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**PLANT 9 CONTAMINATED PERCHED WATER  
REMOVAL ACTION WORK PLAN JULY 1990**

**07/01/90**

**WMCO/DOE**

**46**

**WORK PLAN**

**PLANT 9  
CONTAMINATED PERCHED WATER**

**REMOVAL ACTION  
WORK PLAN**

**JULY 1990**

**Prepared by:  
Westinghouse Materials Company of Ohio  
P.O. Box 398704  
Cincinnati, Ohio 45239-8704**

**Prepared for:  
U.S. Department of Energy  
P.O. Box 398705  
Cincinnati, Ohio 45239-8705**

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**I. INTRODUCTION**

This document provides a work plan describing the removal action which will be taken to address the uranium contaminated water found in Boring 1324 located near the southeast corner of Plant 9 at the Feed Materials Production Center (FMPC). This removal action is a component of Operable Unit #3. The work plan was prepared to satisfy the commitment to expand Removal Action No. 1 as stated in the Consent Agreement Under CERCLA Section 120 and 106(a) (hereafter called the "Consent Agreement"). The scope of work herein delineates the plan which will be used to locate the source of water, the installation of a recovery well system and pumping of the extracted water to existing treatment facilities.

A Removal Site Evaluation (RSE) and an Action Memorandum have been generated and approved by the Department of Energy (DOE) as required by the 40 Code of Federal Register (CFR) Part 300 the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Section 300.410. All activities performed under this work plan will be in accordance with the NCP and the OSWER Directive 9360.0-03B, SUPERFUND REMOVAL PROCEDURES, Rev. 3.

**II. BACKGROUND**

**1.0 Summary of the Potential Threat**

The Production and Additional Suspect Areas Work Plan of the Feed Materials Production Center (FMPC) Remedial Investigation and Feasibility Study (RI/FS) includes a comprehensive plan to sample and characterize the soil, and the extent of perched water in the upper 20 feet of the soil under the FMPC production area. This is to prevent cross-contamination from the contaminated perched water to the underlying Great Miami Groundwater Aquifer by puncturing the confining layer of material between them during boring activities. In addition to systematic borings at 250 foot intervals across the entire production site, one phase of the RI/FS involves "focused" borings to explore suspect areas of contamination under the individual plants.

As part of the Production and Additional Suspect Areas Work Plan, several borings were installed in and around Plant 9 (see Figure 1). A water sample taken from focused Boring 1324 on January 17, 1990, was found to contain a total uranium concentration of 696,000 micrograms per liter (ug/l). While taking a second water sample from Boring 1324 on February 8, 1990, it was observed that the water level in the well recovered within 4 minutes. This supports the concept that a pool of water exists under the secondary containment enclosure located just west of Boring 1324 (see Figures 1 & 2).

## 2.0 Related Actions

A time critical removal action was approved by the U. S. Department of Energy (DOE), U. S. Environmental Protection Agency (USEPA) and Ohio Environmental Protection Agency (OEPA) for the pumping and treating of uranium contaminated perched water from under FMPC buildings. The first action involved pumping water from under Plant 6. This action commenced on August 1, 1988 on a temporary basis and a more permanent pumping system was placed in operation on November 6, 1989. The pumping in Plant 6 was temporarily stopped on April 23, 1990 due to the encountering of VOCs. The pumping will remain stopped until a determination is made on the appropriate level of treatment is necessary. Plant 6 Perched Water is a continuation of the ongoing removal action to remove perched water.

## 3.0 Roles of Participants

- A. The DOE is the lead agency for this removal action and will coordinate and execute this removal action. The state and local roles have been one of participation in the negotiations of the Consent Agreement and Technical Information Exchanges (TIE).
- B. USEPA and OEPA shall review, comment on the work plan, follow progress through TIE meetings and the Consent Agreement progress reports.
- C. Advanced Sciences, Inc. (ASI), as a subcontractor to DOE, is conducting the RI/FS program activities at the FMPC. ASI will also install a recovery well near Boring 1324.
- D. Westinghouse Materials Company of Ohio (WMCO), the Maintenance and Operations Contractor at the FMPC, will coordinate, manage, implement, monitor and prepare all reports associated with the removal action.

## 4.0 Removal Action

A recovery well near Boring 1324 will be installed to remove perched water and pump the water to existing FMPC wastewater treatment facilities. This effort will be undertaken to control the potential for vertical migration into the Great Miami Aquifer by reducing the hydrostatic head of the perched water. The perched water under Plant 9 has been determined to have significant concentrations of uranium, warranting this removal action. However, the concentration levels of other contaminants of concern are not known at this time. For this reason, preliminary sampling for HSLs/VOCs is scheduled prior to the implementation of this removal action to determine contaminants of concern and to determine type and level of treatment required.

Additional sampling has been proposed and approved as part of the RI/FS Facilities Testing Program. Nine additional borings are scheduled under the

RI/FS on a 30 foot grid east and adjacent to the recovery well planned for extraction of the contaminated water. If any of the wells are "wet", they will be used to monitor the effects of pumping the recovery well. Results of these nine additional borings will be integrated into the Plant 9 removal action as they become available.

A slug test will be performed at Boring #1324. This test will quantify the transmissivity and hydraulic conductivity in order to determine how effective pumping the recovery well will be in relieving the hydrostatic head in the perched water zone.

5.0 Integration With Operable Unit 3

The pumping/treatment system for this removal action shall become part of the remedial action for Operable Unit #3 upon implementation of the subproject pertaining to remediation of Plant 9.

III. SUPPORT ACTIVITIES

The following activities will be undertaken to provide planning, design, and management for the removal action.

1.0 Project Planning

Included in this activity will be the preparation of detailed task listings and delineation of responsibilities to support the schedule given in Attachment 1. Also, a training schedule will be generated to ensure that the personnel involved in the scope of work will be trained in accordance with the Occupational Safety and Health Administration (OSHA) standards found in 29 CFR 1910.120.

2.0 HSL/VOC Investigation

If VOC contamination is verified by the sample results in the perched water, the water will be pumped to an above ground holding tank within Plant 9. The water will then be batch pumped to Plant 6 for treatment.

Three options for removing HSL/VOCs from Plant 6 pumping systems discharge water are under investigation. Option 1 involves heating the water to 180 degrees F in the first unit of the existing Plant 6 WTF. The water would be held at this temperature for a sufficient time to vaporize the organics. Preliminary simulation tests for this removal method have been performed at the WMCO laboratory. The water sample resulting from the tests are presently being analyzed for HSL/VOCs by an offsite laboratory. The water sample analysis will determine if Option 1 is viable. Option 3 requires the pumping systems discharge water to be circulated through activated carbon filters for removal of organic compounds. Option 4 involves utilization of an air stripping column to remove the organics

from the contaminated water. Options 3 and 4 would require construction of new treatment units at the FMPC. Option 2 is an investigation into the feasibility of providing no treatment of the HSL/VOCs. A mass balance of the HSL/VOC level in FMPC wastewater discharge to the Great Miami River will be undertaken to determine the need for HSL/VOC treatment. If this option is acceptable, a report of this option will be prepared and issued to EPA for approval.

In the event that treatment is necessary and Option 1 is successful, the standard operating procedures (SOPs) for the Plant WTF will be modified to incorporate the necessary heating time operating changes. However, if the testing is not successful, a detailed design for either option 3 or 4 will be prepared based on the results of the ongoing treatment investigation.

3.0 Pumping System Design

A detailed design for a submersible pumping system with a liquid level control that is capable of removing water from a four-inch casing will be prepared. The pumping system will include provisions for the monitoring/metering of pump discharge, automatic start/stop control, manual override of automatic control, and a sampling port on the discharge line. The design of the pumping units will be based on the pumping units previously used in the Plant 6 Perched Water Removal Action. The boring with the highest pumping rate in Plant 6 pumped approximately 35-40 gallons per day prior to the temporary termination of the pumping. The volume of water to be removed is not expected to be significant in relation to the flow capability in the existing treatment facilities.

4.0 Management of Project

WMCO personnel will manage the project using FMPC-2201 Topical Manual, Project Management Procedures.

IV. FIELD ACTIONS

Actions will be taken to investigate the source of perched water in Boring 1324, install a recovery well adjacent to Boring 1324 and install a pumping system to remove and transfer the water to existing facilities for treatment before discharge to the Great Miami River.

1.0 Perched Water Source Detection

The objective of this activity is to determine the source of perched water found in Boring 1324. Possible sources include leakage or overflow from the sump located in the secondary containment enclosure at the south corner of Plant 9 or leakage from two gravity lines which discharge to the sump (see Figure 2). This will include actions such as hydrostatic testing, dye testing and visual observations.

## 2.0 Install Recovery Well

The objective of this activity is to provide a recovery well for removing the uranium contaminated water. Boring 1324 cannot be pumped because it only has a two-inch well casing designed for obtaining water samples and checking water levels. The recovery well will be installed adjacent to Boring 1324 (see Figure 1) consistent with the procedures of the RI/FS Work Plan. The well will penetrate the same perched water zone as Boring 1324.

## 3.0 Install Pumping System

The objective of this activity is to install a pumping system and associated piping in the new recovery well.

## 4.0 Provide HSL/VOC Treatment (If Required)

The objective of this activity is to install a treatment system (Option 3 or 4) to remove volatile organics from the extracted perched water. Treatment will take place in the event that the no treatment (Option 2) is unacceptable and if it is determined that operation of the existing Plant 6 treatment system (Option 1) can not be modified to achieve HSL/VOC removal.

## 5.0 Pump Contaminated Water

The objective of this activity is to pump the contaminated water. This effort will be undertaken to control the potential for migration of the contamination by reducing the hydrostatic head of the perched water. The uranium contaminated water will be pumped from the new recovery systems into a holding tank at Plant 9. If HSL/VOCs are present, new piping will be installed to transfer the water from the holding tank at Plant 9 to an identified system (Plant 6 or Plant 8) for treatment of the HSL/VOCs. If there are no HSL/VOCs present, existing facilities will pump the water directly to existing wastewater treatment systems for processing.

## V. **SAMPLING AND ANALYSIS PLAN**

The perched groundwater under Plant 9 has been determined to have significant concentrations of uranium, warranting this removal action. However, the concentration levels of other contaminants of concern are not known at this time. For this reason, preliminary sampling is scheduled prior to the implementation of this removal action to determine contaminants of concern and to determine type and level of treatment required.

Split water samples in support of this removal action will be included in the Sampling and Analysis Plan. Split water samples will be taken by the FMPC Environmental Monitoring Group. The collection of the split water samples and the analysis and

reporting will be in accordance with procedures and protocol specified in the Quality Assurance Project Plan (QAPP) approved as part of the Remedial Investigation (RI) Work Plan. One set of split samples will be sent to a certified independent laboratory for analysis. The results from the certified lab will become part of the Administrative Record File.

The other set of split samples will be utilized as process control samples. The collection, handling, documentation, storage, and analysis of the process control water and soil samples will be in compliance with the approved FMPC Environmental Compliance/Monitoring Procedures and the Analytical Laboratories Quality Assurance Plan L.C.N.-QAP, October 1987. The process control samples will be sent to the FMPC Laboratory for analysis. The analysis results of the split samples from the certified independent laboratory will be used for verification of the analysis performed by the FMPC Laboratory. The results from the routine process control water sampling and monitoring by WMCO during operations will be included in the FMPC Annual Environmental Monitoring Report. This report is available for review as part of the Administrative Record File.

The preliminary water samples will be collected from wells #1324 and #1423 (see Figure 1 location). These samples will be analyzed at the certified independent laboratory for the following:

- Full Hazardous Substance List (HSL) Parameters (See Attachment II)
- Total Radionuclides Parameters (See Attachment III)

The preliminary water samples will also be analyzed at the FMPC laboratory for total radionuclides.

The results of this preliminary sampling will provide the list of contaminants for which treatment is required during the operational and maintenance phase of the perched groundwater removal system. Sampling for these identified contaminants of concern will be done on the following basis:

	Sampling Frequency
System start up and verification	Weekly
First 6 months of system operation	Monthly
After first 6 months of system operation	Quarterly

The samples shall be collected quarterly after the first 6 months of system operation until such time as the sampling results indicate that the contaminant levels are below the established criteria developed for Operable Unit 3. Samples shall also be collected quarterly for one year after termination of pumping activities to verify that the contaminants have been removed.

This monitoring and sampling program will be performed in conjunction with the sampling and analysis activities of Operable Unit 3 final remedial actions. The scope of this monitoring and sampling program will not interfere with any activity in this area.

As stated in the Consent Agreement, if the DOE determines that any activities or work being implemented under this Consent Agreement may create an imminent threat to human health or the environment from the release or threat of release of a hazardous substance, pollutant, contaminant, or hazardous constituent, it may stop any work or activities for such period of time as needed to respond and take whatever action is necessary to abate the danger.

Pumping will also be terminated if the sampling results reveal that after pumping operations begin the contaminant levels in the perched water become lower than the established criteria which are to be developed based on the Operable Unit 3 Baseline Risk Assessment.

**VI. HEALTH & SAFETY PLAN**

The work to be performed will be consistent with the Health and Safety Plan prepared for this removal action. A copy of this plan is provided as Attachment 2 of this Work Plan. The plan identifies, evaluates, and controls all safety and health hazards. In addition, it provides for emergency response for hazardous operations. The plan is consistent with 29 CFR 1910.120 and the FMPC Site Health and Safety Plan. Additional safety documentation will be prepared as necessary according to FMPC-2116 Topical Manual "Implementing FMPC Policies and Procedures for System Safety Analysis." FMPC-2116 has been prepared to implement DOE Order 5481.1B - Safety Analysis and Review System and DOE/OR-901 - Guidance for Preparation of Safety Analysis Reports.

**VII. QUALITY ASSURANCE PLAN**

The overall quality assurance program at the FMPC is described in the site Quality Assurance Plan, FMPC 2139. The Quality Assurance Plan is based on the criteria specified in ASME NQA-1, Federal EPA Guideline QAMS-005/80 and DOE Orders 5700.6 and 5400.1. Specific quality assurance requirements will be incorporated into written and approved procedures and during personnel training. The Quality Assurance Department will conduct periodic surveillances to verify compliance.

**VIII. ASSUMPTIONS**

- 1. No new regulatory assessments or permits required.
- 2. A water sample from Boring 1324 is presently being analyzed for organics and other chemical constituents on the Hazardous Substance List (HSL).

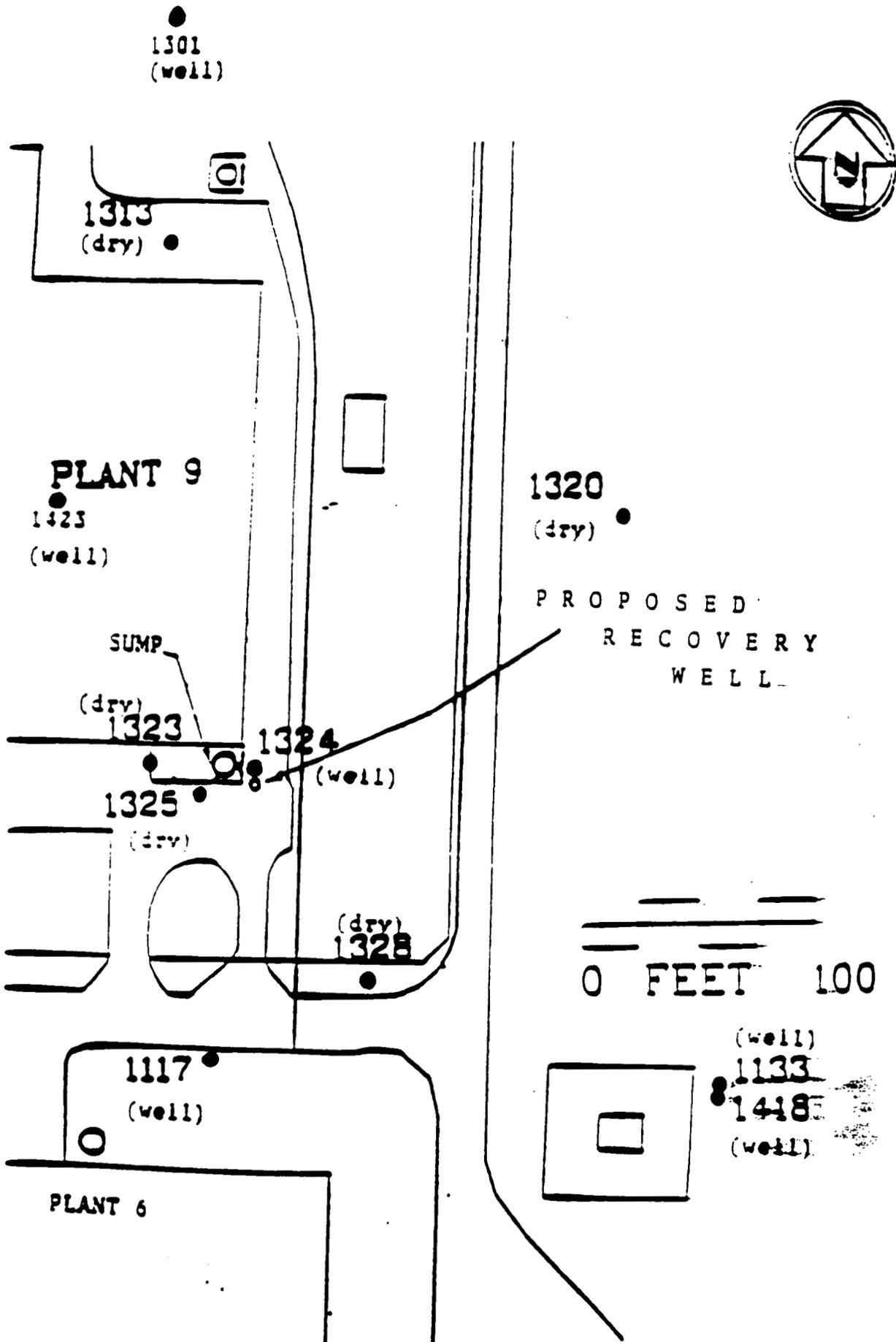


FIGURE 1

BORING 132

Sump

PLANT 9

Floor Drain Line

Secondary Containment Enclosure

Pad Drain Line

"Old" Dust Dust Collector Pad

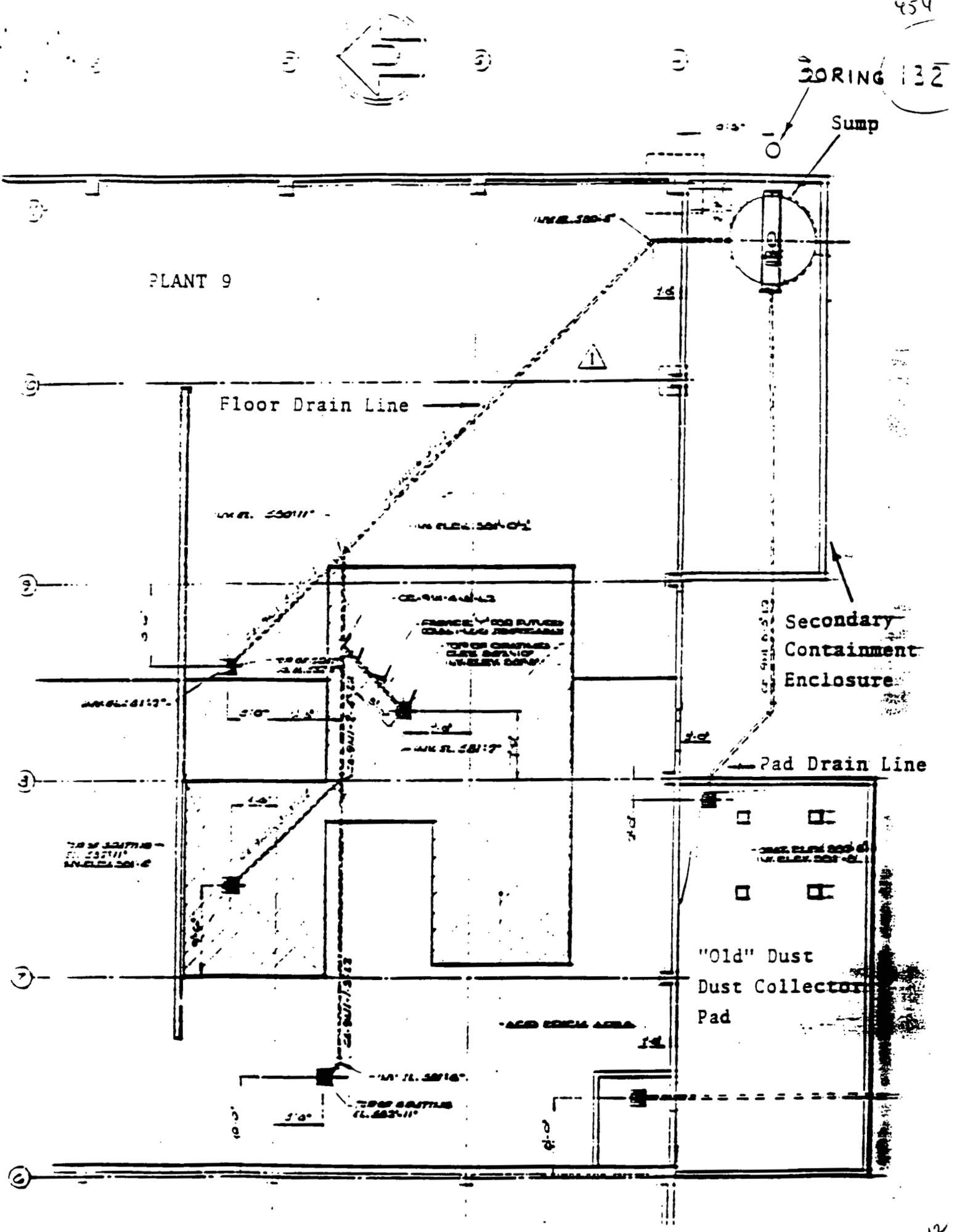


Figure 1

# Plant 9 Contaminated Groundwater Pumping

FMPC

Description	
Work Plan	(70 working days) _____
NEPA	(50 working days) _____
Design	(22 working days) _____
Contaminated Groundwater Source Detection	(85 working days) _____
Install Recovery Well	(44 working days) _____
Install Pumping System	(44 working days) _____
Pump Contaminated Water	(508 working days*) _____

\*Or longer if required

Attachment 1

ATTACHMENT II

FULL HAZARDOUS SUBSTANCE LIST (HSL) PARAMETERS

HSL INORGANICS

- |           |           |
|-----------|-----------|
| Aluminum  | Manganese |
| Antimony  | Mercury   |
| Arsenic   | Nickel    |
| Barium    | Potassium |
| Beryllium | Selenium  |
| Cadmium   | Silver    |
| Calcium   | Sodium    |
| Chromium  | Thallium  |
| Cobalt    | Vanadium  |
| Copper    | Zinc      |
| Iron      | Cyanide   |
| Lead      |           |
| Magnesium |           |

HSL VOLATILES

- |                          |                           |               |
|--------------------------|---------------------------|---------------|
| Chloromethane            | Bromodichloromethane      | Ethyl Benzene |
| Bromomethane             | 1,1,2,2-Tetrachloroethane | Styrene       |
| Vinyl Chloride           | 1,2-Dichloropropane       | Total Xylenes |
| Chloroethane             | trans-1,3-Dichloropropene |               |
| Methylene Chloride       | Trichloroethene           |               |
| Acetone                  | Dibromochloromethane      |               |
| Carbon Disulfide         | 1,1,2-Trichloroethane     |               |
| 1,1-Dichloroethene       | Benzene                   |               |
| 1,1-Dichloroethane       | cis-1,3-Dichloropropene   |               |
| trans-1,2-Dichloroethene | 2-Chloroethyl Vinyl Ether |               |
| Chloroform               | Bromoform                 |               |
| 1,2-Dichloroethane       | 2-Hexanone                |               |
| 2-Butanone               | 4-Methyl-2-pentanone      |               |
| 1,1,1-Trichloroethane    | Tetrachloroethene         |               |
| Carbon Tetrachloride     | Toluene                   |               |
| Vinyl Acetate            | Chlorobenzene             |               |

ATTACHMENT II (Cont.)

HSL SEMI-VOLATILES

Phenol  
 bis(2-Chloroethyl) ether  
 2-Chlorophenol  
 1,3-Dichlorobenzene  
 1,4-Dichlorobenzene  
 Benzyl Alcohol  
 1,2-Dichlorobenzene  
 2-Methylphenol  
 bis(2-Chloroisopropyl)  
 ether  
 4-Methylphenol  
 N-Nitroso-Dipropylamine  
 Hexachloroethane  
 Nitrobenzene  
 Isophorone  
 2-Nitrophenol  
 2,4-Dimethylphenol  
 Benzoic Acid  
 bis(2-Chloroethoxy)  
 methane  
 2,4-Dichlorophenol  
 1,2,4-Trichlorobenzene  
 Naphthalene  
 4-Chloroaniline  
 Hexachlorobutadiene  
 4-Chloro-3-methylphenol  
 (para-chloro-meta-cresol)  
 2-Methylnaphthalene  
 Hexachlorocyclopentadiene  
 2,4,6-Trichlorophenol  
 2,4,5-Trichlorophenol  
 2-Chloronaphthalene  
 2-Nitroaniline  
 Dimethyl Phthalatecenaphthylene  
 3-Nitroaniline

Acenaphthene  
 2,4-Dinitrophenol  
 4-Nitrophenol  
 Dibenzofuran  
 2,4-Dinitrotoluene  
 2,6-Dinitrotoluene  
 Diethylphthalate  
 4-Chlorophenyl Phenyl  
 ether  
 Fluorene  
 4-Nitroaniline  
 4,6-Dinitro-2-methylphenol  
 N-nitrosodiphenylamine  
 4-Bromophenyl Phenyl ether  
 Hexachlorobenzene  
 Pentachlorophenol  
 Phenanthrene  
 Anthracene  
 Di-n-butylphthalate  
 Fluoranthene  
 Pyrene  
 Butyl Benzyl Phthalate  
 3,3'-Dichlorobenzidine  
 Benzo(a)anthracene  
 bis(2-ethylhexyl)phthalate  
 Chrysene  
 Di-n-octyl Phthalate  
 Benzo(b)fluoranthene  
 Benzo(k)fluoranthene  
 Benzo(a)pyrene  
 Indeno(1,2,3-cd)pyrene  
 Dibenz(a,h)anthracene  
 Benzo(g,h,i)perylene

ATTACHMENT II (Cont.)

HSL PESTICIDES

alpha-BHC	Endosulfan I	4,4'-DDT	AROCLOR-1232
beta-BHC	Dieldrin	Endrin Ketone	AROCLOR-1242
delta-BHC	4,4'-DDE	Methoxychlor	AROCLOR-1248
gamma-BHC (Lindane)	Endrin	Chlordane	AROCLOR-1254
Heptachlor	Endosulfan II	Toxaphene	AROCLOR-1260
Aldrin	4,4'-DDD	AROCLOR-1016	
Heptachlor Epoxide	Endosulfan Sulfate	AROCLOR-1221	

ATTACHMENT III

TOTAL RADIONUCLIDES PARAMETERS

- Cesium
- Neptunium
- Plutonium
- Radium
- Ruthenium
- Strontium
- Technetium
- Thorium
- Total Thorium
- Uranium
- Total Uranium

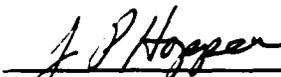
ATTACHMENT 2

HEALTH AND SAFETY PLAN FOR THE PLANT 9  
CONTAMINATED PERCHED WATER REMOVAL ACTION

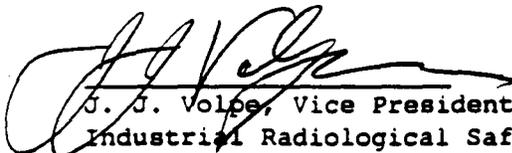
FEED MATERIALS PRODUCTION CENTER

JULY 1990

APPROVAL:

  
\_\_\_\_\_  
J. P. Hopper, Acting Manager Restoration  
Westinghouse Materials Company of Ohio

CONCURRENCE:

  
\_\_\_\_\_  
J. J. Volpe, Vice President  
Industrial Radiological Safety and Training  
Westinghouse Materials Company of Ohio

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### 1.0 TASKS TO BE PERFORMED

The work to be performed involves determining the source of the perched water found in Boring 1324, providing a pumping system for removing the uranium contaminated perched water from the boring, and the actual operation of the pumping system.

The work to be performed will be at a well boring which will be provided by Advanced Sciences Incorporated/International Technology (ASI/IT). A separate Health and Safety Plan has been developed by ASI/IT for the actual drilling and completion of the well (ASI/IT, "Site Specific Hazard Assessment for Plant 9 - Boring 1311, 1312, 1315, 1319, 1322, January 2, 1990").

The contaminant source detection will:

<u>no</u>	Disturb Surface Soil	<u>yes</u>	Sample Surface Water
<u>no</u>	Disturb Subsurface Soil	<u>no</u>	Sample Lagoons
<u>no</u>	Use Heavy Equipment	<u>no</u>	Use Boat
<u>yes</u>	Enter Confined Space	<u>yes</u>	Involve Radioactivity
<u>yes</u>	Disturb Containerized Matter	<u>no</u>	Involve Trenches

The installation of the pumping system will:

<u>yes</u>	Disturb Surface Soil	<u>no</u>	Sample Surface Water
<u>yes</u>	Disturb Subsurface Soil	<u>no</u>	Sample Lagoons
<u>no</u>	Use Heavy Equipment	<u>no</u>	Use Boat
<u>no</u>	Enter Confined Space	<u>yes</u>	Involve Radioactivity
<u>no</u>	Disturb Containerized Matter	<u>yes</u>	Involve Trenches

The operation of the system for pumping the contaminated water will:

<u>no</u>	Disturb Surface Soil	<u>yes</u>	Sample Surface Water
<u>no</u>	Disturb Subsurface Soil	<u>no</u>	Sample Lagoons
<u>no</u>	Use Heavy Equipment	<u>no</u>	Use Boat
<u>no</u>	Enter Confined Space	<u>yes</u>	Involve Radioactivity
<u>no</u>	Disturb Containerized Matter	<u>no</u>	Involve Trenches

### 2.0 SITE HISTORY

The task will be performed at Plant 9 which is located within the FMPC property lines area. At present, the Plant 9 is routinely occupied. The production facility is not actively refining uranium at this time. Soils and groundwater near Plant 9 have the potential to be contaminated with uranium, its daughter products and thorium as a result of contaminant migration.

Plant 9 has been used for the purification of thorium metal (approximately 1955), production of thorium derbies and ingots (1955-1957), molten salt cleaning of uranium derbies (1965-1986), and decladding of uranium fuel cores. Plant 9 has also been used for vacuum casting and machining uranium metal ingots. Uranium metal was also cleaned with nitric acid in Plant 9. In addition to uranium, uranium compounds, thorium, and thorium compounds, chemicals that were possibly used, or believed to be present, in or around Plant 9 include asbestos (pipe and tank insulation and transite), hydrofluoric acid, nitric acid, lithium carbonate, magnesium oxide, potassium carbonate, potassium hydroxide, sodium chloride, potassium chloride, and sodium hydroxide. Other materials that are, or have been present, in and around Plant 9 include cleaners, cutting oils, lubricants, solvents, glues, paints, etc. These later materials are, or were, present in small quantities and should prove little potential hazard to the personnel involved in the work.

### 3.0 TASK SPECIFIC HAZARD ASSESSMENT

A walk-through survey of the tank area (see Figure 1) in Plant 9 indicated the potential hazards identified below. Prior to the initiation of the activities, a reassessment of the conditions will be conducted to ensure that conditions have not changed through the issuance of work permits. All newly identified hazards will be addressed with the Industrial, Radiological, Safety and Training (IRS&T) representative(s) to determine the degree of hazard and if any changes to the safety plan are needed.

- 3.1 Physical Hazards
  - o Noise
  - o Overhead Hazards
  - o Underground Utilities

3.2 Radiation Hazards

The potential radiation hazard are from uranium (depleted to 2% enriched in U-235) and short lived decay products. Thorium content in affected areas is expected to be very low relative to uranium content. Therefore, the hazard potential from thorium is minimal.

3.3 Chemical Hazards

Table 1 includes the suspect contaminants along with the exposure limits, the primary hazard, the applicable action limit, and the background level in ambient air.

Table 1  
CHEMICAL HAZARD TABLE

<u>Contaminant</u>	<u>Primary Hazard</u>	<u>Background</u>		<u>Level in Ambient Air</u>
		<u>Limit</u>	<u>Action Level</u>	
Nitrogen Dioxide <sup>(1)</sup>	Inhalation	1 ppm (Note 3)	0.5 ppm	ND <sup>(8)</sup>
Asbestos <sup>(2)</sup>	Inhalation	0.2 f/cc (Note 4)	0.1 f/cc	ND <sup>(9)</sup>
Hydrofluoric Acid	Contact Skin/ Eyes	3 ppm (Note 4) 6 ppm (Note 3)		ND
Nitric Acid	Contact Skin/ Eyes	2 ppm (Note 4) 4 ppm (Note 3)		ND <sup>(8)</sup>
Sodium Hydroxide	Contact Skin/ Eyes	2 mg/M <sup>3</sup> (ceiling)		ND <sup>(8)</sup>
Uranium	Inhalation/ Ingestion	Note 5		2x10 <sup>-12</sup> uCi/cc <sup>(10)</sup>
Acetone*	Inhalation	750 ppm	375 ppm	ND <sup>(6)</sup>
1,1-Dichloroethylene*	Inhalation	5 ppm	2.5 ppm	ND <sup>(6)</sup>
2-Butanone*	Inhalation	200 ppm	100 ppm	ND <sup>(6)</sup>
Trichloroethylene**	Inhalation	50 ppm	25 ppm	ND <sup>(6)</sup>
Freon-11*	Inhalation	1000 ppm	500 ppm	ND <sup>(6)</sup>
1,1,1-Trichloroethane*	Inhalation	350 ppm	175 ppm	ND <sup>(6)</sup>

Data Sheets have been provided as attachments to this plan to provide additional information on these chemicals.

<sup>(1)</sup> NO<sub>2</sub> may be produced if residual nitric acid is present in lines or sump.

Table 1

CHEMICAL HAZARD TABLE  
(Cont'd)

(2) No asbestos hazard present unless insulated lines or transite is damaged or disturbed (special permit required for asbestos work.)

(3) Based on a 15 minute short term exposure limit.

(4) Based on 8 hour time weighted average.

(5) The action level for uranium is  $5 \times 10^{-12}$  uCi/ml which is based on the DOE derived air concentration limit of  $2 \times 10^{-11}$  uCi/ml

(6) ND - None detectable

(8) None detectable

(9) None detectable using NIOSH 7400 Method (less than 0.01 fiber per cc)

(10) Highest recent monthly average at an air sample location inside plant 2/3. Lower limit of detection is  $1 \times 10^{-13}$  uCi/cc.

• These contaminants were present during the pumping of perched water in Plant 6 at levels over 1 ppm and are listed because of the proximity of Plant 9 to Plant 6.

\*\* This has been detected at 21 ppm in soil samples from beneath Plant 9. This level will not produce over 1 ppm in air.

## 4.0 MONITORING

### 4.1 Goals

During the contaminant source detection task, air monitoring will be performed as determined to be necessary at the time of issuance of the work permit(s) to ensure that exposure levels do not exceed established exposure limits.

### 4.2 Monitoring Equipment and Frequency of Monitoring

#### 4.2.1 Airborne Radioactivity

During the contaminant source detection and installation of the pumping system tasks, air samples will be taken in the general area of the work inside Plant 9 daily while work is in progress. Local or breathing zone samples will be taken in the vicinity of possible leaks of fluid systems as they are air-pressurized for hydrostatic testing.

#### 4.2.2 Radioactive Surface Contamination

During the contaminant source detection and installation of the pumping system tasks, weekly surveys for removable radioactive surface contamination will be performed in Plant 9 and the south sump area near the boring. Contamination surveys will be performed on potentially contaminated fluid systems, as they are opened and following dust generating activities, to ensure that adequate protective clothing is being worn and to verify radiological postings.

Direct frisks and/or field swipe surveys will be performed on potential leak sites during pressure testing.

#### 4.2.3 Radiation Surveys

Area radiation surveys will be taken monthly in Plant 9.

#### 4.2.4 Chemical Hazard

Direct reading monitoring devices will be used to determine the concentration of NO<sub>2</sub> and/or other gases and vapors at the time of issuance of the work permit and thereafter as determined to be necessary by the Industrial Hygiene representative.

A HNu may be used periodically to test for organic vapors as determined to be necessary by the Industrial Hygiene representative. If organic vapors are detected, they will be treated as unknowns. The Breathing Zone action levels are listed in Section 4.3.

#### 4.2.5 Thermoluminescent Dosimetry (TLD)

TLDs will be worn by all workers.

#### 4.3 Action Levels

<u>Measurement</u>	<u>Level</u>	<u>Action</u>
Removable contamination on open surfaces	20,000 dpm/100 cm <sup>2</sup> or 2,000 cpm with portable frisker (average)	Note 1
Airborne radioactivity (long lived)	5 x 10 <sup>-12</sup> uCi/ml	Note 1
HNU Meter (Breathing Zone)	Detection to 10 ppm (Note 2)	Note 1
	10-25 ppm	Supplied Air Respirator (SAR)
	>25 ppm	Withdraw
Nitrogen Dioxide (Breathing Zone)	0.5 ppm	Withdraw

#### Notes

- 1 Full-face air purifying respirators with combination HEPA filter and organic vapor, acid gas, fume cartridges.
- 2 1 ppm above background.

#### 5.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

All employees in the task exclusion area will wear the following personal protective equipment while performing the required tasks.

5.1 Contaminant Source Detection

<u>ITEM</u>	<u>NEED</u>	<u>APPLICABILITY</u>
Air purifying respirator	No (Yes)	Required if action levels are exceeded or as specified by IRS&T representative
Cartridges: HEPA Combination Radiological/OV/AG	No (Yes)	Required if action levels are exceeded or as specified by IRS&T representative
Hard Hat	No	
Hearing Protection	No	
Inner Gloves	No (Yes)	Used underneath leather palm gloves
Rubber/Latex Boots	Yes	As needed to prevent contact with liquids (e.g., sump & drains)
Leather-Palm Gloves	Yes	
Rubber/Nitrile Gloves	Yes	As needed to prevent contact with liquids (e.g., sump & drains)
Plain Tyvek	No	
PE Tyvek	No	
Process Coveralls	Yes	
PVC Gloves	No	
SAR	No	
Safety Glasses	Yes	Minimum Requirement

5.1 Contaminant Source Detection(Cont'd)

<u>ITEM</u>	<u>NEED</u>	<u>APPLICABILITY</u>
Safety Goggles/Face Shield	Yes	During hydrostatic testing, as needed to prevent contact with splash or particulates (e.g., cleaning/grinding on chemically contaminated drain lines)
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Shoe Covers	No	

5.2 Installation of Pumping System

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Air purifying respirator	No (Yes)	Required if action levels are exceeded or as specified by the IRS&T representative.
Cartridges: HEPA Combination Radionuclide/organic vapor/	No (Yes)	Required if action levels are exceeded or as specified by the IRS&T representative.
Hard Hat	Yes	As needed for overhead work
Hearing Protection	Yes	During concrete breaking/cutting
Inner Gloves	No (Yes)	Used underneath leather palm gloves
Rubber/Latex Boots	Yes	As needed to prevent contact with liquids (e.g., sumps, drains, <u>pumping</u> )
Leather-Palm Gloves	Yes	

5.2 Installation of Pumping System

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Rubber/Nitrile Gloves	Yes	As needed to prevent contact with liquids (e.g., sumps, drains, <b>pumping</b> )
Plain Tyvek	No	
PE Tyvek	No	
Process Coveralls	Yes	
PVC Gloves	No	
SAR	No	
Safety Glasses	Yes	Minimum Requirement
Safety Goggles/Face Shield	Yes	During pump testing and as needed
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Shoe Covers	No	

5.3 Operation of the Pumping System

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Air purifying respirator	No (Yes)	Required if action levels are exceeded or as specified by the IRS&T representative.
Cartridges: HEPA Combination Radionuclide/organic vapor/	No (Yes)	Required if action levels are exceeded acid gas or as specified by the IRS&T representative.
Hard Hat	Yes	As needed for overhead work
Hearing Protection	No	

5.3 Operation of the Pumping System(Cont'd)

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Inner Gloves	No (Yes)	Used underneath leather palm gloves
Rubber/Latex Boots	Yes	As needed to prevent contact with liquids (e.g., sumps, drains, <b>pumping</b> )
Leather-Palm Gloves	Yes	
Rubber/Nitrile Gloves	Yes	As needed to prevent contact with liquids (e.g., sumps, drains, <b>pumping</b> )
Plain Tyvek	No	
PE Tyvek	No	
Process Coveralls	Yes	
PVC Gloves	No	
SAR	No	
Safety Glasses	Yes	Minimum Requirement
Safety Goggles/Face Shield	Yes	During initial testing and as needed
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Shoe Covers	No	

6.0 SITE CONTROL

6.1 Access

The work associated with this removal action will be within the FMPC controlled area. In addition, the work area related to this removal action will be posted as "RWP Required for Entry". This will establish the

Exclusion Zone per 29 CFR 1910.120. A layout map of Plant 9 is provided in Figure 2 delineating specific zones of activity, exclusion zones, and contamination control zones as determined by the FMPC radiological safety technicians.

The Exclusion Zone is the zone of high potential hazard due to physical or chemical dangers. Access to the Exclusion Zone will be restricted by Radiological Safety to trained and certified employees, as regulated by 29 CFR 1910.120, who are required to enter in order to perform their job functions. There will be different Exclusion Zones for the various tasks. The Exclusion Zone will be marked with barrier tape or other easily recognizable devices. The zone may be expanded if airborne hazards are detected. All areas requiring the use of respiratory protection are included in the exclusion zone. Entrance shall be limited to one area and controlled by the supervisor in charge.

If necessary, Radiological Safety will establish a Contamination Reduction Zone, consisting of step-off pads, at the exit to the Exclusion Zone. This zone will be used for removal of disposable PPE and for cleaning of contaminated equipment.

6.1.1 Radiological Postings

Radiological areas will be posted in accordance with DOE Order 5480.11. The following is a brief summary of posting requirements based on uranium:

TABLE 2  
POSTING REQUIREMENTS

Regulated Area	> 1000 dpm/100 cm <sup>2</sup> removable > 5000 dpm/100 cm <sup>2</sup> fixed and removable
Contaminated Area	> 10,000 dpm/100 cm <sup>2</sup> removable > 50,000 dpm/100 cm <sup>2</sup> fixed and removable
Airborne Radioactivity Area	> 2 x 10 <sup>-12</sup> uCi/ml
Respirator Area	> 5 x 10 <sup>-12</sup> uCi/ml
Radiation Area	> 5 mrem/hr

In addition, special postings may be added for access to areas: "RWP Required for Entry" or "Contact HP for Entry."

6.2 Bioassay Samples

WMCO personnel involved in this project are required to participate in a routine periodic urine assay program. Any suspected exposure to hazardous substances shall be reported and require additional sampling. Personnel are also required to wear a TLD at all times for radiological purposes. If sample analyses indicate that thorium levels in air or on surfaces were sufficient to deliver more than eight DAC-hours to an individual, in vivo monitoring and/or bioassay measurements will be performed on that individual as deemed appropriate by FMPC Dosimetry.

6.3 Medical Monitoring

In accordance with 29 CFR 1910.120 OSHA requirements, all WMCO and WMCO subcontractor personnel are required to participate in a medical monitoring program which includes:

- o A baseline medical examination
- o Annual medical examination
- o Medical examinations may be required after exposures
- o WMCO respirator clearance for respirator users

Prior to the start of work, personnel involved in this project shall be identified by name and badge number. Each individual shall be subject to a medical surveillance approval by the Director, Medical Services. The approval statement shall certify that each individual is medically qualified to perform the work and is physically fit to wear PPE.

6.4 Training Requirements

All WMCO and WMCO subcontractor personnel assigned to the tasks will, as a minimum, meet the following training requirements:

- o Review of this health & safety plan for this work including site specified hazards and procedures. (This safety meeting(s) will be documented.)
- o WMCO radiation safety training
- o WMCO respiratory training and fit test or equivalent approved by WMCO Industrial Hygiene
- o 40-hour OSHA training
- o 8-hour annual refresher training
- o 8-hour supervisory training (for supervisors)
- o 24-hour supervised field experience

### 6.5 Safety Meetings

A safety meeting, which must be documented, shall be conducted prior to start of each day's work during the perched water source detection and the installation of the pumping system tasks. The meeting will cover the following applicable subjects:

- work operations
- personnel protective equipment
- all monitoring data
- hazard communications
- monitoring tests and results
- decontamination
- task organization
- physical stress
- emergency procedures
- communications
- general safety
- housekeeping

### 7.0 EXPOSURE SYMPTOMS

Exposure to low levels of radioactivity does not produce acute exposure symptoms. Such exposures may cause delayed effects such as cancer. Since biological effects from radiation exposures are cumulative, exposures are to be kept as low as achievable. No treatment is anticipated for the predicted contaminants and concentrations. See Section 11 for contingency plans.

Exposure symptoms for chemical hazards are described in the following paragraphs:

#### Acetone:

**Health Risks:** Highly flammable liquid.  
Inhalation causes irritation of eyes and skin.  
Inhalation systemic effects of nausea, vomiting, muscle weakness, narcosis.

**Exposure Routes:** Skin, eyes, respiratory tract

**First Aid:** Inhalation - Remove to fresh air. Give oxygen and CPR if necessary.

Skin/Eyes - Flush with water for 15 minutes after removing soaked clothing.

1,1-Dichloroethylene:

Health Risks: Highly flammable gas.  
Vapor irritating to eyes, nose, and throat.  
Inhalation causes dizziness, drunkenness, anesthesia.

Exposure Routes: Skin, eyes, and respiratory tract

First Aid: Inhalation - Remove to fresh air. Give CPR if necessary.  
Give oxygen if necessary.

Skin/Eyes - Remove any contaminated clothes; flush skin and eyes for 15 minutes; get medical attention for eyes.

2-Butanone:

Health Risks: Extremely flammable liquid.  
Acute exposure irritates eyes, skin, and respiratory tract.  
Eye contact causes corneal damage.  
Inhalation causes nausea, vomiting, headache, dizziness, difficult breathing, peripheral neuropathy, loss of consciousness.

Exposure Routes: Skin, eyes, and respiratory tract

First Aid: Inhalation - Remove victim to fresh air. If breathing stops, administer CPR. Give oxygen if necessary.

Skin/Eyes - Remove contaminated clothing. Flush skin and eyes 15 minutes with water.

Trichloroethylene:

Health Risks: Acute inhalation causes irritation to nose, eyes, and throat, nausea, blurred vision, CNS disturbance, cardiac failure.  
Chronic inhalation may cause liver damage.  
Defatting action of liquid solvent on skin causes dermatitis.

**Exposure Routes:** Skin, eyes, and respiratory tract

**First Aid:** Inhalation - Remove victim to fresh air. If necessary, provide CPR and oxygen. Do not administer adrenalin or epinephrine.

Eyes - Flush 10 minutes with water

Skin - Wash with soap and water

**Freon-11 (Trichlorofluoromethane):**

**Health Risks:** Inhalation of concentrations approaching 10% in air will cause drowsiness, unconsciousness, and possible cardiac arrest.  
Skin or eye contact causes rapid freezing of tissue.

**Exposure Routes:** Skin, eyes, respiratory tract

**First Aid:** Inhalation - Remove victim to fresh air. Provide CPR and oxygen if necessary.

Skin/Eyes - Treat as for frostbite and wrap then rewarm in water 102-105°F.

**1.1.1-Trichloroethane:**

**Health Risks:** Inhalation causes narcotic effects at low concentrations to loss of consciousness and death at higher levels. Vapor slightly irritating to eyes, but causes no lasting damage.  
Repeated liquid skin contact causes defatting and dermatitis.

**Exposure Routes:** Skin, eyes, inhalation

**First Aid:** Inhalation - Remove victim to fresh air and give CPR and oxygen if necessary.

Skin/Eyes - Flush with water for 10 minutes after removing contaminated clothing.

**Nitrogen Dioxide:**

**Health Risks:** Concentrated gas produces coughing, choking, headache, nausea, chest and abdominal pain; otherwise few

symptoms occur immediately. After several hours, pulmonary edema gradually develops causing fatigue, coughing, frothy expectora, cyanosis, confusion and even death.

Concentrated gas is also irritating to eyes.

Exposure Routes: Eyes, respiratory tract

First Aid: Inhalation - Remove victim to fresh air encouraging to breathe deeply. Give oxygen if necessary.

Eyes/Skin - Flush with water for 15 minutes

Asbestos:

Health Risks: Exposures to high dust levels cause a pneumoconiosis called asbestosis. Exposures to low levels (especially in smokers) increases the risk of lung cancer. A rare cancer of the lung lining, mesothelioma, also is increased in incidence in asbestos workers. All these conditions take 10-20 years to develop.

Exposure Routes: Inhalation

First Aid: None

Nitric Acid:

Health Risks: Gas will burn eyes, nose, and throat. Breathing will cause respiratory irritation. Liquid contact with skin causes a yellow burn.

Exposure Routes: Eyes, skin, and respiratory tract

First Aid: Inhalation - Move victim to fresh air; give CPR if needed.

Eyes/Skin - Remove contaminated clothing. Flush skin or eyes with water for 15 minutes.

Sodium Hydroxide:

Health Risks: An extremely caustic chemical which causes irritation to eyes, nose, and throat if inhaled. When contacts skin or eyes, causes severe burns.

Exposure Routes: Eyes, skin, and respiratory tract

**First Aid:**    **Inhalation** - Remove from further exposure; provide CPR if necessary; give oxygen if necessary.  
                   **Skin/Eyes** - Remove contaminated clothing. Flush with water for 15 minutes.

**Uranium:**

**Health Risks:** High level exposures to soluble uranium compounds causes respiratory irritation and are toxic to the kidneys. Lower level chronic exposures increase the incidence of cancers of the lungs, lymph system, hemopoietic system.

**Exposure Routes:** Broken skin and respiratory tract

**First Aid:**    **Inhalation** - Remove person to fresh air. If trouble breathing because of exposure to soluble compounds, start bioassay procedures (urinalysis) to quantify dose.

**Broken Skin-** Remove contaminated clothing. Flush with water for 15 minutes. Check cleaned skin with frisker to ensure complete uranium removal.

**Hydrofluoric Acid:**

**Health Risks:** An extremely corrosive mineral acid which causes delayed burns to skin and eyes at low concentrations. Severely irritating to nose, throat, and lungs.

**Exposure Routes:** Skin, eyes, respiratory tract

**First Aid:**    **Inhalation** - Remove victim to fresh air. Give CPR and oxygen if necessary.

**Skin/Eyes** - Flush with water after removing contaminated clothing. Calcium gluconate in water soluble cream to neutralize fluoride.

**8.0 SITE ENTRY PROCEDURES**

During the perched water source detection and installation of pumping system tasks, the following procedures apply:

- o Identify exclusion zone, contamination reduction zone, and break area.

- o Perform daily safety meeting to familiarize team with site specific hazards.
- o Discuss alternate communications signals (if applicable).
- o Perform respirator check out and fit check prior to use.
- o Use buddy system. Teams of at least two individuals will be used for all activities within an exclusion zone.

Prior to the initiation of these work tasks, the following permits are required:

- Radiation Work Permit
- Penetration Permit
- Chemical/Hazardous Material Permit
- Work Permit

All personnel entering the Exclusion Zone shall be trained and certified to perform their assigned task as defined by 29 CFR 1910.120.

Entrance to the Exclusion Zone shall be controlled and at the approval of the supervisor in charge.

## 9.0 DECONTAMINATION

Equipment for decontamination of radiological or chemical hazards shall be kept available in the area surrounding the exclusion zone if such is determined necessary by supervisor or by either Radiation Safety or Industrial Hygiene prior to the initiation of the activity. As a minimum, the location of the nearest water for decontamination and eye washing shall be identified and its operability verified prior to start of work.

Decontamination will be performed consistent with the following FMPC Standard Operating Procedure, OSH(SP)-P-35-017 and topical manual FMPC-2084. In addition, specific RI/FS decontamination procedures for the Facilities Testing Program will be followed when appropriate.

## 10.0 WASTES

Wastes include, but are not limited to:

- o Disposable PPE
- o Excess materials such as soil or concrete

All potentially contaminated waste materials resulting from site activities will be collected and placed in drums or other containers. Disposable protective clothing will be placed in plastic bags and disposed of as compactible, potentially contaminated waste.

Drums or containers shall meet DOE 49 CFR Parts 171-178, EPA, 40 CFR Parts 264-265 and 300, and OSHA requirements. Hazard warning label shall be immediately applied to all drums as specified by WMCO management/supervisors and Solid Waste Compliance.

## 11.0 CONTINGENCY PLANS

### 11.1 Incidents or Injuries Involving Possible Intake of Radiological or Chemical Substances by Employees

The steps to be followed shall be as described in Standard Operating Procedures (SOP) No. 11-C-245 for uranium and fluoride intakes.

Incidents or injuries involving potential intake of other hazardous substances shall be reported to supervisor and the WMCO Medical Section by the involved employee and an Incident Investigation Report completed by the involved employee.

### 11.2 Pre-Emergency Planning

During the training and pre-work safety meetings, all employees involved in this task shall be trained and reminded of the provisions of the plant emergency procedure, alarm signals and communications, evacuation routes and emergency reporting.

### 11.3 Lines of Authority

The supervisor in charge has the primary responsibility for the prevention of emergency conditions. In the event that an emergency does occur, the individual involved or observing the condition shall immediately notify a supervisor, the communication center or the Assistant Emergency Duty Officer (AEDO). The AEDO is responsible for ensuring that corrective actions have been implemented, the appropriate personnel notified, and reports completed as required.

### 11.4 Evacuation

In the event of an emergency which necessitates an evacuation of the Exclusion Area, the 2-2, 2-2 shall be sounded over the plant alarm system; a voice message will follow over the Emergency Message System instructing employees to go to their designated Rally Point (see Figure 2). Personnel shall immediately proceed to the Rally Point and participate in the accountability process. Personnel will follow instructions given by the Rally Point Coordinator. When an all-clear condition has been achieved, personnel will be released from the Rally Point.

11.5 Emergency Equipment

The following safety equipment, locations to be identified at safety meetings, is available for employee usage:

- |  |   |
|--|---|
| <input type="checkbox"/> fire extinguisher | <input type="checkbox"/> manual fire alarm      |
| <input type="checkbox"/> eye wash          | <input type="checkbox"/> two-way radio          |
| <input type="checkbox"/> safety shower     | <input type="checkbox"/> emergency SCBA units   |
| <input type="checkbox"/> telephone         | <input type="checkbox"/> respirators            |
| <input type="checkbox"/> spill drums       | <input type="checkbox"/> clean-up materials     |
| <input type="checkbox"/> absorbent         | <input type="checkbox"/> local evacuation alarm |

11.6 Emergency Notification

All emergencies shall be reported immediately. Emergencies can be reported by telephone dialing 6511; by contacting the communications center via two-way radio; or by pulling a manual fire alarm.

11.7 Fire, Explosion, or Medical Emergency

In the event of a fire, explosion or medical emergency, the communication center shall be notified immediately by manual fire alarm, two-way radio, or by calling 6511. The communication center operator will activate the emergency response team and dispatch them to your location. Personnel in the immediate area should evacuate to a safe position and await instructions.

A map delineating the route to the nearest medical facility, which is in back of building 53, is shown on Figure 4. Complete medical assistance will be provided by trained professional FMPC medical personnel.

11.8 Additional Information

11.8.1 Hospitals

The WMCO Medical Facility (Building 53) is the primary choice for on-site injuries. The WMCO ambulance will transport the injured to the nearest hospital if necessary. WMCO maintains an emergency response capability which includes an ambulance and Emergency Medical Technicians.

### 11.8.2 Emergency Telephone Numbers

Ambulance: 6511 or 6512  
 Hospital: 6511 or 6512  
 Fire: 6511 or 6512

<u>Name</u>	<u>Work Radio</u>	
<b>EMERGENCY RESPONSE</b>	<b>6511</b>	
Industrial Hygiene	6207	357
Radiation Safety	6889	355
Fire and Safety	6235	303
Leo Singleton	8908	709
Assistant Emergency Duty Officer (AEDO)	6431	202 or 6295

### 12.0 CONFINED SPACE ENTRY

During the perched water source contamination detection task, entry will have to be made into a coolant floor sump in the machining area and in another below level 5,000 gallon sump hold tank, both of which are designated as confined spaces. Entry will be controlled by issuance of a confined space entry permit. This permit will ensure that all energized equipment inside the space is locked out and all valves of piping to the space are locked shut or blocked out by blanking plates at the nearest flanges. The Industrial Safety and Radiological Technician granting the permit will check the confined space atmosphere for O<sub>2</sub>, CO, H<sub>2</sub>S, and any flammable gases. Depending on the space, the entering person may be issued a portable multi-gas detector with alarm. Vertical confined space entries shall be made using harness and block and tackle, to facilitate quick rescue in emergencies. Further details on confined space permit issuance may be found in ESH-P-41-0046 and FMPC-516.

The confined space tasks to be performed shall include an inspection of cracks in the confined space vessel and inserting inflatable bladders in drains in order to be able to pressure check them for leaks.

13.0 APPROVAL AND COMPLIANCE STATEMENT

This site specific Health and Safety Plan was produced for the use of WMCO employees and WMCO subcontractors. It is intended for the FMPC and specifically for the following activities related to the Plant 9 removal action:

- Contaminant Source Detection
- Installation of Pumping System
- Operation of the Pumping System

The personnel performing these must read and understand the attached site specific health and safety plan and agree to follow its provisions<sup>1</sup>

---

<sup>1</sup>Compliance with the provisions of the Health and Safety may be audited through announced or unannounced site visits. Be sure that the provisions of this safety plan are implemented and document the reasons for field actions/changes when they are necessary. Site visits may be performed by the DOE or WMCO personnel.

BORING 1324

Sump

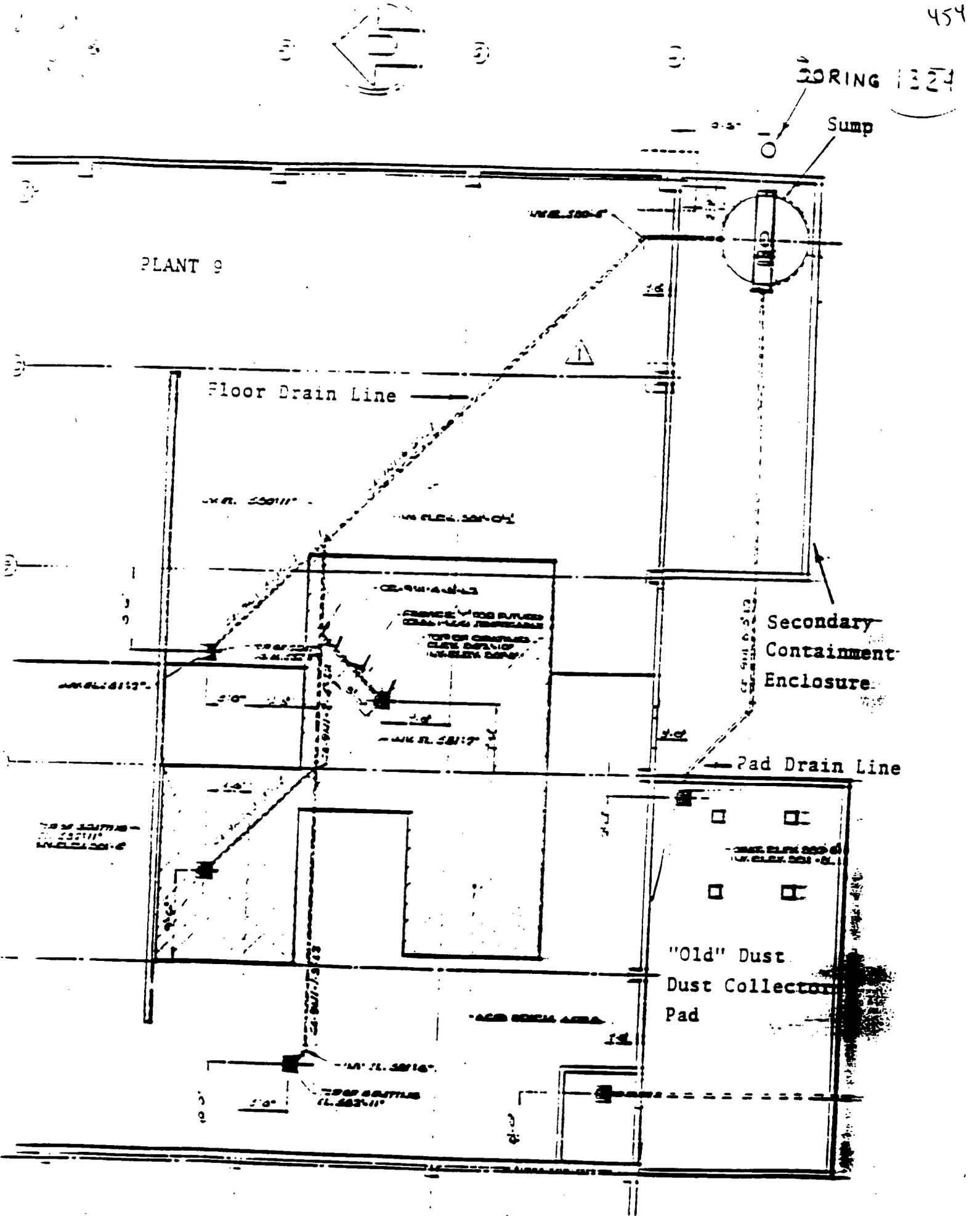
PLANT 9

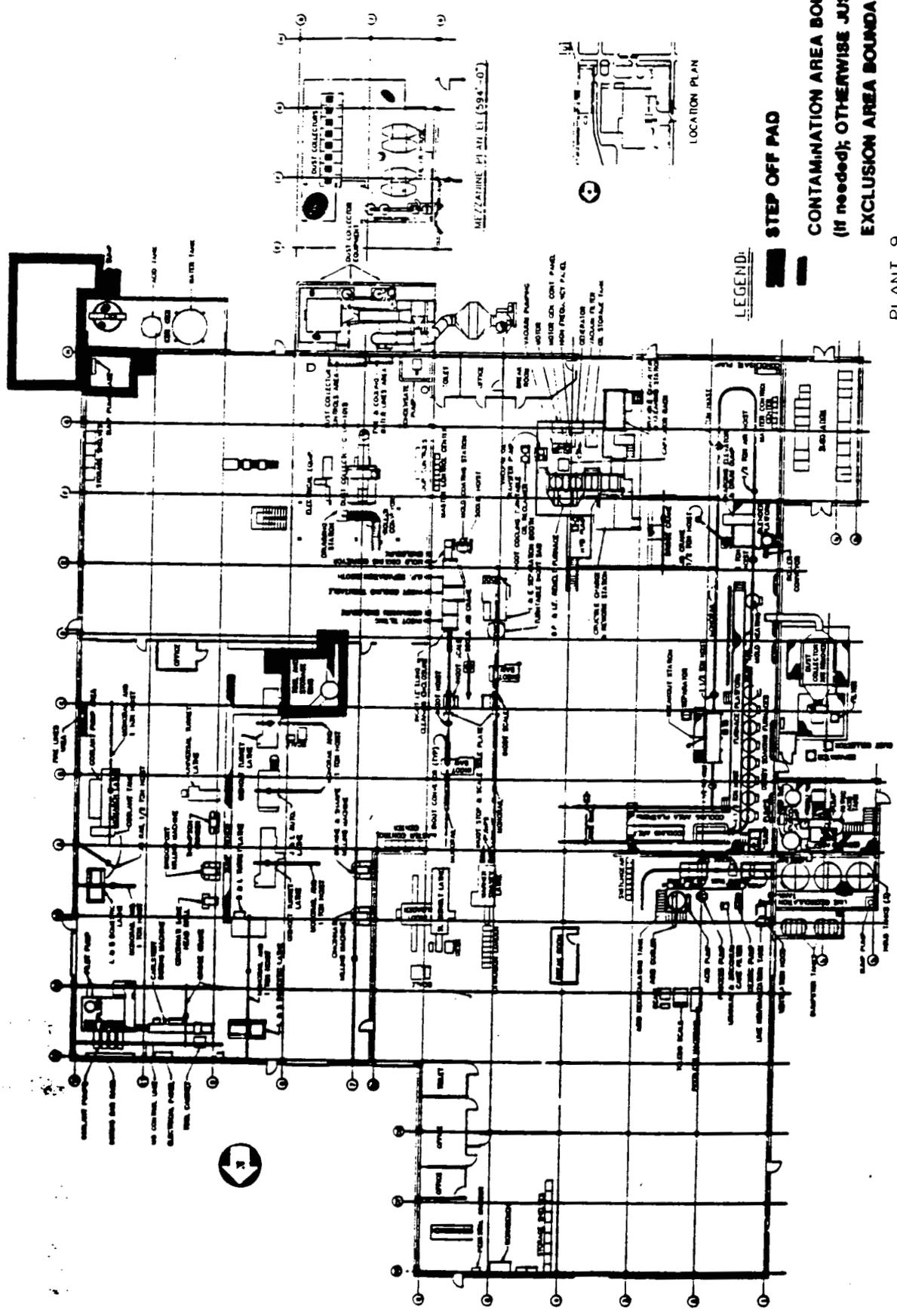
Floor Drain Line

Secondary Containment Enclosure

Pad Drain Line

"Old" Dust Dust Collector Pad





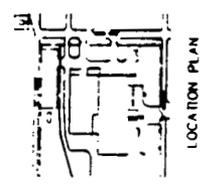
LEGEND:

STEP OFF PAD

CONTAMINATION AREA BOUNDARY  
(If needed); OTHERWISE JUST  
EXCLUSION AREA BOUNDARY.

PLANT 9

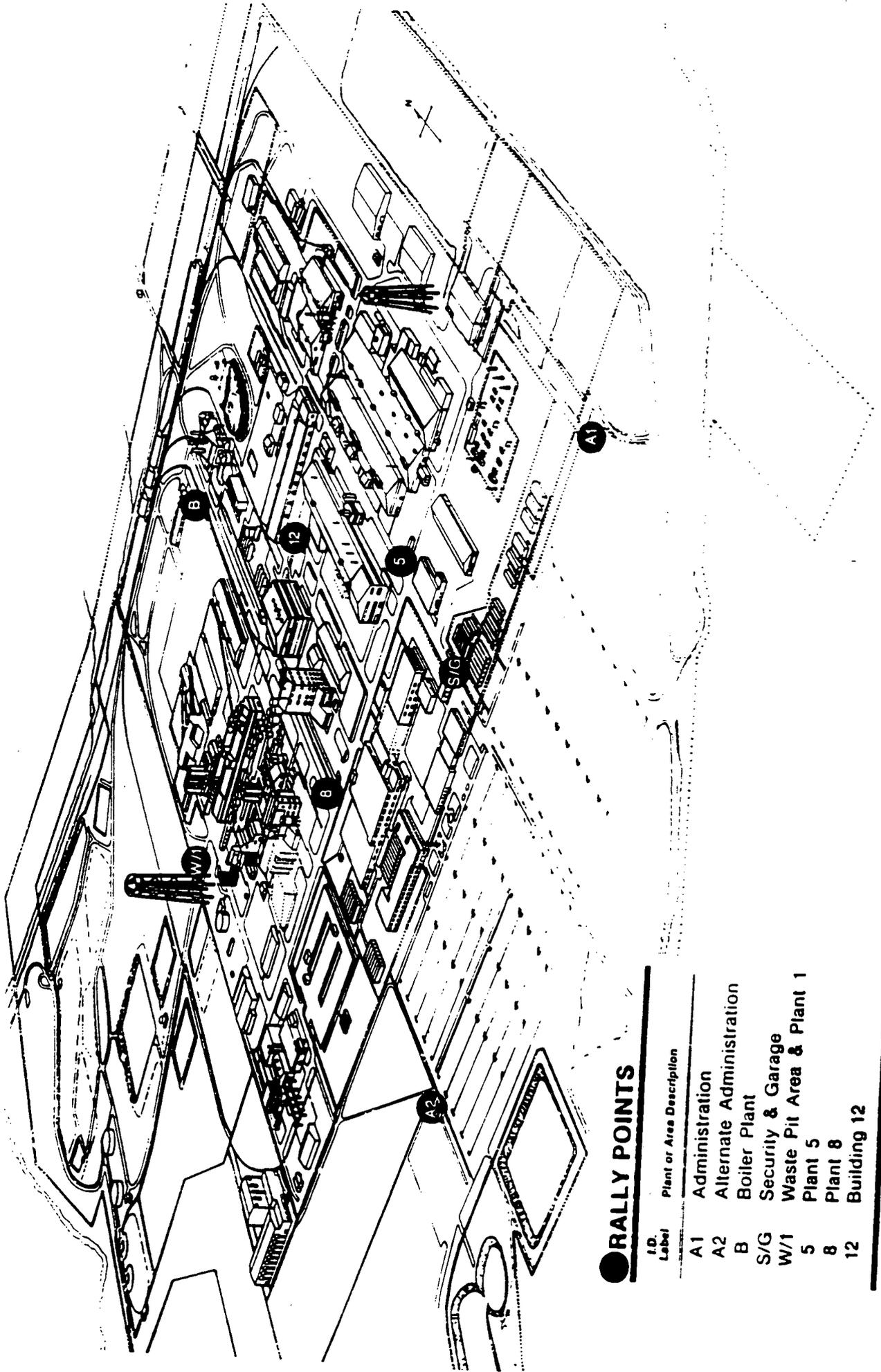
FLOOR PLAN EL. (583'-0")



LOCATION PLAN

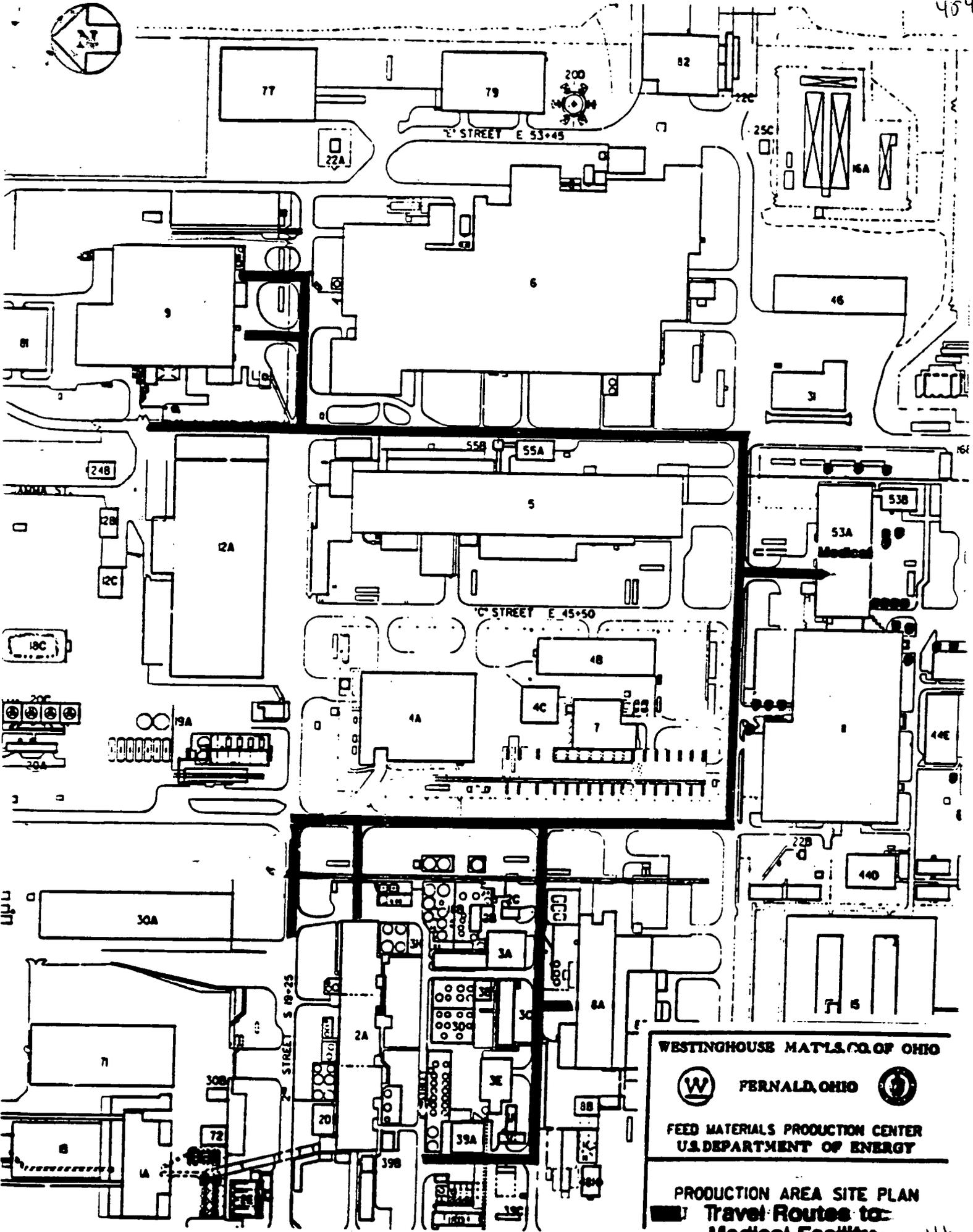
MIZZARDINE, P1 ARI EL. (594'-0")

# FMPC RALLY POINTS



## ● RALLY POINTS

I.D. Label	Plant or Area Description
A1	Administration
A2	Alternate Administration
B	Boiler Plant
S/G	Security & Garage
W/1	Waste Pit Area & Plant 1
5	Plant 5
8	Plant 8
12	Building 12



WESTINGHOUSE MAT'L.S. CO. OF OHIO

 FERNALD, OHIO 

FEED MATERIALS PRODUCTION CENTER  
U.S. DEPARTMENT OF ENERGY

PRODUCTION AREA SITE PLAN

 Travel Routes to  
Medical Facility