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C. Title
Plutonium Finishing Plan Treatment and Storage Unit Waste Analysis Plan

D. Internet Address

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R. H. Engelmann
Manager's Signature Required
If Yes _____ ☒ No ☐ Yes Classified
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H. Author/Requestor
A. L. Prignano 7/5/2000
(Print and Sign)

Responsible Manager
R. H. Engelmann 7-5-00
(Print and Sign)

I. Reviewers

	Yes	Print	Signature	Public Y/N (If N, complete J)
General Counsel	☒	L. F. Willis	7/5/00	Y / N
Office of External Affairs	☐			Y / N
DOE-RL	☒	L. D. Romine	7-17-00	Y / N
Other	☐			Y / N
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Information Clearance Approval
APPROVED FOR RELEASE OFFICIAL CW DOCUMENT 7-18-00

K. If Additional Comments, Please Attach Separate Sheet

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A-6001-401 (02/98)

HNF-5776
Revision 0

Plutonium Finishing Plant Treatment and Storage Unit 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 Hanford
P.O. Box 1000
Richland, Washington

page 2 of 43 CW

Prignano, Andrea L

From: Williams, Joel F Jr
Sent: Wednesday, July 05, 2000 8:49 AM
To: Bartlett, Wilmer D (Dean)
Cc: Prignano, Andrea L; Bramson, Jeffrey E (Jeff); Engelmann, Richard H; Brunke, Ronald C
Subject: RE: PFP WAP and Closure

Importance: High

Dean

Thanks for the review and yes RL will be reviewing these documents.

Thanks for your time and help - Joel ☺

-----Original Message-----
From: **Bartlett, Wilmer D (Dean)**
Sent: Wednesday, July 05, 2000 6:51 AM
To: Williams, Joel F Jr
Subject: RE: PFP WAP and Closure

From a ADC point of view, I see nothing that would make this document classified. You will need to go through DOE before you give this to Ecology.

-----Original Message-----
From: Williams, Joel F Jr
Sent: Monday, July 03, 2000 1:24 PM
To: Bartlett, Wilmer D (Dean)
Cc: Prignano, Andrea L; Bramson, Jeffrey E (Jeff); Christensen, Claire
Subject: FW: PFP WAP and Closure
Importance: High

Dean

Hi Jeff asked me to forward the attached documents for you to look at as the as the ADC. Could be review and see if it meets the ADC requirements, if not call me on **539-1728**. These documents are going to Ecology for approval of startup of the waste processes at PFP so we need your blessing as soon as possible..

Thanks for your time and patience - Joel

-----Original Message-----
From: **Prignano, Andrea L**
Sent: Friday, June 30, 2000 3:22 PM
To: Williams, Joel F Jr
Subject: FW: PFP WAP and Closure

here are the latest versions

THANKS,

Andrea L. Prignano

FH/Waste Management Project/Environmental Services
376-1057

page 3 of 3 RCW

HNF-5776
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P.O. Box 1000
Richland, Washington

Chris Gillenwater 7-18-00
Release Approval Date

CONTENTS

FIGURES

GLOSSARY

ALARA	as low as reasonably achievable
CFR	Code of Federal Regulations
DOE-RL	U.S. Department of Energy, Richland Operations Office
EPA	U.S. Environmental Protection Agency
HNF	Hanford Nuclear Facility (document identifier)
LDR	land disposal restriction
NDA	nondestructive assay
PFP	Plutonium Finishing Plant
PNNL	Pacific Northwest National Laboratory
PPE	personal protective equipment
PRF	Plutonium Reclamation Facility
PVC	polyvinyl chloride
RCRA	*Resource Conservation and Recovery Act of 1976*
RF	Rocky Flats
RMC	remote mechanical C
SS&C	sand, slag, and crucible
TSD	treatment, storage, and/or disposal
WAC	Washington Administrative Code
WAP	waste analysis plan
WIPP	Waste Isolation Pilot Plant

METRIC CONVERSION CHART

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	0.76456	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
Energy			**Energy**		
kilowatt hour	3,412	British thermal unit	British thermal unit	0.000293	kilowatt hour
kilowatt	0.948	British thermal unit per second	British thermal unit per second	1.055	kilowatt
Force/Pressure			**Force/Pressure**		
pounds per square inch	6.895	Kilopascals	kilopascals	0.14504	pounds per square inch

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

PLUTONIUM FINISHING PLANT
TREATMENT AND STORAGE UNIT WASTE ANALYSIS PLAN

1.0 UNIT DESCRIPTION

The purpose of this waste analysis plan (WAP) is to document waste analysis activities associated with the Plutonium Finishing Plant Treatment and Storage Unit (PFP Treatment and Storage Unit) to comply with *Washington Administrative Code* (WAC) 173-303-300(1), (2), (4)(a) and (5). The PFP Treatment and Storage Unit is an interim status container management unit for plutonium bearing mixed waste radiologically managed as transuranic (TRU) waste. TRU mixed (TRUM) waste managed at the PFP Treatment and Storage Unit is destined for the Waste Isolation Pilot Plant (WIPP) and therefore is not subject to land disposal restrictions [WAC 173-303-140 and 40 CFR 268][1]. The PFP Treatment and Storage Unit is located in the 200 West Area of the Hanford Facility, Richland Washington (Figure 1). Because dangerous waste does not include 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.

1.1 DESCRIPTION OF UNIT PROCESSES AND ACTIVITIES

The PFP Treatment and Storage Unit includes Glovebox HA-20MB in Room 235B, Glovebox HC-46F in Room 170, Room 170 and Room 192D of the 234-5Z Building of PFP. Treatment occurs in Glovebox HA-20MB (Figures 2 and 3). Packaging and repackaging activities occur in Glovebox HC-46F (Figure 4). The treatment process is a cementation process performed by mixing a standard cement material with appropriate amounts of TRUM waste and water to form a slurry. Following mixing, the slurry is placed in approximately 3-liter billet cans for curing. The billet cans are placed in 208-liter containers and transferred to an onsite treatment, storage, and/or disposal (TSD) unit, the Central Waste Complex (CWC). TRUM waste is shipped to WIPP, an offsite TSD facility.

Storage occurs in Glovebox HA-20MB in Room 235B, Room 170, Glovebox HC-46F in Room 170, and Room 192D. TRUM waste is accepted for storage untreated or treated. Acceptable knowledge is obtained to properly designate the TRUM waste, as well as determining the ignitable, reactive, and/or incompatible properties of the TRUM waste.

The TRUM waste to be managed in the PFP Treatment and Storage unit is located in the PFP vaults[2]. Typical waste streams contained in the PFP vaults that will be managed include the following:

- Sand, slag, and crucible (SS&C)
- Ash
- Oxide residues
- Remote mechanical C (RMC) line glovebox sweeps
- Plutonium Reclamation Facility (PRF) glovebox sweeps
- Rocky Flats scraps.

[1] 61 FR 60704, Federal Register, "*Termination of Review of Department of Energy Petition to EPA for No-Migration Determination for the Waste Isolation Pilot Plant (WIPP) Under the Resource Conservation and Recovery Act*," November 29, 1996.

[2] For the purpose of this document, vaults include vault-type rooms.

Other combustible or miscellaneous TRUM waste streams also are stored in the PFP vaults. Additional information is located on the PFP Treatment and Storage Unit, Part A, Form 3, in the *Hanford Facility Dangerous Waste Part A Permit Application* (DOE/RL-88-21).

1.1.1 Sand, Slag, and Crucible

SS&C are process residues originally generated in the RMC line during production of plutonium metal buttons. The metal button process converted nitric acid solution of plutonium (plutonium nitrate) to plutonium metal. The plutonium conversion process consisted of precipitating plutonium oxalate from the plutonium nitrate solutions, calcining the oxalate to plutonium oxide (PuO_2), and fluorinating the plutonium oxide to plutonium fluoride (PuF_4). The plutonium fluoride powder was loaded into a magnesium oxide (MgO) crucible with elemental calcium and iodine and fired to produce metallic plutonium and a slag containing calcium fluoride, calcium, iodine, and small amounts of unreacted plutonium fluoride. The slag was isolated and sent to slag and crucible dissolvers to recover the residual plutonium. Sand and crucible pieces consist mainly of magnesium oxide. Slag contains chemicals from the metal button production and consists of calcium iodide, calcium fluoride, residual plutonium, elemental calcium and iodine, and fluoride salts.

1.1.2 Ash

Ash was generated from two different sources. Rocky Flats (RF) ash was received from the U.S. Department of Energy site in Rocky Flats, Colorado. RF ash was produced from 1985 through 1987 during reclamation of plutonium. Hanford Site ash (Hanford ash) consists of ash produced from the PFP 232-Z facility during the reclamation of plutonium and ash received from Pacific Northwest National Laboratory [PNNL (Battelle ash)]. The Battelle ash likely originated from either the RF ash or the PFP produced ash, with samples of the ash sent to PNNL for test purposes. Ash was produced from incineration of plutonium-contaminated combustibles such as paper, polyvinyl chloride (PVC), wood, asbestos filter elements, and cloth at both sites. Spent solvents were contained in or on the materials that were incinerated. Ash will be designated for listed waste numbers based on the spent solvents known to have been incinerated. Heavy metals are anticipated to be present in the ash. Organics would have been destroyed in the incineration process.

1.1.3 Oxide Residues

Oxide residues less than 30 percent plutonium by weight will be managed in the PFP Treatment and Storage Unit. The oxide residues came from a variety of sources including sweeps of the RMC line, the PRF gloveboxes, RF scraps, and other miscellaneous sources. The materials were generated from the sweeps were calcined or reworked in the PRF.

Wet line sweeps, in which residue was swept from the floor of a liquid process, resulted in a mixture of materials containing manganese nitrate, plutonium nitrate, plutonium oxalate, and corrosion products from stainless steel. Dry line sweeps, in which residue was swept from the floor of a dry material process, resulted in a mixture of material containing mostly magnesium oxide, with calcium, broken crucibles, plutonium oxide, plutonium fluoride, and plutonium metal and bristles.

The PRF process used a liquid-liquid solvent extraction process to separate and purify plutonium from impure forms of various chemical compositions. The solvent extraction process changed a dilute aqueous solution containing plutonium and various impurities into a concentrated plutonium nitrate solution. The sweeps were sludges scraped from the floor of the PRF gloveboxes. This material was calcined or

reworked in the PRF. These sweeps resulted in a mixture of materials containing nitric acid, hydrofluoric acid, aluminum nitrate, talc, tributyl phosphate, carbon tetrachloride, iron nitrate, sodium carbonate, plutonium nitrate, metal corrosion products, and cloth fibers.

RF scraps had been considered for dissolution and use as feed in the PRF process. The following compounds have been identified in RF scraps: silicon oxide, calcium oxide, iron oxide, magnesium oxide, neodymium oxide, nickel monoxide, chromium trioxide, aluminum oxide, sodium/potassium chloride, and plutonium oxide.

Much of the other miscellaneous source material is stabilized oxide/scrap and is believed to be a mixture of sludge materials before calcination.

1.1.4 Other Combustibles/Miscellaneous

Combustibles are defined as materials that normally combust but are not ignitable per WAC 173-303. Other combustibles/miscellaneous materials are classified into two categories: other combustibles – not polycubes and other/miscellaneous.

The other combustible materials-not polycubes category are divided into the following subcategories:

- General combustibles [e.g., paper, rags, chemical wipes (rags or paper), and wood]
- Plastics (non-PVC)/miscellaneous combustibles (e.g., filters, bags, oxides, or metal in plastic mounts; vials; and other forms of polystyrene, polyethylene, polypropylene)
- Plutonium-uranium.

The other/miscellaneous materials category is divided into the following subcategories:

- Laboratory miscellaneous scrap (e.g., solid residues from analytical testing--this testing included use of silver, which likely is present above regulatory limits)
- Plutonium-enriched uranium (e.g., grinding wheel residues)
- Graphite/cured carbon (e.g., plutonium oxide/graphite rods alclad)
- Graphite/miscellaneous noncombustibles (e.g., PNNL miscellaneous scrap; could include SS&C and/or magnesium oxide plus plutonium)
- Nonconforming (not usable) unalloyed plutonium metal (e.g., PNNL miscellaneous scrap from RMC line sweeps)
- Encapsulated plutonium compounds (e.g., plutonium foils)
- Nonconforming noncombustibles (e.g., plutonium scrap other than metal)
- Miscellaneous metal (e.g., PNNL scrap)
- Plutonium-enriched uranium alloy and oxides.

1.2 PROCESS FLOW DESCRIPTION AND DIAGRAM

The TRUM waste containers containing residues currently stored in PFP vaults are removed from the PFP vaults and transferred into Glovebox HA-20MB or Glovebox HC-46F (Figures 5 and 6). The cementation process used is shown in Figure 7. TRUM waste will either be packaged/repackaged or treated through the cementation process. TRUM waste designated as ignitable (D001) or reactive (D002) will be treated.

1.3 OPERATING CONDITIONS

TRUM waste is taken to either Glovebox HA-20MB or Glovebox HC-46F. Administrative controls are placed on the amount of open, unreacted TRUM waste in Glovebox HA-20MB or the amount of TRUM waste to be packaged or repackaged in Glovebox HC-46F. Radiologically based criticality restrictions apply at the PFP Treatment and Storage Unit because of plutonium in the TRUM waste. Limitations are placed on the amount of TRUM waste allowed in the PFP Treatment and Storage Unit. The TRUM waste is tracked and managed in Glovebox HA-20MB during the cementation process and in Glovebox HC-46F while being packaged or repackaged. Finally, NDA must be performed on the plutonium bearing material as a condition of waste acceptance into the PFP Treatment and Storage Unit.

The preceeding administrative controls and limits constitute the operating conditions for the packaging/repackaging operations in Glovebox HC-46F. Additional operating conditions also exist for the cementation process in Glovebox HA-20MB.

- The engineering organization prepares a blend plan that identifies the TRUM waste to be cemented. The blend plan takes into consideration the criticality, safeguards, and operational constraints as identified in WAC 173-303-395(1).

- The operations team prepares daily operating instructions using the blend plan as a guide. The operating instructions identify the individual TRUM waste items to be processed.

- Items to be processed are recorded in a cementation log book and cross-referenced to the list in daily operating instructions.

- The operator records 'item number' and 'element weight' on the charge prep data sheet.

- The operator verifies that the amount of TRUM waste introduced into Glovebox HA-20MB does not exceed the amount specified in the operating procedure and the criticality prevention specification. A running inventory is maintained.

- The total quantity of unreacted TRUM waste (e.g., SS&C) in open containers is limited by use of a running inventory.

- After the can is opened, the TRUM waste is inspected visually, and transferred to sieve trays. If the contents of the opened can do not appear to be what is described in the operating instructions, PFP management is notified. Material not meeting the operating instructions description requires further re-evaluation (Section 6.0) to confirm material contents before cementation.

1.4 IDENTIFICATION OF WASTE

The Part A, Form 3, permit application for PFP Treatment and Storage Unit (DOE/RL-88-21) identifies dangerous waste numbers, quantities, and design capacity. Waste numbers are assigned based on process knowledge that includes previously obtained sampling and analysis results of the TRUM waste. Listed waste numbers are assigned based on knowledge of spent solvents. Characteristic waste numbers for heavy metals are assigned to TRUM waste based on conservative assumptions.

2.0 CONFIRMATION PROCESS

The confirmation process includes completing appropriate review of available documentation on the TRUM waste to ensure the waste can be managed in the PFP Treatment and Storage Unit based on the following.

- Waste numbers contained in the Part A, Form 3.
- Whether the TRUM waste is ignitable, reactive, or incompatible as described in Section 7.0.
- Whether the operating conditions listed in Section 1.3 can be met.

This review meets the requirements of WAC 173-303-300(1) and (2) for PFP Treatment and Storage Unit TRUM waste. This review confirms knowledge concerning TRUM waste before treatment or storage to ensure that the waste is managed properly.

3.0 SELECTING WASTE ANALYSIS PARAMETERS

Regulations WAC 173-303-300(2) and (5)(a) require that information be obtained, documented, and/or reported regarding waste accepted into the PFP Treatment and Storage unit. When characterization information does not constitute acceptable knowledge, sampling and analysis of the waste is required. The need to perform sampling and analysis on TRUM could be identified by PFP personnel during management of waste in the PFP Treatment and Storage unit. The parameters, methods, and rationale for sampling and analysis of TRUM is presented below:

Parameters, Methods, and Rationale for Waste Managed within the PFP Treatment and Storage Unit.

Parameter		Method[a]	Media type	Rationale for selection
General chemistry parameters				
pH	Solid	9045C	Solid	To determine regulatory status as WSC2 waste; to provide proper waste designation; and to identify waste that might compromise container integrity
Free liquids		Visual observation	Liquid, sludge, solid	To determine if waste meets WIPP WAC.
Inorganic parameters				
Arsenic, Barium, Cadmium, Chromium, Lead, Silver, Selenium		1311 as applicable, /6010B/6020/200.8[b]	Liquid, sludge, solid	To provide for proper waste designation.
Mercury		1311 as applicable, /7470A/6020/200.8[b]	Liquid, sludge, solid	To provide for proper waste designation.

[a] Procedures based on EPA SW-846, unless otherwise noted. When regulations require a specific method, the method shall be followed. For other cases, method will be reliable.
[b] EPA-600/4-79-020.

The parameter list will be amended as necessary if additional parameters are identified.

4.0 SAMPLING PROCESS

Because of physical variations of waste managed in the PFP Treatment and Storage unit, sampling processes used to acquire and manage samples differ. The specific sampling methods and equipment used vary with the chemical and physical nature of the waste material and sampling circumstances.

4.1 SAMPLE CONTAINERS AND LABELS

Sample collection container selection and labeling practices follow SW-846 protocol.

4.2 SAMPLE PRESERVATIVES

Sample preservatives and holding times follow SW-846 protocol.

4.3 SAMPLE COLLECTION METHODS

Sample collection methods conform to the representative sample methods referenced in WAC 173-303-110(2). Sampling methods and equipment used are identified below:

Waste form	Waste type	Equipment*
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

* other ASTM approved equipment could be used to collect samples.

The number of samples collected from a container depends on the amount of waste present and on the homogeneity of the waste, determined on a case-by-case basis by PFP management. In most instances, there is only one container of waste present. In such instances, it is common to acquire only one grab sample. If more than one container of a waste stream is present, all or some of the waste containers are sampled. When some of the waste containers will be sampled, the containers chosen for sampling will be based on random number generating techniques in SW-846 Chapter 9 and the number of samples necessary to achieve data quality objectives.

4.4 QUALITY ASSURANCE/QUALITY CONTROL

There are many elements of QA/QC associated with sampling processes at the PFP Treatment and Storage unit. These elements are as follows.

- A log of sampling activities is kept in accordance with standard industrial practices.

- A record of sample custody from the time of sample collection to receipt by a laboratory custodian is established. This chain of custody includes the names of responsible individuals and the dates and times of custody transfers.

- Each sample collected is uniquely identified.

- Samples are traceable to the data records.

- Samples are packaged to maintain preservation and to meet transportation requirements necessary to maintain the sample under the exclusions contained in WAC 173-303-071(3)(l). Alterations of samples during collection or transfer are documented.

- Samples are protected from loss, damage, or tampering.

- Analytical data packages are evaluated for completeness (all required parameters present using required methodology), whether applicable holding times have been met, and whether any flags require corrective action.

5.0 SELECTING A LABORATORY, LABORATORY TESTING, AND ANALYTICAL METHODS

Quality control (QC) is applied in implementing both sampling and analytical techniques. Specific performance standards for quality assurance (QA) and QC procedures 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 and used at the PFP complex and are available for review by Ecology upon request. QA/QC practices will comply with WAC 173-303-110(2) and (3) and *Hanford Facility Agreement and Consent Order*, Action Plan, Section 6.5 requirements.

5.1 SAMPLING PROGRAM

The selection of sample collection devices within a laboratory 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 WAC 173-303-110(2) or SW-846 Chapter 9. The selection and use of the sample collection device are supervised or performed by a person who is thoroughly familiar with sampling protocols.

Sampling equipment is constructed of materials that are 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 waste being sampled. Individual container samples that are compatible could be composited before testing.

5.2 ANALYTICAL PROGRAM

A program of analytical QC practices and procedures has been developed on the Hanford Facility to ensure that precision, accuracy, representativeness, and completeness are maintained throughout the laboratories. Good laboratory practices that encompass sampling, sample handling, housekeeping, and safety are maintained at onsite laboratories. The testing methods described in Section 3.0 are intended to comply with WAC 173-303-110(3) requirements.

5.3 CONCLUSION

The aforementioned sampling and analysis QA/QC practices help ensure that the data obtained are sufficiently precise and accurate for the decision required of the dangerous and/or mixed waste stream being sampled. The sampling and analysis results are used by PFP Treatment and Storage unit personnel or designated acceptance organization personnel to:

- Determine acceptable knowledge,
- Determine applicability of a waste number, or
- Determine if the WIPP or CWC waste acceptance criteria has been met.

6.0 SELECTING WASTE RE-EVALUATION FREQUENCIES

Periodic re-analysis of TRUM waste managed in the PFP Treatment and Storage Units based on WAC 173-303-300(5)(d) is not planned unless the conditions in Section 1.3 arise. In the event information concerning TRUM waste arises causing PFP management to believe that the process or operations generating the TRUM waste has significantly changed, analysis will be repeated in accordance with WAC 173-303-300(4)(a).

7.0 SPECIAL PROCEDURAL REQUIREMENTS, TREATMENT, AND POST-TREATMENT

TRUM waste managed at the PFP Treatment and Storage Unit is packaged to meet the waste acceptance criteria for onsite treatment, storage, and/or disposal (TSD) units (CWC and/or WRAP) and for offsite disposal at WIPP.

7.1 PROCEDURES FOR IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE

TRUM waste that designates as ignitable (D001) and/or reactive (D003) must be managed pursuant to WAC 173-303-395(1), and as applicable, the waste management specific requirements contained in 40 CFR 265.176. The operating conditions described in Section 7.2 comply with the requirements of WAC 173-303-395(1) and 40 CFR 265.176. TRUM waste designated as D001 or D003 will be treated to remove the waste numbers. The reaction during treatment is monitored and the auger feed rate is adjusted, as necessary, to control reaction, temperature, and foaming during the treatment process.

No incompatible waste will be stored or treated; therefore, the requirements for incompatible waste do not apply to the PFP Treatment and Storage Unit.

7.2 TREATMENT PROCESS/COMPLYING WITH LAND DISPOSAL RESTRICTION REQUIREMENTS

TRUM waste managed in the PFP Treatment and Storage Unit is destined for WIPP, which specifically is exempt from land disposal restriction (LDR) requirements (61 FR 60704). In addition, WAC 173-303-140 requirements do not apply because TRUM waste will not be disposed in the State of Washington. Therefore, treatment is designed to meet WIPP waste acceptance criteria as necessary to ensure cost effective integration with the Hanford Site TRU program. Any waste described in Section 1.0 that is ignitable and/or reactive will be treated. The cementation process deactivates reactive and ignitable waste.

Although the TRUM waste is not subject to the treatment standards, the PFP treatment and storage unit treatment process is described as follows:

The cementation process for any TRUM waste that designates as ignitable or reactive because of calcium, takes into account the calcium metal present in the material. The calcium metal reacts with water to form hydrogen and calcium hydroxide. The process to cement ignitable or reactive TRUM waste includes steps to react the calcium before mixing with cement and is performed as follows.

- The unopened container is transferred into the glovebox, opened, weighed, sieved, size reduced, as needed, and loaded into an auger.

- The mixer is started and the auger feeds the material, at a predetermined rate, into a mixing bowl containing water. The auger hopper size and feed rate are specified to prevent inadvertently exceeding the calcium limit analyzed in the safety basis. These actions react the calcium at a rate that dissipates the heat and limits the hydrogen concentration in the glovebox to less than flammable levels. The material is allowed to react with water until the reaction is complete. The reaction is considered complete when the temperature stops increasing and foaming ceases.

- The mixing bowl (slurry) is transferred to the second mixer and the slurry mixed with cement.

- The cement mixture is poured into the waste billets and allowed to solidify. When the contents have solidified, the billets are removed from Glovebox HA-20MB and placed in approved waste containers. The waste containers are transferred to an appropriate storage room.

8.0 RECORDKEEPING

Records for the PFP Treatment and Storage Unit are maintained as described in WAC 173-303-380. Additional records maintained during the cementation process will include the blend plan, operating instructions, nuclear material item transfers, and the cementation log book as described in Section 2.0. Information on acceptable knowledge and sampling and analysis results are maintained in the PFP Treatment and Storage Unit operating record.

9.0 REFERENCES

61 FR 60704, Federal Register, "*Termination of Review of Department of Energy Petition to EPA for No-Migration Determination for the Waste Isolation Pilot Plant (WIPP) Under the Resource Conservation and Recovery Act*," November 29, 1996.

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

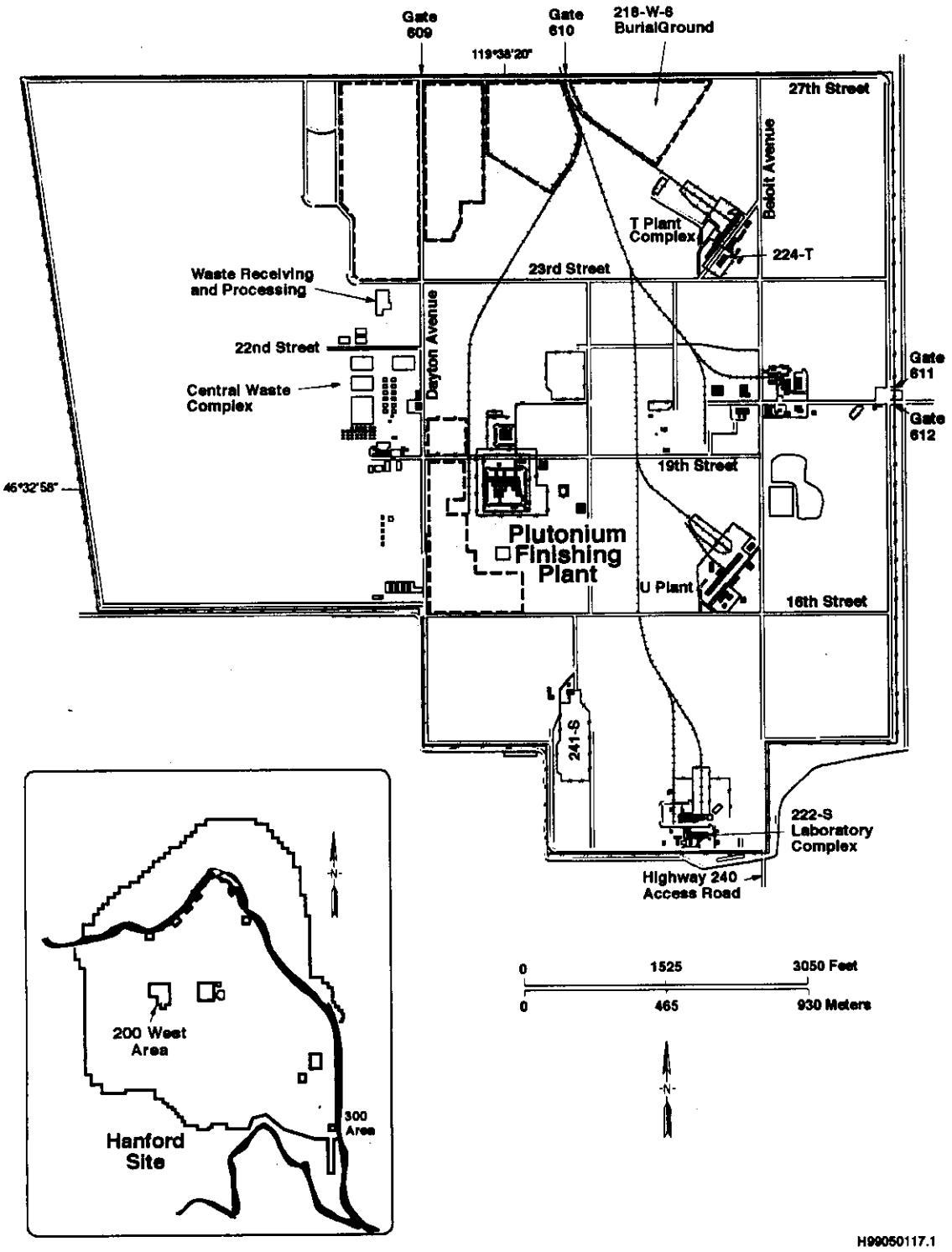


Figure 1. 200 West Area.

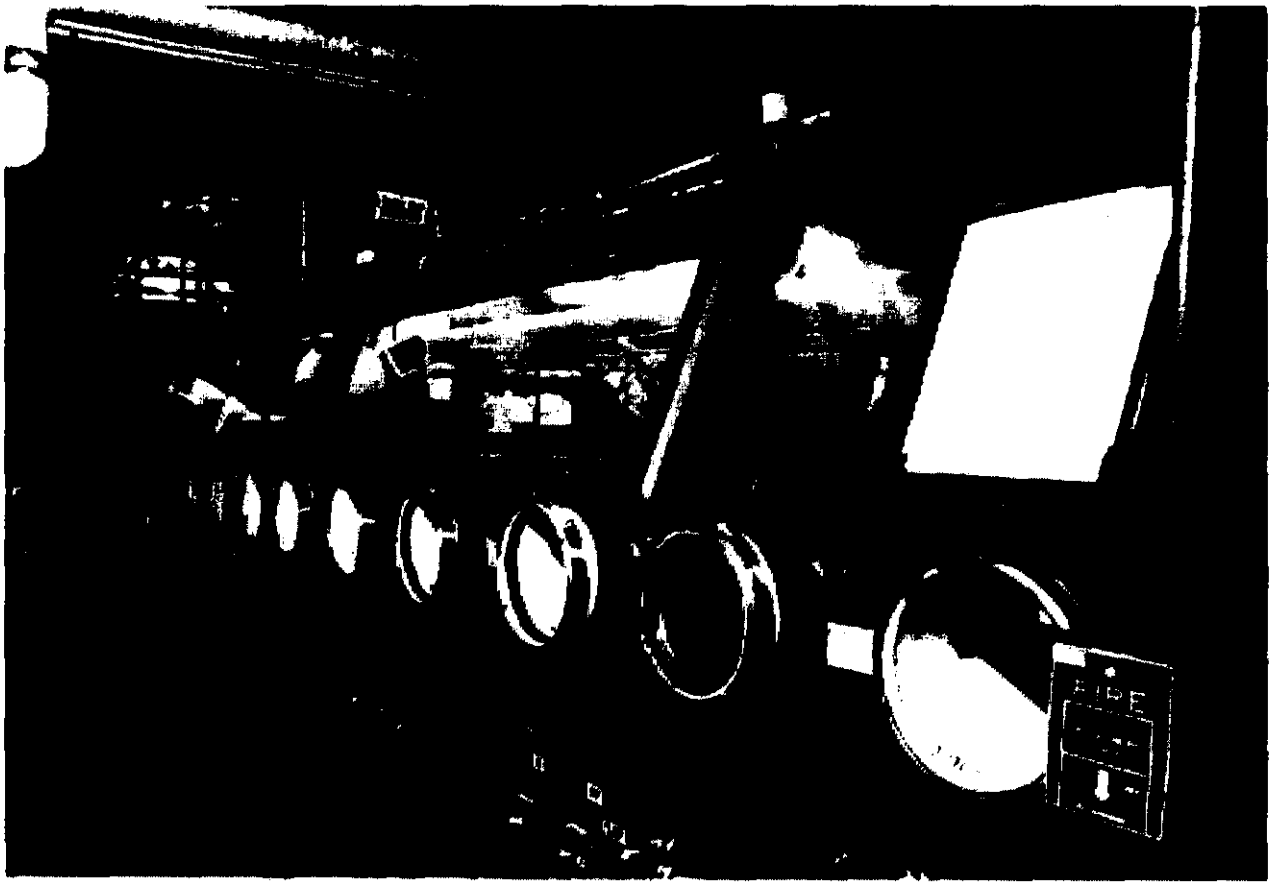
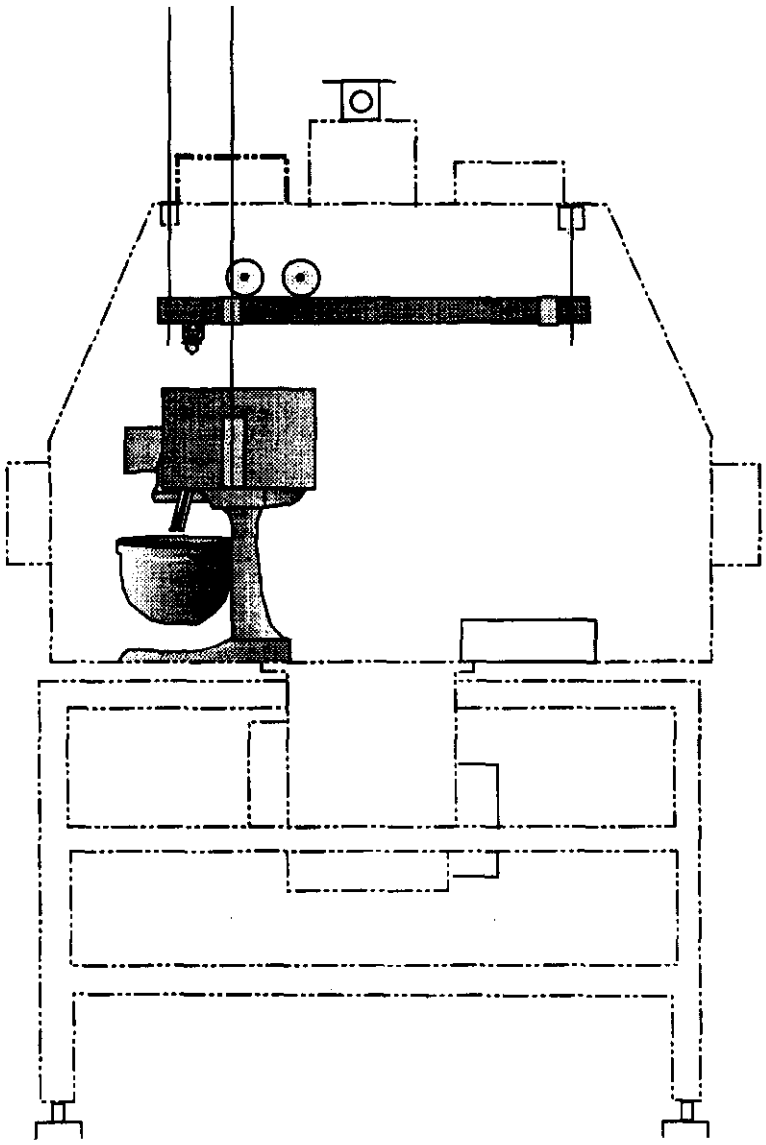


Figure 2. Glovebox HA-20MB in Room 235B of the 234-5Z Building.



Not to scale.

Figure 3. Glovebox HA-20MB.

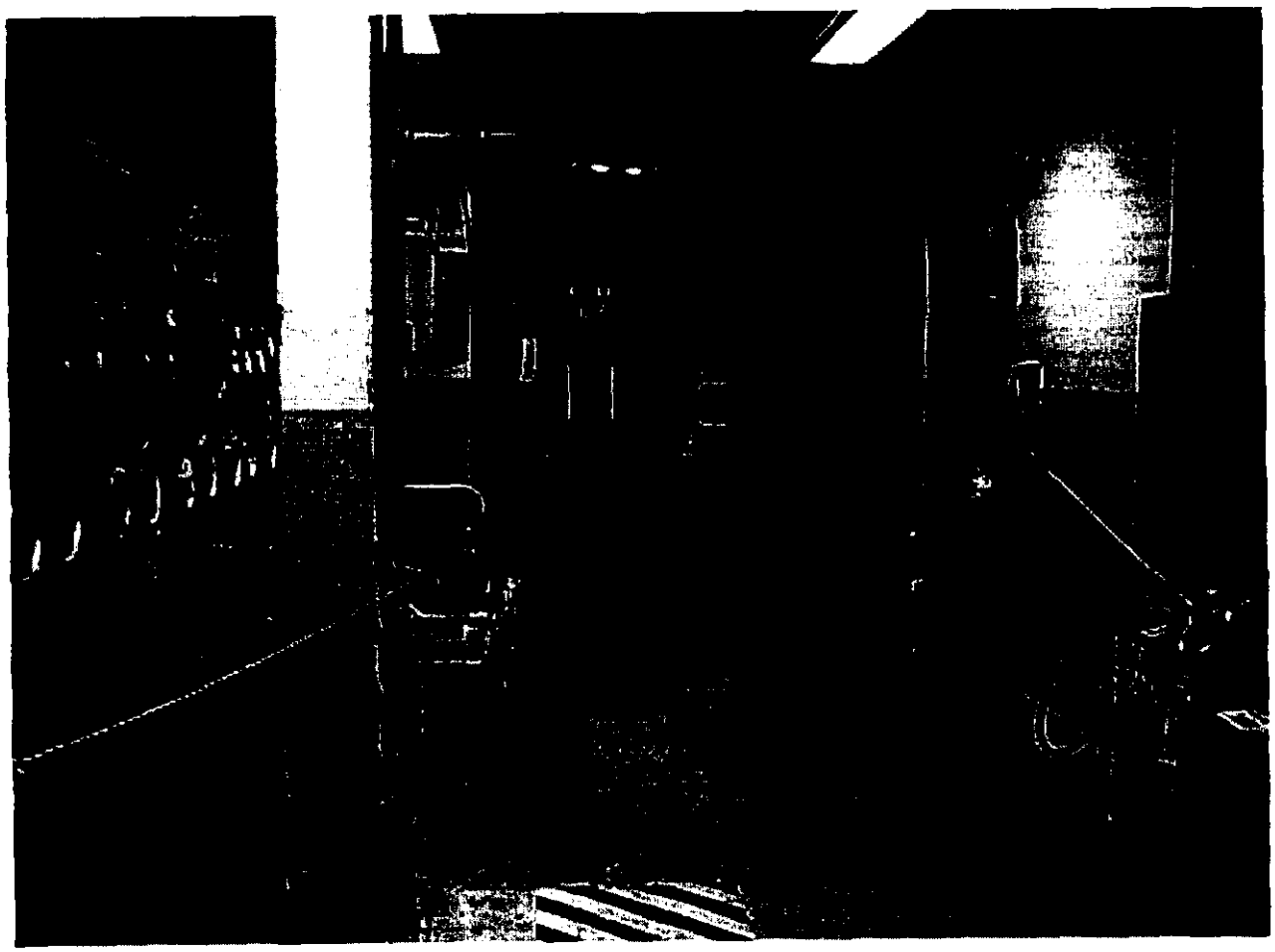
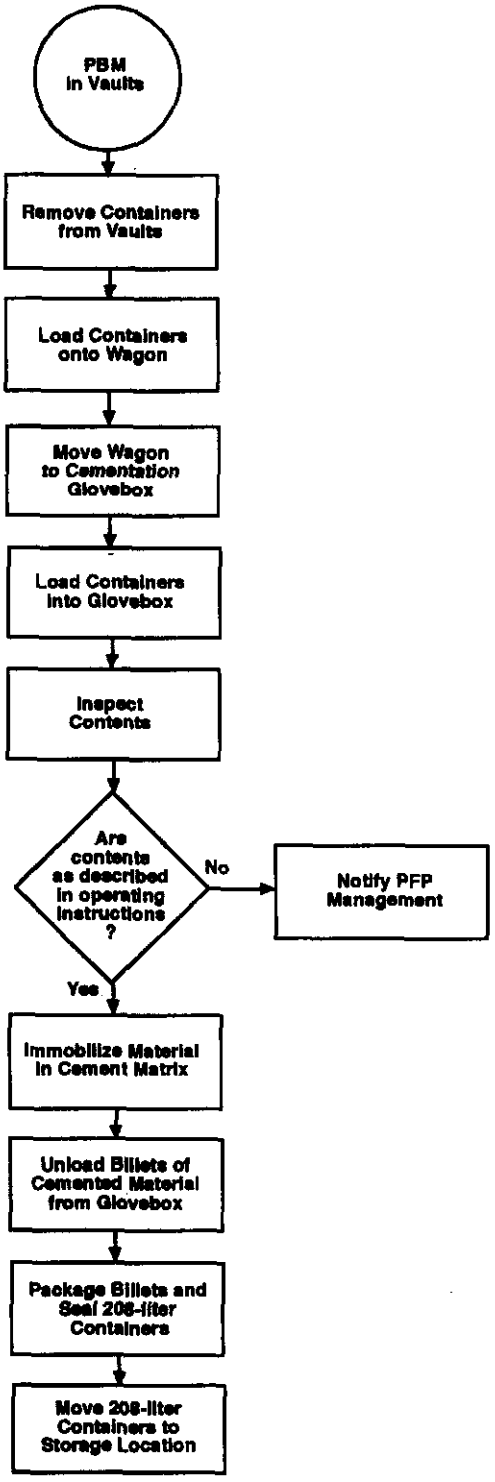


Figure 4. Glovebox HC-46F in Room 170 of the 234-5Z Building.



PBM = plutonium bearing material.
PFP = Plutonium Finishing Plant.

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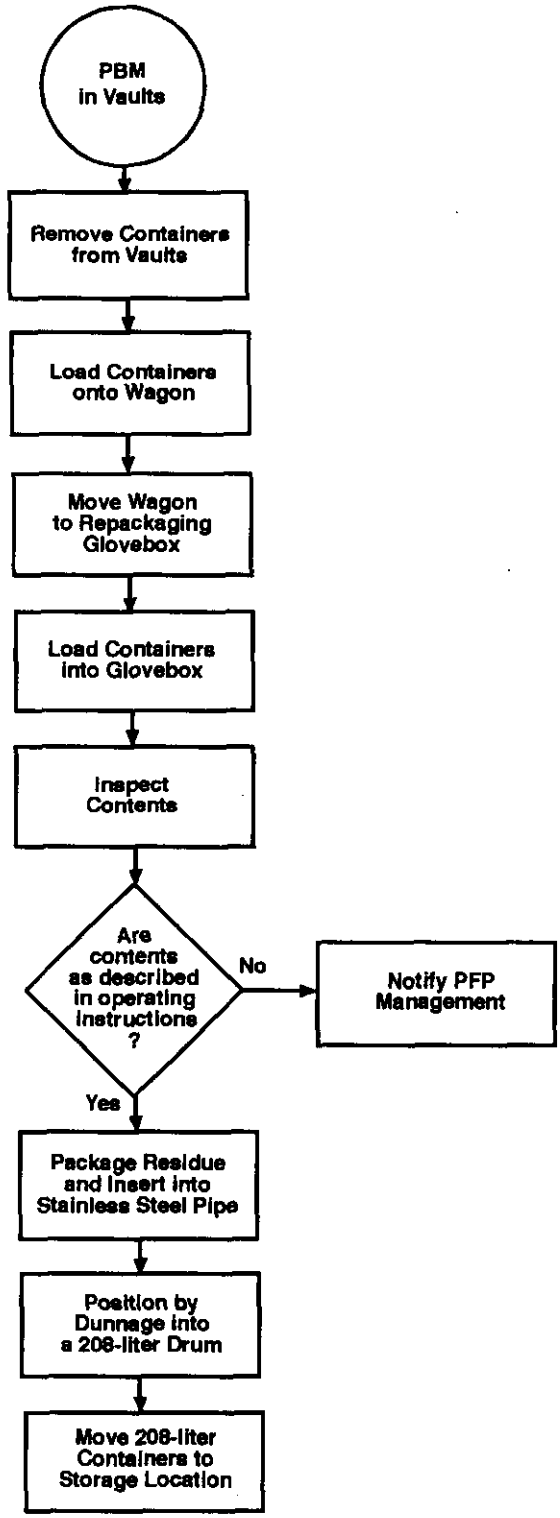
Figure 5. Treatment Process Flow.



PBM = plutonium bearing material.
PFP = Plutonium Finishing Plant.

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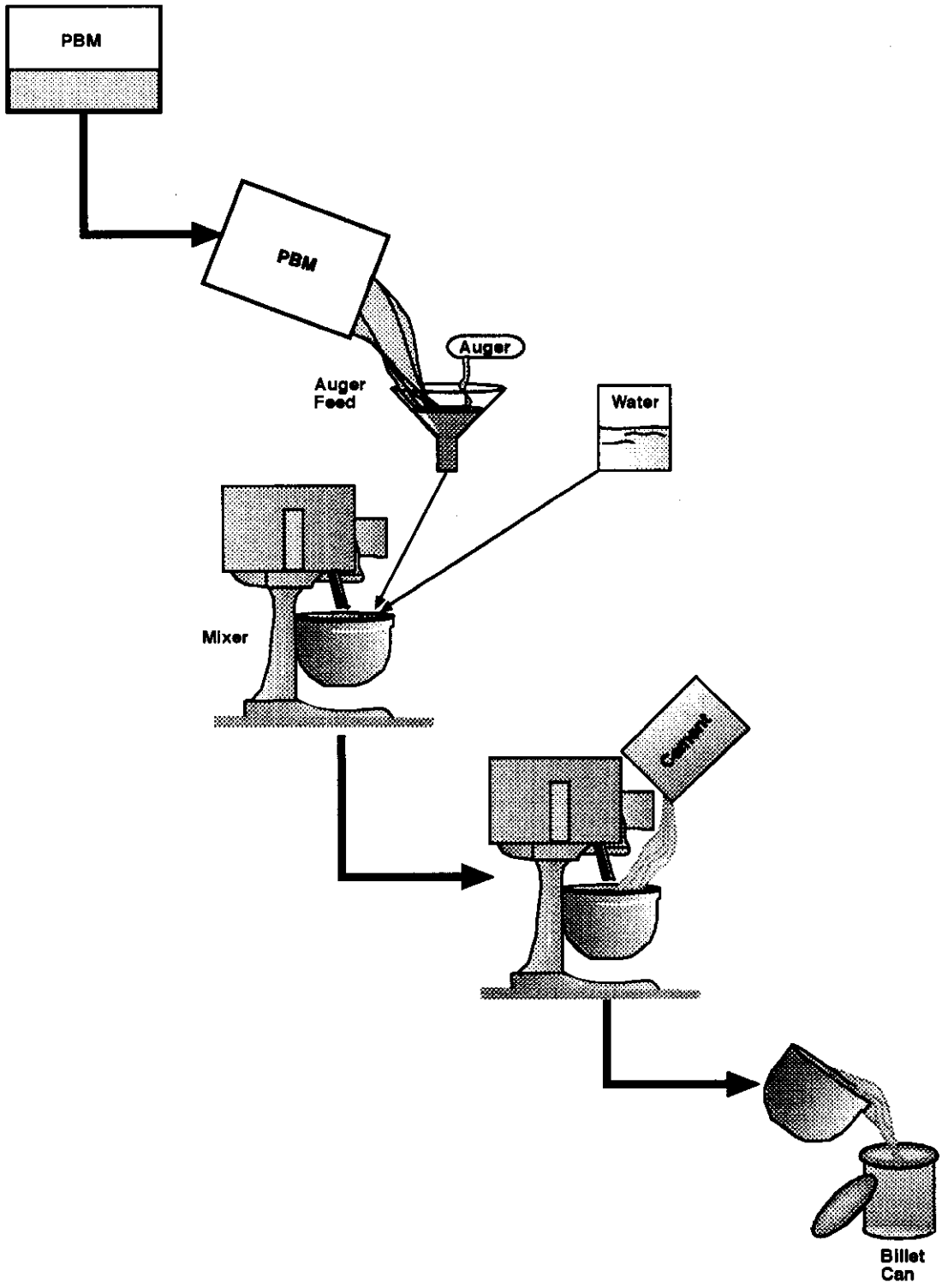
Figure 6. Repackaging Process Flow.



Not to scale.
PBM = plutonium bearing material.

H99050117.3R2

Figure 7. Cementation Treatment Process.

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