SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

# Anaconda Mine Site Transformer Removal Final Report

Yerington,
Lyon County, Nevada

**April 2006**

**Prepared For:**

## U.S. Environmental Protection Agency

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# 1 INTRODUCTION

The U.S. Environmental Protection Agency Region 9 (EPA) Emergency Response Section tasked the Ecology & Environment, Inc. Superfund Technical Assessment and Response Team (START) to provide technical assistance during removal activities at the Anaconda Mine Site located off Highway 95 approximately 2 miles west of Yerington, Nevada. At the request of the Nevada Department of Environmental Protection, the EPA assumed primary responsibility of cleanup oversight activities at the site in December 2004. EPA Remedial Project Manager Jim Sickles requested assistance from the EPA Emergency Response Section, and EPA On-Scene Coordinator (OSC) Tom Dunkelman has initiated several phases of removal activities at the site. This report details the first phase, which consisted an assessment and removal of PCB-contaminated transformers from the site. The START was specifically tasked to conduct an inventory of transformers located at the site, sample and conduct field screening of transformer oil for polychlorinated biphenyls (PCBs), provide oversight during removal activities, maintain the site logbook and collect photographic documentation.

This report describes field activities conducted from February 21 through March 2, 2006 by the START for the EPA, and the results of those activities. The specific field sampling and chemical analysis information pertaining to this assessment is addressed in the *Emergency Response and Time Critical Quality Assurance Sampling Plan for Drum, Tank, and Waste Pile Sampling* (QASP) dated February 1, 2006.

# 2 SITE BACKGROUND

## 2.1 Site Location

The Anaconda Mine site is located at 102 Burch Drive in Yerington, Lyon County, Nevada (see Figure 2-1). The geographic coordinates of the site are 38° 59' 53" North latitude and 119° 11' 57" West longitude. The site is located in a rural area and encompasses 3,468.5 acres. It is bordered to the north by agricultural land, to the east by Highway 95, to the west and southwest by the Singatse Mountain Range and the town of Weed Heights, and to the south by Bureau of Land Management (BLM) land. Approximately fifty percent of the site is privately owned land, with the remainder falling under the jurisdiction of BLM.

## 2.2 Site Description

The Anaconda Mine site consists of an office/process facility, an open-pit mine (Yerington Pit), an overburden dump, sulfide and oxide stockpile dumps, leach pads, sulfide tailings piles, and evaporation ponds. The Anaconda office/process facility consists of a lead shop, a welding shop, a maintenance shop, two warehouses, an electro-winning plant, and an office building. From 1965 to 1978, a mill and a concentrator were also located at the site.

## 2.3 Site History

The site was originally known as the Empire Nevada Mine and began operation around 1918. The Anaconda Minerals Company (Anaconda) acquired the site in 1953 and operated it as a copper mine until 1977 when it was acquired by Atlantic Richfield Company (ARCO). ARCO ceased operations at the site in 1978 and sold a large portion of the site to Don Tibbuls, a private entrepreneur. Tibbuls subsequently sold the majority of his share of the site to Arimetco, Inc. (Arimetco), the current owner of the site, but retained ownership of the Weed Heights community. Arimetco ran a copper recovery operation at the site from 1989 to 1999, at which point it terminated operations at the site and filed for bankruptcy.

During its 25 year operation, 350 million tons of ore and waste rock were mined from the Yerington Pit at the Anaconda Mine. Approximately 189 million tons of waste were generated, consisting of gangue from sulfide ore processing and tailings, and iron and sulfate-rich acid brine from oxide ore processing. Tailings were transported and disposed of in a slurry form in a number of on-site tailings ponds. The acid brine was disposed of in on-site evaporation ponds.

Naturally occurring radioactive materials including uranium, thorium, and radium are present at the site and have become concentrated in some areas due to mining processes. Areas with elevated levels of radioactive materials include the evaporation ponds and sulfide tailings piles.

Sometime between 1978 and 1988, Don Tibbuls sublet a portion of the Anaconda Mine site to a transformer salvaging company called Unison, a subsidiary of Union Carbide Corporation. In May 1992 Clayton Environmental submitted a certification of closure for the closure for the Unison facility in accordance with the EPA approved closure plan.

## 2.4 Regulatory Involvement/Previous Investigations

The NDEP reportedly issued a Finding of Violation and Order to Anaconda Copper Company in November 1982, citing Anaconda for groundwater pollution and requiring additional assessment and remediation. In 1985, the NDEP issued an Administrative Order directing Anaconda to install and monitor a well pumpback system to mitigate the groundwater plume beneath the site. The NDEP assumed responsibility as lead agency at the site when Arimetco filed for bankruptcy and abandoned the site. This role was transferred to EPA in December 2004 at the request of NDEP.

The EPA conducted a Preliminary Assessment and a Site Inspection in 1990 and 1994, respectively. In 2000, the START conducted emergency response assessment activities at the site under the direction of OSC Brad Shipley (TDDs 09-0010-0003 and 09-01-01-0006). At the request of EPA Remedial Project Manager Jim Sickles, the EPA ERS has become involved with the site and an Action Memo has been signed to initiate a removal action to address imminent and substantial threats at the site. This will occur in two phases: the first, detailed in this report, includes the assessment and removal of PCB-containing transformers from the site. The second phase involves mitigation of fugitive dust emissions from the site by capping the sulfide tailings piles, also known as the sulfide tailings study area, and applying a soil sealant to the evaporation ponds. These dust mitigation activities are scheduled to begin in April 2006.

# 3 FIELD ACTIVITIES

OSC Dunkelman, START, and the EPA Emergency Response and Removal Services (ERRS) contractor Environmental Quality Management were onsite from February 21 through March 2, 2006, to identify and remove un-used and potentially PCB-contaminated transformers from the site. Also present on site during transformer removal activities was ERRS subcontractor Miner's Contracting. START field activities consisted of compiling an inventory of transformers onsite, sampling and field screening the mineral oil within select transformers for PCBs, mapping the location of these transformers using a global positioning system (GPS), and documenting transformer removal activities. Photographic documentation of START activities is included in Appendix A.

An inventory of transformers on site performed by START and ERRS revealed 96 transformers of varying sizes stored in one building on site (Storage Building 1) and 6 large transformers stored in a second building (Storage Building 2). Additional transformers were identified at various locations throughout the site, both on the ground and on poles. ERRS requested a final inventory of transformers sent offsite for disposal to Clean Harbors in Coffeyville, Kansas; the inventory is included as Appendix D.

## 3.1 Deviations from the Quality Assurance Sampling Plan

The START was tasked to sample and field screen mineral oil in select site transformers for PCBs using Dexsil Chlor-N-Oil PCB test kits. Sampling was conducted in accordance with the QASP (see Appendix B) with the following exceptions:

- **Section 2.2 Sampling Objectives and Section 3.1 Inspection and Sampling Approach:** The QASP indicates all containers will be sampled. Transformers were sampled at the discretion of the OSC; the majority of the transformers in Storage Buildings 1 and 2 were not sampled.

- **Section 3.4.1 Sample Locations:** The transformer/sample identification scheme was modified in the following manner: Transformers from Storage Building 1 had the prefix SB1, transformers from Storage Building 2 had the prefix SB2, ground-based transformers found at various locations throughout the site had the prefix G,

and transformers found on poles had the prefix P. These prefixes were followed by T (for transformer) and a sequential number. A separate numbering system was employed for each of these four transformer location designations.

- **Section 3.6 Table E Quality Control Samples and Data Quality Indicator Goals:** The QASP indicates that one field duplicate sample will be collected and field screened for every 10 samples collected. Due to a shortage of Dexsil Chlor-N-Oil test kits, fewer duplicate samples were field screened.

## 3.2 Sampling Activities

Under the direction of OSC Dunkelman, the START sampled a total of 23 pole-mounted transformers and 50 ground-based transformers at various locations throughout the site. Transformer locations are presented in Figure 3-1. OSC Dunkelman determined that the transformers in Storage Buildings 1 and 2 would be shipped offsite for disposal, and as Clean Harbors performs its own analysis for PCBs, field screening of these transformers was not necessary.

## 3.3 Field Screening Activities

Transformers were sampled using dedicated drum thieves and were field screened for PCBs using Dexsil Chlor-N-Oil test kits with detection limits of 50 parts per million (ppm) and 500 ppm. These detection limits were selected based on Toxic Substances Control Act (TSCA) disposal regulations. Mineral oil with a PCB content of less than 50 ppm can be disposed of as waste oil. Mineral oil with a PCB content greater than 500 ppm must be disposed of by incineration. Mineral oil with a PCB content between 50 ppm and 500 ppm is considered a TSCA regulated material.

In general, transformers that had PCB field screening concentrations greater than 50 ppm and were identified as not-in-use were removed and sent to the Clean Harbors facility for disposal. Transformers with field screening results of less than 50 ppm PCBs were generally allowed to remain onsite. Transformers that were identified as in-use at the site but had PCB concentrations greater than 50 ppm were removed and replaced with similar transformers that contained less

than 50 ppm PCBs based on field screening results. A total of 23 pole-mounted transformers and 50 ground-based transformers were sampled and field screened using Dexsil Chlor-N-Oil test kits. Four transformers from Storage Building 1 were sampled and field screened to determine whether they could be used to replace in-use transformers.

# 4 ANALYTICAL RESULTS

The START submitted select samples to Severn Trent Laboratories in Sacramento, California for verification of field screening results. Two high (>500 ppm PCBs) range samples (G-T6 and G-T9), two mid (50-500 ppm PCBs) range samples (G-T12 and P-T4), one low (<50 ppm) range sample (P-T3), and one duplicate sample (P-T103, duplicate of P-T3) were submitted for analysis of PCBs by EPA Method 8082.

## 4.1 Data Quality

All laboratory-generated data was validated by a START chemist following *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan Validation Procedures*, OSWER Directive 9360.4-1, April 1990. Laboratory data were found to be acceptable as definitive category data and determined to be usable to meet project use objectives. START data validation reports along with complete, qualified summary data are included in Appendix C.

A comparison of field screening and laboratory analytical results is presented in Table 4-1. Laboratory and field screening results were in agreement for samples that contained less than 50 ppm, the site action level for PCBs. There appears to be some variation between laboratory and field screening results for samples with field screening results greater than 50 ppm PCBs. However, in all cases the field screening method appeared to be biased high when compared to lab results. There were no cases where the PCB field screening result was less than the laboratory analytical result.

Dexsil, the manufacturer of the Chlor-N-Oil test kits, reportedly calibrates the test kits on Arochlor 1242 which contains the least amount of chlorine of all the Arochlors found in electrical insulating fluids. Calibrating using Arochlor 1242 therefore yields the most conservative results and is designed to eliminate the possibility of false negatives. The laboratory results appear to confirm this conservative trend: in all cases, the laboratory analytical result was less than the field screening result. This indicates that it is unlikely that transformers containing greater than 50 ppm PCBs were left onsite.

## 4.2 Discussion of Results

A total of 50 ground-based transformers were sampled and field screened. Ground-based transformer field screening sampling results are presented in Table 4-2. Five of these transformers contained PCB concentrations between 50 ppm and 500 ppm based on field screening results. Field screening results of mineral oil samples collected from four transformers (G-T6, G-T9, G-T18 and G-T19) contained PCB concentrations greater than 500 ppm. A total of 10 ground-based transformers were removed and sent offsite for disposal. This includes transformer G-T16 which tested below 50 ppm but was found disconnected on the ground and was removed due to concerns that it might leak. The remaining ground-based transformers contained PCB concentrations less than 50 ppm based on field screening results. Figure 4-1 presents the locations of the transformers remaining onsite.

A total of 23 pole-mounted transformers were sampled and field screened for PCBs. Pole-mounted transformer field screening results are presented in Table 4-3. Nine of these pole-mounted transformers contained PCB concentrations between 50 ppm and 500 ppm based on field screening test results. The remaining 14 transformers contained mineral oil with a concentration of less than 50 ppm. A total of 11 pole-mounted transformers were removed and sent offsite for disposal.

In some cases, transformers with PCB concentrations less than 50 ppm were removed. Transformer P-T11 had to be removed as it was co-located on a pole with P-T12, which tested greater than 50 ppm. Transformer P-T13 was also removed; because field screening results indicated it contained less than 50 ppm PCBs, it was identified as a potential replacement for in-use transformers containing greater than 50 ppm PCBs.

Two pole-mounted transformers and one ground-based transformer were identified as in-use and contained PCB concentrations greater than 50 ppm based on field screening results. Transformer P-T4, P-T10 and G-T9 were removed and replaced with transformers that contained PCB concentrations less than 50 ppm based on field screening results. Transformer P-T7 was also identified as in-use. Power to this transformer could not be shut down without affecting residents of Yerington; therefore transformer P-T7 was not sampled.

At the request of OSC Dunkelman, START sampled one transformer and six switch boxes at the active Sierra Pacific substation on the site. Field screening results indicated all seven samples contained less than 50 ppm PCBs.

Six truck loads containing a total of 120 transformers and seven 85-gallon overpack drums were removed from the site and sent to the Clean Harbors PCB facility in Coffeyville, Kansas for disposal. On March 3, 2006, after the START's departure from site, one of the trucks carrying transformers from Storage Building 2 was determined to be overweight and returned to the site. ERRS pumped out approximately 275 gallons of mineral oil from one of the transformers in an effort to reduce the weight of the truck's load. Field screening of this mineral oil indicated that the oil contained pure PCBs. The five 55-gallon drums containing this transformer oil remain onsite and will be disposed of during the next phase of removal activities.

ERRS requested a complete inventory of transformers sent offsite for disposal, along with their respective PCB concentrations, from the Clean Harbors facility in Coffeyville, Kansas. At the time of report production, this inventory had not been received by START and is therefore not discussed in this report. However, it is included as received in Appendix D.

# 5 SUMMARY

The EPA tasked the START to provide technical assistance and oversight during transformer removal activities at the Anaconda Mine site in Yerington, Nevada. Specifically, the START compiled an inventory of transformers at the site, collected samples of transformer mineral oil, and field screened this mineral oil for PCBs using Dexil Chlor-N-Oil test kits. The START sampled and field screened 73 transformers during the removal effort.

A total of 120 transformers were removed from the site and sent to the Clean Harbors PCB facility for disposal. The majority of these were located in Storage Buildings 1 and 2 and were not sampled or field screened. Based on field screening results, 11 pole-mounted and 10 ground-based transformers contained greater than 50 ppm PCBs and were removed and sent offsite for disposal. ERRS received a detailed inventory of the transformers sent offsite for disposal and their respective PCB concentrations from Clean Harbors. This inventory had not been provided to the START at the time of the completion of this report and is therefore not discussed, although the data is included as Appendix D. Confirmatory samples sent to the laboratory for PCB analysis indicated the Desxil Chlor-N-Oil test kits produced conservative results. It is therefore unlikely that any transformers sampled and field screened by START that remained onsite contain greater than 50 ppm PCBs.