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PLAN AND SCHEDULE

for

CEASING DISCHARGES TO

THE 300 AREA PROCESS TRENCHES

Prepared by

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March 1990

for the

U. S. DEPARTMENT OF ENERGY

RICHLAND OPERATIONS OFFICE

RICHLAND, WASHINGTON

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I. SUMMARY

1.0 INTRODUCTION

The Federal Facility Agreement and Consent Order (Tri-Party Agreement [TPA]) was executed between the U.S. Department of Energy (DOE), the State of Washington, and the Environmental Protection Agency. This agreement established Milestone M-17-06, "Cease all discharges to 300 Area Process Trenches," by December 31, 1991. Additionally, a second milestone, M-17-05, was established which committed the DOE to "Select 300 Area Process Trench effluent treatment option and establish schedule for implementing treatment and ceasing liquid discharges," by March 31, 1990. A third milestone, M-17-09, establishes a schedule by which treatment and disposal of 300 Area effluent will be achieved by June 1995.

2.0 IMPLEMENTATION STRATEGY

This document provides the implementation strategy for ceasing all discharges to the 300 Area Process Trenches. The strategy is based on the recommendations resulting from studies to determine the best possible options for disposal of 300 Area process effluents and on the availability of funding to support the required activities. Rough order of magnitude estimates indicate total funding required for the activities described is roughly $20 million.

Implementation of the strategy for each of the key elements as described in this document will ensure the effluent discharge is environmentally acceptable, will minimize impacts on DOE operations, and ultimately eliminate discharges to the 300 Area Process Trenches as required by TPA Milestone M-17-06.

3.0 OPTION SELECTION

A variety of options were considered including; shutdown of the 300 Area input streams, end of pipe treatment/disposal of all 300 Area effluent, solar evaporation, mechanical evaporation, treatment of individual streams, multifaceted concept of minimization/treatment/disposal, disposal directly to river, disposal directly to soil, and utilization of the City of Richland treatment disposal capabilities.

A multifaceted approach which employs segregation and volume reduction, and possible treatment of the effluent, offers the best solution. Key elements of the selected approach are:

Waste Minimization/Reduction

Waste Treatment and Disposal

Best Management Practices (including review and revisions of administrative controls and plant operating procedures).

II. BACKGROUND

1.0 HISTORY

The existing 300 Area Process Trenches are used for the disposal of process water from various plants, facilities, and laboratories in the 300 Area. The two trenches, which were put into operation in 1975, are located in the northern part of the 300 Area on the Hanford Site, just north of Richland, Washington. The trenches use percolation of the process water into the soil column as the disposal method. In the past, these trenches received various chemical and other waste. Early in 1985, best management practices (administrative controls) were initiated to eliminate discharges of hazardous wastes into these trenches.

In response to a congressional request, DOE published, in March 1987, a "Plan and Schedule to Discontinue Disposal of Contaminated Liquids into the Soil Column at the Hanford Site." This plan and schedule commits the DOE to ceasing all disposal of contaminated liquids to the soil column by June 1995.

2.0 EXISTING CONDITIONS

The 300 Area Process Sewer collects waste water from approximately 62 facilities and discharges the effluent into two 1,500 ft percolation trenches. The liquid effluent, containing chemical constituents as identified in document WHC-EP-0287, "Waste Stream Characterization Report," dated August 1989, is currently discharged to the soil column. The DOE policies dictate that this practice be discontinued at the earliest possible date by utilizing the best available technology (BAT) economically achievable.

III IMPLEMENTATION STRATEGY

1.0 IMPLEMENTATION OBJECTIVES

Implementing the strategy detailed in this document constitutes the program which, when completed, will eliminate the need for the process trenches.

Each objective of this program is directed toward the fundamental goal of supporting the DOE's commitment to bring operations into compliance with DOE policies and TPA commitments.

The following objectives will support and meet the program goal.

Minimize the effluent streams currently inputting to the process trench through elimination, segregation, and process optimization.

Treat, as required, the remaining effluent using BAT and dispose of the treated effluent in an environmentally sound manner.

Employ best management practices which ensures rigorous control of operations and minimize opportunity for discharging unwanted materials and effluents into the process drains.

2.0 MINIMIZATION/REDUCTION

The minimization strategy is to eliminate as many streams as economically feasible with minimal facility/process disruption. Each input stream to the process trench system was reviewed for partial or total elimination.

These minimization activities, when completed, will significantly reduce the volume of water routed into the process trench system, and will significantly enhance the ability to manage process trench inputs. The schedule for implementing the minimization actions is shown in Section IV, Figure 1. Table 1 shows the flow reductions and associated budget requirements.

Of the 62, 300 Area buildings that currently are capable of contributing to the process trenches, 23 contribute nothing to the current flow. These buildings will have the process sewer drains plugged as part of the minimization actions.

Six contributing facilities currently have authorized projects underway which will eliminate stream input, and 13 facilities will have the process sewer system drains plugged after completion of equipment upgrades. The remaining 20 facilities will continue to release to the process sewer but at a reduced rate due to implementation of the minimization actions and Best Management Practices. In terms of total effluent reduction, it is estimated that the flow will be reduced from approximately 1,295 gal/min to an average daily discharge of approximately 200 gal/min by May 1993.

The following sections describe in more detail the activities associated with the minimization effort.

2.1 Firewater Storage Tank Replacement

This activity, Project L-001, is currently funded and underway. It will eliminate flows from Tanks 382-A and B, Tank 3802-A, and Tanks 3902-A and B. This is a significant reduction and will be completed by December 1991. The estimate of flow reductions from this activity is 265 gal/min.

2.2 309 Building Chiller Replacement

This activity consists of replacing existing cooling units with three, 200-ton air cooled units. This effort is currently planned through the SP-100 program, and will reduce the flow of cooling water by approximately 300 gal/min, and will be completed by December 1991.

2.3 Pacific Northwest Laboratory Plant Upgrades/Modernization

This work package will entail a variety of actions in approximately 12 facilities such as installing drain plugs and equipment and plant upgrades. Total reductions for this activity is 65 gal/min. The completion date is 1993.

2.4 Westinghouse Hanford Company Plant Upgrades/Modernization

This activity consists of various maintenance and plant upgrades similar to those described in Section 2.3 above in approximately 20 facilities. These actions will be completed by 1993, and will result in a reduction of approximately 45 gal/min.

2.5 Cooling Systems upgrades - Pacific Northwest Laboratory and Westinghouse Hanford Company Plants

This activity consists of providing for closed loop cooling systems, cooling towers, equipment replacement, etc., in various Pacific Northwest Laboratory and Westinghouse Hanford Company (WHC) plants, and will reduce the input to the process sewer by approximately 327 gal/min. These activities will be accomplished over a three year period and will be complete by May 1993.

3.0 WASTE TREATMENT/DISPOSAL

The effluent flow which remains after completing minimization and Best Management Practice will require treatment prior to discharge.

This activity provides for the procurement and installation of a commercial treatment plant and supporting facilities, and the construction of the retention basins and discharge piping. The treatment process will be monitored before discharge of the effluent. Any effluent which is unacceptable for discharge after initial treatment will be diverted to the retention basins for later recycle.

The treated water will be returned to the environment after final sampling, through a discharge outfall to the Columbia River, requiring modification to the existing Hanford National Pollution Discharge Elimination System permit.

The schedule and cost associated with this activity are summarized in Section IV, Figure 1 and Table 1.

Final determination for the need to treat the effluent to meet compliance requirements will be made when the stream characterization studies are completed. A treatment process will be identified using the BAT evaluation analysis as stated in the March 1987, "Plan and Schedule to Discontinue Discharges of Contaminated Liquids into the Soil Column at Hanford."

4.0 BEST MANAGEMENT PRACTICES

To assure that inputs to the process sewer system are controlled in a rigorous manner, administrative controls for all contributing facilities will be reviewed and revised as required. The specific actions required are detailed in the following sections.

The overall schedule for implementing these Best Management Practices (administrative controls) is shown in Section IV, Figure 1. Costs associated with this effort are included in the overall project overhead funds.

4.1 Pacific Northwest Laboratory Administrative Policy Controls

Pacific Northwest laboratory facilities operate under several directives and procedures which rigorously control inputs to the process sewer. Currently, there are no known future plans which would impact negatively the 300 Area process waste water effluent. However, all future additions/modifications to process sewer inputs will maintain compliance with current administrative controls and the intent of this program. Policies and procedures will be reviewed and revised as necessary to ensure current and future operations are executed in a manner that minimizes the potential for discharge of undesirable effluents or materials into the process drains.

4.2 Westinghouse Hanford Company Administrative Policy Controls

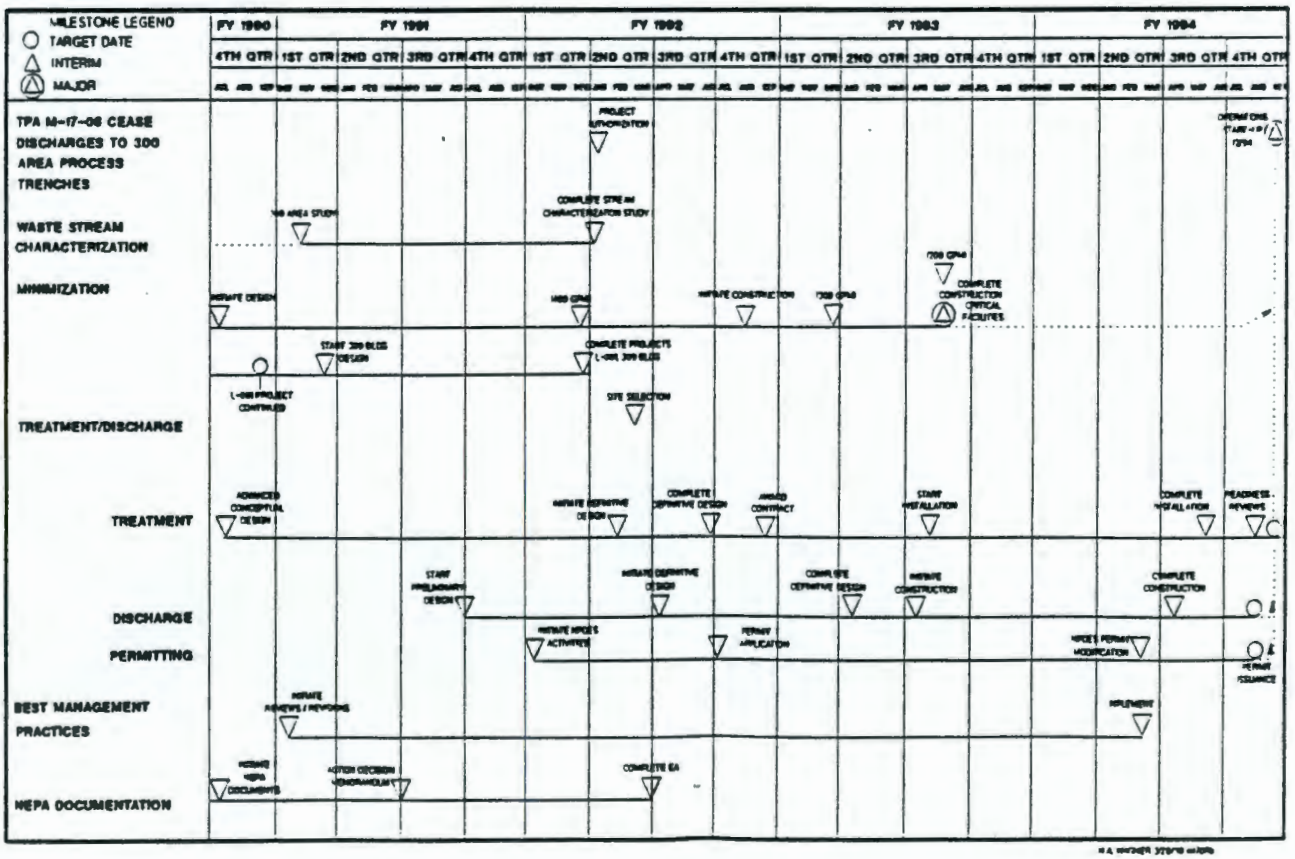
Various WHC administrative procedures will be updated to assure that current and future inputs to the process sewer remain within required parameters. Upper level guidelines will be reviewed and revised as required.

IV SCHEDULE AND COST

1.0 SCHEDULE

A schedule for completing the activities described in this document has been developed showing a three phased minimization process. By the end of calendar year (CY) 1991, the targeted reduced average daily flow to the process trenches will be less than or equal to 400 gal/min. By the end of CY 1992 it will be less than or equal to an average daily flow of 300 gal/min, and the balance of the minimization activities will be completed in 1993. The schedule for the Treatment and Disposal facilities shows project authorization (funding availability) in fiscal year (FY) 1992 and the project completion in FY 1994.

Figure 1. Schedule.



2.0 COST

Budget requirements have been established for each activity based on rough order of magnitude estimates using 1990 dollars. These dollars have been identified by year of requested availability and support the planned schedule. These budget requirements may vary slightly as each activity is defined. Additional cost for supporting activities such as preliminary design, engineering studies, preliminary environmental documentation, etc., will be required in FY 1990, and FY 1991 and are identified in the schedule as project support.

The following table is the schedule of costs and the flow reductions achieved by the minimization program.

Table 1. Summary of Costs and Flow Reductions.

ACTIVITY	FLOW REDUCTION GPM	FY 90 $K	FY 91 $K	FY 92 $K	FY 93 $K	FY 94 $K	TOTAL COST $K
Firewater Storage Tanks	265		400				400
309 Bldg. Chiller Replacement	300		1000				1000
PNL-Facilities Upgrades	65		250	150			400
WHC-Facilities Upgrades	45		200	100			300
Cooling Systems Upgrades							
306E Bldg.							
313 Bldg.	23	40	98				138
318 Bldg.	12			50	193		243
320 Bldg.	37	250	200				450
324 Bldg.	114	200	700				900
325 Bldg.	44			400	662		1062
326 Bldg.	87		110	200			310
328 Bldg.	10		60	112			172
3745-B Bldg.	14			35	100		135
306-W Bldg.	36			175	200		375
	1,092	$ 490	$ 3,393	$ 1,222	$ 1,155		$ 6,260
PROJECT SUPPORT			$ 1.500	$ 1,000	$ 750	$ 750	$ 4,000
TREATMENT/DISPOSAL				$ 3,800	$ 5,900	$ 800	$ 10,500
						PROGRAM TOTAL	$ 20,760

Annual Flow Reduction Milestones:

1. Dec. 91 -< 400 GPM Avg. Daily Flow
2. Dec. 92 -< 300 GPM Avg. Daily Flow
3. May, 93 200 GPM Avg. Daily Flow

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Dear Messrs. Day and Nord:

COMPLETION OF TRI-PARTY AGREEMENT INTERIM MILESTONE M-17-05 AND TRANSMITTAL OF CHANGE CONTROL FORM FOR M-17-90-1 "300 AREA PROCESS TRENCHES"

The attached Plan and Schedule is provided to satisfy completion of the Tri-Party Agreement interim milestone M-17-05, "Select 300 Area Process Trench effluent treatment option and establish schedule for implementing treatment and ceasing liquid discharges."

The Plan and Schedule is based on a study that assessed different options for ceasing discharges to the process trenches and treatment of the waste stream. The Plan and Schedule includes a three-step, phased effluent minimization program in the 300 Area and construction of an effluent treatment facility to be operational by December 1994. The program would reduce flow to the 300 Area Process Trenches from the current level of approximately 1,300 gpm to a maximum of 400 gpm (daily average) by December 1991, 300 gpm (daily average) by December 1992, and 200 gpm (target daily average) by May 1993. The residual effluent flow [200 gpm (target daily average)] would be routed to the treatment facility when it comes on-line in December 1994.

The Plan and Schedule does not support a December 1991 date to "Cease all discharges to 300 Area Process Trenches," (Milestone M-17-06). This reflects an inability to identify $10,500,000 capital funding required to complete construction of the effluent treatment facility by December 1991 due to the requirement to fund the 242-A Evaporator/PUREX liquid effluent retention facility and treatment/disposal capability. However, we are continuing to identify opportunities to improve the December 1994 date within the constraints of currently available funding. We are also investigating every possible avenue to identify the funding required to meet the original December 1991 milestone date. We will keep you informed regarding our progress in this area.

9513388.0027

Change Number	FEDERAL FACILITY AGREEMENT AND CONSENT ORDER CHANGE CONTROL FORM	Date
M-17-90-1	Do not use blue ink. Type, or print using black ink.	3-23-90

Originator: J. L. Waite

Phone: 376-2248

Class of Change

☐ I – Signatories (Section 13.0) ☒ II – Project Manager ☐ III – Unit Manager

Change Title

300 Area Process Trenches

Description/Justification of Change

The Tri-Party Agreement currently requires ceasing liquid discharges to the 300 Area Process Trenches by December 1991 (Milestone M-17-06) and completion of the 300 Area Treated Effluent System by June 1995 (Milestone M-17-09). At the time the agreement was signed, DOE indicated that a study needed to be performed to confirm what actions could be taken associated with the 300 Area Process Trenches. An additional milestone (M-17-05) was established to "select 300 Area Process Trench effluent treatment option and establish schedule for implementing treatment and ceasing liquid discharges" by March 1990. The March 1990 milestone has been completed and the 300 Area Implementation Plan (attached) is the end product of this effort. The plan reflects a significant effort to reduce the volume of effluent going into the process trenches and an acceleration of the 300 Area Treated Effluent System.

The following milestone changes are proposed:

- Delete M-17-06, Cease all discharges to 300 Area Process Trenches - December 1991.

(continued, see attachment)

Impact of Change

This change allows for an orderly shutdown of the 300 Area Process Trenches with no impact to other Tri-Party Agreement activities. The responsible programs will be able to implement their minimization activities without impacting the Tri-Party Agreement and supporting operations. If the December 1991 date to cease discharge has to be met, other Tri-Party Agreement activities would be impacted either due to diverting funds to accelerate the 300 Area Treated Effluent System, or shutting down 300 Area operations until treatment capability is available.

Affected Documents

Approvals ___ Approved ___ Disapproved

DOE _____ Date _____

EPA _____ Date _____

Ecology _____ Date _____

Description/Justification of Change (continued)

- Revise M-17-09 to read , "Complete 300 Area Treated Effluent System and cease all discharges to 300 Area Process Trenches." Accelerate completion date from June 1995 to December 1994.

- Add M-17-11, Reduce average daily flow to 300 Area Process Trenches to 400 GPM or less - December 1991.

- Add M-17-12, Further reduce average daily flow to 300 Area Process Trenches to 300 GPM or less - December 1992.

- Add M-17-13, Further reduce average daily flow to approximately 200 gpm - May 1993.

An acceptable approach to cease discharge by December 1991 does not exist. The facilities must continue to operate in support of TRI-Party Agreement, R&D, and other Waste Management activities. Funding is currently included in the FY 1992 HEC Line Item for construction of the 300 Area Treated Effluent System.

Due to the already tight budgets in FY 1990 and FY 1991, it is not feasible to accelerate construction of the treatment system without impacting other Tri-Party Agreement activities.