# RCRA FACILITY INVESTIGATION REPORT

# ERP SITE NO. DP-62, RITAS DRAW



**Holloman Air Force Base**
**New Mexico**

**August 2004**

**Contract No.: DACA45-03-D-0012**
**Delivery Order No.: 05, WAD 03**
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**Headquarters, Air Combat Command**
**Langley Air Force Base, Virginia**

**49 CES/CEV**
**Holloman Air Force Base, New Mexico**

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# HOLLOMAN AIR FORCE BASE, NEW MEXICO



Prepared for:

**49CES/CEV**
**Holloman Air Force Base**
**New Mexico**

Under Contract To:

**U.S. Army Corps of Engineers**
**Omaha, Nebraska**
**Under Contract No. DACA45-03-D-0012**
**Delivery Order No. 05, WAD 03**

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**Bhate Project No. 9030024.03**

**August 2004**

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AOC | Area of Concern |
| bgs | Below ground surface |
| Bhate | Bhate Environmental Associates, Inc. |
| DO | Delivery Order |
| DPT | Direct push technology |
| EPA | Environmental Protection Agency |
| ERP | Environmental Restoration Program |
| FSP | Field Sampling Plan |
| GPS | Global positioning system |
| HAFB | Holloman Air Force Base |
| HTW | Hazardous and Toxic waste |
| IDW | Investigation derived waste |
| JP-4 | Jet fuel |
| JP-X | Combination of JP-4 and UDMH |
| µg/kg | Micrograms per kilogram |
| µg/L | Micrograms per liter |
| mg/kg | Milligrams per kilogram |
| mg/L | Milligrams per liter |
| MSL | Mean sea level |
| NFA | No Further Action |
| NMED | New Mexico Environment Department |
| NMWQCC | New Mexico Water Quality Control Commission |
| PA | Preliminary Assessment |
| PID | Photo ionization detector |
| QAPP | Quality Assurance Project Plan |
| RCRA | Resource Conservation and Recovery Act |
| RFI | RCRA Facility Investigation |
| SI | Site Inspection |
| SOP | Standard Operating Procedures |
| SSL | Soil Screening Level |
| SVOC | Semi-volatile organic compound |
| SWMU | Solid Waste Management Unit |
| TAL | Target Analyte List |

| | |
|---|---|
| TDS | Total dissolved solids |
| TPH | Total petroleum hydrocarbons |
| UDMH | Unsymmetrical dimethylhydrazine |
| USACE | United States Army Corps of Engineers |
| USCS | United Soil Classification System |
| USGS | United States Geological Service |
| UTL | Upper tolerance limit |
| VOC | Volatile organic compound |

# 1 INTRODUCTION

The U.S. Army Corps of Engineers, Omaha District (USACE) has retained Bhate Environmental Associates, Inc. (Bhate) under the Service Contract with the USACE (Contract No. DACA45-02-D-0012, Delivery Order (DO) No. 5) to conduct a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at site DP-62 (Ritas Draw) at Holloman Air Force Base (HAFB), New Mexico. The RFI was conducted on behalf of the HAFB Environmental Restoration Program (ERP) for the New Mexico Environment Department (NMED), and this report presents the findings of the RFI.

## 1.1 Objectives

The objective of this RFI is to generate data to characterize potential contaminant sources as well as determine the nature and extent of contamination derived from soil sampling as requested by NMED. Additionally, the data generated provides further support for HAFBs request for No Further Action (NFA) at DP-62.

## 1.2 Purpose of the RCRA Facility Investigation

The purpose of this RFI is to address verbal comments made by the NMED during a March 4, 2003, site visit to DP-62. The NMED comments from the site visit were recorded in the meeting minutes and are the primary basis for the scope of work described in the *Final Phase II RCRA Facility Investigation Work Plan* (Bhate, November 2003b) and carried out during the investigation activities.

The key concern was that not enough data was collected from areas immediately adjacent to the debris. It was decided that shallow soil samples should be advanced in the immediate proximity of the exposed drums. NMED stated that four soil borings with two soil samples collected from each boring for laboratory analysis would be sufficient. The samples are to be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and RCRA-8 metals.

The initial request for NFA was based on the original *Preliminary Assessment/Site Inspection* (PA/SI) conducted in 1998 (Foster Wheeler Environmental Corporation and Groundwater Technology, Inc., 1998). The PA/SI was submitted to NMED by HAFB in 1999. Section 2.2 of this document summarizes the original PA/SI conducted for the site.

## 1.3 Scope of Work

The approach adopted to meet the stated primary objective consisted of a field investigation to determine if contamination is present in subsurface soil immediately adjacent to partially buried drums located on the sloped edge of an arroyo which intermittently drains into Ritas Draw. The RFI at DP-62 included the following activities:

- Advancement of 4 soil borings and collection of two soil samples from each soil boring on the basis of field screening criteria for laboratory analysis
- Laboratory analysis of the soil samples for VOCs by Environmental Protection Agency (EPA) Method 8260B, SVOCs by EPA Method 8270C, total petroleum hydrocarbons (TPH) by EPA Method 8015, and RCRA metals by EPA Method 6010B/7471A
- Removal of drums and debris from the site if the soil analytical results did not identify the presence of hazardous constituents

All work was conducted in accordance with HAFB Standard Operating Procedures (SOPs) provided in the *Basewide Quality Assurance Project Plan* (QAPP) (Bhate, November 2003a) and the *Basewide Health and Safety Plan* (Bhate, August 2003).

# 2 SITE BACKGROUND

HAFB is situated in south central New Mexico, in the northwest central part of Otero County (Figure 1). HAFB has a population of 6,000 and occupies about 50,000 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the Base. Private and public owned lands border the remainder of HAFB. The major highway servicing HAFB is Highway 70, which runs southwest from the town of Alamogordo and separates HAFB from publicly owned lands to the south. Alamogordo which has a population of approximately 35,000 is located approximately 7 miles east of the base.

## 2.1 Site Description and Operational History

DP-62 (formerly identified as Area of Concern (AOC) - Ritas Draw) is located in a remote portion of the North Base Area, approximately 300 feet northwest of ERP Site OT-04 (Acid Trailer Burial Site – Solid Waste Management Unit (SWMU) 102). DP-62 is one of many smaller arroyos that terminate into Ritas Draw. A site plan is presented as Figure 2, and surface features, illustrated in the photographs presented in Appendix A, indicate a dendritic drainage pattern across the DP-62 site with a terminus at Ritas Draw. A change in elevation of approximately 30 feet exists from south to north across DP-62. The site terrain generally slopes downward to the north and is near vertical in some locations.

In 1998, during the initial field reconnaissance in the area of AOC-Ritas Draw, two partially buried drums were discovered. These drums were believed to be related to early missile testing that occurred on HAFB during the 1950s. The drums were empty, and the original contents of the drums are unknown. Appendix A contains photographs that illustrate location of the drums as well as additional surface area features.

At the nearby Acid Trailer Burial Site (OT-04, SWMU 102), waste materials were dumped and buried on a one-half acre tract of land along the banks of the DP-62 arroyo. The waste materials appear to have been placed in three drainages of a side channel to Ritas Draw and appear to have been subsequently covered with soil from the surrounding area. The majority of the waste at OT-04 may have originated from the former Unconventional Fuels Storage Area, which is located approximately ½-mile to the south. The Unconventional Fuels Storage Area housed propellants, oxidizers, and other fuel components that were used by the 6585$^{th}$ Test Group for rocket and sled tests conducted at HAFB. Compounds typically stored at the facility included, but were not limited to, the following: JP-4 (jet fuel), unsymmetrical dimethylhydrazine (UDMH), aniline, inhibited red fuming nitric acid, inhibited white fuming nitric acid, liquid oxygen, JPX (a combination of JP-4 and UDMH), dyes, and other like compounds (Foster Wheeler Environmental Corporation and Groundwater Technology, Inc., 1998).

## 2.2 Basis for the RCRA Facility Investigation

In 1998, a PA/SI was performed at DP-62 which was known as AOC-Ritas Draw (Foster Wheeler Environmental Corporation and Groundwater Technology, Inc., 1998). The PA portion of the investigation did not conclusively identify a source for the operational material debris present at the site. However, given the proximity to OT-04 (Acid Trailer Burial Site), it was speculated that similar materials were most likely present at DP-62. The SI field investigation activities at DP-62 consisted of a geophysical survey followed by the installation of direct push technology (DPT) soil borings and DPT groundwater monitoring points.

### 2.2.1 Geophysical Survey

A geophysical survey utilizing a Geometrics G858G gradiometer (magnetometer) was performed on the surface of the site utilizing a grid pattern. Figure 3 is a color-contoured map prepared from the results of the survey. The survey identified approximately five areas of high magnetic response which are assumed to be the result of buried metal objects such as drums or debris. Also, the survey map illustrates the location of each drum exposed on the surface.

### 2.2.2 Soil Sampling

Based on the geophysical survey results, four soil borings were installed in 1998 at DP-62 in locations suspected to contain buried debris (Figure 4). The DPT borings encountered interbedded layers of silt, fine-grained sand, and clay to a depth of 20 feet. Copies of the Drilling/Boring Logs from the PA/SI Report for AOC-Ritas Draw can be found in Appendix B.

Three DPT borings (RITA-1, RITA-2, and RITA-4) were advanced in the immediate proximity of areas of high magnetic response and visible surface disturbance. DPT boring RITA-3 was installed at the confluence of drainage to determine if contamination was present down slope of the debris. DPT borings RITA-1 and RITA-2 were completed to depths of 20 feet and 18 feet, respectively. In boring RITA-2, refusal was encountered upon encountering hard, dry silt (ML) at 18 feet bgs. Futhermore, both borings were determined to be dry, and groundwater sampling was not attempted. After sample collection, borings RITA-1 and RITA-2 were properly abandoned using bentonite in accordance with the approved Field Sampling Plan (FSP). DPT borings RITA-3 and RITA-4 were completed to depths of 9 feet and 10 feet, respectively, with groundwater encountered at 6.5 and 7.5 feet bgs, respectively.

Based upon screening criteria, two soil samples from each boring were submitted for laboratory analysis. The soil samples were analyzed for VOCs by EPA SW-846 Method 8260A, SVOCs by EPA SW-846 Method 8270B, explosives (Nitroaromatics and Nitramines) by EPA SW-846 Method 8330, and Target Analyte List (TAL) Metals by EPA SW-846 Method 6010B/7471A.

SVOCs and explosives were not detected in the soil samples. VOCs were not detected with the exception of acetone at 20 micrograms per kilogram (µg/kg) and 25 µg/kg in samples from 12 and 18 feet below ground surface (bgs) at boring RITA-2. Acetone was also detected in the laboratory blanks and was presumed to be a laboratory artifact in the samples. Results from the analysis of metals in soil samples were compared to EPA Region 6 Media Specific Screening levels. Only arsenic exceeded the risk based screening level in samples RITA-1 (9 feet bgs) at 2.0 milligrams per kilogram (mg/kg), RITA-2 (12 feet bgs) at 17.4 mg/kg, and duplicate sample RITA-2-DUP (12 feet bgs) at 9.1 mg/kg (Foster Wheeler Environmental Corporation and Groundwater Technology, Inc., 1998). Table 1 is a copy of the soil analytical results extracted from the PA/SI Report for AOC-Ritas Draw.

### 2.2.3 Groundwater Sampling

Following completion of borings RITA-3 and RITA-4, groundwater samples were collected using a temporary well screen that was inserted into the drill rods and exposed after retracting the drilling rods. Groundwater samples were collected from boring RITA-3 and RITA-4 using a peristaltic pump and Teflon™ tubing. After sample collection, both borings were properly abandoned using bentonite in accordance with the FSP.

Groundwater samples were analyzed for VOCs by EPA SW-846 Method 8260A, SVOCs by EPA SW-846 Method 8270B, explosives (Nitroaromatics and Nitramines) by EPA SW-846 Method 8330, and TAL Metals by EPA SW-846 Method 6010B/7470A. No VOCs, SVOCs, or explosives were detected in groundwater samples (Foster Wheeler Environmental Corporation and Groundwater Technology, Inc., 1998). Eight metals were detected in one or more samples; however, only the detections of arsenic and antimony exceeded the screening criteria for drinking water. The metals detected included:

- Arsenic (0.029 mg/L (milligrams per liter) to 0.032 mg/L)
- Antimony (0.032 mg/L to 0.036 mg/L)
- Calcium (799 mg/L to 828 mg/L)
- Iron (0.63 mg/L)
- Potassium (54.6 mg/L to 63.8 mg/L)
- Magnesium (1,660 mg/L to 1,840 mg/L)
- Manganese (0.11 mg/L to 0.36 mg/L)
- Sodium (9,490 mg/L to 11,600 mg/L)

Table 2 is a copy of the groundwater analytical results table extracted from the PA/SI Report for AOC-Ritas Draw. Table 3 is a copy of the screening for chemicals of potential concern table extracted from the PA/SI Report for AOC-Ritas Draw.

## 2.3 Screening Level Human Health Risk Evaluation

The PA/SI report provides a screening level evaluation to identify chemicals of potential concern. The evaluation involves a comparison of detected concentrations of constituents in each media with EPA Region 6 Medium-Specific Screening Levels and the New Mexico Water Quality Control Commission (NMWQCC) Human Health Standards for groundwater of 10,000 mg/L total dissolved solids (TDS) concentration or less. If the concentration was below both criteria it was eliminated which is the case for VOCs, TPH, SVOCs and explosives results. A second tier screening was used for metal concentrations which were compared to Basewide background values (Radian 1993b). If the metal was below these ranges it was eliminated. Finally, the metals were also compared to concentration ranges from regional data and were not further evaluated if below these ranges.

Review of the soil data in Table 1 indicates arsenic concentrations exceed the screening levels in Table 3. The 9-foot sample from RITA-1 (2 mg/kg) and the 12 foot sample from the RITA-2 (17.4 mg/kg) as well as the duplicate sample collected from RITA-2 (Rita-2-Dup 9.1 mg/kg) meet or exceed the Medium-Specific Screening Level for Industrial Soil for arsenic as a carcinogen of 2 mg/kg. The two samples from RITA-2 also exceed the Basewide upper tolerance limits (UTL) for arsenic of 6.883 mg/kg but are well within the observed range of <0.1 to 97 mg/kg for arsenic for the Western United States (United States Geological Service (USGS), 1984).

The groundwater analytical results presented in Table 2 indicate arsenic concentration in RITA-3 (32 µg/L) the duplicate sample collected from RITA-3 (29 µg/L) and RITA-4 (17 -B µg/L) exceed the Medium-Specific Screening Level for Tap Water for arsenic (noncancer, 2.3 µg/L) and (carcinogen, 0.045 µg/L) but remains below the Basewide UTL of 35.4 µg/L presented in Table 3. Arsenic concentrations in RITA-3, RITA-3-DP (duplicate), and RITA-4 did not exceed the MCL of 50 µg/L which was established at the time the PA/SI was performed, they do however exceed the current MCL of 10 µg/L. Groundwater results from RITA-3, RITA-3-DP, and RITA-4 with antimony concentrations of 34 µg/L, 36 µg/L, and 32 µg/L respectively exceed both the Drinking Water Maximum Concentration Limit (MCL) of 6 µg/L and Screening Level for Tap Water of 15 µg/L but fall short of the Basewide UTL of 87.1 µg/L. Finally, the sample from RITA-4 presented 360 µg/L manganese which does not exceed the Tap Water Screening Level of 1,700 µg/L but does exceed the NMWQCC standard of 200 µg/L. Although no Basewide UTL has been established for manganese, the concentration does not exceed the typical range of <1 to 1,000 µg/L for manganese in groundwater for natural elemental concentrations (Dragun, 1998).

These data show that arsenic and antimony concentrations in groundwater will routinely exceed their particular MCLs and do not result from past practices or activities at DP-62.

Furthermore, groundwater beneath HAFB has been classified as a Class III B aquifer according to EPA guidance due to total dissolved solids concentrations in excess of 10,000 mg/L. The

groundwater has therefore been designated as unfit for human consumption on the basis of the New Mexico Water Quality Control Commission. The State Engineer also designates any water containing greater than 10,000 mg/L TDS not protectable pursuant to Section 70-2-12-B.(15)n NMSA, 1978.

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# 3 ECOLOGICAL SETTING

## 3.1 Physiography, Topography, and Surface Water Hydrology

HAFB is located in the Tularosa Basin which is bounded by the San Andreas Mountains to the west and the Sacramento Mountains to the east. The basin's interior plain has low relief, with altitudes ranging from about 4,000 feet above mean sea level (MSL) in the southwest to approximately 4,400 feet above MSL in the northeast. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 feet above MSL.

The climate in the Tularosa Basin is arid with annual precipitation averaging 7.9 inches. Most of the precipitation falls as rain from May to October. The winter period is characterized by clear skies with light and intermittent snowfall. March through May is characterized by strong winds with extensive periods of blowing sand and dust. The mean annual evaporation rate in the basin is 67 inches per year. This evaporation rate results in a net annual precipitation rate of minus 59 inches per year which results in a net loss of groundwater due to evapotranspiration (Radian, 1993a).

## 3.2 Geology

The Tularosa Basin is a bolson, or a basin with no surface drainage outlet. The sediments of the basin are carried in by water that does not escape. Sediments in the basin are derived from the limestone, dolomite, and gypsum deposits found in the surrounding mountains. Coarse and heterogeneous alluvial materials are present along the boundary of the basin and the mountains. Fine-grained and fluvial sediments derived from the mountains are located in the center part of the basin. The near surface sediments are alluvial, eolian, and playa or lacustrine in origin. In many locations, wind and water have reworked the sediments into discontinuous layers of silt, sand, and clay. These fine-grained sediments contain gypsum crystals (Radian, 1993a).

## 3.3 Hydrogeology

Groundwater occurs in unconfined conditions within the unconsolidated bolson deposits beneath HAFB. The primary source of recharge is stream runoff from the western side of the Sacramento Mountains. Water migrates through these alluvial deposits into the finer grained sediments of the center of the basin. The depth to water beneath the base ranges from less than 5 feet to 50 feet bgs. Basewide, groundwater flow direction is influenced by the surface water flow along southwest trending arroyos. In general, groundwater flow direction is west and southwest depending upon the immediate proximity of these drainage features.

Groundwater quality in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas (Radian, 1993a). At several SWMU located across the base, monitoring wells contain water with greater than 10,000 mg/L total dissolved solids (TDS)

(Foster Wheeler, 2002). There are no potable water wells on HAFB. Potable water for the base and the city of Alamogordo is derived from the nearby Sacramento Mountains. The only production water well, used for livestock irrigation, is located 13 miles southwest of DP-62. At present, a Basewide study of groundwater quality, particularly TDS, is being performed by others. The purpose of the study is to further document the characteristics and quality of groundwater.

# 4 SITE CHARACTERIZATION

## 4.1 Overview of Investigation Activities

The field work for the RFI was conducted in accordance with HAFB SOPs provided in the *Basewide QAPP* (Bhate, November 2003a). These SOPs outline methodologies for soil boring advancement, soil sampling, soil sample description, field screening, sample management, equipment decontamination, and chain-of-custody procedures.

Prior to boring advancement, all necessary HAFB utility clearance permits (digging permits), flightline, and security permits were obtained. On March 31, 2004, four hand augured soil borings (Figure 5) were advanced at the site to an approximate depth of 5 feet bgs. Continuous soil samples were collected from these borings. A portion of each sample was screened in the field for VOCs using a photo ionization detector (PID).

Based on headspace screening results or other relevant observations (such as staining, odor, or soil type), one soil sample from each soil boring was selected for laboratory analyses. The sample obtained from the bottom of the boring was selected if the screening failed to identify an appropriate interval. A total of 5 soil samples, including one field duplicate sample, were submitted to the laboratory for analysis. The samples were placed on ice and shipped under strict chain-of-custody to Associated Laboratories located in Orange, California. The location of each boring and exposed drum was surveyed using the HAFB global positioning system.

## 4.2 Soil Borings, Lithologic Sampling, and Logging

Each soil boring was logged in the field and visually classified according to the Unified Soil Classification System (USCS). Soils at the site consisted of light yellow sand. Soil boring logs are included in Appendix B.

## 4.3 Laboratory Sample Analysis

Five soil samples (including the field duplicate) were analyzed for VOCs by EPA SW-846 Method 8260B, SVOCs by EPA SW-846 Method 8270C, TPH by EPA SW-846 Method 8015, and RCRA metals (arsenic, barium, chromium, cadmium, lead, mercury, selenium, and silver). The RCRA metals were analyzed by Method 6010B with the exception of mercury, which was analyzed by Method 7471A.

## 4.4 Drum Removal

Because the analytical results of soil sampling around the drums did not identify the presence of hazardous constituents, the drums exposed on the surface were to be removed and recycled as scrap metal by Bhate.

## 4.5 Equipment Decontamination

All reusable equipment associated with soil sampling was decontaminated in accordance with the HAFB SOPs provided in the *Basewide QAPP* (Bhate, November 2003a).

## 4.6 Waste Handling

All investigation derived waste (IDW) produced during the investigation process was handled in accordance with the HAFB SOPs provided in the *Basewide QAPP* (Bhate, November 2003a).

# 5 SOIL ANALYTICAL RESULTS

Four soil samples and one duplicate sample were submitted to Associated Laboratories of Orange, California, for laboratory analysis. The soil samples were analyzed for VOCs, SVOCs, TPH, and RCRA metals. All data was validated in accordance with the *Basewide QAPP* (Bhate, November 2003a), and the Quality Control Summary Report is included as Appendix D.

To provide a screening level human health evaluation and environmental risk evaluation, the analytical results from the RFI soil sampling were compared with the most recent NMED Residential Soil Screening Levels available on the NMED web site: (http://www.nmenv.state.nm.us/HWB/data/SSL%20guidance%20revision%202.0%20%2002-2004.pdf). The NMED SSLs are derived using default exposure parameter values and assumed to be appropriately conservative and protective for the majority of site conditions relevant to soil exposures within New Mexico.

## 5.1 Volatile Organic Compounds

No VOCs were detected above the method detection limits for the samples submitted for laboratory analysis. VOC analytical results are summarized in Table 4. As there were no compounds detected, specific SSLs are not provided.

## 5.2 Semi-Volatile Organic Compounds

No SVOCs were detected above the method detection limits for the samples submitted for laboratory analysis. SVOC analytical results are summarized in Table 4. As there were no compounds detected, specific SSLs are not provided.

## 5.3 Total Petroleum Hydrocarbons

No TPH compounds were detected above the method detection limits for the samples submitted for laboratory analysis. TPH analytical results are summarized in Table 5.

## 5.4 RCRA Metals

Five of the eight RCRA metals were detected above the method detection limits. Analytical results for RCRA metals are summarized in Table 5, and are illustrated on Figure 5.

- Arsenic was detected in soil borings SB-01, SB-02, and SB-03 at 1,869 µg/kg, 2,219 µg/kg, and 1,834 µg/kg respectively. A duplicate sample collected from SB-01 also contained 1,530 µg/kg arsenic These concentrations are below the Residential Soil Screening Level (SSL) of 3,900 µg/kg.
- Barium was detected above the method detection limit in all four soil borings at concentrations ranging from 21,024 to 48,356 µg/kg. These concentrations are below the Residential SSL for barium which is 5,450,000 µg/kg.

- Cadmium was detected in one sample collected from soil boring SB-01 at 192 µg/kg that is well below the Residential SSL for cadmium of 74,100 µg/kg.
- Chromium was detected in all four soil samples at concentrations ranging from 2,932 to 8,503 µg/kg. These values are well below the Residential SSL for chromium of 234,000 µg/kg.
- Selenium was also detected in all four of the soil borings at concentrations ranging from 1,764 to 3,866 µg/kg. These values are well below the Residential SSL for selenium of 391,000 µg/kg.

# 6 SUMMARY AND CONCLUSIONS

The RFI, in addition to the data generated during the PA/SI, conducted at DP-62 has generated sufficient data to characterize potential contaminant sources and determine to the extent possible, the nature and extent of contamination in the soil and groundwater media in the immediate vicinity of the drums. Completion of these tasks allows the formulation of conclusions and recommendations for the site.

## 6.1 Summary

During the PA/SI, soil and groundwater samples were collected to characterize the nature and extent of contamination in the soil and groundwater at DP-62. Data gaps as identified by NMED were addressed during the RFI and additional soils were collected from specific areas that had the greatest potential for environmental impacts resulting from historical waste disposal practices based on visual observations and the previous geophysical survey.

Chemical analysis of the four soil samples collected from DP-62 during this RFI indicate that VOCs, SVOCs, TPH, and RCRA metals are not present in the soil media at the site above residential SSLs. Likewise, soil and groundwater collected during the PA/SI indicate that VOCs, SVOCs, TPH, and explosives are not present at the site above the applicable standards. The presence of arsenic in soil above Medium-Specific Screening levels has been determined to be within the observed range for arsenic in the Western United States (USGS, 1984). Similarly, the presence of antimony concentrations above its MCL was found to be within the respective Basewide UTL established for antimony (Radian, 1993a). Finally, the occurrence of manganese in one groundwater sample in excess of both the Tap Water Screening Level and NMWQCC standard did not exceed the typical range for manganese in groundwater for natural elemental concentrations (Dragun, 1998).

## 6.2 Conclusions

Based on the findings of the PA/SI and the RFI, the following conclusions and recommendations have been developed. Investigation results indicate that elevated levels of RCRA metals are present in soil; however, as indicated by screening the data against residential SSLs, the presence of arsenic, barium, cadmium, chromium, and selenium do not pose any unacceptable risks. The presence of arsenic is within the range for soil in the Western United States (USGS, 1984). Similarly, the concentrations of arsenic and antimony in groundwater above their current MCLs was determined to be within the background range and Basewide UTL and, thus, do not pose any risk. Manganese in groundwater was also determined to be within the range for natural elemental concentrations (Dragun, 1998). Therefore, No Further Action (NFA) is recommended for DP-62.

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