20030227002

AD-A273 011

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)

2. REPORT DATE: 08/09/91

3. REPORT TYPE AND DATES COVERED

4. TITLE AND SUBTITLE: HYDRAZINE BLENDING AND STORAGE FACILITY, INTERIM RESPONSE ACTION, DRAFT IMPLEMENTATION DOCUMENT FOR RINSEWATER TRANSFER, PHASE II

5. FUNDING NUMBERS: DAAA 15 88 0021

(2)

6. AUTHOR(S)

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES): HARDING LAWSON ASSOCIATES

8. PERFORMING ORGANIZATION REPORT NUMBER: 91222R04

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES): ROCKY MOUNTAIN ARSENAL (CO.). PMRMA

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

THE PURPOSE OF THIS DRAFT IS TO OUTLINE THE PLAN FOR TRANSFERRING HYDRAZINE RINSEWATER CURENTLY STORD AT THE HBSF AND DECONTAMINATION OF RINSEWATER GENERATED DURING THE IRA TO THE POND A SURFACE IMPOUNDMENT FOR THE BASIN F LIQUIDS.

14. SUBJECT TERMS: IRA H, HEALTH, SAFETY, SQ1

15. NUMBER OF PAGES

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT: UNCLASSIFIED

18. SECURITY CLASSIFICATION OF THIS PAGE

19. SECURITY CLASSIFICATION OF ABSTRACT

20. LIMITATION OF ABSTRACT

91222R04
2ND COPY

PROGRAM MANAGER FOR ROCKY MOUNTAIN ARSENAL

U.S. ARMY
MATERIEL COMMAND

— COMMITTED TO PROTECTION OF THE ENVIRONMENT —

Hydrazine Blending and Storage Facility
Interim Response Action

Draft Implementation Document for Rinsewater Tr
(Phase II)

August 9, 1991
Contract Number DAAA15-88-0021
Task IRA H Phase I (Delivery Order 0003)

93-28776

58105

Harding Lawson Associates

93 11 23 096

REQUESTS FOR COPIES OF THIS DOCUMENT
SHOULD BE REFERRED TO THE PROGRAM MANAGER
FOR ROCKY MOUNTAIN ARSENAL
AMXRM-PM, COMMERCE CITY, COLORADO 80022

This document complies with the
National Environmental Policy Act of 1969.

91222R04
2ND COPY

TECHNICAL SUPPORT FOR ROCKY MOUNTAIN ARSENAL

Hydrazine Blending and Storage Facility
Interim Response Action

DTIC QUALITY INSPECTED 5

Draft Implementation Document for Rinsewater Transfer
(Phase II)

August 9, 1991
Contract Number DAAA15-88-0021
Task IRA H Phase I (Delivery Order 0003)

PREPARED BY

Harding Lawson Associates

PREPARED FOR

PROGRAM MANAGER FOR ROCKY MOUNTAIN ARSENAL

THIS DOCUMENT COMPLIES WITH THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969.

THE INFORMATION AND CONCLUSIONS PRESENTED IN THIS REPORT REPRESENT THE OFFICIAL POSITION OF THE DEPARTMENT OF THE ARMY UNLESS EXPRESSLY MODIFIED BY A SUBSEQUENT DOCUMENT.

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

This Draft Implementation Document (ID) for Rinsewater Transfer has been prepared as a requirement for conducting and completing the Interim Response Action (IRA) at the Hydrazine Blending and Storage Facility (HBSF) located at Rocky Mountain Arsenal (RMA) in Commerce City, Colorado. This document has been prepared in accordance with requirements set forth in the October 1988 Final Decision Document for the HBSF IRA (Peer, 1988) and the Amendment to the Final Decision Document (HLA, 1991). The HBSF IRA task was separated into two phases that comprise complete decommissioning of the HBSF as cited in the Federal Facility Agreement.

The design portion of Phase I of the HBSF IRA included analytical methods development and laboratory certification for analysis of hydrazine fuel compounds (hydrazine, monomethyl hydrazine [MMH], and unsymmetrical dimethyl hydrazine [UDMH]) and n-nitrosodimethylamine (NDMA) in HBSF rinsewater, chemical characterization of the hydrazine rinsewater, bench- and pilot-scale testing of ultraviolet (UV) light/chemical oxidation treatment systems for treatment of hydrazine rinsewater, full-scale startup testing of a UV light/chemical oxidation treatment system, and air monitoring during startup testing as described in the Draft Final Treatment Report (HLA, 1991).

An inventory of the HBSF site was also conducted during Phase I to assess overall site conditions and to inventory facilities and equipment at the site for planning of decontamination, demolition, and reclamation decommissioning activities. The inventory identified aboveground tanks and piping, buried structures and piping, drums, concrete and asphalt, buildings, and surficial debris. An asbestos survey was also performed during the site inventory.

Phase II of the HBSF IRA will consist of (1) transferring hydrazine rinsewater from the HBSF to the Pond A surface impoundment for the Basin F liquids and (2) incinerating the hydrazine rinsewater with the Basin F liquids in the submerged quench incinerator (SQI) at RMA. The purpose of this Draft ID is to outline the plan for transfer of the rinsewater to Pond A for temporary holding. Details of the rinsewater incineration activity will be included in the Implementation Document for the Basin F Liquid Incineration IRA.

1.0 INTRODUCTION

This Draft Implementation Document (ID) for Rinsewater Transfer has been prepared as a requirement for conducting and completing the Interim Response Action (IRA) at the Hydrazine Blending and Storage Facility (HBSF) located at Rocky Mountain Arsenal (RMA) approximately 10 miles northeast of metropolitan Denver in Commerce City, Colorado (Figure 1.1). This document has been prepared in accordance with requirements set forth in the Final Decision Document for the HBSF IRA (Ebasco, 1988) and the Amendment to the Final Decision Document (HLA, 1991). The HBSF IRA task was separated into two phases that comprise complete decommissioning of the HBSF as cited in the Federal Facility Agreement (FFA).

The purpose of this Draft ID is to outline the plan for transferring hydrazine rinsewater currently stored at the HBSF and decontamination rinsewater generated during the IRA to the Pond A surface impoundment for the Basin F liquids. This section presents a brief description and history of the HBSF, a summary of the Decision Document, a summary of the scope of work for the IRA and primary objectives of the IRA, and Applicable or Relevant and Appropriate Requirements (ARARs) for the rinsewater transfer activity. Section 2.0 details characterization of the hydrazine rinsewater that was conducted during Phase I of the HBSF IRA. Section 3.0 describes the HBSF and Pond A rinsewater transfer areas. A plan of action for transferring the rinsewater, including a schedule and cost estimate, is presented in Section 4.0. Section 5.0 describes the health and safety factors regarding transfer activities.

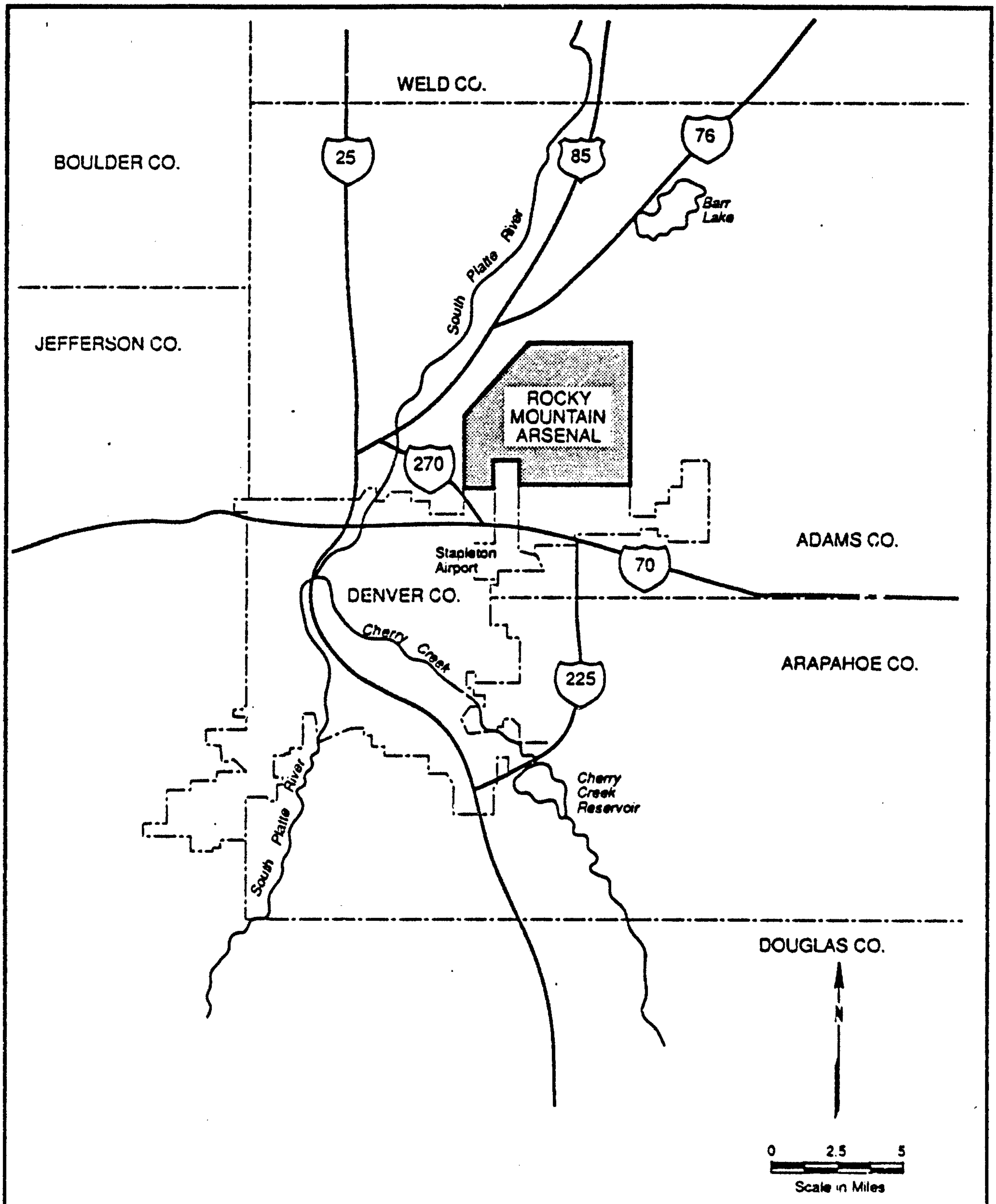
Details of the rinsewater incineration activity will be included in the Implementation Document for the Basin F Liquid Incineration IRA.

1.1 BACKGROUND

1.1.1 Hydrazine Blending and Storage Facility History

The HBSF was operated by RMA for the U.S. Air Force (USAF) between 1962 and 1982 as a depot to receive, blend, store, and distribute hydrazine fuel compounds. The HBSF was primarily used to blend anhydrous hydrazine and unsymmetrical dimethyl hydrazine (UDMH) (or

RMAS 1001



Prepared for: Program Manager for Rocky Mountain Arsenal Commerce City, Colorado	Figure 1.1 RMA LOCATION MAP

1,1-dimethyl hydrazine) to produce Aerozine 50. The materials were manufactured elsewhere and shipped to RMA for blending. Blending operations were not continuous and occurred in response to requests by the USAF. Other operations at the HBSF included loading and unloading of rail cars and tanker trucks, and storage of Aerozine 50, anhydrous hydrazine, monomethyl hydrazine (MMH), monopropellent hydrazine, hydrazine 70, UDMH, and hydrazine.

Hydrazine and UDMH are unstable in the natural environment and rapidly decompose when exposed to the atmosphere. One of the decomposition products of UDMH is n-nitrosodimethylamine (NDMA), a suspected human carcinogen. From January through March 1982, the U.S. Occupational Safety and Health Administration (OSHA) surveyed the HBSF and detected the presence of airborne NDMA within the HBSF. In May 1982, RMA ceased operations and closed the HBSF to all but safety-essential or emergency response entries. After operations ceased, usable fuel was shipped to the USAF or sold. Off-specification fuel was sent to an incinerator.

Following the discontinuation of operations at the HBSF, tanks that had been used to store hydrazine fuel compounds were decontaminated. The decontamination procedure consisted of pumping a sodium hypochlorite solution through horizontal hydrazine fuel storage tanks HAS-1, HAS-2, HAS-3, CS-1, US-1, and US-2 located at the west area of the HBSF. The decontamination solution was subsequently pumped into tanks US-3 and US-4 located at the east area of the HBSF. In addition, an in-ground concrete sump located in the west area of the HBSF received water used to decontaminate various portions of the HBSF. Tanks US-3 and US-4 and the in-ground sump contain approximately 294,000 gallons of hydrazine rinsewater.

On February 17, 1989, the U.S. Department of the Army (Army), Shell Oil Company, the U.S. Environmental Protection Agency (EPA), the U.S. Department of the Interior (DOI), the U.S. Department of Justice (DOJ), and the U.S. Department of Health and Human Services (HHS) executed a Federal Facility Agreement (FFA). The FFA specifies a number of IRAs, including closure of the HBSF, as necessary and appropriate before final remedial action at RMA. The IRA process described in the FFA requires preparation of an IRA Implementation Document before implementation of the response action.

1.1.2 Decision Document

In October 1988, the Final Decision Document for the HBSF IRA was released by the Program Manager for Rocky Mountain Arsenal (PMRMA). The Final Decision Document states that the HBSF IRA will consist of (1) treatment and disposal of pretreated liquids stored in tanks at the HBSF and (2) dismantlement and disposal of the HBSF structures. The Final Decision Document also cites treatment of the rinsewater via the ultraviolet (UV) light chemical oxidation process and disposal of the treated water to the RMA Sewage Treatment Plant (STP) as the preferred treatment and disposal alternative.

In December 1990, the RMA Steering and Policy Committee (SAPC), chaired [illegible] PA, ruled that the disposal alternative identified in the Final Decision Document (i.e., the RMA STP) was no longer valid. On February 25, 1991, the Army released a proposed amendment to the Final Decision Document recommending transfer of the hydrazine rinsewater from the HBSF to Pond A and incineration of the rinsewater/Basin F liquids mixture in the submerged quench incinerator (SQI) as the preferred treatment and disposal alternative in lieu of treatment via the UV light/chemical oxidation process and disposal to the STP. The Amendment to the Final Decision Document reflecting this revised treatment and disposal alternative will be issued to the Organizations and State (OAS) in August 1991.

1.2 SCOPE OF WORK FOR THE HYDRAZINE BLENDING AND STORAGE FACILITY IRA

The HBSF IRA task was separated into two phases for closure of the HBSF. The scope of work for Phase I included planning, rinsewater treatment system selection and modification (including bench- and pilot-scale testing), full-scale system installation, analytical method development and laboratory method certification, treatment system startup testing, and development of an ID for decontamination, demolition, and disposal of structures and equipment at the HBSF and site reclamation (decommissioning). Phase I will conclude with the completion of decommissioning activities. The scope of work for Phase II will include transfer of hydrazine rinsewater stored at the HBSF and generated during decommissioning activities, and onsite incineration of the rinsewater/Basin F liquids mixture in the SQI.

Specific objectives developed for Phase II are as follows:

- Treat and dispose the remaining hydrazine rinsewater stored at the HBSF and the rinsewater generated during decommissioning of the HBSF in the SQI
- Treat and dispose any sludge remaining in the hydrazine rinsewater storage tanks after completion of rinsewater transfer

1.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR RINSEWATER TRANSFER

Because the rinsewater transfer activities will take place entirely onsite RMA, the administrative requirements of 40 Code of Federal Regulations (CFR) Part 262, regarding transportation of hazardous waste, are neither applicable nor relevant and appropriate to this transfer action. No other action will be taken, therefore, no other regulations are applicable or relevant and appropriate.

2.0 CHARACTERIZATION OF HYDRAZINE RINSEWATER

During Phase I of the HBSF IRA, the Army characterized the chemical constituents in hydrazine rinsewater stored in tanks US-3 and US-4 and the in-ground concrete sump.

Nine investigative samples and three duplicate samples were collected during January 1990 from tanks US-3 and US-4 and the in-ground concrete sump. Samples were collected at three depths in the tanks to provide characterization of the rinsewater at the upper, middle, and bottom intervals in each tank. Samples were collected from tank US-3 at 4.5, 9.5, and 14.5 feet below the liquid surface. Samples were collected from tank US-4 at 5, 15, and 25 feet below the liquid surface. Samples were collected from the in-ground concrete sump at 1, 2, and 4.5 feet below the liquid surface. Duplicate samples were collected from a single sampling interval in each tank to evaluate the analytical reproducibility.

Each of the 12 hydrazine rinsewater samples collected from the tanks and the in-ground sump were analyzed for NDMA, hydrazine fuel compounds (hydrazine, UDMH, and MMH), priority pollutant list volatile organic compounds (VOCs), priority pollutant list semivolatile organic compounds (SVOCs), priority pollutant list pesticides/polychlorinated biphenyls (PCBs), 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), and priority pollutant list metals (plus iron) listed in the draft National Pollutant Discharge Elimination System (NPDES) discharge permit that was under consideration for the RMA STP at that time. Samples were also analyzed for RMA-related compounds (organophosphorus pesticides, organosulfur compounds, dibromochloropropane [DBCP], diisopropylmethylphosphonate [DIMP], dimethylmethylphosphonate [DMMP], and dicyclopentadiene [DCPD]).

Appendix A is a tabular summary of the analytical results of the investigative rinsewater samples. Table 2.1 summarizes the concentration ranges of analytes detected above the method reporting limit (MRL) in rinsewater samples collected from the tanks and the in-ground sump. Analytes listed in Appendix A but not listed in Table 2.1 were not detected in rinsewater samples.

Table 2.1: Concentration[1] Ranges of Analytes Detected in Hydrazine Rinsewater Samples from Rocky Mountain Arsenal During January 1990 (Page 1 of 2)

Analyte	Tank US-3	Tank US-4	In-Ground Sump
Hydrazine Fuel Compounds/NDMA			
Hydrazine	22,000 - 60,000	79,000 - 1,100,000	380 - 2100
Monomethyl hydrazine	50,000 - 94,000	140,000 - 180,000	ND
Unsymmetrical dimethyl hydrazine	53,000 - 110,000	790,000 - 1,100,000	85 - 1600
n-Nitrosodimethylamine	500 - 790	53 - 60	1.4 - 5.8
Volatile Organic Compounds			
Acetone	50.7	23.8 - 32.0	ND
Benzene	53 - 112	2.25 - 2.66	ND
Chlorobenzene	41.6	ND	ND
Chloroethane	2000	ND	ND
Chloroform	3000 - 4750	96.6 - 106	ND
Chloromethane	45.3	7.25 - 25.6	ND
1,2-Dichloroethane	66 - 143	1.61 - 1.67	ND
1,1-Dichloroethane	96 - 570	3.66 - 3.89	ND
1,1-Dichloroethene	13.1	ND	ND
1,2-Dichloropropane	26.0 - 89.1	ND	ND
Dimethyl sulfide	4.87 - 14.2	46 - 61	ND
Methylethyl ketone	ND	ND	13.3
Methylene chloride	2600 - 13,000	61 - 110	ND
o,p-Xylene	1.84	ND	ND
Tetrachloroethene	2.60	ND	ND
Toluene	5.09	ND	96 - 680
Trichloroethene	5.16	ND	ND
Vinyl acetate	134 - 186	ND	ND
Vinyl chloride	78.3	ND	ND
Semivolatile and Pesticide Compounds			
Aniline	1200 - 1460	1500 - 6400	ND
Atrazine	33.1 - 44.0	4.52 - 5.50	8.86 - 150
Benzothiazole	2.47 - 2.92	2.97 - 14.9	ND
4-Chloroaniline	ND	2.88 - 2.94	ND
Malathion	ND	ND	0.574
4-Methylphenol	ND	ND	45.5 - 320
Naphthalene	8.18 - 9.68	ND	ND
Parathion	ND	ND	3.78
Phenol	ND	ND	4.12 - 4.52
Vapona	19.1	ND	ND
bis(2-Ethylhexyl) phthalate	2.00	11.0	2.14

20003,644.10 - ADD
0708080791

Table 2.1: (Page 2 of 2)

Analyte	Tank US-3	Tank US-4	In-Ground Sump
Metals			
Arsenic	43.1 - 66.3	16.1 - 20.4	220 - 288
Cadmium	ND	ND	0.601-1.88
Chromium	5.22 - 6.87	6.62 - 7.61	5.8 - 10.7
Copper	7.48	ND	ND
Iron	48 - 81,000	6330 - 12,100	700 - 1080
Mercury	0.738 - 0.868	0.241 - 0.658	ND
Silver	0.462	0.224	ND
Zinc	12.2 - 28.9	12.4 - 22.8	24.6 - 55.4

[1] concentrations are in micrograms per liter (µg/l)
ND = not detected at or above the method reporting limit
NDMA = n-nitrosodimethylamine

20003,644.10 - ADD
0708080591

3.0 RINSEWATER TRANSFER AREAS

Hydrazine rinsewater to be transferred will be loaded into a tanker truck at the east area (near the Hydrazine Rinsewater Treatment Facility [WWTF]) and the west area (near the in-ground concrete sump) of the HBSF. The rinsewater will be discharged to Pond A for temporary holding before incineration. The HBSF and Pond A sites are described in the following sections.

3.1 HYDRAZINE BLENDING AND STORAGE FACILITY SITE

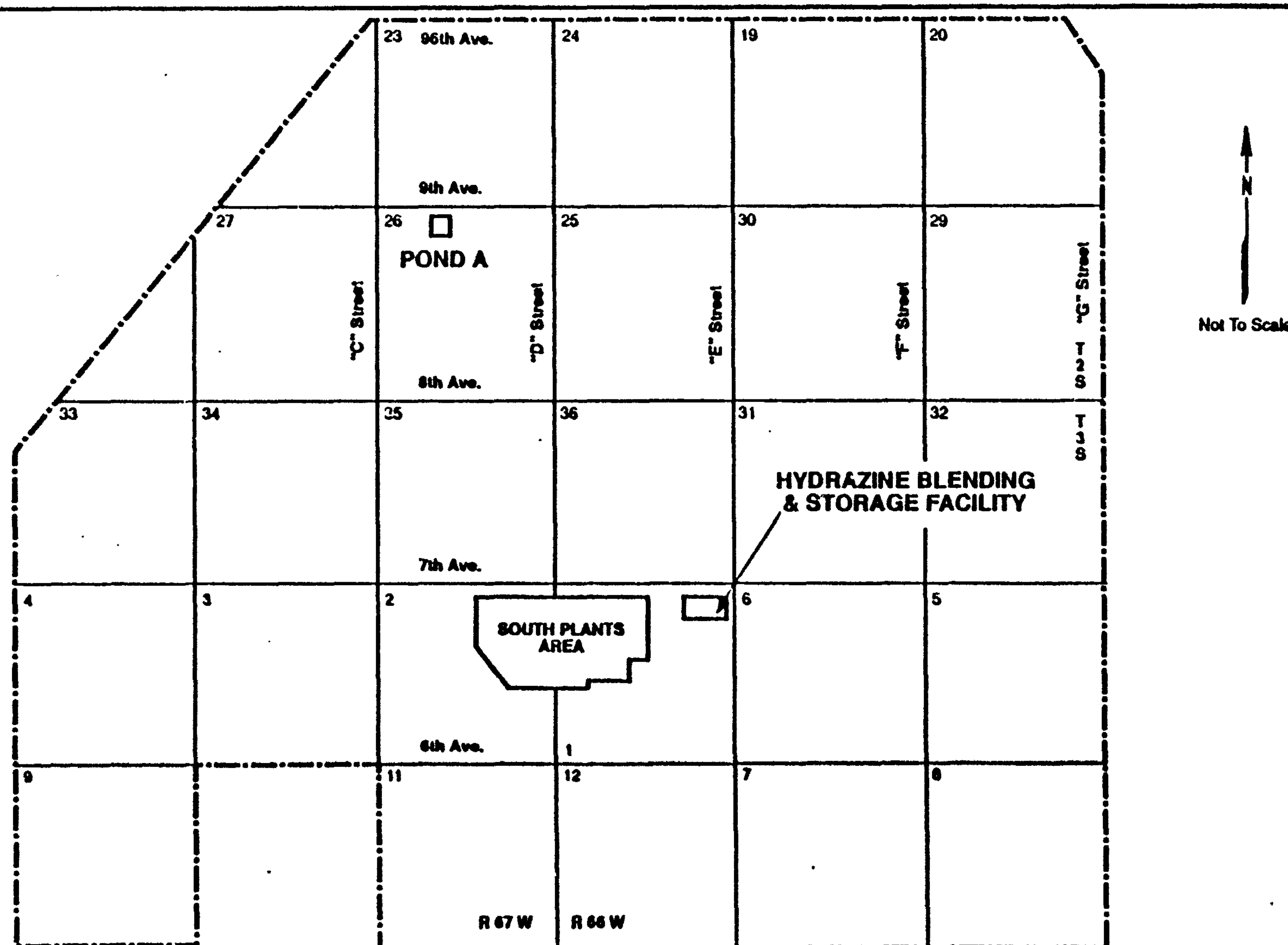
The HBSF is located east of the South Plants area in the northeast corner of Section 1 at RMA (Figure 3.1). The 10-acre HBSF site consists of two separate areas, each area completely surrounded by a chain-link fence and a barbed wire fence (Figure 3.2). Overhead piping, access roads, and a railroad spur connect the two areas.

The west area was constructed in 1961 and encompasses approximately 346,000 square feet. The west area contains a staging area for tanker trucks and railroad cars, a drum storage area, blending facilities, three buildings, a 44,000 gallon in-ground concrete sump, two 19,000-gallon carbon steel tanks (US-1 and US-2), and four 24,900-gallon stainless-steel horizontal tanks (HAS-1, HAS-2, HAS-3, and CS-1). Secondary containment structures associated with hydrazine fuel storage tanks HAS-1, HAS-2, HAS-3, CS-1, US-1, and US-2 are connected to the in-ground concrete sump via buried pipelines.

The east area was constructed in 1976 and encompasses approximately 103,000 square feet. The east area contains one 50,000-gallon and one 200,000-gallon vertical, carbon steel storage tank previously used for additional storage of UDMH (tanks US-3 and US-4, respectively). Tanks US-3 and US-4 are connected by a pipeline at the bottom of each tank.

Since the discontinuation of operations at the HBSF, all tanks have been emptied of fuel and decontaminated. The quantities of decontamination rinsewater generated and currently stored in tanks US-3, US-4, and the in-ground sump are approximately 50,000, 200,000, and 40,000 gallons, respectively. During the week of October 30, 1989, an inventory of the HBSF site was conducted. Included in the inventory was an assessment of the condition of tanks. Insulation

RMAH 1033.1



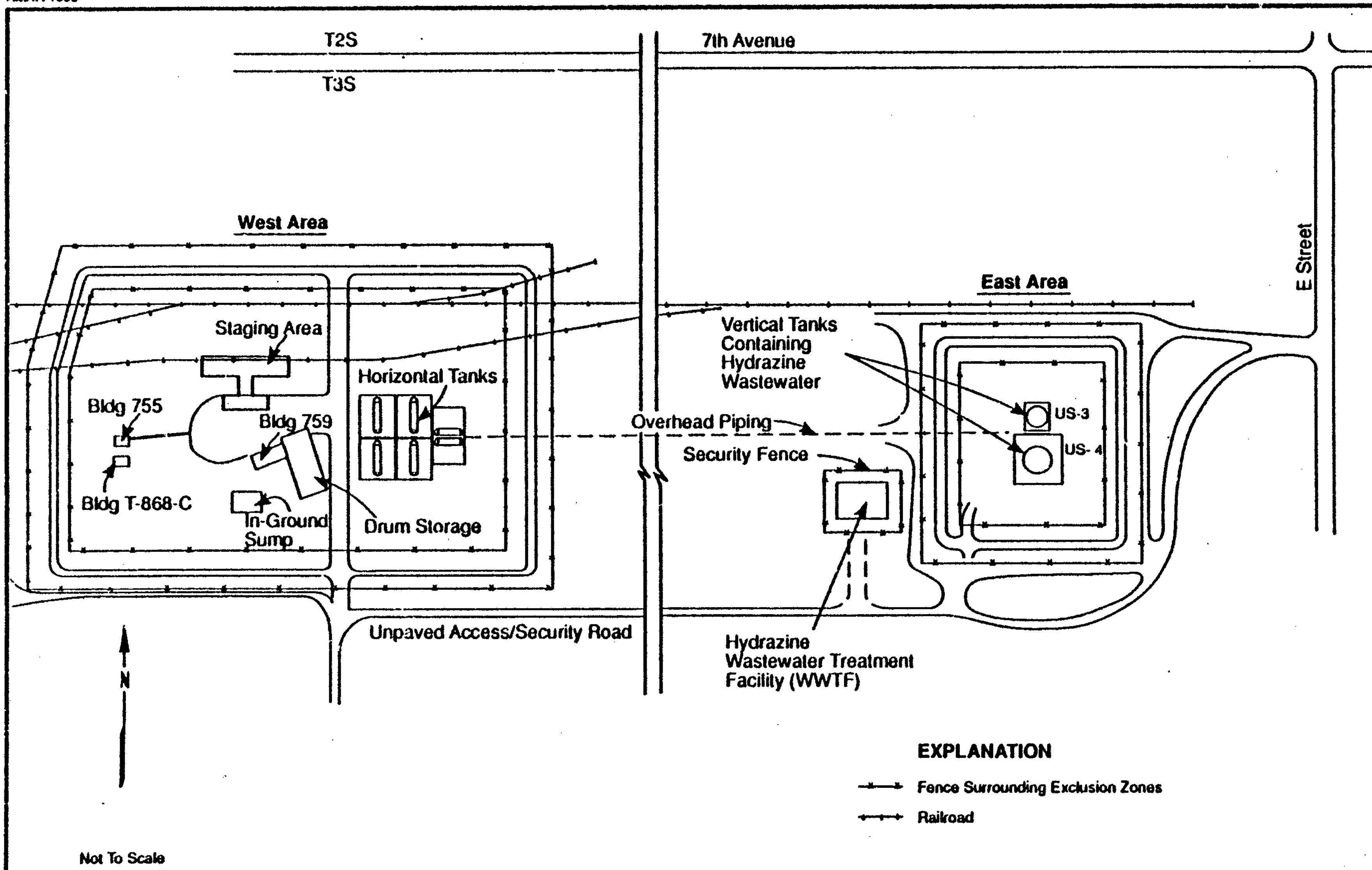
Prepared for:
Program Manager for
Rocky Mountain Arsenal

Commerce City, Colorado

Figure 3.1

LOCATION OF TRANSFER AREAS AT RMA

RMAH 1005



Prepared for: Program Manager for Rocky Mountain Arsenal Commerce City, Colorado	Figure 3.2 HYDRAZINE BLENDING AND STORAGE FACILITY MAP

surrounding the outside of tanks US-3 and US-4 limited the inspection. The insulation on these tanks is composed of foam and is severely weathered and in a state of disrepair. The concrete secondary containment structures of both tanks contain floor cracks. It is not known whether these cracks extend completely through the floor of the containment structures. The walls of the secondary containment structure for tank US-4 also contain cracks that may extend through the walls. No cracks were noted in the walls of the secondary containment structure for tank US-3. Since the initial inspection, tanks US-3 and US-4 and their secondary containment structures have been inspected daily (five days per week), except during January 1990 when weather conditions and personnel availability limited daily inspection. In addition, the cracks in the secondary containment structures were sealed during June 1990 to reduce the risk in the event of a loss of material from US-3 or US-4.

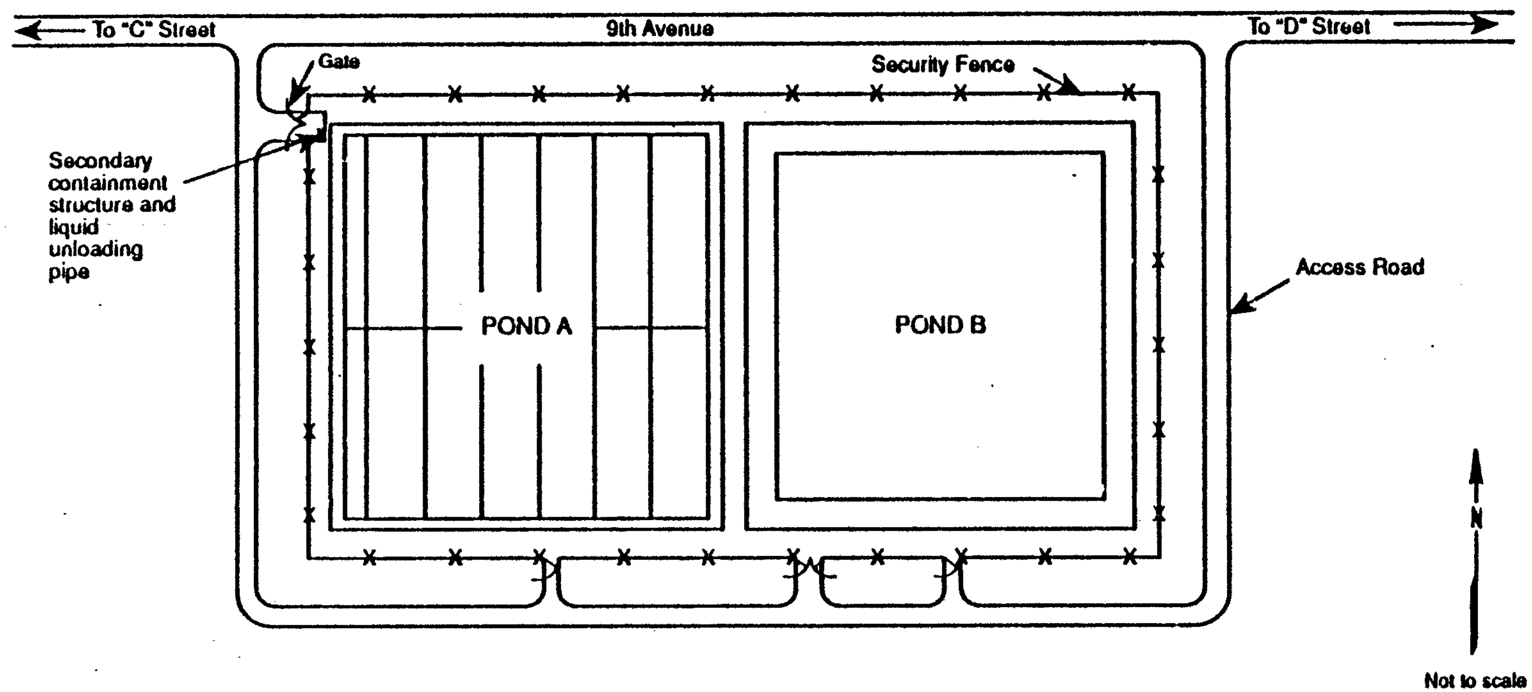
3.2 POND A SITE

Pond A is a covered, double-lined surface impoundment located north of the former Basin F site in Section 26 of RMA (Figure 3.1). Pond A contains liquid drained from the former Basin F as part of the Basin F IRA. Pond A is also used to hold liquids collected from the Basin F waste pile leachate collection system and any excess precipitation collected on the Pond A cover. Before July 26, 1991, excess precipitation from the Basin F tank farm secondary containment area was also placed in Pond A. Pond A covers 3.77 acres and has a capacity of 7.5 million gallons with a 2-foot freeboard (Figure 3.3).

Pond A is covered by a white Hypalon floating cover to prevent the exposure of wildlife to the liquid in the pond and to prevent or minimize air emissions. The cover is equipped with four pressure release vents, a hatch to allow sampling and liquid-level measurement, and a fill port to allow liquids to be added to the pond. The cover was designed to support a 4-inch rainfall or a 5-foot snowfall. There are four collection points at the corners of the cover to facilitate removal of precipitation that accumulates on the cover.

Pond A is lined with a combination of high-density polyethylene (HDPE) and geonet. The first layer of 60-mil HDPE (secondary liner) was placed on a 12-inch compacted clay foundation.

RMAH 1031



Prepared for:
Program Manager for
Rocky Mountain Arsenal

Commerce City, Colorado

Figure 3.3

POND A SITE MAP

A layer of 200-mil geonet was placed over the HDPE for leachate collection. A second layer of 60-mil HDPE (primary liner) was placed over the geonet. The combined liner is anchored at the top of the impoundment berm by a 12-inch deep trench filled with dike and embankment materials.

Pond A slopes toward the south at a 1 percent grade. The base of the pond is also sloped toward the north-south centerline at a 1 percent grade. A sump is located at the base of the liner at the south-central end of the pond. The sump is constructed to collect any liquid that might accumulate in the geonet layer. A 6-inch diameter HDPE pipe is connected to the sump and is used to transfer any accumulated liquid to a 6-inch diameter riser pipe that serves as the observation and collection point for leachate entering the sump.

Pond A is inspected weekly and after storm events in accordance with standard operating procedures.

4.0 PLAN OF ACTION

The hydrazine rinsewater currently stored in tanks US-3, US-4, and the in-ground concrete sump and decontamination water from decommissioning activities will be removed and transferred via tanker truck from both areas of the HBSF to the truck unloading area of Pond A. The proposed sequence for transfer of the hydrazine rinsewater and decontamination water is as follows:

1. Transfer the rinsewater currently stored in tank US-4 (with the exception of any sludge that may have accumulated at the bottom of the tank) to tanker trucks via the submersible pump that is suspended in tank US-4 and the piping that exists between tank US-4 and the WWTF. Transport the rinsewater via tanker trucks to Pond A.

2. Transfer the rinsewater currently stored in tank US-3 (with the exception of any sludge that may have accumulated at the bottom of the tank) to tank US-4 and then to tanker trucks as described above for tank US-4. Transport the rinsewater via tanker truck to Pond A.

3. Transfer the rinsewater from the in-ground concrete sump directly into a tanker truck via the tanker truck's vacuum pump. Transport the rinsewater via tanker truck to Pond A.

4. Transfer the decontamination water from decommissioning operations from temporary storage tanks directly to a tanker truck via the tanker truck's vacuum pump. Transport the decontamination water via tanker truck to Pond A.

Any sludge encountered during the decommissioning will be characterized and disposed of accordingly.

This section addresses the activities involved in the transfer action and includes (1) preparation for transfer activities, (2) loading operations, (3) transport of the rinsewater, (4) discharge from the truck into Pond A, (5) a schedule, and (6) cost estimate. Specific information regarding health and safety procedures to be followed during transfer activities is contained in Section 5.0.

4.1 PREPARATION FOR TRANSFER OF HYDRAZINE RINSEWATER

Transfer of hydrazine rinsewater from tanks US-3 and US-4 to the tanker truck will occur at the southeast corner of the WWTF utilizing piping installed during Phase I of the HBSF IRA. Currently, rinsewater can be pumped from tank US-4 to the WWTF via a submersible pump and associated double-walled transfer piping. A lined, bermed area for temporary secondary containment will be constructed where the truck will be loaded.

Upon transfer of the rinsewater in tank US-4 to Pond A, the valve in the pipeline connecting the tanks will be opened to allow the rinsewater in tank US-3 to enter tank US-4. Rinsewater transfer will continue as for tank US-4.

4.2 LOADING OPERATIONS

At the southeast side of the WWTF, the tanker truck will be loaded at the temporary containment structure through a quick-coupling transfer hose. Hydrazine rinsewater stored in tank US-4 will be pumped out of the tank via the submersible pump, through the transfer pipeline and transfer hose directly into the tanker truck at an average rate of 100 gallons per minute (gpm). An estimated volume of 5000 gallons will be transferred per tanker truck load. Approximately four hours will be required to transfer each 5000-gallon load.

The in-ground concrete sump will be drained utilizing the vacuum capabilities of the tanker truck. The tanker truck will enter and exit the west area of the HBSF from the north entrance and load on the south side of the sump. The HBSF decommissioning contractor will properly cover or remove the in-ground sump when it is drained of hydrazine rinsewater to prevent accumulation of additional liquid requiring transfer. Details of the transport route from the WWTF and the in-ground sump to Pond A are shown in Figure 4.1.

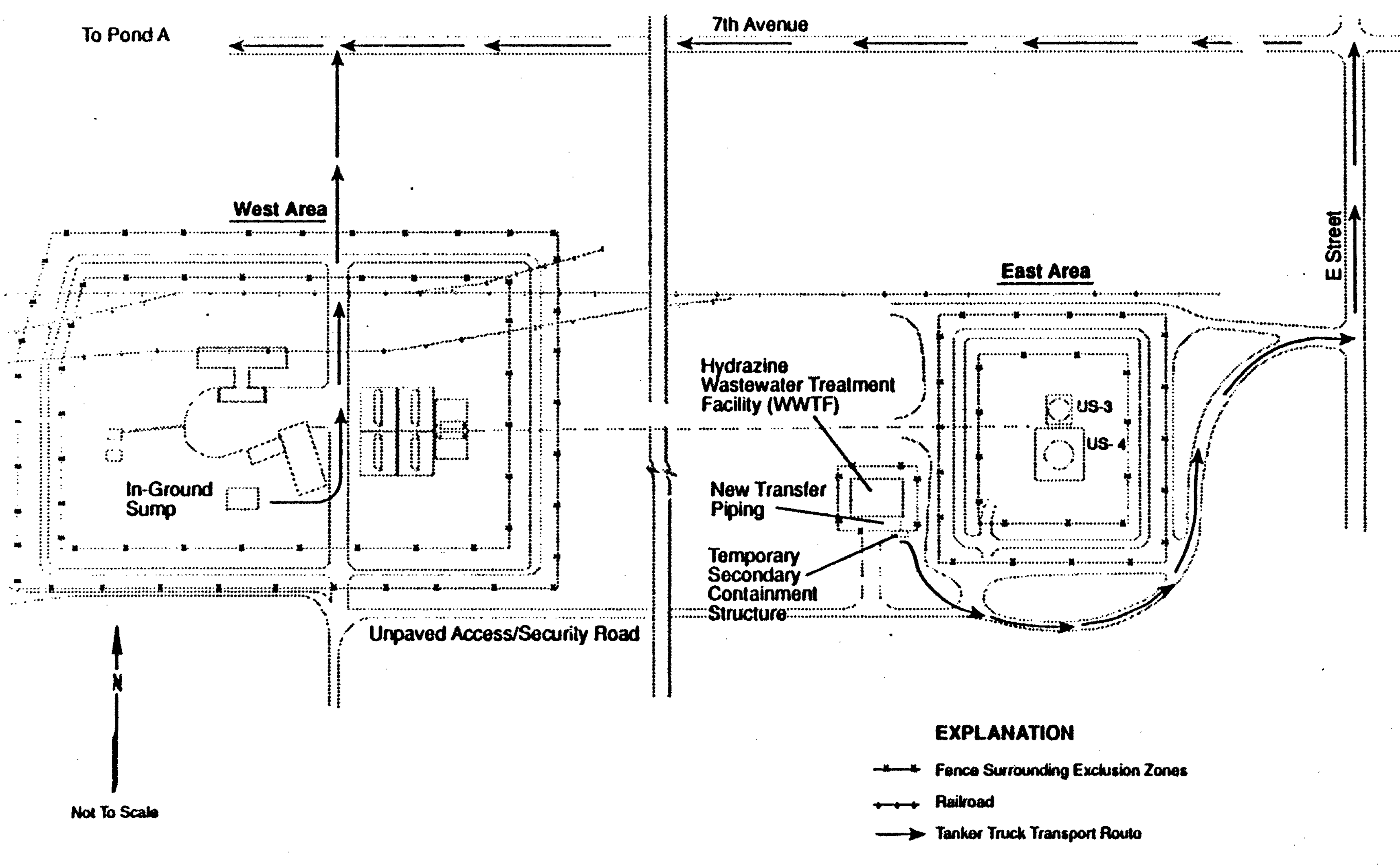
The temporary storage tanks for decontamination water generated during HBSF decommissioning will be drained utilizing the vacuum capabilities of the tanker truck. The most direct route to 7th Avenue will be utilized when exiting the HBSF.

Gates at the HBSF will be secured upon departure from the loading area for Pond A.

4.3 TRANSPORT OF RINSEWATER TO POND A

Once the tanker truck has been loaded at the WWTF, it will exit the east area of the HBSF and proceed north on E Street to 7th Avenue. The truck will follow 7th Avenue westbound to D Street, head north on D Street to 9th Avenue, and proceed west on 9th Avenue to Pond A. The

RMAH 1032

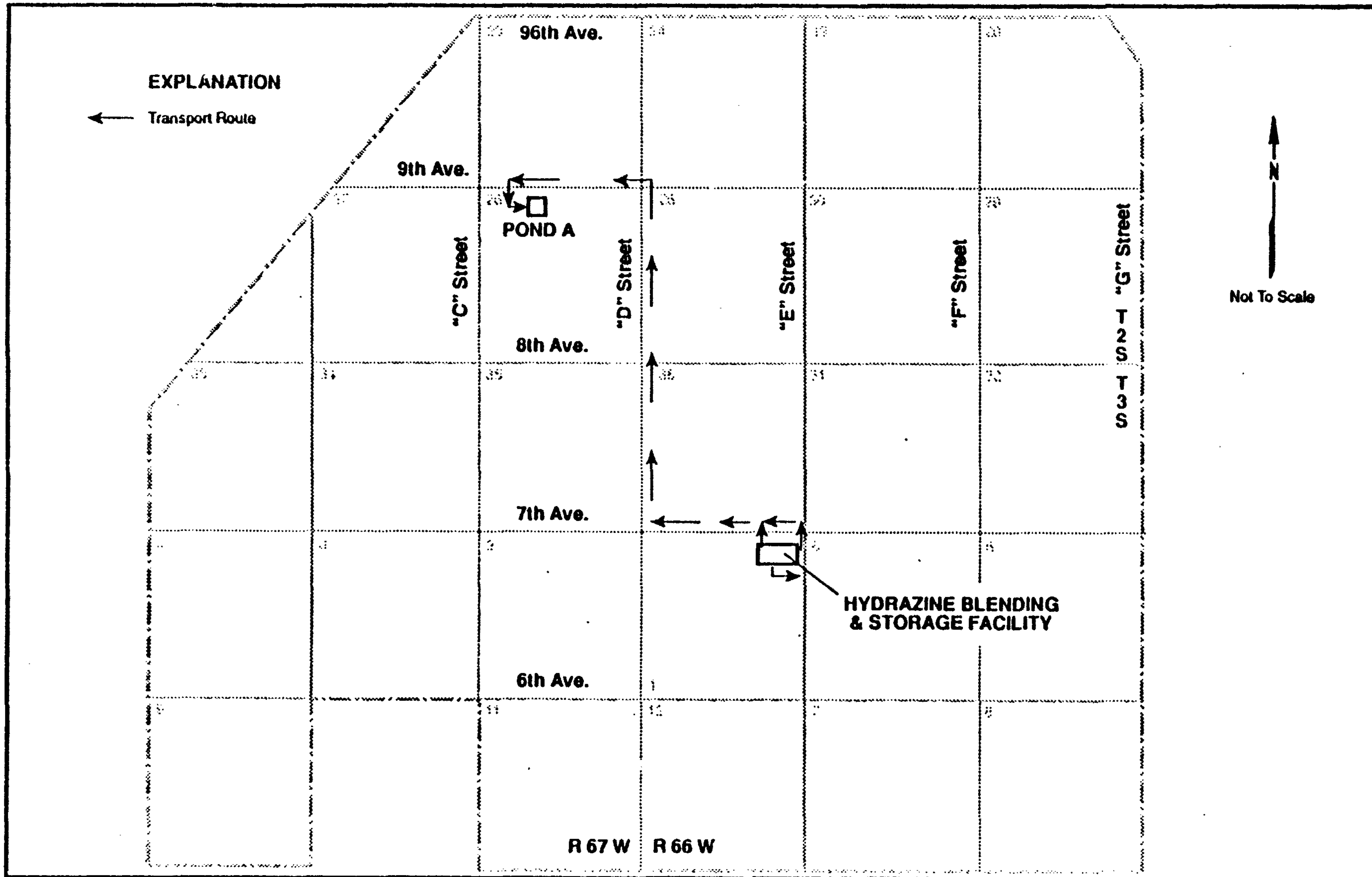


Prepared for:
Program Manager for Rocky Mountain Arsenal

Commerce City, Colorado

Figure 4.1

TRANSPORT DETAILS AT THE HYDRAZINE BLENDING AND STORAGE FACILITY



Prepared for:
Program Manager for
Rocky Mountain Arsenal

Commerce City, Colorado

Figure 4.2

TRANSPORT ROUTE FROM THE HYDRAZINE BLENDING AND STORAGE FACILITY TO POND A route to Pond A, which is approximately 4 miles long and predominantly paved, is shown in Figure 4.2. Estimated total transport time is 30 minutes. Once the truck has been loaded at the in-ground sump, it will exit the west area of the HBSF through the north entrance to 7th Avenue and continue as described above. For decontamination water generated during the decommissioning of the two areas, the tanker truck will take the most direct route to 7th Avenue and continue as described above.

4.4 DISCHARGE OF RINSEWATER INTO POND A

Hydrazine rinsewater will be discharged into Pond A utilizing the standard operating procedures (SOP) established for transferring liquids to Pond A as described in Basin F IRA SOP Number 453.4 (Weston, 1990) (Appendix B), with the exception of health and safety procedures. Section 5.0 of this document describes the health and safety program for this HBSF IRA transfer activity.

The existing secondary containment area at Pond A will be used during discharge operations. Details of the transport route to Pond A are shown in Figure 4.3.

After discharge of rinsewater into Pond A, the tanker truck will return to the HBSF via the transport route.

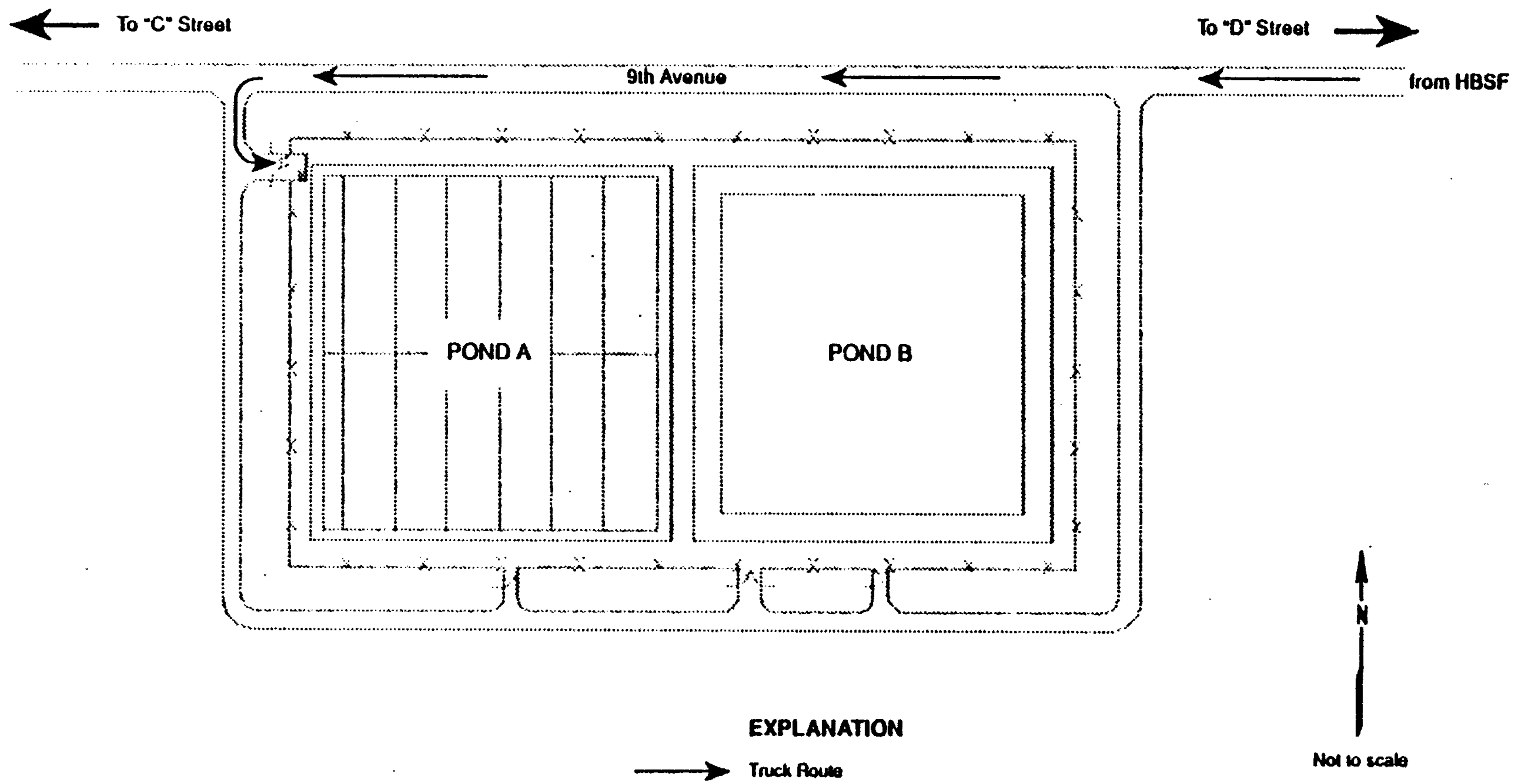
4.5 SCHEDULE

A schedule of rinsewater transfer activities is shown in Figure 4.4. Based on the issuance of the Final ID for Rinsewater Transfer and the availability of decontamination water generated during decommissioning activities, transfer of rinsewater is expected to be completed within 10 weeks after issuance of the Final ID.

4.6 COSTS

The following cost estimate was developed for implementation of rinsewater transfer activities:

RMAH 1031.1

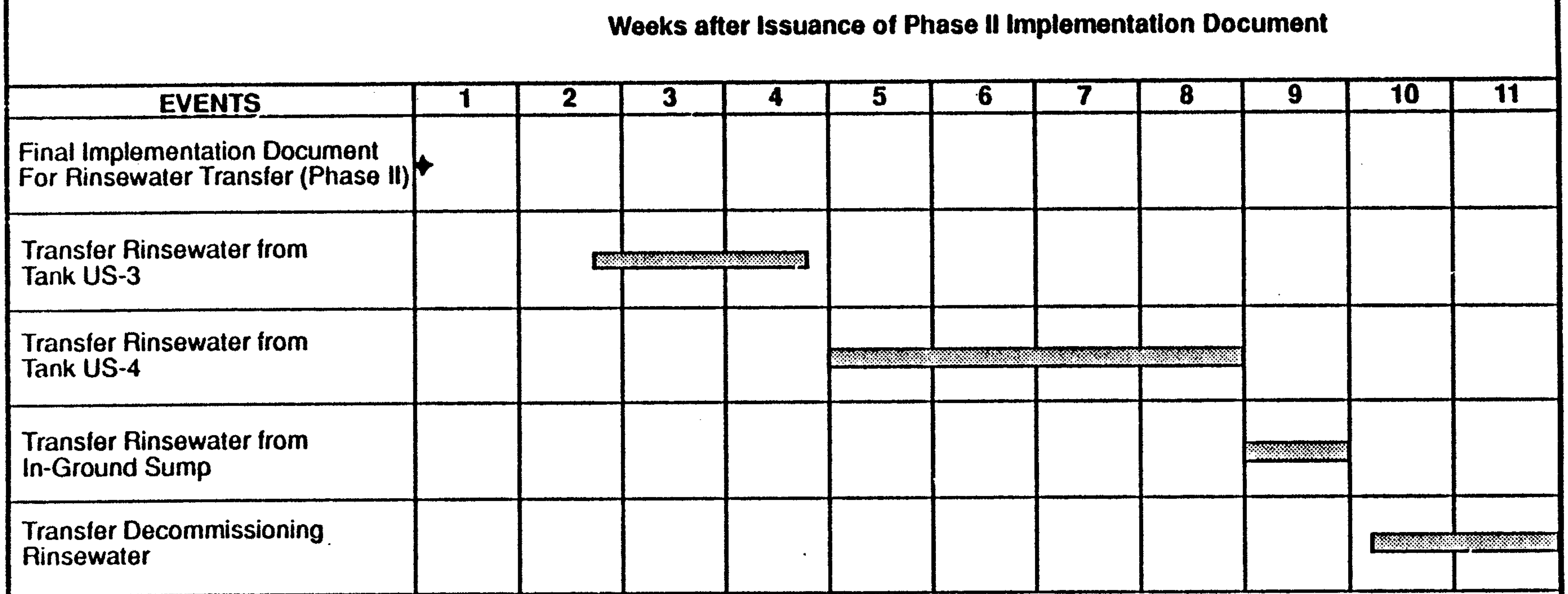


Prepared for:
Program Manager for
Rocky Mountain Arsenal

Commerce City, Colorado

Figure 4.3

TRANSPORT ROUTE DETAILS AT POND A



Prepared for:
Program Manager for
Rocky Mountain Arsenal

Commerce City, Colorado

Figure 4.4

RINSEWATER TRANSFER SCHEDULE

Activity	Estimated Cost
Planning	$ 10,000
Transfer of rinsewater currently stored	82,000
Transfer of rinsewater to be generated	20,500
Administration and support	7,500
Total	$ 120,000

5.0 HEALTH AND SAFETY

This section addresses health and safety factors associated with the transfer of the hydrazine rinsewater and decontamination water to Pond A. The following subsections discuss the general hazard categories as well as risks associated with the hazards. Training, medical surveillance, personal protective equipment (PPE), site control, and site-specific emergency procedures will also be discussed. References will be made to the Final Safety Plan (FSP) for IRA H (Appendix C to Final Task Plan, HLA, 1989). Section 5.0 is considered an addendum to the FSP.

5.1 HAZARD ANALYSIS

The following sections discuss the potential hazards associated with the transfer of hydrazine rinsewater. Table 5.1 presents a summary of these hazards.

5.1.1 Mechanical

The 5000-gallon, stainless-steel tanker trucks with vacuum pumping capability used to transfer liquids could present potential mechanical hazards. Trucks must have the emergency brake set when not being driven.

5.1.2 Electrical

Electrical hazards associated with transfer activities include the submersible pump and electrical storms.

The following are general guidelines to be followed when working with electrical equipment:

- Inspect and test equipment before use.
- Be familiar with the latest edition of the National Electric Code.
- Always work with a buddy.
- Repair frayed or exposed wiring before use.
- Portable electrical equipment should be doubly insulated or grounded and equipped with a ground fault circuit interrupter.
- Extension cords should be three-wire grounded.
- No 3- to 2-prong electrical adapters will be used.

Table 5.1: Hazard Analysis

Hazard Categories	Hazards
Mechanical	Tanker trucks
Electrical	Submersible pump, generator, electrical storms
Chemical	Hydrazine rinsewater, toxic gases
Temperature	Heat stress
Acoustical	Pumps, generators
Oxygen deficiency in confined spaces	Tanker truck decontamination
Biohazards	Insects, animals, reptiles
Fire/explosion	Generators
Severe weather	Lightning, high winds, tornadoes
Physical	Falls, trips, etc.

- Do not work on electrical equipment if standing water or liquids are near the work area.
- Use electrical lock-out/tag-out procedures if pumping equipment requires servicing.
- Cardiopulmonary resuscitation (CPR) training is suggested.
- Cease work immediately in the event of an electrical storm.

Use of extension cords should be avoided. If there is no other option, the guidelines below should be followed:

- Extension cords will only be used in an emergency and only for temporary use.
- All extension cords must be heavy-duty service type.
- Extension cords must be kept out of water.
- No wire hangers will be used with extension cords.

5.1.3 Chemical

Anticipated chemical hazards associated with transfer activities include hydrazine rinsewater and toxic gases. Analytical results for characterization of the hydrazine rinsewater can be found in Section 2.0 and in Appendix A of this ID. Appendix A of the FSP presents the hazardous property information (HPI) for these compounds and for the compounds used to treat the hydrazine rinsewater during Phase I startup testing. The treatment compounds can be disregarded for the transfer activities.

5.1.4 Temperature

Heat stress is the most likely temperature hazard anticipated for this task. Section 5.3.3 on page 14 of the FSP discusses procedures to minimize the potential of heat stress.

5.1.5 Acoustical

This task will involve noise levels anticipated to be louder than is acceptable for unprotected hearing. Hearing protection will be worn anytime noise prevents normal conversation at a distance of 3 feet.

Sound measurements will be taken with a noise dosimeter, and signs will be posted in areas where levels meet or exceed 85 db(A).

5.1.6 Oxygen Deficiency/Confined Space Hazards

Oxygen deficiency/confined space hazards anticipated for this activity will be limited to tanker truck decontamination. The following guidelines will be followed when entering a tanker for decontamination:

1. Fill out the confined space entry permit and have it signed by the Designated Health and Safety Officer (DHSO), Project Manager, Site Manager, and PMRMA Occupational Safety Manager.

2. Monitor oxygen (O_2) and organic vapors before entering. If the following values are exceeded, do not enter without supplied air:

   - O_2 less than 19.5 percent or greater than 25 percent

   - Total volatile organic detections greater than 5 parts per million (ppm) above background, if all air contaminants have not been identified

   - Concentrations of specific contaminants exceeding threshold limit values (TLVs) provided in Appendix A of the FSP, if all air contaminants are identified

3. Monitor O_2 and organic vapors continuously while inside the confined space. If values cited under Item 2 above are exceeded when supplied air is not in use, evacuate immediately and do not re-enter until values under Item 2 are no longer measured or unless breathing air is supplied. Record instrument readings.

4. At least one person capable of summoning assistance to pull workers from the confined space in an emergency must be on standby outside the confined space. Rescuers must have current first aid and CPR training and wear the appropriate level of protection, Level B PPE.

5. Use portable fans or blowers to introduce fresh air to confined spaces for ventilation whenever Level C PPE is worn.

6. Supplied air must be used when steam-cleaning in a confined space. (A respirator cartridge may become inefficient if saturated.)

7. Work involving the use of flame, arc, spark, or other source of ignition is prohibited within a confined space.

5.1.7 Biohazards

Section 5.3.2 on page 13 of the FSP discusses the need to avoid prairie dogs and the necessity of seeking medical help if plague symptoms occur. Section 5.3.2 also discusses precautions to avoid being bitten by rattlesnakes as well as first aid for a snake-bite victim.

Because the transfer activity will involve outdoor work, insects may become a nuisance. An insect repellant may be applied to minimize insect bites.

5.1.8 Fire/Explosion

A fire extinguisher (rated A, B, C) will be kept in each HLA field vehicle at the site. An additional fire extinguisher will be placed within 15 feet of any generator in use during the transfer activities. The RMA Fire Department must be notified immediately of a fire or explosion of sufficient nature (e.g., a grass fire larger than 3 feet in diameter initiated by contact with the hot generator).

5.1.9 Severe Weather

In the event of an electrical storm, all work will cease and personnel will seek shelter. If the storm develops into a tornado, personnel will seek safety in the nearest building or low-lying area (e.g., ditch).

5.1.10 Physical

While moving around the loading and discharge areas, care should be taken to avoid tripping and possible resultant injury.

5.2 RISK ANALYSIS

Table 5.2 presents the risk analysis for rinsewater transfer. Potential hazards discussed in the previous subsections are listed on this table with the corresponding projected frequency of exposure, probability for injury given exposures, and the degree of injury as a consequence of that exposure.

Table 5.2: Risk Analysis for Rinsewater Transfer
(Page 1 of 2)

Hazard	Exposure[1]	Probability[2]	Consequence[3]
Mechanical			
Tanker trucks	FREQ	IMP	MOD-FATAL
Electrical			
Pumps	CONT	UNU	MIN-SER
Generator	CONT	LIKE	MIN-SER
Electrical storms	OCC	UNU	MOD-FATAL
Chemical			
Hydrazine rinsewater	CONT	LIKE	MIN-SER
Toxic gases	CONT	LIKE	MIN-SER
Temperature			
Heat stress	CONT	LIKE	MIN-FATAL
Acoustical	CONT	UNU	CHRON
Oxygen deficiency in confined spaces	OCC	UNU-LIKE	MIN-FATAL
Biohazards			
Insects	CONT	UNU	MIN-FATAL
Animals	CONT	UNU	MIN-FATAL
Reptiles	CONT	UNU	MIN-FATAL
Fire/Explosion			
Generators	CONT	UNU	MIN-FATAL
Severe weather	OCC	LIKE	MIN-FATAL
Physical	FREQ	LIKE	MIN-FATAL

[1] Exposure: The frequency of exposure to the hazardous event
a. CONT = Continuously - many times daily
b. FREQ = Frequently - once/day or twice/day
c. OCC = Occasionally - once/week to once/month
d. SELD = Seldom - once/month to once/year

[2] Probability: The likelihood that an injury will occur after exposure to the hazardous event
a. CERT = Certain or almost certain
b. LIKE = Likely, not unusual, 50/50 chance of occurring
c. UNU = Unusual, would happen less often than not
d. IMP = Improbable, not likely to happen

Table 5.2: (Page 2 of 2)

[3] Consequence: The degree of injury resulting from exposure to the hazardous event if any injury occurs

a. FATAL = Fatality
b. SER = Serious injury, including chemical exposure requiring hospitalization
c. MOD = Moderate injury, including chemical exposure requiring outpatient medical treatment
d. MIN = Minor injury, including chemical exposure, requiring onsite first-aid
e. CHRON = Chemical, acoustical, or other exposure above threshold limit value (TLV) or other recommended standard that may not produce immediate acute effects (especially chronic toxicants)

5.3 TRAINING

All HLA field personnel will have attended a 40-hour hazardous waste operations health and safety class in accordance with 29 CFR 1910.120(e). All field personnel are required to attend an eight-hour annual refresher course within 30 days of the expiration of the most recent health and safety training. Site managers and site safety officers must also attend the eight-hour hazardous waste operations supervisory class. Training certificates are filed at the HLA-Denver office. Copies will also be kept at the work site.

Before field operations begin, all field personnel are required to read the site safety plan and acknowledge acceptance of the plan by signature. A field safety meeting will be held at job startup and as needed thereafter.

5.4 MEDICAL SURVEILLANCE

HLA has contracted Medical Toxicology Partnership (MTP) to conduct annual physicals for HLA field personnel in accordance with 29 CFR 1910.120(f). Records (originals) are maintained by MTP. HLA receives statements from MTP regarding the fitness of employees for field work. Copies of these statements are maintained in HLA's health and safety files and will also be kept at the work site. Further discussion of the medical surveillance program can be found on page 20, Section 6.2 of the FSP.

5.5 PERSONAL PROTECTIVE EQUIPMENT

Level B PPE will be required for HLA field personnel conducting tanker truck loading and discharge operations. Level B PPE consists of the following:

- Supplied air (cascade or self-contained breathing apparatus [SCBA])
- Saranex coveralls
- Outer and inner gloves
- Steel-toed boots
- Booties
- Hard hat

Any other actions taken during rinsewater transfer may be conducted in Level C PPE but only if the activity does not occur near (within 30 feet) the exposed rinsewater. Level C PPE consists of Level B PPE protection without the supplied air. Safety glasses will be worn when supplied air is not in use.

5.6 AIR MONITORING

During tanker truck loading and discharge activities, a photoionization detector (PID) will be used to detect volatiles in the ambient air. Hydrazine detector tubes will also be used. Personnel will periodically wear personal air monitoring pumps for NDMA and hydrazine fuel compound exposure monitoring.

Calibration of air monitoring equipment will be as directed by the manufacturers' operation and maintenance manuals.

5.7 SITE CONTROL

Both areas of the HBSF are fenced and have locked gates. The gates will be unlocked only while field personnel are preparing for or conducting transfer activities at the site.

Personnel not involved with the Level B PPE operations will maintain a minimum distance of 30 feet from the loading area. This will be the limit of the exclusion zone. The contamination reduction zone (CRZ) will be immediately outside the exclusion zone on the upwind side. The support zone will be located at HLA's office trailer adjacent to the WWTF.

5.8 EMERGENCY PROCEDURES

The following sections outline procedures for handling spills, personnel injuries, and emergency communications.

5.8.1 Spills

Response to spills, spill cleanup, and notification will be handled in accordance with the RMA Contingency Plan (ES, 1990) and the Basin F IRA SOP No. 453.4.

5.8.2 Personnel Injuries

Personnel injuries will be handled in accordance with Section 10.3 of the FSP.

5.8.3 Emergency Communications

A telephone will be located at HLA's office trailer for emergency use. Emergencies will be reported to the DHSO and the HLA Project Manager immediately. HLA field personnel will carry a hand-held walkie-talkie for direct contact with the RMA Fire Department.

Procedures to follow for accident investigation and reporting are presented in Section 9.1 of the FSP.

5.9 SUBCONTRACTORS

Subcontractors are responsible for the training and medical monitoring of their personnel. While working on the rinsewater transfer, subcontractors will follow the directives of HLA's health and safety program.

THIS
PAGE
IS
MISSING
IN
ORIGINAL
DOCUMENT

MMH	monomethyl hydrazine
MRL	method reporting limit
MTP	Medical Toxicity Partnership
NDMA	n-nitrosodimethylamine
NPDES	National Pollutant Discharge Elimination System
OAS	Organizations and State
OSHA	U.S. Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PID	photoionization detector
PMRMA	Program Manager for Rocky Mountain Arsenal
PPE	personal protective equipment
ppm	parts per million
RMA	Rocky Mountain Arsenal
SAPC	Steering and Policy Committee
SOP	standard operating procedures
SQI	Submerged Quench Incinerator
STP	Sewage Treatment Plant at RMA
SVOC	semivolatile organic compound
TLV	threshold limit value
UDMH	unsymmetrical dimethyl hydrazine
USAF	U.S. Air Force
UV	ultraviolet
VOC	volatile organic compound
WWTF	Hydrazine Wastewater Treatment Facility

7.0 REFERENCES

Peer Consultants, 1988, Final Decision Document for the Interim Response Action at the Rocky Mountain Arsenal Hydrazine Blending and Storage Facility, October.

Engineering-Science, Inc., 1990, RMA Contingency Plan, December.

Harding Lawson Associates (HLA), 1989, Final Task Plan, HBSF IRA Implementation, August 30.

Harding Lawson Associates, 1991, Draft Final Treatment Report, HBSF IRA Implementation, January 7.

Roy F. Weston, Incorporated, 1990, Basin F Interim Response Action Operation/Maintenance Manual and Inspection Procedures, January.

Appendix A

RINSEWATER CHARACTERIZATION

Table A1: Chemical Characterization[1] - Rinsewater Stored in Tank US-3
Hydrazine Blending and Storage Facility
January 1990 Sampling Event
(Page 1 of 4)

Analytes	Sampling Depth (from Top of Tank (feet)) 4.5	9.5	14.5
Hydrazine Fuel Compounds / NDMA			
Hydrazine	22,000	60,000	27,000
Monomethyl hydrazine	94,000	90,000	50,000
Unsymmetrical dimethyl hydrazine	69,000	110,000	53,000
n-Nitrosodimethylamine	610	790	500
Volatile Organics			
Acetone	< 440	< 550	50.7
Acrolein	< 400	< 500	< 19.5
Acrylonitrile	< 168	< 210	< 8.43
Benzene	92.0	112	53.0
Bromodichloromethane	< 36.0	< 45.0	< 1.82
Bromoform	< 106	< 133	< 5.25
Bromomethane	< 136	< 170	< 6.81
Carbon disulfide	< 144	< 180	< 7.20
Carbon tetrachloride	< 24.0	< 30.0	< 1.19
Chlorobenzene	< 10.6	< 13.3	41.6
Chloroethane	< 320	< 400	2000
Chloroform	3200	4750	3400
Chloromethane	< 108	< 135	45.3
Dibromochloromethane	< 64.0	< 80.0	< 3.23
Dibromochloropropane	< .130	< .130	< .130
1,2-Dichloroethane	66.0	< 35.0	143
1,1-Dichloroethane	108	190	570
1,1-Dichloroethene	< 240	< 300	13.1
1,2-Dichloropropane	< 26.0	37.5	89.1
Dicyclopentadiene	< 9.31	< 9.31	< 9.31
Dimethyl disulfide	9.65	14.2	4.87
Ethylbenzene	< 22.0	< 27.5	< 1.09
2-Hexanone	< 220	< 275	< 11.2
Methylethyl ketone	< 220	< 275	27.2
Methylene chloride	2800	4000	13,000
Methylisobutyl ketone	< 12.9	< 12.9	< 11.2
o,p-Xylene	< 22.0	< 27.5	1.84
Styrene	< 11.2	< 14.0	< .560
1,1,2,2-Tetrachloroethane	< 166	< 208	< 8.25
Tetrachloroethene	< 20.0	< 25.0	2.60
Toluene	< 26.0	< 32.5	5.09
1,1,1-Trichloroethane	< 17.8	< 22.3	< .890
1,1,2-Trichloroethane	< 74.0	< 92.5	< 3.72
Trichloroethene	< 7.80	< 9.75	5.16
Vinyl acetate	134	< 158	< 6.26
Vinyl chloride	< 110	< 138	78.3
cis-1,3-Dichloropropylene	< 92.0	< 115	< 4.61
trans-1,2-Dichloroethylene	< 66.0	< 82.5	< 3.31
trans-1,3-Dichloropropene	< 38.0	< 47.5	< 1.88

Table A1: (Page 2 of 4)

Analytes	Sampling Depth from Top of Tank (feet) 4.5	9.5	14.5
volatile Organics			
.cenaphthene	< 1.91	< 1.91	< 1.91
.cenaphthylene	< 1.37	< 1.37	< 1.37
.niline	1200	1460	1260
.nthracene	< 1.07	< 1.07	< 1.07
.trasine	33.1	44.0	41.3
ienzidine	< 12.5	< 12.5	< 12.5
ienzo [A] anthracene	< .880	< .880	< .880
ienzo [A] pyrene	< 2.59	< 2.59	< 2.59
ienzo [B] fluoranthene	< 1.90	< 1.90	< 1.90
ienzo [G,H,I] perylene	< 1.05	< 1.05	< 1.05
ienzo [K] fluoranthene	< 2.37	< 2.37	< 2.37
ienzoic acid	< 6.23	< 6.23	< 6.23
ienzothiazole	2.74	2.47	2.74
ienzyl alcohol	< 1.28	< 1.28	< 1.28
-Bromophenylphenyl ether	< .990	< .990	< .990
iutylbenzyl phthalate	< 2.06	< 2.06	< 2.06
-Chloroaniline	< 1.68	< 1.68	< 1.68
-Chloronaphthalene	< 1.27	< 1.27	< 1.27
-Chlorophenol	< 1.12	< 1.12	< 1.12
-Chlorophenylmethyl sulfide	< 1.08	< 1.08	< 1.08
.-Chlorophenylmethyl sulfone	< 2.24	< 2.24	< 2.24
:-Chlorophenylmethyl sulfoxide	< 1.98	< 1.98	< 1.98
:-Chlorophenylphenyl ether	< 1.20	< 1.20	< 1.20
Chrysene	< 1.38	< 1.38	< 1.38
ii-n-Butyl phthalate	< 1.50	< 1.50	< 1.50
ii-n-Octyl phthalate	< 1.01	< 1.01	< 1.01
Dibenz [A,H] anthracene	< .900	< .900	< .900
Dibenzofuran	< 1.03	< 1.03	< 1.03
:,3,7,8-Dibenzo-p-dioxin	< .001	< .001	< .001
.,3-Dichlorobenzene	< 3.18	< 3.18	< 3.18
.,4-Dichlorobenzene	< 3.52	< 3.52	< 3.52
.,2-Dichlorobenzene	< 3.86	< 3.86	< 3.86
3,3'-Dichlorobenzidine	< 1.60	< 1.60	< 1.60
:,4-Dichlorophenol	< 1.42	< 1.42	< 1.42
Diethyl phthalate	< 2.36	< 2.36	< 2.36
Diisopropyl methylphosphonate	< 10.1	< 10.1	< 10.1
Dimethyl phthalate	< 2.62	< 2.62	< 2.62
Dimethylmethyl phosphonate	< 16.3	< 16.3	< 16.3
2,4-Dimethylphenol	< 3.43	< 3.43	< 3.43
4,6-Dinitro-2-cresol	< 2.40	< 2.40	< 2.40
2,4-Dinitrophenol	< 3.04	< 3.04	< 3.04
2,4-Dinitrotoluene	< 1.13	< 1.13	< 1.13
2,6-Dinitrotoluene	< 1.65	< 1.65	< 1.65
1,2-Diphenylhydrazine	< 5.00	< 5.00	< 5.00
Dithiane	< 3.34	< 3.34	< 3.34
Fluoranthene	< 1.62	< 1.62	< 1.62
Fluorene	< 1.54	< 1.54	< 1.54

Table A2: Chemical Characterization[1] - Rinsewater Stored in Tank US-4
Hydrazine Blending and Storage Facility
January 1990 Sampling Event
(Page 1 of 4)

Analytes	Sampling Depth from Top of Tank (feet) 4.5	9.5	15.0
Hydrazine Fuel Compounds / NDMA			
Hydrazine	790,000	1,000,000	1,100,000
Monomethyl hydrazine	140,000	320,000	180,000
Unsymmetrical dimethyl hydrazine	1,100,000	810,000	790,000
n-nitrosodimethylamine	60.0	120	53.0
Volatile Organics			
Acetone	< 22.2	32.0	23.8
Acrolein	< 19.5	< 10.0	< 19.5
Acrylonitrile	< 8.43	< 10.0	< 8.43
Benzene	2.66	< 5.00	2.41
Bromodichloromethane	< 1.82	< 5.00	< 1.82
Bromoform	< 5.25	< 5.00	< 5.25
Bromomethane	< 6.81	< 10.0	< 6.81
Carbon disulfide	< 7.20	< 5.00	< 7.20
Carbon tetrachloride	< 1.19	< 5.00	< 1.19
Chlorobenzene	< .530	< 5.00	< .530
Chloroethane	< 16.2	< 10.0	< 16 [illegible]
Chloroform	96.6	106	102
Chloromethane	25.6	< 10.0	< 5.43
Dibromochloromethane	< 3.23	< 5.00	< 3.23
Dibromochloropropane	< .130	< .130	< .130
1,2-Dichloroethane	1.67	< 5.00	1.66
1,1-Dichloroethane	3.66	< 5.00	3.89
1,1-Dichloroethene	< 12.4	< 5.00	< 12.4
1,2-Dichloropropane	< 1.34	< 5.00	< 1.34
Dicyclopentadiene	< 9.31	< 9.31	< 9.31
Dimethyl disulfide	57.0	53.0	61.0
Ethylbenzene	< 1.09	< 5.00	< 1.09
2-Hexanone	< 11.2	< 10.0	< 11.2
Methylethyl ketone	< 10.9	< 10.0	< 10.9
Methylene chloride	61.0	110	89.6
Methylisobutyl ketone	< 11.2	< 10.0	< 11.2
o,p-Xylene	< 1.10	< 5.00	< 1.10
Styrene	< .560	< 5.00	< .560
1,1,2,2-Tetrachloroethane	< 8.25	< 5.00	< 8.25
Tetrachloroethene	< 1.01	< 5.00	< 1.01
Toluene	< 1.29	< 5.00	< 1.29
1,1,1-Trichloroethane	< .890	< 5.00	< .890
1,1,2-Trichloroethane	< 3.72	< 5.00	< 3.72
Trichloroethene	< .390	< 5.00	< .390
Vinyl acetate	< 6.26	< 10.0	< 6.26
Vinyl chloride	< 5.51	< 10.0	< 5.51
cis-1,3-Dichloropropylene	< 4.61	< 5.00	< 4.61
trans-1,2-Dichloroethylene	< 3.31	< 5.00	< 3.31
trans-1,3-Dichloropropene	< 1.88	< 5.00	< 1.88

Table A2: (Page 2 of 4)

Analytes	Sampling Depth from Top of Tank (feet) 4.5	9.5	15.0
Semivolatile Organics			
Acenaphthene	< 1.91	< .385	< 1.91
Acenaphthylene	< 1.37	< .343	< 1.37
Aniline	1500	N/A	6400
Anthracene	< 1.07	< .634	< 1.07
Atrazine	4.92	4.86	5.50
Benzidine	< 12.5	N/A	< 12.5
Benzo [A] anthracene	< .880	< .302	< .880
Benzo [A] pyrene	< 2.59	< .291	< 2.59
Benzo [B] fluoranthene	< 1.90	< .842	< 1.90
Benzo [G,H,I] perylene	< 1.05	< 1.25	< 1.05
Benzo [K] fluoranthene	< 2.37	< 1.73	< 2.37
Benzoic acid	< 6.23	< 3.32	< 6.23
Benzothiazole	3.25	14.9	2.97
Benzyl alcohol	< 1.28	< .728	< 1.28
4-Bromophenylphenyl ether	< .990	< .603	< .990
Butylbenzyl phthalate	< 2.06	< 2.20	< 2.06
4-Chloroaniline	2.94	< .707	2.88
2-Chloronaphthalene	< 1.27	< .478	< 1.27
2-Chlorophenol	< 1.12	< .281	< 1.12
4-Chlorophenylmethyl sulfide	< 1.08	< 1.08	< 1.08
4-Chlorophenylmethyl sulfone	< 2.24	< 2.24	< 2.24
4-Chlorophenylmethyl sulfoxide	< 1.98	< 1.98	< 1.98
4-Chlorophenylphenyl ether	< 1.20	< .832	< 1.20
Chrysene	< 1.38	< 3.21	< 1.38
di-n-Butyl phthalate	< 1.50	< 1.80	< 1.50
di-n-Octyl phthalate	< 1.01	< 5.13	< 1.01
Dibenz [A,H] anthracene	< .900	< 1.70	< .900
Dibenzofuran	< 1.03	< .354	< 1.03
2,3,7,8-Dibenzo-p-dioxin	< .001	< .001	< .001
1,3-Dichlorobenzene	< 3.18	< .104	< 3.18
1,4-Dichlorobenzene	< 3.52	< .239	< 3.52
1,2-Dichlorobenzene	< 3.86	< .416	< 3.86
3,3'-Dichlorobenzidine	< 1.60	< 4.04	< 1.60
2,4-Dichlorophenol	< 1.42	< .364	< 1.42
Diethyl phthalate	< 2.36	< 1.76	< 2.36
Diisopropyl methylphosphonate	< 10.1	< 10.1	< 10.1
Dimethyl phthalate	< 2.62	< .874	< 2.62
Dimethylmethyl phosphonate	< 16.3	< 16.3	< 16.3
2,4-Dimethylphenol	< 3.43	< .281	< 3.43
4,6-Dinitro-2-cresol	< 2.40	< 3.15	< 2.40
2,4-Dinitrophenol	< 3.04	< 3.55	< 3.04
2,4-Dinitrotoluene	< 1.13	< 1.93	< 1.13
2,6-Dinitrotoluene	< 1.55	< 2.55	< 1.65
1,2-Diphenylhydrazine	< 5.00	N/A	< 5.00
Dithiane	< 3.34	< 3.34	< 3.34
Fluoranthene	< 1.62	< 1.44	< 1.62
Fluorene	< 1.54	< .905	< 1.54

Table A2: (Page 3 of 4)

Analytes	Sampling Depth from Top of Tank (feet) 4.5	9.5	15.0
Hexachlorobenzene	< 1.37	< .707	< 1.37
Hexachlorobutadiene	< 3.54	< .551	< 3.54
Hexachlorocyclopentadiene	< 2.05	< .083	< 2.05
Hexachloroethane	< 4.46	< .291	< 4.46
Indeno [1,2,3-C,D] pyrene	< 1.36	< 1.67	< 1.36
Isophorone	< .910	< .374	< .910
Malathion	< .373	< .373	< .373
3-Methyl-4-chlorophenol	< 1.61	< .988	< 1.61
2-Methylnaphthalene	< 3.16	< .894	< 3.16
2-Methylphenol	< 1.28	< .832	< 1.28
4-Methylphenol	< 3.89	< .884	< 3.89
n-nitrosodiphenylamine	< 1.08	< .551	< 1.08
Naphthalene	< 2.96	< .270	< 2.96
2-Nitroaniline	< 1.07	< 2.38	< 1.07
3-Nitroaniline	< 1.78	< 3.17	< 1.78
4-Nitroaniline	< 2.72	< 3.99	< 2.72
Nitrobenzene	< .940	< 1.14	< .940
2-Nitrophenol	< .720	< 1.86	< .720
4-Nitrophenol	< 2.61	< 3.90	< 2.61
Nitroso di-n-propylamine	< 1.20	< 1.42	< 1.20
1,4-Oxathiane	< 1.35	< 1.35	< 1.35
Parathion	< .647	< .647	< .647
Pentachlorophenol	< 2.20	< 1.89	< 2.20
Phenanthrene	< .960	< .478	< .960
Phenol	< 2.30	< 1.06	< 2.30
Pyrene	< 1.02	< 1.73	< 1.02
Supona	< .787	< .787	< .787
1,2,4-Trichlorobenzene	< 2.97	< .541	< 2.97
2,4,5-Trichlorophenol	< 1.38	< .354	< 1.38
2,4,6-Trichlorophenol	< 1.47	< .957	< 1.47
Vapona	< .384	< .384	< .384
bis(2-Chloroethoxy) methane	< 1.18	< .499	< 1.18
bis(2-Chloroethyl) ether	< 1.01	< .291	< 1.01
bis(2-Chloroisopropyl) ether	< 1.67	< 1.09	< 1.67
bis(2-Ethylhexyl) phthalate	< 1.98	< 3.26	11.0
Pesticides			
Aldrin	< .050	< .155	< .050
Alpha BHC	< .050	< .155	< .050
Alpha endosulfan	< .050	N/A	< .050
Beta BHC	< .050	< .155	< .050
Beta endosulfan	< .100	< .315	< .100
Chlordane	< .500	< 1.55	< .500
DDD	< .100	< .315	< .100
DDE	< .100	< .315	< .100
DDT	< .100	< .315	< .100
Delta BHC	< .050	< .155	< .050
Dieldrin	< .100	< .315	< .100

20003,644.10 - ADD
0708072291

Analytes	Sampling Depth from Top of Tank (feet) 4.5	9.5	15.0
Endrin	< .100	< .315	< .100
Endrin aldehyde	< .500	< 1.55	< .500
Endrin sulfate	< .100	< .315	< .100
Heptachlor	< .050	N/A	< .050
Heptachlor epoxide	< .050	< .155	< .050
Lindane	< .050	N/A	< .050
Methoxychlor	< .500	< 1.55	< .500
PCB 1016	< .500	< 1.55	< .500
PCB 1221	< .500	< 1.55	< .500
PCB 1232	< .500	< 1.55	< .500
PCB 1242	< .500	< 1.55	< .500
PCB 1254	< 1.00	< 3.15	< 1.00
PCB 1260	< 1.00	< 3.15	< 1.00
Toxaphene	< 1.00	< 3.15	< 1.00
Metals			
Arsenic	18.8	16.1	20.4
Cadmium	< .500	< .200	< .500
Chromium	6.62	< 22.4	6.95
Copper	< 1.70	< 10.0	< 1.70
Iron	6330	N/A	12100
Lead	< 5.00	< 2.00	< 5.00
Mercury	.241	.658	.327
Selenium	< 2.50	< 2.00	< 2.50
Silver	< .200	.224	< .200
Zinc	13.4	< 20.0	12.4

[1] concentrations in micrograms per liter (µg/l)

BHC = hexachlorocyclohexane
DDD = 2-(ortho-chlorophenyl)-2-(para-chlorophenyl)-1,1-dichloroethane
DDE = 2-(ortho-chlorophenyl)-2-(para-chlorophenyl)-1,1-dichloroethene
DDT = 2-(ortho-chlorophenyl)-2-(para-chlorophenyl)-1,1,1-trichloroethane
N/A = no analysis available
NDMA = n-nitrosodimethylamine
PCB = polychlorinated biphenyl
< = compound not detected at or above method reporting limit

Table A3: Chemical Characterization[1] - Rinsewater Stored in the In-Ground Concrete Sump
Hydrazine Blending and Storage Facility
January 1990 Sampling Event
(Page 1 of 4)

Analytes	Sampling Depth from Top of Sump (feet) 1.0	4.5	2.0
Hydrazine Fuel Compounds / NDMA			
Hydrazine	2100	850	380
Monomethyl hydrazine	< 2500	< 2500	< 2500
Unsymmetrical dimethyl hydrazine	1600	350	85.0
n-Nitrosodimethylamine	4.40	5.80	1.40
Volatile Organics			
Acetone	< 22.2	< 22.2	< 440
Acrolein	< 19.5	< 19.5	< 400
Acrylonitrile	< 8.43	< 8.43	< 168
Benzene	< .830	< .830	< 16.6
Bromodichloromethane	< 1.82	< 1.82	< 36.0
Bromoform	< 5.25	< 5.25	< 106
Bromomethane	< 6.81	< 6.81	< 136
Carbon disulfide	< 7.20	< 7.20	< 144
Carbon tetrachloride	< 1.19	< 1.19	< 24.0
Chlorobenzene	< .530	< .530	< 10.6
Chloroethane	< 16.2	< 16.2	< 320
Chloroform	< 1.93	< 1.93	< 38.0
Chloromethane	< 5.43	< 5.43	< 108
Dibromochloromethane	< 3.23	< 3.23	< 64.0
Dibromochloropropane	< .130	< .130	< .130
1,2-Dichloroethane	< 1.41	< 1.41	< 28.0
1,1-Dichloroethane	< 1.53	< 1.53	< 30.0
1,1-Dichloroethene	< 12.4	< 12.4	< 240
1,2-Dichloropropane	< 1.34	< 1.34	< 26.0
Dicyclopentadiene	< 9.31	< 9.31	< 9.31
Dimethyl disulfide	< 1.16	< 1.16	< 1.16
Ethylbenzene	< 1.09	< 1.09	< 22.0
2-Hexanone	< 11.2	< 11.2	< 220
Methylethyl ketone	< 10.9	13.3	< 220
Methylene chloride	< 22.2	< 22.2	< 440
Methylisobutyl ketone	< 11.2	< 11.2	< 12.9
o,p-Xylene	< 1.10	< 1.10	< 22.0
Styrene	< .560	< .560	< 11.2
1,1,2,2-Tetrachloroethane	< 8.25	< 8.25	< 166
Tetrachloroethene	< 1.01	< 1.01	< 20.0
Toluene	98.8	115	680
1,1,1-Trichloroethane	< .890	< .890	< 17.8
1,1,2-Trichloroethane	< 3.72	< 3.72	< 74.0
Trichloroethene	< .390	< .390	< 7.80
Vinyl acetate	< 6.26	< 6.26	< 126
Vinyl chloride	< 5.51	< 5.51	< 110
cis-1,3-Dichloropropylene	< 4.61	< 4.61	< 92.0
trans-1,2-Dichloroethylene	< 3.31	< 3.31	< 66.0
trans-1,3-Dichloropropene	< 1.88	< 1.88	< 38.0

Analytes	Sampling Depth from Top of Sump (feet) 1.0	4.5	2.0
Semivolatile organics			
Acenaphthene	< 1.91	< 1.91	< 1.91
Acenaphthylene	< 1.37	< 1.37	< 1.37
Aniline	< 1.60	< 1.60	< 1.60
Anthracene	< 1.07	< 1.07	< 1.07
Atrazine	150	10.5	8.86
Benzidine	< 12.5	< 12.5	< 12.5
Benzo [A] anthracene	< .880	< .880	< .880
Benzo [A] pyrene	< 2.59	< 2.59	< 2.59
Benzo [B] fluoranthene	< 1.90	< 1.90	< 1.90
Benzo [G,H,I] perylene	< 1.05	< 1.05	< 1.05
Benzo [K] fluoranthene	< 2.37	< 2.37	< 2.37
Benzoic acid	< 6.23	< 6.23	< 6.23
Benzothiazole	< 11.4	< 11.4	< 11.4
Benzyl alcohol	< 1.28	< 1.28	< 1.28
4-Bromophenylphenyl ether	< .990	< .990	< .990
Butylbenzyl phthalate	< 2.06	< 2.06	< 2.06
4-Chloroaniline	< 1.68	< 1.68	< 1.68
2-Chloronaphthalene	< 1.27	< 1.27	< 1.27
2-Chlorophenol	< 1.12	< 1.12	< 1.12
4-Chlorophenylmethyl sulfide	< 10.8	< 10.8	< 10.8
4-Chlorophenylmethyl sulfone	< 22.4	< 22.4	< 22.4
4-Chlorophenylmethyl sulfoxide	< 19.8	< 19.8	< 19.8
4-Chlorophenylphenyl ether	< 1.20	< 1.20	< 1.20
Chrysene	< 1.38	< 1.38	< 1.38
di-n-butyl phthalate	< 1.50	< 1.50	< 1.50
di-n-octyl phthalate	< 1.01	< 1.01	< 1.01
Dibenz [A,H] anthracene	< .900	< .900	< .900
Dibenzofuran	< 1.03	< 1.03	< 1.03
2,3,7,8-Dibenzo-p-dioxin	< .001	< .001	< .001
1,3-Dichlorobenzene	< 3.18	< 3.18	< 3.18
1,4-Dichlorobenzene	< 3.52	< 3.52	< 3.52
1,2-Dichlorobenzene	< 3.86	< 3.86	< 3.86
3,3'-Dichlorobenzidine	< 1.60	< 1.60	< 1.60
2,4-Dichlorophenol	< 1.42	< 1.42	< 1.42
Diethyl phthalate	< 2.36	< 2.36	< 2.36
Diisopropyl methylphosphonate	< 10.1	< 10.1	< 10.1
Dimethyl phthalate	< 2.62	< 2.62	< 2.62
Dimethylmethyl phosphonate	< 16.3	< 16.3	< 16.3
2,4-Dimethylphenol	< 3.43	< 3.43	< 3.43
4,6-Dinitro-2-cresol	< 2.40	< 2.40	< 2.40
2,4-Dinitrophenol	< 3.04	< 3.04	< 3.04
2,4-Dinitrotoluene	< 1.13	< 1.13	< 1.13
2,6-Dinitrotoluene	< 1.65	< 1.65	< 1.65
1,2-Diphenylhydrazine	< 5.00	< 5.00	< 5.00
Dithiane	< 33.4	< 33.4	< 33.4
Fluoranthene	< 1.62	< 1.62	< 1.62
Fluorene	< 1.54	< 1.54	< 1.54

Table A3: (Page 3 of 4)

Analytes	Sampling Depth from Top of Sump (feet)		
	1.0	4.5	2.0
Hexachlorobenzene	< 1.37	< 1.37	< 1.37
Hexachlorobutadiene	< 3.54	< 3.54	< 3.54
Hexachlorocyclopentadiene	< 2.05	< 2.05	< 2.05
Hexachloroethane	< 4.46	< 4.46	< 4.46
Indeno [1,2,3-C,D] pyrene	< 1.36	< 1.36	< 1.36
Isophorone	< .910	< .910	< .910
Malathion	< .373	.574	< .373
3-Methyl-4-chlorophenol	< 1.61	< 1.61	< 1.61
2-Methylnaphthalene	< 3.16	< 3.16	< 3.16
2-Methylphenol	< 1.28	< 1.28	< 1.28
4-Methylphenol	105	45.5	320
n-nitrosodiphenylamine	< 1.08	< 1.08	< 1.08
Naphthalene	< 2.96	< 2.96	< 2.96
2-Nitroaniline	< 1.07	< 1.07	< 1.07
3-Nitroaniline	< 1.78	< 1.78	< 1.78
4-Nitroaniline	< 2.72	< 2.72	< 2.72
Nitrobenzene	< .940	< .940	< .940
2-Nitrophenol	< .720	< .720	< .720
4-Nitrophenol	< 2.61	< 2.61	< 2.61
Nitroso di-n-propylamine	< 1.20	< 1.20	< 1.20
1,4-Oxathiane	< 13.5	< 13.5	< 13.5
Parathion	< .647	< .647	< .647
Pentachlorophenol	< 2.20	< 2.20	< 2.20
Phenanthrene	< .960	< .960	< .960
Phenol	4.12	< 2.30	< 2.30
Pyrene	< 1.02	< 1.02	< 1.02
Supona	< .787	< .787	< .787
1,2,4-Trichlorobenzene	< 2.97	< 2.97	< 2.97
2,4,5-Trichlorophenol	< 1.38	< 1.38	< 1.38
2,4,6-Trichlorophenol	< 1.47	< 1.47	< 1.47
Vapona	< .384	< .384	< .384
bis(2-Chloroethoxy) methane	< 1.18	< 1.18	< 1.18
bis(2-Chloroethyl) ether	< 1.01	< 1.01	< 1.01
bis(2-Chloroisopropyl) ether	< 1.67	< 1.67	< 1.67
bis(2-Ethylhexyl) phthalate	< 1.98	< 1.98	2.14
Pesticides			
Aldrin	< .500	< .500	< .500
Alpha BHC	< .500	< .500	< .500
Alpha endosulfan	< .500	< .500	< .500
Beta BHC	< .500	< .500	< .500
Beta endosulfan	< .100	< .100	< .100
Chlordane	< 5.00	< 5.00	< 5.00
DDD	< .100	< .100	< .100
DDE	< 1.00	< 1.00	< 1.00
DDT	< .100	< .100	< .100
Delta BHC	< .500	< .500	< .500
Dieldrin	< 1.00	< 1.00	< 1.00

Analytes	Sampling Depth from Top of Sump (feet) 1.0	4.5	2.0
Endrin	< .100	< .100	< .100
Endrin aldehyde	< .500	< .500	< .500
Endrin sulfate	< .100	< .100	< .100
Heptachlor	< .500	< .500	< .500
Heptachlor epoxide	< .500	< .500	< .500
Lindane	< .500	< .500	< .500
Methoxychlor	< .500	< .500	< .500
PCB 1016	< 5.00	< 5.00	< 5.00
PCB 1221	< 5.00	< 5.00	< 5.00
PCB 1232	< 5.00	< 5.00	< 5.00
PCB 1242	< 5.00	< 5.00	< 5.00
PCB 1254	< 10.0	< 10.0	< 10.0
PCB 1260	< 1.00	< 1.00	< 1.00
Toxaphene	< 1.00	< 1.00	< 1.00
Metals			
Arsenic	230	245	288
Cadmium	.840	.601	1.88
Chromium	7.45	7.77	10.7
Copper	< 1.70	< 1.70	< 1.70
Iron	974	700	1080
Lead	< 5.00	< 5.00	< 5.00
Mercury	< .200	< .200	< .200
Selenium	< 2.50	< 2.50	< 2.50
Silver	< .200	< .200	< .200
Zinc	42.3	24.6	55.4

[1] concentrations in micrograms per liter (μg/l)

BHC = hexachlorocyclohexane
DDD = 2-(ortho-chlorophenyl)-2-(para-chlorophenyl)-1,1-dichloroethane
DDE = 2-(ortho-chlorophenyl)-2-(para-chlorophenyl)-1,1-dichloroethene
DDT = 2-(ortho-chlorophenyl)-2-(para-chlorophenyl)-1,1,1-trichloroethane
NDMA = n-nitrosodimethylamine
PCB = polychlorinated biphenyl
< = compound not detected at or above method reporting limit

20003.644.10 - ADD
0708072391

Appendix B

BASIN F IRA STANDARD OPERATING PROCEDURE NO. 453.4

ROCKY MOUNTAIN ARSENAL
BASIN F INTERIM RESPONSE ACTION
STANDARD OPERATING PROCEDURES

TITLE:	Waste Pile Maintenance: Transfer of Liquids to Pond A	**SOP NO.:**	453.4
		REVISION:	1.2
DATE:	January 25, 1990		
PROJECT MGR.:	WPL	**AUTHOR:**	CPW
TASK MGR.:	MEW	**PMRMA REVIEW:**	

PURPOSE: To establish standard procedures for transferring liquid to Pond A.

RELATED SOPS:
412 Ponds A and B Health and Safety Plan
452.3 Ponds A and B Maintenance: Sump Pumping
453.3 Waste Pile Maintenance: Sump Pumping

FREQUENCY OF PROCEDURE: As Necessary

PERSONNEL REQUIREMENTS: A minimum of two people who are familiar with this SOP, the Site Health and Safety Plan, and the tasks to be performed.

HEALTH AND SAFETY: As per SOP 413; Modified Level D (Tyvek, boot covers, rubber gloves) for routine maintenance activities; Level C if air monitoring indicates the necessity. Decontamination procedure will be to dispose of personnel protective clothing in a trash bag after completing the inspection.

FIELD EQUIPMENT REQUIRED:
Two-way radio
Plastic sheet
Rags
Measuring rod
Basin F Pond A/B Operating Record

PROCEDURE:

1. Drive tanker to the Pond A truck unloading area.
2. Place the free end of the drain hose as far into the truck unloading pipe as it will go and secure it with rope attached to unloading pipe.
3. Open the truck drain valve and allow fluid to gravity flow into Pond A.
4. After tank is empty, close drain valve and rinse inside of drain hose with clean water using hose connection at the drain valve.
5. Pull drain hose from Pond A unloading pipe and rinse hose with clean water as it is pulled from the pipe. Allow rinse water to flow into Pond A through the unloading pipe.
6. Wipe drips from drain hose with rag.
7. Make entry into Pond A operating log indicating the date, time, volume of liquid transferred, source of liquid, and operator's name.
8. Secure gates upon leaving unloading area.

RESPONSE TO PROBLEMS:

Major leak, spill, or other emergency:

1. Call FTM on radio and describe situation. The FTM shall initiate the Contingency Plan.
2. For fire, the FTM will call Arsenal Fire Department at 289-0223.
3. For medical emergency, the FTM will call Arsenal ambulance at 289-0223.
4. To report a security violation, the FTM will contact the Security Desk at 289-0369 or the Security Chief at 289-0367.

Minor leak or spill:

1. Call FTM on radio and describe situation.
2. If in Level D, leave area and put on Level C gear.
3. Provide containment for leaking material using plastic sheeting, plastic bags, buckets, or other materials on hand.
4. Collect any related material and contaminated soil in a bag, bucket, or drum, using care not to damage the liner beneath the topsoil. Refer to SOP 490.
5. Contact the FTM so that he can arrange for proper storage of any collected material.
6. After responding to the incident, complete inspection form noting responses taken.

BASIN F
OPERATING RECORD

DATE	TIME	INITIALS	LIQUID SOURCE	AMOUNT TRANSFERRED (GAL)	NEW POND A LIQUID LEVEL	COMMENTS