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Explanation of Significant Differences:

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ADAMS COUNTY, CO
09/24/2004

EXPLANATION OF SIGNIFICANT DIFFERENCES FOR NORTH PLANTS STRUCTURE DEMOLITION AND REMOVAL PROJECT

ROCKY MOUNTAIN ARSENAL FEDERAL FACILITY SITE

Prepared by:
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Prepared for:
Rocky Mountain Arsenal Committee
Department of the Army
Shell Oil Company
U.S. Fish and Wildlife Service
U.S. Environmental Protection Agency
Colorado Department of Public Health and Environment

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DAIM-BD-A-RM-RE 29 September 2004

MEMORANDUM FOR U.S. Environmental Protection Agency, (Mr. Greg Hargreaves), Region VIII, Mail Code 8HWM-FF, 999-18th Street, Suite 300, Denver, Colorado 80202-2405

SUBJECT: Final Explanation of Significant Differences (ESD) for the North Plants Structure Demolition and Removal Project at the Rocky Mountain Arsenal (RMA) Federal Facility Site

1. Enclosed for your records is the Final ESD for the North Plants Structure Demolition and Removal Project at the RMA Federal Facility Site.

2. The point of contact for this issue is Mr. Jim Green at 303-289-0412.

Encl

Bruce M Huenefeld
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ACRONYMS AND ABBREVIATIONS

bcy	bank cubic yard(s)
bgs	below ground surface
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
EPA	U. S. Environmental Protection Agency
ESD	Explanation of Significant Differences
GB	Sarin, nerve agent
HHE	Human Health Exceedance
HWL	Hazardous Waste Landfill
JARDF	Joint Administrative Record Document Facility
NCP	National Contingency Plan
NPL	National Priorities List
NPSA	North Plants Study Area
OU	Operable Unit
RAB	Restoration Advisory Board
RDIS	Remediation Design and Implementation Schedule
RI	Remedial Investigation
RMA	Rocky Mountain Arsenal
ROD	Record of Decision
SAR	Study Area Report
SEC	Site Evaluation Criteria
SQCSR	Soil Quantity Calculation Summary Report
TCHD	Tri-County Health Department
VX	Nerve Agent

1.0 INTRODUCTION

This Explanation of Significant Differences (ESD) documents a significant change in the soil remediation portion of the remedy for the North Plants Structure Demolition and Removal Project at the Rocky Mountain Arsenal (RMA) Federal Facility Site. The RMA On-Post Operable Unit (OU) is a federally owned facility located in southern Adams County, Colorado, approximately 10 miles northeast of downtown Denver, directly north of the former Stapleton International Airport and west of Denver International Airport (Figure 1). The RMA On-Post OU site encompasses 17.2 square miles and is currently on the U.S. Environmental Protection Agency (EPA) National Priorities List (NPL) for environmental cleanup as a result of contamination released during previous RMA operations. The North Plants project area is located in the north central part of the On-Post OU.

The Record of Decision (ROD), which describes the remedy for the entire On-Post OU of RMA, was signed by the U.S. Army, the EPA, and the Colorado Department of Public Health and Environment (CDPHE) on June 11, 1996 (FWENC 1996a). The selected remedy includes 31 cleanup projects for soil, structures, and treatment of groundwater contamination (PMRMA 2004a). As the site-wide remediation is completed, most of the On-Post OU of RMA will become a National Wildlife Refuge, as provided in Public Law #102-402.

The Army is the lead agency for RMA and is issuing this ESD as part of its responsibilities under Section 117 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendment and Reauthorization Act of 1986, and pursuant to the National Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Section 300.435(c)(2)(i). Regulatory oversight is conducted by the EPA, CDPHE, and the Tri-County Health Department (TCHD). The TCHD oversees local public health and environmental issues in Adams, Arapahoe, and Douglas Counties.

During design for the North Plants remedy, new information obtained during detailed document review and developed during additional field design investigation and implementation have resulted in significant changes to the remediation volumes and soil remediation cost. Changes to remediation boundaries and depths based on the extent of human health exceedance (HHE) areas resulted in a 277 percent increase in the HHE volume. For biota risk soil, the remedy was changed to include excavation and consolidation to Basin A. In addition, the biota risk soil remediation area decreased significantly resulting in a 58 percent decrease in the remediation volume. Together, these changes resulted in a cost increase of approximately 73 percent greater than the ROD estimate. These changes, while necessitating an ESD, do not alter the overall hazardous waste management remedy that was selected in the ROD.

The Army published a public notice in the Rocky Mountain News and Denver Post on August 20, 2004, making the Draft North Plants Structure Demolition and Removal Project ESD available for public review and comment. A presentation explaining the proposed changes contained in the ESD was provided to the RMA Restoration Advisory Board (RAB) on August 26, 2004. The RAB is a community group that meets monthly to receive information and provide input on the cleanup being conducted at the RMA. The public comment period closed on

September 20, 2004. Comments received were reviewed by the Army and responses were provided to the commenters under separate letter (PMRMA 2004b). No changes were required to the ESD based on the comments collected. The requirements set out in the National Contingency Plan, Section 300.435(c)(2)(ii), have been met.

This ESD will become part of the Administrative Record as required by the NCP, 40 CFR 300.825(a)(2). The Administrative Record is available to the public at the Joint Administrative Record Document Facility (JARDF) on the RMA in Building 129, Room 2024. The JARDF is open Monday through Friday between Noon and 4 pm or by appointment. The telephone number for the JARDF is 303-289-0136 or 1-800-862-0754.

2.0 SITE HISTORY, CONTAMINATION AND SELECTED REMEDY

2.1 RMA Operational History

The RMA was established in 1942 by the Army to manufacture chemical warfare agents and agent-filled munitions and to produce incendiary munitions for use in World War II. Following the war and through the early 1980s, the facilities continued to be used by the Army. Beginning in 1946, some facilities were leased to private companies to manufacture industrial and agricultural chemicals. Shell Oil Company, the principal lessee, manufactured pesticides from 1952 to 1982 at the site. Common industrial and waste disposal practices during those years resulted in contamination of structures, soil, surface water, and groundwater.

The On-Post OU is one of two operable units at RMA. The Off-Post OU addresses contamination north and northwest of RMA. The On-Post OU addresses contamination within the approximately 27 square miles of RMA. As of January 2004, 9.4 square miles of the On-Post OU have been determined to meet cleanup requirements and are no longer part of the NPL site. Implementation of the remedy for the remaining 17.2 square miles is ongoing and is scheduled for completion in 2011.

The contaminated areas within the On-Post OU included approximately 3,000 acres of soil, 15 groundwater plumes, and 798 structures. The most highly contaminated areas were identified in South Plants (the central processing area, Hex Pit, Buried M-1 Pits, and the chemical sewers), Basins A and F, the Lime Basins, and the Complex (Army) and Shell Trenches. The primary contaminants found in soil and groundwater in these areas are organochlorine pesticides, solvents, metals, and chemical warfare agent byproducts.

The areas with the highest levels and/or the greatest variety of contaminants are located in the central manufacturing, transport, and waste disposal areas. The highest contaminant concentrations tend to occur in soil within five feet of the ground surface, although exceptions are noted, particularly where burial trenches, disposal basins, or manufacturing complexes were located.

The characteristics and locations of the groundwater plumes suggest that the greatest contaminant releases to the groundwater have occurred from Basin A and the Lime Basins, the South Plants chemical sewer, the South Plants tank farm and production area, the Complex

(Army) and Shell trenches in Section 36, and the former Basin F. The Motor Pool/Rail Yard and North Plants areas have been other sources of contaminant releases to the groundwater.

2.2 North Plants History and Contamination Summary

The North Plants was designed and constructed by the Army from 1950 to 1953 as a chemical nerve agent manufacturing facility to produce sarin (GB), Isopropyl Methylphosphonofluoridate. The North Plants complex covers approximately 90 acres located within the central part of Section 25 in T2S, R67W. Production of GB began in April 1953 and continued intermittently until 1957. The Army redistilled low purity GB intermittently from 1964 to 1970 (Ebasco 1988a). The facilities were also used by the Army to containerize, transfer, store, and demilitarize/neutralize chemicals and munitions.

The North Plants manufacturing facility included a network of chemical sewers consisting of three major parts: a cast iron collection network, the Building 1727 sump, and trunk lines from the sump to the disposal basins. The collection network was constructed as part of the original complex and connected various manufacturing facilities to the Building 1727 sump. Caustic solution and water were added to the liquid waste collected in the sump to neutralize potential chemical agent contamination. Two pressurized discharge lines transported waste from the Building 1727 sump to the disposal basins. Initially, a 6-inch cast iron pipe conveyed the waste to Basin A for disposal. Sometime prior to 1961, a 12-inch steel line was added to transport the waste to the chemical sewer interceptor line running between South Plants and Basin F (Ebasco 1988b).

The Remedial Investigation (RI) of the North Plants area was conducted in 1988 and included soil sampling in the areas surrounding the buildings (Ebasco 1988a). Samples were located around the buildings to target investigation of potential spill areas and drainage ditches. Soil samples collected from the surface soil and drainage areas around Building 1611 (North Plants Study Area [NPSA]-5) contained concentrations of arsenic in excess of the HHE site evaluation criteria (SEC). Building 1611 was used in 1983 and 1984 for demilitarization of adamsite, an arsenic-containing chemical agent. Soil samples collected from the drainage areas around Building 1703 (NPSA-6) contained concentrations of arsenic and dieldrin in excess of the HHE SEC. Building 1703 was used as an ammunition demilitarization facility and was suspected to be contaminated with arsenic (Ebasco 1988a). Soil samples collected around Building 1501 (NPSA-3) did not exceed the HHE SEC; however, concentrations of dieldrin in surface soils were sufficient to result in delineation of a biota risk area. Dieldrin is a prevalent contaminant in surface soils at RMA, generally attributable to windblown contaminants from other source areas.

Sampling was not conducted along the cast iron pipe chemical sewer lines in the North Plants complex or the steel trunk lines downstream of the Building 1727 sump. However, soil samples collected in Section 36 and in South Plants along vitrified clay pipe sewer segments were used to provide a worst case estimate of contaminated soil associated with the North Plants chemical sewers (Ebasco 1988b). Based on sampling results from the South Plants chemical sewer RI, a contaminated soil corridor was defined for the chemical sewers in North Plants.

A summary of the information collected during the Remedial Investigation/Feasibility Study process can be found in the North Plants Contamination Summary Reports (Ebasco 1988a, 1988b) the RI Summary Report (Ebasco 1992) and in the Detailed Analysis of Alternatives Report (FWENC 1995). Risk-based analysis of sample data collected during the RI resulted in designation of HHE soil and biota risk soil in the North Plants project area.

2.3 Summary of the Selected On-Post Remedy

The overall remedy required by the 1996 ROD for the On-Post OU includes the following:

- Interception and treatment of contaminated groundwater at the three existing on-site treatment plants
- Construction of a new Resource Conservation and Recovery Act- and Toxic Substances Control Act-compliant hazardous waste landfill (HWL) on post
- Demolition of structures with no designated future use and disposal of the debris in either the new, on-post HWL or the Basin A consolidation area, depending upon the degree of contamination
- The contaminated soil at RMA is addressed primarily through containment in the on-post HWL or under caps/covers, or through treatment depending upon the type and degree of contamination. Areas that have caps or covers require long-term maintenance and will be retained by the Army. These areas will not become part of the future wildlife refuge.
- The Basin A disposal area is used for consolidation of biota risk soil and structural debris from other RMA contamination areas and is covered with a soil cover, including a biota barrier.

2.4 Summary of the Selected Remedy for North Plants Soil

The North Plants soil remediation includes six areas from three ROD medium groups/subgroups. The contamination areas consist of chemical sewers, surface drainage areas and surface soils surrounding North Plants structures where contamination was present. These areas were grouped for implementation under the North Plants soil remediation since they are all present in the North Plants area. A site plan showing the North Plants soil remediation areas is included as Figure 2. The following ROD-identified areas are included in the North Plants soil remedy:

North Plants Medium Subgroup

NPSA-3, GB Manufacturing Area

NPSA-5, Special Weapons Plant

NPSA-6, Underground Spill Area

Chemical Sewers Medium Subgroup, NPSA-1

Ditches/Drainage Areas Medium Group

NPSA-8c, Surface Drainage

NPSA-9f, Isolated Arsenic Detection

The ROD identifies the following major remedial actions for North Plants soil:

- Excavate chemical sewers and associated HHE soil and dispose in the on-post HWL (NPSA-1).
- Excavate North Plants surface HHE soil and dispose in the on-post HWL (NPSA-5 and NPSA-6).
- Monitor for chemical agent during excavation and treat agent-contaminated soil by caustic solution washing.
- Backfill HHE soil excavations with clean soil.
- Construct a 2-foot-thick soil cover over soil posing a potential risk to biota (NPSA-3, NPSA-5 and NPSA-6) and the footprint of the North Plants processing area.
- Excavate potential biota risk soil that is located outside the 2-foot-thick soil cover and consolidate to Basin A for containment under soil cover (NPSA-8c and NPSA-9f).
- Revegetate all disturbed areas.

2.5 North Plants Remedy Implementation

The ROD remedy for North Plants includes the above mentioned soil remediation as well as structures demolition. In the Remediation Design and Implementation Schedule (RDIS), elements of the North Plants remediation were divided into the North Plants Structure Demolition and Removal Project and the North Plants Soil Remediation Project. Because the chemical sewers and other soil areas would be disturbed during building demolition, the excavation of HHE and biota risk soil in North Plants was implemented under the North Plants Structure Demolition and Removal Project (PMRMA 2004a). The combination of structures demolition and soil removal scope within the demolition project allowed an integrated design and implementation approach, resulting in overall program schedule savings. The remaining scope of the North Plants soil remediation (i.e., soil cover) will be addressed under the North Plants Soil Remediation Project design.

3.0 BASIS FOR THE ESD

3.1 Basis for HHE Soil Volume Modifications

Surface Contamination Areas

The ROD and Soil Quantity Calculation Summary Report (SQCSR)(FWENC 1996b) identify three surface soil areas as HHE soil based on concentrations of arsenic above the human health SEC. These areas are present in surface drainage ditches adjacent to North Plants structures in Study Area Report (SAR) sites NPSA-5 and NPSA-6. Remediation volumes were estimated by multiplying the ditch width and length by an excavation depth of 2 feet. These volume calculations are documented in the SQCSR (FWENC 1996b). During design, a data review detected two additional soil samples not evaluated in the SQCSR that exceeded the human health SEC. As a result, two remediation areas were added to the project, one in NPSA-5 and one in NPSA-6 (FWENC 2001).

In addition, actual excavation depths completed during implementation exceeded the minimum required remediation depth. This overexcavation ensured that the minimum depth was achieved and minimized the possibility of having to return to the area for additional excavation.

Chemical Sewers

The ROD identifies chemical sewers associated with North Plants both downstream and upstream from the North Plants neutralization sump, Building 1727. The ROD estimated soil volume for chemical sewers using the estimated linear feet, depth of pipe and width of contaminated soil along the pipe as presented in the RI. The area was calculated using the length and width provided. The remediation volume was then calculated using a contaminated soil thickness of 2 feet below the pipe or a depth of 10 feet below ground surface (bgs), whichever was deeper. These calculations are documented in the SQCSR (FWENC 1996b).

Chemical Sewer Downstream of 1727 Sump

To address the portion of the chemical sewer downstream of the Building 1727 sump, the ROD used an assumed pipe depth of 8 feet bgs. The HHE volume was calculated from the bottom of the pipe to the required depth. Potholing completed during design provided additional information related to sewer pipe depth indicating that the actual average depth was 5 feet bgs. Because the remediation requirement for chemical sewer HHE is excavation to 10 feet, or 2 feet below the pipe, whichever is deeper, the shallower pipe depth resulted in less overburden and a thicker HHE soil interval of 5 feet, rather than the ROD-estimated 2 feet, in order to meet the 10-foot minimum depth requirement. This resulted in an increase in design HHE soil volume for this segment of sewer 2.5 times the ROD volume.

Actual field conditions varied from the ROD and design estimates and contributed to volume increases as follows:

- Actual pipe depths encountered during excavation were typically shallower than 5 feet. The impact of the shallower sewer pipe depth on HHE volume is shown on Figure 3.
- The ROD volume did not include the soil interval between the top and bottom of the pipe. Actual sewer excavation was completed from the top of the pipe to ensure that all contaminated soil was removed. The impact of this change is also shown on Figure 3.
- The actual length of sewer pipe was 120 feet longer than the estimate provided in the RI, a 6 percent increase.
- Actual excavation depths completed during implementation exceeded the minimum required remediation depth. This overexcavation ensured that the minimum depth was achieved and minimized the possibility of having to return to the area for additional excavation.

Chemical Sewer Upstream of 1727 Sump

For the portion of the chemical sewer upstream of the Building 1727 sump, the ROD used an assumed pipe depth of 9.3 feet bgs and the minimum 2-foot-thick excavation requirement. Potholing was not completed during design to refine the sewer pipe depths upstream of the

Building 1727 sump due to health and safety concerns. Actual field conditions varied from the ROD and design estimates and contributed to volume increases as follows:

- Actual pipe depths encountered during implementation were often less than the assumed ROD depth, resulting in a thicker HHE soil interval and increased HHE soil volume (see Figure 3). Some segments of sewer were as shallow as 2 feet, resulting in a fourfold increase. In cases where the pipe was deeper than the assumed ROD depth, the minimum 2 feet below the pipe excavation requirement still applied.
- Excavation between the top and bottom of the pipe increased the actual HHE volume.
- Actual excavation widths completed during implementation exceeded the ROD requirements. This was primarily a result of side sloping for excavation slope stability and difficulties in restricting the excavation to the required width due to tight work spaces and sewer turns and intersections.
- Finally, as mentioned above, overexcavation was performed to ensure that the minimum required depth was achieved and to minimize the possibility of having to return to the area for additional excavation.

3.2 Basis for Biota Risk Soil Remedy and Volume Modifications

The ROD includes two distinct remedies for biota risk soil in North Plants. For ditches/drainage areas (NPSA-8c and NPSA-9f) the ROD-identified remedy is excavation with consolidation to Basin A. There were no changes to the remedy for these two areas. For surface soil areas around the North Plants structures (NPSA-3, NPSA-5, and NPSA-6), the ROD-identified remedy is containment in place beneath a 2-foot-thick soil cover. During design, evaluation of the project activities indicated that demolition of structures and foundations could not be accomplished without disturbing virtually all the biota risk soil. Therefore, the remedy for these surface areas was modified to include excavation of biota risk soil with consolidation under the Basin A cover. This change was incorporated to take advantage of implementation efficiency and to prevent cross contamination between soil and structures debris during the structures demolition and foundation removal. In addition, the possibility of eliminating the soil cover and resulting long-term maintenance requirements was discussed for North Plants. Although the final decision concerning the soil cover was not made at the structures demolition design stage, the biota risk soil that existed within the soil cover footprint was excavated to support the possibility of eliminating the soil cover at a future time. Deletion of the soil cover, if accomplished, will be documented in a separate ESD.

Although the ROD-identified remedy for the biota risk soil did not include excavation, the SQCSR did provide calculations of biota risk soil volumes for SAR sites NPSA-3, NPSA-5 and NPSA-6. Biota risk soil volumes were calculated by determining the area of each SAR site and multiplying by 1 foot depth. The entire SAR site area was considered biota soil without consideration for buildings or other nonsoil features (e.g., paved areas such as parking lots) present within the area. During design, the biota risk soil volume was corrected by eliminating the area below building footprints and impervious surfaces (i.e., asphalt and concrete areas) that were in place before manufacturing operations commenced in North Plants (FWENC 2001). These features provided a sufficient barrier to surficial soil contamination from North Plants

operations as well as a barrier to potential windblown contamination from the enhanced evaporation efforts in 1973 at Basin F, located to the west of North Plants.

Design biota risk soil areas were determined by review of aerial photographs to identify structures and other pavement areas for elimination from soil area. The design review resulted in a 41 percent reduction in biota risk soil volume. Although this provided an estimate of the total soil area, the actual biota soil area encountered during implementation was even smaller due to paved surfaces not identified from the aerial photograph review. The resulting actual biota risk soil volume removed was 58 percent less than the ROD volume. Although the paved surfaces were eliminated from the biota risk soil volume, pavement and concrete from these areas was removed and disposed with structures demolition debris.

4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES

The following sections summarize the changes to the ROD-identified remedy and remediation volumes for the North Plants for both human health soil and biota risk soil. The changes in remedy and remediation volumes described do not alter the hazardous waste management remedy selected in the ROD and the remedy remains protective of human health and the environment.

4.1 Changes to the HHE Soil Remediation Volumes

The primary change for human health remediation volume is caused by changes to the excavation depth and width of the chemical sewer trenches. These changes were based on the difference in the actual depth of the pipe compared to what was expected and overexcavation of depth and width requirements during implementation. These changes increased the HHE volume from 11,220 bank cubic yards (bcy) to 42,307 bcy.

In addition, two surface remediation areas were added to the North Plants soil during design data review. Volume excavated from the surface HHE areas increased from 222 bcy to 803 bcy, bringing the total North Plants HHE soil volume to 43,110 bcy. Table 1 summarizes the changes in the human health soil volumes. Overall, the human health soil remediation volume increased from the ROD-identified volume by 62 percent during design and 277 percent during implementation.

4.2 Changes to Biota Risk Soil Remedy and Remediation Volumes

For biota risk soil areas in North Plants, the ROD remedy is containment in place beneath a 2-foot-thick soil cover. During design, the remedy was modified to excavation with consolidation under the Basin A cover. This change was incorporated to take advantage of implementation efficiency and to prevent cross contamination between soil and structures debris during the structures demolition and foundation removal.

The biota risk soil remediation volume was modified during design and implementation to eliminate structures footprints and other asphalt and concrete areas from the excavation boundaries. These changes decreased the total biota risk soil volume from 17,140 bcy to 7,234 bcy. Table 2 summarizes the changes in the biota risk soil volumes. Overall, the biota risk soil remediation volume decreased from the ROD-identified volume by approximately 58 percent.

Table 1: Changes to Human Health Soil Remediation Volumes

ROD-Prescribed Remedy	Modification	Human Health Soil Volume (bcy)			
		Area	ROD[1]	Design[2]	Actual[3]
Excavate ROD HHE volume and dispose in on-post HWL.	**Increase: Volume Changes from Adjustments to Excavation Depths and Overexcavation**. Chemical sewer depths were shallower than previously identified, resulting in additional HHE soil excavation to achieve the minimum 10-foot depth requirement. Other increases resulted from overexcavation of required widths and depths due to excavation methods.	NPSA-1 NPSA-5 NPSA-6	11,220 170 52	18,018 473 98	42,307 598 205
Total HHE Soil Volume			**11,442**	**18,589**	**43,110**
Percent Change from ROD				**+ 62 %**	**+ 277 %**

[1]Volume calculations are presented in the Soil Quantity Calculation Summary Report (FWENC 1996b).
[2]Volume calculations are presented in the North Plants Structure Demolition and Removal 100 percent design (FWENC 2001).
[3]Volume calculations are based on pre- and postexcavation surveys.

Table 2: Changes to Biota Risk Soil Remediation Volumes

ROD-Prescribed Remedy	Modification	Human Health Soil Volume (bcy)			
		Area	ROD[1]	Design[2]	Actual[3]
Construct 2-ft-thick soil cover over biota risk soil area.	**Enhancement: Eliminate containment in place.** Excavate ROD biota risk soil volume and consolidate to Basin A. **Reduction: Volume decrease due to change in actual biota risk area.** Eliminate excavation for structures footprints and other asphalt or concrete areas.	NPSA-3 NPSA-5 NPSA-6	6,056 5,454 4,994	4,137 3,036 2,096	2,373 2,517 1,056
Excavate biota risk soil volume and consolidate to Basin A.	**No Change.** ROD-identified biota risk soil volume excavated and consolidated to Basin A. Volume increase due to overexcavation.	NPSA-8c NPSA-9f	352 284	614 284	889 399
Total Biota Risk Soil Volume			**17,140**	**10,167**	**7,234**
Percent Change from ROD				**- 41 %**	**- 58 %**

[1]Volume calculations are presented in the Soil Quantity Calculation Summary Report (FWENC 1996b).
[2]Volume calculations are presented in the North Plants Structure Demolition and Removal 100 percent design (FWENC 2001).
[3]Volume are calculations based on pre- and postexcavation surveys.

4.3 Summary of Cost Change

The baseline estimated cost for the North Plants soil portion of the North Plants Structure Demolition and Removal Project was $1.1 million based on cost estimates presented in the ROD (FWENC 1996a). The baseline estimate represents original ROD estimated costs reorganized to reflect implementation project descriptions in the RDIS (PMRMA 2004a). The final cost for excavation of North Plants HHE and biota risk soil is estimated at $1.9 million. The cost increase is directly related to the substantial HHE soil volume increase. The remedy change for biota risk soil from containment to excavation had minimal impact on project cost because the entire area was being disturbed during the structures demolition and foundation removal. Overall, this represents a cost increase of $0.8 million above the ROD-estimated cost, or a 73 percent increase. Although the cost for soil remediation in North Plants increased compared to the ROD estimate due to the HHE soil volume increase, an overall program cost savings was realized by executing the structure and soil remediation efforts jointly.

5.0 SUPPORT AGENCY COMMENTS

The EPA, CDPHE, and TCHD have reviewed this ESD. Comments from these agencies have been incorporated into the document.

6.0 PUBLIC PARTICIPATION COMPLIANCE

The Army published a public notice in the Rocky Mountain News and Denver Post on August 20, 2004, making the Draft North Plants Structure Demolition and Removal Project ESD available for public review and comment. A presentation explaining the proposed changes contained in the ESD was provided to the RMA RAB on August 26, 2004. The RAB is a community group that meets monthly to receive information and provide input on the cleanup being conducted at the RMA. The public comment period closed on September 20, 2004. Comments received were reviewed by the Army and responses were provided to the commenters under separate letter (PMRMA 2004b). No changes were required to the ESD based on the comments collected. The requirements set out in the National Contingency Plan, Section 300.435(c)(2)(ii), have been met.

This ESD and all documents that support the changes and clarifications are part of the Administrative Record and are available at the JARDF and the EPA Region 8 Superfund Record Center. The EPA Superfund Record Center can be reached at 303-312-6473. Hours of operation are Monday through Friday from 8 a.m. to 4:30 p.m.

7.0 STATUTORY DETERMINATIONS

Considering the new information presented in this ESD, the Army, in consultation with EPA and CDPHE, believes that the North Plants remedy, with the modifications described, satisfies the requirements of CERCLA Section 121 and is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, uses a permanent solution through proper disposal and containment of the wastes in the on-post HWL and Basin A, and is cost effective.

Signatures

For U.S. Environmental Protection Agency

Date 9·24·04

Terry L. Anderson
Director, Federal Facilities Program

For U.S. Army

Date 9/24/04

Charles T. Scharmann
Program Manager for Rocky Mountain Arsenal

For State of Colorado

Date 9/28/04

Gary W Baughman
Director, Hazardous Materials and Waste Management Division
Colorado Department of Public Health and Environment

8.0 REFERENCES

Ebasco (Ebasco Services Incorporated)

1992 (Jan.) *Remedial Investigation Summary Report.* Final. Version 3.2. (5 v).

1988a (Sept.) *Phase I Contamination Assessment Report North Plants Complex.* Final. Version 3.2.

1988b (Sept.) *Contamination Assessment Report Chemical Sewers — North Plants and South Plants.* Final. Version 3.2.

FWENC (Foster Wheeler Environmental Corporation)

2001 (July) *North Plants Structure Demolition and Removal Project.* 100 Percent Design Package. Revision 0.

1996a (June) *Record of Decision for the On-Post Operable Unit.* Version 3.1. (3 v).

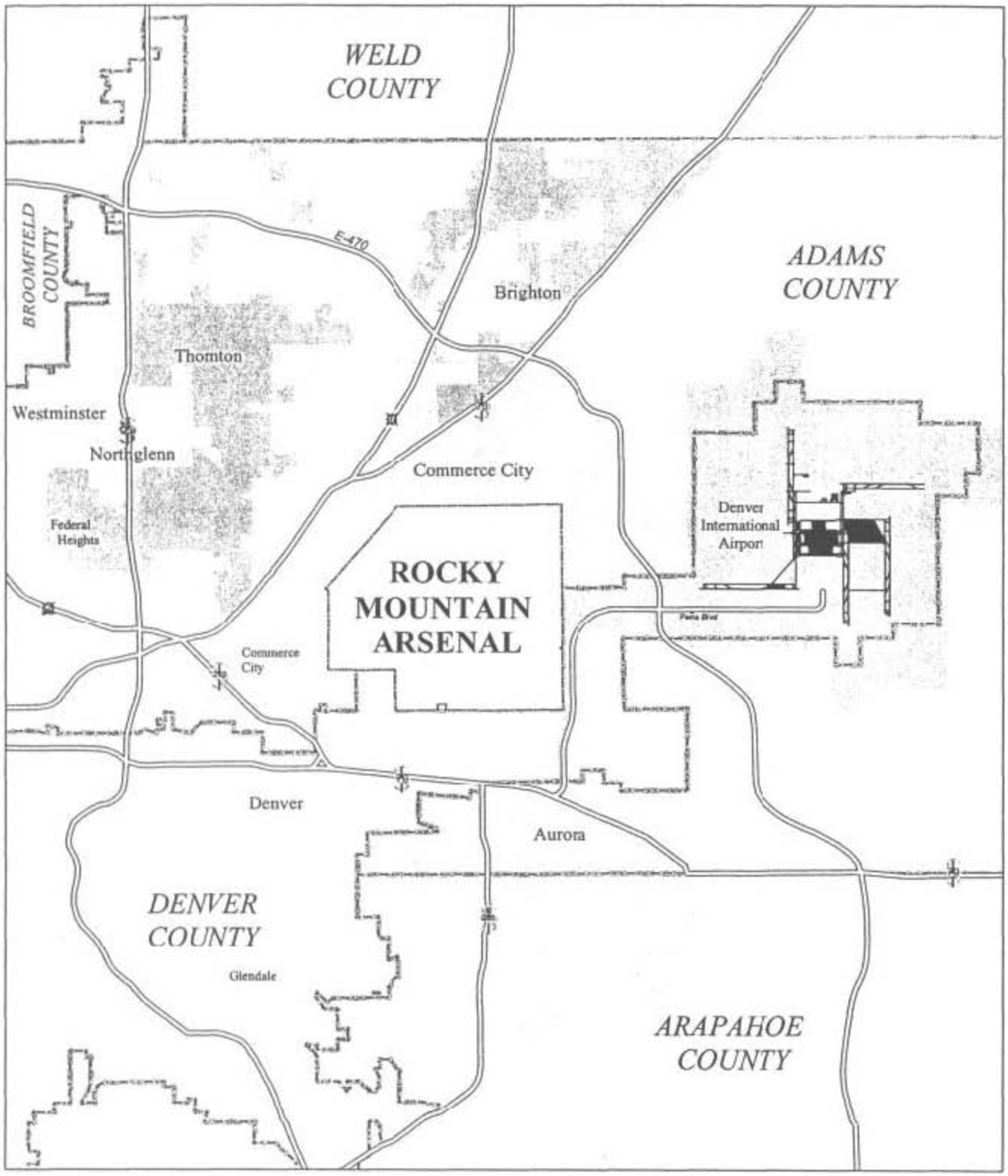
1996b (Sept.) *Soil Quantity Calculation Summary Report.*

1995 (Oct.) *Detailed Analysis of Alternatives Report.* Final. Version 4.1. (7 v).

PMRMA (Program Manager Rocky Mountain Arsenal)

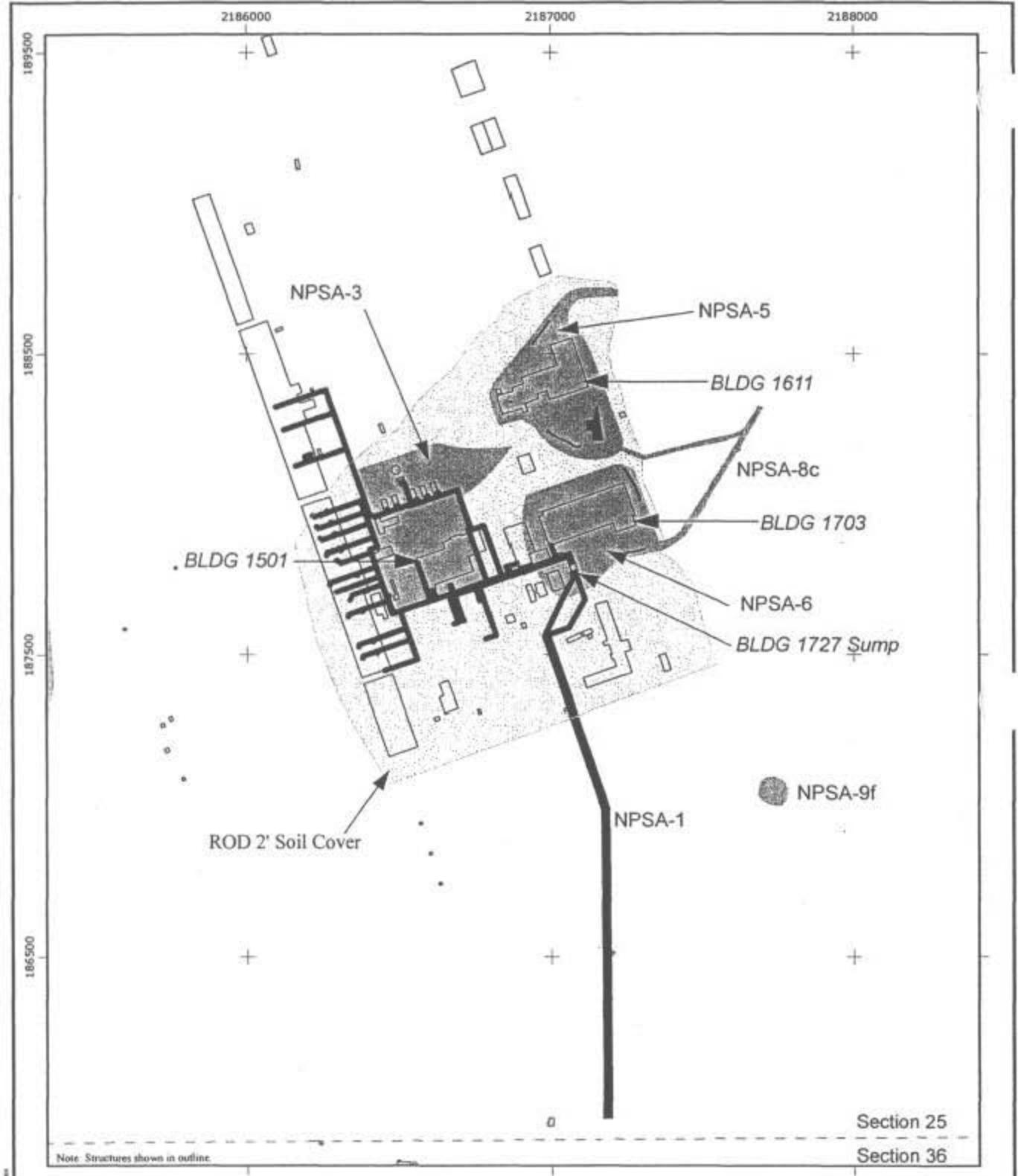
2004a (Feb.) *Remediation Design and Implementation Schedule.*

2004b (Sept. 23) *Feedback on issues raised at the September 9, 2004 Site Specific Advisory Board Meeting.* Memorandum from Charles Scharmann, Program Manager Rocky Mountain Arsenal, to the Site Specific Advisory Board.



ROCKY MOUNTAIN ARSENAL
Regional Reference

Figure 1



ROCKY MOUNTAIN ARSENAL

North Plants

Soil Remediation Areas

Human Health Exceedance Soils

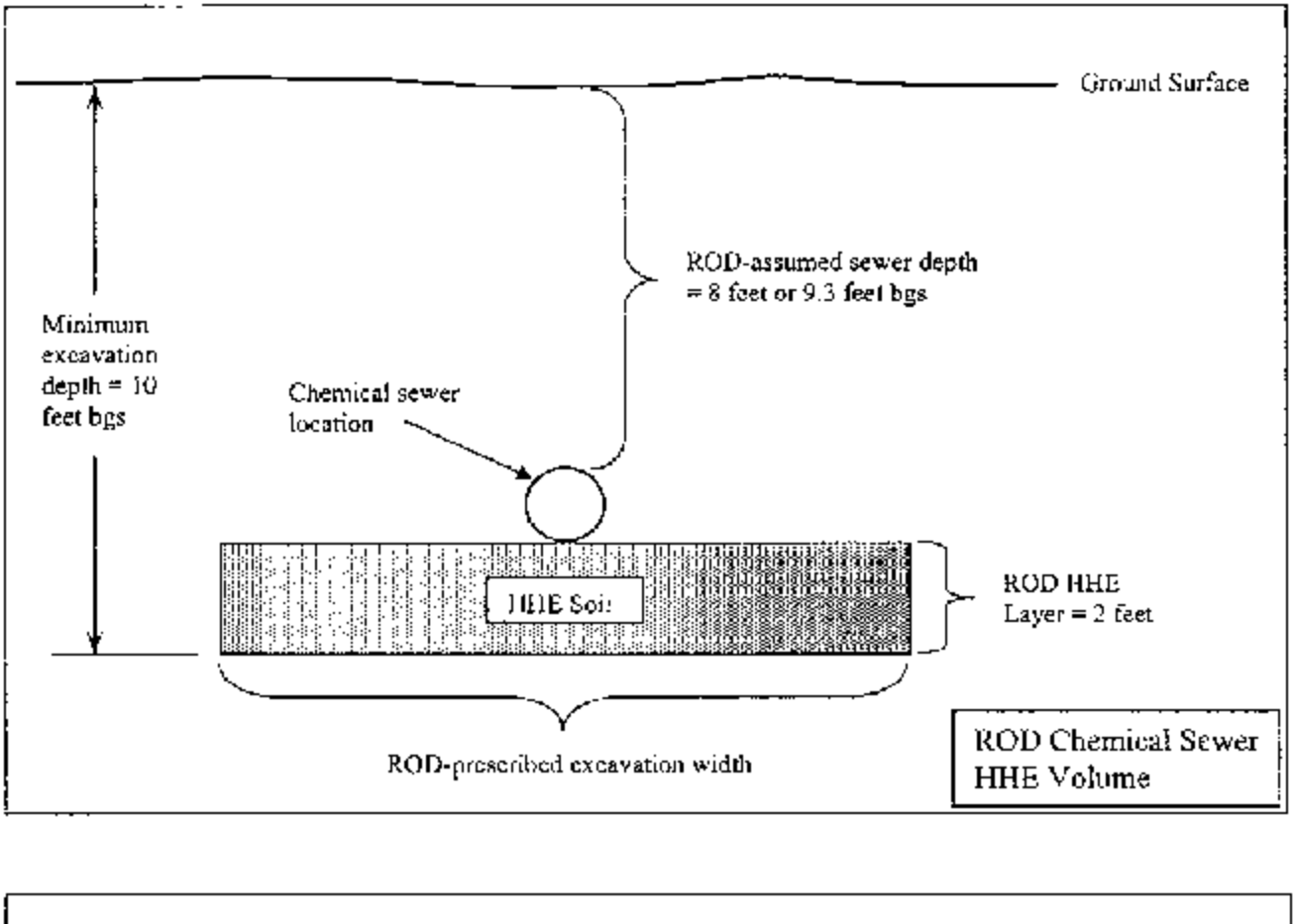
Biota Risk Areas

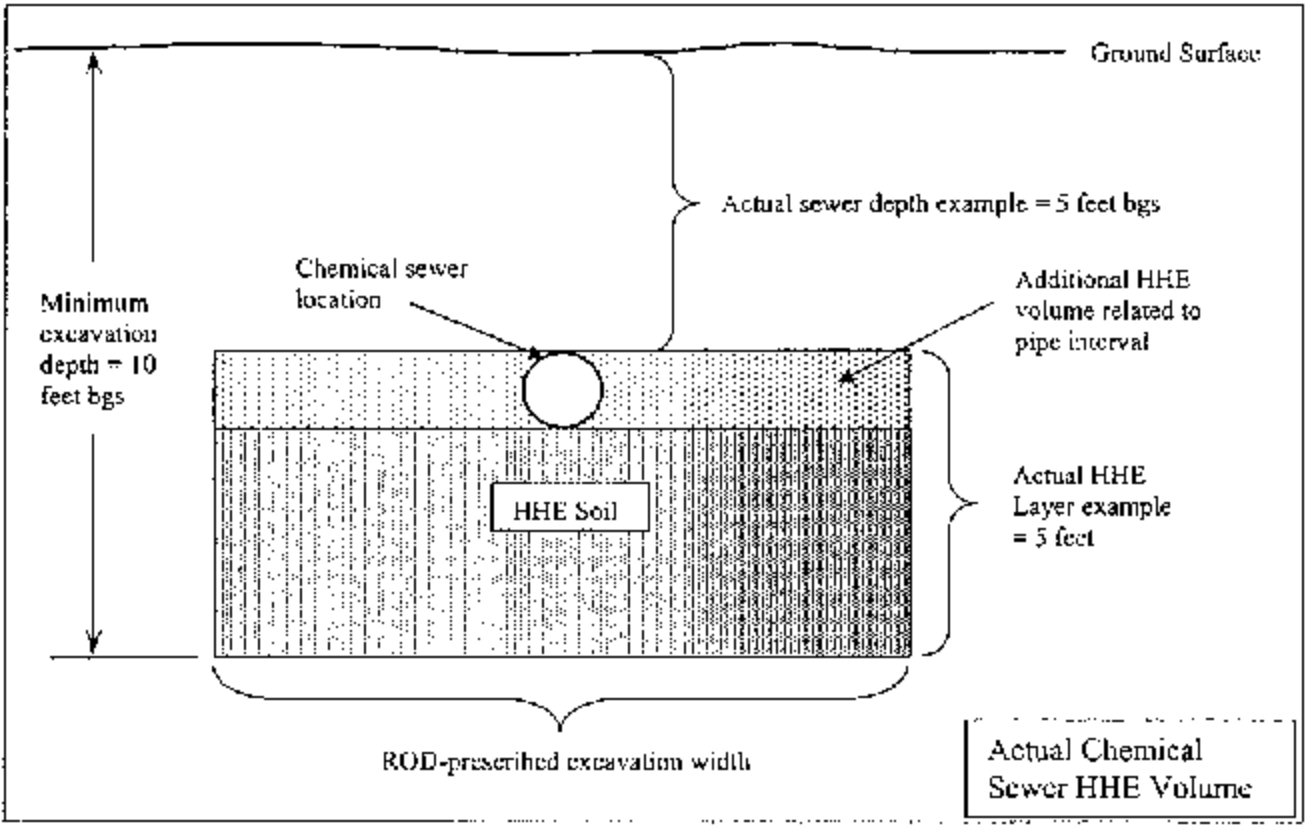
0 250 500

Feet

Lambert Conic Conformal Projection
State Plane Coordinate System
Colorado North Zone - NAD 1927

Figure 2


Ground Surface
ROD-assumed sewer depth
= 8 feet or 9.3 feet bgs
Minimum
excavation
depth = 10
feet bgs
Chemical sewer
location
HHE Soil
ROD HHE
Layer = 2 feet
ROD-prescribed excavation width
ROD Chemical Sewer
HHE Volume


Ground Surface
Actual sewer depth example = 5 feet bgs
Chemical sewer
location
Additional HHE
volume related to
pipe interval
Minimum
excavation
depth = 10
feet bgs
HHE Soil
Actual HHE
Layer example
= 5 feet
ROD-prescribed excavation width
Actual Chemical
Sewer HHE Volume