HNF-1886
Revision 1

Central Waste Complex Waste Analysis Plan

Prepared for the U S Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U S Department of Energy under Contract DE AC06-96RL13200

FLUOR DANIEL HANFORD, INC.

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Date Published
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GLOSSARY

ALARA	as low as reasonably achievable
ASTM	American Society for Testing and Materials
AWMP	alternative waste management plan
CAP	corrective action plan
COLIWASA	composite liquid waste sampler
CFR	Code of Federal Regulations
CWC	Central Waste Complex
DOE RL	U S Department of Energy, Richland Operations Office
DQO	data quality objectives
Ecology	Washington State Department of Ecology
HNF	Hanford Nuclear Facility (document identifier)
LDR	land disposal restriction
LLBG	Low-Level Burial Grounds
MSDS	material safety data sheet
NDA	nondestructive assay
NDE	nondestructive examination
PCB	polychlorinated biphenyl
PES	performance evaluation system
pH	negative logarithm of the hydrogen ion concentration
QA/QC	quality assurance and quality control
RCRA	*Resource Conservation and Recovery Act of 1976*
RCW	Revised Code of Washington
SWITS	solid waste information tracking system
SWMU	solid waste management unit
TRU	transuranic
WAC	Washington Administrative Code
WAP	waste analysis plan
WSRd	waste specification record
°C	degrees Celsius

METRIC CONVERSION CHART

The following conversion chart is provided to the reader as a tool to aid in conversion

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	25 40	millimeters	millimeters	0 0393	inches
inches	2 54	centimeters	centimeters	0 393	inches
feet	0 3048	meters	meters	3 2808	feet
yards	0 914	meters	meters	1 09	yards
miles	1 609	kilometers	kilometers	0 62	miles
Area			**Area**		
square inches	6 4516	square centimeters	square centimeters	0 155	square inches
square feet	0 092	square meters	square meters	10 7639	square feet
square yards	0 836	square meters	square meters	1 20	square yards
square miles	2 59	square kilometers	square kilometers	0 39	square miles
acres	0 404	hectares	hectares	2 471	acres
Mass (weight)			**Mass (weight)**		
ounces	28 35	grams	grams	0 0352	ounces
pounds	0 453	kilograms	kilograms	2 2046	pounds
short ton	0 907	metric ton	metric ton	1 10	short ton
Volume			**Volume**		
fluid ounces	29 57	milliliters	milliliters	0 03	fluid ounces
quarts	0 95	liters	liters	1 057	quarts
gallons	3 79	liters	liters	0 26	gallons
cubic feet	0 03	cubic meters	cubic meters	35 3147	cubic feet
cubic yards	0 76	cubic meters	cubic meters	1 308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source *Engineering Unit Conversions*, M R Lindeburg PE , Second Ed , 1990, Professional Publications, Inc , Belmont, California

1 0 UNIT DESCRIPTION

The purpose of this waste analysis plan (WAP) is to document the waste acceptance process, sampling methodologies, analytical techniques, and overall processes that are undertaken for waste accepted for storage at the Central Waste Complex (CWC), which is located in the 200 West Area of the Hanford Facility, Richland, Washington Because dangerous waste does not include the source special nuclear and by-product material components of mixed waste, radionuclides are not within the scope of this documentation The information on radionuclides is provided only for general knowledge

This document has been revised to meet the interim status waste analysis plan requirements of Washington Administrative Code (WAC) 173 303-300(5) When the final status permit is issued, permit conditions will be incorporated and this document will be revised accordingly

1 1 DESCRIPTION OF UNIT PROCESSES AND ACTIVITIES

The CWC is a nonland-based unit consisting of various buildings, storage modules, and storage pad (Figure 1 1) The CWC structures are used for the storage of waste and are subject to *Dangerous Waste Regulations* WAC 173-303 and 40 Code of Federal Regulations (CFR) 761

The CWC consists of the 2401 W, 2402-W, 2403-W and 2404-W waste storage buildings, Flammable and Alkali Metal Waste Storage Modules, the waste storage pad, and the waste receiving and staging area (Figures 1-2 through 1 8) Further discussion on these structures can be found in Chapter 2 0 of the *Hanford Facility Dangerous Waste Permit Application Central Waste Complex* (DOE/RL-91-17)

1 1 1 How Waste is Accepted, Moved, Processed, and Managed

The following sections and the flowchart on page F2 1 describe the different types of information and knowledge used for waste acceptance

1 1 1 1 Narrative Process Descriptions

The onsite generating unit, offsite generator and treatment, storage, and/or disposal (TSD) unit transferring waste to the CWC is hereafter referred to as a 'generator' unless otherwise denoted in this WAP

Waste that meets land disposal restriction (LDR) requirements, as specified in 40 CFR 268 and WAC 173-303-140, is stored in the CWC Waste not meeting LDR requirements, but awaiting further treatment offsite or onsite either at the Waste Receiving and Processing Facility (WRAP) or the T Plant Complex (T Plant) can be stored at the CWC Unless excepted or otherwise discussed in Section 2 1 of this WAP, the CWC unit-specific operating record will contain information necessary to meet LDR requirements for any waste awaiting further treatment Containerized waste that is not fully characterized or is awaiting sampling results can be stored in CWC The Hanford Facility is required to sample certain waste depending on the type of treatment standard to ensure that the waste or treatment residuals are in compliance with applicable LDR requirements Such testing is performed according to the frequency specified in this WAP

1 1 1 2 Waste Acceptance Process

CWC waste acceptance process consists of following activities

- Waste Stream Approval The generator provides information concerning each waste stream on a waste profile sheet The waste stream information is reviewed against the CWC waste acceptance criteria However, waste that previously was accepted at a Waste Management Project operated TSD unit does not require the development or redevelopment of a waste profile and is exempt from the waste stream approval function If the waste stream information is sufficient and meets the applicable acceptance criteria, the waste stream is approved[1] In addition the initial verification frequency for the waste is determined in accordance with the requirements found in the performance evaluation program (PES) (Section 1 1 1 3) For a more complete description of the waste stream approval process refer to Section 2 1 1

- Waste Shipment Approval The generator provides specific data for each waste container The container data are reviewed against the waste profile sheet data and the CWC acceptance criteria before being approved for shipment In addition the CWC operating organization or its representative, hereafter referred to the 'CWC operating organization', determines if any of the containers require verification based on the verification frequency as determined by PES For a more complete description of the waste transfer/shipment approval process refer to Section 2 1 2

- Verification Verification activities include container receipt inspection and also could include physical screening and/or chemical screening All containers received at the CWC are receipt inspected before acceptance, and a percentage of waste containers are selected for physical and/or chemical screening during the waste shipment approval process These containers can be inspected visually verified by nondestructive examination (NDE) or sampled for field or laboratory analysis to confirm that the waste matches the waste profile and container data information supplied by the generator Any discrepancies between the verification results and the waste profile sheet must be resolved before final acceptance at CWC in accordance with the conformance issue resolution process found in Section 1 1 1 3 3

1 1 1 2 1 Types of Acceptable Knowledge

When collecting documentation on a waste stream or container, the CWC operating organization must determine if the information provided by the generator is acceptable knowledge Acceptable knowledge requirements are met using any one or a combination of the following types of data

- Mass balance from a controlled process that has a specified input for a specified output
- Material safety data sheets (MSDSs) on unused chemical products
- Test data from a surrogate sample
- Analytical data on the waste or a waste from a similar process

In addition, acceptable knowledge requirements can be met using a combination of analytical data or screening results and one or more of the following

- Interview information
- Logbooks
- Procurement records
- Qualified analytical data
- Radiation work package

[1] Approved waste profiles will be retained in the Operating Record and will be made available to regulators upon request

- Procedures and/or methods
- Process flow charts
- Inventory sheets
- Vendor information
- Mass balance from an uncontrolled process (e g , spill cleanup)
- Mass balance from a process with variable inputs and outputs (e g , washing/cleaning methods)

If the information is sufficient to quantify constituents of regulatory concern and determine waste characteristics as required by the regulations and CWC acceptance criteria, the information is considered acceptable knowledge The CWC acceptance criteria is defined as the requirements found in this WAP and the associated Part A, Form 3 (DOE/RL-88 21)

1 1 1 3 Description of Performance Evaluation System

The PES determines the initial physical screening frequency of each generator waste stream PES provides a periodic status of an individual generator's performance for waste received Also, PES provides a mechanism for determining corrective actions, resolving waste acceptance issues, and physical screening frequency adjustments when a problem has been discovered

1 1 1 3 1 Initial Physical Screening Frequency Determination

The initial physical screening frequency is determined based on the following process

- CWC operating organization reviews the generator waste profile information to determine the relative potential for misdesignation or inappropriate segregation based on all relevant information, including any previous experience with the generator Based on this review, CWC operating organization identifies any concerns associated with the following criteria

  - documented waste management program
  - waste stream characterization information
  - potential for inappropriate segregation

- Based on the identification of concerns during the review, the CWC operating organization establishes the initial physical screening frequency for the new generator's waste stream based on the following criteria

  - Initial physical screening frequency of, at a minimum 20 percent No concerns identified

  - Initial physical screening frequency of, at a minimum, 50 percent Concern(s) identified in one criterion

  - Initial physical screening frequency of 100 percent Concerns identified in two or more criteria

1 1 1 3 2 Monthly Performance Evaluation

A performance evaluation is used to trend a generator's performance and is used to raise the generator s overall group of streams physical screening frequency based on the type of issue The evaluation should be objective and should consider the conformance issues documented during the preshipment review and verification functions The CWC operating organization will (1) perform monthly evaluations based on

deficiencies and conformance issues identified, (2) evaluate unsatisfactory performance for corrective actions and (3) adjust physical screening rates accordingly

1 1 1 3 3 Conformance Issue Resolution

Conformance issues identified during verification could result in a waste container that does not meet CWC waste acceptance criteria If a possible conformance issue is identified, the following actions are taken to resolve the issue

- CWC operating organization compiles all information concerning the possible conformance issue(s)
- The generator is notified and requested to supply additional knowledge to assist in the resolution of the concern(s) If the generator supplies information that alleviates the concern(s) identified, no further action is required
- Upon determination that a conformance issue has been identified, the CWC operating organization personnel and the generator discuss the conformance issue and identify the appropriate course of action to resolve the container/shipment in question, i e , pick another sample set, return the container/shipment, divert the container/shipment to another TSD unit that can accept the container/shipment and resolve the issue, or the generator resolves the issue at the TSD unit If the conformance issue(s) results in the failure of a shipment, the physical screening frequency for all streams that could exhibit a similar issue(s) from the generator are adjusted to 100 percent until the issue(s) adequately can be addressed
- On resolution of the initial conformance issue, CWC operating organization requests the generator to provide a corrective action plan (CAP) that clearly states the reason for the failure and describes the actions to be completed to prevent re-occurrence The generator could request a reduction in verification of additional streams the generator believes are unaffected This request must be accompanied by a justification that identifies why this stream(s) would not exhibit the same conformance issue
- CWC operating organization reviews the CAP and stream justification for adequacy If the stream justification is adequate, CWC operating organization could provide an alternative frequency as denoted in Section 1 1 1 3 2

1 1 1 3 4 Process for Reducing the Physical Screening Frequency

Screening rate frequencies and changes to those frequencies could be applied to a specific waste stream, to a specific contractor or to a specific offsite generator based on the circumstances surrounding the conformance issue After the initial screening frequency for a given waste stream has been established or increased, the physical screening frequency can be reduced in accordance with the following process

The physical screening frequency will be reduced in three steps Reduction for all steps is based on the ability to demonstrate that five containers from the waste stream in question pass verification In addition, reduction to the minimum frequency requires that the CWC operating organization documents an acceptable evaluation of the CAP At no time will the physical screening frequency be reduced below 5 percent for waste generated onsite or below 10 percent for offsite generators

- Step 1 Reduce frequency by a maximum of 66 percent after five containers from the waste stream in question pass verification
- Step 2 Reduce frequency established in Step 1 by a maximum of 50 percent or to the minimum

allowable, whichever results in a greater frequency after five containers from the waste stream in question pass verification

- Step 3 Reduce frequency to the minimum allowable after five containers from the waste stream in question pass verification The CWC operating organization documents an acceptable evaluation of the corrective action plan

1 1 2 Process Flow Diagram

Refer to Figure 2-1 for the waste analysis plan flowchart and Section 1 1 for description

1 1 3 Operating Conditions

The following conditions and constraints apply to waste accepted at CWC The waste container weight must be known and proper handing procedures imposed to ensure safe operations The waste container radiation dose must be known and procedures must ensure that personnel exposure is kept as low as is reasonably achievable (ALARA) The quantity of fissile material within the waste must be determined and must be low enough to prevent a criticality hazard Liquid waste is allowed when packaged in compatible inner containers, surrounded with a sufficient quantity of sorbent to sorb the total liquid quantity of the waste package Residual liquid is allowed when sorbent is placed in the bottom of the outer container or is dispersed among the waste in sufficient quantity to sorb the total residual liquid content of the waste package Containers of waste that cause pressurization must be vented Radionuclide and dangerous waste constituent inventories in waste containers must be kept low enough to ensure that personnel emergency exposure limits are not exceeded

The Part A, Form 3, permit application for CWC identifies dangerous waste numbers, quantities, and design capacity (DOE/RL-88 21)

Dangerous and/or mixed waste with waste numbers not identified on the CWC Part A Form 3, will not be managed at CWC Additionally, waste for which CWC is unable to obtain the information required by WAC 173 303 300 will not be managed in CWC

1 2 IDENTIFICATION AND CLASSIFICATION OF WASTE

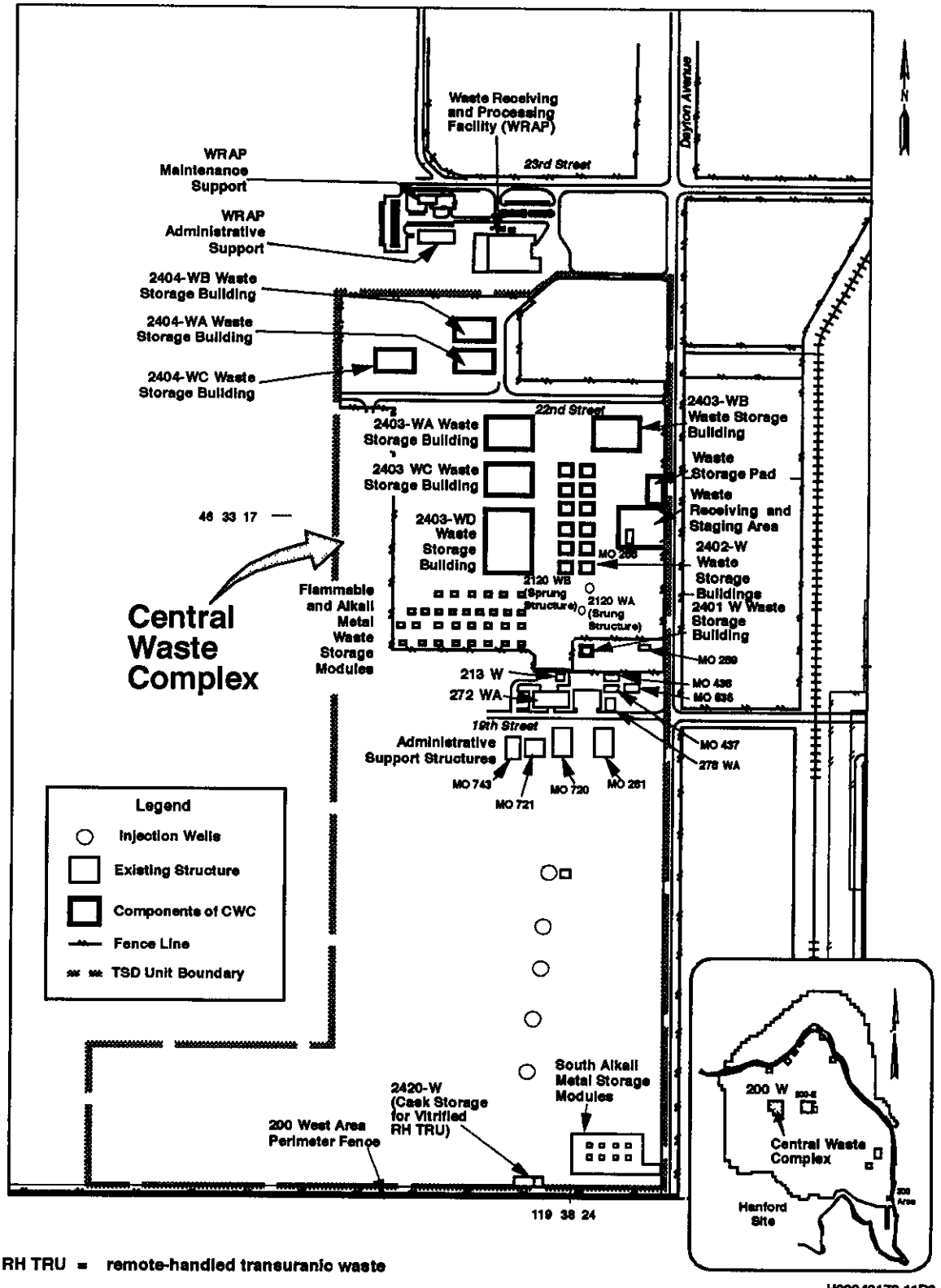
Waste is accepted for treatment (mixed waste) and/or storage (mixed and dangerous) in CWC except for the following waste types

- Bulk liquid waste
- Explosive waste
- Shock sensitive waste
- Class IV oxidizer waste
- Infectious waste

CWC manages the following waste types

- Labpack liquids
- Solids/debris
- Sludges/soils

These waste types could be classified as transuranic, low-level mixed, and/or dangerous Unless otherwise prohibited by this WAP, the waste could exhibit the characteristics of ignitable, toxic, corrosive, and/or reactive In addition to the waste received at CWC for verification or reprocessing, CWC generates mixed and dangerous waste This waste material consists of items such as personal protective equipment (PPE), rags, and spent equipment contaminated with dangerous cleaning agents, lubricants, paints, or other dangerous materials Process knowledge, field screening, or sampling and analysis are used as appropriate to characterize these waste materials Field screening and sampling are in accordance with this WAP and occur at the point of waste generation or at the location where the waste materials are stored



RH TRU = remote-handled transuranic waste

Not to scale

Refer to topographic map (H 13-000003) for detail

Figure 1-1 Central Waste Complex Site Plan

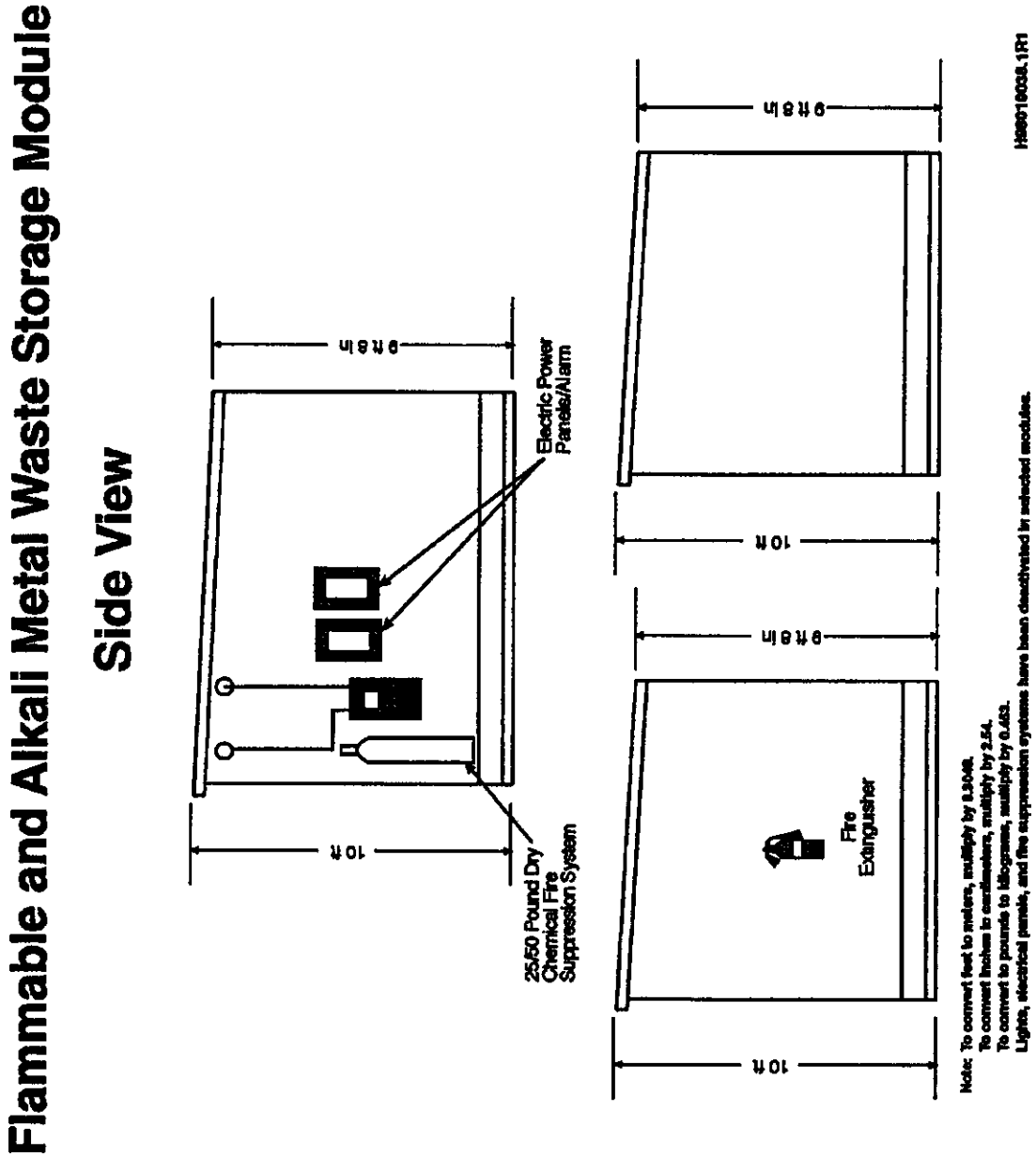


Figure 1-2 Flammable and Alkali Metal Waste Storage Building

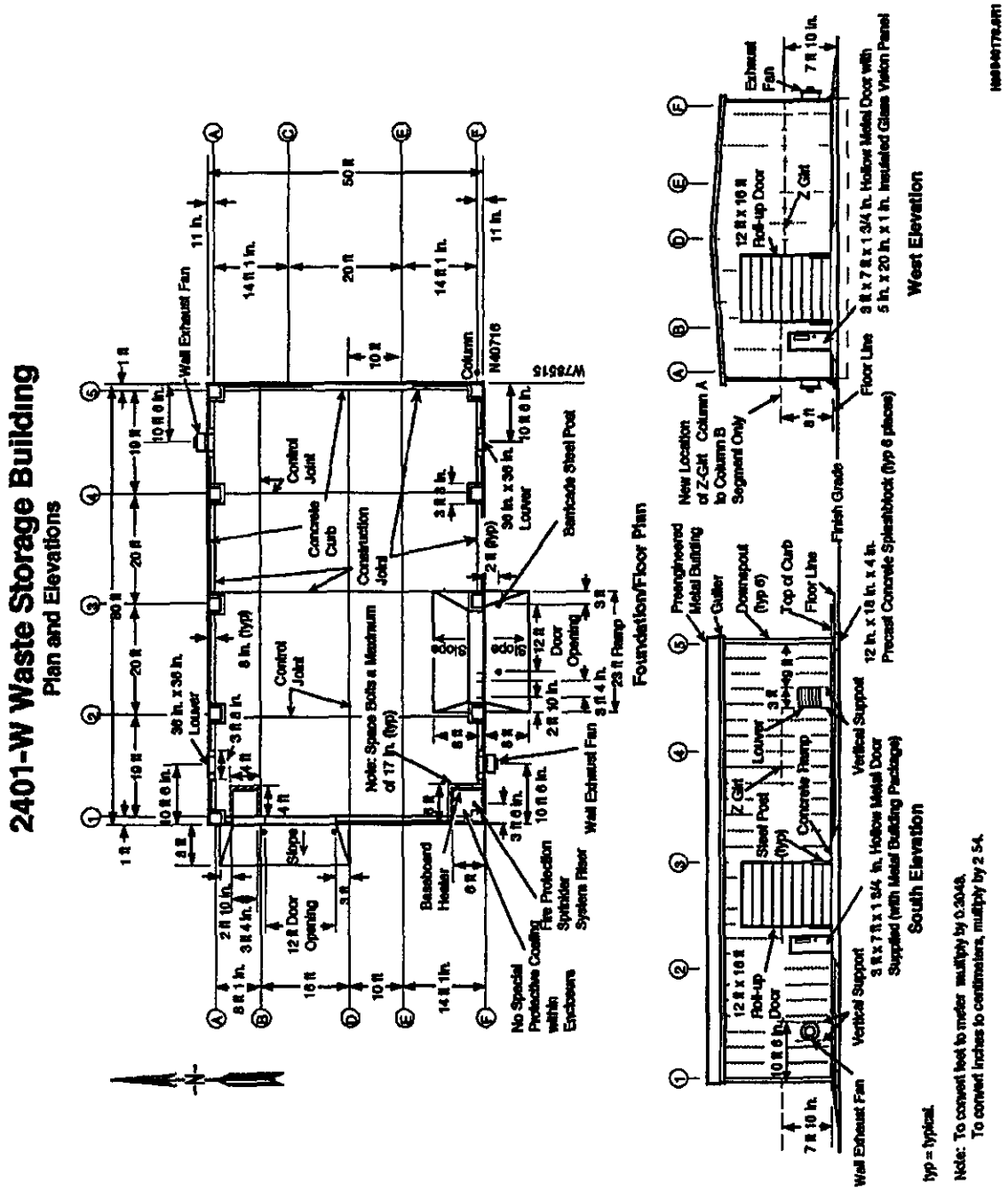


Figure 1-3 2401-W Waste Storage Building

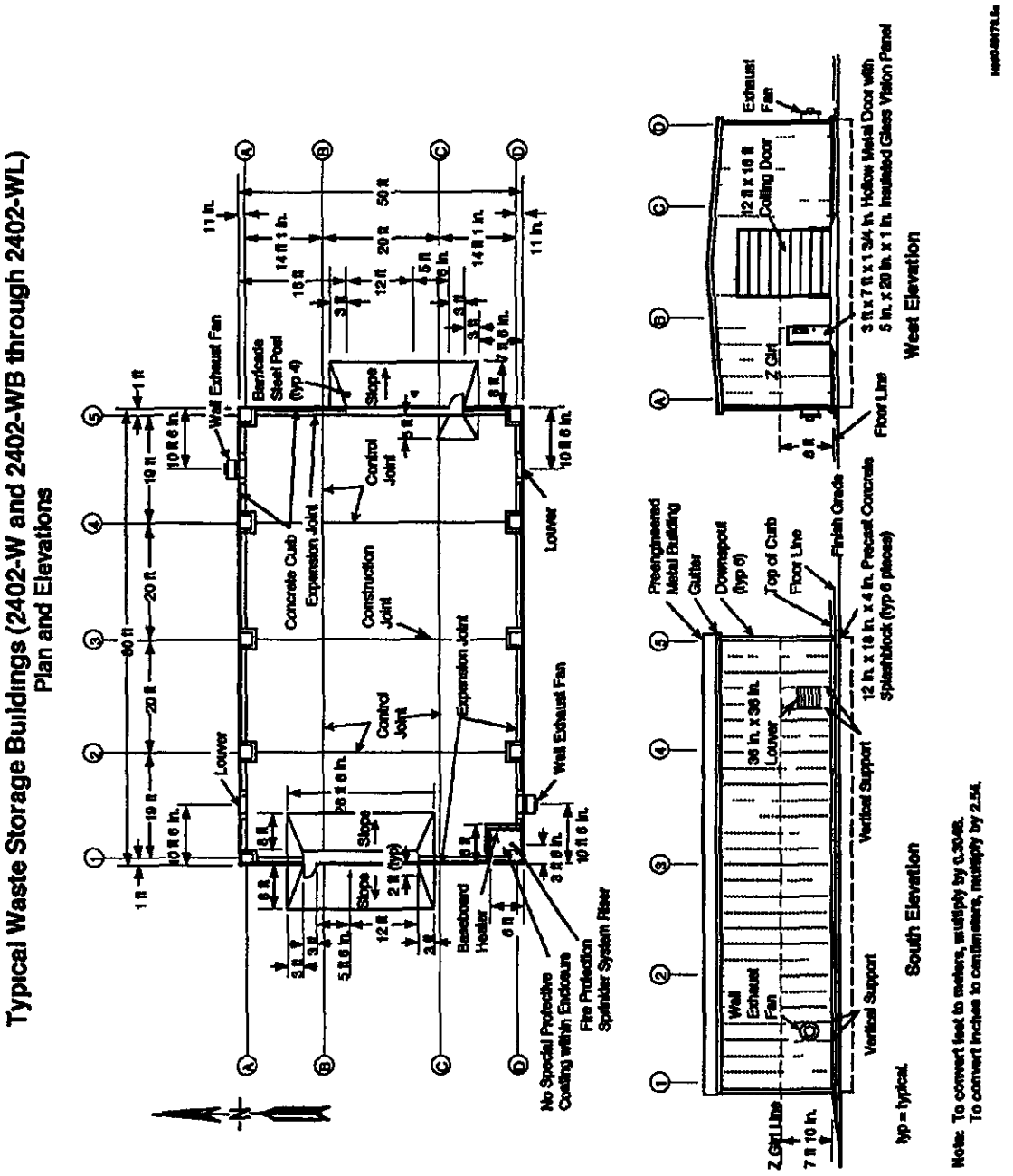


Figure 1-4 2402-W Waste Storage Building

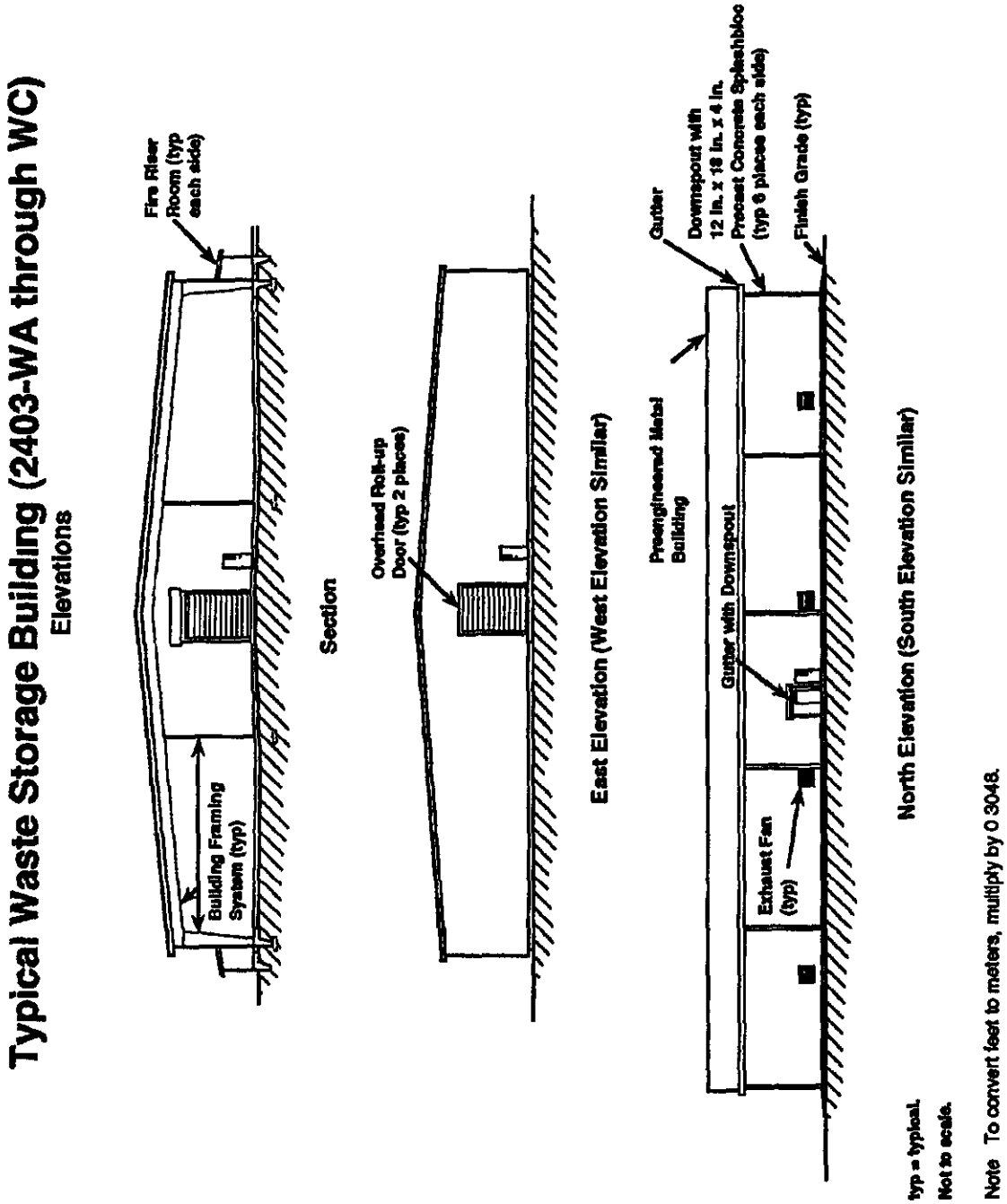


Figure 1-5 2403 WA through WC Waste Storage Building

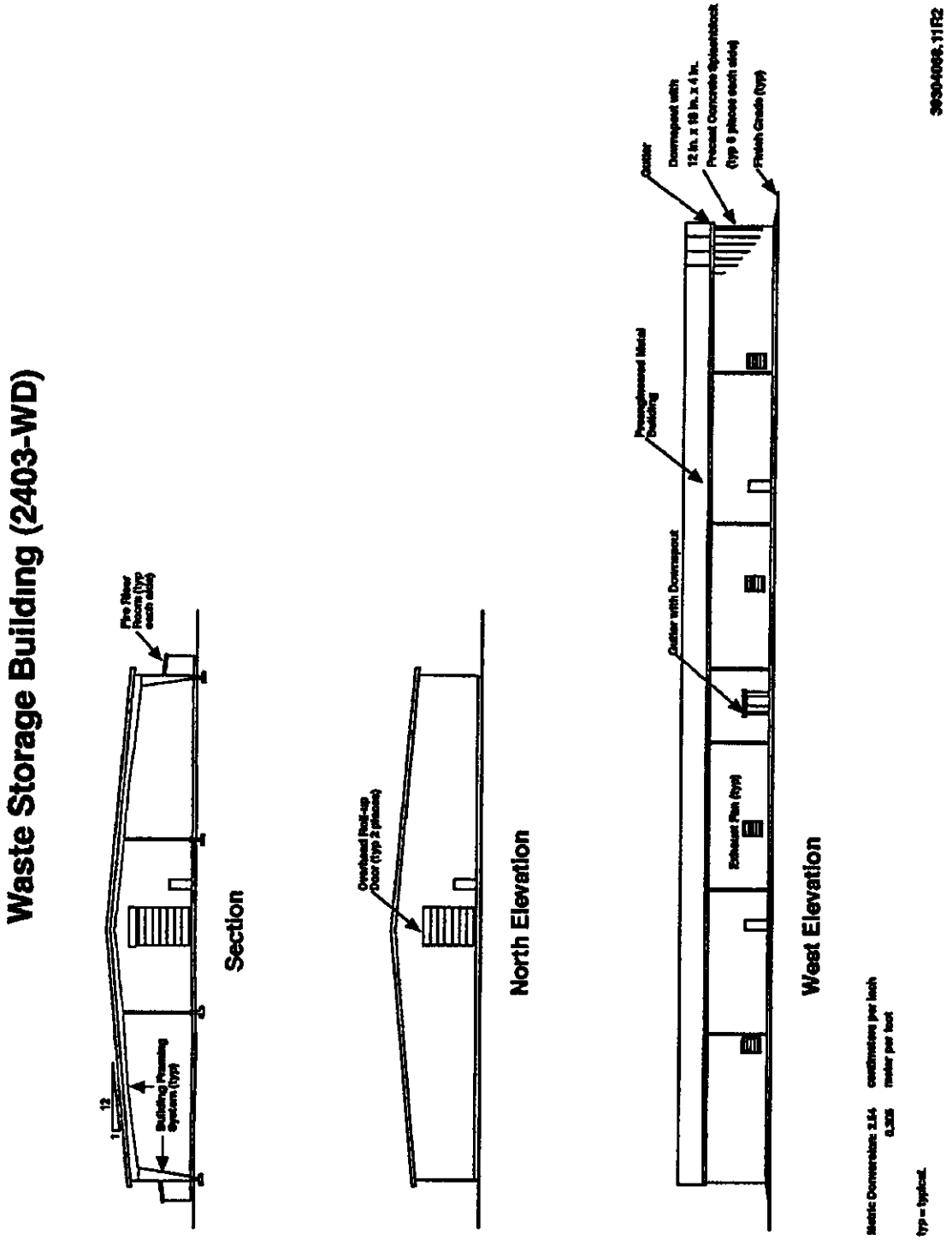


Figure 1-6 2403 WD Waste Storage Building

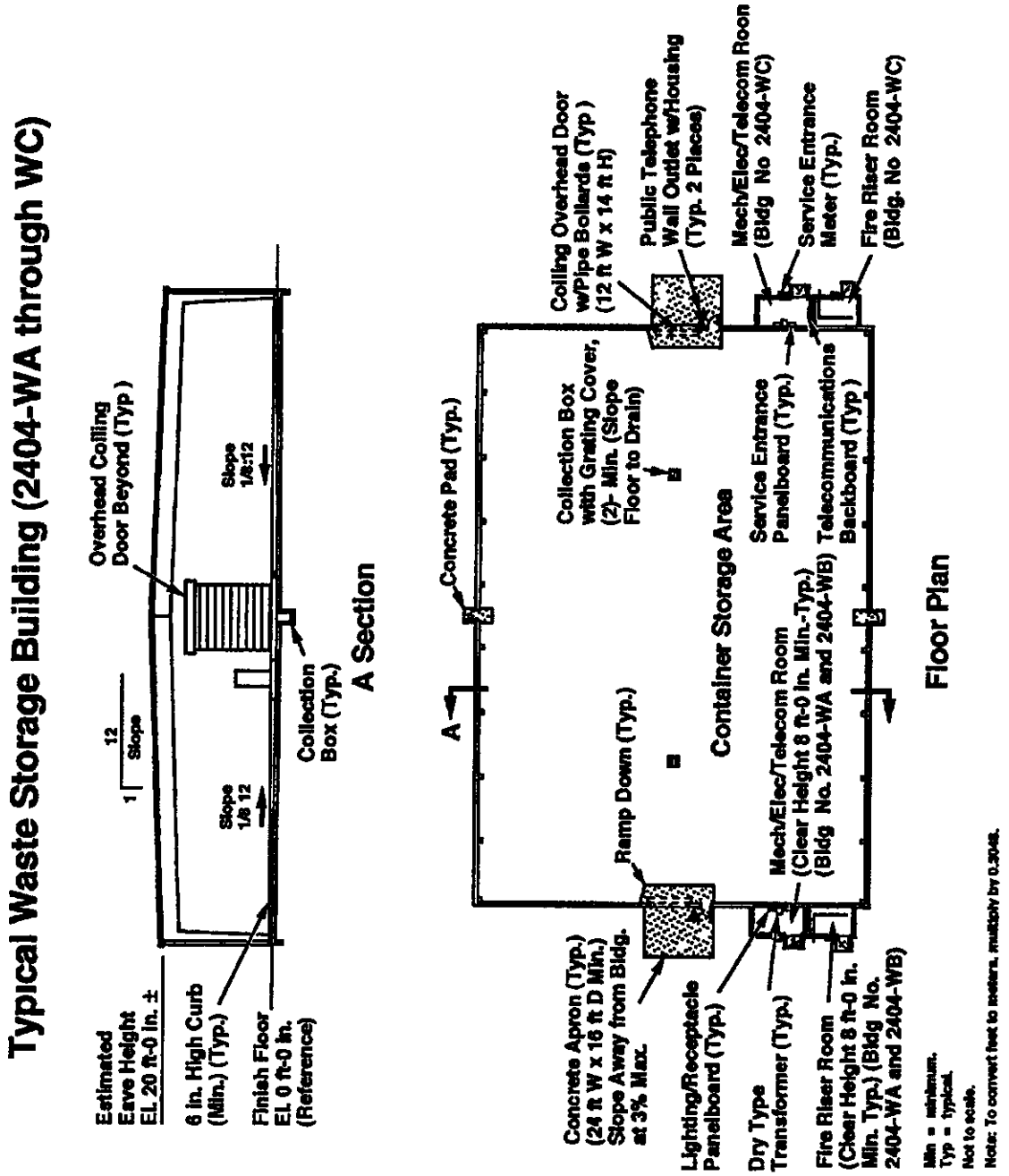


Figure 1-7 2404-W Waste Storage Buildings

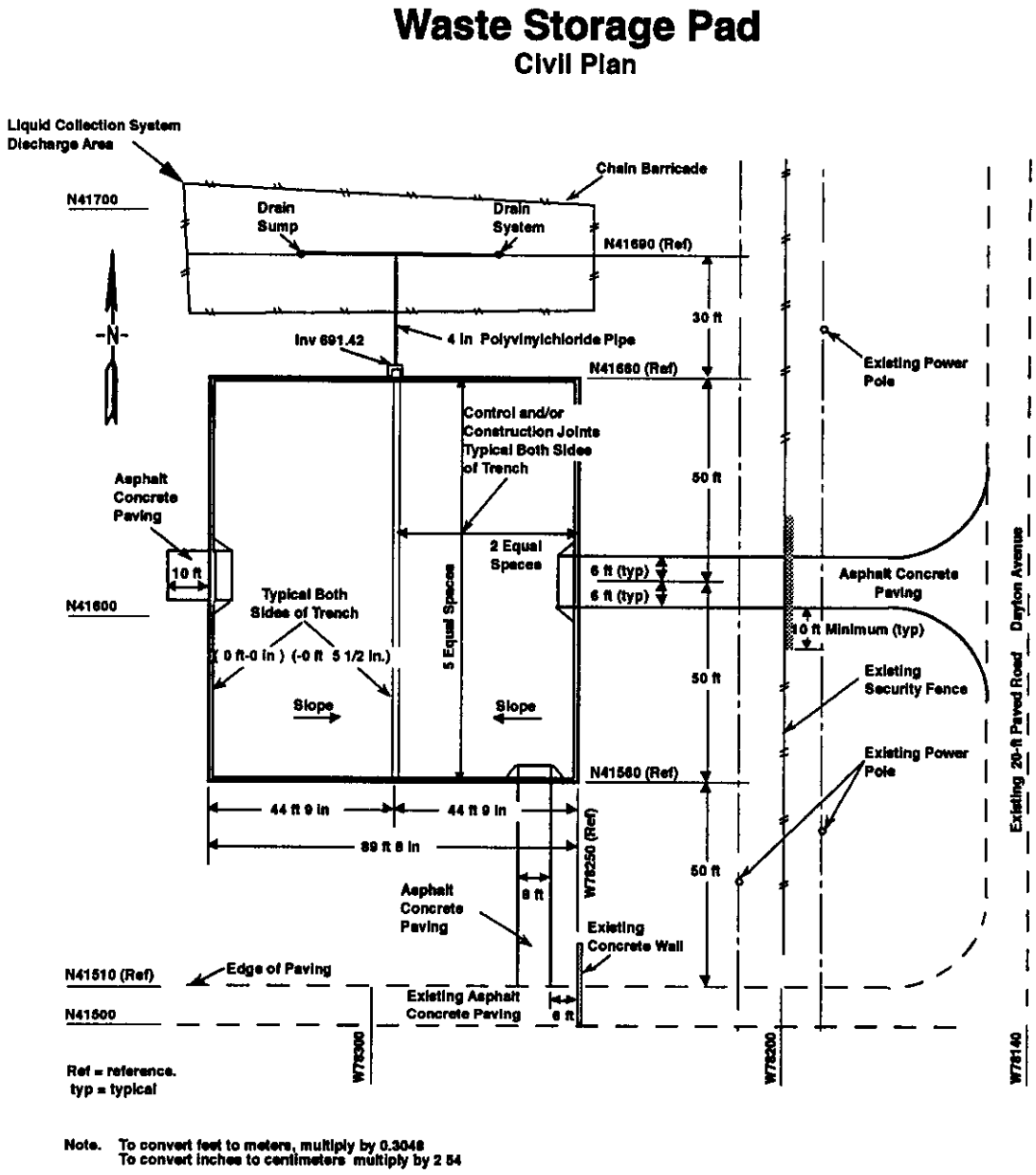


Figure 1-8 Waste Storage Pad

2 0 CONFIRMATION PROCESS

The confirmation process includes completing appropriate pre-shipment reviews and verification steps and/or parameters

2 1 PRE-SHIPMENT REVIEW

Pre-shipment review takes place before waste can be scheduled for transfer or shipment to CWC The review focuses on whether the waste stream is defined accurately, meets the CWC waste acceptance criteria, and the LDR status is determined correctly Only waste determined to be acceptable for treatment and/or storage is scheduled This determination is based on the information provided by the generator Except for waste transfers among Waste Management Project operated TSD units, the pre shipment review consists of the waste stream approval and waste shipment approval process Previously accepted waste that is transferred from one Waste Management Project operated TSD unit to another does not require the development or approval of a profile The following sections discuss the pre shipment review process The information obtained from the generator during the pre-shipment review at a minimum, includes all information necessary to safely treat and/or store the waste The pre-shipment review ensures the waste has been characterized and the data provided qualify as 'acceptable knowledge' (Section 2 1 3)

2 1 1 Waste Stream Approval Process

The waste stream approval process consists of reviewing stream information supplied on a waste stream profile and attached analysis At a minimum, the profile requests the following information

- Generator information (e g , name, address, point of contact, telephone number)
- Waste stream name
- Waste generating process description
- Radiological knowledge (e g , classification, reportable radionuclides, characterization method)
- Chemical characterization information (e g , characterization method(s), chemicals present, concentration ranges)
- Designation information
- LDR information including identification of underlying hazardous constituents if applicable
- Waste type information (e g , physical state, sorbents used, inert materials, stabilizing agents used)
- Packaging information (e g , container type, maximum weight, size)
- Attachments could consist of container drawings, process flow information, analytical data, etc

In some cases such as variable waste streams, the profile information can be general in nature In these cases, more detailed information will be gathered during the waste shipment approval process This information is reviewed against the CWC waste acceptance criteria to ensure the waste is acceptable for receipt If discrepancies are found during this review, additional information is requested that could include analytical data or a sample to be analyzed If the waste cannot be received, the CWC operating organization will pursue acceptance of the waste at an alternative TSD unit or request the generator to pursue acceptance at an offsite facility

On determination that the waste is acceptable, the CWC operating organization assigns the profile to a waste management path and establishes a waste verification frequency based on the requirements found in Sections 1 1 1 3 and 2 2 2 2

2 1 2 Waste Shipment Approval Process

For each waste transfer or shipment that is a candidate for treatment and/or storage, the generator provides the following information

- Container identification number
- Profile number (except for waste transfers of previously accepted waste)
- Waste description
- Generator information (e g name, address, point-of-contact, telephone number)
- Container information (e g , type, size, weight)
- Waste numbers
- Extremely hazardous waste or dangerous waste
- Dose rate information
- Reportable radionuclides and quantities
- Waste composition
- Packaging materials and quantities

The pertinent information is entered into Solid Waste Information Tracking System (SWITS) Figure 2 1 is the waste acceptance process

Where potential nonconformances exist in the information provided (i e , waste characteristics do not match the waste profile information/CWC waste acceptance criteria, or additional constituents are expected to be present that do not appear on the documentation), the generator is contacted by the CWC operating organization Refer to Section 6 0 for discussion on repeat and review frequency

For each container, a technical review, physical screening determination, and chemical screening determination are performed as follows

- **Technical review** Individual container data on waste not previously accepted are compared to the waste profile data to ensure the waste to be transferred/shipped to CWC is as described by the waste profile Every transfer or shipment is reviewed to ensure the waste meets the CWC waste acceptance criteria

  Based on waste identification information provided, the waste designation is reviewed to ensure consistency with waste designations per WAC 173-303 070, as well as for technical accuracy to ensure the waste meets the waste acceptance criteria

If the transfer or shipment information is found to be acceptable, the CWC operating organization determines if any of the waste containers will be physically or chemically screened

- **Physical screening determination** Containers are chosen based on the methodology described in this section The first criterion is based on whether pre-shipment review activities (document and characterization review) identify areas of potential concern The second criterion is reviewing the current physical screening percentage to ensure that the minimum physical screening confirmation rates and stream criteria required by this WAP are met

  - The number of containers initially selected for physical screening constitutes a sample set

  - Individual containers within a transfer or shipment are selected based on a review of the contents listed in the associated documentation

  - Containers are selected at random unless variability within the stream is noted In this case containers representing different variations are selected (e g , wood debris versus metallic debris)

- **Chemical screening determination** Individual containers within a transfer or shipment are selected based on a review of the contents listed in the associated documentation Containers are selected at random unless variability within the stream is noted In this case, containers representing different variations are selected (e g used oil spent solvent)

On determining whether the transfer or shipment will be verified the transfer or shipment is scheduled

2 1 3 Acceptable Knowledge Requirements

The CWC operating organization ensures that all information used to make waste management decisions are based adequate characterization data, as described in the following sections The CWC operating organization evaluates the data to ensure that the data are adequate acceptable knowledge for management of the waste

2 1 3 1 General Acceptable Knowledge Requirements

Adequate acceptable knowledge includes (1) general waste knowledge requirements, (2) LDR waste knowledge requirements and/or (3) waste knowledge exceptions

(1) **General Waste Knowledge Requirements** At a minimum, the generator supplies enough information for the waste to be treated and/or stored at CWC The minimum level of acceptable knowledge consists of designation data where the constituents causing a waste number to be assigned are quantified, and the data address any CWC operational parameters necessary for proper management of the waste

Where the available information does not qualify as acceptable knowledge or is not sufficient to characterize a waste for management, the sampling and testing methods outlined in WAC 173-303 110 must be used to determine whether a waste designates as toxic characteristic, corrosive, and/or contains free liquids

If a generator's process knowledge indicates that constituents, which if present in the waste might

cause the waste to be regulated are input to a process but not expected to be in the waste sampling and analysis must be performed to ensure the constituents are not present above regulatory limits in the waste This requirement can be met through chemical screening as long as the constituents of concern can be measured by the screening method This sampling and analysis is required only for initial characterization of the waste stream

(2) **LDR Waste Knowledge** Waste might be stored in CWC while awaiting analytical results for LDR requirements The CWC operating record contains all information required to document that the appropriate treatment standards have been met or will be met after the waste is treated unless otherwise excepted in this section

For the purposes of this WAP a representative sample is required to demonstrate compliance with a concentration based treatment standard (refer to Section 4 5) Corroborative testing for the sample could be accomplished in the following manner

- Generators could use onsite laboratories or other laboratories to certify that the waste meets LDR requirements For waste that does not meet LDR requirements, the generator must supply information on the treatment methods necessary to meet LDR requirements and in accordance with WAC 173-303 380(1)(o)

- The CWC operating organization uses these analytical data to ensure that the applicable requirements found in 40 CFR 268 7 and WAC 173-303 140(4) are met

(3) **Waste Knowledge Exceptions** In some situations, full characterization of waste for cradle to grave management is not possible or feasible before receipt at CWC for storage For storage purposes, waste analysis requirements could be met through application of partial acceptable knowledge when such knowledge provides sufficient information to ensure that waste will be stored properly Acceptable knowledge could be used to accommodate storage at CWC for the following

- Waste previously disposed before the effective date of the regulation that has been or will be retrieved for storage at CWC, and for which adequate information has been obtained to ensure proper storage at CWC

- Waste placed in storage before the effective date of this waste analysis plan for which adequate information has been obtained to ensure proper storage at CWC

- Newly-generated waste for which adequate information has been obtained to ensure proper storage at CWC

For situations in which acceptable knowledge has been used to accommodate storage, such information will be supplemented as necessary before treatment and/or disposal of the waste

2 1 3 2 Methodology to Ensure Compliance with Land Disposal Restrictions Requirements

All generators are subject to LDR requirements and are required to submit all information notifications and certifications described in WAC 173 303-380(1)(n) or (o) Mixed waste not meeting the treatment standards, but meeting the CWC waste acceptance criteria, can be stored at CWC (refer to Chapter 1 0, Section 1 1 1 1) The following are general requirements for offsite notifications or onsite information and supporting documentation

- The waste is subject to LDR and the generator has treated the waste The generator supplies the appropriate LDR certification information (40 CFR 268)

- The waste is subject to LDR and the generator has determined that the waste meets the LDR as generated The generator develops the certification based on process knowledge, and/or analytical data and supplies the appropriate LDR certification information necessary to demonstrate compliance with the LDR treatment standards of 40 CFR 268 and WAC 173 303 140 State-only LDRs do not require this type of certification

- The waste is subject to LDR and requires further treatment to meet applicable treatment standard The generator supplies additional information concerning the waste and details any treatment necessary to meet applicable treatment standards

When demonstrating that a concentration-based treatment standard has been met, a representative sample of the waste must be submitted for analysis This sample could be taken by the CWC operating organization or the generator, and is required to comply with the treatment standards contained in 40 CFR 268 40 and 268 48

2 2 VERIFICATION

Verification is an evaluation performed by the CWC operating organization to substantiate that the waste received at CWC is the same as represented by the analysis supplied by the generator for the pre-shipment review Verification is performed on waste received by CWC Verification includes container receipt inspection, physical screening, and chemical screening Waste is not accepted by CWC for treatment and/or storage until required elements of verification have been completed, including evaluation of any data obtained from verification activities

All discrepancies identified during the verification process are resolved in accordance with Section 1 1 1 3 3

2 2 1 Container Receipt Inspection

The container receipt inspection is a mandatory element of the confirmation process Therefore, 100 percent of the transfers/shipments are inspected for damage and to ensure the waste containers are those indicated on the documentation This activity is a mechanism for identifying any document discrepancies or damaged containers before acceptance The container receipt inspection is performed by the CWC operating organization at CWC or at another onsite location The CWC operating organization ensures that the transfer/shipment (1) is received in good condition, (2) is the waste indicated on the manifest or shipping papers, (3) has not been opened improperly after physical and/or chemical screening was performed and (4) is complete

2 2 2 Physical Screening Process

Physical screening is considered an additional verification element This section describes the requirement pertaining to methods, frequency, and exceptions concerning the use of physical screening as a verification activity Physical screening could be performed before the waste is transferred/shipped to CWC When screening is performed at a location not within the Waste Management Project (e g ,

WRAP T Plant Complex, Low-Level Burial Grounds), unique tamper resistant seals are applied to each container examined Selection, interpretation, and performance of the appropriate physical screening method(s) are conducted by qualified personnel

2 2 2 1 Physical Screening Methods

Each of the following physical screening methods, listed in order of preference, complies with the requirement to verify a waste If a method other than 1 or 2 is used, the reasoning behind the method chosen must be documented in the operating record (refer to Section 3 1 for the criteria for choosing a physical screening method)

1 Visual inspection (opening the container)
2 NDE
3 Nondestructive assay (NDA)
4 Dose rate profile

Refer to Section 2 2 5 for quality control pertaining to physical screening

2 2 2 2 Physical Screening Frequency

The minimum physical screening frequency is 5 percent for onsite generators applied per waste stream[2] per subcontractor per year For offsite generators, the minimum physical screening frequency is 10 percent per waste stream per generator per year The CWC operating organization adjusts the physical screening frequency for generators based on objective performance criteria (refer to Section 1 1 1 3 1)

In the event that one of the containers in the original sample set fails, a second sample set of equal size, or a minimum of three additional containers, is selected First and second sample sets are selected using the rationale described in the pre-shipment review section (Section 2 1) A second failure in either the first or the second sample set constitutes failure of the transfer/shipment If the second sample set passes the inspection the single failed container is considered an anomaly and the remainder of the transfer/shipment passes verification All failed containers and transfer/shipments are dispositioned via the PES as described in Section 1 1 1 3

When physical screening is performed at a location not within the Waste Management Project, tamper resistant seals are applied to each outer container examined

2 2 2 3 Physical Screening Exceptions

The following exceptions to the physical screening process outlined previously have been developed

- Shielded, classified, transuranic (TRU) retrieved waste and remote-handled mixed waste are not required to be physically screened, however, the CWC operating organization must perform a more rigorous documentation review and obtain the raw data used to characterize the waste (<1 percent of current waste receipts) For classified waste, it is necessary to have an appropriate U S Department

[2] The term waste stream as referred to in the context of physical screening frequencies refers to general waste grouping for treatment/disposal and should not be equated to the waste stream referred to in the waste profile discussion

of Energy security clearance and a need to know the information as defined by the classifying organization or agency

- Waste that physically cannot be screened at CWC or associated screening facility must be physically screened at the generator location (e g large components, containers that cannot be opened are greater than 20 mrem per hour, contain greater than 10 nanocuries per gram of TRU radionuclides, or will not fit into the NDE unit) If no location can be found to perform the physical screening no screening is required

- Waste that is packaged by the CWC operating organization is considered to have met the physical screening requirements noted in this WAP (e g , CWC operating organization packaged waste that is transferred to a Waste Management Project managed unit) On closure of the container, tamper resistant seals must be applied to ensure the integrity of the contents

2 2 3 Chemical Screening Process

Chemical screening is considered an additional verification element This section describes methods, frequency, and exceptions for chemical screening Chemical screening could be performed by the CWC operating organization before waste is transferred/shipped to CWC After chemical screening is performed, tamper resistant seals are applied on each outer container screened The requirements described for tamper resistant seals used for physical screening apply for chemical screening as well

Selection, and interpretation, and performance of the appropriate chemical screening method(s) are conducted by qualified personnel Unless otherwise noted, tests are qualitative not quantitative The objective of chemical screening is to obtain reasonable assurance that the waste received is consistent with the description of the waste on the waste profile, and to provide information that will be used to safely manage the waste The following tests are selected depending on the waste matrix and the applicability of the method A minimum of three listed screening tests, including pH screening are conducted on each sample If less than five of the following methods are selected, the rationale is recorded by the qualified analyst

The following tests are conducted on all samples collected for chemical screening

- pH
- Peroxide
- Oxidizer
- Water reactivity

Additionally the following screening tests could be performed as needed

- Halogenated organic carbon (chlor n oil/water/soil)
- Ignitability/headspace screening for volatile compounds
- Sulfide
- Cyanide
- Paint filter liquids test

Refer to Section 2 2 5 2 for quality control pertaining to chemical screening

2 2 3 1 Chemical Screening Frequency

At a minimum 10 percent of the mixed waste containers verified by physical screening (Section 2 2 2 2) must be screened chemically Although grab samples are acceptable, the CWC operating organization obtains a representative sample

Small containers of waste (labpacks), not otherwise identified in the exceptions, packaged in accordance with 40 CFR 265 316 and WAC 173 303 161 are screened chemically in accordance with the waste stream chemical screening frequency as determined by PES (Section 1 1 1 3) Inner containers are segregated by physical appearance At least one container from each group (or three containers if all are similar) are screened chemically

2 2 3 2 Chemical Screening Exceptions

The following are cases in which chemical screening is not required

- Small containers of waste in overpacked containers (labpacks) packaged in accordance with WAC 173 303 161 and not prohibited under LDR specified in WAC 173-303 140
- Waste exempted from the physical screening requirements (Section 2 2 2 3) is exempted from chemical screening
- Commercial chemical products in the original product container(s) (e g , off-specification, outdated or unused products)
- Chemical containing equipment removed from service, (e g , ballasts, batteries)
- Waste containing asbestos
- Waste, environmental media, and/or debris from the cleanup of spills or release of single substance or commercial product or otherwise known material (e g , material for which an MSDS can be provided)
- Confirmed noninfectious waste (e g , xylene, acetone, ethyl alcohol, isopropyl alcohol) generated from laboratory tissue preparation, slide staining, or fixing processes
- Hazardous debris as defined in WAC 173 303-040

Other special cases could be exempted from chemical screening on a case-by-case basis

2 2 4 Sampling for Confirmation Screening

Sampling is performed in accordance with WAC 173-303-110(2) A representative sample is obtained for chemical screening The chemical screening methods described in Section 3 0 do not require any sample preservation methods because the screening tests are performed at the time and location of sampling or as soon as possible thereafter During the interim period, the samples are stored in a manner that maintains chain of custody and protects the sample composition

The equipment requirements in Section 4 0, Table 4-1, apply to sampling for chemical screening In addition, the following sampling equipment could be used in sampling for chemical screening (1) for liquids and slurries – dip, tank, bomb, and bailer samplers, as well as tube-type samplers (e g , thin-walled Shelby tubes, split spoons, probes, pipettes), and for sludges and solids – tube-type samplers (as previously mentioned) and augers, and for small containers, a spoon could be used in place of a scoop

2 2 5 Quality Assurance and Quality Control for Confirmation Process

The following quality assurance (QA) and quality control (QC) elements are used by the CWC operating organization to ensure confirmation activities provide sufficient data to provide an indication that waste received is as described in the transfer/shipment documentation

2 2 5 1 Physical Screening Quality Control

This section describes the QC used by the CWC operating organization or its representative to ensure that quality data are obtained when performing physical screening methods identified in Section 2 2 2, except visual inspection Visual inspection does not consist of the use of instrumentation or chemical tests Therefore QC for visual inspection depends on appropriate training for the individual(s) performing the test For the remaining physical screening tools (NDE, NDA, and dose rate profile), QC for these methods is incorporated in accordance with manufacturer s instructions or site specific protocols If any results are questionable, those affected containers must be re evaluated and handled appropriately

2 2 5 2 Chemical Screening Quality Control

This section describes the QC used by the CWC operating organization or its representative to ensure that appropriate data are obtained when performing chemical screening methods identified in Section 2 2 3

The following applies for all chemical screening parameters

- Each lot will be evaluated to determine that the lot is useable Unstable reagents will be accounted for when determining the usability of the lot
- For each lot, the source concentration, date of receipt, lot number, and manufacturer/preparer (as applicable) will be maintained in a logbook
- For individual chemical screening parameters, QC checks will be performed in accordance with manufacturer's instructions or site specific protocols

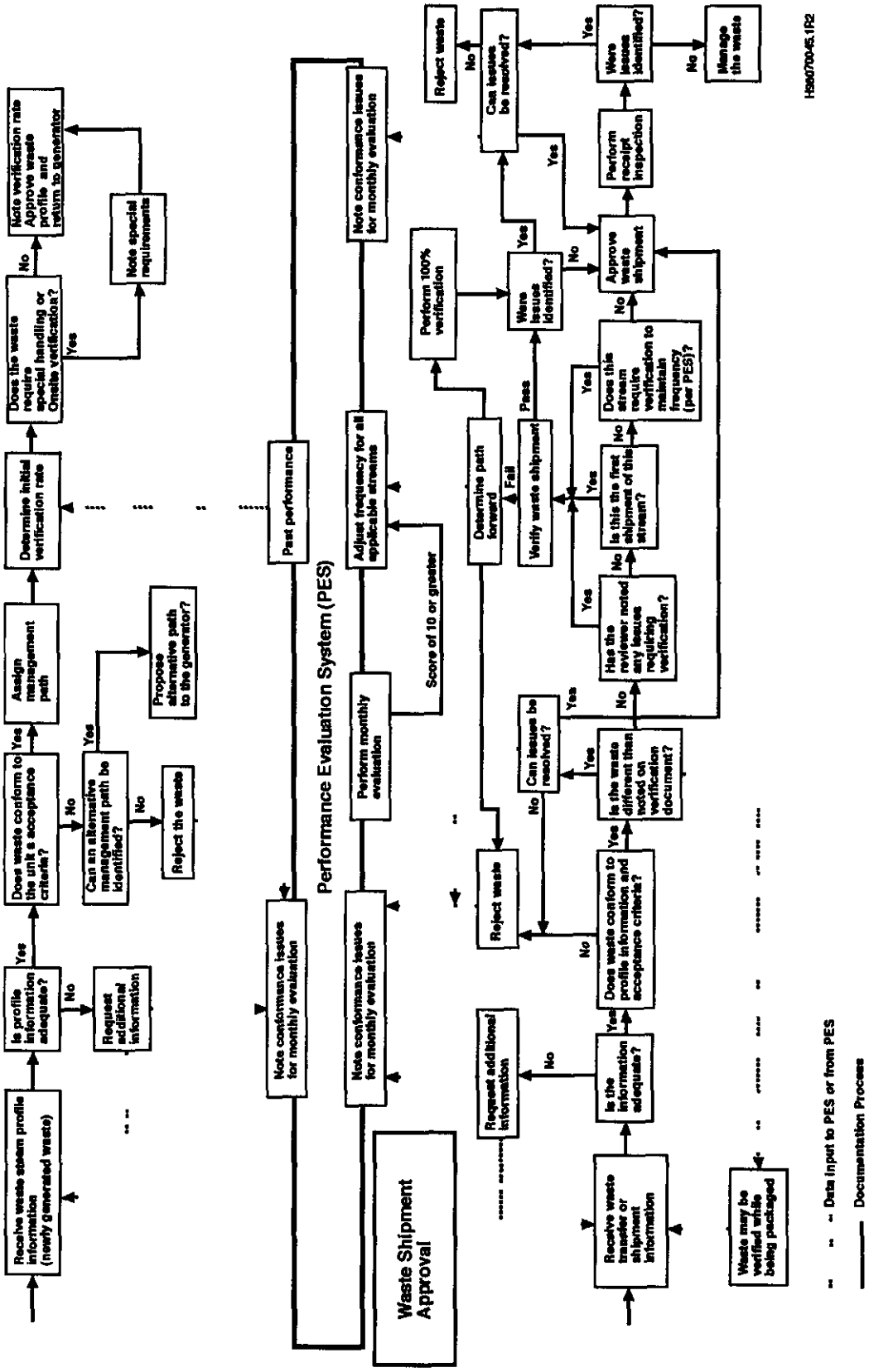


Figure 2 1 Waste Acceptance Process

3 0 SELECTING WASTE ANALYSIS PARAMETERS

Physical and chemical screening parameters for verification must be chosen from those in Section 3 1 and 3 2 Other sampling and analysis parameters are addressed in Section 3 3

3 1 PHYSICAL SCREENING PARAMETERS

The following methods are approved for use in performing physical screening These methods are listed in order of preference If a method other than 1 or 2 is used, the reasoning behind the method selection will be documented

(1) Visual inspection (preferred method for physical screening)

Rationale This method meets the requirement to ensure consistency between waste containers and the accompanying transfer/shipment documentation

Method The container is opened and the contents are removed as needed for visual examination Homogenous loose solids are probed to determine the presence of material not documented or for improperly sorbed liquids Visual observations are compared with the applicable profile information and the container specific information in the transfer/shipment documentation

Failure criteria A container fails the inspection for any of the following reasons (a) undocumented or improperly packaged waste, (b) discovery of prohibited articles or materials listed in Section 1 2 (c) discovery of material not consistent with the applicable waste stream profile, and (d) variability greater than 25 percent by volume in listed constituents (e g paper plastic, cloth, metal)

(2) NDE

Rationale This method meets the requirement to ensure consistency between waste containers and the accompanying transfer/shipment documentation This method also is subject to the QA checks listed in Section 2 2 5 1 Containers that are not easily amenable to visual inspection because of physical or radiological content, or facility availability, can be safely and economically examined

Method The container is scanned with a NDE system Data are observed on a video monitor and captured on video tape Personnel experienced with the interpretation of NDE imagery record their observations These observations are compared to the contents listed on the transfer/shipment documentation

Failure criteria A container fails the inspection for any of the following reasons (a) undocumented, improperly packaged, or inadequately sorbed liquids, (b) discovery of prohibited articles listed in Section1 2, (c) image data not consistent with the applicable waste stream profile, and (d) variability greater than 25 percent by volume in listed constituents (e g , paper, plastic, cloth, metal)

(3) NDA

Rationale This method is available for obtaining data that can be compared with accompanying transfer/shipment documentation for consistency on containers that cannot be opened for visual inspection, and cannot be examined by NDE (e g , high container dose rate, shielding) The reason for selection of this method is documented

Method Radioactive waste is assayed in one or both of two different assay systems The assay systems include gamma energy analysis (GEA) and imaging passive/active neutron (IPAN) Gamma emitting radionuclides are detected in the GEA assay system This instrument determines the type and quantity of radionuclides based on their gamma energy spectrum IPAN uses passive and active neutron detection to determine the presence of fissionable radionuclides Passive detection results are equated with Pu 240 and active detection results are equated with Pu 239 The curie amount of low energy gamma emitting radionuclides, other fissile and non-fissile alpha emitting radionuclides, and beta emitting radionuclides are calculated from the GEA and IPAN data and the generator supplied radionuclide information Radionuclide ratios are calculated by dividing the activity of each radionuclide reported by the activity of the most prominent radionuclide

Failure criteria A container fails the assay if the difference between the reported radionuclide ratios and the measured ratios and the reported and measured curie amounts exceed 50 percent The failure criteria are adjusted based on the density of the waste and the amount of fissionable material present

(4) Dose rate profile

Rationale This method is used to obtain data that can be compared for consistency with the transfer/shipment documentation for a container This method is used only when the previous three methods cannot be performed for technological or ALARA reasons (e g , container size, weight, shielding, dose rate) The reason for selection of this method is documented

Method A portable dose rate meter is used to determine the contact dose rate at six evenly distributed points on the exterior of the waste package The six readings obtained are recorded and averaged The average reading is compared with the container contact dose rate recorded on the transfer/shipment documentation

Failure criteria If the average dose rate observed during the dose rate profile examination differs from that recorded on the transfer/shipment documentation by more than 100 percent, the container fails

3 2 CHEMICAL SCREENING PARAMETERS

The following methods are approved for use in performing chemical screening

(1) Ignitability and/or headspace volatile organic compound screening

Rationale To determine the potential ignitability and the presence or absence of volatile organic compounds in waste, and to ensure personnel adequately are protected This method is used when containers are opened for inspection This method can be applied to any matrix

Method A sample of the headspace gases in a container is analyzed by one or more of the following types of portable instrumentation organic vapor monitor, colorimetric gas sampling tubes, or a lower explosive level meter

Tolerance High organic vapor readings in matrices not documented as having volatile organic content constitutes failure

(2) Peroxide screening

Rationale To determine the presence of organic peroxides in solvent wastes, to alert personnel to potential hazards, to ensure safe segregation and storage of incompatible wastes, and to confirm consistency with the transfer/shipment documentation The test is sensitive to low parts per million ranges

Method A peroxide test strip is dampened with a pipette sample of liquid waste Solids are tested by first wetting the test strip with water and contacting a small sample of the waste A blue color change indicates a positive reaction The color change can be compared with a chart on the packaging to determine an approximate organic peroxide concentration

Tolerance Peroxide concentrations greater than 20 parts per million in liquid waste constituents that are known organic peroxide formers not documented as having been stabilized constitutes failure

(3) Paint filter liquids test

Rationale To verify the presence or absence of free liquid in solid or semisolid material

Method To a standard paint filter 100 cubic centimeters or 100 grams of waste are added and allowed to settle for 5 minutes Any liquid passing through the filter signifies failure of the test

Tolerance Failure of the test in waste matrices not documented as having free liquids constitutes failure of the container Small quantities of condensate trapped in inner plastic liner folds are acceptable

(4) pH screen

Rationale To identify the pH and corrosive nature of an aqueous or solid waste, to ensure safe segregation and storage of incompatible waste, and to confirm consistency with the transfer/shipment documentation

Method Full range pH paper is used for the initial screening If the initial screen indicates a pH below 4 or above 10, a pH meter could be used, or a narrow range pH paper Solids are mixed with an equal weight of water and the liquid portion of the solution is tested

Tolerance pH paper for this test has a sensitivity of +/-1 0 pH units If the pH of a matrix appears to exceed regulatory limits (<2 0 or >12 5) in waste not documented as being regulated for this property the container fails the test

(5) Oxidizer screen

Rationale To determine if a waste exhibits oxidizing properties to ensure safe segregation and storage of incompatible waste, and to confirm consistency with the transfer/shipment documentation This test can be applied to waste liquids solids, and semisolids

Method Acidified potassium iodide (KI) test paper is applied to solid or liquid waste A darkening of the paper is a positive indication

Tolerance This method is very sensitive to oxidizing properties A positive indication in a waste that cannot be explained by documented constituents constitutes failure

(6) Water reactivity screen

Rationale To determine if the waste has the potential to vigorously react with water, form gases or other reaction products This information is used to ensure safe segregation and storage of incompatible waste, and to confirm consistency with the transfer/shipment documentation

Method Water is added to a sample of solid or liquid waste The solution is observed for evidence or fuming, bubbling spattering, or temperature change These reactions are considered to be positive evidence that the waste is water reactive

Tolerance A positive indication in a waste that cannot be explained by documented constituents constitutes a failure

(7) Cyanide screen

Rationale To indicate if waste could release hydrogen cyanide upon acidification near pH 2 This information is used to ensure safe segregation and storage of incompatible waste, and to confirm consistency with the transfer/shipment documentation

Method To a test tube or watch dish containing approximately 2 milligrams of sample, an equal amount of freshly prepared ferrous ammonium citrate is added 3 Normal hydrochloric acid is used to reduce the pH of the solution to near 2 0 A deep blue color indicates the presence of cyanide

Tolerance A positive indication in a waste that cannot be explained by documented constituents constitutes a failure

(8) Sulfide screen

Rationale To indicate if the waste could release hydrogen sulfide upon acidification near pH 2 This information is used to ensure safe segregation and storage of incompatible wastes, and to confirm consistency with the transfer/shipment documentation

Method Approximately 2 milligrams of sample is added to a watch dish or test tube and enough 3 Normal hydrochloric acid is added to bring the pH down to near 2 0 A sulfide test strip is placed in the solution If the paper turns brown or silvery black, the presence of sulfides in the sample is indicated

Tolerance A positive indication in a waste that cannot be explained by documented constituents constitutes a failure

(9) HOC screen

Rationale To indicate whether polychlorinated biphenyls (PCBs) or other chlorinated solvents are present in the waste This information is used to ensure safe segregation and storage of incompatible waste, to confirm consistency with the transfer/shipment documentation and to determine if the waste needs to be managed in accordance with the regulations prescribed in the *Toxic Substance Control Act of 1976*

Methods Field organic chlorine tests appropriate to the matrix, such as those offered by the Dexsil Corporation (e g Chlor N-Oil, Chlor N-Soil) are used These screening tests are available with several detection limits At a minimum, the 50 parts per million test is performed on oily matrices

Tolerance A positive indication of chlorinated organics in a waste not documented as having chlorinated organic content constitutes failure

3 3 OTHER ANALYSIS PARAMETERS

Parameters needed to meet other waste characterization needs for waste stored at CWC are identified in Appendix A

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4 0 SELECTING SAMPLING PROCEDURES

Specific sampling procedures and techniques depend on both the nature of the material and the type of packaging This section describes the sampling methodology used to obtain representative samples

4 1 SAMPLING STRATEGIES

Table 4 1 contains waste forms and sample equipment used to sample referenced waste Sampling of these waste forms is performed in accordance with Table 4-1

4 2 SAMPLING METHODS

The appropriate personnel are responsible for arranging all sampling and laboratory support for sample analysis Samples are processed at one of several laboratories qualified to perform analysis of waste samples (refer to Section 5 0) Sampling methods are those described in WAC 173 303 110(2)

The basic sampling sequence is as follows

- Obtain a unique sample number and complete the sample tag before sampling
- Obtain a precleaned sampler and sample bottles
- Attach sample label to sample bottles
- For sampling liquid waste a sampler or pipette will be used to sample for two phase liquids Homogeneous liquids in small containers will be poured into a sample bottle
- For sampling solid waste a scoop trier, or hand auger will be used to obtain a sample of the waste For large containers of waste composite several augers or scoops to ensure samples are representative
- Fill sample containers in the following sequence volatile organics, semivolatile organics, metals ignitability pH (corrosivity)
- For solid waste, wipe the exterior surfaces of the sample bottles with a dry rag
- Attach sample labels to outer plastic bags
- Place samples in an appropriate receptacle for transfer to the laboratory
- Complete the chain of-custody forms
- Seal and mark the receptacle in accordance with WAC 173-303 071(3)(1)
- Transfer receptacle to the analytical laboratory as appropriate to meet sample holding times

- Properly clean and decontaminate nondisposable sampling equipment or package for return to central sampling equipment decontamination area according to onsite requirements

4 3 SELECTING SAMPLING EQUIPMENT

Sampling equipment selection is detailed in Table 4 1 Waste sampling equipment is maintained and decontaminated as necessary by the CWC operating organization

4 4 SAMPLE PRESERVATION

Sample preservation follows SW 846 protocol or other approved sample preservation methods for waste in accordance with 62 FR 62079

4 5 ESTABLISHING QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES FOR SAMPLING

The sampling team ensures all samples are labeled with a unique identifier

Sample collectors prepare a permanent log of sampling activities Log entries include as appropriate date of collection, time of collection, location, batch number sample number, copy of the chain of-custody form, sampling methodology, container description, waste matrix (liquid), description of generating process (e g , decontamination activities), number and volume of samples, field observations, field measurements (e g , pH, percent lower explosive limit), laboratory destination and laboratory number and signature These logs entries are made by the appropriate personnel[3] while the sampling is performed The logs are permanent records of the TSD unit and must be retained in the Operating Record If sampling is conducted in a posted radiological zone, the logbook entries could be made by a person who is outside the zone or by the sampler immediately after the sampling is completed The sampling logs are retained in accordance with standard industrial practices A chain of custody record accompanies samples at all times The record contains a unique sample number for each sample date and time of collection, sample type, sample location, methods of transfer and signatures (or electronic equivalent, e g signature password) of the collector and all subsequent custodians

During all sampling activities, strict compliance with applicable industrial hygiene and safety standards is mandatory If sampling personnel accidentally contact waste material, decontamination of sampling personnel is performed immediately Transportation of samples is performed in accordance with all applicable onsite and U S Department of Transportation requirements

The following QA/QC elements are used by the CWC operating organization to ensure sampling activities for designation purposes result in acceptable laboratory data

- Representative sampling methods as defined by WAC 173 303-110(2), 40 CFR 261 Appendix I, and/or SW-846 Chapter 9

- Appropriate sample containers and equipment

[3] 'appropriate personnel' are defined as sampling personnel or a person directed by a sampler

- Samples numbered
- Traceable labeling system
- Field QA/QC samples (applicable sampling and analysis plan)
- Equipment calibration (current as appropriate)
- Chain of custody

Table 4-1 Central Waste Complex Chemical Screening Sampling Equipment

Waste form	Reference in SW-846	
	Waste type	Equipment*
Liquids	Free-flowing liquids and slurries	COLIWASA, SW-846, Chapter 9 glass thief or pipette
Solidified liquids	Sludges	Trier, SW-846, Chapter 9 scoops and shovels
Sludges	Sludges	Trier, SW-846, Chapter 9, scoops and shovels
Soils	Sand or packed powders and granules	Auger SW-846 Chapter 9 scoops and shovels
Sorbents	Large-grained solids	Large trier, SW-846 Chapter 9, scoops and shovels
Wet sorbents	Moist powders or granules	Trier SW-846 Chapter 9 scoops and shovels
Process solids and salts	Moist powders or granules	Trier SW-846, Chapter 9 scoops and shovels
	Dry powders or granules	Thief, SW-846, Chapter 9, scoops and shovels
	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels
	Large-grained solids	Large trier, SW-846 Chapter 9, scoops and shovels
Ion exchange resins	Moist powders or granules	Trier SW-846 Chapter 9 scoops and shovels
	Dry powders or granules	Thief, SW-846, Chapter 9 scoops and shovels
	Sand or packed powders and granules	Auger SW-846, Chapter 9, scoops and shovels

COLIWASA = composite liquid waste sampler
* other ASTM approved equipment could be used to collect samples

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5 0 SAMPLING AND ANALYTICAL PROGRAM

QC will be applied in implementing both sampling and analytical techniques Specific performance standards for QA and QC methods for individual sampling and analysis activities are dynamic and are revised as warranted to reflect technological advances in available, appropriate techniques These performance standards are described in policies maintained at CWC and are available for review on request

These sampling and analytical quality policies help ensure that the sample obtained provides precise and accurate analytical results for the waste being sampled The analytical results are used by CWC operating organization to decide whether or not to accept a particular waste On acceptance, results are used to determine the appropriate method of treatment and storage and that incompatible waste is not combined inadvertently Just as these analytical results are important, so is the quality of the sampling program

5 1 SAMPLING PROGRAM

Sampling procedures for CWC operations are described in Section 2 2 4 Selection of sample collection devices depends on the type of sample the sample container, the sampling location, and the nature and distribution of regulated constituents in the waste In general, the methodologies used correspond to those referenced by 40 CFR Part 261, Appendix I The selection and use of the sample collection device are supervised or performed by qualified personnel

Sampling equipment are constructed of materials that nonreactive with the waste being sampled Materials such as glass, polyvinyl chloride plastic, aluminum, or stainless steel could be used Care is taken in the selection and use of the sample collection device to prevent contamination of the sample and to ensure compatibility with the waste being sampled Individual container samples that are related and compatible could be composited before analysis

5 2 ANALYTICAL PROGRAM

A program of analytical QC practices and methods has been developed on the Hanford Site to ensure that precision and accuracy are maintained throughout the laboratories Good laboratory practices that encompass sampling sample handling housekeeping and safety are maintained at onsite laboratories

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6 0 SELECTING WASTE RE-EVALUATION FREQUENCIES

The re evaluation (repeat and review) frequency to review profile information is yearly, or more often if the waste generation process changes

Thee CWC operating organization re-evaluates a waste profile if the following occurs

- A generator notifies the CWC operating organization that the generating process has changed
- Inspection or analysis indicates that the waste received at CWC does not match the profile and/or transfer/shipment documentation

When a waste profile is re-evaluated the CWC operating organization could request the generator to do one of the following

- Verify the current waste profile is accurate
- Supply a new waste profile
- Submit a sample for parameter analysis

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7 0 SPECIAL PROCEDURAL REQUIREMENTS

This section discusses any special process requirements for receiving mixed waste at CWC

7 1 PROCEDURES FOR RECEIVING WASTE GENERATED ONSITE

In general, mixed waste received from onsite generator units is managed the same as waste received from offsite generators Differences include, but are not limited, to the following (1) physical and chemical screening frequencies for verification (minimum percentages of 5 percent for waste from onsite generating units and 10 percent for waste from offsite generators (note that chemical screening frequency depends on the physical screening frequency) (2) transfer/shipment documentation (Uniform Hazardous Waste Manifest are used for waste from offsite generators and waste tracking forms are used for waste from onsite generating units), and (3) LDR documentation requirements (notification for waste from offsite generators and the information contained in the notice for waste from onsite generating units)

7 2 PROCEDURES FOR RECEIVING WASTE GENERATED OFFSITE

Waste received from offsite is handled in the same manner as mixed waste received from onsite except as denoted in Section 7 1

7 3 PROCEDURES FOR IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE

CWC accepts ignitable, reactive, or incompatible waste (refer to Section 1 2) The following precautions are taken before ignitable, reactive, or incompatible waste is accepted at CWC

- Pre shipment review and/or chemical screening identify whether the waste is ignitable, reactive or incompatible
- CWC waste acceptance criteria identifies storage requirements for ignitable, reactive, and incompatible waste ensuring the waste is stored in a safe manner

The types of prohibited waste are identified in Section 1 2

7 4 PROVISIONS FOR COMPLYING WITH FEDERAL AND STATE LAND DISPOSAL RESTRICTION REQUIREMENTS

Although CWC does not treat LDR waste, sampling could be performed at CWC to support LDR certification The following sections are required for treatment of LDR waste

Federal and state-only LDR requirements restrict the land disposal of certain types of waste subject to *Resource Conservation and Recovery Act* (RCRA) *of 1976* and the *Washington State Hazardous Waste Management Act of 1976* Waste managed on the Hanford Site falls within the purview of these LDRs per 40 CFR 268 and WAC 173 303-140 Waste constituents that are subject to LDRs are identified in 40 CFR 268 40 and referenced by WAC 173-303 140 Waste must meet certain treatment standards as specified in 40 CFR 268 40 and WAC 173-303 140, if the waste is to be land disposed

Generators (as defined in the regulation) determine if LDRs apply to the waste based on knowledge or testing [40 CFR 268 7(a)] Each waste is analyzed for those LDR constituents contained in the listed and characteristic waste numbers identified by the generator, if the generator's knowledge is not sufficient to make a determination If the LDR waste does not meet the applicable treatment standards the generator (Section 1 1 1 1) provides information stating so with each transfer/shipment of waste, in accordance with WAC 173-303-380(1)(j) (k),-(n) or -(o) If the waste meets the standards the generator must send a certification that the waste meets the treatment standards

7 4 1 Waste Treatment

Retrieved and newly generated waste is treated to meet LDR as specified in 40 CFR 268 40 and WAC 173 303-140 with the exception of TRU mixed waste TRU mixed waste is treated to the applicable standards required by the Waste Isolation Pilot Plant or other generator requirements An onsite TSD unit potentially can pretreat certain waste before shipment to a permitted offsite facility that could perform full treatment of the specific waste to meet full LDR Waste requiring treatment other than what an onsite TSD unit can provide is repackaged labeled and transferred to a TSD unit for storage pending identification or development of an appropriate treatment

LDR requirements apply to all mixed waste except a small class of state-only waste When evaluating the treatability of certain characteristic waste, consideration must be given to any additional underlying hazardous constituents that might be found in the waste The treatment standards, for the most part, are concentration-based If the constituent concentrations for the waste fall below those specified in 40 CFR 268 40 and/or 268 48 for underlying hazardous constituents and in WAC 173 303-140, the waste can be land disposed without being treated If the concentrations exceed these limits, the waste must be treated before disposal

Specific treatments performed onsite include but are not limited to, deactivation, encapsulation stabilization, and amalgamation

Deactivation is used to remove the hazardous characteristics of the waste due to its ignitability (D001) corrosivity (D002) solid corrosive acid (WSC2), and/or reactivity (D003) Treatment techniques include but are not limited to neutralization, cementing, absorption, controlled reaction with water, and macroencapsulation

- Neutralization is the primary method of treatment for corrosive waste that has a pH $\leq$2 and/or $\geq$12 5 Examples of bases that could be used as neutralizing agents include sodium hydroxide, calcium hydroxide, or calcium carbonate Examples of acids that could be used to neutralize bases are hydrochloric acid and sulfuric acid

- Absorption is the primary method of treatment for ignitable waste which includes waste that is liquid and has a low total organic carbon content (<10 percent) Absorbent material that could be used includes polyacrylates, polypropylene, polymer type superabsorbent polymer, cellulose, or other absorbent materials meeting various disposal requirements

- Cementing or grouting is the primary method of treatment for ignitables consisting of metal fines or other corrosive materials These types of waste are deactivated by mixing and binding the waste with an inert cementacious material

- Controlled reaction with water is the primary method of treatment for reactive materials such as sodium metal This process will deactivate the material and allow for further disposition

- Macroencapsulation with polyethylene plastic containers is the primary treatment for debris For elemental lead, macroencapsulation is performed in accordance with Table 1 of 40 CFR 268 42

Stabilization methods used include cementing or grouting, sealing, and sorption Particulates and/or liquid waste containing hazardous constituents could be cemented or grouted to meet either RCRA LDR, Waste Isolation Pilot Plant waste acceptance criteria, and/or the disposal criteria of future TSD units The waste is stabilized by mixing and binding the waste with an inert material The inert material generally used is Portland cement When dealing with some waste streams such as sludges that might contain an inconsistent or excess liquid content sorbent could be added to the waste to provide a drier matrix to allow identification of the proper combination of ingredients to ensure a successful stabilization effort

Amalgamation of liquid elemental mercury (D009) is achieved using inorganic reagents such as copper, zinc, nickel, gold and sulfur The resultant matrix is a nonliquid solid or semi solid visually inspected to verify compliance

Treatment of state-only extremely hazardous waste (WT01, WP01, and WP03) is performed in accordance with RCW 70 105 050(2) and/or WAC 173 303 140(4)(a) as applicable

7 4 2 Sampling and Analytical Methods

If waste is sampled and analyzed to demonstrate that a federal LDR has been met, only U S Environmental Protection Agency methods are used Waste is analyzed using the methods outlined in 40 CFR 268 40 and WAC 173 303 140(4)(b) or any other reliable method allowed by regulations

Samples of waste are transferred to the sample management area for packaging and transferred to an onsite laboratory or shipped offsite to a laboratory for analysis Samples are collected and analyzed in accordance with SW-846 or any other method allowed by regulations Storage is provided for waste containers while waiting for laboratory analysis results

7 4 3 Land Disposal Restriction Certification of Treatment

When LDR treatment has been completed and analytical results (if applicable per 40 CFR 268 40 and WAC 173-303-140) have verified that the LDR treatment is successful, certification of the LDR treatment is required The certification statement is prepared by the onsite TSD unit in accordance with 40 CFR 268 7 A copy of the certification is placed in the operating record

When a LDR waste does not meet the applicable treatment standards set forth in 40 CFR 268 40 and WAC 173-303-140, or exceeds the application prohibition levels set forth in 40 CFR 268 32 or Section 3004(d) of RCRA, this information is placed in the CWC operating record in accordance with WAC 173 303-380(1)(k), (n),-(o)

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8 0 RECORDKEEPING

Recordkeeping requirements that are applicable to this WAP are described in Chapter 12 0, Table 12-1, *Hanford Facility Dangerous Waste Permit Application General Information Portion* (DOE/RL-91 28) and within this WAP

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9 0 REFERENCES

DOE/RL-88-21, *Hanford Facility Dangerous Waste Part A Permit Application*, U S Department of Energy, Richland Operations Office, Richland, Washington

DOE/RL-91-28, *Hanford Facility Dangerous Waste Permit Application General Information Portion* U S Department of Energy, Richland Operations Office, Richland, Washington, revised periodically

EPA SW 846, *Test Methods for Evaluating Solid Waste Physical/Chemical Methods* Third Edition, as amended, U S Environmental Protection Agency, Washington, D C

EPA 600/4 7-020, *Methods for Chemical Analysis of Water and Wastes*, U S Environmental Protection Agency, Environmental Monitoring and Support Laboratory Cincinnati Ohio

62 FR 62079, *Mixed Waste Testing Guidance*, November 20, 1997

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APPENDIX A

ANALYTICAL PARAMETERS, METHODS, AND RATIONALE FOR WASTE RECEIVED AT CENTRAL WASTE COMPLEX

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Analytical Parameters Methods, and Rationale for Waste Received at Central Waste Complex

Parameter		Analytical method[a]	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
General chemistry					
Flashpoint		1010/1020	Liquid	To provide documentation for safe storage conditions	To determine regulatory status as D001 waste to provide proper waste designation and applicability of LDR requirements
pH	Liquid	9040	Liquid, sludge	To indicate the degree of corrosivity for safe handling, to provide for proper waste designation, and to identify waste that might compromise container integrity	To determine regulatory status as D002 waste, to provide proper waste designation applicability of LDR requirements and state-only requirements
	Solid	9045c	Solid		
Hydroxide		9040	Liquid	To provide documentation for safe treatment and storage conditions, and to comply with CWC waste acceptance criteria	To provide proper waste designation and applicability of LDR requirements
Water reactivity		Field method	Liquid sludge	To determine whether the waste has a potential to violently react with water to form gases or generate heat, to provide documentation for safe treatment and/or storage conditions for waste designation and to comply with CWC waste acceptance criteria	To provide proper waste designation safe storage and management
Free liquids		9095A	Liquid sludge solid	To determine applicability of LDRs and for characterization of appropriate treatment	To determine appropriate state-only LDR status of the waste

Analytical Parameters Methods and Rationale for Waste Received at Central Waste Complex

Parameter	Analytical method[a]	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Cyanide	9010B/9012A	Liquid, sludge, solid	For safe storage for proper waste designation, applicability of LDR and characterization of appropriate treatment	To provide proper waste designation and applicability of LDR requirements
Sulfide	9030B	Liquid, sludge solid	For safe storage, for proper waste designation, applicability of LDR, and characterization of appropriate treatment	To provide proper waste designation and applicability of LDR requirements
Organic analyses				
PCBs	8081A/8082	Liquid sludge, solid	To determine proper waste designation for management of waste in accordance with the *Toxic Substance Control Act of 1976 (TSCA)* and WAC 173-303	To provide proper waste designation and to meet TSCA and LDR requirements
Total organic carbon	9060	Liquid sludge, solid	To determine applicability of LDR and applicability to state-only requirements	To provide proper waste designation and applicability to state-only requirements, to meet LDR requirements, and to comply with CWC waste acceptance criteria
Total organic halides	9020B/9021/9022	Liquid sludge	To determine proper waste designation and applicability to state-only requirements	To provide proper waste designation and applicability to state-only requirements
Persistent constituents	9075/9076/9077/ 9211/9212/9214/ 9250/9251/9253			
Total suspended solids	160 2[b]	Liquid sludge	To determine applicability of LDR and status as a wastewater	To provide applicability of LDR and status as a wastewater

Analytical Parameters Methods and Rationale for Waste Received at Central Waste Complex

Parameter	Analytical method[a]	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Volatile organic compounds	1311/8260B	Liquid, sludge, solid	To determine proper waste designation, applicability of LDRs, and characterization of appropriate treatment	To provide proper waste designation regulatory status and applicability of LDR requirements
Semivolatile organic compounds	1311/8270A	Liquid, sludge, solid	To determine proper waste designation applicability of LDRs and characterization of appropriate treatment	To provide proper waste designation, regulatory status and applicability of LDR requirements
Chlorinated herbicides	8151A	Liquid	Not applicable	To provide proper waste designation and applicability to state-only requirements
Inorganic analyses				
Arsenic	1311/6010B	Liquid sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment	To determine proper waste designation regulatory status as a toxic characteristic waste, and applicability of LDR requirements
Barium	1311/6010B	Liquid sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment	To determine proper waste designation, regulatory status as a toxic characteristic waste and applicability of LDR requirements
Cadmium	1311/6010B	Liquid sludge solid	To provide for proper waste designation applicability of LDRs, and for characterization of appropriate treatment	To determine proper waste designation regulatory status as a toxic characteristic waste, and applicability of LDR requirements

Analytical Parameters Methods and Rationale for Waste Received at Central Waste Complex

Parameter	Analytical method[a]	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Chromium	1311/6010B	Liquid, sludge, solid	To provide for proper waste designation applicability of LDRs, and for characterization of appropriate treatment	To determine proper waste designation regulatory status as a toxic characteristic waste, and applicability of LDR requirements
Lead	1311/6010	Liquid, sludge solid	To provide for proper waste designation applicability of LDRs and for characterization of appropriate treatment	To determine proper waste designation regulatory status as a toxic characteristic waste and applicability of LDR requirements
Mercury	1311/7470	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment	To determine proper waste designation regulatory status as a toxic characteristic waste and applicability of LDR requirements
Silver	1311/6010	Liquid sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation regulatory status as a toxic characteristic waste and applicability of LDR requirements
Selenium	1311/6010	Liquid sludge solid	To provide for proper waste designation, applicability of LDRs and for characterization of appropriate treatment	To determine proper waste designation regulatory status as a toxic characteristic waste and applicability of LDR requirements
Nickel	6010	Liquid sludge, solid	To determine applicability of LDRs, and for characterization of appropriate treatment	To meet LDR requirements

[a] EPA SW-846, unless otherwise noted
[b] EPA-600/4 7-020, unless otherwise noted
LDR = land disposal restriction
PCB = polychlorinated biphenyls

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