

9B101



P. O. Box 464
Golden, Colorado 80402-2677
Phone: (303) 966-2677
Fax: (303) 966-8244

June 4, 1996

96-RM-TA-0117-KH

Randy Leitner, Program Manager
Compliance & Performance Assurance
Kaiser-Hill Company, L.L.C.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PART B PERMIT MODIFICATION NUMBER
58 - BENCH-SCALE TREATMENT OF HAZARDOUS WASTE CHEMICALS - GRK-159-96

Action: Transmit Class 1 Permit Modification for Treatment of Hazardous Waste Chemicals

RMRS is submitting the attached Class 1 RCRA Part B Permit Modification for approval by the Colorado Department of Public Health and the Environment (CDPHE) pursuant to 6 CCR 1007-3, Section 100.63(a)(2). Specifically, CDPHE approval is requested for a new hazardous waste treatment unit (Unit 80.2 - Bench-Scale Hazardous Waste Chemical Treatment). The purpose of Unit 80.2 is to provide the capability for on-site treatment of hazardous waste chemicals at the Rocky Flats Environmental Technology Site. The unit will be located in Building 881, Room 267.

Unit 80.2 includes five treatment processes (i.e., ultraviolet oxidation, hydrolysis, cementation, organic treatment, and in-situ treatment). Those processes utilize standard laboratory techniques and CDPHE-approved treatment technologies which have been demonstrated to be effective for treatment of hazardous waste chemicals. Wastes proposed for treatment include but are not limited to expired and off-specification chemicals and reference standards, as well as wastes derived from treatment of those materials.

Also attached are draft transmittal letters to DOE, RFFO and CDPHE. We request that the enclosed permit modification be submitted to DOE, RFFO at your earliest convenience. If you have any questions, please contact Kirk Ticknor at extension 6344.

Gary R. Konwinski, Manager
Performance Assurance

Attachment:
As Stated

cc:

K. M. Lavorato - Kaiser-Hill
K. North - Kaiser-Hill
W. Wierzbicki - SSOC
G. G. Englemann - RMRS

C. C. Jierree - RMRS
K. W. Ticknor - RMRS
RMRS Records Center, Building 080



1/25

ADMIN RECORD
SW-A-004260

Attachment 1
96-TA-0117-KH
Page 1 of 1

DRAFT

DRAFT

DRAFT

June XX, 1996

96-RF-XXXXX

Steven Tower, Group Lead
Environmental Assessment Group
DOE, RFFO

Attn: Dave Grosek

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PART B PERMIT MODIFICATION NUMBER
58 - BENCH-SCALE TREATMENT OF HAZARDOUS WASTE CHEMICALS (5400.1) - RML-XXX-96

Kaiser-Hill is submitting the enclosed Class 1 RCRA Part B Permit Modification for approval by the Colorado Department of Public Health and the Environment (CDPHE) pursuant to 6 CCR 1007-3, Section 100.63(a)(2). Specifically, CDPHE approval is requested for a new hazardous waste treatment unit (Unit 80.2 - Bench-Scale Hazardous Waste Chemical Treatment). The purpose of Unit 80.2 is to provide the capability for on-site treatment of hazardous waste chemicals at the Rocky Flats Environmental Technology Site. The unit will be located in Building 881, Room 267.

Unit 80.2 includes five treatment processes (i.e., ultraviolet oxidation, hydrolysis, cementation, organic treatment, and in-situ treatment). Those processes utilize standard laboratory techniques and CDPHE-approved treatment technologies which have been demonstrated to be effective for treatment of hazardous waste chemicals. Wastes proposed for treatment include but are not limited to expired and off-specification chemicals and reference standards, as well as wastes derived from treatment of those materials.

Also enclosed is a draft transmittal letter to CDPHE. We request that the enclosed permit modification be submitted to CDPHE within two weeks of receipt of this letter. If you have any questions, please call me at extension 3537.

Randy M. Leitner, Program Manager
Compliance & Performance Assurance

Enclosures:
As Stated

cc:

K. North - Kaiser-Hill
K. M. Lavorato - Kaiser-Hill
G. L. Engelmann - RMRS
K. W. Ticknor - RMRS

2

DRAFT

DRAFT

DRAFT

Mr. Joe Schieffelin, Unit Leader
Colorado Department of Public Health and the Environment
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

Dear Mr. Schieffelin:

The United States Department of Energy, Rocky Flats Field Office (DOE, RFFO) is submitting the enclosed Resource Conservation and Recovery Act (RCRA) Permit Modification Number 58 for approval by the Colorado Department of Public Health and the Environment (CDPHE) pursuant to 6 CCR 1007-3, Section 100.63(a)(2). Specifically, CDPHE approval is requested for a new hazardous waste treatment unit (Unit 80.2 - Bench-Scale Hazardous Waste Chemical Treatment). The purpose of Unit 80.2 is to provide the capability for on-site treatment of hazardous waste chemicals at the Rocky Flats Environmental Technology Site. The unit will be located in Building 881, Room 267.

Unit 80.2 includes five treatment processes (i.e., ultraviolet oxidation, hydrolysis, cementation, organic treatment, and in-situ treatment). Those processes utilize standard laboratory techniques and CDPHE-approved treatment technologies which have been demonstrated to be effective for treatment of hazardous waste chemicals. Wastes proposed for treatment include but are not limited to expired and off-specification chemicals and reference standards, as well as wastes derived from treatment of those materials.

This request is submitted as a Class 1 Permit Modification pursuant to 6 CCR 1007-3, Section 100.63, Appendix 1. We request your approval of this request at your earliest convenience. If you have any questions, please contact David Maxwell at 966-4017.

Sincerely,

Bob April, Group Lead
Environmental Liaison Group

Enclosure ,

cc w/enclosure:

C. Gilbreath CDPHE
D. Maxwell DOE, RFFO
D. Grosek DOE, RFFO
R. Leitner Kaiser-Hill
W. Wierzbicki SSOC
K. Holstein DCI
K. Ticknor RMRS

3

96-RM-TA-0117-KH



RCRA PERMIT MODIFICATION #58

**Bench-Scale Treatment of
Hazardous Waste Chemicals**

June 1996



4

**RCRA PERMIT MODIFICATION #58:
Bench-Scale Treatment of Hazardous Waste Chemicals**

**State R.C.R.A. Permit No. 91-09-30-01
CO 7890010526**

**United States Department of Energy -
Rocky Flats Environmental Technology Site**

June 1996

1.0 INTRODUCTION

This document is submitted as a Class 1 RCRA Part B Permit Modification pursuant to 6 CCR 1007-3, Part 100.63(a)(2). Specifically, CDPHE approval is requested for a new hazardous waste treatment unit (Unit 80.2 - Bench-Scale Hazardous Waste Chemical Treatment). The purpose of Unit 80.2 is to provide the capability for on-site treatment of hazardous waste chemicals at the Rocky Flats Environmental Technology Site (Site). The unit will be located in Building 881, Room 267.

Unit 80.2 includes five treatment processes (i.e., ultraviolet oxidation, hydrolysis, cementation, organic treatment, and in-situ treatment). Those processes utilize standard laboratory techniques and CDPHE-approved treatment technologies which have been demonstrated to be effective for treatment of hazardous waste chemicals. Wastes proposed for treatment include but are not limited to expired and off-specification chemicals and reference standards, as well as wastes derived from treatment of those materials. The unit is also capable of treating chemicals that contain radioactive material.

In accordance with the requirements for Class 1 Permit Modifications, this document provides the applicable information required by 6 CCR 1007-3, Section 100.63(a), and describes proposed changes to conditions in the Rocky Flats RCRA Part B Permit.

2.0 PART A: NOTIFICATION

A proposed revision to the Rocky Flats Part A application is submitted with the attached supporting information pursuant to 6 CCR 1007-3, Section 100.63(a).

3.0 CHANGES TO PERMIT CONDITIONS

This section of the Permit Modification describes proposed changes to the Permit as well as parts which shall remain unchanged.

3.1 Introduction

No changes are necessary to this part to address Unit 80.2.

3.2 Part I: Standard Conditions

No changes are necessary to this part to address Unit 80.2.

3.3 Part II: General Facility Conditions

No changes are necessary to this part to address Unit 80.2.

3.4 Part III: Storage Units

No changes are necessary to this part to address Unit 80.2.

3.5 Part IV: Waste Analysis Plan

No changes are necessary to this part to address Unit 80.2.

3.6 Part V: Procedures to Prevent Hazards
No changes are necessary to this part to address Unit 80.2.

3.7 Part VI: Contingency Plan
No changes are necessary to this part to address Unit 80.2.

3.8 Part VII: Personnel Training
No changes are necessary to this part to address Unit 80.2.

3.9 Part VIII: Closure of Permitted Units
Table VIII-1, Unit Specific Closure Information should be revised to include Unit 80.2 as follows:

<u>RCRA Unit ID</u>	<u>Unit Type</u>	<u>Typical Number of Personnel Required for Closure</u>	<u>Estimated Time Required for Closure</u>
80.2	Glovebox/Treatment	4	180 days

3.10 Part IX: Decontamination
No changes are necessary to this part to address Unit 80.2.

3.11 Part X: Soil Sampling
No changes are necessary to this part to address Unit 80.2.

3.12 Part XI: Waste Minimization
No changes are necessary to this part to address Unit 80.2.

3.13 Part XII: Land Disposal Restrictions
No changes are necessary to this part to address Unit 80.2.

3.14 Part XIII: Mixed Waste Plan
No changes are necessary to this part to address Unit 80.2.

3.15 Part XIV: Organic Air Regulations
No changes are necessary to this part to address Unit 80.2.

3.16 Part XV: Corrective Action Requirements
No changes are necessary to this part to address Unit 80.2.

3.17 Part XVI: Treatment Units

Table of Contents: The Table of Contents should be revised to reflect the addition of Unit 80.2.

Section C. Treatment Units - Unit Specific Conditions: Add new unit specific conditions and drawings for Unit 80.2 as follows:

Unit 80.2 - Bench-Scale Hazardous Waste Chemical Treatment

This bench-scale unit includes five treatment processes (i.e., ultraviolet oxidation, hydrolysis, cementation, organic treatment, and in-situ treatment). Wastes proposed for treatment include but are not limited to expired and off-specification chemicals and reference standards, as well as wastes derived from treatment of those materials. Wastes other than expired and off-specification chemicals and reference standards may be treated in this unit; however, the on-duty chemist must develop, prior to treatment, additional pre- and post-treatment waste acceptance criteria for those wastes since they may contain constituents which could impair the effectiveness of treatment. This waste acceptance criteria must meet the requirements of 6 CCR 1007-3, Section 264.13 to ensure that treatment can be done safely and produce an acceptable waste form. Any additional waste acceptance criteria must be documented and kept in the operating record.

One or more of the treatment processes may be applied to a hazardous waste chemical. The following table provides guidelines for identifying the optimal treatment processes for the various types of wastes to be treated.

Waste Description	Treatment Process				
	UV Oxidation	Hydrolysis	Cementation	Organic Treatment	In-Situ
Organic chemicals that are readily oxidized (including peroxide forming compounds that have been stabilized by the in-situ treatment process)	X				
Water reactive metals and metal hydrides, oxides, sulfites, and carbides		X			
Insoluble inorganic and organic salts, metal fines, metal powders, and bases. Also, waste water derived from the other treatment processes in Unit 80.2			X		
Organic chemicals that are ignitable, toxic, or reactive				X	
Peroxides or peroxide-forming organic compounds	X				X

Except in-situ treatment, hazardous waste chemicals will be treated in Building 881, Room 267. Container staging is also allowed in Room 267 up to the capacity of six 55-gallon drums for the EPA waste codes and waste descriptions allowed in Units 80.1 and 80.2. In-situ treatment will be performed at the location where the hazardous waste chemical is discovered or at an alternate location if deemed appropriate by Site personnel. The treatment processes in Unit 80.2 may also be performed at alternate locations provided CDPHE is notified prior to treatment. Documentation of the notice will be kept in the Site's operating record.

All work will be performed in accordance with a Site-approved authorization basis. A Site-approved Job Safety Analysis (JSA), which addresses special hazards and precautions, will be prepared and kept on file for each treatment process. Minimum personnel protective equipment (PPE) for this unit will include safety glasses and chemical-resistant gloves. The on-duty chemist or industrial hygienist will have the flexibility to require additional PPE, modify the treatment processes, or add precautionary measures to assure safe and effective treatment as long as the minimum conditions of this Permit are met.

In addition to following good laboratory practices, an operating record will be kept documenting inspections, operational and safety decisions, treatment locations, dates when hazardous waste chemicals are treated, waste analysis data, and container numbers into which treated wastes are placed (as applicable).

Personnel supervising Unit 80.2 operations will have a minimum of a Bachelor of Science degree in chemistry and a minimum of 3 years practical experience in chemistry.

Following is a detailed description of the specific permit conditions for each process shown in the previous table.

Ultraviolet (UV) Oxidation

This treatment process uses hydrogen peroxide (H_2O_2) and UV light to destroy organic chemicals. Organic chemicals such as trichloroethane, tetrachloroethane, vinyl chloride, and aromatic compounds such as phenol, toluene, benzene, and xylene are particularly amenable to this treatment process since they are readily oxidized.

The UV oxidation is built on a portable cart that can be locked into position during treatment. The organic chemicals are dissolved in water and placed into a 5-gallon holding tank. Hydrogen peroxide is added to the solution. The solution is pumped out of the tank and through the UV reaction chamber. Inside the UV chamber, hydroxyl radicals are generated through UV photolysis of the H_2O_2 . The hydroxyl radicals attack organic compounds and oxidize them. The solution is then returned to the holding tank. This process continues until the organic compounds are eventually destroyed. The process flow diagram for this process is shown on page 11.

The chemist will control certain operating parameters during the treatment process to optimize treatment. Such parameters include retention time, hydrogen peroxide dose, influent pH level, and temperature of the solution.

9

The UV oxidation equipment is located within a containment structure which is connected to the Building 881 exhaust system. This minimizes release of organic vapors into Room 267. Because heat is liberated during the exothermic organic destruction process, the holding tank is cooled with an immersion chiller. This prevents excessive loss of organic compounds through evaporation. The UV oxidation system has a UV meter to assist the on-duty chemist in determining when the reaction is complete. Protection from UV radiation is provided by the design of the equipment.

Pre-treatment waste acceptance criteria for UV oxidation are as follows:

Pre-treatment Parameter	Pre-treatment Waste Acceptance Criteria
EPA Hazardous Waste Codes and Waste Description	Must be a hazardous waste chemical, and must meet the EPA Waste Codes and Waste Description listed on the Unit Specific Conditions Sheet for Unit 80.2.
Solubility	The chemicals to be treated must be soluble in water.

Post-treatment waste acceptance criteria for UV oxidation to verify that the waste is suitable for disposal or further treatment are as follows:

Post-treatment Parameter	Post-treatment Waste Acceptance Criteria
Disposal Requirements	The treated waste must meet LDR requirements of 6 CCR 1007-3, Part 268 based on process knowledge or analytical sample results if the waste will be transferred to a disposal facility. In addition, the treated waste must meet the waste acceptance criteria for the disposal facility.
Further Treatment Requirements	The treated waste must meet the waste acceptance criteria for the unit(s) that the waste will be transferred to if the process is considered pretreatment for final treatment.

Hydrolysis

This treatment process uses water to hydrolyze reactive metals and metal hydrides, oxides, sulfites, and carbides. After hydrolysis, these chemicals become stable, non-reactive compounds.

Hydrolysis is performed in small laboratory containers located in a fume hood. Reactive chemicals will be added to water in a controlled manner. An exothermic reaction will occur, liberating heat and small amounts of hydrogen. The liquid generated will be adjusted with an appropriate acidic or basic material to a pH between 2 and 12.

The addition of chemicals to the water will be done slowly to minimize splattering of the chemicals. A protective barrier for splash protection will be also be used.

Pre-treatment waste acceptance criteria for hydrolysis are as follows:

Pre-treatment Parameter	Pre-treatment Waste Acceptance Criteria
EPA Hazardous Waste Codes and Waste Description	Must be a water reactive metal or compound, and must meet the EPA Waste Codes and Waste Description listed on the Unit Specific Conditions Sheet for Unit 80.2.

Wastes resulting from the hydrolysis treatment process will typically be suitable for final treatment in the Building 374 waste water treatment facility. Post-treatment waste acceptance criteria to verify that the waste is suitable for disposal or further treatment are as follows:

Post-treatment Parameter	Post-treatment Waste Acceptance Criteria
Reactivity	The waste will no longer exhibit the characteristic of reactivity as defined in 6 CCR 1007-3, Part 261. Specifically, the chemist will verify that the waste is no longer reacting in water, indicating that the reaction has gone to completion.
Further Treatment or Disposal Requirements	If the waste is destined for treatment in Building 374, no further action is required to meet Building 374's waste acceptance criteria. If the treated waste is destined for treatment or disposal at a facility other than Building 374, it must meet the waste acceptance criteria for the receiving facility.

Cementation

This treatment process immobilizes hazardous waste chemicals or waste water derived from other Unit 80.2 treatment processes. Wastes to be treated can be liquid or solid; however, the best candidates for cementation are insoluble inorganic and organic salts, metal fines, metal powders, and liquids that are basic and non-reactive with cement.

Waste are cemented in batches in a 5-liter capacity mixer located in a fume hood. The pH of liquid wastes will be adjusted, if necessary, to a minimum pH of 7 before cementation. The hazardous waste chemicals are mixed with cement and/or fly ash at a predetermined ratio into a homogenous waste form. Then the waste is poured from the mixer to a container and allowed to cure and solidify.

Pre-treatment waste acceptance criteria for cementation are as follows:

Pre-treatment Parameter	Pre-treatment Waste Acceptance Criteria
EPA Hazardous Waste Codes and Waste Description	Must be either a hazardous waste chemical or a waste water derived from other Unit 80.2 treatment processes, and must meet the EPA Waste Codes and Waste Description listed on the Unit Specific Conditions Sheet for Unit 80.2.
pH/Normality	Liquids will be adjusted to a minimum pH of 7 prior to cementation.
Disposal Requirements	The on-duty chemist will confirm and document that LDR requirements of 6 CCR 1007-3, Part 268 and the waste acceptance criteria of the disposal facility are achievable based on previous test results or process knowledge. Test results or process knowledge will be used to determine appropriate process controls and formulas for each waste type to ensure compliance with disposal requirements.

Post-treatment waste acceptance criteria for cementation to verify that the waste is suitable for disposal are as follows:

Post-treatment Parameter	Post-treatment Waste Acceptance Criteria
Disposal Requirements	The treated waste must meet LDR requirements of 6 CCR 1007-3, Part 268 based on process knowledge or analytical sample results. In addition, the treated waste must meet the waste acceptance criteria for the disposal facility (e.g., compressive strength, hardness, concentration of radionuclides or dispersible fines).
Absence of Free Liquids	The treated waste must be visually inspected to verify the absence of free liquids.

Organic Treatment

This treatment process uses controlled chemical reactions for the treatment of organic hazardous waste chemicals. The organic compounds in these chemicals are broken down into non-toxic compounds such as carbon dioxide, hydrogen, and water. The hazardous waste chemicals to be treated may be ignitable, toxic, or reactive organic compounds.

Wastes are treated in batches of 5 liters or less in laboratory containers located in a fume hood. Due to the potentially reactive nature of some of the hazardous waste chemicals being treated, the process will be carried out using small quantities of chemicals to maintain control of the chemical reactions.

12

The chemical reactions will be carried out in dilute solutions, when necessary, to minimize the rate at which the chemical reactions occur.

Pre-treatment waste acceptance criteria for organic treatment are as follows:

Pre-treatment Parameter	Pre-treatment Waste Acceptance Criteria
EPA Hazardous Waste Codes and Waste Description	Must be a hazardous waste chemical, and must meet the EPA Waste Codes and Waste Description listed on the Unit Specific Conditions Sheet for Unit 80.2.

Post-treatment waste acceptance criteria for organic treatment to verify that the waste is suitable for disposal or further treatment are as follows:

Post-treatment Parameter	Post-treatment Waste Acceptance Criteria
Disposal Requirements	The treated waste must meet LDR requirements of 6 CCR 1007-3, Part 268 based on process knowledge or analytical sample results if the waste will be transferred to a disposal facility. In addition, the treated waste must meet the waste acceptance criteria for the disposal facility.
Further Treatment Requirements	The treated waste must meet the waste acceptance criteria for the unit(s) that the waste will be transferred to if the process is considered pretreatment for final treatment.

In-Situ Treatment of Peroxides and Peroxide-Forming Compounds

The in-situ treatment process destroys peroxides and peroxide-forming organic compounds. This is accomplished by addition of chemicals that reduce and inhibit formation of peroxides.

Due to the unstable nature of peroxides, in-situ treatment will be done at the location where the hazardous waste chemical is discovered or at an alternate location if deemed appropriate by Site personnel. A work plan will be developed and implemented prior to performing in-situ treatment. This will include development of a JSA, verification of appropriate work authorization, and specification of appropriate PPE such as blast suits with hoods and gloves. A restricted area will be established to protect personnel and facilities at the Site.

Peroxide-forming compounds may vaporize at temperatures greater than 90° F and condense as unstable crystals (especially on the inside of the container lid). Opening these containers poses a risk of detonation. Therefore, the containers will be carefully inverted in an appropriate solvent before opening to dissolve any peroxide crystals that may have formed. After the container is opened, an appropriate reducing agent (e.g., ferrous ammonium sulfate) will be added to the peroxide-forming compound to reduce the concentration of peroxide.

Tests strips will be used intermittently during the addition of the reducing agent until peroxides are no longer detected. More reducing agent and an appropriate inhibitor (e.g., 2,6-Di-tert-butyl-4-methylphenol) will then be added to minimize additional peroxide formation.

Treated chemicals will be removed from the restricted area and repackaged into the original container, if possible, in accordance with applicable waste packaging procedures. The treated waste will be sent to the UV oxidation process for final destruction of peroxide forming organic compounds or packaged for off-site shipment for additional treatment and disposal.

In case of an emergency, the Site maintains a dedicated Hazardous Material Response Team (as described in the Contingency Plan Section of the Rocky Flats Part B RCRA permit). This team is on call 24 hours a day to assist the chemists if necessary.

Pre-treatment waste acceptance criteria for in-situ treatment are as follows:

Pre-treatment Parameter	Pre-treatment Waste Acceptance Criteria
EPA Hazardous Waste Codes and Waste Description	Must be a peroxide or peroxide-forming compound, and must meet the EPA Waste Codes and Waste Description listed on the Unit Specific Conditions Sheet for Unit 80.2.

Post-treatment waste acceptance criteria for in-situ treatment are as follows:

Post-treatment Parameter	Post-treatment Waste Acceptance Criteria
Peroxide Concentration	Peroxides must not be detected based on results from test strips.
Presence of Inhibitor	The treated waste must contain an inhibitor to minimize additional peroxide formation.
Further Treatment Requirements	The treated waste may be sent to the UV oxidation process for further treatment. If this is the case, the waste must meet the waste acceptance criteria for the UV oxidation process.
Off-Site Shipment Requirements	If the treated waste is sent off-site, it must meet the Waste Acceptance Criteria for the receiving facility.

The Unit Specific Conditions sheets, process flow diagrams, and typical unit inspection sheets for Unit 80.2 are provided in the following section.

Unit 80.2 - Unit Specific Conditions

Unit Number: 80.2 - UV Oxidation

Location: Building 881, Room 267 (staging prior to treatment may occur in fume hood FH-3)

Process Description: UV Oxidation

Capacity: 1 liter per day

Dimensions: Approximately 4 feet x 4 feet

Waste Codes: D001, D003, D022, D029, D035, P016, U002, U003, U009, U027, U031, U044, U077, U078, U079, U080, U108, U112, U113, U123, U154, U159, U160, U161, U188

Waste Description: Liquid and solid hazardous and mixed waste

Secondary Containment:
Type: Catch basin formed as part of portable cart base
Minimum Berm Height: Minimum volume to contain 100% of the waste being treated

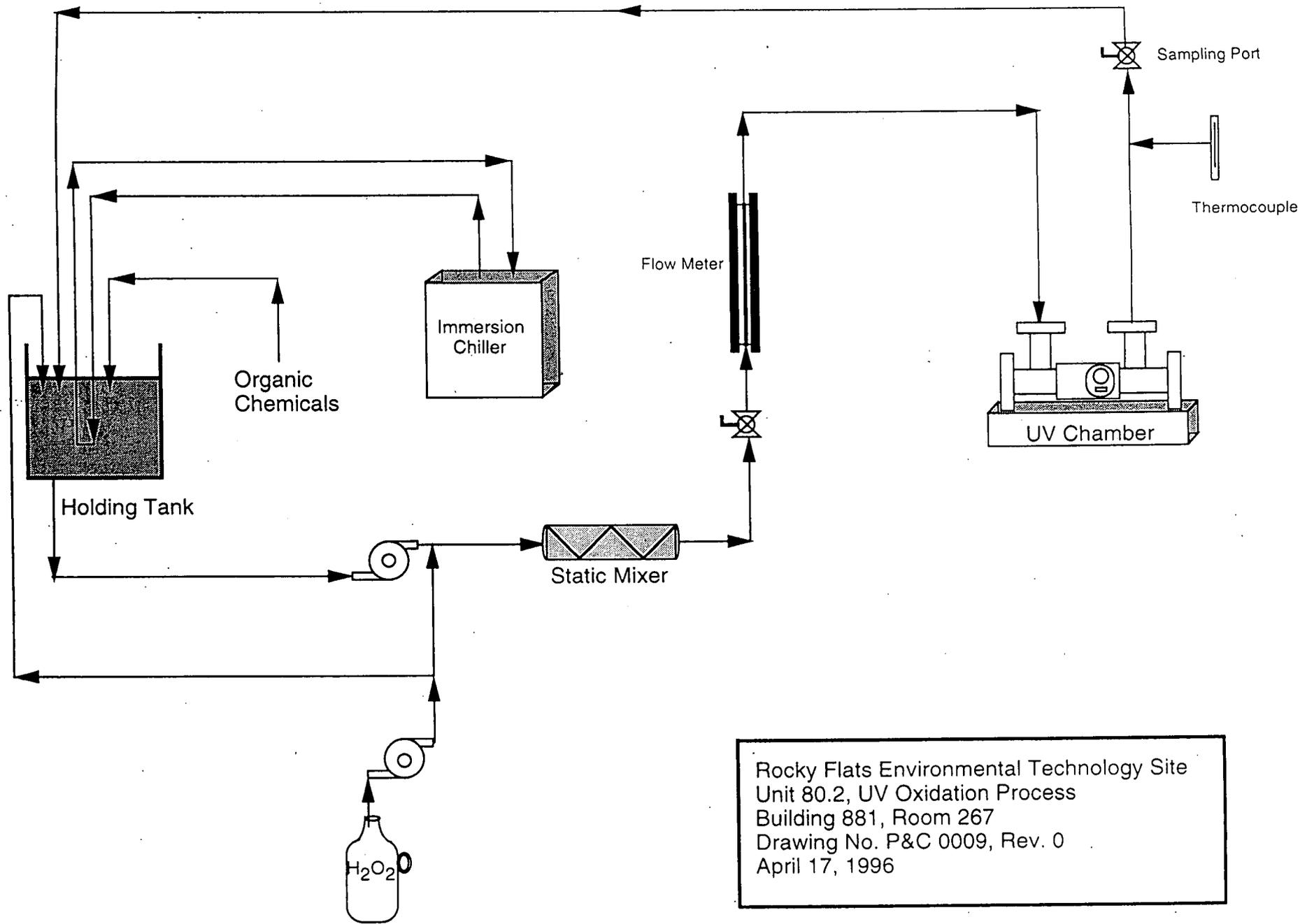
Inspection Method: Visual

Process Control Variables:
UV transmission
Vessel: UV lamp either on or off
Minimum: N/A
Maximum: 30,000 μ watt per cm^2
Peroxide feed rate
Vessel: Peristaltic pump
Minimum: N/A
Maximum: 20 ml/min (or 30 percent by weight)

Drawing Number: P&C 0008 and P&C 0009

Unit Specific Conditions: None

15



Rocky Flats Environmental Technology Site
 Unit 80.2, UV Oxidation Process
 Building 881, Room 267
 Drawing No. P&C 0009, Rev. 0
 April 17, 1996

16

Unit 80.2 - Unit Specific Conditions

Unit Number 80.2 - Hydrolysis

Location: Building 881, Room 267, fume hoods FH-4 and 5

Process Description: Hydrolysis

Capacity: 5 liters per day

Hood Dimensions: Approximately 3 feet x 4 feet

Waste Codes: D001, D003, D005

Waste Description: Liquid and solid hazardous and mixed waste

Secondary Containment:

Type: Steel or plastic catch basins

Minimum Berm Height: Minimum volume to contain 100% of the waste being treated

Inspection Method: Visual

Process Control Variables:

pH

 Minimum: 2

 Maximum: 12

Temperature

 Treatment will continue until no additional temperature rise occurs in the solution

Drawing Number: P&C 0008

Unit Specific Conditions:

1. Splash protection is to be used at all times.

Unit 80.2 - Unit Specific Conditions

Unit Number 80.2 - Cementation

Location: Building 881, Room 267, fume hoods FH-4 and 5

Process Description: Cementation

Capacity: 25 liters of waste per day

Hood Dimensions: Approximately 3 feet x 4 feet

Waste Codes: D001, D002, D003, D004, D005, D006, D007, D008, D009, D010, D011, P011, P012, P015, P022, P087, P113, P119, P120, U123, U144, U145, U151, U204, U214, U215, U216, U217

Waste Description: Liquid and solid hazardous and mixed waste

Secondary Containment:

Type: Steel or plastic catch basins

Minimum Berm Height: Minimum volume to contain 100% of the waste being treated

Inspection Method: Visual

Process Control Variables:

Solid to Liquid Ratio

Minimum: N/A

Maximum: 25 percent waste loading by solid weight

pH

Minimum: 7

Maximum: N/A

Drawing Number: P&C 0008

Unit Specific Conditions:

1. Up to 5 liters may be mixed per batch due to the capacity limit of the mixer.

18

Unit 80.2 - Unit Specific Conditions

Unit Number 80.2 - Organic Treatment

Location: Building 881, Room 267, fume hoods FH-4 and 5

Process Description: Organic Treatment

Capacity: 5 liters per day

Hood Dimensions: Approximately 3 feet x 4 feet

Waste Codes: D001, D003, D012, D018, D019, D021, D022, D024, D025, D026, D028, D029, D035, D036, D038, D040, D041, D042, P014, P016, P022, P027, P028, P077, P093, P116, P123, U002, U003, U009, U012, U018, U019, U027, U028, U031, U037, U041, U042, U044, U052, U053, U055, U056, U057, U067, U068, U069, U070, U071, U072, U077, U078, U079, U080, U081, U083, U098, U102, U103, U106, U107, U108, U112, U113, U116, U118, U120, U122, U123, U127, U131, U134, U137, U138, U147, U148, U151, U154, U159, U160, U161, U162, U165, U166, U169, U170, U188, U190, U191, U196, U197, U201, U204, U207, U209, U210, U211, U218, U219, U220, U221, U222, U225, U226, U228, U234, U238, U239, U240, U328, U353

Waste Description: Liquid and solid hazardous and mixed waste

Secondary Containment:

Type: Steel or plastic catch basins

Minimum Berm Height: Minimum volume to contain 100% of the waste being treated

Inspection Method: Visual

Process Control Variables: N/A

Drawing Number: P&C 0008

Unit Specific Conditions: None

Unit 80.2 - Unit Specific Conditions

Unit Number 80.2 - In-Situ Treatment

Location: Various on-site locations (case-by-case determination)

Process Description: In-Situ treatment of peroxide-forming compounds

Capacity: 4 liters per day

Dimensions: N/A

Waste Codes: D001, D003, U009, U159, U160

Waste Description: Liquid and solid hazardous and mixed waste

Secondary Containment:

Type: Steel or plastic catch basins

Minimum Berm Height: Minimum volume to contain 100% of the waste being treated

Inspection Method: Visual

Process Control Variables:

Peroxide Concentration

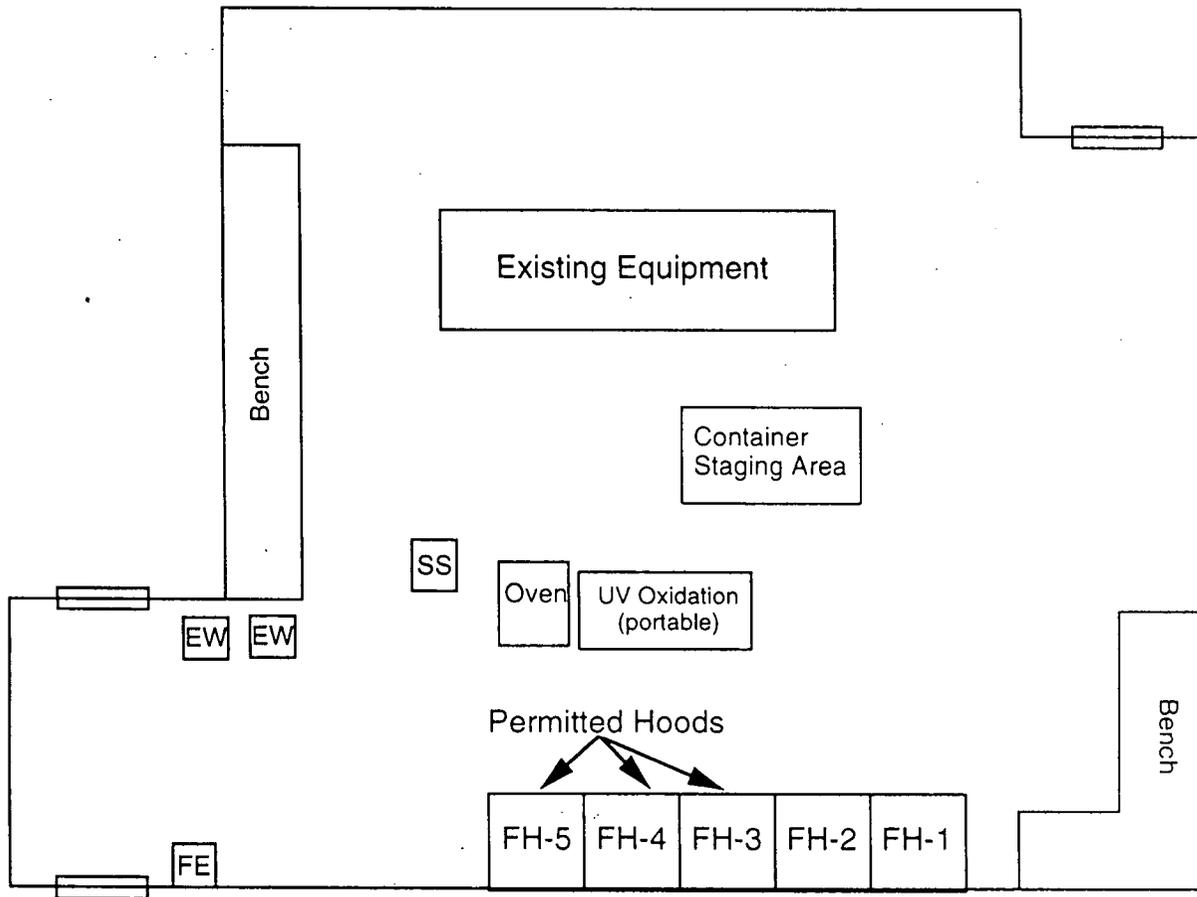
Range: When peroxides are no longer detected using test strips, more reducing agent and an inhibitor will be added to the solution to complete treatment.

Drawing Number: N/A

Unit Specific Conditions:

1. Plastic Shielding and use of blast suit or other appropriate bunker gear with hoods and gloves are typically required.

20



Note: Containers may be staged up to the capacity of six 55-gallon drums for EPA Waste Codes and Waste Descriptions allowed in Units 80.1 and 80.2.

Rocky Flats Environmental Technology Site
Unit 80.2 Layout, Building 881, Room 267
Drawing No. P&C 0008, Rev.0
April 17, 1996

21

**RCRA TREATMENT UNIT 80.2
BENCH-SCALE HAZARDOUS WASTE CHEMICAL TREATMENT
INSPECTION SHEET**

BUILDING
ROOM
UNIT ID NO.
DATE
TIME
INSPECTOR
SIGNATURE

The following log sheet must be filled out completely and accurately. The only acceptable responses are "Yes," "No," or "NA."

1. Are unit signs present, correct, and visible at each entrance to Room 267?
2. Is hazardous waste present in the treatment unit?
3. Is adequate aisle space present around treatment unit and clear of obstruction?
4. Is the catch basin in good condition and free of cracks or gaps that could impair the effectiveness of the containment?
5. Are wastes authorized for storage within the unit?
6. Is process equipment in good condition?
7. Lack of evidence of leakage from process equipment?
8. Is spill response equipment accessible and in good working condition?

- If the response to this question is "No", the inspector must note in the comment section that inspections are not required if hazardous wastes are not present in the treatment unit.

REMEDIAL ACTIONS

- Always notify Supervision of any problems.
- "No" answers require explanation and/or corrective action in the comments section.

COMMENTS AND CORRECTIVE ACTIONS (The reverse side can be used if additional space is needed for comments).

Date

22

4.0 SUPPORTING INFORMATION

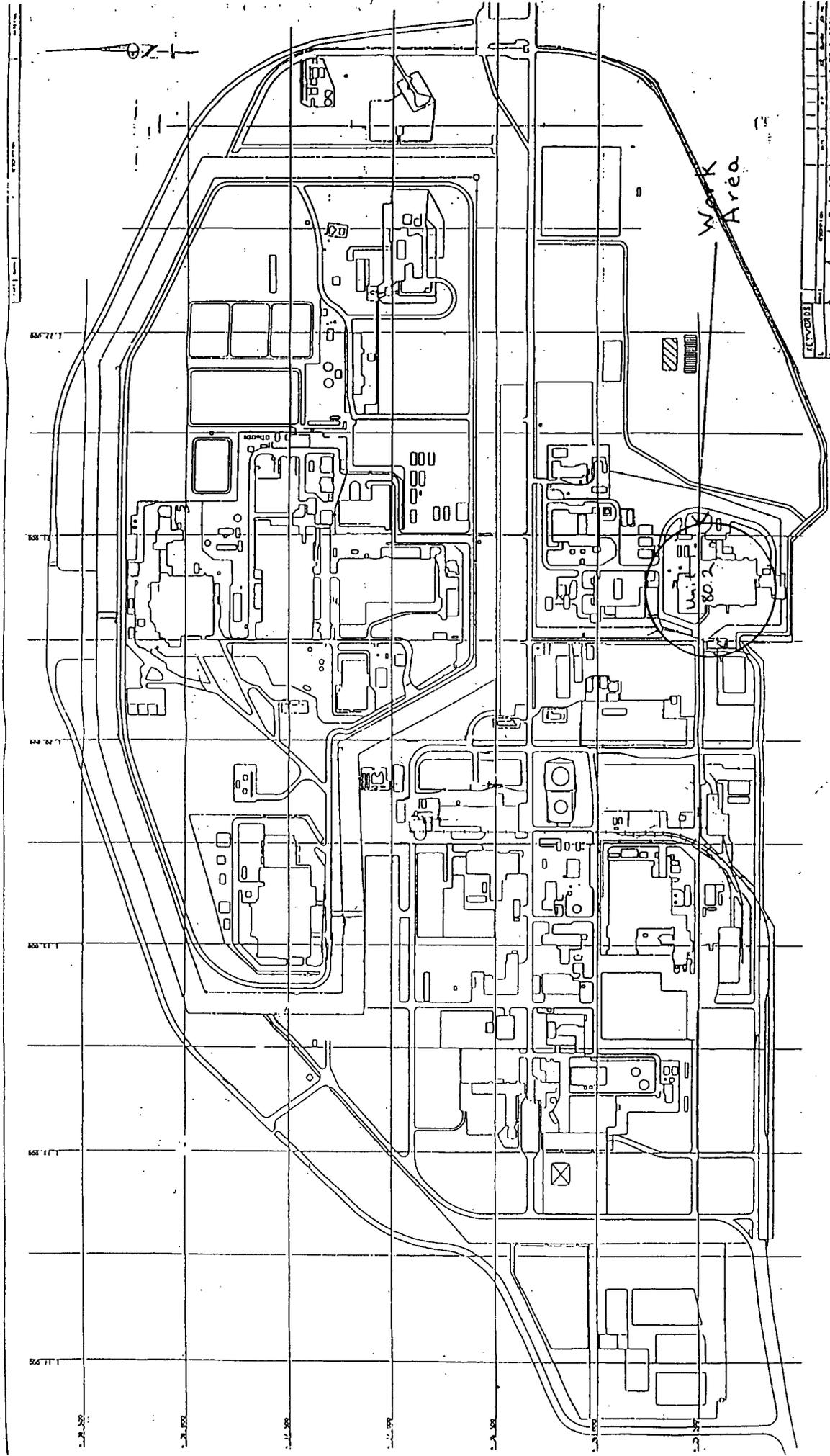
The information provided in this section is submitted pursuant to 6 CCR 1007-3, Section 100.63(a). This section contains additional information which is not incorporated in the proposed permit conditions.

4.1 Unit 80.2

Except for in-situ treatment, Unit 80.2 will be located in Building 881, Room 267. Room 267 has been used as a Research and Development laboratory for many years of the Site's manufacturing and waste management history. Building 881 is a large concrete building with a high-efficiency air particulate (HEPA) ventilation system. Air is pulled by vacuum from the UV oxidation system and fume hoods FH-3, 4 and 5 into the Building 881 ventilation system. Room 267 is equipped with an eye-wash stations, safety shower, and fire extinguisher. In-situ treatment will be performed at the location where the hazardous waste chemical is discovered or at an alternate location if deemed appropriate by Site personnel.

4.2 Site Location

A site location drawing is provided as Figure 4.1



NO.	DESCRIPTION	DATE	BY
1	PRELIMINARY PLAN	11/1/58	J. H. [unclear]
2	REVISED PLAN	11/15/58	J. H. [unclear]
3	REVISED PLAN	11/25/58	J. H. [unclear]
4	REVISED PLAN	12/5/58	J. H. [unclear]
5	REVISED PLAN	12/15/58	J. H. [unclear]
6	REVISED PLAN	12/25/58	J. H. [unclear]
7	REVISED PLAN	1/5/59	J. H. [unclear]
8	REVISED PLAN	1/15/59	J. H. [unclear]
9	REVISED PLAN	1/25/59	J. H. [unclear]
10	REVISED PLAN	2/5/59	J. H. [unclear]
11	REVISED PLAN	2/15/59	J. H. [unclear]
12	REVISED PLAN	2/25/59	J. H. [unclear]
13	REVISED PLAN	3/5/59	J. H. [unclear]
14	REVISED PLAN	3/15/59	J. H. [unclear]
15	REVISED PLAN	3/25/59	J. H. [unclear]
16	REVISED PLAN	4/5/59	J. H. [unclear]
17	REVISED PLAN	4/15/59	J. H. [unclear]
18	REVISED PLAN	4/25/59	J. H. [unclear]
19	REVISED PLAN	5/5/59	J. H. [unclear]
20	REVISED PLAN	5/15/59	J. H. [unclear]
21	REVISED PLAN	5/25/59	J. H. [unclear]
22	REVISED PLAN	6/5/59	J. H. [unclear]
23	REVISED PLAN	6/15/59	J. H. [unclear]
24	REVISED PLAN	6/25/59	J. H. [unclear]
25	REVISED PLAN	7/5/59	J. H. [unclear]
26	REVISED PLAN	7/15/59	J. H. [unclear]
27	REVISED PLAN	7/25/59	J. H. [unclear]
28	REVISED PLAN	8/5/59	J. H. [unclear]
29	REVISED PLAN	8/15/59	J. H. [unclear]
30	REVISED PLAN	8/25/59	J. H. [unclear]
31	REVISED PLAN	9/5/59	J. H. [unclear]
32	REVISED PLAN	9/15/59	J. H. [unclear]
33	REVISED PLAN	9/25/59	J. H. [unclear]
34	REVISED PLAN	10/5/59	J. H. [unclear]
35	REVISED PLAN	10/15/59	J. H. [unclear]
36	REVISED PLAN	10/25/59	J. H. [unclear]
37	REVISED PLAN	11/5/59	J. H. [unclear]
38	REVISED PLAN	11/15/59	J. H. [unclear]
39	REVISED PLAN	11/25/59	J. H. [unclear]
40	REVISED PLAN	12/5/59	J. H. [unclear]
41	REVISED PLAN	12/15/59	J. H. [unclear]
42	REVISED PLAN	12/25/59	J. H. [unclear]
43	REVISED PLAN	1/5/60	J. H. [unclear]
44	REVISED PLAN	1/15/60	J. H. [unclear]
45	REVISED PLAN	1/25/60	J. H. [unclear]
46	REVISED PLAN	2/5/60	J. H. [unclear]
47	REVISED PLAN	2/15/60	J. H. [unclear]
48	REVISED PLAN	2/25/60	J. H. [unclear]
49	REVISED PLAN	3/5/60	J. H. [unclear]
50	REVISED PLAN	3/15/60	J. H. [unclear]
51	REVISED PLAN	3/25/60	J. H. [unclear]
52	REVISED PLAN	4/5/60	J. H. [unclear]
53	REVISED PLAN	4/15/60	J. H. [unclear]
54	REVISED PLAN	4/25/60	J. H. [unclear]
55	REVISED PLAN	5/5/60	J. H. [unclear]
56	REVISED PLAN	5/15/60	J. H. [unclear]
57	REVISED PLAN	5/25/60	J. H. [unclear]
58	REVISED PLAN	6/5/60	J. H. [unclear]
59	REVISED PLAN	6/15/60	J. H. [unclear]
60	REVISED PLAN	6/25/60	J. H. [unclear]
61	REVISED PLAN	7/5/60	J. H. [unclear]
62	REVISED PLAN	7/15/60	J. H. [unclear]
63	REVISED PLAN	7/25/60	J. H. [unclear]
64	REVISED PLAN	8/5/60	J. H. [unclear]
65	REVISED PLAN	8/15/60	J. H. [unclear]
66	REVISED PLAN	8/25/60	J. H. [unclear]
67	REVISED PLAN	9/5/60	J. H. [unclear]
68	REVISED PLAN	9/15/60	J. H. [unclear]
69	REVISED PLAN	9/25/60	J. H. [unclear]
70	REVISED PLAN	10/5/60	J. H. [unclear]
71	REVISED PLAN	10/15/60	J. H. [unclear]
72	REVISED PLAN	10/25/60	J. H. [unclear]
73	REVISED PLAN	11/5/60	J. H. [unclear]
74	REVISED PLAN	11/15/60	J. H. [unclear]
75	REVISED PLAN	11/25/60	J. H. [unclear]
76	REVISED PLAN	12/5/60	J. H. [unclear]
77	REVISED PLAN	12/15/60	J. H. [unclear]
78	REVISED PLAN	12/25/60	J. H. [unclear]
79	REVISED PLAN	1/5/61	J. H. [unclear]
80	REVISED PLAN	1/15/61	J. H. [unclear]
81	REVISED PLAN	1/25/61	J. H. [unclear]
82	REVISED PLAN	2/5/61	J. H. [unclear]
83	REVISED PLAN	2/15/61	J. H. [unclear]
84	REVISED PLAN	2/25/61	J. H. [unclear]
85	REVISED PLAN	3/5/61	J. H. [unclear]
86	REVISED PLAN	3/15/61	J. H. [unclear]
87	REVISED PLAN	3/25/61	J. H. [unclear]
88	REVISED PLAN	4/5/61	J. H. [unclear]
89	REVISED PLAN	4/15/61	J. H. [unclear]
90	REVISED PLAN	4/25/61	J. H. [unclear]
91	REVISED PLAN	5/5/61	J. H. [unclear]
92	REVISED PLAN	5/15/61	J. H. [unclear]
93	REVISED PLAN	5/25/61	J. H. [unclear]
94	REVISED PLAN	6/5/61	J. H. [unclear]
95	REVISED PLAN	6/15/61	J. H. [unclear]
96	REVISED PLAN	6/25/61	J. H. [unclear]
97	REVISED PLAN	7/5/61	J. H. [unclear]
98	REVISED PLAN	7/15/61	J. H. [unclear]
99	REVISED PLAN	7/25/61	J. H. [unclear]
100	REVISED PLAN	8/5/61	J. H. [unclear]

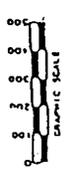


FIGURE 4-1

AREA PLOT PLAN
PORTLAND

24

REVISED PART A APPLICATION

The following is a summary of the changes to the Part A Application resulting from this permit modification.

Unit Number: 80.2
Unit Name: Hazardous Waste Chemical Treatment
Process Code: T04
Design Capacity: 30 liters per day
Waste Type: L, H
Process - Total Number of Units: 5

Description of T04 Processes: Ultraviolet Oxidation: Treatment process which destroys water soluble organic chemicals using hydrogen peroxide and ultraviolet light.
Hydrolysis: Treatment process which neutralizes reactive materials by controlled introduction of water into the waste, thus forming a hydrolyzed, non-reactive compound.
Cementation: Treatment process which immobilizes waste into a LDR compliant waste form using predetermined mixtures of cement and/or fly ash, excess chemicals, and water.
Organic Treatment: Treatment process that uses chemical synthesis to treat reactive organic chemicals. Treatment is performed by inducing small controlled chemical reactions to convert non-stable chemicals into a stable compound.
In-Situ Treatment: Treatment process which stabilizes peroxide-forming compounds using specific chemical addition.

EPA Hazardous Waste codes: D001, D002, D003, D004, D005, D006, D007, D008, D009, D010, D011, D012, D018, D019, D021, D022, D024, D025, D026, D028, D029, D035, D036, D038, D040, D041, D042, F007, P011, P012, P014, P015, P016, P022, P027, P028, P029, P030, P031, P074, P077, P087, P093, P098, P104, P106, P113, P116, P119, P120, P121, P123, U002, U003, U009, U012, U018, U019, U027, U028, U031, U037, U041, U042, U044, U052, U053, U055, U056, U057, U067, U068, U069, U070, U071, U072, U077, U078, U079, U080, U081, U083, U098, U102, U103, U106, U107, U108, U112, U113, U116, U118, U120, U122, U123, U127, U131, U134, U137, U138, U144, U145, U147, U148, U151, U154, U159, U160, U161, U162, U165, U166, U169, U170, U188, U190, U191, U196, U197, U201, U204, U207, U209, U210, U211, U214, U215, U216, U217, U218, U219, U220, U221, U222, U225, U226, U228, U234, U238, U239, U240, U328, U353

Estimated Annual Quantity of Waste: 1 T

Unit Permitting Status: Permitted

29/25