REMOVAL ACTION REPORT

For

COWBOY TIMBER

Manderson, Big Horn County, Wyoming

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 8
1595 Wynkoop Street
Denver, Colorado 80202

Approved by: _____ Date: _____
Craig Myers
United States Environmental Protection Agency
Region VIII On-Scene Coordinator

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LIST OF ABBREVIATIONS AND ACRONYMS

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
COC	contaminant of concern
ERRS	Emergency and Rapid Response Services
EPA	United States Environmental Protection Agency
ft	foot
g/PCP	gram(s) of PCP
GC/MS	Gas Chromatography/Mass Spectrometry
mg/kg	milligram(s) per kilogram
NPKS	nitrogen, phosphorus, potassium, sulfur
PAH	polycyclic aromatic hydrocarbon
PCP	Pentachlorophenol
RAL	Removal Action Limit
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RSL	Regional Screening Level
START	Superfund Technical Assessment and Response Team
TDD	Technical Direction Document
µg/kg	microgram/kilogram
µg/l	microgram/liter
VOC	Volatile Organic Compounds
WDEQ	Wyoming Department of Environmental Quality
WESTON	Weston Solutions, Inc.
Yd^3	cubic yards

1.0 INTRODUCTION

Weston Solutions, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START) was tasked by the United States Environmental Protection Agency (EPA) Removal Program, Region 8, under Technical Direction Document No. 1507-08, to prepare a Removal Action Report for the Cowboy Timber site in Manderson, Wyoming. This Removal Action Report documents all actions performed by the EPA, START and ERRS contractor at the Cowboy Timber site (the Site).

The contaminant of concern (COC) at this Site is Pentachlorophenol (PCP) in contaminated soils and equipment. Exposure to elevated PCP concentrations is known to be associated with adverse health effects.

This Removal Action Report serves to communicate the successful completion of the EPA activities. This report addresses the Site activities and outlines the following components:

- Excavation of contaminated soils from the property that are contaminated with PCP from the treatment of wood products.
- Sampling data confirming the treatment of contaminated soils.
- Treatment and backfilling of contaminated soils from the property.

1.1 SITE LOCATION AND DESCRIPTION

The Site address is 91 Highway 31, Manderson, Big Horn County, Wyoming. The Site is located at latitude 44.284291 and longitude -107.960274 (Figure 1). The property is approximately 36 acres in size. Approximately 3 acres of the property was formerly used for lumber treatment and petroleum refining operations (Figure 2). The property is currently owned by Mr. Bruce Quade, owner of Cowboy Timber and Treating Inc.

1.2 SITE BACKGROUND AND HISTORY

Prior to the 1960s, a petroleum refinery operated on the property. During the 1960s, the Site began operation as a lumber mill and wood treatment facility under the ownership of Mr. R. Cullison (EPA 1982). From establishment of operations until the early 2000s, the facility used a PCP/diesel fuel lumber treatment process. The quantity of PCP stored on site is not well documented. However, in February 1982 the owner reported that the Site used approximately 10,000 pounds of PCP per year (EPA 1982). Wyoming Department of Environmental Quality (WDEQ) records indicate that an underground storage tank (UST), and approximately 7,700 pounds of PCP/ diesel

contaminated soil were removed from the property in June 1992 (WDEQ 2012). Additionally, on an unknown date in 1992, structures on the property were upgraded including the construction of a 120-foot long building housing a 100-foot long concrete and carbon steel drip pad (WDEQ 2012). In the early 2000s, the Site ceased PCP wood treatment operations began intermittently using a copper naphthenate treatment process. All wood treating operations on the site have ceased at the time of this report.

In 2012, the WDEQ conducted a soil and groundwater investigation at the Site that included the installation of five soil borings and groundwater monitoring wells. The investigation concluded that PCP was present in groundwater.

The WDEQ requested assistance from the EPA after conducting a compliance inspection of the Cowboy Timber site in 2011. During the Site inspection, the inspector observed totes, drums, and containers throughout the site, many of which were unlabeled and could not be identified by personnel on site (WDEQ 2012). The inspector also noted multiple instances of stained soil and hydrocarbon odor.

Industrial equipment and structures located on the Site include the following:

- A 110 foot long concrete pad which formerly served as a primary drip pad for the PCP treatment process;
- A metal-lined basin and associated sump at the downslope (north) end of the primary drip pad;
- A secondary drip pad / lumber drying structure;
- A large vertical tank (approximately 10,000 gallons) presumed to be a mix tank;
- A smaller horizontal tank with a cover welded on, presumed to be a work tank;
- A concrete vault presumed to be a product capture structure over which the retort tank was formerly located;
- A concrete equipment platform, with associated piping, believed to have been associated with the former refinery;
- Two concrete building foundations with evidence of tank foundations, piping, and floor drains believed to have been associated with the former refinery;
- A vacant, fire damaged office; and
- A material storage shed.

The office building burned in the early 2000s. The building was reportedly used for administrative functions; no potential contamination associated with the former office is expected.

1.3 CHRONOLOGY OF EVENTS

Assessment and removal activities have been performed by Region 8 EPA, and Region 8 EPA contractors. Previous investigations include:

- April 2013 – START conducted an investigation focused on the portion of the Site where PCP/diesel treatment took place. With the assistance of ERRS, who dug the test pits, these investigations established the presence of PCP in surface soil, subsurface soil, and groundwater. PCP concentrations in subsurface soil ranged from non-detect at the method detection limit of 17 micrograms per kilogram (µg/kg) in various locations to 3,580,000 µg/kg in Test Pit 12 (UOS 2013).

  PCP concentrations in surface soil ranged from non-detect at the method detection limit of 13 µg/kg to 3,500 µg/kg.

  The investigation also documented the presence of PAHs and the Volatile Organic Compound (VOC) tetrachloroethylene in one subsurface soil sample from Test Pit 12. Trichloroethylene (TCE) was detected at 91.3 µg/kg, below the Regional Screening Level (RSL) of 2,600 µg/kg. The PAHs in Test Pit 12 were detected as follows:

  - benzo(a)anthracene: 5,250 µg/kg;
  - benzo(b)fluoranthene: 5,620 µg/kg;
  - benzo(a)pyrene: 7,740 µg/kg;
  - dibenzo(a,h)anthracene: 1,580 µg/kg.

  All of the above-listed compounds were detected above both the EPA RSL for industrial soil, and the WDEQ Migration to Groundwater Standard.

  Additionally, BTEX was detected in groundwater sample CTGW02, and staining consistent with the presence of hydrocarbons was observed in Test Pits 10 and 12.

  The START investigations resulted in an estimated area of PCP contamination of approximately 8,000 square feet, but was not able to define the vertical extent of contamination.

- August 2013 - START, mobilized to the Site to assess the vertical extent of PCP contamination, and collect soils for a bench-scale treatability study. Nineteen samples from five borings were collected on site. Samples collected from the boreholes were submitted to and analyzed by a qualified subcontract laboratory for volatile organic compounds (VOCs) and PCP. Detections occurred in four out of the five borings. PCP was the most prevalent contaminant and was detected at levels exceeding the EPA Regional Screening Level (RSL) in 4 of the five borings. PCP was identified in all samples collected from CTSB-02 and CTSB-03, and at depths of 29 and 38 ft bgs in CTSB-04, and 33 ft bgs in CTSB-05. No analytes were detected above the method detection limit for any samples collected from CTSB-01.

  Multiple VOCs were detected in samples collected at depths of 16, 20, and 28 ft bgs from

CTSB-02; 8, 17, and 24 ft bgs from CTSB-03; and, 29 and 38 ft bgs from CTSB-04. Detected VOCs included 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Ethylbenzene, Isopropylbenzene, n-Propylbenzene, Naphthalene, o-Xylene, p-Isopropyltoluene, and sec-Butylbenzene. No VOCs were detected at concentrations which exceed the RSL, and no VOCs were detected above the method detection limit for any samples collected from CTSB-01 or CTSB-05 (Weston 2013).

- September 2013-July 2014 – Environmental Restoration (ER) under the Emergency and Rapid Response Services (ERRS) contract conducted a soil treatability pilot study using soils from the August 2013 site investigation. Soils were treated with varying combinations of sawdust and nitrogen-phosphorous-potassium-sulfur (NPKS) fertilizer additive (ERRS 2013). Sawdust and NPKS additives, combined with regular watering and tilling yielded the best results with a 95% PCP removal rate.

- May 2016-July 2016 – START and ERRS mobilized to the Site to begin excavation and treatment of the contaminated soils. The Site was divided into 53 grids, which were sampled and excavated in one (1) foot lifts. Excavation of each grid was determined by the results of a 5-point composite sample that was collected within the grid. TechLaw, under the START contract, performed onsite analytical analysis for PCP to guide and inform excavation activities in near real time.

- October 2016 – ERRS began weekly watering and tilling of the treatment cell based on soil moisture readings collected onsite by START. START divided the site into two halves, and collected 10 samples from each half. PCP results showed a reduction from ~55 mg/kg in June 2016 to ~12 mg/kg in October 2016 across the treatment cell.

- November 2016 – START mobilized with the Geoporbe© to collect samples prior to shutting down treatment for the winter. START divided the site into two halves, and collected approximately 19 samples from 0 to 2 feet bgs from each half. The samples were then cut in half to form samples from 0-1 foot bgs and 1-2 feet bgs. The one-foot samples from each depth interval and half were then randomly split into two sub samples, thus providing 8 samples for the treatment cell.

- April 2017 – START and ERRS mobilized to the site to begin treatment for the season. START divided the site into two halves, and collected two sets of samples from three different depths per half (12 samples total). ERRS continued to water and till the site weekly. ERRS collected samples using the START method on a weekly basis and shipped samples to START for analysis.

- June 2017 – START mobilized to the site to collect a final round of samples to determine if the treatment of the cell was complete. START divided the site into two halves, and

collected two sets of samples from three different depths per half (12 samples total).

- August 2017 – START mobilized to the site to photograph the final condition of the site.

2.0 REMOVAL ACTIVITIES

2.1 APPROACH

The current removal action was designed to remove source contamination (PCP) on the Site. Removal activities included excavation to a maximum depth of 18 ft bgs on the northern portion of the site, and 4 ft bgs on the southern portion of the site. Contaminated soil from the northern portion of the Site was stockpiled on the southern portion of the Site until a suitable treatment area was constructed. Soils were placed in the treatment cell after amending with fertilizer and moisture to the optimum levels indicated in the treatability study.

The Site was divided into 53 40 ft. by 40 ft. grids (Figure 3). Each grids average elevation was measured using a GPS unit. Grids were then assigned an elevation and the lift maps were generated. A reference elevation was collected from the highest point on the site (Grid C7). From the reference elevation, soil was removed from the grids in one-foot lifts. ERRS used a laser level and stadia rod to ensure lifts were exactly one foot. Based on sampling results, grids were identified as clean (below 7 mg/kg), and contaminated (above 7 mg/kg). Clean and contaminated cells were excavated using different excavators, and soil was stockpiled in separate locations. Clean soil was stock piled to the west of the Site, near the old saw mill, and Contaminated soil was initially stockpiled on the southern portion of the site (grids B9, 10 and 11 through D9, 10 and 11). Due to the depths of identified contamination, the scope of the removal action was limited to source removal. The action memorandum specifically directed the OSC to determine the extent of the excavation on a diminishing returns basis using the cost per mass of contaminant removed as the basis for decision making.START and EPA used the daily burn rates of both the START contractor and the ERRS contractor divided by the number of cubic yards (yd^3) removed during that day. START then calculated the cost per gram of PCP removed to assist the OSC in determining when additional excavation was becoming cost prohibitive.

2.2 REMOVAL

The initial work involved breaking up the two concrete pads which were located in grids A1-A5, B1-B5 and C4-C8. A large hydraulic breaker was attached to an excavator to break apart the concrete into manageable sizes, which could be then moved to be treated as contaminated debris in accordance with 40 CFR 268.45, or cleaned using a steam pressure washer.

Excavation work was initiated on June 5, 2016. ERRS personnel were provided with a map of the proposed excavation grid area prior to work. The excavation was conducted by the EPA ERRS contractor using leased track hoes, skid steers, and front-end loaders. Each grid was 40 ft. by 40 ft., and each lift was approximately 1 foot deep. The first four lifts leveled out the excavation area to a consistent elevation. Sampling and analysis took place before each lift was removed to determine if any individual grid was contaminated and needed treatment, or if it was suitable for

use as clean fill material. Prior to each new lift after lift 4, the cost per gram of PCP was calculated. The excavation of each new lift continued until sample concentrations were either below the removal action levels or the cost of the removal of contaminated soil was deemed to be cost prohibitive. Laboratory analysis was performed onsite by team subcontractor TechLaw using a GC/MS to test the soil for PCP concentrations.

Figures 4 through14 show the excavation by lift. Photo documentation is provided in Attachment A. Logbook copies are provided in Attachment B. Laboratory data is provided in Attachment C. Data Validation is provided in Attachment D. A description of each lift is provided below.

- Lift one consisted of grids A1, A2, B1, B2, C1, C2, C5, C6, C7, C8, D1, D2, and E3. Grids A1, A2, B1, C1, C2, C7, D1 and E3 were determined to be clean by onsite laboratory analysis. Figure 4 shows the extent of lift one.
- Lift two consisted of grids A3, B2, B3, B5, B6, C2, C3, C4, C5, C6, C7, D2, D3, D4, D5, D6, D7, and E4. Grids A3, D2, D3, D4, D5, D6, D7 and E4 were determined to be clean by onsite laboratory analysis. Figure 5 shows the extent of lift two.
- Lift three consisted of grids A5, B2, B3, B4, B5, B6, B7, C2, C3, C4, C5, C6, C7, D2, D3, D4, D5, D6, D7, D8, E5, E6, E7, and E8. Grids A5, B7, C7, D2, D3, D4, D5, D6, D7, E6, E7, and E8 were determined to be clean by onsite laboratory analysis. Figure 6 shows the extent of lift three.
- Lift four consisted of grids AA7, AA8, AA9, AA10, A6, A7, A8, A9, A10, B2, B3, B4, B5, B6, B7, B8, B9, B10, C2, C3, C4, C5, C6, C7, C8, C9, C10, D8, D9, D10, E5, E8, E9, and E10. Grids A6, B3, B5, B8, B10, D8, E5, and E8 were determined to be clean by onsite laboratory analysis. Figure 7 shows the extent of lift four.
- Lift five consisted of grids AA7, AA8, AA9, AA10, A7, A8, A9, A10, A11, B2, B3, B4, B6, B7, B9, B10, B11, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, D9, D10, D11, E9, E10, and E11. Grids C5, C6, and C7 were dug in a three foot lift due to the amount of contamination. Grids A7, A8, B6, B7, C2, and C10 were determined to be clean by onsite laboratory analysis. Figure 8 shows the extent of lift five.
- Lift six consisted of grids AA7, AA8, AA9, AA10, A9, A10, A11, B2, B3, B4, B9, B10, B11, C3, C4, C8, C9, C11, D9, D10, D11, E9, E10, and E11. Grids A9, A11, B3, B9, B10, B11, C8, C9, D9, E9, E10, and E11 were determined to be clean by onsite laboratory analysis. Figure 9 shows the extent of lift six.
- Lift seven consisted of grids AA7, AA8, AA9, AA10, A1, A10, B2, B3, B4, C3, C4, C11, D10, and D11. Grids AA8, AA10, A1, A10, B3, C11, D10, and D11 were determined to be clean by onsite laboratory analysis. Figure 10 shows the extent of lift seven.
- Lift eight consisted of grids AA8, AA10, B2, B4, C3, C4, C5, C6, and C7. Grids C5, C6, and C7 were dug in a three foot lift due to the amount of contamination. Grids AA8 and AA10 were determined to be clean by onsite laboratory analysis. Figure 11 shows the extent of lift eight. Grids AA7 and AA9 were determined to be cost prohibitive[1] to continue excavation, and were left as contaminated grids.
- Lift nine consisted of grids B2, B4, C3 through C7. No grids were determined to be clean by onsite laboratory analysis. Figure 12 shows the extent of lift nine. Grids B2 and B4 were

determined to be cost prohibitive[1] to continue excavation, and were left as contaminated grids, and therefore not sampled as part of lift 9.

- Lift 10 consisted of grids C3 through C7. No grids were determined to be clean by onsite laboratory analysis. Figure 13 shows the extent of lift ten. All contaminated grids were determined to be cost prohibitive[1] to continue with excavation and sloping. Figure 14 shows which areas were left contaminated due to further excavation being cost prohibitive, and therefore not sampled as part of lift 10.

[1] Grids determined to be cost prohibitive to continue were determined by the cost per gram of PCP removed. This was determined by collecting the total cost per day to have ERRS and START on site, and dividing it by the amount of PCP removed. Calculations can be found in Attachment E.

2.2.1 Groundwater Monitoring Wells

Three former monitoring wells, Facility Name Cowboy #2, Converse Ditch and Comerse Reservoir, were removed on the property as part of the continued operations and maintenance at the site.

2.3 SAMPLING

Approximately 10 percent of all collected soil samples were submitted to an off-site laboratory for analysis of PCP. Samples were submitted for analysis to ESC Lab Sciences, in Mount Juliet, TN. The laboratory analytical data is provided in Attachment C. A discussion of the data quality is provided in Attachment D.

2.3.1 Confirmation Sampling

All samples for analysis were given a unique sample number based on a pre-assigned ID and zone for which the sample was collected. An example sample identifier is CTSO-A1D1-20160601, in which the following fields are delineated:

- The first field is comprised of four digits, the first two characters, “CTSO” correspond with the site name, Cowboy Timber. “SO,” is the pre-assigned identifier for soil.
- The second field, “A1D1” is comprised of four to six characters, the first two “A1” indicate which column and row in the excavation zone is being sampled, and the last two “D1” indicate which depth, or lift the sample was collected from.
- The third field is an eight-digit, numeric field that represents the date collected. This will allow for multiple samples to be collected at different depths from the same zone should additional removal be required to achieve the removal objective. In the first example shown above, the depth of the sample would be 0-1 foot below the initial reference elevation established on site.

The excavation continued until soil concentrations were at or below the RAL of 7.0 mg/kg, or the cost of the removal of contaminated soil was above the cost based analysis per g/PCP.

Visual inspection of staining and confirmation sampling was performed in the field by START to guide the ER excavation work. The confirmation samples were analyzed for PCP in the field laboratory as well processed by ESC Lab Sciences, in Mount Juliet, TN as a check.

2.3.2 Fill Soil Sampling and Analysis

Samples were collected from fill soil sources to verify that the soil was suitable for use at the site. ER used top soil, common fill, and cleaned/decontaminated concrete found onsite. Samples of fill soil collected were submitted for analysis to Pace Analytical Services, Inc. in Billings, MT. Samples were analyzed for polychlorinated phenyl (PCP). Attachment C provides the analytical results of all clean backfill materials.

2.3.3 Air sampling

START collected air samples from three stationary locations (upwind, downwind, and near the residence), and within an excavator while digging in contaminated cells during the removal to determine if on-site dust control was sufficient. All air samples were sent to ALS laboratories in Salt Lake City for analysis. Personal air monitoring data was not used after the preliminary air monitoring showed no elevated levels. Sampling was performed by START, and all sample concentrations were below action levels. All site work was performed in Level D personal protective equipment. The air monitoring results can be found in Attachment C.

2.3.4 Drum Sampling

Approximately 400 gallons of waste liquid was evacuated from a larger tank into drums. The drums were sampled and the samples were analyzed onsite. The liquid did not contain enough PCP to interfere with the biological treatment process; therefore, the liquid was mixed in with the contaminated soil and was treated on site.

2.3.5 Post-Treatment Sampling

Upon completion of backfilling the treatment cell, START sampled the entire treatment cell on 6/30/2016. START collected 20 aliquots from various depths and composited it into one sample. Sample results indicate an average of 54.5 mg/kg of PCP across the cell.

Before winter, START sampled the treatment cell twice, on 10/11/2016 and 11/14/2016. During the October sampling event, START collected 20 aliquots from various depths and composited into one sample. Sample results indicated a cell-wide average of 11.9 mg/kg of PCP. This represents an approximately 78 percent reduction in PCP the first four months of treatment.

During the November sampling event, START divided the sample into two halves. Approximately 20 samples were collected using a Geoprobe direct push drill rig from 0-2 feet bgs in each half of the treatment cell. Samples were then cut in half to represent the top layer and bottom layer of the treatment cell. Samples from both layers were randomly divided into two samples per layer (8 total) with 10 cores each. Sample results are shown in Table 1.

Beginning April 2017, START and ERRS resumed sampling for the season. The cell was divided into two halves, North and South. Two sets of samples (10 aliquots each) were collected from three different depths from each half of the treatment cell (12 total samples). Sample results are shown in the tables 2-10. Below are the average PCP results for each sampling event.

Date Sampled	Average PCP Result in mg/kg
6/30/2016	**55**
10/11/2016	11.9
11/14/2016	7.5
04/18/2017	11.0
04/25/2017	25.08
05/03/2017	6.98
05/08/2017	3.19
05/17/2017	5.91
05/24/2017	3.63
05/31/2017	4.42
06/04/2017	4.8
06/06/2017	2.55

2.4 INSTITUTIONAL CONTROLS

Contamination potentially remains in the areas identified on the property map, or under permanent structures at the properties (i.e. buildings, etc.) located in grids C2, D2, C3, D3, AA7, and AA9. Grids B2, B4, C3, C4, C5. C6 and C7 were also potentially contaminated, but as discussed above, it was cost prohibitive to remove the contamination. A sidewall sample was collected from the soil under the structure which housed the raised drip pad. Samples were also collected approximately 10 feet west of the building, and were clean. Any contamination that might have been under the raised drip pad was left in place. This structure is located in grids AA10, AA09, AA08, AA07.

2.4.1 Engineering Controls

Water was applied to the soil in the excavation areas and general site area to control dust. At least one ER crew member was usually dedicated to dust control throughout the duration of the removal. Orange safety fencing was also used to mark excavation boundaries to prevent the public from

entering excavation areas during idle periods. A boot wash station was set up at each of the entrances to eliminate contamination leaving the hot zone. Excavators and loaders were designated to be "hot" or "clean" to avoid contaminated soil being stockpiled with clean soil, excavators and loaders were hot-washed on designated decon pads or, if just the bucket was contaminated, over a contaminated area, prior to changing designations.

Controls were implemented to minimize the tracking of contaminated soil through uncontaminated areas. Appropriate barriers and signs for traffic control were placed at the site entries and exits.

2.5 BACKFILL

The removed washed concrete waste was placed in the bottom of the cell to be used as filler in the deepest areas. Any clean native excavated material was replaced as fill between the washed concrete. The stockpile of clean saw dust and contaminated material was then mixed using an excavator and screen, and placed in ~24 a inch lift with a bucket loader,. The ERRS crew ten graded the cell level with the bulldozer on site. Due to the large amount in the stockpile, the Cell was extended to the west from grids A1 – A7 increasing the total cell size to 4.3 Acres. This can be found in Figure 15. Photographic documentation of the restoration work done on the cell are provided in Attachment A.

2.5.1 Treatment Layer Construction

ERRS constructed the final layer as the treatment layer per the design and with periodic on-site guidance from staff. Approximately five cubic yards of fertilizer was added to the top of the treatment layer with a spreader and tractor. ERRSs then tilled the top (8-10) inches to blend the fertilizer and contaminated mixture. As shown by the treatability study, the combination of the sawdust and fertilizer will allow for a more positive affect on minimizing the concentration of PCP. Photographic documentation of the restoration work done on the Cell are provided in Attachment A.

2.5.2 Treatment Operations

ERRS began routine tilling and watering operations in October 2016, and continued into November 2016. Tilling and watering operations were stopped for the winter, and resumed in April 2017 when freezing was unlikely. Tilling, watering and sampling continued into June 2017, when PCP levels stopped dropping and the OSC suspended operations. Decreased treatment efficacy seems to be due to an inability to keep the moisture content of the cell near 20%, the levels achieved during the treatability study. Subsequently, the OSC has determined that further treatment will require a substantial increase in expense that has become cost prohibitive to continue.

2.6 FINAL CELL VOLUMES

Volumes of material excavated, stockpiled and replaced were tracked by ERRS contractor. Volumes were totaled and monitored by the ERRS contractor. Total volumes reported are:

- 9,016 yd^3 of contaminated soil was removed from the cell
- 1,965 yd^3 of clean soil was removed from the cell
- 1100 yd^3 of sawdust was added to the contaminated soil
- 5 yd^3 of NKPS fertilizer was added to the contaminated soil
- 210 yd^3 of concrete was treated per 40 CFR 268.45, removed from the excavation area, and reused for back fill.

3.0 SUMMARY OF PROJECT COSTS

The Budgeted and Actual Costs for the cleanup associated with the **Removal Action - (FY 2016 – 2017) are:**

Removal Action Costs - (FY 2016 - 2017)			
	Ceiling	Actual Cost	Remaining Cost
Region VIII START (as of 09/15/2017):	$163,500	$155,256	$8,244
Region VIII ERRS (as of 09/15/2017):	$677,000	$662,823	$14,177
Total Cost to Date:		**$820,267**	

4.0 REFERENCES

Environmental Protection Agency (EPA). 2015. Technical Direction Document (TDD) 0001/1507-08.

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FIGURES

TABLES

ATTACHMENTS