SS, ASTM A240 (DET 5, SHT 5)
26	1	2 X 2 1/4	ANGLE RING - 304SS, ASTM A276 (DET 5 SHT 5)
27	12	1/2"-13 X 1" LG	HEX HEAD CAP SCREW - 18-8 SS, ASTM A193, GR B8, McMASTER-CARR P/N 92655A399
28	12	1/2"-13	HEX NUT - 18-8 SS, ASTM A194, GR8, McMASTER-CARR P/N 94252A712
29	A/R	#12 X 3/4	HEX HEAD DRILLING SCREWS, 410 SS, McMASTER-CARR P/N 90822A580
30	1	14" OD X 10" ID	GASKET - 1/8" RED RUBBER, ASTM D2000, HOLES PUNCHED TO TO MATCH BOM ITEM 25
31	1	10" ID X 4" LG	DUCT HOSE CONNECTOR - 304SS, FOR 10" ID HOSE, McMASTER-CARR P/N 5518K49
32	1	9 1/4" TO 10 3/4"	BRIDGE CLAMP - RIGHT HAND, 301 SS, McMASTER-CARR P/N 45955K76
33	1	1" X 1" MESH	WELDED WIRE CLOTH - 304 STAINLESS STL., 0.080 WIRE DIA., McMASTER-CARR P/N 9322T61
34	1	9 7/8" - 11 5/8"	DUCT CLAMP - QUICK RELEASE, 304SS, McMASTER-CARR P/N 5215K16
35	2	1 1/2" X 3" LG	PIPE NIPPLE - STD WT., ASTM A312, 304SS, CLASS 150, McMASTER-CARR P/N 9157K47
36	2	1 1/2"	PIPE CAP - THREADED, CLASS 150, 304SS, ASTM A351, McMASTER-CARR P/N 4464K514
37	1	10" PIPE SIZE	PIPE STRAP - GALVANIZED, COOPER-BLINE P/N B2400-10 OR APPROVED EQUAL
38	1	3/4" X 0.125	FOAM TAPE ADHESIVE - 3M VHB (VERY HIGH BOND) ADHESIVE BOTH SIDES, FOR USE IN SUPPORTING 1 5/8" CHANNEL TO CPE SKIN. McMASTER-CARR P/N 75935A29.





SECTION M-M (SHEET 3)
ELEVATION VIEW - LOOKING EAST



KEY PLAN

ELEVATIONS SHOWN ON THIS DRAWING ARE BASED ON FINISHED FLOOR ELEVATIONS ON THE FIRST FLOOR OF +768' AND +770'. REFERENCE FWENC DWGS T-CM-FW-D-CE-004 & -005

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
5	10/9/17	JAL	EB	GW	INCORPORATED DCN-ME-413 R2 & 422 R1
4	3/23/12	JAL	JWW	GW	INCORP. FCR-ME-334 & 335; REVISED FOR AS-BUILT CONDITIONS
3	10/31/11	JAL	JWW	GW	REMOVED HOLD; ADDED DETAIL 4 & 5; REV. DUCT SIZE
2	9/23/11	JAL	JWW	GW	ADDED SORTING TABLE HOLD; RELOCATED CPE-EDS-09
					ADDED DUCT DROP & MINOR DIMENSION CHANGES

JAMES T. DUNCAN — REGISTERED ENGINEER — STATE OF TENNESSEE — No. 022778 — 10/9/17

DRAWN BY J. A. LALONDE	DATE 7/11/11
DESIGNED BY J. A. LALONDE	DATE 7/11/11
CHECKED BY JUNIE WEEKS JR.	DATE 7/11/11
APPROVED BY J. G. WAGNER	DATE 7/11/11
APPROVED BY	DATE

NORTHWIND WPC

TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
HVAC SYSTEM DESIGN

SIZE	SCALE:	DWG. NO.	REV
D	3/8"=1'-0"	T-CM-FW-D-ME-249	5
	SHEET: 3 OF 6		

FILENAME: T-CM-FW-D-ME-249_SHT 3

FIGURE 8.1-28

PART PLAN - EL 770'-0"

SECTION J-J (SHEET 4)
ELEVATION VIEW
LOOKING NORTH

SECTION K-K (SHEET 4)
ELEVATION VIEW
LOOKING NORTH

KEY PLAN

ELEVATIONS SHOWN ON THIS DRAWING ARE BASED ON FINISHED FLOOR ELEVATIONS ON THE FIRST FLOOR OF +768' AND +770'. REFERENCE FWENC DWGS T-CM-FW-D-CE-004 & -005

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	3/23/12	JAL	JWW	GW	REVISED FOR AS-BUILT CONDITIONS
1	8/15/11	JAL	JWW	GW	REVISED DUCT ROUTING; ADDED SUPPORT & REV SUPPORT LOCATIONS
0	7/11/11	JAL	JWW	GW	FOR HVAC BID PURPOSES ONLY

RPE
JUNIE W. WEEKS JR.
REGISTERED ENGINEER
STATE OF TENNESSEE

DRAWN BY	J. A. LALONDE	DATE 7/11/11
DESIGNED BY	J. A. LALONDE	DATE 7/11/11
CHECKED BY	JUNIE WEEKS JR.	DATE 7/11/11
APPROVED BY	J. G. WAGNER	DATE 7/11/11
APPROVED BY		DATE

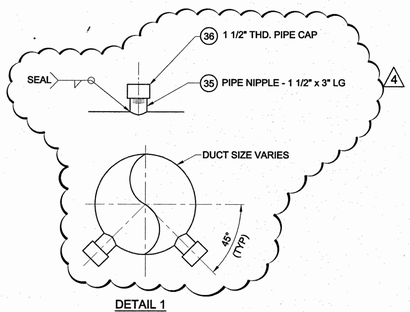
WPC WAI Team

TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
HVAC SYSTEM DESIGN

SIZE	SCALE	DWG. NO.	REV
D	3/8"=1'-0"	T-CM-FW-D-ME-249	2
	SHEET: 4 OF 6		

FILENAME: T-CM-FW-D-ME-249_SHT 4

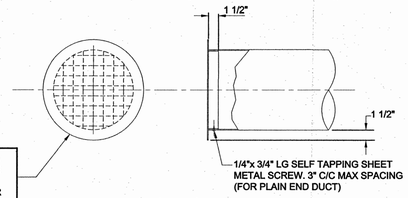
FIGURE 8.1-29



DETAIL 1
EXHAUST DUCTS ONLY

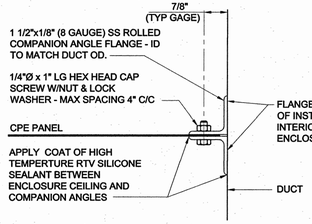
TYPICAL FLOW TEST POINT
304 STAINLESS STEEL
NTS

FABRICATOR SHALL PROVIDE BD-192B WITH BOTH A GRILLE AND AN ADDITIONAL BLIND FLANGE FOR USE DURING AIR BALANCING

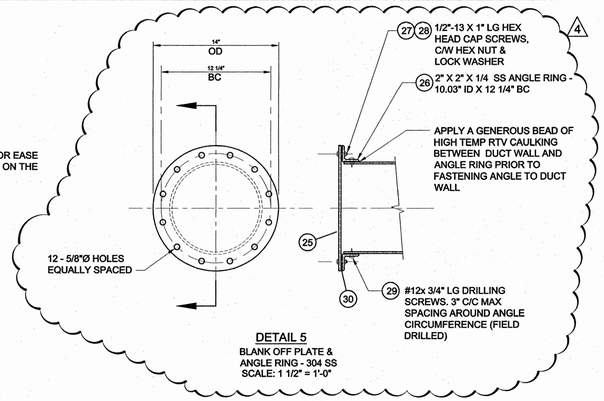


FABRICATE COLLAR AND SCREEN TO FIT DUCT AS SHOWN IN DETAIL. STAINLESS STEEL SCREEN SHALL BE 0.080 IN. DIAMETER WIRE ON 1 IN. SPACING. MINIMUM SS COLLAR THICKNESS SHALL MATCH DUCT. ADD FLANGED EXTENSION COLLAR AS REQUIRED FOR DAMPER BLADE CLEARANCE.

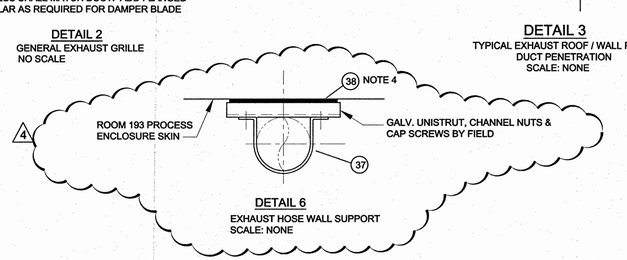
DETAIL 2
GENERAL EXHAUST GRILLE
NO SCALE



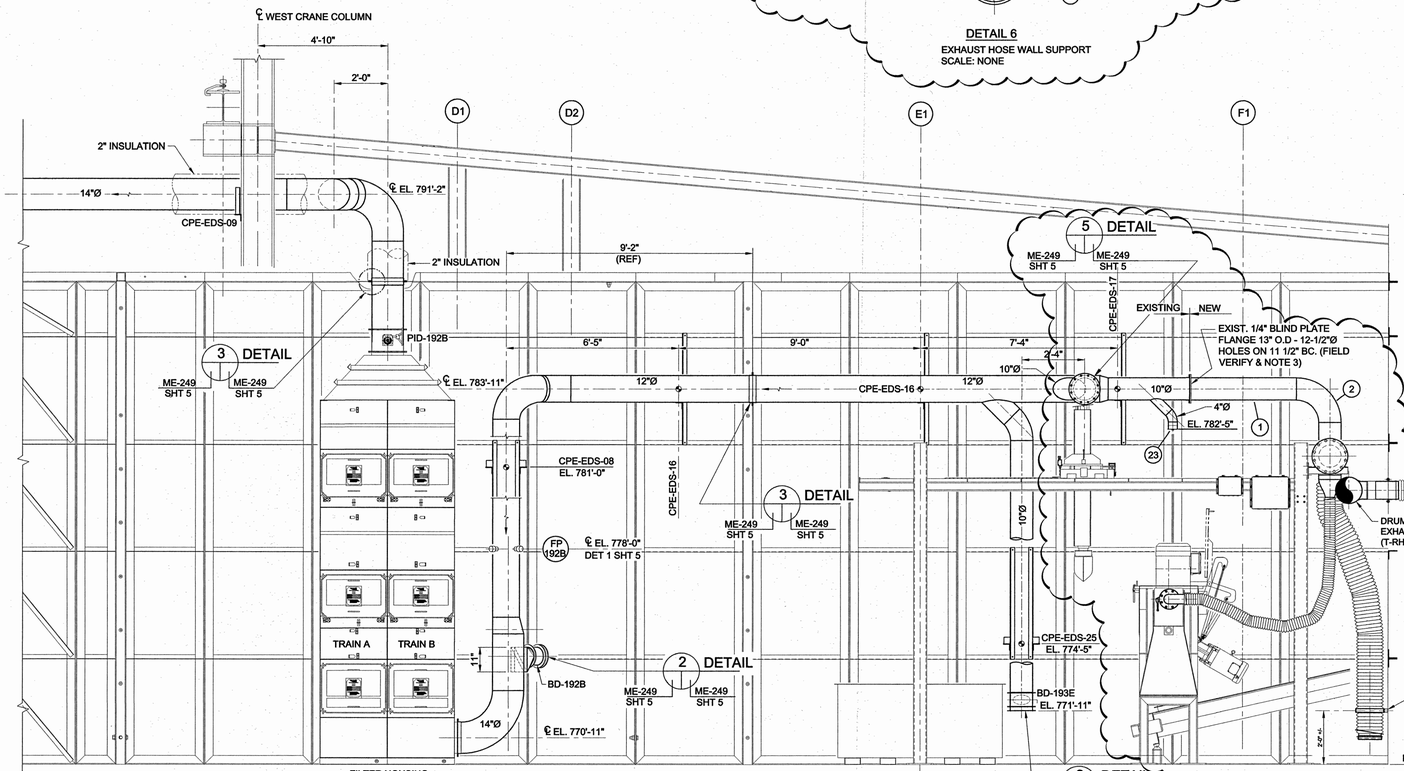
DETAIL 3
TYPICAL EXHAUST ROOF / WALL PANEL DUCT PENETRATION
SCALE: NONE



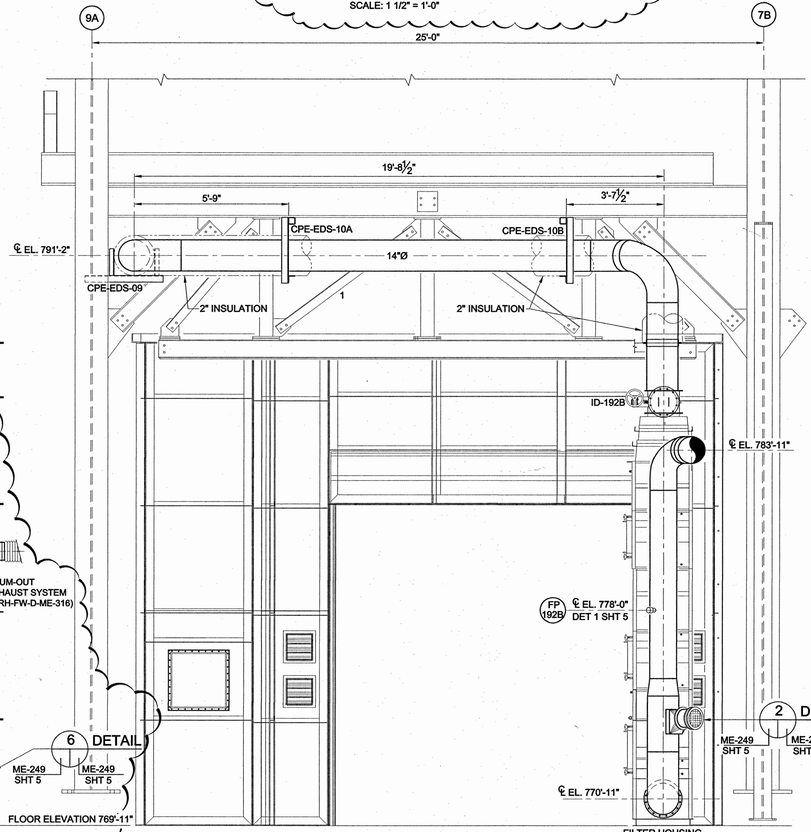
DETAIL 5
BLANK OFF PLATE & ANGLE RING - 304 SS
SCALE: 1 1/2" = 1'-0"



DETAIL 6
EXHAUST HOSE WALL SUPPORT
SCALE: NONE



SECTION F-F (SHEET 3)
ELEVATION VIEW - LOOKING SOUTH



SECTION G-G (SHEET 3)
ELEVATION VIEW - LOOKING EAST

NOTES:

1. FLAME RETARDANT FLEX HOSES - HI-TECH DURAVENT TYPE TD-HS - UL94V-0, TEMP RATING (-) 40° F TO 180° F. FIELD MAY ADJUST HOSE LENGTH AS REQUIRED. CONNECT HOSE TO DUCT WITH TWO (2) STAINLESS STEEL BRIDGE CLAMPS (ONE EACH END). 4
2. ALL CASK PROCESSING ENCLOSURE STRUCTURAL STEEL SHOWN IS FOR REFERENCE AND IS LOCATED ON THE ENCLOSURE EXTERIOR. INTERIOR WALL IS SMOOTH 1/16" STAINLESS STEEL SHEET.
3. REMOVE EXISTING BLIND FLANGE AND INSTALL NEW 10"Ø DUCT INTEGRAL WITH MATCHING SUPPLIED PLATE FLANGE (BOM ITEM 24). USE EXISTING CONNECTION HARDWARE. FIELD SHALL VERIFY AND MATCH EXISTING FLANGE BOLT ORIENTATION PRIOR TO FABRICATION OF COMPANION FLANGE TO NEW DUCTWORK. 4
4. INSTALL TWO (2) STRIPS ADHESIVE FOAM TAPE PER UNISTRUT CHANNEL (BOM ITEM 38). STRICTLY ADHERE TO MANUFACTURER'S RECOMMENDATIONS FOR CLEANING STAINLESS STEEL SURFACES PRIOR TO APPLYING FOAM TAPE.

ELEVATIONS SHOWN ON THIS DRAWING ARE BASED ON FINISHED FLOOR ELEVATIONS ON THE FIRST FLOOR OF +768' AND +770'. REFERENCE FWENC DWGS T-CM-FW-D-CE-004 & -005

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
4	10/3/17	JAL	EB	GW	INCORPORATED DCN-ME-413 R2 & 422 R1
3	10/3/11	JAL	JWW	GW	REV DUCT SIZE FROM 8" TO 10" DIA.; LOWERED DROP 12"
2	9/26/11	JAL	JWW	GW	ADDED BLANK-OFF PLATE; ADDED EXH DUCT DROP;
					RE-LOCATED CPE-EDS-09 & MINOR REV'S

JAMES T. DUNCAN — REGISTERED ENGINEER — AGREEMENT — No. 92171 — STATE OF TENNESSEE — 10/3/2017

DRAWN BY / DATE	J. A. LALONDE 7/11/11
DESIGNED BY / DATE	J. A. LALONDE 7/11/11
CHECKED BY / DATE	JUNIE WEEKS JR. 7/11/11
APPROVED BY / DATE	J. G. WAGNER 7/11/11
APPROVED BY / DATE	

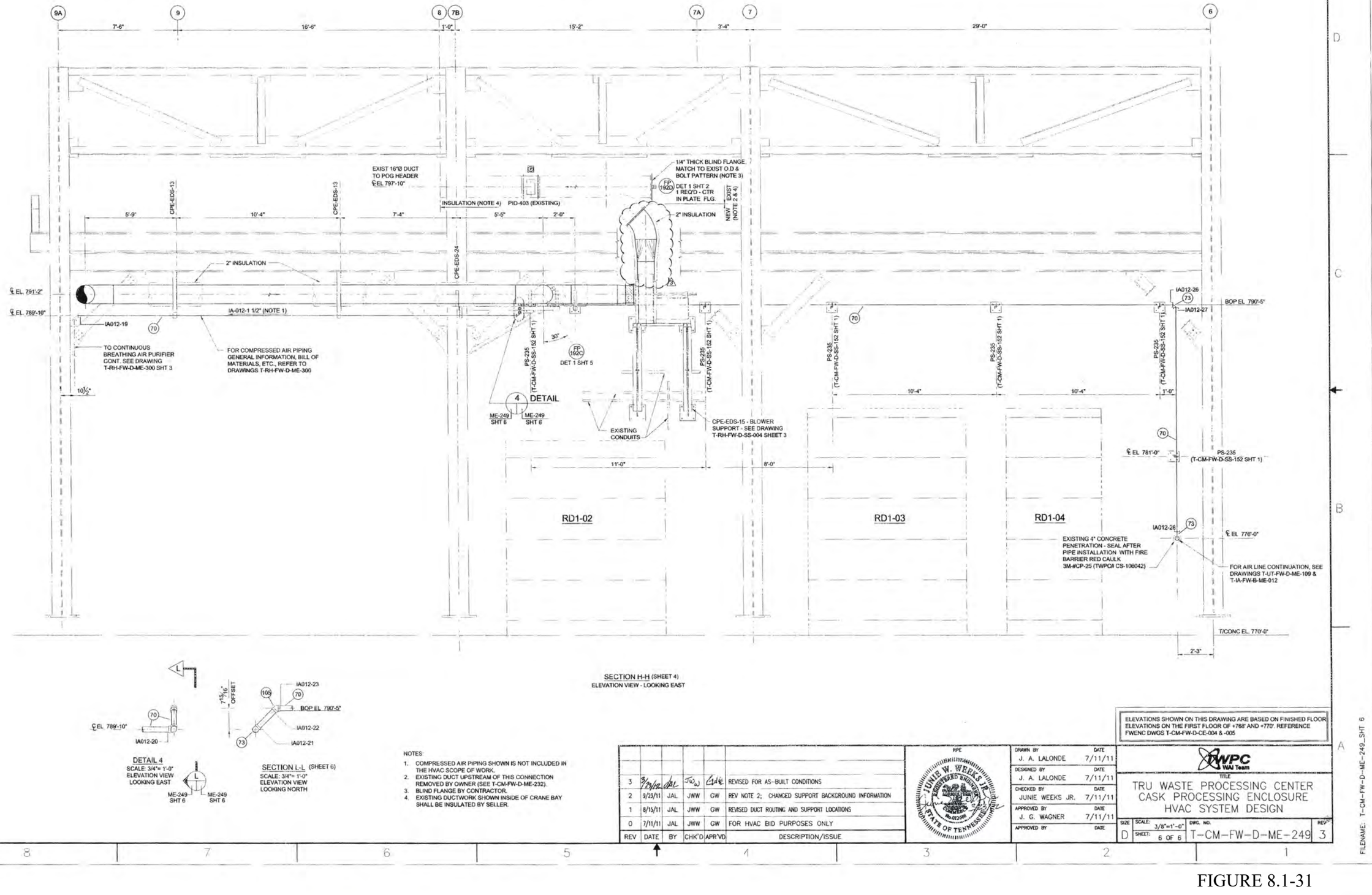
NORTHWIND NWPC

TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
HVAC SYSTEM DESIGN

SIZE	SCALE:	DWG. NO.	REV
D	3/8"=1'-0"	T-CM-FW-D-ME-249	4
	SHEET: 5 OF 6		

FILENAME: T-CM-FW-D-ME-249_SHT 5

FIGURE 8.1-30



NOTES:

1. COMPRESSED AIR PIPING SHOWN IS NOT INCLUDED IN THE HVAC SCOPE OF WORK.
2. EXISTING DUCT UPSTREAM OF THIS CONNECTION REMOVED BY OWNER (SEE T-CM-FW-D-ME-232).
3. BLIND FLANGE BY CONTRACTOR.
4. EXISTING DUCTWORK SHOWN INSIDE OF CRANE BAY SHALL BE INSULATED BY SELLER.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
3	3/29/12	JAL	JWW	GW	REVISED FOR AS-BUILT CONDITIONS
2	9/23/11	JAL	JWW	GW	REV NOTE 2; CHANGED SUPPORT BACKGROUND INFORMATION
1	8/15/11	JAL	JWW	GW	REVISED DUCT ROUTING AND SUPPORT LOCATIONS
0	7/11/11	JAL	JWW	GW	FOR HVAC BID PURPOSES ONLY

RPE
JUNIE W. WEEKS JR.
REGISTERED ENGINEER
No. 012098
STATE OF TENNESSEE

DRAWN BY	J. A. LALONDE	DATE 7/11/11
DESIGNED BY	J. A. LALONDE	DATE 7/11/11
CHECKED BY	JUNIE WEEKS JR.	DATE 7/11/11
APPROVED BY	J. G. WAGNER	DATE 7/11/11
APPROVED BY		DATE

ELEVATIONS SHOWN ON THIS DRAWING ARE BASED ON FINISHED FLOOR ELEVATIONS ON THE FIRST FLOOR OF +768' AND +770'. REFERENCE FWENC DWGS T-CM-FW-D-CE-004 & -005

WPC WAJ Team

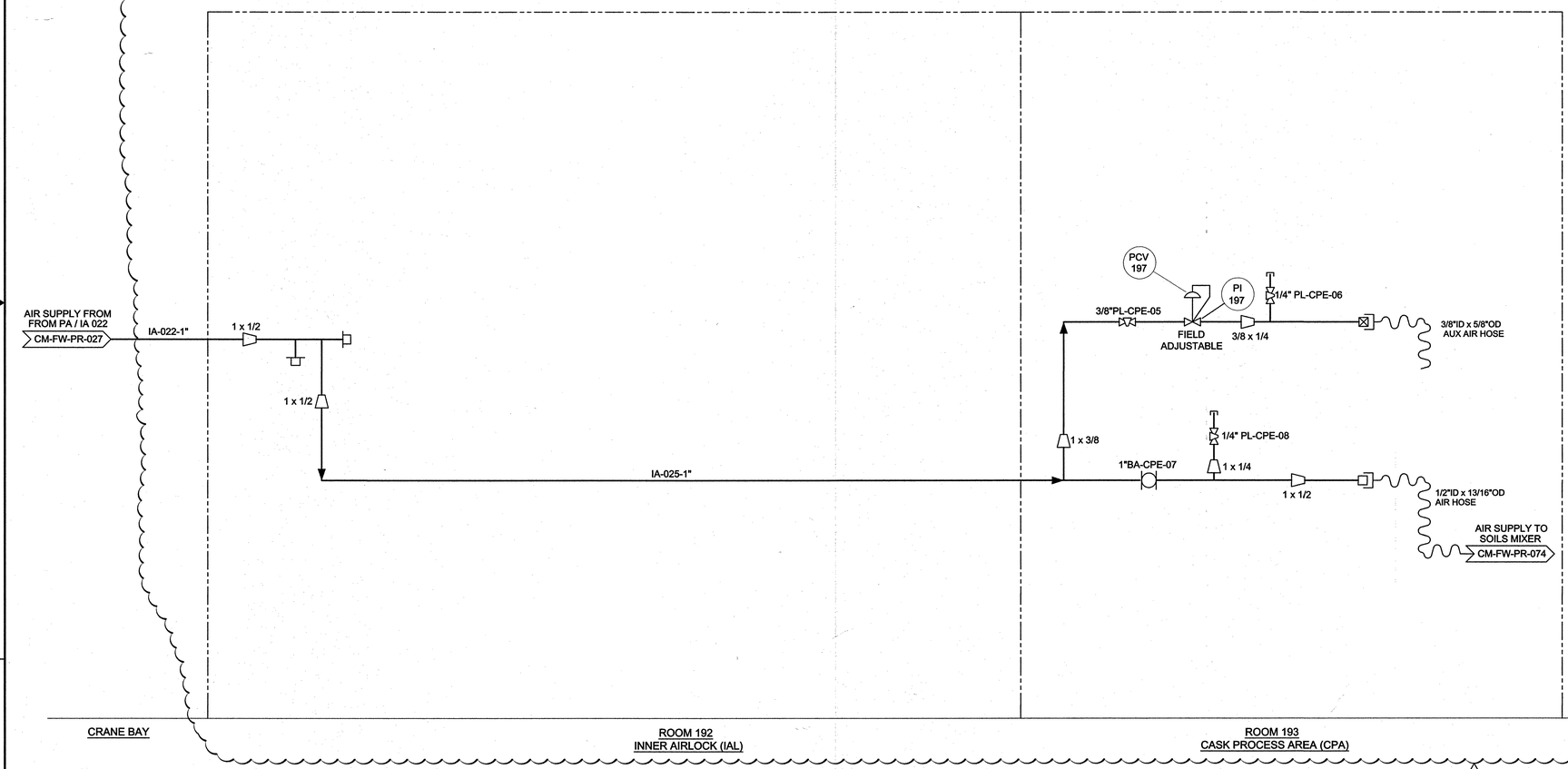
TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
HVAC SYSTEM DESIGN

SIZE	SCALE	DWG. NO.	REV
D	3/8"=1'-0"	T-CM-FW-D-ME-249	3
	SHEET: 6 OF 6		

FILENAME: T-CM-FW-D-ME-249_SHT 6

FIGURE 8.1-31

NOTES:
1. CPE LIQUID HANDLING SYSTEM REMOVED. REMAINING ORPHANED PIPING NOT DECOMMISSIONED SHALL BE ABANDONED IN PLACE. SEE PHYSICAL DRAWINGS SERIES T-RH-FW-D-ME-416 FOR TERMINATIONS.



REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
4	10/6/17	JAL	EB	GW	INCORPORATED DCN-ME-413 R2
3	11/1/12	JAL	GW	GW	INCORP. DCN-ME-347 R0, -351 R0; FCR-ME-355 R0, -359 R0; REMOVED FUTURE DESIGNATION FOR FILTER ASSEMBLY
2	3/23/12	JAL	GW	GW	ADDED FUTURE WATER FILTRATION SYS; REV. LEVEL SWITCH
					DESIGNATIONS; INCORP. FCR-ME-337 R1 & MINOR REVS.

RPE
John Gregorie Wagner
REGISTERED ENGINEER
No. 20649
STATE OF TENNESSEE

DRAWN BY / DATE	J. A. LALONDE 10/17/11
DESIGNED BY / DATE	J. A. LALONDE 10/17/11
CHECKED BY / DATE	EARL BLEDSOE 10/17/11
APPROVED BY / DATE	J. G. WAGNER 10/17/11
APPROVED BY / DATE	

NORTHWIND WPC

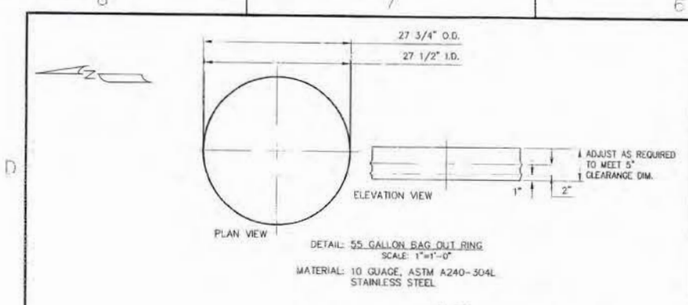
TITLE
TRU WASTE PROCESSING CENTER
PIPING & INSTRUMENT DIAGRAM
TANK W-1A MOTIVE AIR INTERFACE

SIZE	SCALE:	DWG. NO.	REV
D	NONE	T-CM-FW-D-PR-069	4
	SHEET: 1 OF 1		

FILENAME: T-CM-FW-D-PR-069

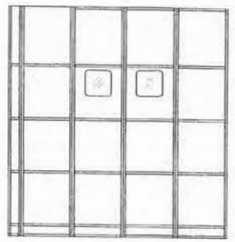
FIGURE 8.1-32

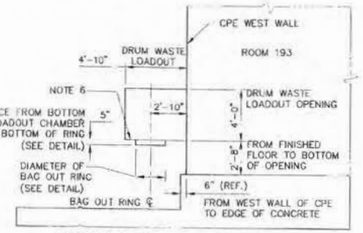
This is an Uncontrolled Copy -- for Information Only.



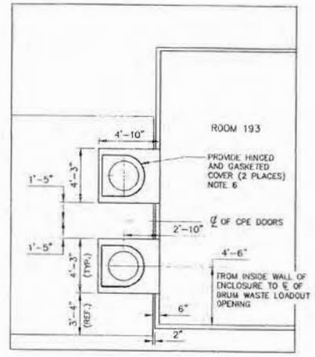
DETAIL: 55 GALLON BAG OUT RING
SCALE: 1"=1'-0"

MATERIAL: 10 GUAGE, ASTM A240-304L STAINLESS STEEL



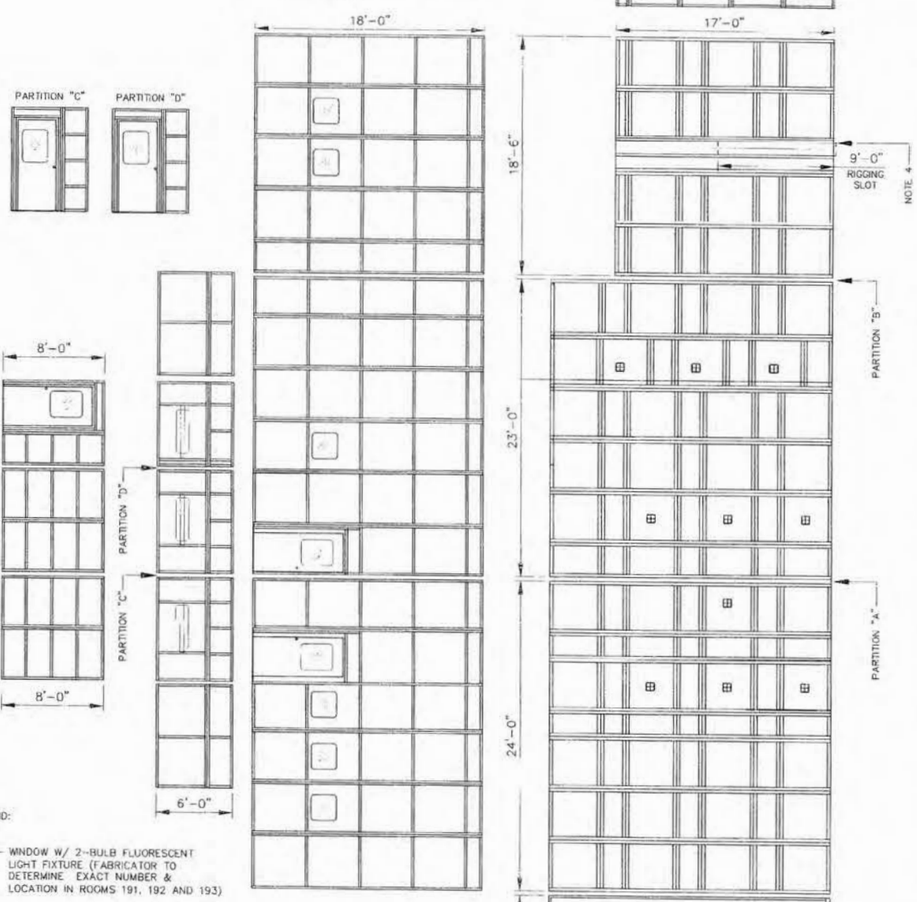


ELEVATION LOOKING NORTH - WEST WALL OF CPE
DRUM WASTE LOADOUT DIMENSIONS



NOTES:

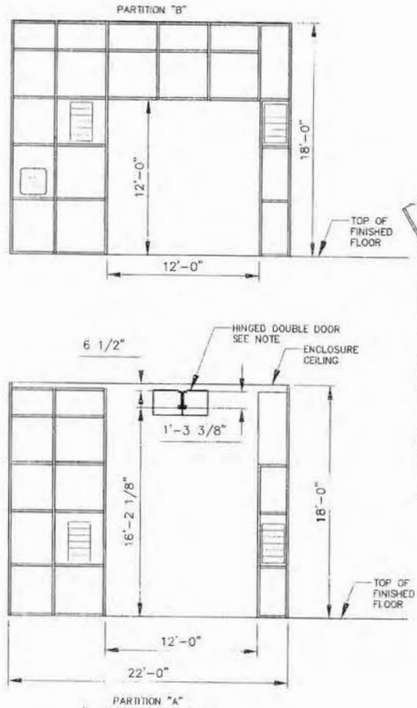
1. PERSONNEL DOORS SHALL HAVE WINDOWS.
2. WORK THIS DRAWING WITH SPECIFICATION NO. T-RH-FW-S-ME-805.
3. ENCLOSURE PANELS AND LIGHT PORTS ARE FOR ILLUSTRATIVE PURPOSES, MANUFACTURER SHALL ADJUST TO SUIT MANUFACTURER PRACTICES AND MEET SPECIFICATION REQUIREMENTS.
4. RIGGING SLOT IN ACCORDANCE WITH SPECIFICATION.
5. FOR DRUM WASTE LOADOUT REVISIONS SEE WEST WALL OF CPE, ELEVATION AND PLAN VIEW DETAILS.
6. HINGES LOCATED ON WEST END OF COVER. FURNISH RESTRAINT (WHICH MAY BE OPERATED FROM ROOM 193) TO SECURE COVER IN THE OPEN/RAISED POSITION.
7. REFER TO DCN-ME-340 R1 FOR CLET HPU CONTROL PANEL SUPPORT LOCATION.
   REFER TO DCN-ME-342 FOR ADDITION OF 12" BAG PORT AND CAM PENETRATIONS.



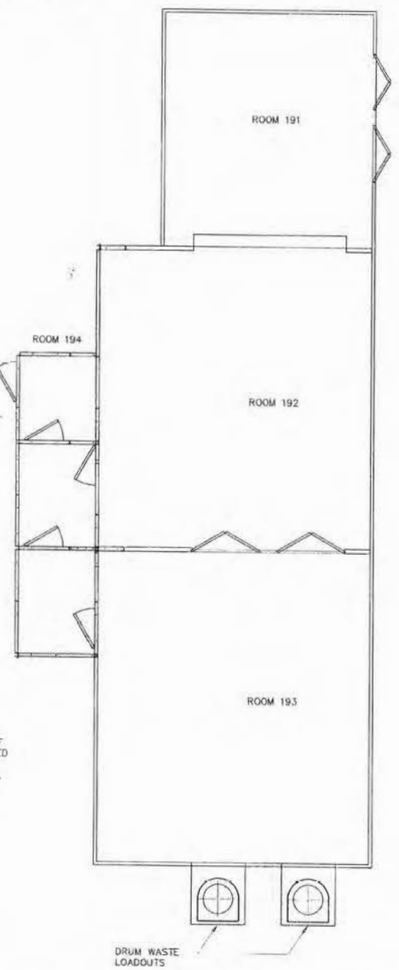
LEGEND:

- WINDOW W/ 2-BULB FLUORESCENT LIGHT FIXTURE (FABRICATOR TO DETERMINE EXACT NUMBER & LOCATION IN ROOMS 191, 192 AND 193)
- WINDOWS
- TUBE STEEL SPLICE LOCATION AT PANEL BY BUYER
- BACKDRAFT DAMPER APPROXIMATE LOCATION

REVISION NOTE:
SCOPE OF THIS REVISION LIMITED TO DRUM WASTE LOADOUT PORTALS AND MANUFACTURER PROVIDED DETAILS. INDIVIDUAL PANELS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL PANEL LAYOUT WILL VARY, SEE APPROVED MANUFACTURER'S DRAWINGS FOR DETAILS.



HINGED DOUBLE DOOR NOTE:
PROVIDE HINGED DOUBLE DOOR FOR MONORAIL HOIST/TROLLEY PASS-THRU. ACTUATE DOOR TO OPEN/CLOSE WITH BI-FOLD DOOR. DIMENSIONS APPROXIMATE. FINAL DIMENSIONS TO BE DETERMINED.



PARTIAL LAY-FLAT DIAGRAM

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	3/11/11	JGM	NG	GW	ADDED NOTE 7
1	7/29/11	JGM	NG	GW	SEE REVISION NOTE
0	3/10/11	JGM	NG	GW	ISSUED FOR BID PURPOSES

RPE
NASSER GHASSABIAN
REGISTERED ENGINEER
AGRICULTURE
No. 22551
STATE OF TENNESSEE
3/11/11

DRAWN BY / DATE	J. G. MCSORLEY 3/10/11
DESIGNED BY / DATE	N. GHASSABIAN 3/10/11
CHECKED BY / DATE	N. GHASSABIAN 3/10/11
APPROVED BY / DATE	J. G. WAGNER 3/10/11
APPROVED BY / DATE	

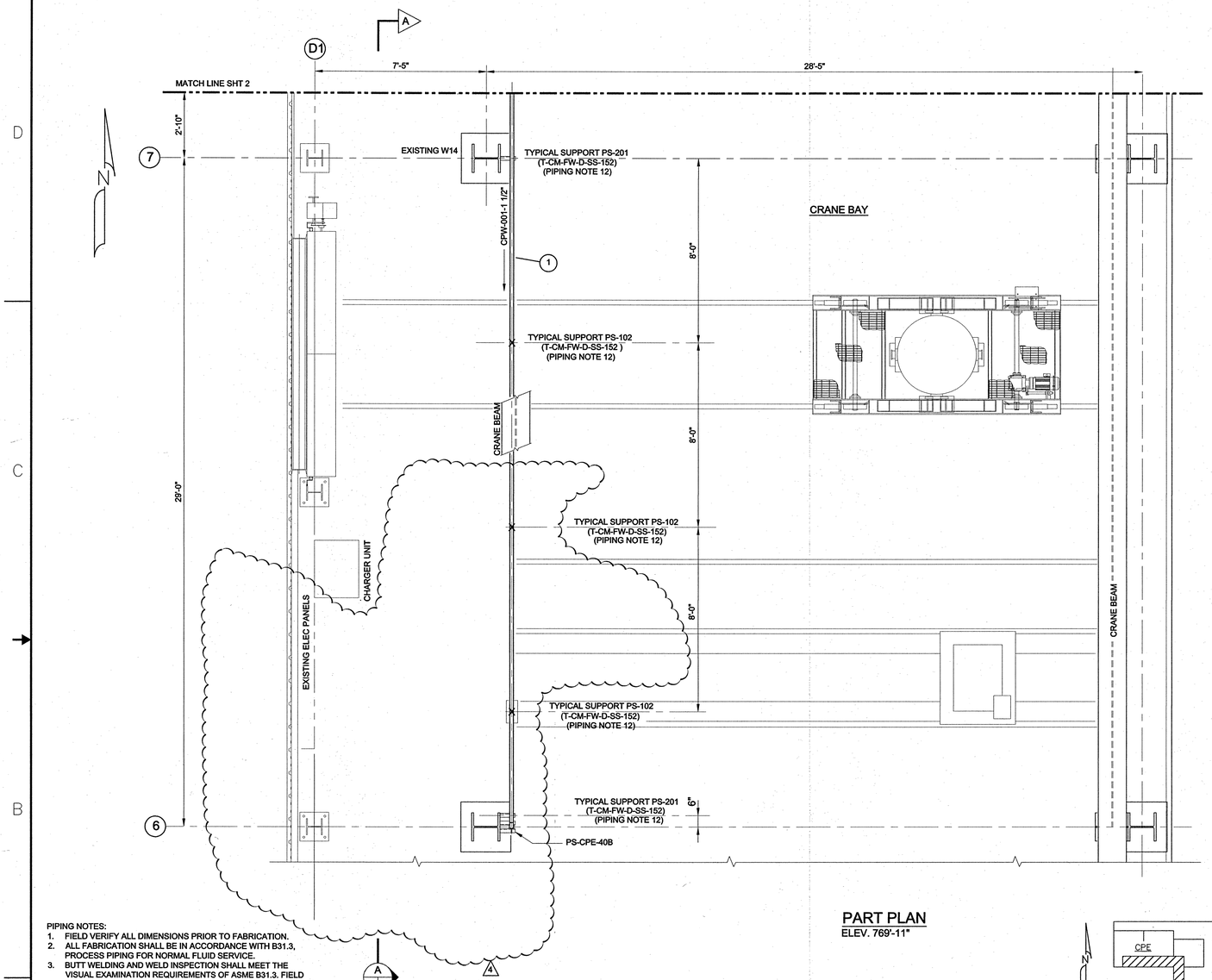
WPC WAI Team

TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESS ENCLOSURE
PARTIAL LAY-FLAT DIAGRAM

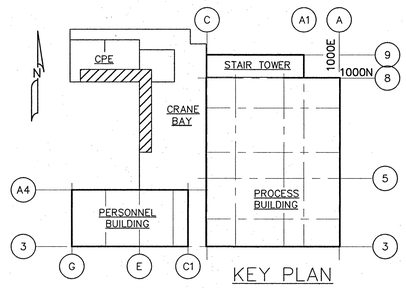
SIZE	SCALE	DWG. NO.	REV
D	3/16" = 1'-0"	T-RH-FW-D-ME-009	2
	SHEET: 1 OF 1		

FILENAME: T-RH-FW-D-ME-009

FIGURE 8.1-33



PART PLAN
ELEV. 769'-11"



NOTES:
1. CPE LIQUID HANDLING SYSTEM REMOVED. REMAINING ORPHANED PIPING AND SPECIALITIES NOT DECOMMISSIONED SHALL BE ABANDONED IN PLACE. REFER TO THIS SERIES DRAWINGS FOR SPECIFIC TERMINATIONS.
2. ITEMS AND QUANTITIES INCLUDED IN BILL OF MATERIALS ARE FOR ORIGINAL INSTALLATION AND MAY NOT REFLECT ITEMS AND QUANTITIES AFTER MODIFICATIONS.

4

BILL OF MATERIALS

	ITEM	QUAN	SIZE	DESCRIPTION
	1	120 FT	1 1/2"	PIPE - STAINLESS STEEL, SCH 40, ASTM A312 TP304L
	2	-	-	NOT USED
	3	17	1 1/2"	90° ELL - STAINLESS STL., SCH 40, BW, ASTM A403 - WP304L
	4	8	1 1/2"	45° ELL - STAINLESS STL., SCH 40, BW, ASTM A403 - WP304L
	5	1	1 1/2"	LATERAL - THD, STAINLESS STEEL, CLASS 3000#, ASTM A182-F304
	6	3	1 1/2"	PLUG - HEX. HEAD, THD, STAINLESS STEEL, ASTM A182-F304
	7	4	1" x 3" LG	PIPE NIPPLE - STAINLESS STEEL, SCH 40, ASTM A312 TP304
	8	2	1 1/2"	BALL VALVE - 2-WAY, THD, 316SS, SWAGELOK SS-67TF24-JL
	9	1	1 1/2"	CLOSE NIPPLE - THD, STAINLESS STEEL, SCH 40, ASTM A312 TP304
	10	3	1 1/2"	DUST CAP FOR DRY DISCONNECT - DIXON P/N DDC150
	11	2	1 1/2"	DUST PLUG FOR DRY DISCONNECT - DIXON P/N DDDP150
	12	4	1 1/2"	DRY DISCONNECT HOSE UNIT - 316 SS, DIXON P/N DDC150SS
	13	6	1 1/2"NPT x HOSE BARB	BOSS COUPLING - MALE STEM, 316SS, DIXON P/N RMS21 OR KING COMBINATION NIPPLE PART No. RST20
	14	4	1/2" O.D.	UNION - 1/2" OD TUBE x 1/2" OD TUBE, SWAGELOK P/N B-810-6
	15	1	1/2"	AIR REGULATOR W/PRESS GAUGE - 1/2" PIPE SIZE, 80 MAX SCFM@100 PSI, 5-60 PSI REGULATING RANGE, McMASTER-CARR P/N 1888K33 OR EQUAL
	16	6	1 1/2"x3" LG	PIPE NIPPLE - STAINLESS STEEL, SCH 40, ASTM A312 TP304 (TOE)
	17	4	1 1/2" x 1"	RED COUPLING - THREADED, 3000#, STAINLESS STEEL, ASTM A182-F304
	18	1	1" x 6" LG	NIPPLE - STAINLESS STEEL, STD WT, ASTM A-312 TP304 (TBE)
	19	6	1 1/2"	MALE ADAPTOR x MALE NPT - 316 SS, DIXON TYPE "F", P/N 150-F-SS
	20	3	1 1/2"	FEMALE COUPLER x HOSE SHANK - 316 SS, DIXON TYPE "C", P/N RC150BL
	21	4	1"	COUPLING - THREADED, 3000#, STAINLESS STEEL, ASTM A182-F304
	22	10	3/8" O.D.	UNION - 3/8" OD TUBE x 3/8" OD TUBE, SWAGELOK P/N B-800-6
(PIPING NOTE 7)	23	4	1 1/2"ID x 2" OD x 50 FT LG	TUBING - CLEAR PVC, WIRE REINFORCED, 100 PSI@70°F, 29.9" Hg@70°F, McMASTER CARR P/N 5393K38 OR APPROVED EQUAL
	24	6	1/2" O.D.	UNION ELBOW - 1/2" OD TUBE x 1/2" OD TUBE, SWAGELOK P/N B-810-9
	25	2	42"W X 48"D X 51"H	LIQUID TOTE - 350 GALLON CAPACITY, 304 STAINLESS STEEL CONSTRUCTION, UN31A CERTIFIED, DRAWING No. T-RH-FW-D-ME-417
	26	2	53"W X 72"D X 28"H	HEAVY-GAUGE WELDED CONTAINMENT PALLET - 385 GALLON SUMP CAPACITY, 2-WAY FORK LIFT ACCESS. CHEMICAL RESISTANT COATING, ALL-STEEL CONTAINMENT SYSTEMS P/N K3120, MEETS EPA 40CFR264.175 OR APPROVED EQUAL. (15,000 LB UDL LOAD CAPACITY, WT. 550 LBS.).
(PIPING NOTE 10)	27	1	1" NPT FEMALE SUCTION & DISCHARGE CONN.	AOD PUMP - AIR OPERATED DOUBLE DIAPHRAGM PUMP, WARREN RUPP "SANDPIPER" MODEL No. S1F (METALLIC)
	28	1	1/3 HP - 5 GAL. CAP.	WASTEWATER REMOVAL PUMP - SUBMERSIABLE, 1/3 HP, 1 1/2" NPT DISCHARGE, 1 1/2" NPT INTAKE, 5 GALLON BASIN CAPACITY, "LITTLE GIANT DRAINOSAUR" M/N WRS-8E OR APPROVED EQUAL
4	29	8	1"	UNION - ASTM A105, SW, 3000#, MSS SP-83.
	30	9	1 1/2"	DRY DISCONNECT ADAPTER - TANK UNIT, 316 SS OR ALUMINUM, DIXON P/N DDA150SS OR DDA150AL
	31	22	1 3/4 TO 2 5/8" HOSE OD	HOSE CLAMP - WORM DRIVEN, SS, HTM HI TORQUE, DIXON VALVE M/N HTM250 OR EQUAL
	32	2	1 1/2" x 3"	PIPE NIPPLE - STAINLESS STEEL, SCH 40, ASTM A312 TP304 (TBE)
	33	6	1 1/2"	TEE - STAINLESS STEEL, BW, SCH 40, ASTM A-403 -WP304L
	34	4	1 1/2"	UNION - STAINLESS STEEL, THD, CLASS 3000, ASTM A182 F304
	35	2	1 1/2"	CHECK VALVE - UNION INSERT, SS, CHECK-ALL STYLE UIV, P/N UVJSSBN.125SS
	36	1	1 1/2"x1/4"	RED BUSHING - THREADED, HEX HEAD, STAINLESS STEEL, ASTM A182-F304
	36A	1	1/4"FNPT X 1/4" MNPT	CHECK VALVE - STAINLESS STL.,1 PSI CRACKING PRESS., SWAGELOK P/N SS-4CP6-1
	37	4	1/4" NPT	QUICK-CONNECT STEM - QC SERIES, 1/4" MALE NPT, W/STEM SHUT-OFF VALVE, SWAGELOK P/N B-QC4-D-4PM
	38	3	1/4" NPT	QUICK-CONNECT BODY - QC SERIES, 1/4" FEMALE NPT, SWAGELOK P/N B-QC4-B-4PF
(TUBING NOTE 8)	39	2	1/4"ID x 1/2"OD	AIR HOSE - EPDM RUBBER HOSE AND COVER, 300 PSI RATED, RED, TEMP RANGE -40 TO + 200 DEG F, 12 FOOT LENGTH, COMPLETE WITH 1/4" MALE NPT THREADS EACH END, McMASTER-CARR P/N 54075K18
(TUBING NOTE 1)	40	60 FT	3/8"OD	HARD TUBING - COPPER, 3/8" OD x 0.035 Wall, SMLS Type "K", ASTM B88
	41	1	3/8" TUBE	PLUG VALVE - BRASS W/ FEMALE ADAPTOR, SWAGELOK P/N 6P6T-TA
	42	2	1/4"	PLUG VALVE - 1/4" MALE NPT X 1/4" MALE NPT, BRASS, SWAGELOK P/N B-4P4T2
	43	1	3/8"	AIR REGULATOR W/PRESS GAUGE - 3/8" PIPE SIZE 149 MAX SCFM@100 PSI, 5-60 PSI REGULATING RANGE, McMASTER-CARR P/N 4959K202 OR EQUAL
	44	-	-	DELETED
	45	1	3/8"NPT x 1/4" NPT	HEX REDUCING NIPPLE - BRASS, SWAGELOK P/N B-6-HRN-4
	46	1	1/4" NPT	TEE - BRASS, SWAGELOK P/N B-4-T
	47	2	1/4" NPT	CAP - FEMALE NPT, BRASS, SWAGELOK P/N B-4-CP
	48	1	3/8" x 6" LG	NIPPLE - STD WT., ASTM A106 GR B OR A53 GR B, (TBE)
(TUBING NOTE 5)	49	10 FT	CHANNEL	UNISTRUT - P1000SS (0.105") SS TYPE 304, ASTM A240
(TUBING NOTE 5)	50	40	3/8" TUBE O.D.	TUBE CLAMPS - UNISTRUT, "CUSH-A-GRIP", P/N: CG-10
(TUBING NOTE 5)	51	5	3/8"	PIPE CLAMPS - UNISTRUT, "CUSH-A-GRIP", P/N: CG-20
	52	60 FT	1"	PIPE - STD WT, ASTM A106 GR B OR A53 GR B
	53	1	1/2"	ELBOW - SW, ASTM A105, 3000#, ASME B16.11
	54	1	1/2"	UNION - ASTM A105, SW, 3000#, MSS SP-83.
	55	1	1/2"	PLUG VALVE - BRASS, NPT x NPT, SWAGELOK P/N B-8P6T4
	56	1	1/2"	HEX LONG NIPPLE - BRASS, SWAGELOK P/N B-8-HLN-2.00
	57	1	1/2" NPT	TEE - BRASS, SWAGELOK P/N B-8-T
	58	1	1/2" X 1/4"	RED BUSHING - BRASS, SWAGELOK P/N B-8-RB-4
	59	1	1/2"	HEX LONG NIPPLE - BRASS, SWAGELOK P/N B-8-HLN-3.00
	60	1	1/2"	BALL VALVE - 3 WAY, BRASS, 1 PIECE, SWAGELOK P/N B45XF8
	61	2	1/2" NPT x 1/2" OD TUBE	MALE CONNECTOR - BRASS, SWAGELOK P/N B-810-1-8
(TUBING NOTE 1)	62	20 FT	1/2" OD	HARD TUBING - COPPER, 1/2" OD x 0.049 Wall, SMLS Type "K", ASTM B88,
	63	1	1 1/2" x 1/2"	THREDOLET, 3000#, SS, ASTM A182 F-304
	64	1	1 1/2" x 1"	RED - ECCENTRIC, BW, SS, ASTM A403 WP-304 (FOB)
	65	1	1"	FLANGE - RFWN, 304 SS, CLASS 150, ASTM A182, ANSI B16.5
	66	2	1"	CHECK VALVE - FLANGE INSERT, 316 SS, 1/8 PSI CRACKING PRESSURE CHECK-ALL STYLE FIV, BUNA-N SEAT, P/N F1HSSBN.125SS
66A	1	1 1/2 X 1"		THREDOLET, 3000#, SS, ASTM A182 F-304
66B	2	1" X 2" LG		HEX NIPPLE - STAINLESS STL., SWAGELOK P/N SS-16-HN
66C	1	1"		BALL VALVE - STAINLESS STL. THREADED, McMASTER-CARR P/N 46495K23
66D	1	1"		PLUG - HEX. HEAD, THD, STAINLESS STEEL, ASTM A182-F304
66E	1	2"		PVC STR. COUPLING - SOCKET X SOCKET, ASTM D2467
66F	1	1"		CHECK VALVE - SS, CHECK-ALL STYLE UN-3, 0.125 CRACKING PRESSURE, P/N U3HSSBN.125SS

BILL OF MATERIALS CONTINUED ON SHEET 4

PIPING NOTES:
1. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.
2. ALL FABRICATION SHALL BE IN ACCORDANCE WITH B31.3, PROCESS PIPING FOR NORMAL FLUID SERVICE.
3. BUTT WELDING AND WELD INSPECTION SHALL MEET THE VISUAL EXAMINATION REQUIREMENTS OF ASME B31.3. FIELD TO ASSIGN AND MAINTAIN WELD MAP UNIQUE IDENTIFIERS VIA DRAWING MARK-UP AND SUBMIT TO DCRM FOR ARCHIVE.
4. USE OF THREADED UNIONS AS REQUIRED FOR ASSEMBLY IS ACCEPTABLE, (MINIMIZE TO THE EXTENT POSSIBLE).
5. APPLY TEFLON TAPE OR OTHER APPROVED LUBRICANT/SEALANT TO NPT THREADS PRIOR TO ASSEMBLY (WHERE APPLICABLE).
6. AFTER INSTALLATION PERFORM IN-SERVICE LEAK TEST ON ALL FLUID SYSTEMS AT OPERATING PRESSURE.
7. FIELD CUT HOSE LENGTH FOR ASSEMBLIES AS REQUIRED TO SUIT TRANSFER EQUIPMENT.
8. PIPE AND FITTING QUANTITIES LISTED IN THE BILL OF MATERIALS ARE EXACT FOR THIS DRAWING.
9. DELETED
10. DELETED
11. DELETED

4

12. TYPICAL SUPPORTS AS REFERENCED (SHOWN ON DRAWING T-CM-FW-D-SS-152) ARE SIMILAR. ATTACHMENT TO EXIST STRUCTURAL MEMBERS IN LIEU OF EMBEDDED PLATE IS THE ONLY VARIANCE. WELD SIZE AND QUANTITY REMAINS.

TUBING NOTES:
1. 3/8" O.D. & 1/2" O.D. COPPER TUBING SHALL BE STICK TUBING ONLY. COILED TUBING NOT ALLOWED.
2. BENDS OR TUBE FITTINGS MAY BE USED AT CHANGES IN DIRECTIONS. BENDS SHALL BE FABRICATED IN ACCORDANCE WITH GOOD INDUSTRY PRACTICES.
3. TUBE AND TUBE FITTING QUANTITIES AS LISTED IN THE BILL OF MATERIALS ARE ESTIMATES. ADJUST QUANTITIES AS REQUIRED TO MEET FIELD CONDITIONS.
4. MINIMIZE THE USE OF TUBE FITTINGS TO THE EXTENT PRACTICAL.
5. TUBING & SPECIALTIES SHOWN AND FIELD ROUTED TUBING TO DESIRED END POINTS SHALL BE SUPPORTED USING BOM ITEMS 49, 50 & 51 OR OTHER APPROVED SUPPORTS WITH MAX SPACING NOT TO EXCEED 3 FT. ADDITIONAL AND INTERMEDIATE SUPPORTS MAY BE REQUIRED AT CHANGES IN DIRECTION, VALVES AND SPECIALTY ITEMS.
6. PERFORM IN SERVICE LEAK TEST USING SWAGELOK SNOOP OR OTHER APPROVED LEAK TEST SOLUTION.
7. INSTALL TWO (2) STRIPS ADHESIVE FOAM TAPE PER UNISTRUT CHANNEL (BOM ITEM 80). STRICTLY ADHERE TO MANUFACTURER'S RECOMMENDATIONS FOR CLEANING STAINLESS STEEL SURFACES PRIOR TO APPLYING FOAM TAPE.
8. ADDITIONAL HOSES OF VARYING LENGTHS MAY BE UTILIZED

REFERENCE DRAWINGS:

T-CM-FW-D-PR-069	PIPING & INSTRUMENT DIAGRAM - CPE LIQUID HANDLING SYSTEM
T-RH-FW-D-SS-003	CASK PROCESSING ENCLOSURE - PIPE SUPPORT DETAILS
T-RH-FW-D-SS-005	CPE LIQUID HANDLING SYSTEM - DIAPHRAGM PUMP SHELF
T-RH-FW-D-SS-006	CPE BULK LIQUID TRANSFER PUMP - ACCESS PLATFORM
T-RH-FW-D-SS-007	CPE LIQUID HANDLING SYSTEM - PIPE SUPPORTS DETAILS
T-CM-FW-D-SS-152	PROCESS BUILDING PIPE SUPPORTS
T-CM-FW-D-ME-249	CASK PROCESSING ENCLOSURE - HVAC SYSTEM DESIGN
T-CM-FW-D-SS-117	MAIN CRANE STRUCTURE - PLAN, SECTION & DETAILS
T-CM-FW-D-SS-137	CASK PROCESSING ENCLOSURE - BUILDING AND EQUIPMENT STRUCTURES
T-BB-FW-D-ME-101	BBA ENCLOSURE - PIPING PENETRATION DETAILS
T-RH-FW-D-ME-417	CPE LIQUID HANDLING SYSTEM - 350 GAL. LIQUID CONTAINER

ELEVATIONS SHOWN ON THIS DRAWING ARE BASED ON FINISHED FLOOR ELEVATIONS ON THE FIRST FLOOR OF +768' AND +770'. REFERENCES FWENC DWGS T-CM-FW-D-CE-004 & -005

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
4	9/25/17	JAL	EB	CSW	INCORP. DCN-ME-413 R2 & FCR-ME-415 R0
3	11/7/12	JAL	GW	GW	INCORP. DCN-ME-351; FCR-350, -352, -358; ADDED SHT. 6
2	3/23/12	JAL	GW	GW	ADDED SHT 5; INCORP. FCR-ME-337 R1, REV. BOM & MINOR REV'S
1	2/14/12	JAL	GW	GW	ADDED TOTE HEPA FILTERS; REV. BILL OF MATERIALS
0	11/2/11	JAL	EB	GW	INITIAL ISSUE – FOR CONSTRUCTION

RPE
JOHN GRAYBILL WAGNER
REGISTERED ENGINEER
No. 120645
STATE OF TENNESSEE

DRAWN BY	J. A. LALONDE — DATE 11/2/11
DESIGNED BY	J. A. LALONDE — DATE 11/2/11
CHECKED BY	E. BLEDSOE — DATE 11/2/11
APPROVED BY	J. G. WAGNER — DATE 11/2/11
APPROVED BY	DATE

WPC
WAI Team

TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
LIQUID HANDLING SYSTEM

SIZE	SCALE:	DWG. NO.	REV
D	3/8"=1'-0"	T-RH-FW-D-ME-416	4
	SHEET: 1 OF 6		

FILENAME: T-RH-FW-D-ME-416 SHT 1.DWG

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FIGURE 8.1-34

ROOM 193
PROCESS AREA (PA)

ROOM 192
INNER AIRLOCK (IAL)

ROOM 191
OUTER AIRLOCK (OAL)

SOILS EXCAVATOR

SOILS MIXER / SCREW CONVEYOR

SOILS BOX

24'-0"

13'-0"

4'-3"

7'-5"

10"

℄ CRANE BEAM

FOR CONTINUATION, SEE DRAWING T-RH-FW-D-ME-300 SHT. 2

IA-022-1"

CPE-EDS-10A
T-RH-FW-D-SS-004 SHT 2

4'-10" (REF)

BOGIE

CPE-EDS-10B
T-RH-FW-D-SS-004 SHT 2

CPW001-03
1 1/2" PIPE PENETRATION
DETAIL T-BB-FW-D-ME-101

5 3/4"

DETAIL
1/2" CK-CPE-04

7'-0"

7"

CPW002-06
CPW002-05
CPW002-07

PS-CPE-42

PS-CPE-43

CPW002-09
CPW002-10

PART PLAN
ME-416 SHT 2 — ME-416 SHT 2

DETAIL
ME-416 SHT 2 — ME-416 SHT 4

8"

CPW-002-1 1/2"

PS-CPE-42

** NOTE:
OPTIONAL TERMINATIONS MAY BE USED - TO BE DETERMINED BY FIELD:
- THREADED CONNECTION AND PIPE CAP
- R.F.S.O. OR R.F.S.W. FLANGE
- COVER PLATE OF APPROVED THICKNESS

PART PLAN
TANK W-1A / UTILITY AIR STATION
ME-416 SHT 2 — ME-416 SHT 2

PS-CPE-44

PS-CPE-40A

CPW002-08

PS-CPE-46
PS-CPE-45
CPW001-10
CPW001-11
CLEANOUT

IA022-17
IA022-18

IA022-20
IA022-19

*** OVER ALL SPOOL LENGTH TO BE DETERMINED BY FIELD

CPW001-11A
CPW001-11B
CPW001-11C
CPW001-11D
CPW001-11E
CPW001-11F
CPW001-11G

10"

2'-1"

1'-2"

7"

FOR CONT. SEE SHT. 5
LINE NO. CPW-001-1 1/2"
SLOPED TO LIQUID TOTE.
ADJUST WATER FILTRATION
INLET & OUTLET CONNECTION
PIPE WELDS FOR HORIZONTAL
RUN (NO SLOPE)

2'-2 3/4"

1'-1 1/2"

PS-102
(T-CM-FW-D-SS-152)
(PIPING NOTE 12)

CPW-001-1 1/2"

15'-8"

3'-3 1/2"

CRANE BEAM

MATCH LINE SHT 1

ME-416 SHT 3 — ME-416 SHT 3

UTILITY AIR CONNECTION

ROTATE 90° VERTICAL IF DESIRED

PCV 197 — PI 197

ME-416 SHT 2 — ME-416 SHT 5

1/4" PL-CPE-06

3/8" PL-CPE-05

CPE SKIN

1" O.D. TUBING - FROM IA-022-1" SUPPLY (FIELD ROUTE) (SEE PART PLAN "D")

IA-025-1"

PART PLAN "C"

LINE IA-025-1" TANK W-1A MANIFOLD & UTILITY STATION (FINAL LOCATION TO BE DETERMINED BY OPERATIONS)
SCALE: 3"=1'-0"

IA-025-1"

TO TANK W-1A MANIFOLD STATION, (SEE PART PLAN "C")

SPARE

SPARE

* EITHER TEE MAY BE USED FOR AUX. AIR & ROTATE 90° IF DESIRED

IA-022-1"

PART PLAN "D"

1" O.D. MOTIVE AIR TUBING - TO TANK W-1A SOILS AUX EQUIPMENT MANIFOLD & UTILITY AIR STATION.
(SEE PART PLAN "C")
SCALE: 3"=1'-0"

PART PLAN
ELEV. 769'-11"

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
4	9/28/17	JAL	EB	GW	INCORPORATED DCN-ME-413 R2; FCR-ME-415 R0 & ADDED
					TANK W-1A PROCESS FEATURES.
3	11/7/12	JAL	GW	GW	INCORP. DCN-ME-347; FCR-ME-350, -355; ADDED SHT 6
2	3/23/12	JAL	GW	GW	INCORP. FCR-ME-334, 336 & 337 R1; ADDED CHECK
					VALVE AT BLOWDOWN CONN., ADDED SHT 5, REV BOM
1	2/15/12	JAL	GW	GW	ADDED WATER FILTRATION TIE-IN; REV. FOR AS-BUILT

RPE — Robert Gregory Wagner — No. 20643 — STATE OF TENNESSEE — 10/4/17 — Rev 4

DRAWN BY	J. A. LALONDE — DATE 11/2/11
DESIGNED BY	J. A. LALONDE — DATE 11/2/11
CHECKED BY	E. BLEDSOE — DATE 11/2/11
APPROVED BY	J. G. WAGNER — DATE 11/2/11
APPROVED BY	DATE

NORTHWIND NWPC

TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
LIQUID HANDLING SYSTEM

SIZE	SCALE:	DWG. NO.	REV
D	3/8"=1'-0"	T-RH-FW-D-ME-416	4
	SHEET: 2 OF 6		

FILENAME: T-RH-FW-D-ME-416 SHT 2.DWG

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FIGURE 8.1-35

9A 7B 7A 7 6

25'-0" 15'-2" 3'-4" 29'-0"

CONT. DRAWING T-RH-FW-D-ME-500 SHT 2

℄ EL 792'-3 3/8"

PS-CPE-30B (T-RH-FW-D-SS-003)

IA022-12

CPE-EDS-10A T-RH-FW-D-SS-004 SHT 2

CPE-EDS-10B T-RH-FW-D-SS-004 SHT 2

IA-022-1"

52

IA022-13

84

IA022-14

PS-CPE-47

SUPPLY AIR TUBING TO SV-192B (BY FIELD)

52

WP EL 784'-11"

CPW001-09
CPW001-06
CPW001-07
CPW001-08

CLEANOUT 5 8 100

CPW-001-1 1/2"

SLOPE

CPW001-12

WP EL 784'-5"

CPW001-13

℄ EL 784'-11"

CPW-002-1 1/2"

99

CPW001-11H

FOR CONT. SEE SHT. 5

1 1/2" CK-CPW-05 34 35 33

℄ EL 782'-11"

PS-CPE-40A EL. 783'-0"

1

3

52

CPW001-04

1

CPW001-05

3

℄ EL. 781'-6"

PS-CPE-30A (T-RH-FW-D-SS-003)

ROOM 192
INNER AIRLOCK (IAL)

℄ 780'-3 3/4"

29

℄ 779'-5"

29

138 139

PS-CPE-46

4

1 DETAIL

52

ME-416 SHT 4

ME-416 SHT 4

RD1-02

RD1-03

RD1-04

PS-CPE-40B EL. 779'-0"

SEE ENLARGED VIEW "A" SHEET 4

℄ EL 777'-11"

NOTES:

1. CPE LIQUID HANDLING SYSTEM REMOVED. REMAINING ORPHANED PIPING AND SPECIALITIES NOT DECOMMISSIONED SHALL BE ABANDONED IN PLACE. REFER TO THIS SERIES DRAWINGS FOR SPECIFIC TERMINATIONS.

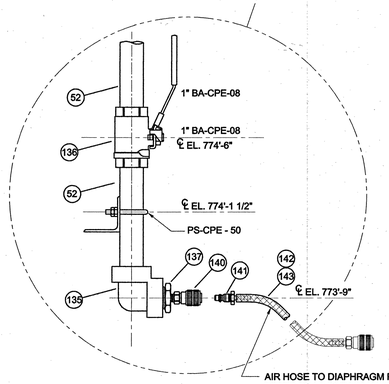
NOM. EL. 769'-11"

NOM. EL. 769'-11"

4

SECTION A-A (SHEET 1)

LOOKING EAST
ELEV. 769'-11"



DETAIL

SCALE: 3"=1'-0"

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
4	9/22/17	JAL	EB	GW	INCORP. DCN-ME-413 R2
3	11/7/12	JAL	GW	GW	INCORP. DCN-ME-347, -351; ADDED SHEET 6
2	3/23/12	JAL	GW	GW	INCORP. FCR-ME-336 & 337 R1; ADDED SHT 5
1	2/15/12	JAL	GW	GW	ADDED WATER FILTRATION TIE-IN; REV. FOR AS-BUILT
0	11/2/11	JAL	EB	GW	INITIAL ISSUE – FOR CONSTRUCTION

RPE
John Gregorie Wagner
REGISTERED ENGINEER
No. 120543
STATE OF TENNESSEE

DRAWN BY	DATE
J. A. LALONDE	11/2/11
DESIGNED BY	DATE
J. A. LALONDE	11/2/11
CHECKED BY	DATE
E. BLEDSOE	11/2/11
APPROVED BY	DATE
J. G. WAGNER	11/2/11
APPROVED BY	DATE

NORTHWND TWPC

TITLE

TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
LIQUID HANDLING SYSTEM

SIZE	SCALE:	DWG. NO.	REV
D	3/8"=1'-0"	T-RH-FW-D-ME-416	4
	SHEET: 3 OF 6		

FILENAME: T-RH-FW-D-ME-416 SHT 3.DWG

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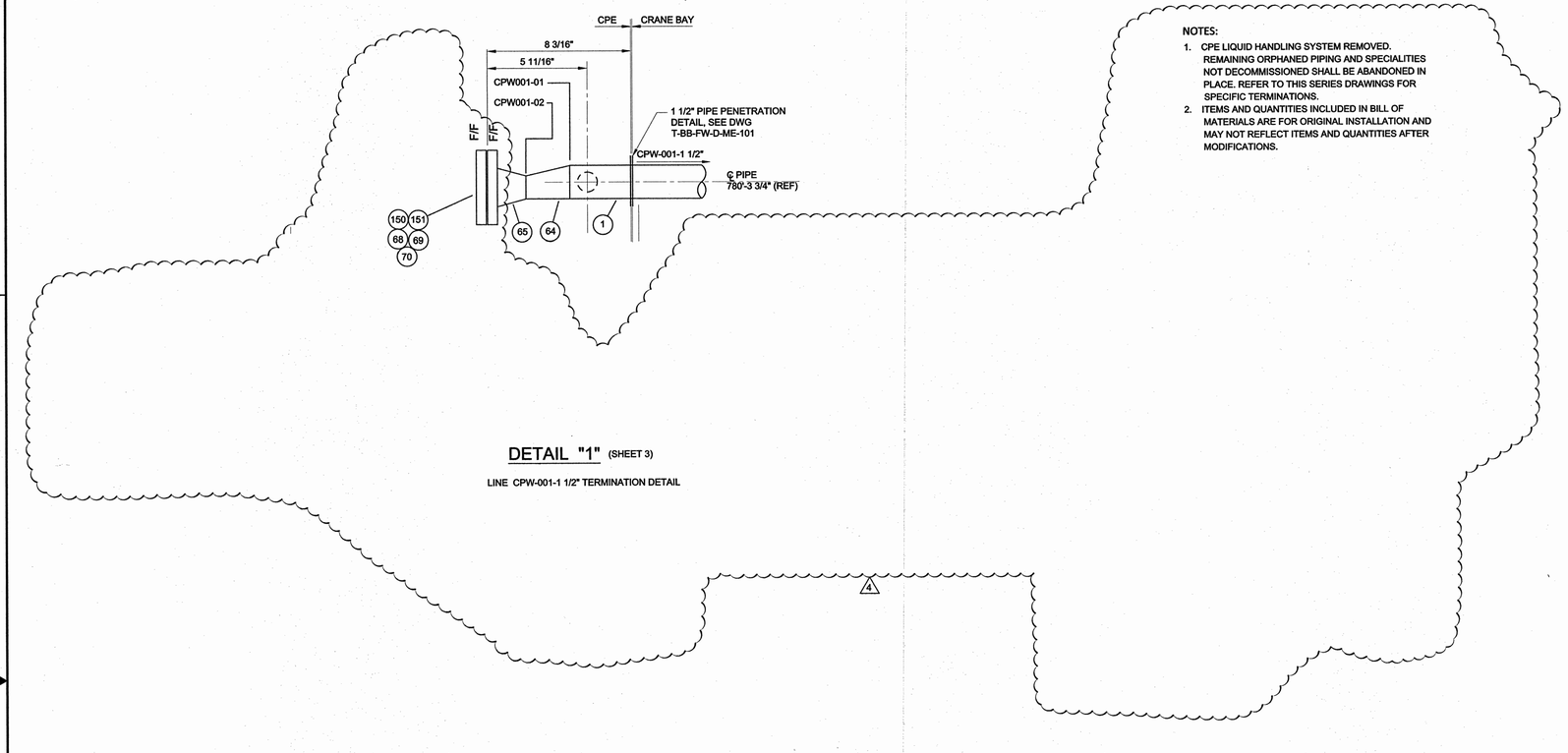
FIGURE 8.1-36



DETAIL "1" (SHEET 3)

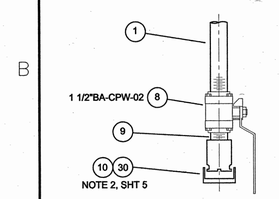
LINE CPW-001-1 1/2" TERMINATION DETAIL

NOTES:

1. CPE LIQUID HANDLING SYSTEM REMOVED. REMAINING ORPHANED PIPING AND SPECIALITIES NOT DECOMMISSIONED SHALL BE ABANDONED IN PLACE. REFER TO THIS SERIES DRAWINGS FOR SPECIFIC TERMINATIONS.
2. ITEMS AND QUANTITIES INCLUDED IN BILL OF MATERIALS ARE FOR ORIGINAL INSTALLATION AND MAY NOT REFLECT ITEMS AND QUANTITIES AFTER MODIFICATIONS.

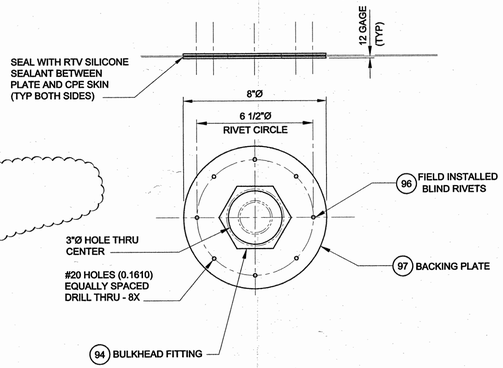
BILL OF MATERIALS (CONT. FROM SHEET 1)

	ITEM	QUAN	SIZE	DESCRIPTION
	67	10	1"	GASKETS - RING TYPE, RED RUBBER SHT, 1/8" THK, ASTM D2000.
	68	4	1"	FLANGE - THREADED, SS, 150#, ASTM A182-F304
	69	12	1/2" x 3" LG	STUD BOLTS - ALLOY STEEL, ASTM A193 GR B7.
	70	24	1/2"	NUTS - ALLOY STEEL, ASTM A194, GRADE 2H, HEAVY HEX
	71	2	1/2" PIPE SIZE	OFFSET PIPE CLAMP - STAINLESS STEEL, B-LINE SYSTEMS P/N B3148-1/2
	72	10 FT	1/2"	PIPE - STD WT, ASTM A106 GR B OR A53 GR B
	73	1	1/2"	POPPET CHECK VALVE - BRASS, 10 PSI CRACKING PRESSURE, BUNA N SEAT, MALE NPT x MALE NPT, SWAGELOK P/N B-8CP2-10
	74	1	1/2" NPT x 1/2" OD TUBE	FEMALE CONNECTOR - BRASS, SWAGELOK P/N B-810-7-8
	75	1	1"	SOLENOID VALVE - FCV-195 - ASCO CAT# 8210G078 OR APPROVED EQUAL
	76	1	1" x 1/2"	BUSHING - HEX HEAD, THREADED, ASTM A105, 3000#, ASME B16.11
(PIPING NOTE 10)	77	1	1" NPT MALE SUCTION & DISCHARGE	AOD PUMP - AIR OPERATED DOUBLE DIAPHRAGM PUMP, WARREN RUPP "SANDPIPER" MODEL S05, METALLIC
	78	2	1" x 4 1/2" LG	NIPPLE - STAINLESS STEEL, STD WT, ASTM A-312 TP304 (TBE)
	79	2	1" x 5" LG	NIPPLE - STAINLESS STEEL, STD WT, ASTM A-312 TP304 (TBE)
(TUBING NOTE 7)	80	1	3/4" X 0.125	FOAM TAPE ADHESIVE - 3M VHB (VERY HIGH BOND) ADHESIVE BOTH SIDES, FOR USE IN SUPPORTING ITEM 49 TO CPE SKIN & 71 TO PUMP SHELF SUPPORT McMASTER-CARR P/N 75935A29.
	81	10	3/8" O.D.	UNION ELBOW - 3/8" OD TUBE x 3/8" OD TUBE, SWAGELOK P/N B-600-9
	82	1	1/2" x 3" LG	PIPE NIPPLE - STD WT, ASTM A106 GR B OR A53 GR B (TBE)
	83	1	1/2" NPT x 3/8" OD TUBE	MALE CONNECTOR - BRASS, SWAGELOK P/N B-600-1-8
	84	6	1"	ELBOW - SW, ASTM A105, 3000#, ASME B16.11
	85	2	2"	90° ELL - PVC, SCH 80, SOCKET WELD, ASTM D2467, NSF 61
	86	1	2" x 12" LG	PIPE NIPPLE - PVC, SCH 80, ASTM D-1784 & D-1785 (TOE)
	87	2	2 " X LG AS REQ'D	PIPE - PVC, SCH 80, ASTM D-1784 & D-1785
	88	1	1 "	DUST CAP - TYPE "H" "BOSS LOCK", DIXON VLV. & COUPLING P/N RH100BL
	89	2	1 1/2" MNPT x 1 1/2 HOSE ID	MALE PIPE ADAPTER x HOSE BARB - PVC, ASTM D1784, GRAINGER P/N 3ELH5
	90	1	1 1/2"	STREET ELL - 3000#, SS, MALE x FEMALE NPT, ASTM A182-F-304
	91	1	1 1/2"	TEE - STAINLESS STEEL, THD, 3000#, ASTM A182 F304
	92	1	1/2"	TEE - THD, ASTM A105, 3000#, ASME B16.11
	93	1	1 1/2"	ELBOW - THD, MALE NPT x FEMALE NPT POLYPROPYLENE, McMASTER-CARR P/N 46885K126
	94	3	1 1/2"	BULKHEAD TANK FITTING - THD, STAINLESS STL., GRAINGER ITEM# 1MKJ5
	95	1	1"	BULKHEAD TANK FITTING, THD, STAINLESS STL., GRAINGER ITEM# 1MKJ1
	96	32	-	BLIND RIVETS - TYPE 316 STAINLESS STEEL, MATERIAL THICKNESS RANGE (0.178-0.255) McMASTER-CARR P/N 97550A215
	97	8	12 GA. (0.105")	BACKING PLATES - FABRICATED FROM ASTM A240 TYPE 304 STAINLESS STEEL TWO REQUIRED PER PENETRATION. SEE DETAILS 3 & 4.
	98	1	1/2"	CLOSE NIPPLE, STD WT, ASTM A106 GR B OR A53 GR B
	99	2	1 1/2"	BALL VALVE - THREADED, 316 SS, McMASTER-CARR P/N 4632K147
	100	1	1 1/2"	BALL VALVE - SOCKET WELD, 316 SS, McMASTER-CARR P/N 4866K77
	101	2	6" DIA X 4 3/4"H	HEPA AIR FILTER - 1 1/2" MALE NPT, 85 CFM, McMASTER-CARR P/N 4399K45
	102	2	-	HEPA REPLACEMENT ELEMENT - McMASTER-CARR P/N 9179K12
	103	2	1 1/2"	STRAIGHT COUPLING - THREADED, McMASTER-CARR P/N 45525K568
	104	3	1 1/2"	BALL VALVE - 2-WAY, SW, 316SS, McMASTER-CARR P/N 4866K77
	105	3	1 1/2"	90 DEG ELL - STAINLESS STEEL, THD, 3000#, ASTM A182 F304
	106	10 FT	1"	PIPE - STAINLESS STEEL, SCH 40, ASTM A312 TP304L
	107	5 FT	2"	PIPE - STAINLESS STEEL, SCH 40, ASTM A312 TP304L
	108	3	2"	TEE - STAINLESS STEEL, BW, SCH 40, ASTM A-403 -WP304L
	109	2	2" x 1"	RED - ECCENTRIC, BW, SS, ASTM A403 WP-304 (FOB)
	110	1	2" x 1 1/2"	RED - CONCENTRIC, BW, SS, ASTM A403 WP-304
	111	2	2"	90 DEG ELL - STAINLESS STEEL, BW, SCH 40, ASTM A-403 -WP304L
	112	1	1"	PIPE CAP - STAINLESS STEEL, THD, CLASS 3000#, ASTM A182-F304
	113	1	1 1/2"	PIPE CAP - STAINLESS STEEL, THD, CLASS 3000#, ASTM A182-F304
	114	1	2"	PIPE CAP - STAINLESS STEEL, THD, CLASS 3000#, ASTM A182-F304
	115	2	1"	TEE - STAINLESS STEEL, BW, SCH 40, ASTM A-403 -WP304L
	116	2	1"	90 DEG ELL - STAINLESS STEEL, BW, SCH 40, ASTM A-403 -WP304L
	117	1	1 "	STR COUPLING - THD, 3000#, STAINLESS STEEL, ASTM A182-F304
	118	2	1 "	BALL VALVE - 2-WAY, SW, 316SS, McMASTER-CARR P/N 4866K75
	119	1	1 "	MALE ADAPTOR x MALE NPT - 316 SS, DIXON TYPE "F", P/N 100-F-SS
	120	2	1/4 "	TEE - THD, 3000#, STAINLESS STEEL, ASTM A182-F304
	121	2	1/4 "	PLUG VALVE - STAINLESS STL. M/F NPT, SWAGELOK P/N SS-4P4T5
	122	2	1/4 "	PLUG VALVE - STAINLESS STL. FNPT BOTH ENDS, SWAGELOK P/N SS-4P4T4
	123	2	1/4 "	CHECK VALVE - STAINLESS STL., MALE NPT, 1/3 PSI CRACKING PRESSURE, SWAGELOK P/N SS-4CP2-1/3
	124	2	1/4 " MNPT	PRESSURE GAUGE - SS, 0-60 PSI, 2 1/2" DIAL, McMASTER-CARR P/N 3906K112
	125	1	2" X 1 1/2"	REDUCING BUSHING - STAINLESS STL. THD HEX HEAD, ASTM A182 F304
	126	1	1/4" X 2" LG	HEX NIPPLE - STAINLESS STL., SS-4-HLN-2.00
	127	1	6 1/4" DIA X 23 1/2" LG	WATER FILTER - 35 GPM, 2" INLET & OUTLET, ASME 304 SS HOUSEING, WITH DUAL FILTER BAG 200/100 MICRON, McMASTER-CARR P/N's 51665K54 & 5726K46
	128	1	6 1/4" DIA X 23 1/2" LG	WATER FILTER - 35 GPM, 2" INLET & OUTLET, ASME 304 SS HOUSEING, WITH DUAL FILTER BAG 50/25 MICRON, McMASTER-CARR P/N's 51665K54 & 5726K44
	129	2	1 1/2"	FLANGE - SOCKET WELD, RF, 304 SS, CLASS 150, ASTM A182, ANSI B16.5
	130	3 (4)	1 1/2"	FLANGE - RFWN, 304 SS, CLASS 150, ASTM A182, ANSI B16.5
	131	3	1 1/2"	GASKET - SPIRAL-WOUND, MICA GRAPHITE FILLER FOR 150# FLANGES
	132	2	1/4" MNPT X 1/2" OD TUBE	MALE CONNECTOR - BRASS, SWAGELOK P/N B-810-1-4
	133	1	1/4" NPT	AIR REGULATOR WITHOUT PRESSURE GAUGE 1/4" PIPE SIZE, 70 MAXIMUM SCFM @ 100 PSI 5-30 PSI OUTLET RANGE McMASTER-CARR P/N 4956K11
	134	1	1/8" NPT	PRESSURE GAUGE, 0-30 PSIG, ABS PLASTIC, 1/8" NPT CENTER MOUNT BACK MCMASTER-CARR P/N 3947K72
	135	1	1"	ELBOW - THD, ASTM A105, 3000#, ASME B16.11
	136	1	1"	BALL VALVE - CS, THREADED,150 PSI, McMASTER-CARR P/N 9788K83
	137	1	1" x 1/4"	BUSHING - HEX HEAD, THREADED, ASTM A105, 3000#, ASME B16.11
	138	1	1"	CROSS - THREADED, ASTM A105, 3000#, ASME B16.11
	139	1	1"	PLUG - HEX HEAD, THREADED, ASTM A105, 3000#, ASME B16.11
	140	1	1/4"	HOSE COUPLING -PUSH TO CONNECT SOCKET, 1/4" MALE NPT X FEMALE SOCKET, 303 SS, McMASTER-CARR P/N 6718K91
	141	1	1/4"	QUICK DISCONNECT AIR HOSE COUPLING - PLUG X 1/4" ID HOSE BARB, 303 SS, McMASTER-CARR P/N 6718K72
		100 FT	1/4" ID X 5/16 OD	COMP. AIR HOSE - RED, NYLON, 240 PSI @ 70° F, McMASTER-CARR P/N 5644K13
		2	7/32"-5/8"	HOSE CLAMP - ID RANGE 7/32"-5/8", 316SS, McMASTER-CARR P/N 5011T141
		1	1 1/2"	CHECK VALVE - 316 SS, CHECK-ALL STYLE CON, P/N CNJSSBNNOSPRG
		1	1 1/2"	90 DEG ELL, PVC, SCH 80, THREADED, ASTM D2464
		10 FT	2" OD X 1 1/2" ID	CLEAR PVC TUBING - FLEXIBLE (SHORE A60), McMASTER-CARR PN 5231K282 OR EQUIVALENT



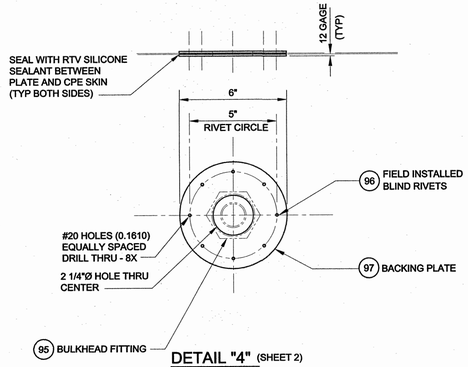
ENLARGED VIEW "A" (SHEET 3)

SCALE: 1 1/2"=1'-0"



DETAIL "3" (SHEET 2 & 5)

PIPE PENETRATION & BACKING PLATES
TWO (2) PLATES (ONE EACH SIDE) REQ'D FOR PENETRATION. REMOVE ALL BURRS - SMOOTH ALL EDGES.



DETAIL "4" (SHEET 2)

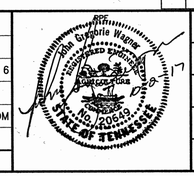
PIPE PENETRATION & BACKING PLATES
TWO (2) PLATES (ONE EACH SIDE) REQ'D FOR PENETRATION. REMOVE ALL BURRS - SMOOTH ALL EDGES.

BILL OF MATERIALS (CONT. FROM THIS SHEET)

ITEM	QUAN	SIZE	DESCRIPTION
147	2	1/2"	PLUG – HEX HEAD, THREADED, CS, ASTM A105, 3000#, ASME B16.11
148	2	1/2"	PIPE CAP - BRASS, SWAGELOK P/N B-8-CP
149	3	1 1/2"	BLIND FLANGE - RF, 304 SS, CLASS 150, ASTM A182, ANSI B16.5
150	2	1"	GASKET - SPIRAL-WOUND, MICA GRAPHITE FILLER FOR 150# FLANGES
151	1	1"	BLIND FLANGE - RF, 304 SS, CLASS 150, ASTM A182, ANSI B16.5
152	1	1 1/2"	PIPE CAP - 304 SS, CLASS 150, ASTM A182, ANSI B16.5

ELEVATIONS SHOWN ON THIS DRAWING ARE BASED ON FINISHED FLOOR ELEVATIONS ON THE FIRST FLOOR OF +768' AND +770'. REFERENCES FWENC DWGS T-CM-FW-D-CE-004 & -005

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
4	9/20/17	JAL	EB	GW	INCORP. DCN-ME-413 R2
3	11/7/12	JAL	GW	GW	INCORP. DCN-ME-351; FCR-ME-350, - 355; ADDED SHT 6
2	3/23/12	JAL	GW	GW	ADDED SHT. 5; DET 3 SHT. REF.; REVISED BOM
1	2/14/12	JAL	GW	GW	ADDED DRY DISCONNECT ADAPTOR & CAP; REVISED BOM
0	11/2/11	JAL	EB	GW	INITIAL ISSUE – FOR CONSTRUCTION



DRAWN BY J. A. LALONDE	DATE 11/2/11
DESIGNED BY J. A. LALONDE	DATE 11/2/11
CHECKED BY E. BLEDSOE	DATE 11/2/11
APPROVED BY J. G. WAGNER	DATE 11/2/11
APPROVED BY	DATE

NORTHWIND WPC

TITLE

TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
LIQUID HANDLING SYSTEM

SIZE	SCALE:	DWG. NO.	REV
D	3/8"=1'-0"	T-RH-FW-D-ME-416	4
	SHEET: 4 OF 6		

FILENAME: T-RH-FW-D-ME-416 SHT 4.DWG

This is an Uncontrolled Copy -- for Information Only.

FIGURE 8.1-37

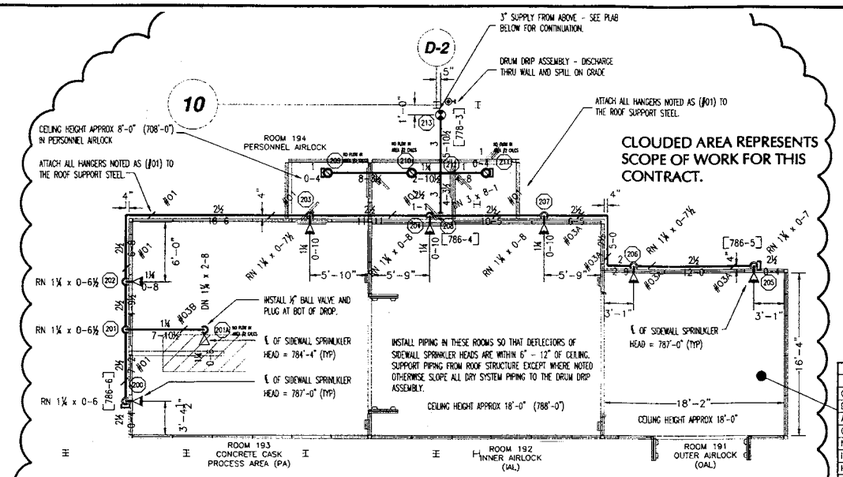
DRY SYSTEM MATERIAL

- ALL PIPE 2" AND SMALLER TO BE HOT-DIPPED GALVANIZED SCHEDULE 40 CARBON STEEL ASTM A53, FURNACE WELDED OR ASTM 135 GRADE A OR B, ERW OR SEAMLESS WITH HOT-DIPPED GALVANIZED CLASS 150 MALLEABLE IRON THREADED FITTINGS OR D.I. GALV. GROOVED FITTINGS WHERE B.I. ARE WELDED.
- ALL PIPE 2½" AND LARGER TO BE HOT-DIPPED GALVANIZED SCHEDULE 10 CARBON STEEL ASTM A53 GRADE A OR B, ERW OR SEAMLESS WITH HOT-DIPPED GALVANIZED DUCTILE IRON GROOVED FITTINGS & GALVANIZED COUPLINGS LISTED FOR DRY PIPE SERVICE.
- ALL BRANCH LINE CONNECTIONS TO CROSS MAINS TO BE MADE THROUGH WELDED THREAD-O-LETS UNLESS NOTED.

GENERAL NOTES

- ALL HANGERS ARE TO BE INSTALLED IN ACCORDANCE WITH NFPA #13.
- ALL MATERIALS AND METHODS OF INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA #13.
- (1) DENOTES HYDRAULIC REFERENCE POINT.
- [14' 8in] DENOTES DISTANCE FROM TOP OF 8" STEEL BEAMS (BOTTOM OF Z PURLIN) DOWN TO CENTER OF PIPE.
- [9'-8"] DENOTES DISTANCE FROM CENTER OF PIPE DOWN TO FINISH FLOOR
- (791'-6") DENOTES PIPE ELEVATION ABOVE FINISH FLOOR ELEVATION OF 770'-0"
- (1) DENOTES FLEXIBLE COUPLING LOCATION. (PLAN VIEW)
- ALL GROOVE COUPLINGS SHALL BE OF THE RIGID TYPE EXCEPT WHERE FLEXIBLE COUPLINGS ARE REQUIRED BY NFPA 13 TO MEET SEISMIC REQUIREMENTS.
- (W) DENOTES LOCATION & TYPE OF HANGER ON PIPE.
- ALL ELECTRICAL WIRING TO BE BY OTHERS. SEE FIRE ALARM ELECTRICAL DRAWINGS FOR WIRING OF ELECTRICAL DEVICES.
- ALL DRY SYSTEM PIPING SHALL BE PITCHED TO DRAIN TO LOWPOINT DRAIN IN ACCORDANCE WITH NFPA 13. BRANCH LINES SHALL BE PITCHED A MINIMUM OF ¼" PER 10 FT. MAINS SHALL BE PITCHED A MINIMUM OF ½" PER 10 FT.
- ALL TESTING WILL BE PERFORMED IN ACCORDANCE WITH NFPA #13 (2007).

CLOUDED AREA REPRESENTS SCOPE OF WORK FOR THIS CONTRACT.

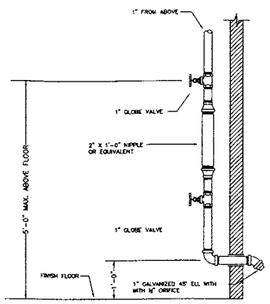


DRY PIPE SYSTEM CAPACITY CHART									
NOMINAL DIAMETER	INTERNAL DIAMETER			CAPACITY OF ONE FOOT OF PIPE IN GALLONS			TOTAL FOOTAGE OF PIPE FOR EACH TYPE OF PIPE			TOTAL GALLONS
	SCH. 10	SCH. 40	" XL "	SCH. 10	SCH. 40	" XL "	SCH. 10	SCH. 40	" XL "	
1"	1.097	1.049	1.104	.049	.045	.050		197		8.87
1-1/4"	1.442	1.380	1.452	.085	.078	.086		167		13.03
1-1/2"	1.682	1.610	1.687	.115	.106	.116		158		16.75
2"	2.157	2.067	2.154	.190	.174	.189		149		25.0
2-1/2"	2.635	2.469	2.581	.283	.248		180			50.94
3"	3.260	3.068	3.200	.433	.383		340			147.22
3-1/2"	3.760	3.548	N/A	.576	.513					
4"	4.260	4.026	N/A	.740	.660					
5"	5.295	5.047	N/A	1.144	1.040					
6"	6.357	6.065	N/A	1.849	1.501					
8"	8.249	7.981	N/A	2.776	2.660					
							ESTIMATED TOTAL GALLONS			262.71
							QUICK OPENING DEVICE REQUIRED			YES ☐ NO ☒

DRY SYSTEM VOLUME MODIFIED 10/17/11 FOR ADDITION OF THE CASK ENCLOSURE BLDG - C1100034.

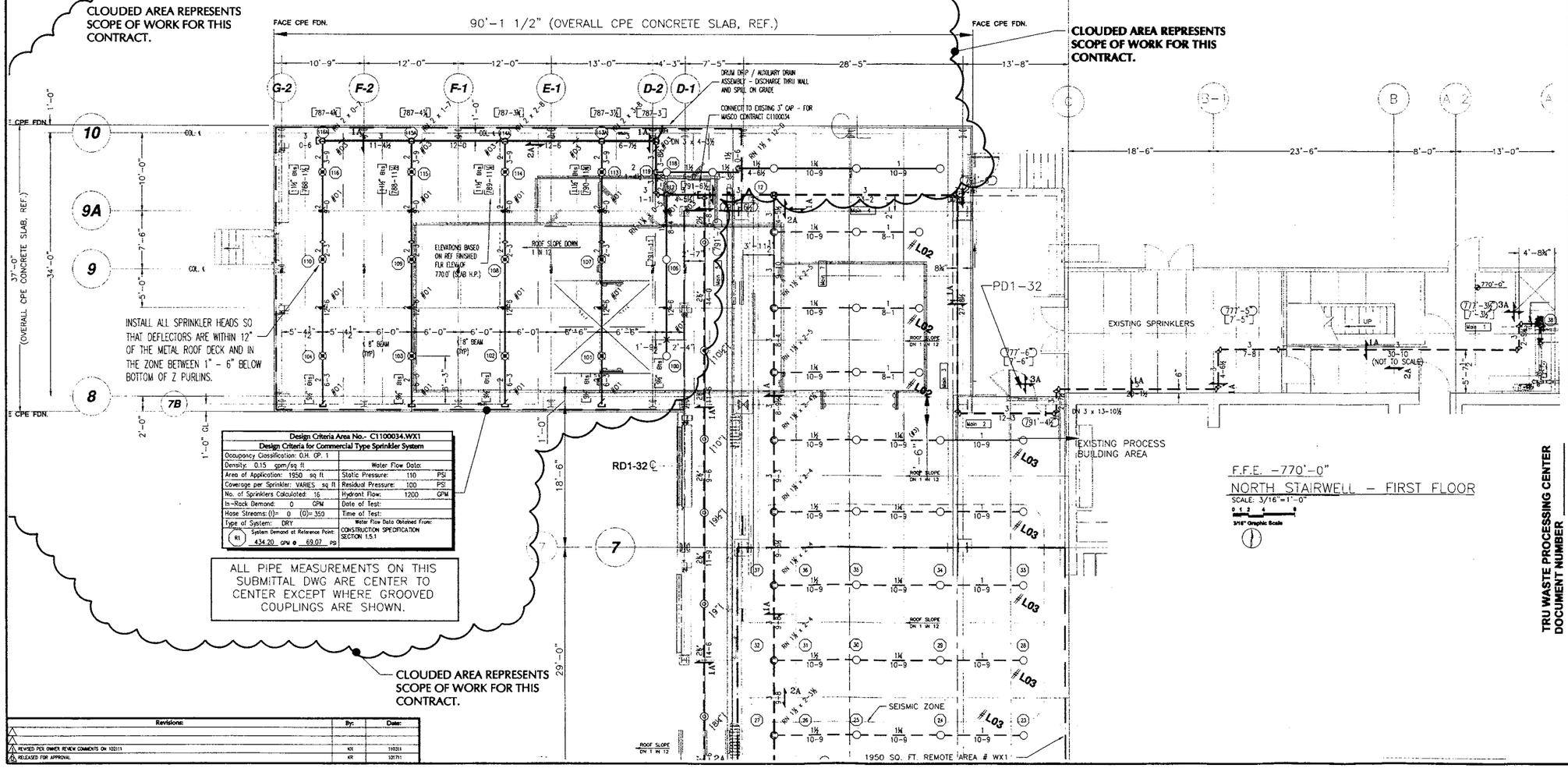
Design Criteria Area No.- C1100034.WX2			
Design Criteria for Commercial Type Sprinkler System			
Occupancy Classification: O.H. GP. 1			
Density: 0.15 gpm/sq ft	Water Flow Data:		
Area of Application: 1300 sq ft	Static Pressure:	110	PSI
Coverage per Sprinkler: VARIES sq ft	Residual Pressure:	100	PSI
No. of Sprinklers Calculated: 7	Hydrant Flow:	1200	GPM
In-Rack Demand: 0 GPM	Date of Test:		
Hose Streams: (1)= 0 (0)= 350	Time of Test:		
Type of System: DRY	Water Flow Data Obtained From:		
(R1) System Demand at Reference Point: 379.4 GPM @ 80.12 PSI	CONSTRUCTION SPECIFICATION SECTION 1.5.1		

CALCULATIONS WOULD NOT SUPPORT THE ADDITION OF HEADS AT NODE POINTS 201A, 209, 210, AND 211 DUE TO EXCESSIVE LOSS THROUGH THE EXISTING 3" SUPPLY MAIN TO THIS AREA. HEADS INCLUDED IN THE REMOTE AREA ARE ALL THE EXTENDED COVERAGE HEADS IN ROOMS 191, 192, AND 193.



AUXILIARY DRAIN / INSPECTORS TEST DETAIL

NO SCALE



Design Criteria Area No.- C1100034.WX1			
Design Criteria for Commercial Type Sprinkler System			
Occupancy Classification: O.H. GP. 1			
Density: 0.15 gpm/sq ft	Water Flow Data:		
Area of Application: 1950 sq ft	Static Pressure:	110	PSI
Coverage per Sprinkler: VARIES sq ft	Residual Pressure:	100	PSI
No. of Sprinklers Calculated: 16	Hydrant Flow:	1200	GPM
In-Rack Demand: 0 GPM	Date of Test:		
Hose Streams: (1)= 0 (0)= 350	Time of Test:		
Type of System: DRY	Water Flow Data Obtained From:		
(R1) System Demand at Reference Point: 434.20 GPM @ 69.07 PSI	CONSTRUCTION SPECIFICATION SECTION 1.5.1		

ALL PIPE MEASUREMENTS ON THIS SUBMITTAL DWG ARE CENTER TO CENTER EXCEPT WHERE GROOVED COUPLINGS ARE SHOWN.

CLOUDED AREA REPRESENTS SCOPE OF WORK FOR THIS CONTRACT.

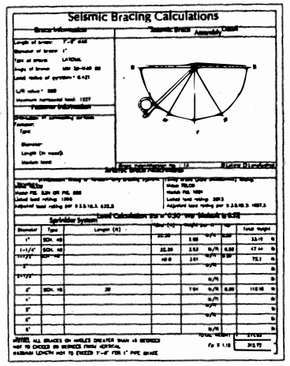
F.F.E. -770'-0"
NORTH STAIRWELL - FIRST FLOOR
SCALE: 3/16"=1'-0"
3/16" Graphic Scale

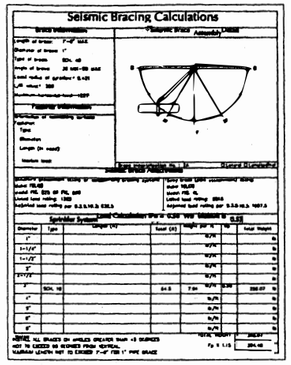
TRU WASTE PROCESSING CENTER
DOCUMENT NUMBER

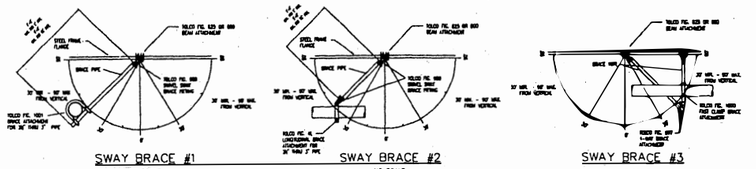
Revisions:	By:	Date:
REVISED PER OWNER REVIEW COMMENTS ON 102311	KR	110311
RELEASED FOR APPROVAL	KR	101711

Sprinkler Legend

Reference Symbol	Qty.	Manufacturer	Model No.	Description	Finish	Temperature Rating	Orifice	Connection Size	Remarks
SW (QR)	12	VIKING	M33521	3" HORIZONTAL SIDEWALL	BRASS	200	1/2"	3/4"	
SW (QR)	1	VIKING	M33526	3" HORIZONTAL SIDEWALL	BRASS	200	1/2"	3/4"	
EH	1	VIKING	M33255	3" STANDARD COVERAGE HORIZONTAL SIDEWALL	BRASS	200	1/2"	1/2"	
EH	1	VIKING	F1543311	3" STANDARD COVERAGE HORIZONTAL SIDEWALL	BRASS	200	1/2"	1/2"	
EH	175	VIKING	F1543311	3" STANDARD COVERAGE HORIZONTAL SIDEWALL	CHROME PLATED	200	1/2"	3/4"	
EH	1	VIKING	F1543311	3" STANDARD COVERAGE HORIZONTAL SIDEWALL	CHROME PLATED	200	1/2"	1/2"	
EH	1	VIKING	F1543311	3" STANDARD COVERAGE HORIZONTAL SIDEWALL	CHROME PLATED	200	1/2"	1/2"	
EH	1	VIKING	F1543311	3" STANDARD COVERAGE HORIZONTAL SIDEWALL	CHROME PLATED	200	1/2"	1/2"	
SW (QR)







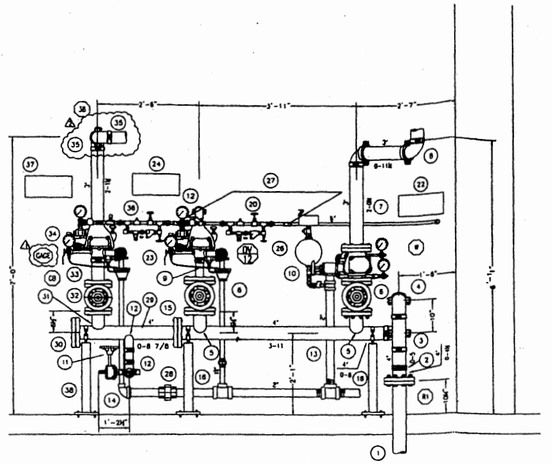
SWAY BRACING NOTES
- LATERAL BRACES SHALL BE SPACED MAXIMUM OF 40 FT. ON CENTER ON ALL FEED & CROSS MAINS REGARDLESS OF SIZE & BRANCH LINES 2½" & LARGER.
- DISTANCE FROM LAST LATERAL BRACE & END OF PIPE SHALL NOT EXCEED 20 FT.
- LATERAL BRACES SHALL BE ALLOWED TO ACT AS LONGITUDINAL BRACES IF THEY ARE WITHIN 24 IN. OF THE CENTER LINE OF THE PIPE BEING BRACED LONGITUDINALLY FOR LINES THAT ARE 2½" & LARGER.
- LATERAL BRACES SHALL NOT BE REQUIRED FOR PIPE SUPPORTED BY ROD LENGTHS LESS THAN 6 IN AS MEASURED FROM TOP OF PIPE TO POINT OF ATTACHMENT
- LONGITUDINAL BRACES SHALL BE SPACED MAXIMUM OF 80 FT. ON CENTER ON ALL FEED & CROSS MAINS
- DISTANCE FROM LAST LONGITUDINAL BRACE & END OF PIPE SHALL NOT EXCEED 40 FT.
- TOP OF RISERS EXCEEDING 3 FT. IN LENGTH SHALL BE PROVIDED WITH A FOUR-WAY BRACE.
- THE FOUR-WAY BRACE PROVIDED AT TOP OF RISERS CAN ALSO PROVIDE LONGITUDINAL & LATERAL BRACING FOR ADJACENT MAINS.
- THE LAST LENGTH OF PIPE AT THE END OF A FEED OR CROSS MAIN SHALL BE PROVIDED WITH A LATERAL BRACE.

3A 1A 2A — DENOTE TYPE & LOCATION OF SWAY BRACES. SEE SHEET FOR SEISMIC BRACE DETAILS.

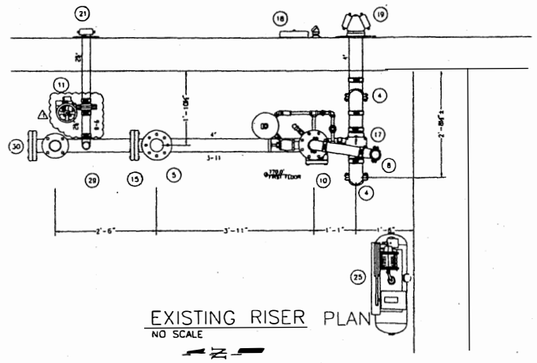
SEISMIC FLEXIBLE COUPLING LOCATIONS FOR PIPE 2½" & LARGER
- WITHIN 24" OF TOP & BOTTOM OF ALL RISERS. RISERS LESS THAN 3' IN LENGTH FLEXIBLE COUPLINGS ARE PERMITTED TO BE OMITTED. RISERS 3' TO 7' IN LENGTH, ONE FLEXIBLE COUPLING IS ADEQUATE
- WITHIN 12" ABOVE & 24" BELOW FLOOR IN MULTISTORY BUILDINGS. WHEN THE FLEXIBLE COUPLING BELOW FLOOR IS ABOVE TIE-IN MAIN SUPPLING THAT FLOOR , A FLEXIBLE COUPLING SHALL BE PROVIDED ON THE VERTICAL PORTION OF PIPING
- ON BOTH SIDES OF CONCRETE OR MASONARY WALLS WITHIN 12" OF WALL SURFACE. EXCEPT WHEN CLEARANCE AROUND PIPE IS PROVIDED PER N.F.P.A. 13 SECTION 8.3.4 FLEXIBLE COUPLINGS ARE NOT REQUIRED.
- WITHIN 24" OF TOP OF DROP EXCEEDING 15 FT. IN LENGTH TO PORTIONS OF SYSTEMS SUPPLYING MORE THAN ONE SPRINKLER REGARDLESS OF PIPE SIZE.
- WITHIN 24" OF TOP & BOTTOM OF DROP TO HOSE LINES, RACK SPRINKLERS & MEZZANINES REGARDLESS OF PIPE SIZE.
- ABOVE & BELOW ANY INTERMEDIATE POINTS OF SUPPORT FOR A RISER OR OTHER VERTICAL PIPE
- WITHIN 24" OF BUILDING EXPANSION JOINTS.

EQUIPMENT NOMENCLATURE

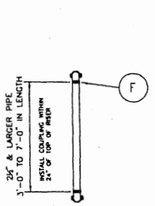
1. EXISTING 4" SUPPLY
2. EXISTING FLEXIBLE GROOVE COUPLING
3. EXISTING 4" GROOVE TEE
4. EXISTING 4" GROOVE 90° ELL
5. EXISTING 4" WELDED OUTLET WITH WELDED FLANGE
6. EXISTING 4" FLANGED O.S.&Y. GATE VALVE MUELLER CO. MODEL A-2078-6 WITH TAMPER SWITCH POTTER MODEL OSYSU-2
7. EXISTING FLANGE X GROOVE SPOOL PIECE. WITH 3⅜"ø WELDED REDUCING FLANGE
8. EXISTING 3" GROOVE 90° ELL
9. EXISTING 2½"X2-6 FLANGE X GROOVE SPOOL PIECE WITH 2⅜"ø WELDED REDUCING FLANGE.
10. EXISTING 4" FLANGED ALARM CHECK VALVE TYCO MODEL AV-1-300 WITH: 1.) RETARD CHAMBER TYCO MODEL RC-1 2.) ALARM PRESSURE SWITCH POTTER MODEL PS10-2A
11. EXISTING 2½" GROOVE BUTTERFLY VALVE WITH TAMPER SWITCH TYCO MODEL BFV-N (RELOCATED)
12. EXISTING 2½" GROOVE 90° ELL (RELOCATED)
13. EXISTING 2" MAIN DRAIN PIPED TO EXISTING PENETRATION THRU WALL
14. 2X1¼ 90° REDUCING ELL (RELOCATED)
15. NEW 4"X9"ø WELDED FLANGE
16. EXISTING 2" PIPE STAND
17. EXISTING 4" GROOVE CHECK VALVE
18. EXISTING ELECTRIC BELL (SERVES TWO EXISTING & ONE NEW SYSTEM)
19. EXISTING FIRE DEPT. CONNECTION & ¾" BALL DRIP
20. EXISTING AIR MAINTENANCE DEVICE (VERIFY LOCATION)
21. 2½" TEST CONNECTION FOR FORWARD FLOW OF BACKFLOW PREVENTER
22. EXISTING SPARE HEAD CABINET WITH STOCK OF THREE EACH OF TYCO ECOH HORIZONTAL SIDEWALL MODELS SW-20 & SW-24 WITH WRENCH
23. EXISTING 2½" GROOVE X GROOVE DRY PIPE VALVE TYCO MODEL DPV-1 WITH 1.) ALARM PRESSURE SWITCH POTTER MODEL PS10-2A 2.) HIGH/LOW PRESSURE SWITCH POTTER MODEL PS40-2A
24. EXISTING SPARE HEAD CABINET WITH 2 TY-B-3.8 PENDENT SPRINKLERS & 4 EC-14 UPRIGHT & HEAD WRENCH FOR EACH TYPE
25. EXISTING AIR COMPRESSOR (VERIFY LOCATION)
26. NEW ¾" GALVANIZED CLASS 150 MALEABLE IRON SCREWED TEE (FOR AIR SUPPLY TO NEW 3" DRY PIPE VALVE)
27. NEW ¾" GALVANIZED SCH. 40 AIR LINE SUPPLY
28. NEW 2" CLASS 150 MALEABLE IRON SCREWED UNION
29. NEW 4" SCH. 10 BLACK STEEL FLANGED SPOOL PIECE
30. NEW 4" CLASS 125 CAST IRON BLIND FLANGE
31. NEW 3" WELDED FLANGE STUB
32. NEW 3" FLANGED O.S.&Y. GATE VALVE NIBCO MODEL F-607-RW WITH TAMPER SWITCH POTTER MODEL OSYSU-2
33. NEW 3" X 0-7 SCH. 10 BLACK STEEL FLANGE X GROOVE SPOOL PIECE
34. NEW 3" GROOVE X GROOVE DRY PIPE VALVE TYCO MODEL DPV-1 WITH 1.) ALARM PRESSURE SWITCH POTTER MODEL PS10-2A 2.) HIGH/LOW PRESSURE SWITCH POTTER MODEL PS40-2A
35. NEW 3" GALVANIZED DUCTILE IRON 90° GROOVE ELL
36. NEW AUTOMATIC AIR MAINTENANCE DEVICE PRESSURE REDUCING TYPE TYCO MODEL AMD-1
37. NEW SPARE HEAD CABINET WITH SIX 200° BRASS UPRIGHT SPRINKLER VIKING VK 100 & SPRINKLER WRENCH V20
38. NEW 2" PIPE STAND



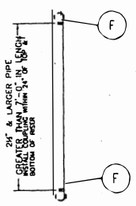
EXISTING RISER DETAIL
NO SCALE



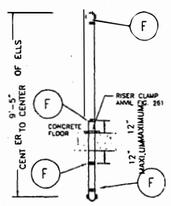
EXISTING RISER PLAN
NO SCALE



FLEXIBLE COUPLING DETAIL #1
NO SCALE



FLEXIBLE COUPLING DETAIL #2
NO SCALE



FLEXIBLE COUPLING DETAIL #2
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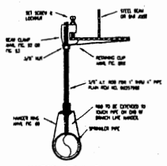
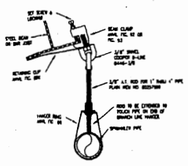
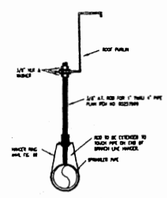


HANGER DETAIL #1
NO SCALE



HANGER DETAIL #2
NO SCALE



HANGER DETAIL #3
NO SCALE

#03A SIMILAR EXCEPT ATTACHED TO BRACKET WELDED TO SIDE OF PROCESS AREA ENCLOSURE.

#03B SIMILAR EXCEPTED PUNCHED THRU TOP OF ENCLOSURE CEILING WITH NUT AND WASHER ON TOP AND BOT

Revisions:	By:	Date:
1		
2 REVISED PER OWNER COMMENTS DATED 10/21/11	KR	110311
3 RELEASED FOR APPROVAL	KR	101711

FIGURE 8.1-39

Symbols Legend

Symbol	Description
W.G.	HYDRAULIC GRADE LINE (WATER GRADE)
E.F.F.	ELEVATION OF FIRE FLOOR (TOP OF SLAB)
E.A.F.	ELEVATION OF FIRE ABOVE FINISH FLOOR
E.S.L. + C.F.	TOP OF SLAB ELEVATION
E.S.L. + C.F.	BOTTOM OF SLAB ELEVATION
E.S.L. + C.F.	TOP OF JOIST ELEVATION
E.S.L. + C.F.	BOTTOM OF JOIST ELEVATION
	INDICATES LOCATION OF ANGLE

Sprinkler Legend

Symbol	Description	Qty.
	Pendent	
	Upright	
	Sidewall	
	Recessed	
	Concealed	
	Pend. Flush	
	Wear Plate	
	Escutcheon	
	Dry Pipe	
	Deluge	
	Other	
	Total	

Sheet No. FP-2
Project No. 2

TRU WASTE PROCESSING CENTER
DOCUMENT NUMBER

Drawn for: 300 TON OVERHEAD BAY / CASK PROCESSING ENCLOSURE
Re: FIRE PROTECTION PLAN

TRU WASTE PROCESSING CENTER
100 WPP ROAD
LENOIR CITY, TENNESSEE 37771

Owner: WASTREN ADVANTAGE, INC
Contact with: 100 WPP ROAD
LENOIR CITY, TENNESSEE 37771

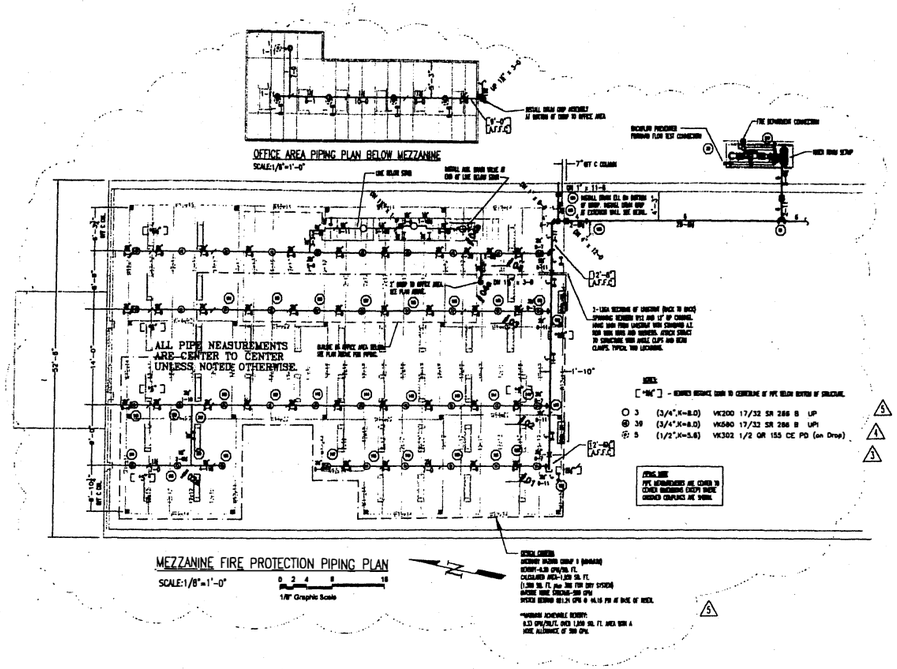
Tennessee Sprinkler License No. 002
Qualifier: Scott Ryan — TBAE No. 009
Date: 10/17/11
Drawn By: KR
Scale: AS NOTED
Approved: OWNER
Contract No.: C1100034
Sheet FP-2 of 2

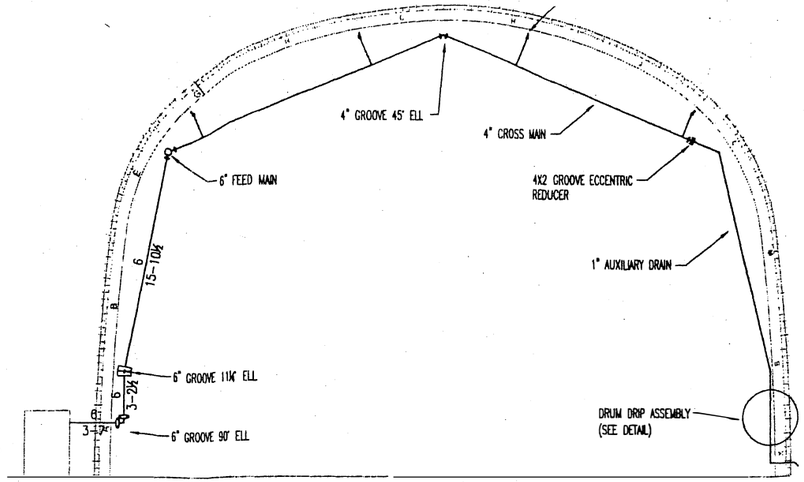
MASCO

Mechtronen Automatic Sprinkler Co., Inc.
1310 Kamel Avenue - Knoxville, TN 37917
Phone (865) 689-4466 / Fax (865) 687-0622

All Project Issues To Be Certified In The Contractor Name

Symbols
Special

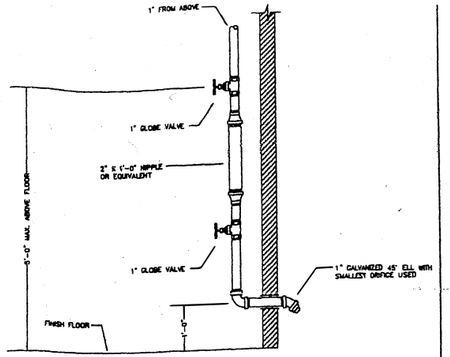




BUILDING SECTION A-A

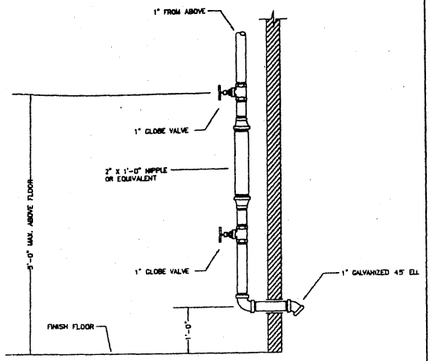
SCALE:1/4"=1'-0"

1/4" Graphic Scale



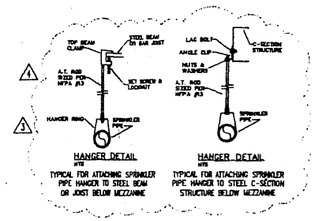
INSPECTORS TEST DETAIL

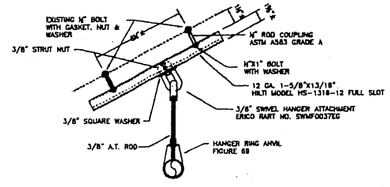
NO SCALE



DRY SYSTEM DRUM DRIP ASSEMBLY

NO SCALE





HANGER DETAIL #1

NO SCALE

TYPICAL FOR BRANCH LINE AND MAIN ABOVE MEZZANINE

DRY SYSTEM MATERIAL

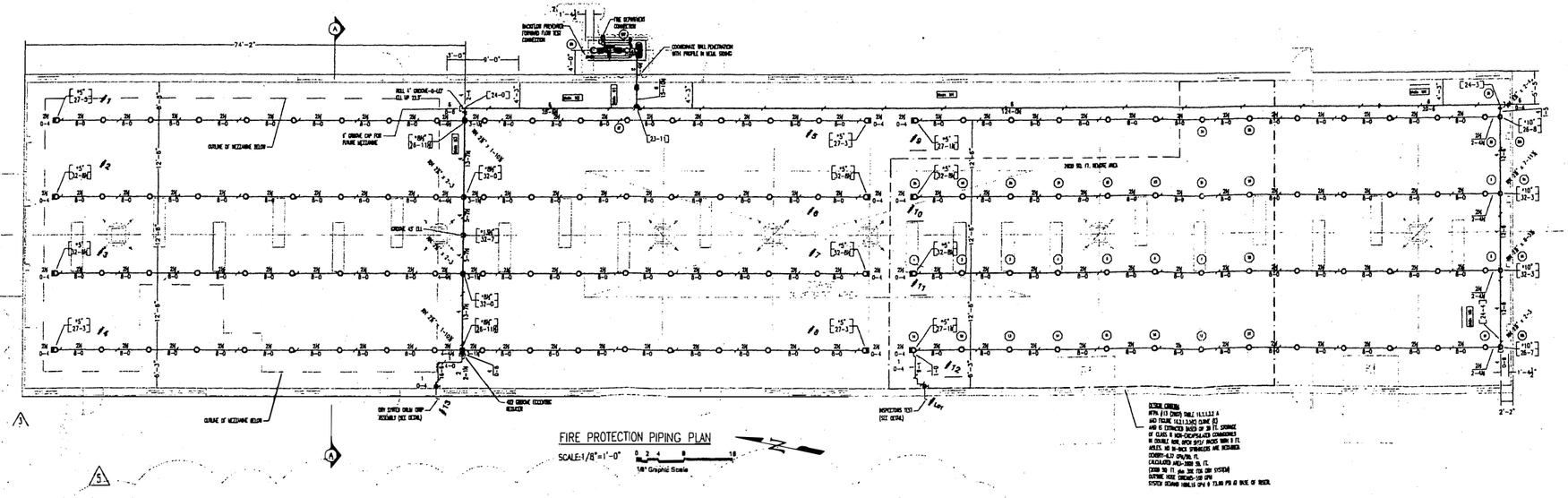
- ALL PIPE 2" AND SMALLER TO BE HOT-DIPPED GALVANIZED SCHEDULE 40 BLACK STEEL ASTM A53, FURNACE WELDED OR ASTM 135 GRADE A OR B, ERW OR SEAMLESS WITH PAINTED GALVANIZED CLASS 150 MALLEABLE IRON THREADED FITTINGS.
- ALL PIPE 2½" AND LARGER TO BE HOT-DIPPED GALVANIZED SCHEDULE 10 BLACK STEEL ASTM A53 GRADE A OR B, ERW OR SEAMLESS WITH PAINTED DUCTILE IRON GROOVE FITTINGS & & PAINTED COUPLINGS LISTED FOR DRY PIPE SERVICE.
- ALL BRANCH LINE CONNECTIONS TO CROSS MAINS TO BE MADE THROUGH WELDED GROOVE-O-ETS UNLESS NOTED.
- ALL SPRINKLER CONNECTIONS TO BRANCH LINES TO BE MADE THROUGH WELDED THREAD-O-LETS UNLESS NOTED.

GENERAL NOTES

- ALL HANGERS ARE TO BE INSTALLED IN ACCORDANCE WITH NFPA #13.
- ALL MATERIALS AND METHODS OF INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA #13.
- ① DENOTES HYDRAULIC REFERENCE POINT.
- [+5"] DENOTES DISTANCE FROM BOTTOM OF STEEL DECK DOWN TO CENTER OF PIPE.
- [28-7] DENOTES DISTANCE FROM CENTER OF PIPE DOWN TO FINISH CONCRETE FLOOR.
- (F) DENOTES FLEXIBLE COUPLING LOCATION. (PLAN VIEW)
- ALL GROOVE COUPLINGS SHALL BE OF THE RIGID TYPE EXCEPT WHERE FLEXIBLE COUPLINGS ARE REQUIRED BY NFPA 13 TO MEET SEISMIC REQUIREMENTS.
- —⊢— DENOTES LOCATION OF PIPE HANGER.
- ALL ELECTRICAL WIRING TO BE BY OTHERS. SEE FIRE ALARM ELECTRICAL DRAWINGS FOR WIRING OF ELECTRICAL DEVICES.
- ALL BRANCH LINE PIPE SHALL BE PITCHED TO DRAIN ¼ INCH IN 10 FEET BACK TO MAINS & MAINS PITCHED ½ INCH IN 10 FEET TO DRAIN THRU THE SYSTEM MAIN DRAIN.
- ALL TESTING WILL BE PERFORMED IN ACCORDANCE WITH NFPA #13 (2007).

DRY PIPE SYSTEM CAPACITY CHART

NOMINAL DIAMETER	INTERNAL DIAMETER			CAPACITY OF ONE FOOT OF PIPE IN GALLONS			TOTAL FOOTAGE OF PIPE FOR EACH TYPE OF PIPE			TOTAL GALLONS
	SCH. 10	SCH. 40	" XL "	SCH. 10	SCH. 40	" XL "	SCH. 10	SCH. 40	" XL "	
1"	1.097	1.049	1.104	.098	.045	.050		67		3.01
1-1/4"	1.442	1.380	1.453	.085	.078	.086		34		2.65
1-1/2"	1.682	1.610	1.687	.115	.106	.116		32		3.39
2"	2.157	2.067	2.154	.199	.174	.189		34		5.92
2-1/2"	2.635	2.469	2.581	.283	.248		1208			342.15
3"	3.260	3.068	3.200	.433	.383					
3-1/2"	3.760	3.548	N/A	.578	.513					
4"	4.280	4.026	N/A	.740	.660		138			102.64
5"	5.295	5.047	N/A	1.144	1.040					
6"	6.357	6.065	N/A	1.849	1.501		204			326.40
8"	8.249	7.981	N/A	2.778	2.660					
						ESTIMATED TOTAL GALLONS				784.16
						QUICK OPENING DEVICE REQUIRED				YES ☒ NO ☐



REVISIONS:

Description:	By	Date
ADDED CALCULATION POINTS AND HYDRAULIC DATA FOR CALCULATED AREA BELOW MEZZANINE.	JAR	8-4-11
REVISED GENERAL NOTES REGARDING HANGERS. REVISED NEW HANGER DETAILS. ADDED DRAIN LOCATION BELOW MEZZANINE.	JAR	7-27-11
ADDED MEZZANINE AND PIPING BELOW MEZZANINE. REVISED SPRINKLER LEGEND. REVISED NOTES.	JAR	7-21-11
REVISED PER CONSTRUCTION DRAWING 1-CM-FW-0-FP-005 REV2.	D.L.W.	3-7-11
REVISED PER DESIGN REVIEW COMMENTS.	D.L.W.	10-25-10
RELEASED FOR APPROVAL	D.L.W.	9-20-10

SPRINKLER LEGEND

Symbol	S.I.N.	LINE	Sprinkler Head Description & Notes	Head Part #	Head Finish	Esc. Model #	Esc. Part #	Esc. Finish	Temp.	K-Factor	N.P.T.	Drop Dia.	Quantity	HD Wrench
○	VK530	SR	UPRIGHT ELO	09678AC	BRASS			CHROME	286	11.2	3/4"		124	05118CW/B
⊛	VK302	QR	VIKING MODEL PENDENT SPRINKLER	06562BFB	CHROME	MATL #83			155	5.6	1/2"	1"	5	12144W/B
○	VK200	SR	BRASS UPRIGHT	10141AC	brass				286	17/32	3/4		3	10896W/B
◎	VK560	SR	INTERMEDIATE LEVEL BRASS UPRIGHT	10141AQU	BRASS				286	17/32	3/4		39	10896W/B

PROJECT DATA

Type & Number of Systems	
WET	
DRY	1
ANTIFREEZE	
PREACTION	
Center of Tile Required	
Seismic Required	
Total Heads for Sheet:	171
Total Heads for Project:	171

Additional Notes:

MASCO
Morristown Automatic Sprinkler Co.,Inc.
1310 Kemper Avenue - Knoxville, TN 37917
Phone (865) 688-4480 Fax (865) 687-0622

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Drawing Contents: FIRE PROTECTION PIPING PLAN & DETAILS

JOB MULTI-PURPOSE BUILDING SUBCONTRACT #070417

TRU WASTE PROCESSING CENTER
100 WPP ROAD
LENOIR CITY, TENNESSEE 37771

Contract With: WASTREN ADVANTAGE, INC.
100 WPP ROAD
LENOIR CITY, TENNESSEE 37771

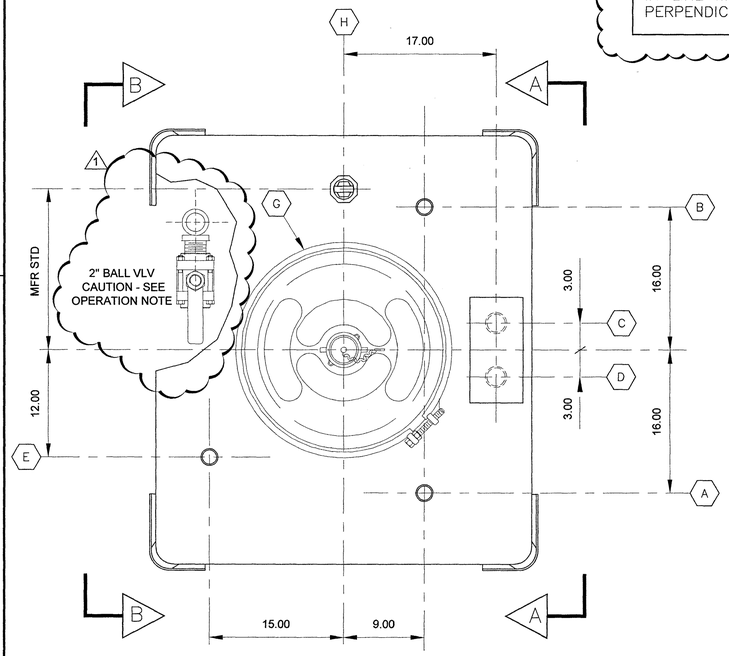
Tennessee Sprinkler License No. 002

Roof No. 009

Date: 9-20-10
Drawn By: D.L.W.
Scale: AS NOTED
Approved: OWNER
Contract No.: C1000047
Sheet: FP-2 of 2

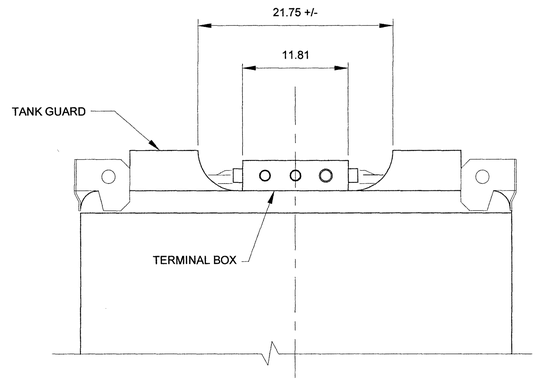
FIGURE 8.1-40

OPERATION NOTE: BALL VALVE HANDLE IS IN-LINE WHEN CLOSED. MOVE HANDLE PERPENDICULAR TO PIPING TO OPEN VALVE.



NOZZLE SCHEDULE

MK	SIZE	TYPE	PROJ	DESCRIPTION
A	1 1/2"	NPT MALE	1 1/2"	CASK PRODUCED WATER FILL W/DOWNCOMER (NOTE 7)
B	1 1/2"	NPT MALE	1 1/2"	AUXILIARY LIQUID TRANSFER W/DOWNCOMER (NOTE 7)
C	2"	FNPT BUNG	-	TANK FITTING FOR LEVEL SWITCH
D	2"	FNPT BUNG	-	TANK FITTING FOR LEVEL SWITCH
E	1 1/2"	NPT MALE	1 1/2"	HEPA FILTER (NOTE 9)
F	2"	NPT	-	DRAIN W/ VALVE & PLUG
G	22 1/2"	-	-	DRUM COVER W/ ACCESSORIES
H	2"	FNPT BUNG	-	SPARE

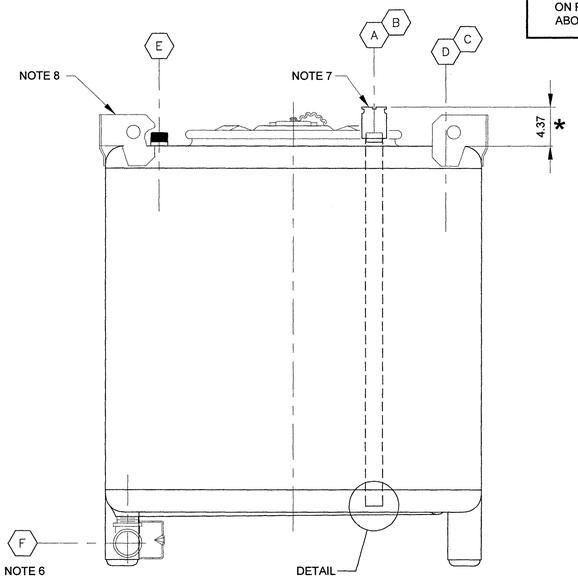


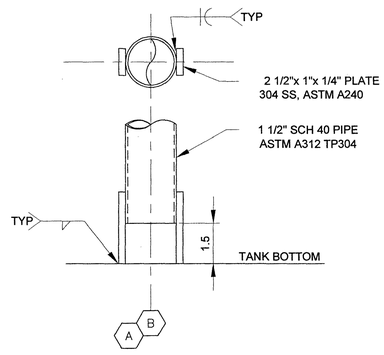
SECTION A-A
(TERMINAL BOX ACCESS)

NOTES:

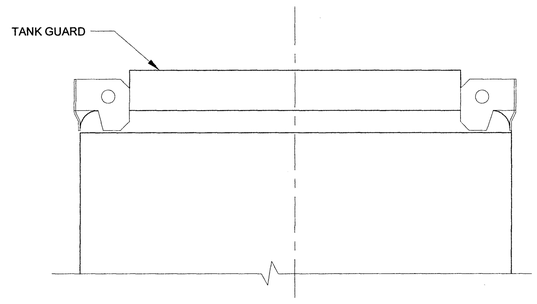
1. MATERIAL: 300 SERIES STAINLESS STEEL, OR APPROVED ALTERNATE.
2. DESIGN, FABRICATION, INSPECTION, TESTS & MARKINGS SHALL COMPLY W/ APPLICABLE SECTIONS OF 49CFR178, UN31A RATED.
3. INTERIOR CORNERS SHALL HAVE MINIMUM 2" RADIUS.
4. REMOVE ALL BURRS AND SHARP EDGES.
5. CLEAN TANK OF ALL OILS, GREASE & PARTICULATES AFTER FINAL ASSEMBLY.
6. TANK BOTTOM SHALL SLOPE TOWARDS DRAIN OR INCLUDE SUMP SUCH THAT NO HEEL REMAINS IN TANK AFTER DRAINING. DRAIN SHALL INCLUDE D.O.T. COMPLIANT VALVE AND PLUG.
7. MARKS A & B SHALL BE PROVIDED WITH:
   - 2 (TWO) DRY QUICK CONNECT ADAPTERS x FEMALE NPT - 1½", 316SS, DIXON VALVE PART NO DDA150SS.
   - 2 (TWO) DUST CAPS, 1 1/2", POLYETEN - PE-HD 300, DIXON VALVE PART NO. DDDC150
8. CAPACITY OF LIFTING LUGS SHALL BE CLEARLY INDICATED. CAPACITY OF LIFTING LUGS SHALL BE BASED ON THE MORE RESTRICTIVE OF THE FOLLOWING DESIGN MARGINS
   - 3:1 SMYS
   - 5:1 ULTIMATE TENSILE STRENGTH
9. HEPA FILTER FURNISHED AND INSTALLED BY OWNER. FABRICATOR SHALL FURNISH WITH STAINLESS STEEL PIPE CAP.

* TANK GUARD HEIGHT BASED ON FITTING DIMENSION ABOVE TOP OF TANK





SUGGESTED DOWNCOMER DETAIL
(NO SCALE)
2 REQ'D



SECTION B-B
(REMAINING TWO SIDES SIMILAR)

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	9/23/11	JAL	RM	GW	ADDED OPERATION NOTE
0	10/4/11	JAL	RM	GW	INITIAL ISSUE

CPE
Julie Gregorie Wagner
REGISTERED ENGINEER
No. 120629
STATE OF TENNESSEE

DRAWN BY J. A. LALONDE	DATE 10/4/11
DESIGNED BY J. A. LALONDE	DATE 10/4/11
CHECKED BY R. C. MITCHELL	DATE 10/4/11
APPROVED BY J. G. WAGNER	DATE 10/4/11
APPROVED BY	DATE

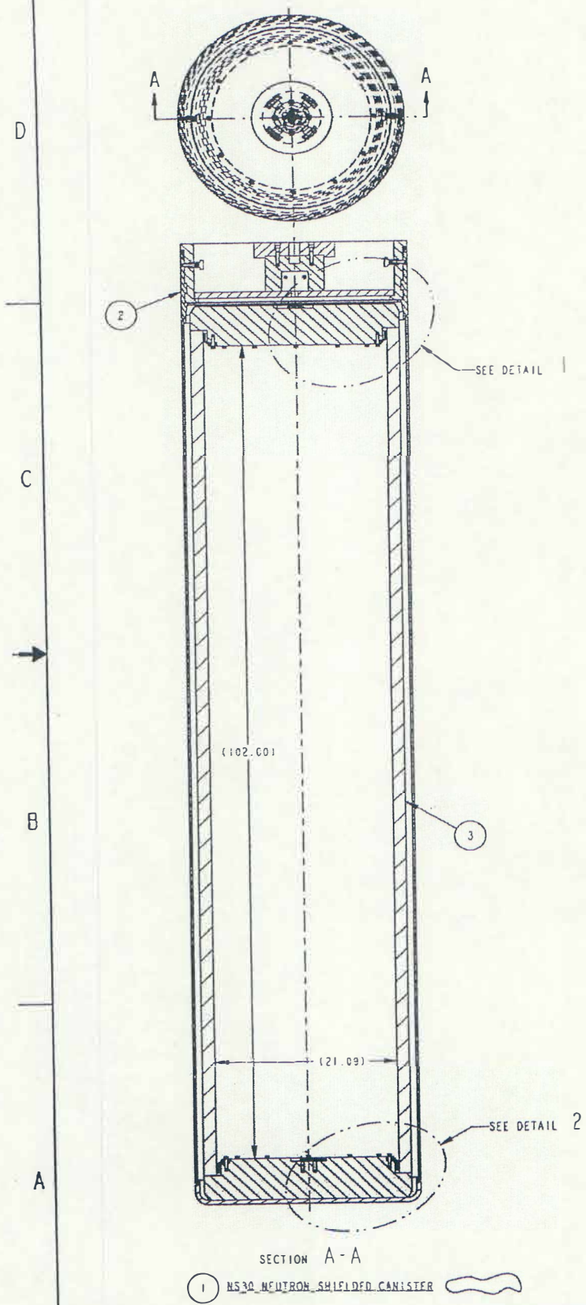
NORTHWIND NWPC

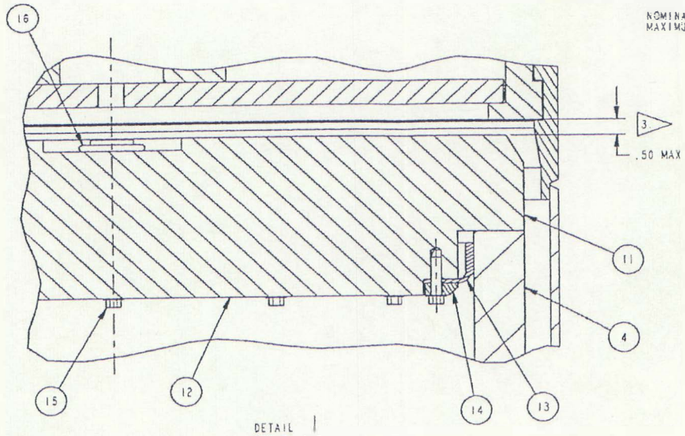
TITLE
TRU WASTE PROCESSING CENTER
CPE LIQUID HANDLING SYSTEM
350 GALLON CONTAINER

SIZE	SCALE:	DWG. NO.	REV
D	1 1/2"=1'-0" U.N.O.	T-RH-FW-D-ME-417	1
	SHEET: 1 OF 1		

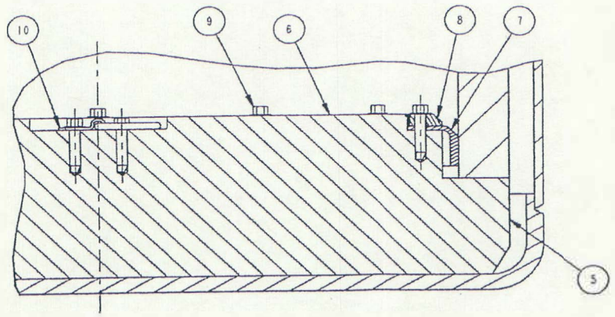
FILENAME: T-RH-FW-D-ME-417.DWG

DWG NO NSC-DWG-0002 | SHEET 1 | REV 0





DETAIL 1
SCALE 1:2



DETAIL 2
SCALE 1:2

LIST OF MATERIAL

TYPE/LEVEL	QTY REQ'D	ITEM NO.	NAME/DESCRIPTION	NOTE NO.	DRAWING NUMBER OR PART ID. NUMBER	MATERIAL SPECIFICATION MATERIAL	MATERIAL SPECIFICATION STD/NUMBER
ASM	1	1	NS30 NEUTRON SHIELDED CANISTER		SHEET 1	-	-
ASM	1	2	REMOVABLE LID CANISTER		RLC-DWG-0001-1	-	-
ASM	1	3	NS30 SHIELD INSERT ASSEMBLY		SHEET 2	-	-
PRT	1	4	BODY PIPE		SHEET 2	SEE NOTE 1	SEE NOTE 1
ASM	1	5	BOTTOM END CAP ASSEMBLY		SHEET 2	-	-
PRT	1	6	BOTTOM END CAP		SHEET 3	SEE NOTE 1	SEE NOTE 1
PRT	1	7	GASKET	6	4701-50-15230-04	PORON	-
PRT	1	8	GASKET RING		SHEET 3	CARBON STEEL	ASTM A36
PRT	14	9	HEX HD SELF-TAPPING SCREW, 5/16-18 X 1-1/2 LG	7	90054A713	ALLOY STEEL	-
PRT	1	10	D-RING TIE DOWN	8	HH-117	ALLOY STEEL	-
ASM	1	11	TOP END CAP ASSEMBLY		SHEET 2	-	-
PRT	1	12	TOP END CAP		SHEET 3	SEE NOTE 1	SEE NOTE 1
PRT	1	13	GASKET	6	4701-50-15230-04	PORON	-
PRT	1	14	GASKET RING		SHEET 3	CARBON STEEL	ASTM A36
PRT	14	15	HEX HD SELF-TAPPING SCREW, 5/16-18 X 1-1/2 LG	7	90054A713	ALLOY STEEL	-
PRT	1	16	D-RING TIE DOWN	8	HH-117	ALLOY STEEL	-

NOMINAL TARE WEIGHT = 1,660 LB
MAXIMUM GROSS WEIGHT = 3,100 LB

NOTES:

1. MATERIAL: PIPE-GRADE, EXTRA-HIGH MOLECULAR WEIGHT, HIGH-DENSITY POLYETHYLENE (EHMW-HDPE) WITH ASTM D3350 CELL CLASSIFICATION #345444C, OR BETTER. THE MINIMUM HYDROSTATIC DESIGN BASIS FOR THE EHMW-HDPE MATERIAL SHALL BE 800 PSI AT 140 °F, 1600 PSI AT 73 °F, AND 3180 PSI AT -40 °F PER ASTM D2837. COMPONENTS SHALL BE FREE OF EXTERNAL SCRATCHES AND GOUGES THAT EXCEED 1/4 IN. DEPTH.
2. IPS PIPE PER ASTM F714 WITH THE FOLLOWING ADDITIONAL GEOMETRIC REQUIREMENTS: OUTSIDE DIAMETER TOLERANCE SHALL BE AS SPECIFIED HEREIN AND WALL THICKNESS VARIABILITY (ECCENTRICITY) SHALL NOT EXCEED 6%.
3. MAXIMUM GAP REQUIREMENT MAY BE MET BY INSTALLING A Ø24.0 - 24.5 IN., 1/4 - 1 IN. STOCK THICKNESS, DISC OF CDX GRADE PLYWOOD EITHER ABOVE THE TOP END CAP ASSEMBLY (ITEM 11) OR BELOW THE BOTTOM END CAP ASSEMBLY (ITEM 5).
4. PILOT HOLES (Ø3/16 IN. MAX) MAY BE UTILIZED TO AID INSTALLATION OF SELF-TAPPING SCREWS (ITEMS 9 & 15). SELF-TAPPING SCREWS INSTALLED THROUGH THE GASKET RING (ITEMS 8 & 14) SHALL BE TIGHTENED TO COMPRESS THE GASKET (ITEMS 7 & 13) UNTIL THE SURFACE OF THE GASKET RING IS ALIGNED FLUSH (± 1/32 IN.) WITH THE CORRESPONDING END CAP SURFACE. SELF-TAPPING SCREWS INSTALLED THROUGH THE D-RING TIE DOWN (ITEMS 10 & 16) SHALL BE TIGHTENED ONE QUARTER TURN BEYOND THE INITIATION OF INTIMATE CONTACT BETWEEN THE ASSEMBLED COMPONENTS.
5. FABRICATE IN ACCORDANCE WITH WASHINGTON TRU SOLUTIONS (WTS) SPECIFICATION GEN-SPC-0001 / USE IN ACCORDANCE WITH NSC-MAN-0001.
6. SUPPLIED BY ROGERS CORPORATION OR WTS ENGINEER APPROVED EQUIVALENT.
7. SUPPLIED BY MCMASTER CARR OR WTS ENGINEER APPROVED EQUIVALENT.
8. SUPPLIED BY REID SUPPLY OR WTS ENGINEER APPROVED EQUIVALENT.
9. MARK "NS30" IN 1 IN. MIN. HIGH CHARACTERS BELOW EXISTING DOT BODY MARKINGS BY WELDING ON A STAMPED TAG OR STENCILING WITH HIGH-VISIBILITY PAINT.

REV	DESCRIPTION	DATE	APPROVED
0	REVISED FROM NS30-DWG-0001		

REVISIONS

UNLESS OTHERWISE SPECIFIED
INTERPRET DWG PER ASME Y14.5-2009
DIMENSIONS IN INCHES BASED ON 68 °F
BREAK EDGES .03 MAX | FILLET RADII .03 MIN
TOLERANCES

FRACTION	1 PL DEC	2 PL DEC	3 PL DEC	ANGLES
±1/16	±.1	±.03	±.010	±.5°

THIRD ANGLE PROJECTION
FINISH 125

DRAWN | DATE
CHECKER | DATE
ENGINEER | DATE
MANAGER | DATE
QUALITY ASSURANCE | DATE
APPROVED | DATE
APPROVED | DATE

Washington TRU Solutions LLC
Waste Isolation Pilot Plant — Carlsbad, NM

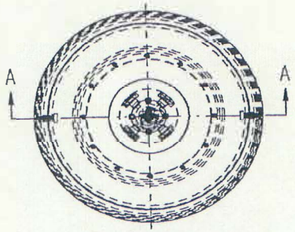
TITLE
NS30 NEUTRON SHIELDED CANISTER

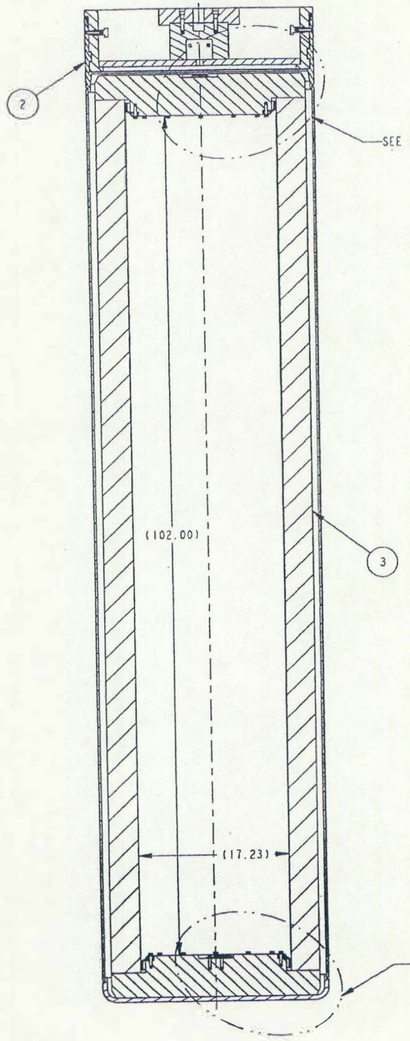
SIZE	SYSTEM	DWG NO	REV
D	PT02	NSC-DWG-0002	0

SCALE 1:8 | CAD SOURCE Pro/ENGINEER | SHEET 1 OF 3

FIGURE 8.1-42
NS30 Neutron Shielded Canister

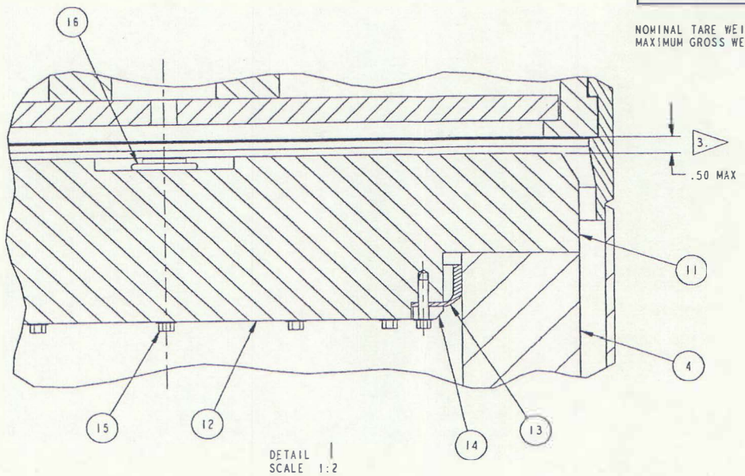
DWG NO NSC-DWG-0001 | SHEET 1 | REV 1



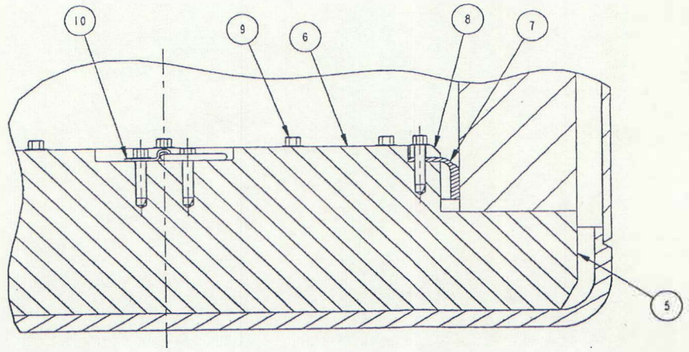


SECTION A-A

(1) NS15 NEUTRON SHIELDED CANISTER



DETAIL 1
SCALE 1:2



DETAIL 2
SCALE 1:2

LIST OF MATERIAL

TYPE/LEVEL	QTY REQ'D	ITEM NO.	NAME/DESCRIPTION	NOTE NO.	DRAWING NUMBER OR PART ID. NUMBER	MATERIAL SPECIFICATION	
						MATERIAL	STD/NUMBER
ASM	1	1	NS15 NEUTRON SHIELDED CANISTER		SHEET 1	-	-
ASM	1	2	REMOVABLE LID CANISTER		RLC-DWG-0001-1	-	-
ASM	1	3	NS15 SHIELD INSERT ASSEMBLY		SHEET 2	-	-
PRT	1	4	BODY PIPE		SHEET 2	SEE NOTE 1	SEE NOTE 1
ASM	1	5	BOTTOM END CAP ASSEMBLY		SHEET 2	-	-
PRT	1	6	BOTTOM END CAP		SHEET 3	SEE NOTE 1	SEE NOTE 1
PRT	1	7	GASKET	6	4701-50-15250-04	PORON	-
PRT	1	8	GASKET RING		SHEET 3	CARBON STEEL	ASTM A36
PRT	14	9	HEX HD SELF-TAPPING SCREW, 5/16-18 X 1-1/2 LG	7	90064A713	ALLOY STEEL	-
PRT	1	10	D-RING TIE DOWN	8	HH-117	ALLOY STEEL	-
ASM	1	11	TOP END CAP ASSEMBLY		SHEET 2	-	-
PRT	1	12	TOP END CAP		SHEET 3	SEE NOTE 1	SEE NOTE 1
PRT	1	13	GASKET	6	4701-50-15250-04	PORON	-
PRT	1	14	GASKET RING		SHEET 3	CARBON STEEL	ASTM A36
PRT	14	15	HEX HD SELF-TAPPING SCREW, 5/16-18 X 1-1/2 LG	7	90064A713	ALLOY STEEL	-
PRT	1	16	D-RING TIE DOWN	8	HH-117	ALLOY STEEL	-

NOMINAL TARE WEIGHT = 2,070 LB.
MAXIMUM GROSS WEIGHT = 3,100 LB.

NOTES:

1. MATERIAL: PIPE-GRADE, EXTRA-HIGH MOLECULAR WEIGHT, HIGH-DENSITY POLYETHYLENE (EHMW-HDPE) WITH ASTM D3350 CELL CLASSIFICATION #345444C, OR BETTER. THE MINIMUM HYDROSTATIC DESIGN BASIS FOR THE EHMW-HDPE MATERIAL SHALL BE 800 PSI AT 140 °F, 1600 PSI AT 73 °F, AND 3180 PSI AT -40 °F PER ASTM D2837. COMPONENTS SHALL BE FREE OF EXTERNAL SCRATCHES AND GOUGES THAT EXCEED 1/4 IN. DEPTH.
2. IPS PIPE PER ASTM F714 WITH THE FOLLOWING ADDITIONAL GEOMETRIC REQUIREMENTS: OUTSIDE DIAMETER TOLERANCE SHALL BE AS SPECIFIED HEREIN AND WALL THICKNESS VARIABILITY (ECCENTRICITY) SHALL NOT EXCEED 6%.
3. MAXIMUM GAP REQUIREMENT MAY BE MET BY INSTALLING A Ø24.0 - 24.5 IN., 1/4 - 1 IN. STOCK THICKNESS, DISC OF CDX GRADE PLYWOOD EITHER ABOVE THE TOP END CAP ASSEMBLY (ITEM 11) OR BELOW THE BOTTOM END CAP ASSEMBLY (ITEM 5).
4. PILOT HOLES (Ø3/16 IN. MAX) MAY BE UTILIZED TO AID INSTALLATION OF SELF-TAPPING SCREWS (ITEMS 9 & 15). SELF-TAPPING SCREWS INSTALLED THROUGH THE GASKET RING (ITEMS 8 & 14) SHALL BE TIGHTENED TO COMPRESS THE GASKET (ITEMS 7 & 13) UNTIL THE SURFACE OF THE GASKET RING IS ALIGNED FLUSH (± 1/32 IN.) WITH THE CORRESPONDING END CAP SURFACE. SELF-TAPPING SCREWS INSTALLED THROUGH THE D-RING TIE DOWN (ITEMS 10 & 16) SHALL BE TIGHTENED ONE QUARTER TURN BEYOND THE INITIATION OF INTIMATE CONTACT BETWEEN THE ASSEMBLED COMPONENTS.
5. FABRICATE IN ACCORDANCE WITH NUCLEAR WASTE PARTNERSHIP (NWP) SPECIFICATION GEN-SPC-0001. USE IN ACCORDANCE WITH NSC-MAN-0001.
6. SUPPLIED BY ROGERS CORPORATION OR NWP ENGINEER APPROVED EQUIVALENT.
7. SUPPLIED BY MCMASTER CARR OR NWP ENGINEER APPROVED EQUIVALENT.
8. SUPPLIED BY REID SUPPLY OR NWP ENGINEER APPROVED EQUIVALENT.
9. MARK "NS15" IN 1 IN. MIN. HIGH CHARACTERS BELOW EXISTING DOT BODY MARKINGS BY WELDING ON A STAMPED TAG OR STENCILING WITH HIGH-VISIBILITY PAINT.

REV	DESCRIPTION	DATE	APPROVED
1	REVISION		
0	REVISED FROM NS15-DWG-0001	9/18/12	TS

REVISIONS

UNLESS OTHERWISE SPECIFIED
INTERPRET DWG PER ASME Y14.5-2009
DIMENSIONS IN INCHES BASED ON 68 °F
BREAK EDGES .03 MAX | FILLET RADII .03 MIN
TOLERANCES

FRACTION	1 PL DEC	2 PL DEC	3 PL DEC	ANGLES
±1/16	±.1	±.03	±.010	±.5°

THIRD ANGLE PROJECTION
FINISH 125

DRAFTER		DATE
CHECKER		DATE
ENGINEER		DATE
MANAGER		DATE
QUALITY ASSURANCE		DATE
APPROVED		DATE
APPROVED		DATE

NWP Nuclear Waste Partnership LLC
Waste Isolation Pilot Plant — Carlsbad, NM

TITLE: NS15 NEUTRON SHIELDED CANISTER

SIZE	SYSTEM	DWG NO	REV
D	PT02	NSC-DWG-0001	1

SCALE 1:8 | CAD SOURCE Pro/ENGINEER | SHEET 1 OF 3

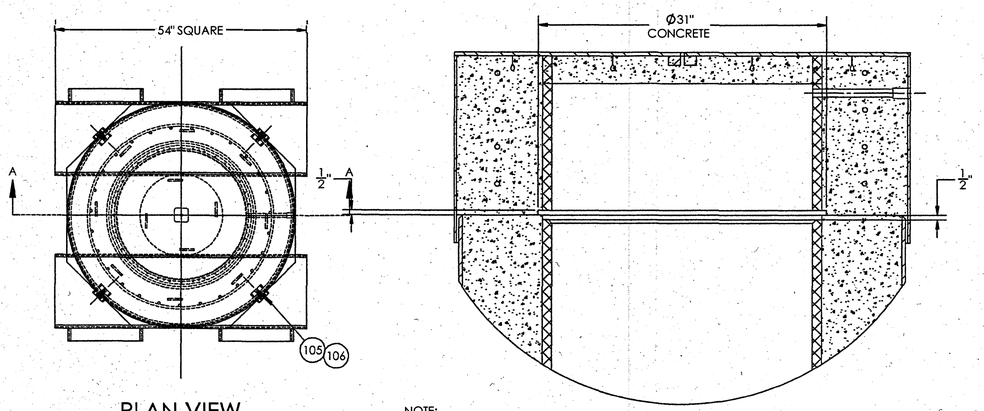
FIGURE 8.1-43
NS15 Neutron Shielded Canister

SEE NOTES SHEET 1 OF 4

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	ROP BASE/BODY SUB-ASSEMBLY	SHEET 3 OF 4
2	1	ROP LID SUB-ASSEMBLY	SHEET 4 OF 4
3	1	ROP LINER	SHEET 4 OF 4
4	1	ROP LID LINER	SHEET 4 OF 4
5	1	ROP LINER CLOSED BOTTOM	SHEET 4 OF 4
6	1	RING SPACER	SHEET 4 OF 4
7	1	ROP LINER CLOSED STEEL BOTTOM	SHEET 4 OF 4
8			
9			
100	24	HHCS, 1/4-20 UNC X 1" LG., #92865A542	McMASTER CARR
101	24	1/4" FLAT WASHER #90108A411	McMASTER CARR
102	1	1/2" CPLG., 3000# FNPT, ASTM A105,	STEEL
103	A/R	1/2" SCH. 40 PIPE, ASTM A106, GR. B	STEEL
104	1	1/2" NPT REMOVABLE PLUG	STEEL OR PVC
105	4	HEX BOLT, 3/4-10 UNC X 2" LG	ASTM A325
* 106	4	FLAT WASHER, 3/4"	ASTM F436

* TWO WASHERS, ITEM 106, MAY BE INSTALLED ON EACH BOLT BY THE BUYER WHEN INSTALLING OVERPACK LIDS ONTO LOADED ROP's.

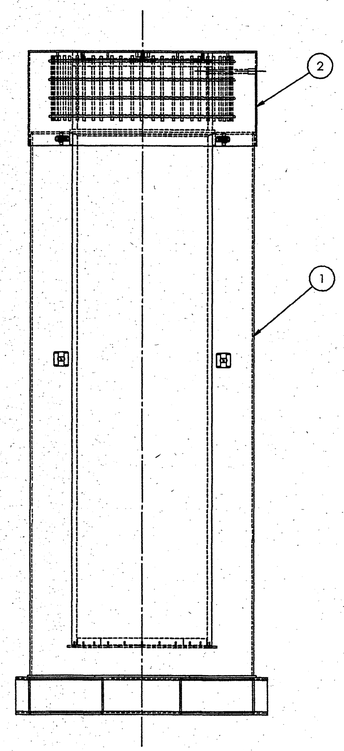
△6



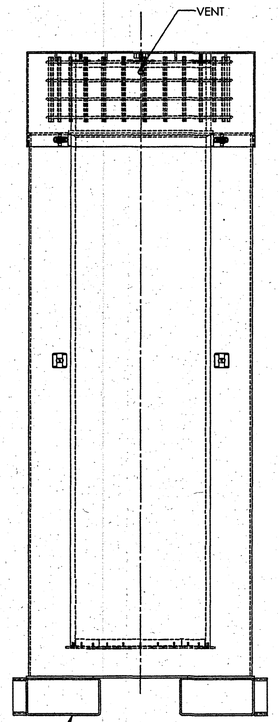
PLAN VIEW
SCALE 1 : 15

NOTE:
1/2" DECREASE IN ROP LINER AND LID DOES NOT APPLY TO S/N 080755 & 080756

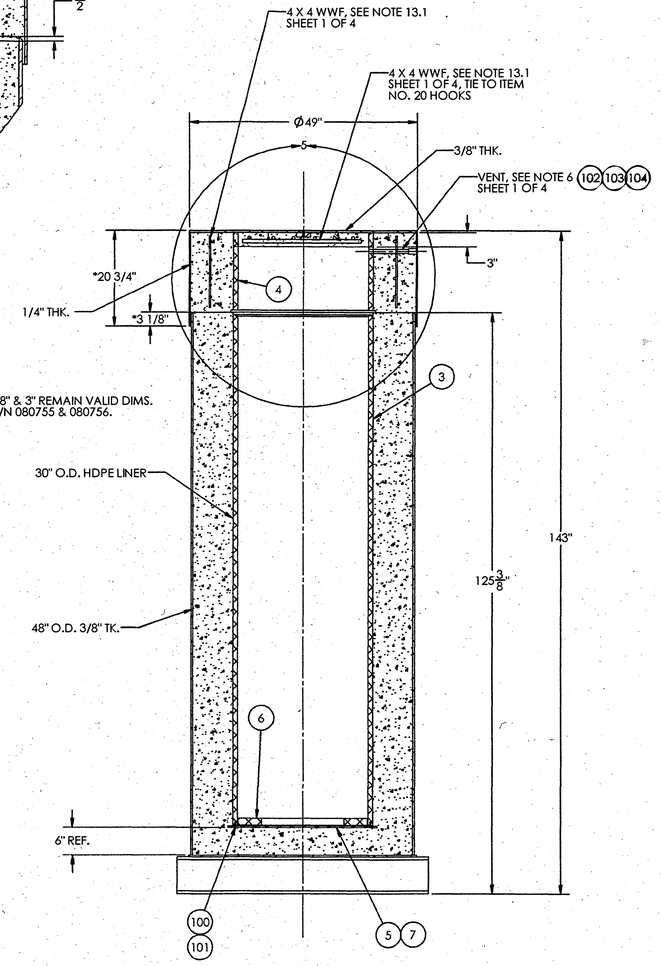
DETAIL 5
SCALE 2 : 15



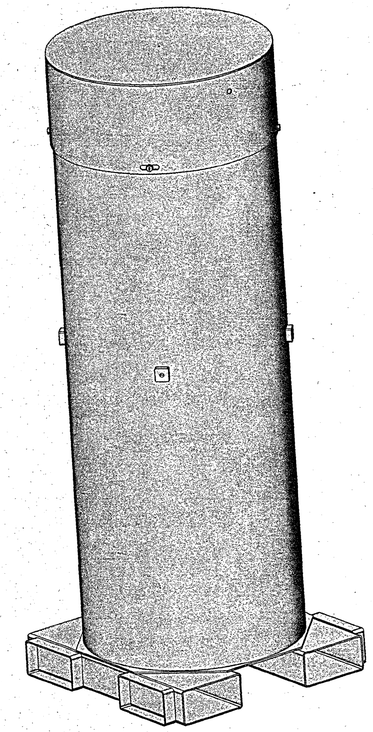
FRONT ELEVATION
SCALE 1 : 15



SIDE ELEVATION
SCALE 1 : 15



SECTION A-A
SCALE 1 : 15
SEE NOTES 10.2 & 14 SHEET 1 OF 4



ISOMETRIC VIEW
SCALE 1 : 15

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION
6	4/7/16	EB	TD	Cooley	INCORP. FCR-SC-046
5	11/12/15	BA	TD	GW	REVISED DIMENSIONS
4	10/12/15	EB	TD	GW	REVISED ITEMS 3, 4 & 5
3	8/27/15	EB	TD	GW	REVISED ITEM 3 & 4, ADD DETAIL "5", ADD CONCRETE RELIEF IN LID, ADD 6" REF. DIM.
2	5/19/15	EB	TD	GW	REVISED ITEM 5, ADDED ITEM 7

REVISIONS

UNLESS OTHERWISE SPECIFIED:
125 ALL MACHINED SURFACES
REMOVE BURRS, BREAK SHARP CORNERS.

STANDARD TOLERANCE

0.0	± .030	ANGULAR DIM. 1/2°
0.00	± .010	
0.000	± .005	FRACT. DIM. 1/16"
0.0000	± .0005	

RPE- STAMP

NASSER GHASABIAN — REGISTERED ENGINEER — AGRICULTURE — No. 22501 — STATE OF TENNESSEE — 4/7/16

DRAWN BY: EARL BLEDSOE	DATE: 3/16/15
DESIGNED BY: EARL BLEDSOE	DATE: 3/16/15
CHECKED BY: GLYNN RAGLAND	DATE: 3/16/15
APPROVED BY: GLYNN RAGLAND	DATE: 3/16/15
APPROVED BY: J.G. WAGNER	DATE: 3/16/15

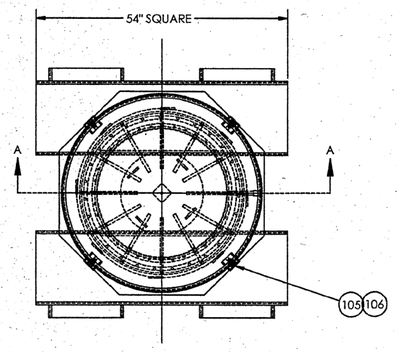
WPC — WAI Team

TRU WASTE PROCESSING CENTER
MK III REMOVABLE LID CANISTER, STEEL & CONCRETE OVERPACK, DETAILS/NOTES

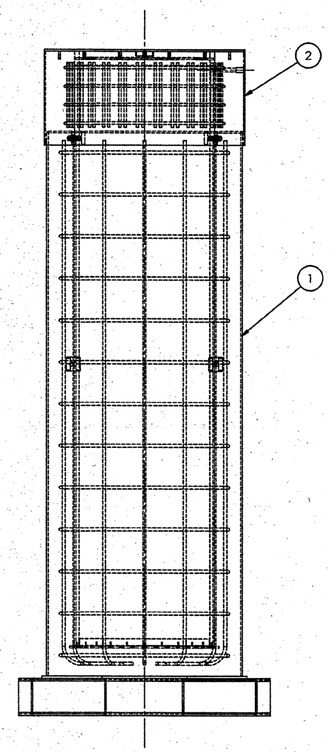
SIZE D | SCALE: 1:20 U.N. | SHEET 2 OF 4 | DWG. # T-RH-FW-D-SC-008 | REV .6

REV .6 | DWG.# T-RH-FW-D-SC-008 | SIZE D

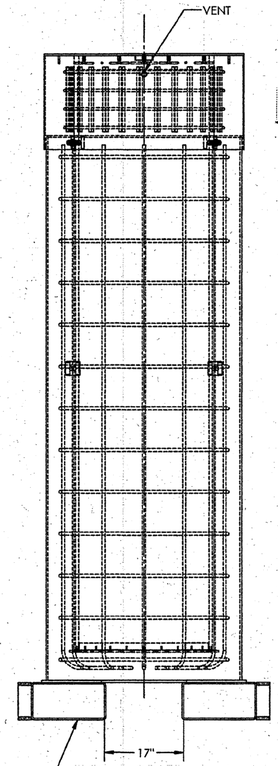
Figure 8.1-44



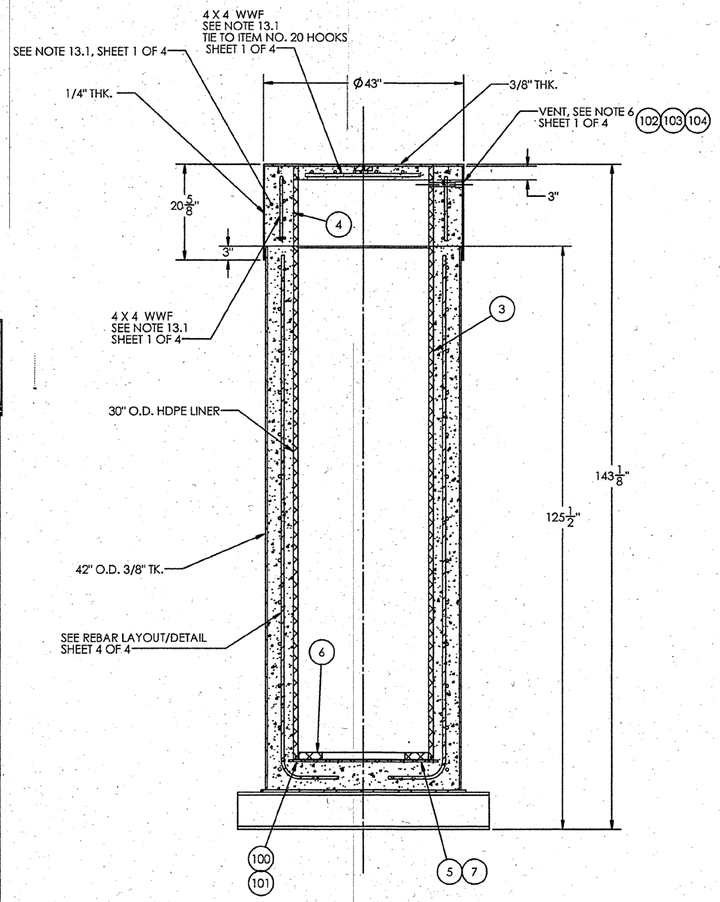
PLAN VIEW
SCALE 1 : 15



FRONT ELEVATION
SCALE 1 : 15



SIDE ELEVATION
SCALE 1 : 15



SECTION A-A
SCALE 1 : 15
SEE NOTES 10.2 & 14 SHEET 1 OF 4

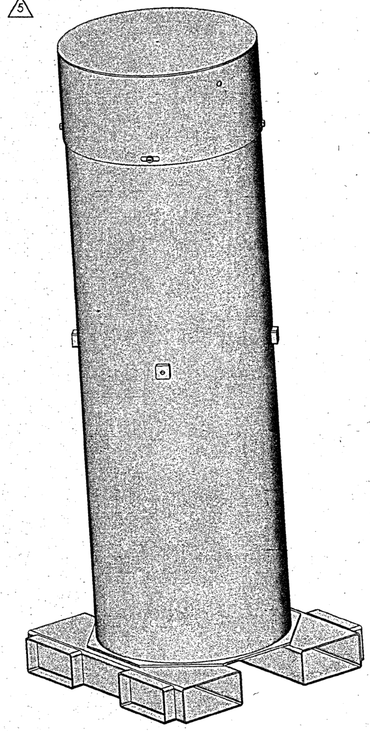
SEE NOTES SHEET 1 OF 4

S/N-005 FORWARD

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	ROP BASE/BODY SUB-ASSEMBLY	SHEET 3 OF 4
2	1	ROP LID SUB-ASSEMBLY	SHEET 4 OF 4
3	1	ROP HDPE LINER	SHEET 4 OF 4
4	1	ROP LID HDPE LINER	SHEET 4 OF 4
5	1	ROP LINER CLOSED HDPE BOTTOM	SHEET 4 OF 4
6	1	RING SPACER	SHEET 4 OF 4
7	1	ROP LINER CLOSED STEEL BOTTOM	SHEET 4 OF 4
8			
9			
10			
100	24	1/4-20 UNC X 1" LG. HHCS, #92865A542	McMASTER CARR
101	24	1/4" FLAT WASHER #90108A411	McMASTER CARR
102	1	1/2" CPLG., 3000# FNPT, ASTM A105.	STEEL
103	A/R	1/2" SCH. 40 PIPE, ASTM A106, GR. B	STEEL
104	1	1/2" NPT REMOVABLE PLUG	STEEL OR PVC
105	4	HEX BOLT, 3/4-10 UNC X 2" LG.	ASTM A325
* 106	4	FLAT WASHER, 3/4"	ASTM F436

* TWO WASHERS, ITEM 106, MAY BE INSTALLED ON EACH BOLT BY THE BUYER WHEN INSTALLING OVERPACK LIDS ONTO LOADED ROP's.

5



ISOMETRIC VIEW
SCALE 1 : 15

UNLESS OTHERWISE SPECIFIED:
125/ ALL MACHINED SURFACES
REMOVE BURRS, BREAK SHARP CORNERS.

STANDARD TOLERANCE

0.0	± .030	ANGULAR DIM. 1/2°
0.00	± .010	
0.000	± .005	FRACT. DIM. 1/16"
0.0000	± .0005	

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION
5	4/7/16	EB	TD	GW	INCORP. FCR-SC-046
4	5/19/15	EB	TD	GW	REV. ITEM 5, ADDED ITEM 7, CHGD. PVC TO HDPE
3	4/6/15	EB	GR	GW	ADDED ITEM 105 & 106
2	3/26/15	EB	GR	GW	REV. SHELL MATERIAL
1	3/3/15	EB	GR	GW	CERTIFIED FOR CONSTRUCTION

REVISIONS

RPE STAMP
NASSER GHASSABIAN
REGISTERED ENGINEER
AGRICULTURE
No. 22560
STATE OF TENNESSEE
4/7/16

DRAWN BY: EARL BLEDSOE	DATE: 2/4/15
DESIGNED BY: EARL BLEDSOE	DATE: 2/4/15
CHECKED BY: GLYNN RAGLAND	DATE: 2/4/15
APPROVED BY: GLYNN RAGLAND	DATE: 2/4/15
APPROVED BY: J.G. WAGNER	DATE: 2/4/15

WPC WAI Team

TRU WASTE PROCESSING CENTER
REMOVABLE LID CANISTER, STEEL AND CONCRETE OVERPACK, DETAILS/NOTES

SIZE	SCALE: 1:20 U.N.	DWG. #	REV
D	SHEET 2 OF 4	T-RH-FW-D-SC-007	5

REV 5 | SIZE D | DWG. # T-RH-FW-D-SC-007

Figure 8.1-45

TC-1
PROCESS TRANSFER CHAMBER
TBD CU. FT.
WITH PURGE / FILL

GB-1
INERT ATMOSPHERE GLOVEBOX
TBD CU. FT.
NOTE 3

DESIGN BASIS:
H_2O < 5 PPM
O_2 < 1 PPM
OPERATING BASIS:
WITH N_2 OR Ar_2
APPROX. −40°C DEWPOINT
H_2O ~ 200 PPM
O_2 < 1% (10,000 PPM)

TC-2
TUBE FURNACE
TRANSFER CHAMBER
TBD CU. FT.
WITH PURGE / FILL

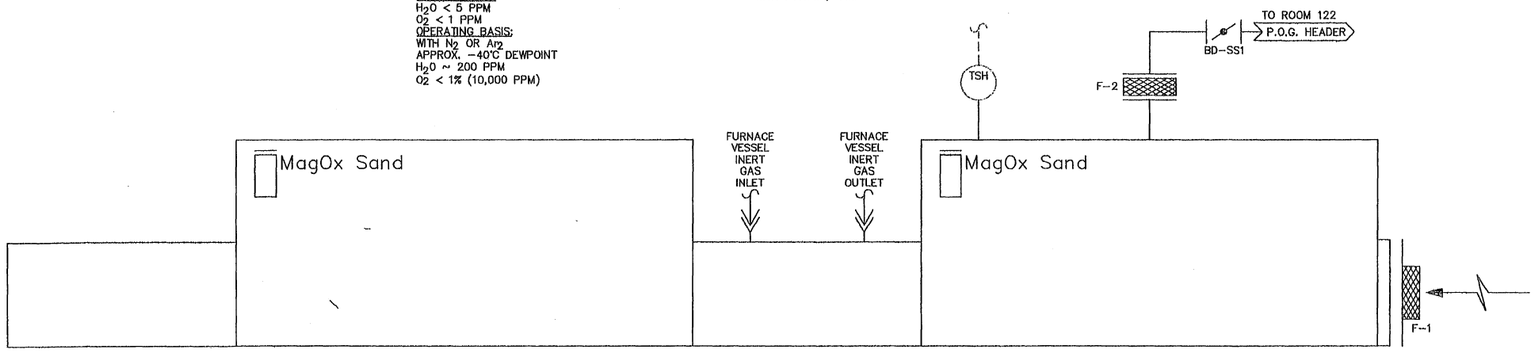
GB-2
PROCESS GLOVEBOX
TBD CU. FT.
WITH TBD X TBD EQUIPMENT HATCH

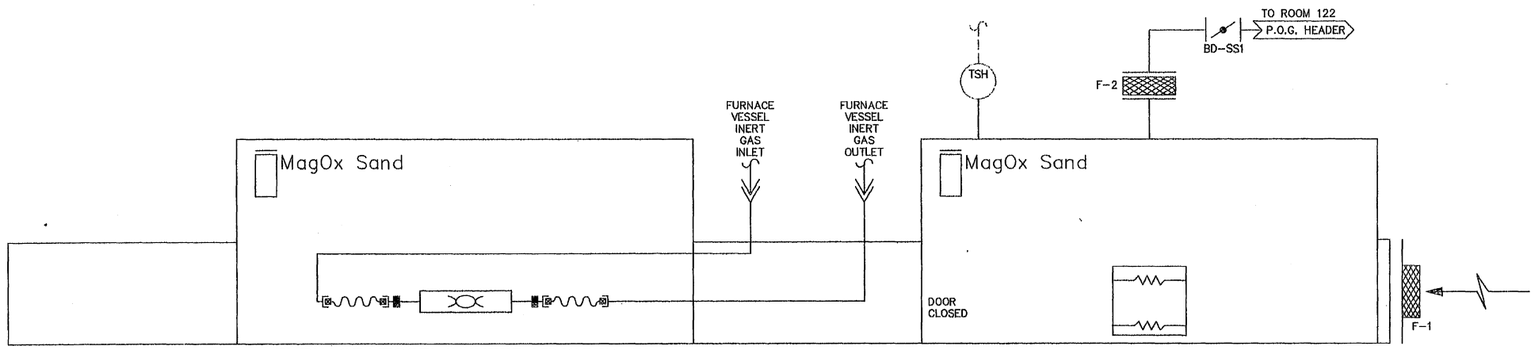
F-2
PROCESS GLOVEBOX
EXHAUST HEPA FILTER

F-1
PROCESS GLOVEBOX
INLET HEPA FILTER
LOCATED IN
EQUIPMENT HATCH

NOTES:

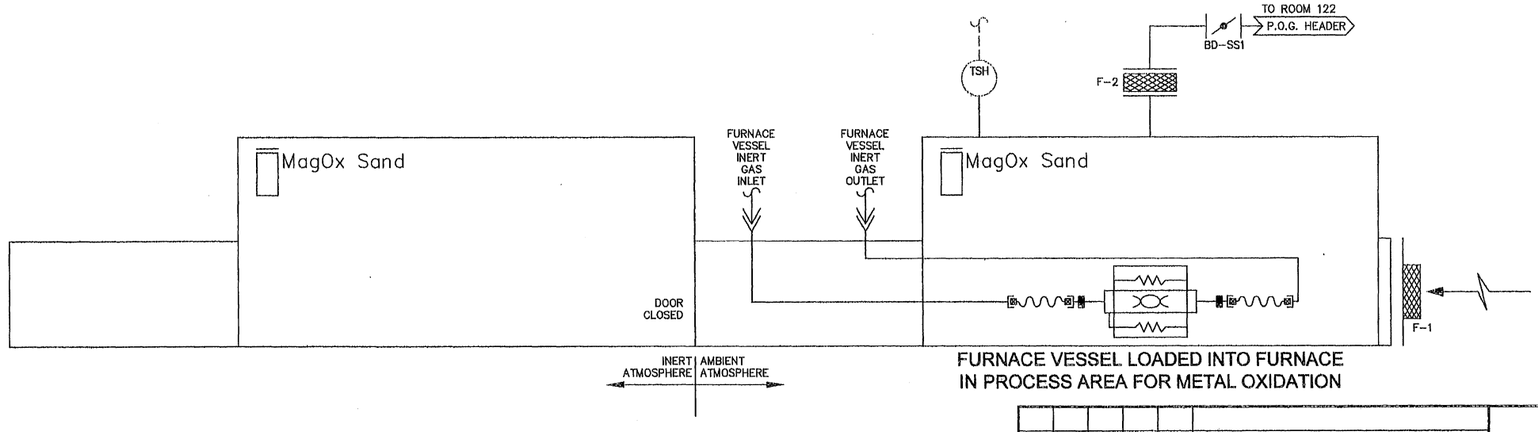
1. ALL ITEMS LOCATED WITHIN ROOM 122 PROCESS ENCLOSURE.
2. REFER TO SWSA 5 PROJECT, METAL OXIDATION PROCESS, PROCESS FLOW DIAGRAM FOR TUBE FURNACE DETAILS AND PROCESS CONTROLS (DWG. T-GB-DOE-D-OP-003).
3. GAS PURIFIER AND INERT GAS REGENERATOR PROVIDED BY GLOVEBOX MANUFACTURER.
4. FURNACE VESSEL OVERALL ASSEMBLY LENGTH APPROX. 30".
   VESSEL DIAMETER: 3.75"
   VESSEL LENGTH: 6.00"



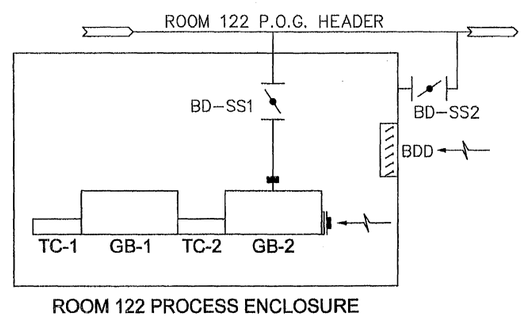


FURNACE VESSEL IN INERT ATMOSPHERE
FOR MATERIAL TRANSFER AND VESSEL LOADING
(NOTE 4)

EMPTY FURNACE



FURNACE VESSEL LOADED INTO FURNACE
IN PROCESS AREA FOR METAL OXIDATION



ROOM 122 PROCESS ENCLOSURE
MBVS CONNECTION DIAGRAM

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
0	12/5/11	JCN	GHG	GHG	ISSUED FOR BID PURPOSES ONLY

RPE
STATE OF TENNESSEE

DRAWN BY		DATE 12/5/11
DESIGNED BY		DATE 12/5/11
CHECKED BY		DATE 12/5/11
APPROVED BY		DATE 12/5/11
APPROVED BY		DATE

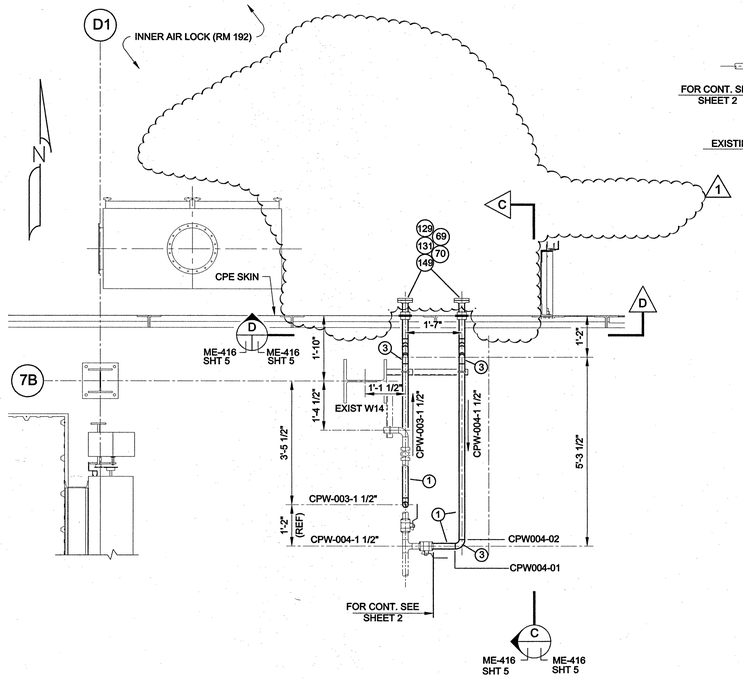
WPC
WAI Team

TITLE
TRU WASTE PROCESSING CENTER
METAL OXIDATION PROCESS
GLOVEBOX BLOCK DIAGRAM

SIZE	SCALE:	DWG. NO.	REV
D	N/A	T-CH-FW-K-PR-001	0
	SHEET: 1 OF 1		

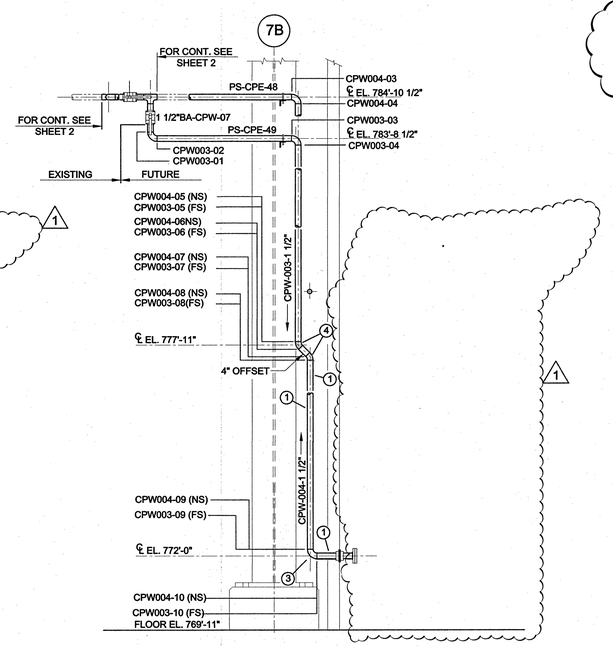
FILENAME: T-CH-FW-K-PR-001

Figure 8.1-46



PART PLAN

ELEV. 769'-11"
BULK LIQUID TRANSFER
FILTRATION SYSTEM



SECTION C-C

LOOKING WEST

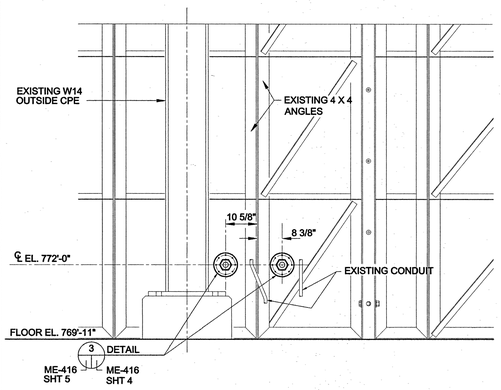
NOTES:
1. CPE LIQUID HANDLING SYSTEM REMOVED. REMAINING ORPHANED PIPING AND SPECIALITIES NOT DECOMMISSIONED SHALL BE ABANDONED IN PLACE. REFER TO THIS SERIES DRAWINGS FOR SPECIFIC TERMINATIONS.

BILL OF MATERIALS - PIPING *

ITEM	QUAN	SIZE	DESCRIPTION
200	60FT	1" O.D.	TUBING - COPPER, 1" OD x 0.083 WALL, SOFT ANNEAL, ASTM B75, STRAIGHT LENGTHS
201	20 FT	3/8" O.D.	TUBING - COPPER, 3/8" OD x 0.035 Wall, SOFT ANNEAL, ASTM B75, STRAIGHT LENGTHS
202	1	1" O.D. X 1/2" NPT	MALE CONNECTOR - BRASS, SWAGELOK P/N B-1610-1-8
203	1	1" O.D.	UNION TEE - BRASS, SWAGELOK P/N B-1610-3
204	1	1" O.D.	UNION 90° ELBOW - BRASS, SWAGELOK P/N B-1610-9
205	1	1" X 1/2"	TUBE REDUCER - BRASS, SWAGELOK P/N B-810-R-16
206	1	1/2" X 3/8"	TUBE REDUCER - BRASS, SWAGELOK P/N B-600-R-8
207	1	3/8" O.D.	PLUG VALVE - BRASS, SWAGELOK P/N B-6P6T-BK
208	1	3/8" O.D. X 3/8" NPT	MALE CONNECTOR - BRASS, SWAGELOK P/N B-600-1-6
209	1	3/8" NPT	AIR REGULATOR W/PRESS GAUGE - 3/8" PIPE SIZE 149 MAX SCFM@100 PSI, 5-150 PSI REGULATING RANGE, McMASTER-CARR P/N 4959K52
210	1	3/8"NPT x 1/4" NPT	HEX REDUCING NIPPLE - BRASS, SWAGELOK P/N B-6-HRN-4
211	1	1/4" NPT	TEE - BRASS, SWAGELOK P/N B-4-T
212	1	1/4" NPT	PLUG VALVE - 1/4" MALE NPT X 1/4" MALE NPT, BRASS, SWAGELOK P/N B-4P4T2
213	1	1/4" NPT	CAP - FEMALE NPT, BRASS, SWAGELOK P/N B-4-CP
214	1	1/4" NPT	QUICK-CONNECT STEM - QC SERIES, 1/4" MALE NPT, W/STEM SHUT-OFF VALVE, SWAGELOK P/N B-QC6-D-4PM
215	1	1/4" NPT	QUICK-CONNECT BODY - QC SERIES, 1/4" FEMALE NPT, SWAGELOK P/N B-QC6-B-4PF
** 216	1	1/4" NPT X 25 FT	AIR HOSE - 3/8" I.D., PVC, 300 PSI RATED, COLOR RED, TEMP RANGE 25 TO 150 DEG F, 25 FOOT LENGTH, COMPLETE WITH 1/4" MALE, NPT THREADS EACH END, McMASTER-CARR P/N 54075K28
** 217	1	1/4" NPT X 50 FT	AIR HOSE - 3/8" I.D., PVC, 300 PSI RATED, COLOR RED, TEMP RANGE 25 TO 150 DEG F, 50 FOOT LENGTH, COMPLETE WITH 1/4" MALE, NPT THREADS EACH END, McMASTER-CARR P/N 54075K28
218	1	1/2" NPT X 20 FT	AIR HOSE - 1/2" I.D., PVC, 300 PSI RATED, COLOR RED, TEMP RANGE 25 TO 150 DEG F, 20 FOOT LENGTH, COMPLETE WITH 1/2" MALE, NPT THREADS EACH END, McMASTER-CARR P/N 54075K29
219	1	1" OD	BALL VALVE - BRASS, 1" OD TUBE END FITTINGS, SWAGELOK P/N B-65TS16
220	1	1" O.D. X 1" NPT	MALE CONNECTOR - BRASS, SWAGELOK P/N B-1610-1-16
221	1	1" NPT	TEE - BRASS, 1" NPT FEMALE, SWAGELOK P/N B-16-T
222	1	1" X 1/4" NPT	RED BUSHING - BRASS, SWAGELOK P/N B-16-RB-4
223	1	1/4" NPT	PLUG VALVE - BRASS, 1/4" NPT MALE, SWAGELOK P/N B-4P4T2
224	1	1/4" NPT	PIPE CAP - BRASS, SWAGELOK P/N B-4-CP
225	2	1/2" NPT	QUICK-CONNECT STEM - 1/2" PIPE SIZE, FULL FLOW, BRASS, SWAGELOK "QF SERIES" P/N B-QF8-S-8PM
226	2	1/2" NPT	QUICK-CONNECT BODY - 1/2" PIPE SIZE, FULL FLOW, BRASS, SWAGELOK "QF SERIES" P/N B-QF8-B-8PF
227	2	———	AIR HOSE WHIP CHECK - SPRING-LOADED X CHOKER, FOR 1/2"-1 1/4" HOSE ID, McMASTER-CARR P/N 5484K27
228	1	1" X 1/2" NPT	RED BUSHING - BRASS, SWAGELOK P/N B-16-RB-8
229	4	1"	FLANGE - STEEL, RFSW, CLASS 150, ASTM A105, McMASTER-CARR P/N 68095K142
230	2	1"	GASKET - RING TYPE, ANSI CLASS 150, ASTM D2000, McMASTER-CARR P/N 8516T133
231	8	1/2" X 2 3/4" LG	STUD BOLTS - ASTM A193 GR B7, McMASTER-CARR P/N 98750A476
232	16	1/2"-13	HEX NUTS - ASTM A194 GR 2H, McMASTER-CARR P/N 91026A033
232A	AS REQ'D	1"	PIPE - CS, STD WT. SMLS, ASTM A106 OR A53 GRADE B
			BILL OF MATERIALS - TUBING SUPPORTS
233	AS REQ'D	———	PIPE CLAMPS - UNISTRUT, "CUSH-A-GRIP", P/N: CG-10
234	AS REQ'D	———	PIPE CLAMPS - UNISTRUT, "CUSH-A-GRIP", P/N: CG-30
235	AS REQ'D	1 5/8" X 1 5/8"	UNISTRUT - P1000SS (0.105") SS TYPE 304, ASTM A240
236	AS REQ'D	3/4" X 0.125	FOAM TAPE ADHESIVE - 3M VHB (VERY HIGH BOND) ADHESIVE BOTH SIDES, FOR USE IN SUPPORTING ITEM 49 TO CPE SKIN & 71 TO PUMP SHELF SUPPORT McMASTER-CARR P/N 75935A29.

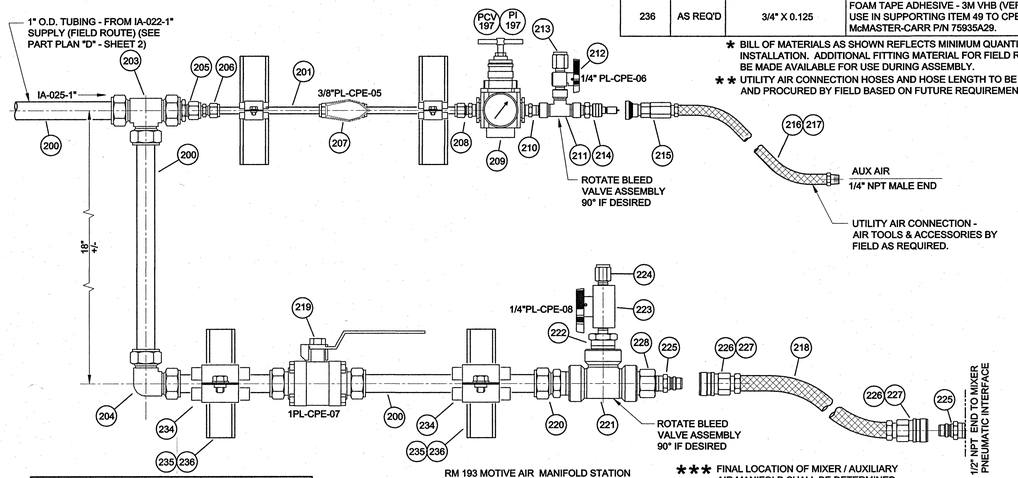
* BILL OF MATERIALS AS SHOWN REFLECTS MINIMUM QUANTITIES FOR INSTALLATION. ADDITIONAL FITTING MATERIAL FOR FIELD ROUTING SHALL BE MADE AVAILABLE FOR USE DURING ASSEMBLY.

** UTILITY AIR CONNECTION HOSES AND HOSE LENGTH TO BE DETERMINED AND PROCURED BY FIELD BASED ON FUTURE REQUIREMENTS.



SECTION D-D

PENETRATION LOCATIONS
OUTSIDE CPE
LOOKING NORTH



NOTE:
TUBING MAY BE ADJUSTED BASED ON FIELD CONDITIONS.

RM 193 MOTIVE AIR MANIFOLD STATION
LOOKING SOUTH
SCALE: 3"=1'-0"

SECTION J-J (SHEET 2)

*** FINAL LOCATION OF MIXER / AUXILIARY AIR MANIFOLD SHALL BE DETERMINED AND SUPPORTED BY FIELD. LENGTH OF HOSE MAY VARY BASED ON FINAL LOCATION.

ELEVATIONS SHOWN ON THIS DRAWING ARE BASED ON FINISHED FLOOR ELEVATIONS ON THE FIRST FLOOR OF +768' AND +770'. REFERENCES FWENC DWGS T-CM-FW-D-CE-004 & -005

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	9/26/17	JAL	EB	GW	INCORP. DCN-ME-413 R2
0	11/17/12	JAL	GW	GW	INITIAL ISSUE - INCORP DCN-ME-347

RPE
John Gregory Wagner
REGISTERED ENGINEER
AGRICULTURE
No. 120549
STATE OF TENNESSEE

DRAWN BY J. AL LALONDE	DATE 11/7/12
DESIGNED BY J. G. WAGNER	DATE 11/7/12
CHECKED BY J. G. WAGNER	DATE 11/16/12
APPROVED BY J. G. WAGNER	DATE 11/16/12
APPROVED BY	DATE

NORTHWND WPC

TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
LIQUID HANDLING SYSTEM

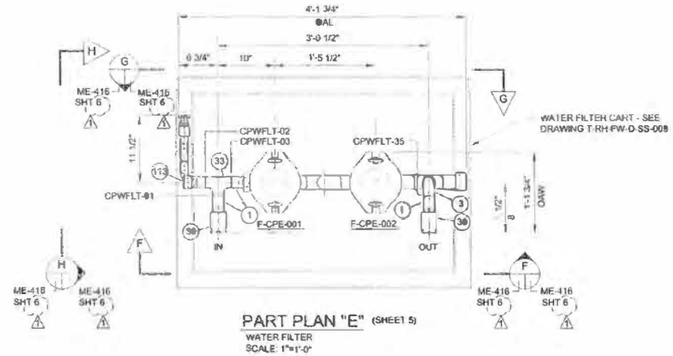
SIZE	SCALE:	DWG. NO.	REV
D	1/2"=1'-0" UNO	T-RH-FW-D-ME-416	1
	SHEET: 5 OF 6		

FILENAME: T-RH-FW-D-ME-416 SHT 5.DWG

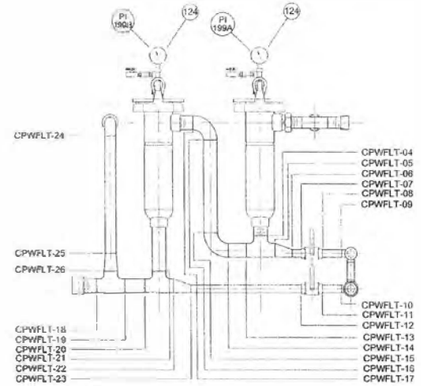
This is an Uncontrolled Copy -- for Information Only.

FIGURE 8.1-47

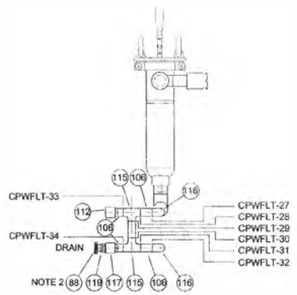
NOTES:
1. DUST CAPS AND PLUGS NOT FOR PRESSURE BOUNDARY ISOLATION VALVE(S) MUST REMAIN CLOSED.
2. FOR BILL OF MATERIALS DESCRIPTIONS, REFER TO SHEET 4. QUANTITIES MAY VARY.



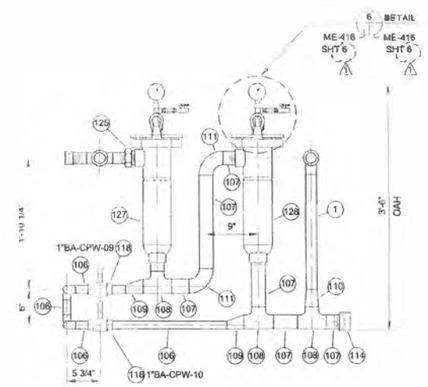
PART PLAN "E" (SHEET 5)
WATER FILTER
SCALE: 1"=1'-0"



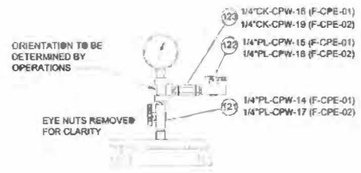
SECTION G-G
SCALE: 1"=1'-0"



SECTION H-H
SCALE: 1"=1'-0"



SECTION F-F
SCALE: 1"=1'-0"



DETAIL "6"
TYP 2 PLACES
SCALE: NONE

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	11/9/12	JAL	EB	GW	REVISED SECTION & DETAIL SHEET NUMBERS
0	4/26/12	JAL	EB	GW	INITIAL ISSUE – FOR CONSTRUCTION

RPE
No. 20645
STATE OF TENNESSEE

DRAWN BY: J. A. LALONDE	DATE: 4/26/12
DESIGNED BY: J. A. LALONDE	DATE: 4/26/12
CHECKED BY: E. BLEDSOE	DATE: 4/26/12
APPROVED BY: J. G. WAGNER	DATE: 4/26/12
APPROVED BY	DATE

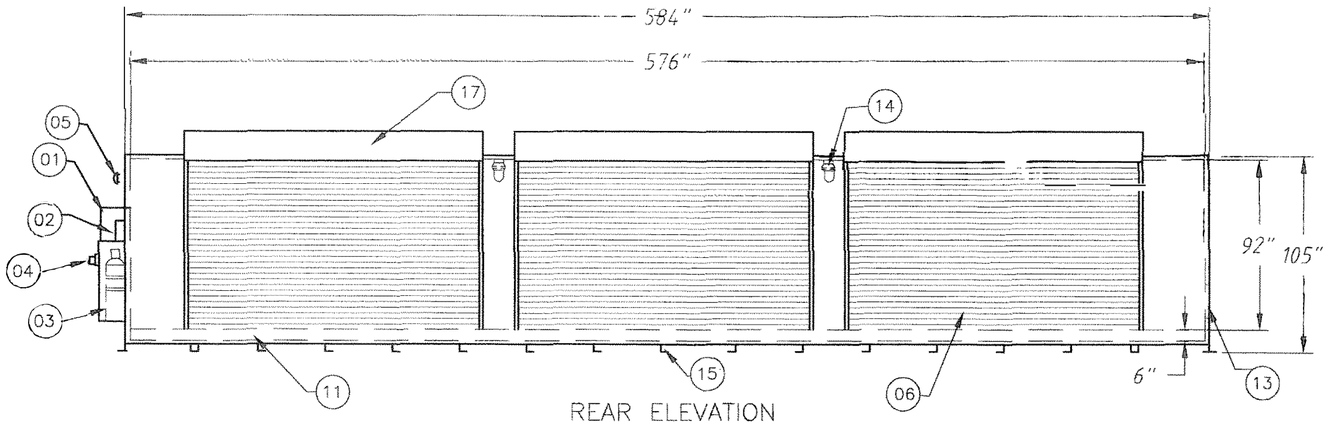
WPC WAI Team

TITLE
TRU WASTE PROCESSING CENTER
CASK PROCESSING ENCLOSURE
LIQUID HANDLING SYSTEM

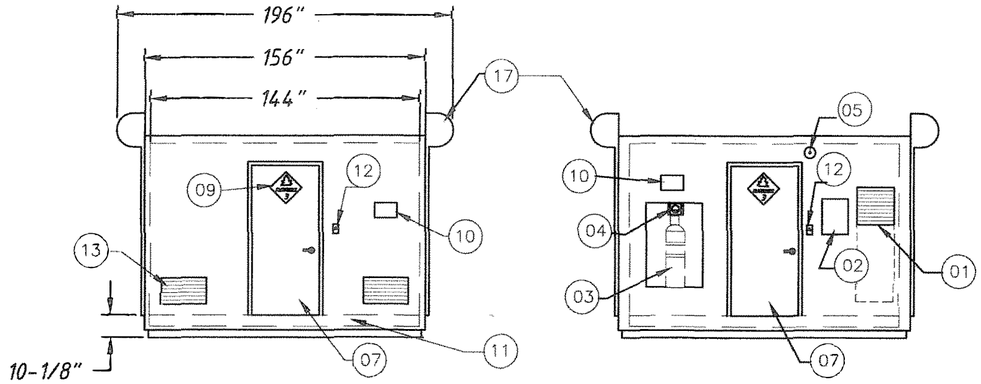
SIZE	SCALE: 1/2"=1'-0" UNO	DWG. NO.	REV
D	SHEET: 6 OF 6	T-RH-FW-D-ME-416	1

FILENAME: T-RH-FW-D-ME-416 SHT 5.DWG

This is an Uncontrolled Copy -- for Information Only.

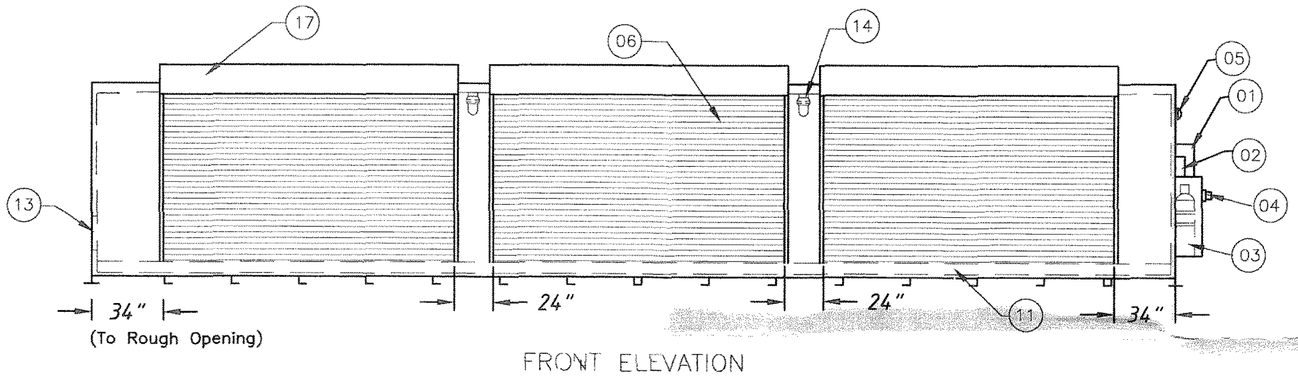


REAR ELEVATION

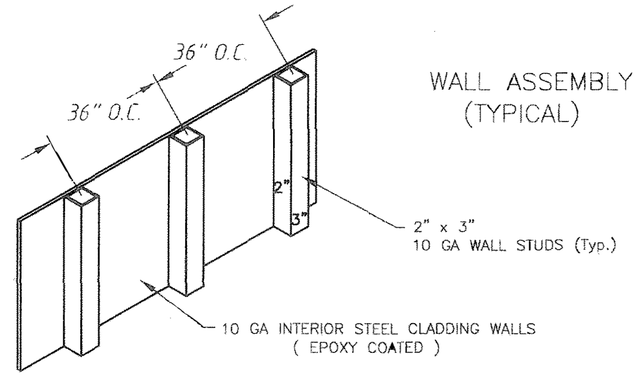


LEFT ELEVATION

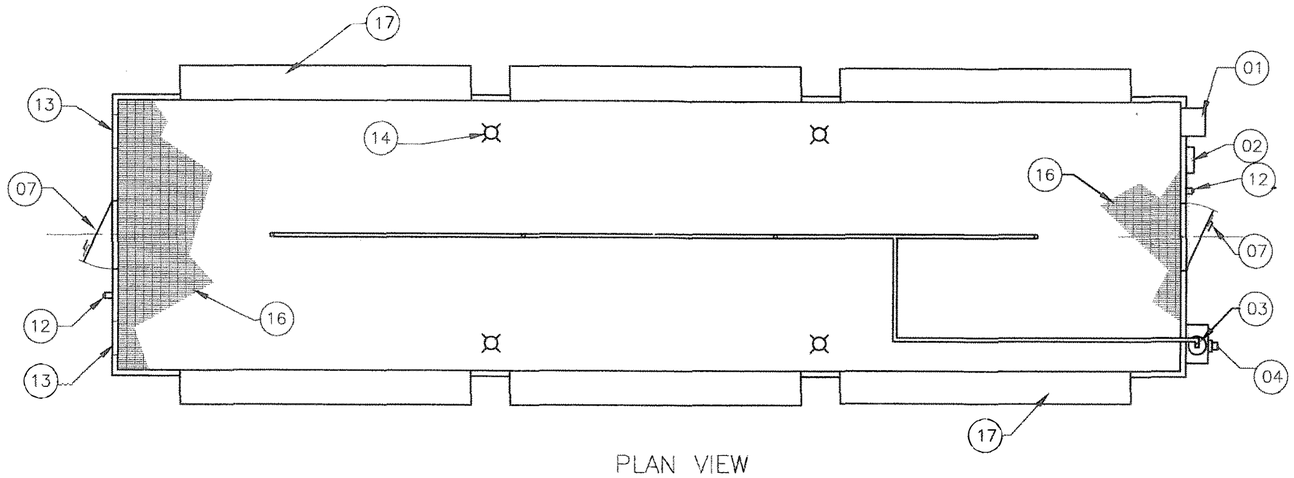
RIGHT ELEVATION



FRONT ELEVATION



WALL ASSEMBLY
(TYPICAL)



PLAN VIEW

PLAN NOTES

ITEM	DESCRIPTION
01	1500 CFM EXPLOSION PROOF MECHANICAL VENTILATOR
02	120–240 SINGLE PHASE ELECTRIC LOAD CENTER
03	DRY CHEMICAL FIRE SUPPRESSION SYSTEM
04	DRY CHEMICAL EXTERIOR PULL STATION
05	DRY CHEMICAL FIRE SUPPRESSION SYSTEM ALARM HORN
06	156"x90" NON–COMBUSTIBLE MECHANICAL ROLLUP DOORS (6 EA.) (FIELD MOUNTED)
07	36"X80" NON–COMBUSTIBLE PERSONNEL DOORS (2 EA.)
08	EXPLOSION RELIEF OMITTED
09	DOT FLAMMABLE PLACARD
10	MCC NAME PLATE
11	SECONDARY SPILL CONTAINMENT SUMP
12	NON–EXPLOSION PROOF EXTERIOR LIGHT SWITCH
13	MAKEUP AIR VENTS WITH WEATHER SHROUDS & INSECT SCREENS
14	EXPLOSION PROOF INTERIOR LIGHTS (4 EA. 150w)
15	BUILDING RISERS
16	500 PSF 1" STEEL BAR GRATE DECKING (IN REMOVABLE SECTIONS)
17	MECHANICAL ROLLUP DOOR CANISTERS

DESIGN NOTES:

BUILT TO FM APPROVAL STANDARD

DESIGN LIVE LOADS
- ROOF 40 PSF
- WIND 30 PSF
- FLOOR 500 PSF

SEISMIC ZONE 4

SUMP CAPACITY 2154 GALLONS

ELECTRICAL NOTES

ALL INTERIOR ELECTRICAL APPLIANCES AND COMPONANTS ARE CLASS 1, DIVISION 1, GROUP D.

WESKEM, LLC
ETTP, K–1065 YARD
OAK RIDGE TENNESSEE
P.O. NO. WD00640

CERTIFIED SHOP DRAWING

THIS DRAWING IS FOR CONFIRMATION OF YOUR ORDER AND ILLUSTRATES THE APPROXIMATE LOCATION OF THE FACTORY INSTALLED EQUIPMENT AND APPLIANCES

ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FOR YOUR REFERENCE. TOLERANCES ARE ± 1" AND ± 1/2" UNLESS OTHERWISE NOTED.

MCC DEVELOPEMENT, INC.

7831F FSU
(MCC14NC48)
Figure 8.1-49

WESKEM, LLC WASTE DISPOSITION
Oak Ridge, Tennessee
Prefabricated Hazardous Waste Storage Building
Project No. MCC–6674 Model No. MCC14NC48

MCC Design Department Date: 05/11/01
Drawn By: r.j. annarella
Scale: 1:64 (all measurements are nominal) Drawing: 1 of 1 Rev: 1

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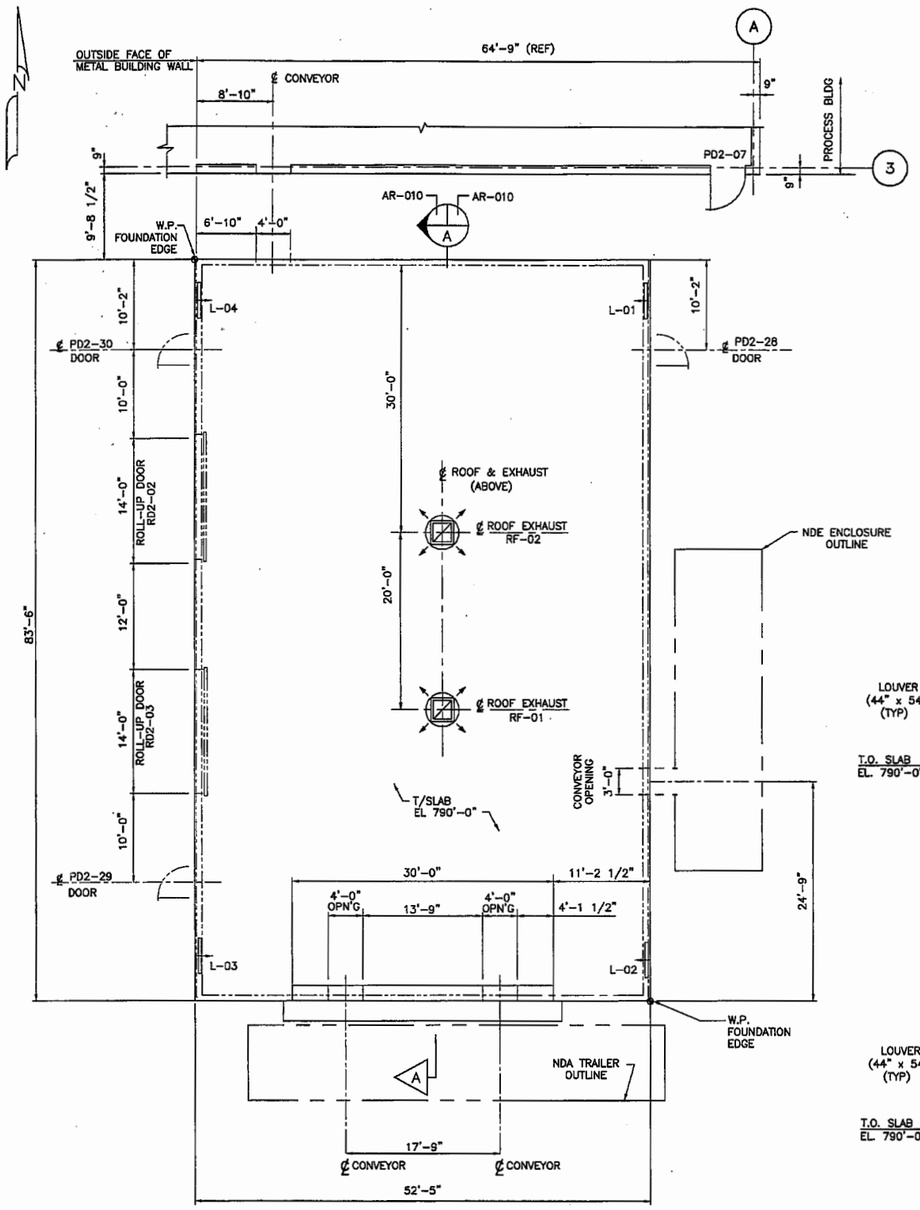
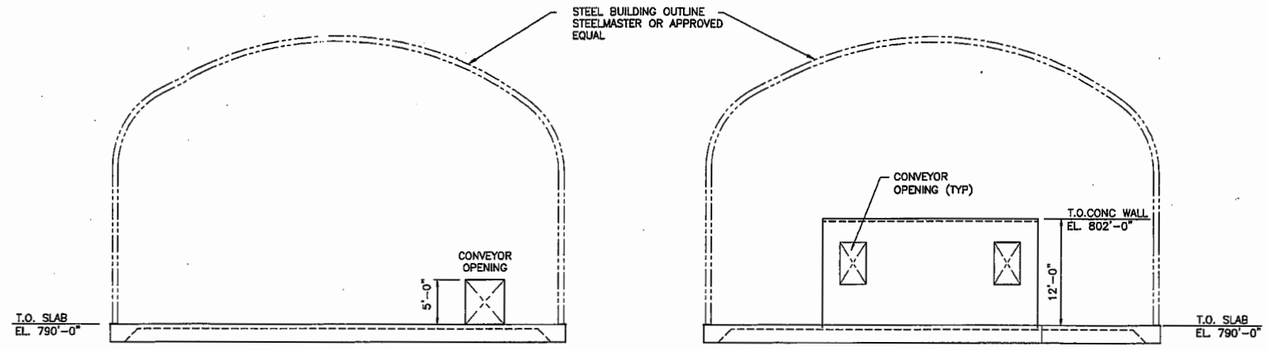
MCC Development, Inc.
Corporate Headquarters:
25877 West Apache Lane Barrington, IL 60010
(847) 381–8081 Fax: (847) 381–8086
E-mail: info@hazmatbuildings.com Website: www.hazmatbuildings.com

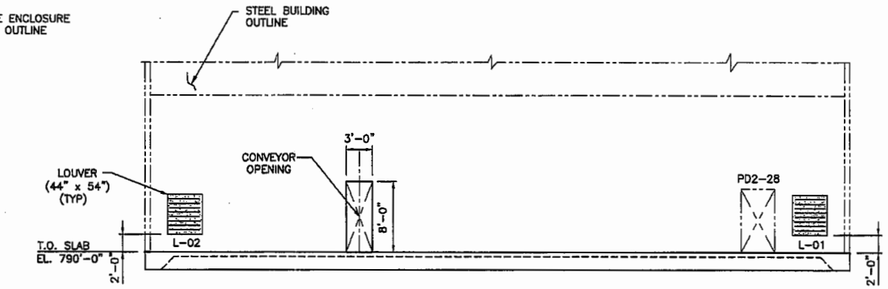


BUILDING PLAN

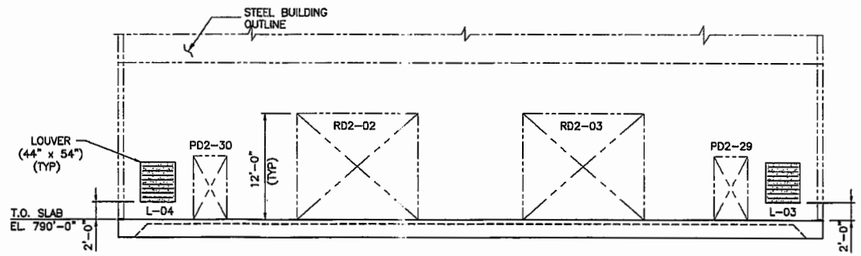


NORTH ELEVATION
(LOOKING SOUTH)

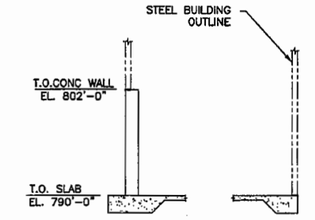
SOUTH ELEVATION
(LOOKING NORTH)



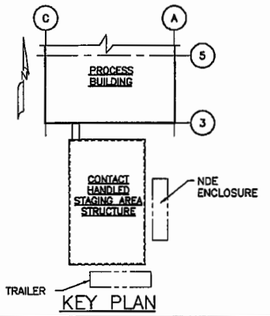
EAST ELEVATION
(LOOKING WEST)



WEST ELEVATION
(LOOKING EAST



A SECTION
SCALE: 1/8"=1'-0"
AR-010 AR-010



KEY PLAN

THIS DRAWING SUPERSEDES DRAWING T-CH-FW-D-AR-008

ELEVATIONS SHOWN ON THIS DRAWING ARE ACTUAL ELEVATIONS. PROCESS BUILDING 2ND FLOOR ELEV +790'.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
0	2/21/05	[illegible]	NG	NG	CERTIFIED FOR CONSTRUCTION

NASSER GHASSABIAN REGISTERED ENGINEER 22360 STATE OF TENNESSEE 2/21/05

DRAWN BY	[illegible]	DATE 2/21/05
DESIGNED BY	[illegible]	DATE 2/21/05
CHECKED BY	N. GHASSABIAN	DATE 2/21/05
APPROVED BY	N. GHASSABIAN	DATE 2/21/05
APPROVED BY		DATE

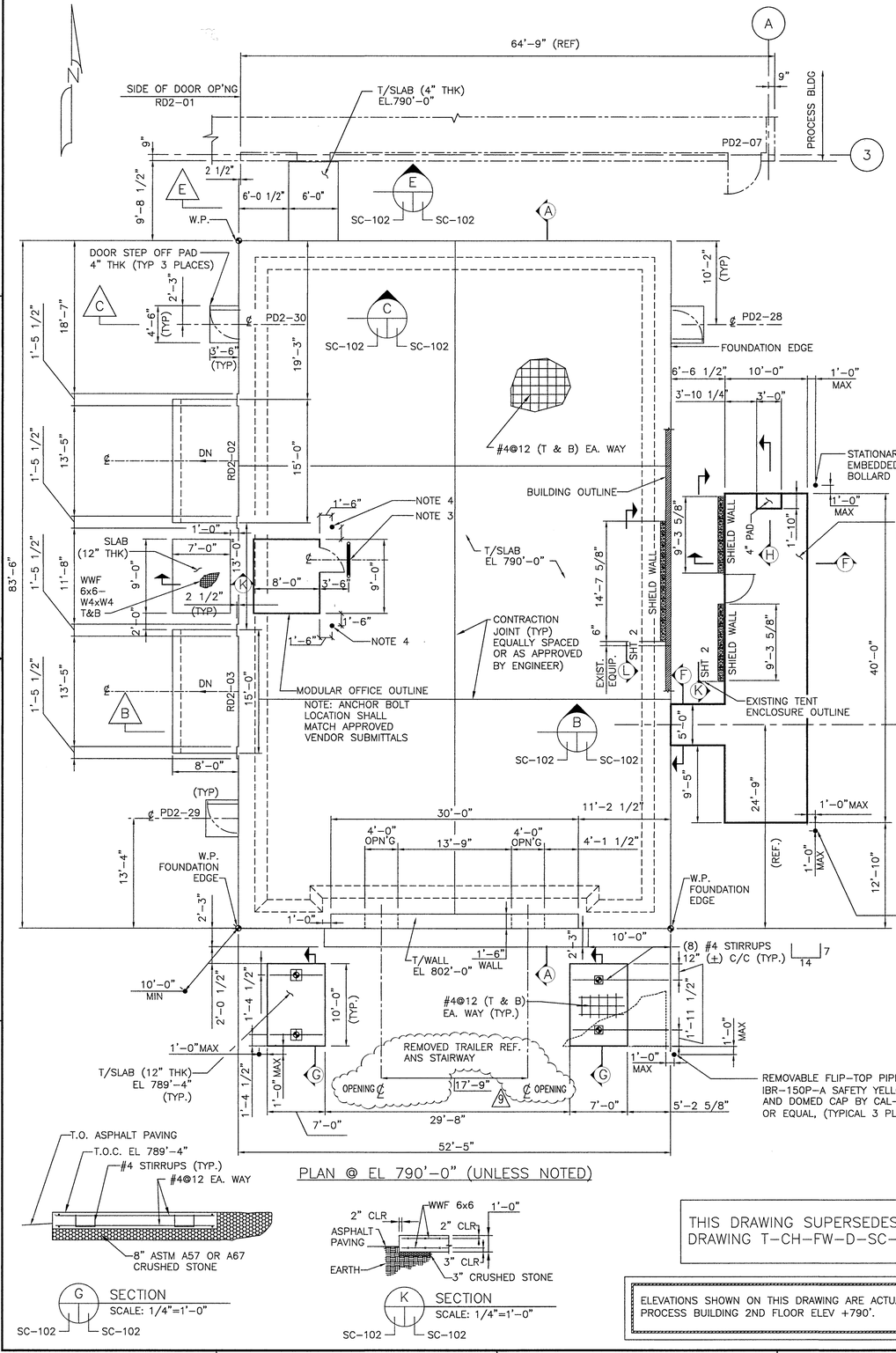
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRU/ALPHA WASTE TREAT. PROJ.
CONTACT HANDLED STAGING AREA STRUCTURE

SIZE	SCALE:	DWG. NO.	REV
D	1/8"=1'-0"	T-CH-FW-D-AR-010	0
	SHEET: 1 OF 1		

FILENAME: T-CH-FW-D-AR-010

Figure 8.1-50



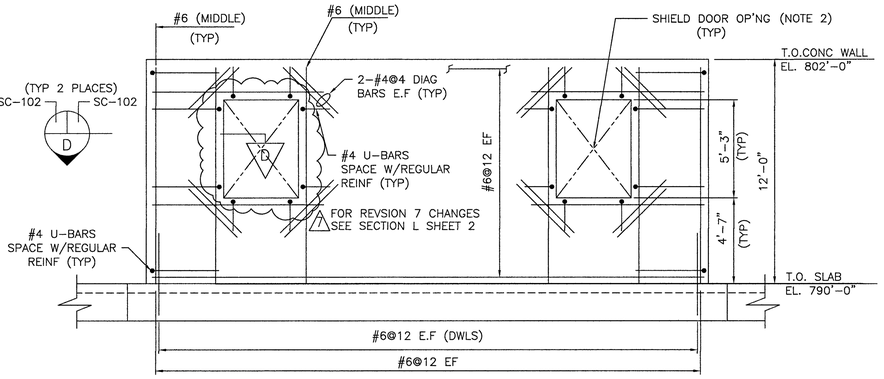
PLAN @ EL 790'-0" (UNLESS NOTED)

G SECTION
SCALE: 1/4"=1'-0"
SC-102 SC-102

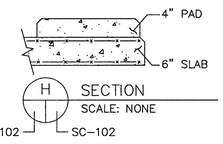
K SECTION
SCALE: 1/4"=1'-0"
SC-102 SC-102

THIS DRAWING SUPERSEDES DRAWING T-CH-FW-D-SC-101

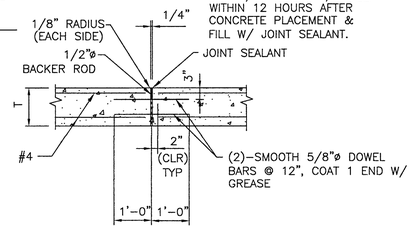
ELEVATIONS SHOWN ON THIS DRAWING ARE ACTUAL ELEVATIONS. PROCESS BUILDING 2ND FLOOR ELEV +790'.



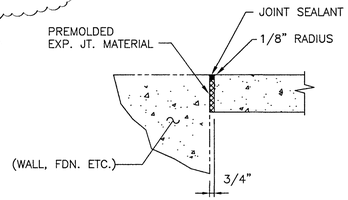
SOUTH ELEVATION
(LOOKING NORTH)



H SECTION
SCALE: NONE



TYPICAL DOWELED CONTRACTION JOINT
SCALE: NONE



TYPICAL ISOLATION JOINT
SCALE: NONE

NOTES

1. FOR GENERAL NOTES SEE DRAWING T-CH-FW-D-SC-001.
2. INSTALL #6 REBAR COUPLERS AROUND OPENING TO MATCH REGULAR REINFORCEMENT, FOR FUTURE MODIFICATION.
3. 42"H X 48"L X 4"DIA. HIGH-PROFILE MACHINE GUARD, SAFETY YELLOW, P/N 33847 BY LAB SAFETY SUPPLY OR APPROVED EQUAL. USE FOUR (4) 1/2"ø HILTI KWIK BOLT II EXPANSION ANCHORS (3 1/2" MIN. EMB.) PER "MOUNTING PLATE" EIGHT (8) ANCHORS TOTAL.
4. STATIONARY PLATE-MOUNTED PIPE BOLLARD IBR-150B SAFETY YELLOW WITH DOMED CAP BY CAL-PIPE MANUFACTURING OR APPROVED EQUAL. USE FOUR (4) 1/2"ø HILTI KWIK BOLT II EXPANSION ANCHORS (3 1/2" MIN. EMB.) PER "GUARD POST PLATE."

TYPICAL CONSTRUCTION JOINT
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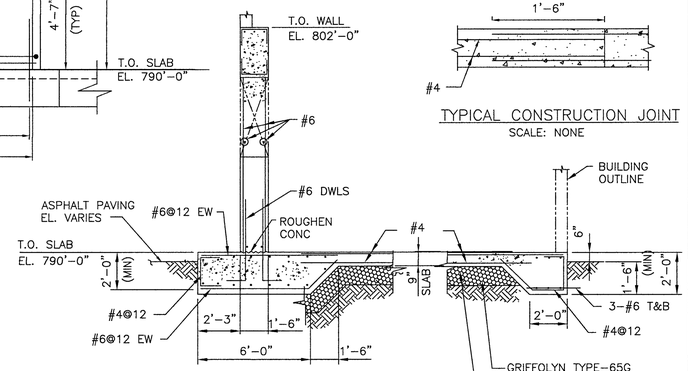
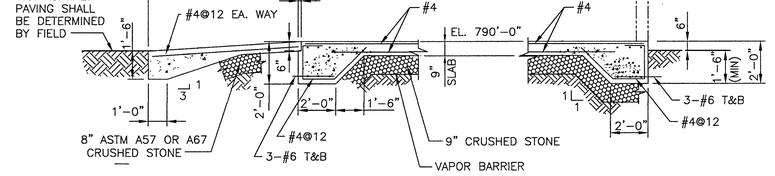
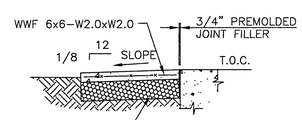


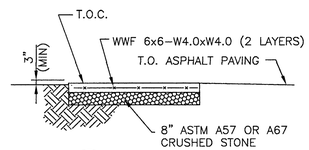
A SECTION
SCALE: 1/4"=1'-0"
SC-102 SC-102





C SECTION
SCALE: 3/8"=1'-0"
SC-102 SC-102

B SECTION
SCALE: 1/4"=1'-0"
SC-102 SC-102



F SECTION
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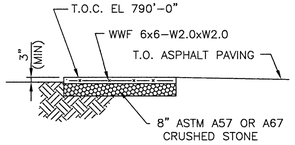
SC-102 SC-102



E SECTION
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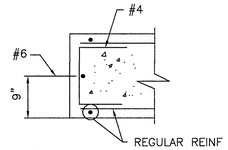
SC-102 SC-102



D SECTION
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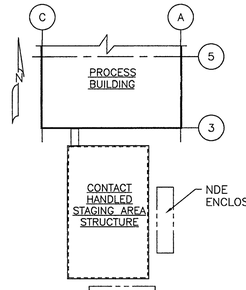
SC-102 SC-102



KEY PLAN

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
9	12/21/11	EB	JC		DELETED REF. FOR REMOVAL OF IQ3 AND DWAS
8	11/3/15	BA	NG	GW	INCORPORATED DCN-SC-104 & FCR-SC-042
7	4/29/09	JGM	NG	GW	DWAS RELOCATION AND IQ3 INSTALLATION; INCORP.
					DCN-SC-093 AND REFLECT AS BUILT CONFIG
6	11/9/06	JGM	NG	GW	ADD SLAB FOR SCALE

JOHN G. ESCHIK REGISTERED ENGINEER STATE OF TENNESSEE 100215 DEC. 2, 2011

DRAWN BY F. SCHRIMPE	DATE 11/30/04
DESIGNED BY N. GHASSABIAN	DATE 12/1/04
CHECKED BY R. GOYAL	DATE 11/30/04
APPROVED BY N. GHASSABIAN	DATE 12/1/04
APPROVED BY	DATE

NORTHWIND TWPC

TITLE
TRU WASTE PROCESSING CENTER
CONTACT HANDLED STAGING AREA
FOUNDATION MAT AT EL. 790'-0"

SIZE	SCALE:	DWG. NO.	REV
D	1/8"-1'-0"	T-CH-FW-D-SC-102	9
	SHEET: 1 OF 2		

FILENAME: T-CH-FW-D-SC-102_SH_1

Figure 8.1-51

EPA ID Number: TN1890090003
Permit Number: TNHW-DRAFT

ATTACHMENT 9. PHYSICAL AND CHEMICAL TREATMENT AT THE TRU WASTE PROCESSING CENTER (TWPC)

Macroencapsulation (T-1)

The purpose of macroencapsulation is to substantially reduce surface exposure of the waste to potential leaching media once the waste is disposed in a burial facility, creating a waste more suitable for land disposal. Macroencapsulation technology will be used at TWPC to treat mixed low-level waste (MLLW) debris per TN Rule 0400-12-01-.10(3)(f)1(i), Alternative Treatment Standards for Hazardous Debris requirements. The Waste Analysis Plan (Attachment 2) provides information on the physical and chemical characteristics of the debris wastes to be treated at TWPC. The solid debris waste stream forms leaving TWPC macroencapsulation treatment process will have the same basic physical and chemical properties as the input waste streams, primarily solid waste made up of ferrous metals, non-ferrous metals, other inorganics, cellulosic material, rubber, and plastics.

The treatment for MLLW debris will utilize commercially available 110-gallon drums or metal boxes with an inner polyethylene liner on the interior of the container, or polymeric bags which are secured closed and placed in the drum or metal box. Once a waste container or waste is loaded into the liner or bag within the macroencapsulation container, then the lid is placed on the container and is secured closed. In some macroencapsulation container brands, such as Unitech International, the lid contains embedded wires that will be in contact with both the lid and the flanged area at the top of the container. The macroencapsulation control unit is plugged into an approved power source and attached to the connector on the lid. The wires heat up and melt the localized area of polyethylene on the lid and the container unit, welding them together. Other brands of the macroencapsulation bags utilize a flexible polymeric bag with a zipper closure system. The bags consist of an inner bag, middle bag, and outer shell. Waste containers will be placed in the macroencapsulation bag and sealed per manufacturer's instructions. The microencapsulation process will be conducted by personnel trained to the applicable manufacturer's instructions and requirements from site operating procedures.

Macroencapsulation will be performed in the Macroencapsulation Building (MEB)(TWPC-5), in the parking lot of the Contact Handled Marshalling Building (CHMB) (TWPC-6), in the Cask Processing Enclosure (CPE) located within the Drum Aging Criteria (DAC) (TWPC-3), or on the 2nd floor of the Waste Processing Building (WPB) (TWPC-2) in the Box Breakdown Area (BBA). Treatment will be conducted in the BBA or CPE if the waste needs to be exposed (i.e., removed from the current waste container) and containment for radiological contamination is required. In the parking lot of the CHMB, macroencapsulation treatment will be performed only on closed containers (i.e., no exposed waste). The macroencapsulation treatment process will also be performed in the MEB. The MEB consists of an enclosed metal building (30.5 ft by 20 ft) with a concrete floor. Only closed containers will be treated in the MEB (i.e., no exposed waste). If treatment is conducted in the MEB or CHMB parking lot, waste containers may be staged for treatment outside of the storage unit for less than 12 hours. If the waste containers cannot be macroencapsulated within this 12-hour period, they will be returned to a permitted storage unit.

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The macroencapsulation treatment will be documented using the inspection log sheet identified in Attachment 4.3 during active operations. Containers with liquids or mercury will not be macroencapsulated. Liquids will be solidified/stabilized, mercury amalgamated, or removed from the waste before the final waste form is macroencapsulated. Macroencapsulation will be used as the waste treatment system for MLLW debris to ensure the final waste form complies with the Land Disposal Restrictions (LDR) treatment standard for debris waste by completely encapsulating the debris within the macroencapsulation container.

The treatment effectiveness is based on the treatment standards for hazardous debris as set forth in TN Rule 0400-12-.10(3)(f).

The capacity of the macroencapsulation treatment process is 170 55-gal drum equivalents per year. See Figure 9-1 for a block flow diagram of the Macroencapsulation (T-1) treatment process.

Amalgamation (T-2)

Amalgamation will be the treatment used for stabilizing elemental mercury contaminated with radioactive materials, which combines the physical and chemical conversion of mercury to a non-volatile metal. Commercially available amalgamation agents such as zinc, or a functional equivalent will be used for treatment of mercury. Amalgamation treatment of mercury will be confined to the glove box, BBA, or CPE for CH TRU waste, and the hot cell for RH TRU waste. The glove box, BBA, and hot cell process areas are within TWPC-2 of the WPB. The CPE process area is within TWPC-3. All of these processing areas are connected to a ventilation system with HEPA filtration and have fire suppression systems. The amalgamation treatment process for elemental mercury will be performed by personnel trained to the applicable vendor instructions and requirements from site operating procedures.

Treatment of elemental mercury will be conducted within secondary containment pans. In all cases, the mercury will be placed into a container with sufficient headspace to ensure no spills within the secondary containment pan and sufficient capacity to treat the waste in the container with the appropriate stabilizing agent. The amount of elemental mercury to be treated in any one batch shall not exceed one cup. If the amount of mercury exceeds one cup, then the excess mercury will be placed into another container for treatment. The secondary containment pan will be wiped clean between individual treatment operations to prevent mixing of incompatible wastes. The amalgamation treatment process will be documented using the inspection log sheet (Attachment 4.3) for each waste container treated.

The treatment effectiveness is based on the treatment standards for hazardous waste set forth in TN Rule 0400-12-01-.10(3)(a).

The amalgamation treatment process is limited to 10 pounds per hour.

Only residual/incidental elemental mercury found in MLLW containers will be treated by amalgamation due to restrictions of the approved NNSS waste profile. Mercury containing objects or containerized elemental mercury found within MLLW containers will be segregated from the waste for treatment at an approved off-site facility.

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See Figure 9-2 for a block flow diagram of the Amalgamation (T-2) treatment process.

Solidification/Stabilization (T-3)

Small amounts (less than 1%) of liquids may be identified during processing at TWPC. Treatment of liquids prior to repackaging is required. Both CH TRU and RH TRU waste will not be treated to meet LDR requirements, as this is not required at WIPP, but will be treated to meet the WIPP WAC. Any MLLW debris will be treated to meet LDR requirements or shipped to an approved treatment facility, as required. Bench scale treatment operations will be used to treat the small amount of liquids expected to be encountered.

Solidification/Stabilization will be used to treat RCRA waste containing liquids. Commercially available super-absorbents will be used to solidify RCRA liquids based on the liquid composition. Super-absorbents are used for treatment of oil and organic liquid wastes, aqueous wastes, and unknown mixtures. Solidification/Stabilization of CH TRU waste will be performed in the glove box, BBA, or CPE, while operations associated with treatment of RH TRU waste will be performed within the hot cell or CPE. The glove box, BBA, and hot cell process areas are within TWPC-2 of the WPB. The CPE process area is within TWPC-3. All of these processing areas are connected to a ventilation system with HEPA filtration and have fire suppression systems. The solidification/stabilization treatment process for RCRA liquids will be performed by personnel trained to the requirements from site operating procedures.

If containerized liquids are found in CH TRU or RH TRU waste containers, solidification/stabilization treatment will be performed in secondary containment pans. The liquid will be placed into a container with sufficient headspace to ensure no spills within the secondary containment pan and sufficient capacity to treat the waste in the container with the appropriate solidification/stabilization agent. The amount of RCRA liquids to be treated in any one batch shall not exceed one liter. If the amount of liquids exceeds one liter, then the excess liquid will be placed into another container for treatment. The secondary containment pan will be wiped clean between individual treatment operations to prevent mixing of incompatible wastes.

MLLW containers with treated liquids will not meet LDR requirements. Therefore, the treated liquids will be removed and segregated from the waste container and shipped to an approved off-site treatment facility. Once the treated liquids have been segregated and removed from the MLLW container, it becomes a compliant container for disposal at NNSS.

If non-containerized liquids are found in a TRU or MLLW waste drum or box, it is assumed that these liquids are water from condensation or groundwater infiltration from storage of containers in buried wells and trenches for many years.

The condensate or groundwater infiltrate may come in direct contact with this waste, and the waste can become saturated. The liquid treatment will occur on worktables or in secondary containment pans in the glove box, BBA, CPE, or hot cell. The glove box, BBA, and hot cell process areas are within TWPC-2 of the WPB. The CPE process area is within TWPC-3. All of these processing areas are connected to a ventilation system with HEPA filtration and have fire suppression systems. The liquid will be absorbed to the extent necessary with a super-absorbent to meet the appropriate

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burial site "no-liquid" definition. After each treatment, the table or secondary containment pans, as applicable will be decontaminated by wiping or removing to the extent practical any residual liquid waste. The pads or absorbent material used to decontaminate the worktable will be managed with the treated debris waste. These liquids will be treated in batches not to exceed 5 gal of liquid. See Figure 9-3 and Figure 9-4 for a block flow diagram of the Solidification/Stabilization (T-3) treatment process.

CH TRU or RH TRU Waste Stabilization

TWPC will process certain waste materials that will be preferentially mixed with a cementitious media to ensure adequate stabilization and to protect the waste from potential chemical incompatibility with other waste materials. Some waste streams received by TWPC may contain waste materials (including but not limited to cellulosics, resins, absorbed liquids, and powders) that require stabilization to be accepted under WIPP waste acceptance criteria.

No more than a cumulative total of one 55-gallon drum of CH TRU or RH TRU materials requiring stabilization will be treated in 24 hours. The treatment will be documented using the inspection log sheet (Attachment 4.3).

Groundwater Absorption (T-4)

Some of the TRU or MLLW waste containers received at TWPC have groundwater or other environmental media infiltration that may come in direct contact with the waste inside of the containers. Therefore, some of the debris waste may be saturated with this groundwater or environmental media. If the debris is saturated with non-containerized liquid (e.g., groundwater), the debris will be mixed with an approved super-absorbent so that the liquid is absorbed to the extent necessary to meet the appropriate burial site "no-liquid" definition. The liquid treatment will occur on worktables or in secondary containment pans in the glove box, BBA, CPE, or hot cell. The glove box, BBA, and hot cell process areas are within TWPC-2 of the WPB. The CPE process area is within TWPC-3. All of these processing areas are connected to a ventilation system with HEPA filtration and have fire suppression systems. The treated debris will then be packaged into a DOT compliant container. After each treatment, the table or secondary containment pan, as applicable, will be decontaminated by wiping and removing to the extent practical any residual liquid waste. Pads or absorbent material used to decontaminate the worktable or secondary containment pan will be managed with the treated debris waste. The groundwater absorption treatment process will be conducted by personnel trained to the requirements from site operating procedures.

TRU containers with treated groundwater are acceptable for disposal at WIPP. MLLW containers with treated groundwater are acceptable for disposal at NNSS. The treatment will be documented using the inspection log sheet (Attachment 4.3) for each batch treated. No more than 15 55-gal drum equivalents of debris waste will be treated in a day (24 hours). See Figure 9-5 for a block flow diagram of the Groundwater Absorption (T-4) treatment process.

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Size Reduction (T-5)

Treatment by size-reduction will be conducted on CH TRU, RH TRU, and MLLW large waste items so as to make the waste amenable to fit in containers. These items are typically received in RH casks or CH boxes. Size-reduction activities will be conducted in the glove box, BBA, CPE, or hot cell. The glove box, BBA, and hot cell process areas are within TWPC-2 of the WPB. The CPE process area is within TWPC-3. All of these processing areas are connected to a ventilation system with HEPA filtration and have fire suppression systems. Size reduction treatment is accomplished using mobile (handheld) tools such as various types of saws or nibblers. The size reduction treatment process will be conducted by personnel trained in the requirements from site operating procedures.

The treatment will be documented using the inspection log sheet (Attachment 4.3) for each container of size-reduced waste generated. No more than 41, 55-gal drum equivalents will be size reduced per 24 hours. See Figure 9-6 for a block flow diagram of the Size Reduction (T-5) treatment process.

Groundwater Filtration (T-6)

Groundwater filtration will take place in the WPB, CPE, or in the DVB. Some of the waste containers received by TWPC have been buried in wells and trenches for many years and may contain large volumes of groundwater infiltration. Environmental media (e.g., groundwater) is collected in totes or drums from containers in the glove box, BBA, CPE, or hot cell. The glove box, BBA, and hot cell process areas are within TWPC-2 of the WPB. The CPE process area is within TWPC-3. All of these processing areas are connected to a ventilation system with HEPA filtration and have fire suppression systems. The groundwater collected will be sampled to verify the media "no longer contains" a hazardous constituent. If the totes or drums of groundwater fail based on the analytical results, the groundwater will be filtered through media (i.e., screen, carbon filtration media) as a form of treatment for potential hazardous constituents. The treated groundwater will be collected in containers (i.e., totes or drums) and resampled to determine if any potential characteristic or listed hazardous waste constituents are present. If the groundwater samples pass Regional Screening Levels from EPA Region 4, the groundwater media will "no longer contain" hazardous constituents and be processed as low-level non-hazardous wastewater. The groundwater filtration treatment process will be conducted by personnel trained to the requirements from site operating procedures.

The groundwater filtration treatment will be documented using the inspection log sheet (Attachment 4.3) for each batch of groundwater filtered. No more than 5000 gallons of groundwater will be filtered per year. See Figure 9-7 for a block flow diagram of the Groundwater Filtration (T-6) treatment process.

Neutralization (T-7)

Some TRU legacy waste containers potentially have small amounts of liquid solutions that exhibit the hazardous characteristic of corrosivity. These corrosive waste solutions may be by-products of chemical reactions, stabilization agents, spent catalysts, or simple industrial cleansers. At TWPC,

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TRU liquid solutions found in containers that exhibit the hazardous characteristic of corrosivity will have a base or an acid added to neutralize the solution to a pH above 2 and below 12.5. The Neutralization treatment will occur in secondary containment pans. After each treatment, the secondary containment pan will be decontaminated by wiping and removing to the extent practical any residual liquid waste. Once neutralized, these TRU solutions will be further treated by absorption/stabilization (T-3) and packaged into compliant containers for disposal at WIPP. Neutralization treatment will occur in the glove box, BBA, CPE, or hot cell. The glove box, BBA, and hot cell process areas are within TWPC-2 of the WPB. The CPE process area is within TWPC-3. All of these processing areas are connected to a ventilation system with HEPA filtration and have fire suppression systems. The neutralization treatment process will be conducted by personnel trained to the requirements from site operating procedures. MLLW liquid solutions that exhibit the definition of corrosivity will be packaged and shipped to an approved off-site treatment facility.

No more than 5 gal will be neutralized per 24 hours. The neutralization treatment process will be documented using the inspection log sheet (Attachment 4.3) for each batch neutralized. See Figure 9-8 for a block flow diagram of the Neutralization (T-7) treatment process.

Oxidation/Deactivation (T-8)

Some TRU containers from the legacy waste inventory contain potentially pyrophoric metals. The metal oxidation treatment process will oxidize these potentially pyrophoric metals. After oxidation, it ensures these metals are not capable of future energetic reaction with an oxidizing atmosphere. The oxidation process will be performed in a specially designed glove box in TWPC-4. This processing area is connected to a ventilation system with HEPA filtration and has a fire suppression system. The oxidation glove box will be kept under inert Helium atmosphere. The potentially pyrophoric metal will be loaded into a ceramic furnace vessel and heated in an oven to the ultimate temperature of 650C. Oxygen will be introduced through a restrictive flow orifice in very small percentages to fully oxidize the metal under a controlled environment. The final stage will allow exposure of the metal to ambient atmosphere for a predetermined time. Following cool down to ambient temperature, the oxidized metal remains in the furnace vessel and will be packaged into DOT compliant containers for disposal. Instruments which relate to temperature and flow of helium, oxygen, and ambient atmosphere will be monitored at least every 15 minutes during treatment. Once treated, the oxidized metal will be acceptable for storage, transport, and disposal at the WIPP repository. The oxidation treatment process will be conducted by personnel trained to the requirements from site operating procedures. No more than 1 kg of potentially pyrophoric metals will be treated per 24 hours.

The oxidation treatment process will be recorded and maintained in the operating record. Treatment will be documented using the inspection log sheet (Attachment 4.3) for each batch oxidized. See Figure 9-9 for a block flow diagram of the Oxidation/Deactivation (T-8) treatment process.

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Puncturing Potentially Pressurized Containers (T-9)

Puncturing potentially pressurized containers will take place in the WPB or CPE. The TRU legacy inventory can contain Potentially Pressurized Containers (PPC) which are Prohibited Items (PI) for disposal at both WIPP and NNSS and are therefore segregated from compliant waste. The PPCs can be considered D001 Ignitable and D003 reactive waste due to the presence of ignitable compressed gases. They will be treated (punctured) with an off-the-shelf device such as the Aerosolv Aerosol Can System to create a stable, non-ignitable and non-reactive carcass acceptable for disposal at both WIPP and NNSS. The puncturing system fits onto a standard drum and uses a non-sparking pin to puncture PPCs safely. It drains any remaining product along with the propellant into the sealed drum. An active carbon filter attached to the bung opening filters VOCs. Electrical bonding of the PPC to the unit and drum prevents static discharge. The residual liquids captured will be sent to an off-site facility for treatment. Care will be taken not to mix incompatible waste materials. Unknown PPCs will be punctured, and the residual liquids captured separately for sampling and subsequent off-site facility treatment. No more than 55 gallons will be treated in 24 hours. The treatment will be documented using the inspection log sheet (Attachment 4.3). See Figure 9-10 for a block flow diagram of the Puncturing Potentially Pressurized Containers treatment process.

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Figure 9-1. Block Flow Diagram for Permitted Treatment Macroencapsulation (T-1)

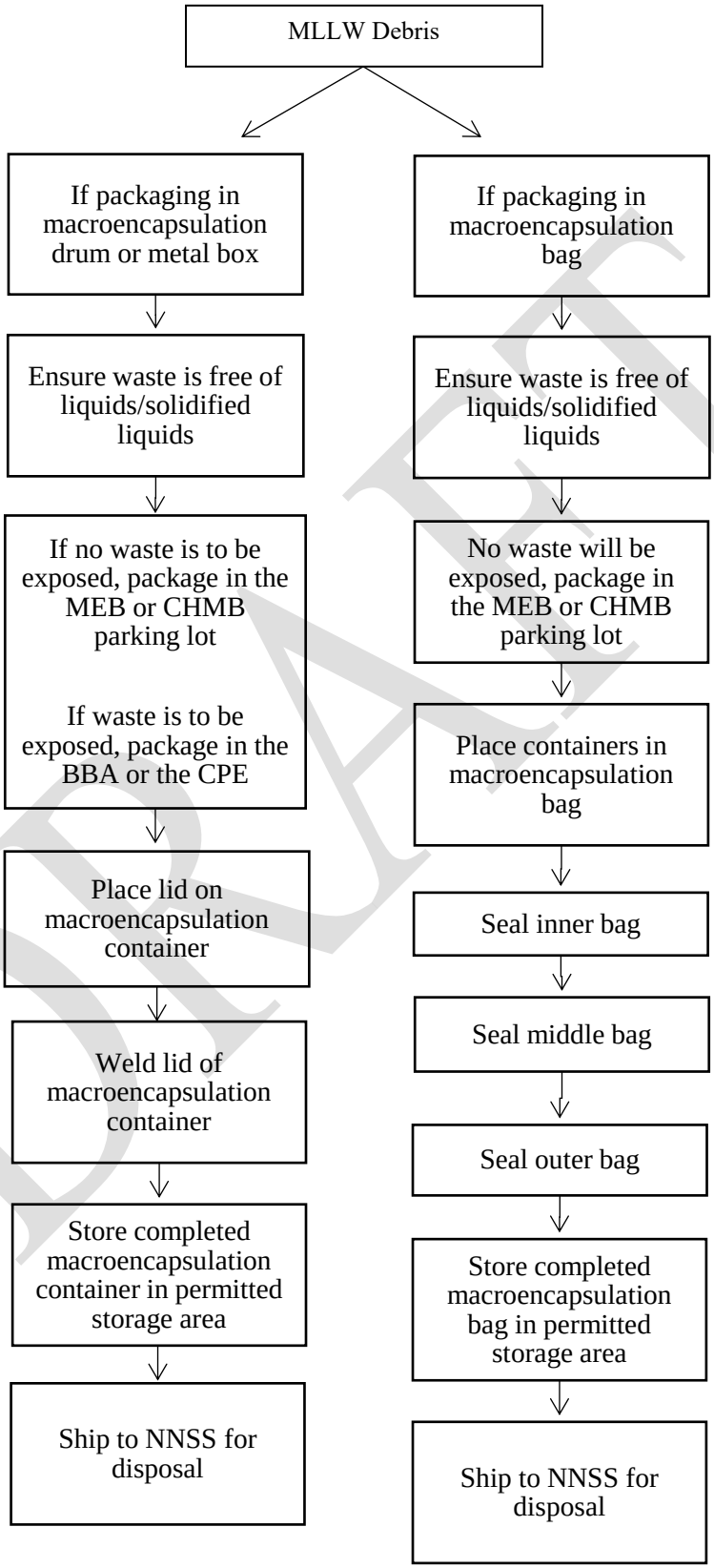

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Figure 9-2. Block Flow Diagram for Permitted Treatment Amalgamation (T-2)

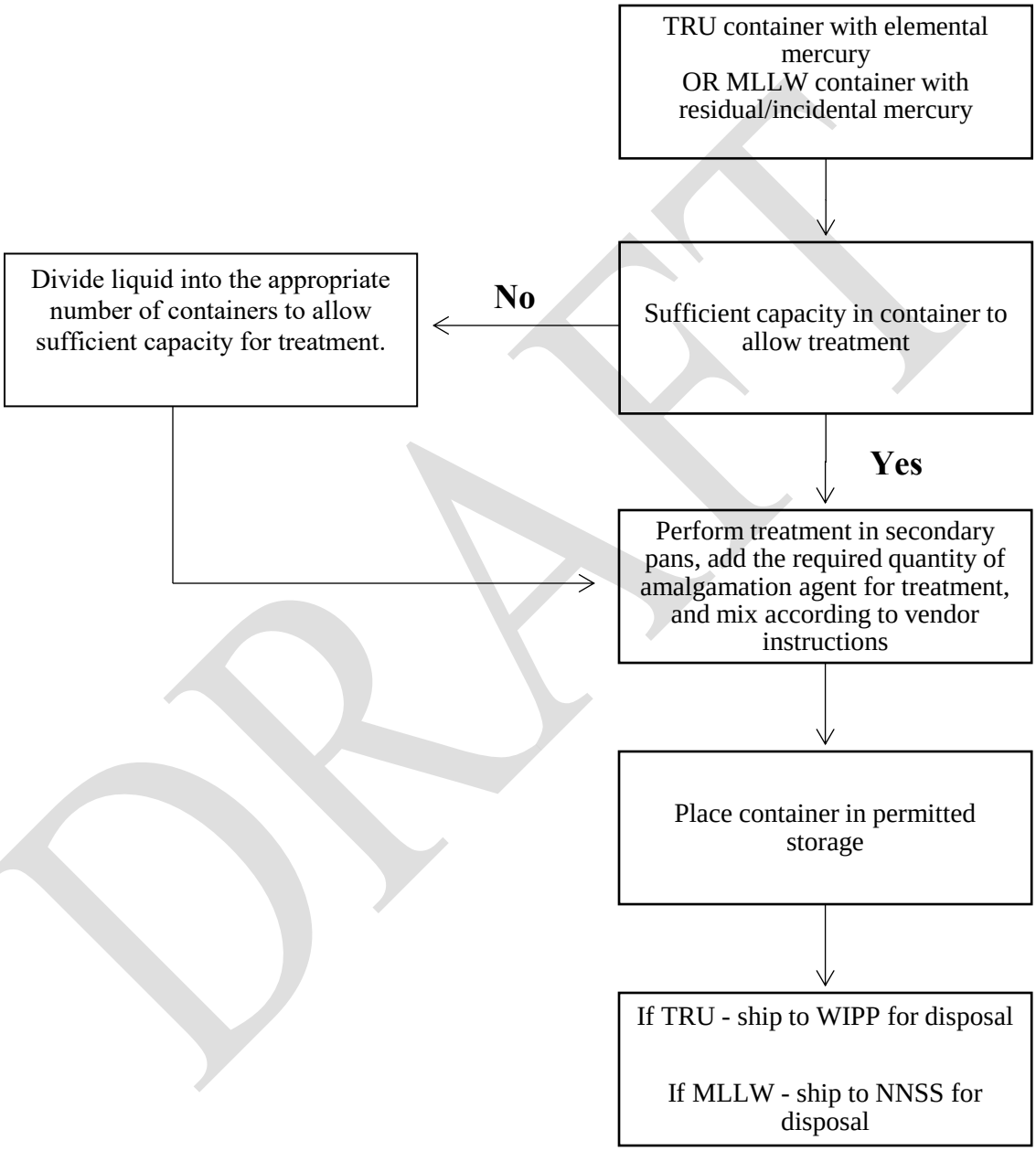

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Figure 9-3. Block Flow Diagram for Permitted Treatment Solidification/Stabilization (T-3)

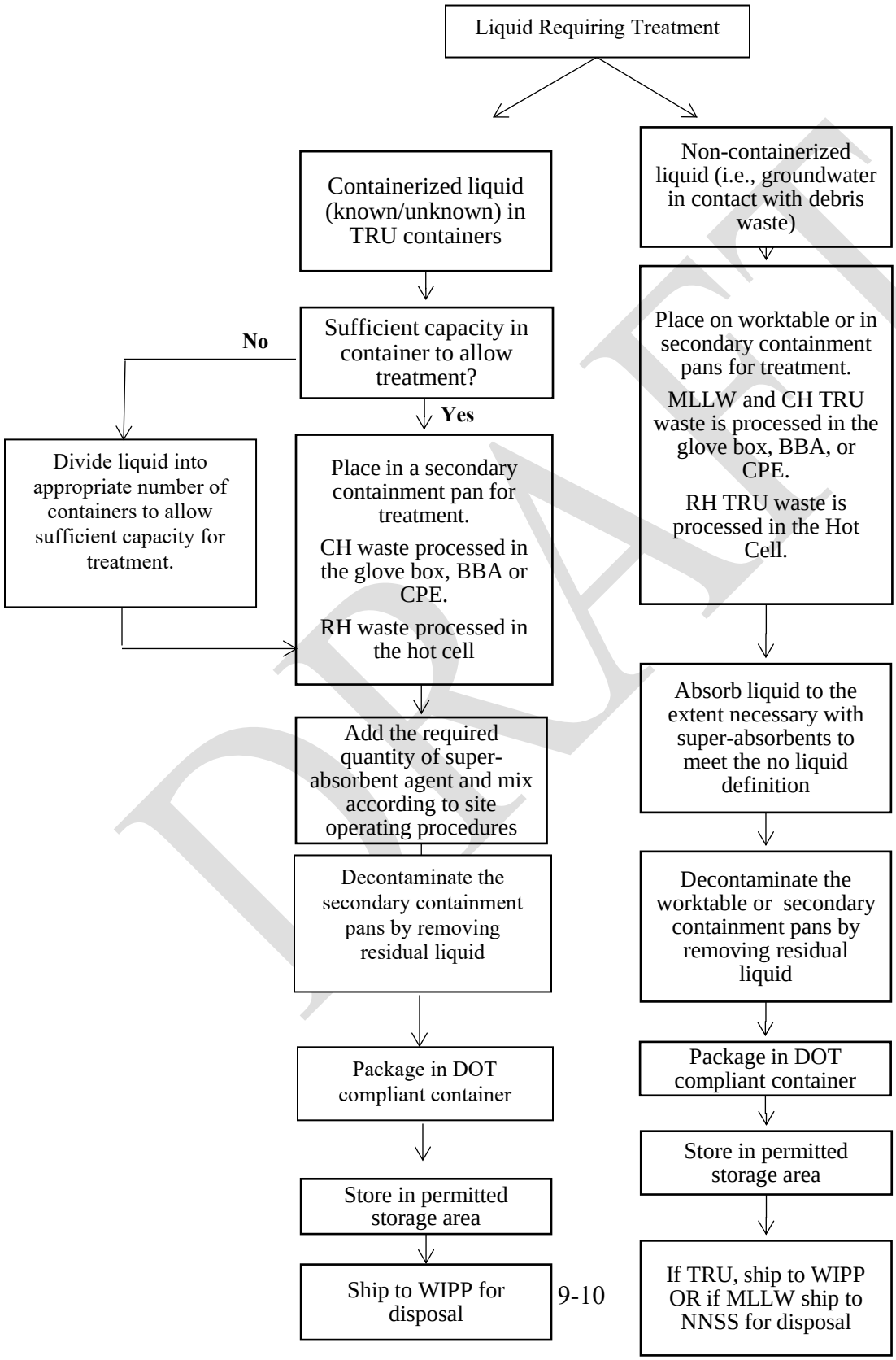

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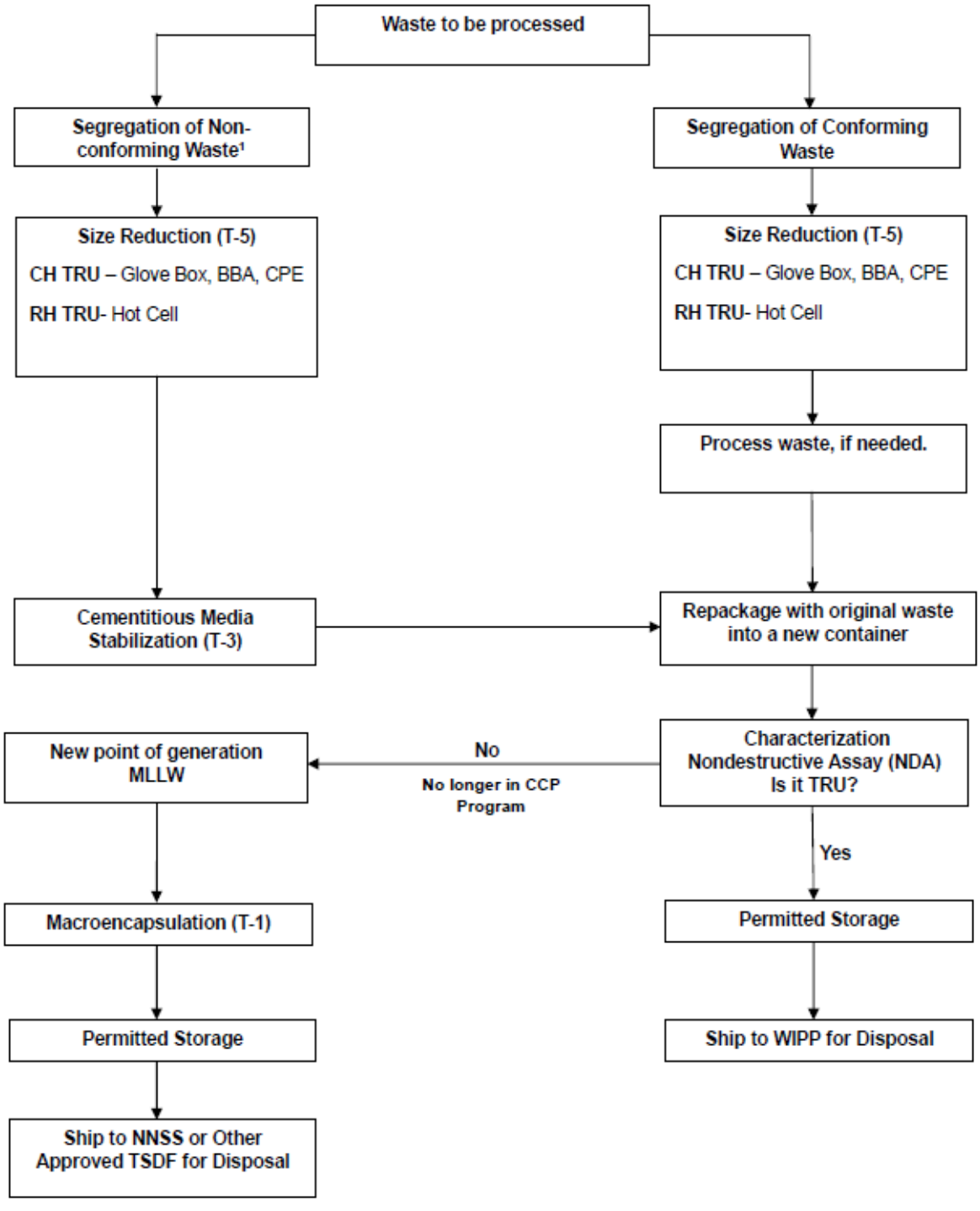
Figure 9-4. CH TRU or RH TRU Stabilization (T-3)



[1] The term "Non-conforming" in this context indicates waste that does not meet the WIPP WAC.

Figure 9-5. Block Flow Diagram for Permitted Treatment Groundwater Absorption (T-4)

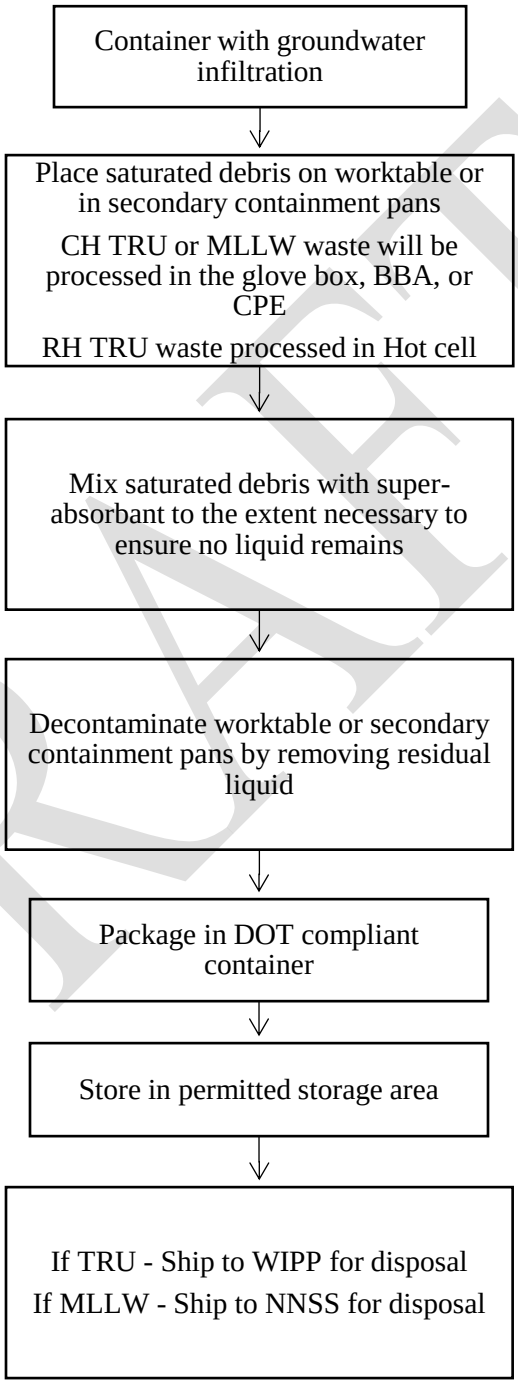


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Figure 9-6. Block Flow Diagram for Permitted Treatment Size Reduction (T-5)

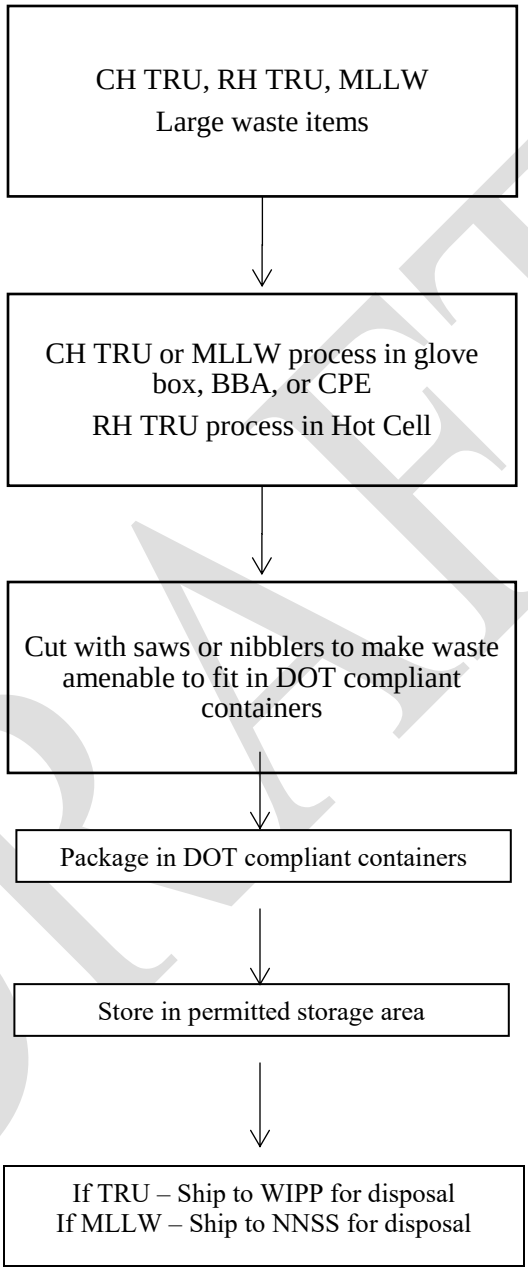

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Figure 9-7. Block Diagram for Permitted Treatment Groundwater Filtration (T-6)

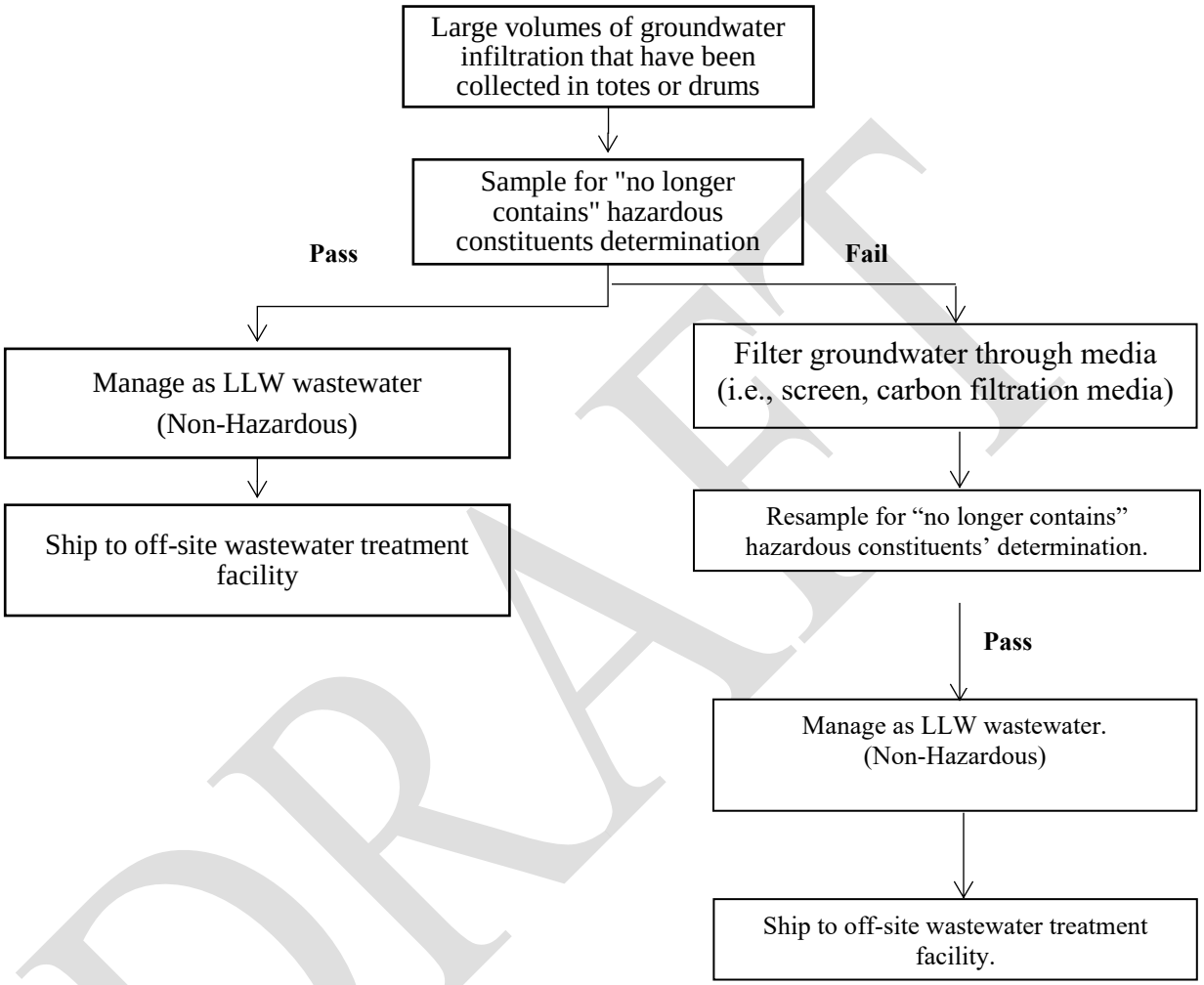

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Figure 9-8. Block Flow Diagram for Permitted Treatment Neutralization (T-7)

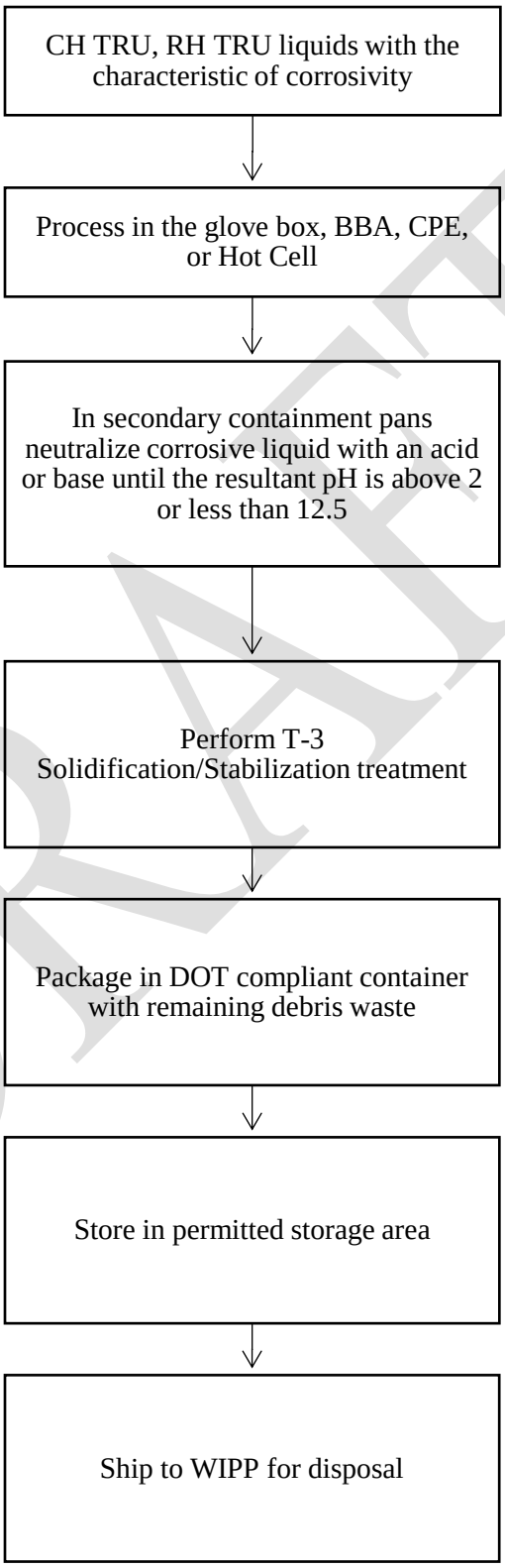

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Figure 9-9. Block Flow Diagram for Permitted Treatment Oxidation/Deactivation (T-8)

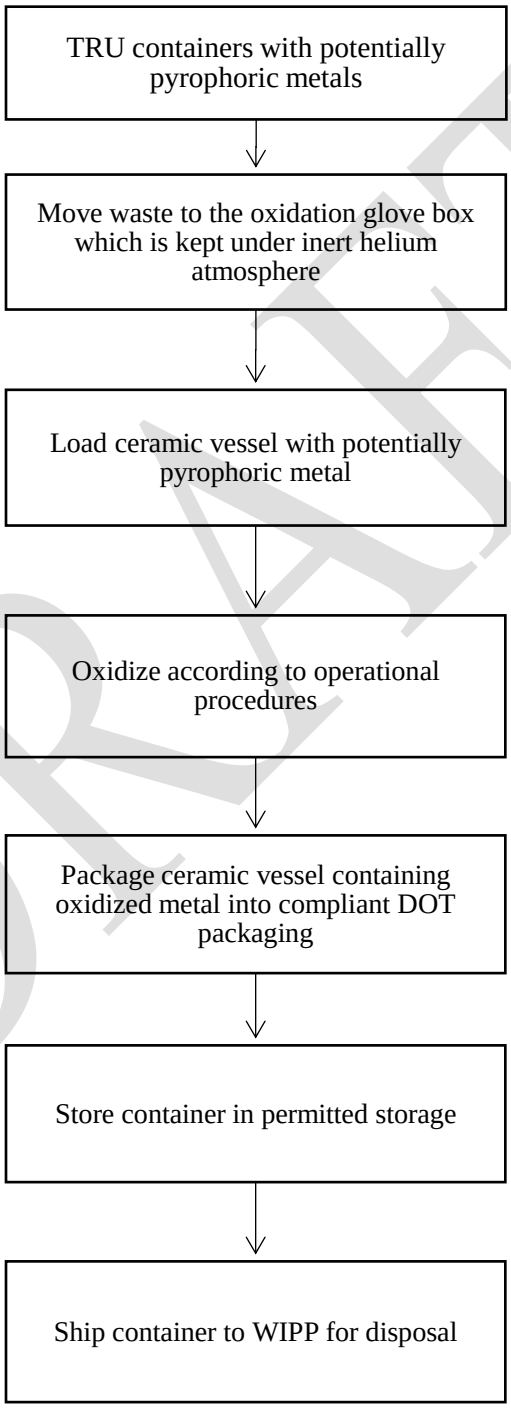

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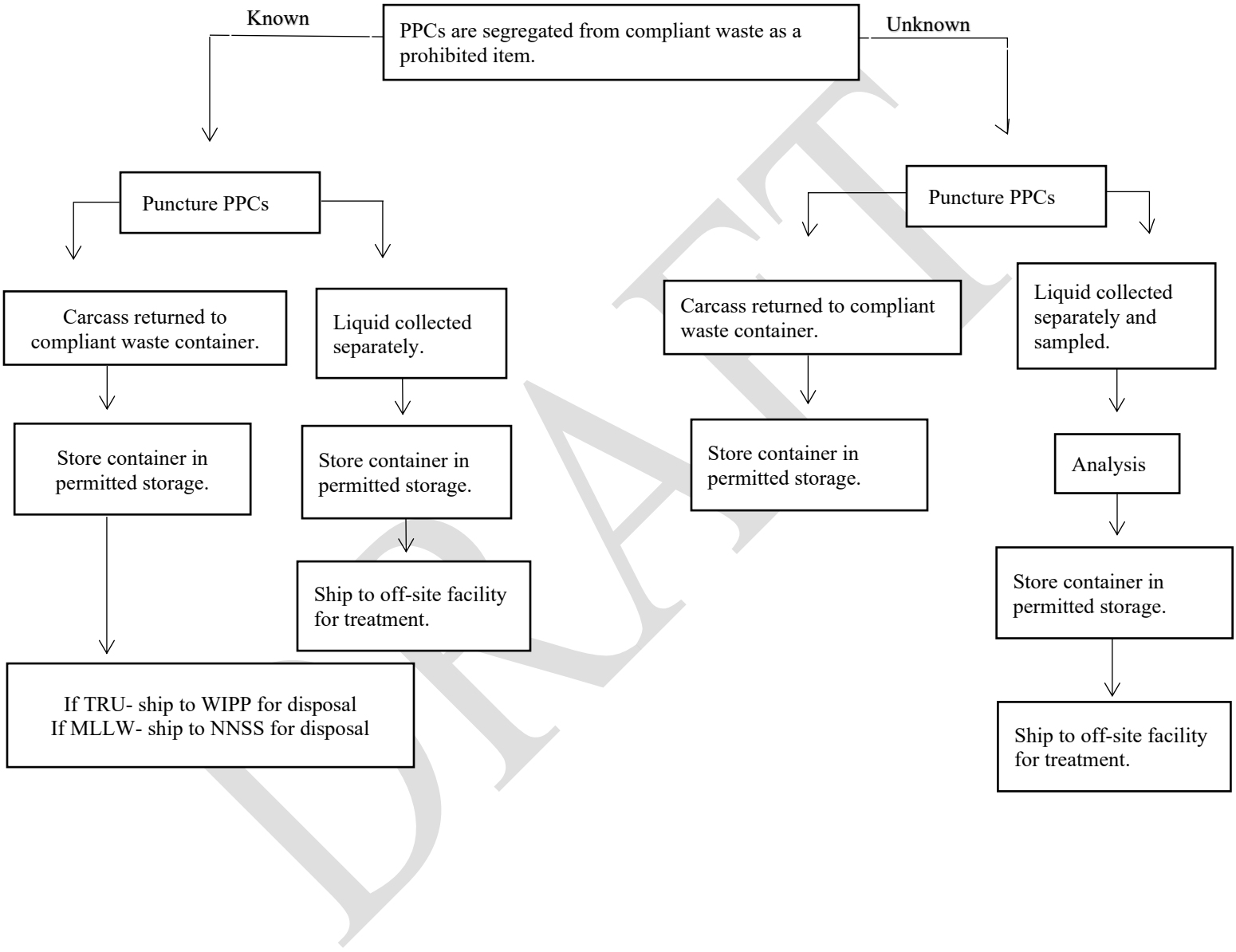
Figure 9-10. Block Flow Diagram for Permitted Treatment Puncturing Potentially Pressurized Containers (T-9)



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