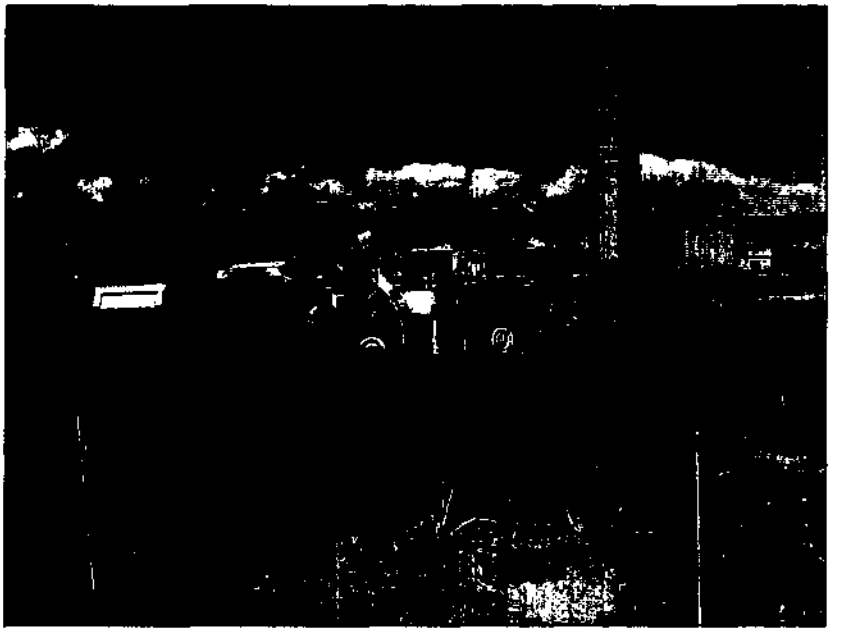
Final Removal Action Close-Out Report
Smeltertown Superfund Site
Operable Unit No. 1
Salida, Colorado



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SMELTERTOWN SUPERFUND SITE OPERABLE UNIT ONE

REMEDIAL ACTION CLOSE-OUT REPORT

Based on a good faith diligent inquiry of those individuals responsible for carrying out or supervising the Work, I certify to the best of my information and belief information provided by Settling Defendants contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

ON BEHALF OF SETTLING DEFENDANT PHELPS DODGE CORPORATION

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Date: 12/10/03

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Date: 12/9/03

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SMELTERTOWN SUPERFUND SITE – OPERABLE UNIT NO. 1
SALIDA, COLORADO

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List of Acronyms

AM	Action Memorandum
AOC	Administrative Order on Consent
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSU	Colorado State University
FRDR	Final Removal Design Report
EPA	U.S. Environmental Protection Agency
NTCRA	Non-Time Critical Removal Action
O&M	Operation and Maintenance
OU1	Operable Unit No. 1
PCMP	Post-Construction Monitoring Plan
PDC	Phelps Dodge Corporation
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RA	Removal Action
RACOR	Removal Action Close-Out Report
RAWP	Removal Action Work Plan
RDWP	Removal Design Work Plan
SHSP	Site Health and Safety Plan
SOW	Statement of Work
SSS	Smeltertown Superfund Site
UAO	Unilateral Administrative Order
WCOR	Work Close-Out Report
WMP	Waste Management Plan

FINAL REMOVAL ACTION CLOSE-OUT REPORT
SMELTERTOWN SUPERFUND SITE – OPERABLE UNIT NO. 1
SALIDA, COLORADO

1.0 INTRODUCTION

This Removal Action Close-Out Report (RACOR) documents the completion of the Smeltertown Superfund Site (SSS) Operable Unit No. 1 'non-time critical removal action' (NTCRA). The SSS OU1 is a NTCRA that required remediation of a historic Smelter site located in Salida, Chaffee County, Colorado. The NTCRA was performed in accordance with Consent Decree Civil Action No. 01-0080 (CD), executed on April 27, 2001. The CD was implemented under the direction of the U.S. Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE). Phelps Dodge Corporation (PDC) was the funding Respondent who performed the SSS OU1 NTCRA.

1.1 Purpose and Scope

This RACOR was developed to document that the SSS OU1 NTCRA was completed in accordance with the SSS OU1's: CD Removal Work Plan Statement of Work [SOW (EPA 1997)]; the CD Action Memorandum [AM (EPA 1996)]; Final Removal Design Report [FRDR (EMC^2 2003b)]; and Removal Action Work Plan [RAWP (EMC^2 2003c)].

SOW Section 5.1.2 directs that the RACOR include: a narrative summary of construction activities, a construction chronology, a list of construction modifications, pre-certification and certification inspection corrections, and documentation substantiating that the performance standards have been met. EPA's 'Close Out Procedures for National Priorities List (NPL) Sites' (EPA 2000), Exhibit 2-3 provides a guide for the specific contents that should be included in a typical Remedial Action Report. Using the SOW requirements and the EPA Exhibit 2-3 as guidance, the contents of this RACOR include the following:

- Summary of site background conditions, previous actions and the selected remedy;
- Chronology of events describing significant activities conducted at the site during the RA;
- Demonstration that remedial activities were completed consistent with performance standards and construction quality control requirements;
- Report of final inspection outcomes/issues and certifications;
- Summary of operation/monitoring and five year review requirements;
- Summary of project costs;
- Operable unit contact information; and
- References.

1.2 Site Background and History

The SSS is located in Chaffee County, Colorado, about one mile northwest of the City of Salida in Section 25 of Township 50 North, Range 8 East (see Figure 1). The SSS is bound on the north by County Road 150, the east by State Highway 291, and the south and west by the Arkansas River. The SSS was proposed for inclusion to the NPL in February 1992. The SSS covers approximately 120 acres and includes three operable units (OUs) or subsites: the historic smelting operation area (OU1); the Koppers, Inc. site, a former wood treating facility (OU2); and the CoZinCo, Inc. (CoZinCo) facility (OU3). The three OU subsites were established based on historic property ownership. This RACOR, in particular, is focused to the SSS OU1 subsite. Both the former Koppers Inc. and CoZinCo subsites are being, or were addressed under, separate response actions.

The SSS is currently surrounded by a few residences and a variety of industries. Tri-State Generation and Transmission Association, Inc. (Tri-State) operates a substation located approximately midway along the eastern border of the SSS OU1. Butala Construction Company (Butala) is actively quarrying gravel from the valley fill in the west and northwest portion of the SSS OU1. E&R Trucking, Inc., (E&R) which occupied part of the smelter subsite, was a semi-trailer hauling operation. A peat packaging facility, which uses peat hauled in from elsewhere, is located southwest of CoZinCo. Salida Auto Salvage operates a facility open to the public south of CoZinCo.

The SSS OU1 consists of the historic smelting operation area. The Ohio and Colorado Smelting and Refining Company operated the smelter starting in 1902. During its first year of operation, the smelter purchased and processed 1,000 tons per day of ore to produce gold, silver, lead and copper. Smelter operations from 1902 through 1917 included a number of structures and processes. Most notable included the two stacks in use prior to the existing stack structure, ore storage areas, a slag pile and a cinder pile. Construction on the existing stack began in early 1917 and was completed in November of that year. The smelter continued operation until 1919 when financial problems forced the smelter to cease operation. The smelter was sold at auction in 1920; the buyer stripped the facility of machinery, salvage, and brick. The existing 365-foot-high smelter stack, constructed in 1917, was placed on the National Register of Historic Places in 1976. The SSS OU1 has had a number of historic owners. E&R is the current owner of the SSS OU1 property. PDC assumed responsibility as the NTCRA funding Respondent through their acquisition of Cyprus Amax Minerals Company, which had historic ownership ties to the SSS OU1 property. The CD facilitated a cooperative agreement between E&R and PDC that allowed PDC property access to perform the NTCRA implementation.

1.3 Previous Actions

A fund-lead classic emergency removal action (Removal Action #1) was initiated on May 26, 1993, and bottled water was provided to five area rental units due to zinc in the groundwater beneath the CoZinCo subsite. Removal Action #1 was completed on May 23, 1994.

EPA issued a unilateral administrative order (UAO) (Removal Action #2, CERCLA 94-09) on April 28, 1994 to CoZinCo for the purpose of taking over the actions described in Removal Action #1. Violations of the UAO led EPA to assume control of the work. The duration of the UAO was from May 24, 1994 to November 1, 1995.

Phase I of a time-critical removal action (Removal Action #3) was initiated on September 27, 1993 to remove: creosote-contaminated sludge from four residential driveways; lead-contaminated soil from five residential yards; a slag, cinder and debris pile from one residential property; and metal-contaminated soil next to the smelter. The contaminated soils were stockpiled within the SSS OU1 boundary and have previously been referred to as the Existing Waste Stockpile. Two homes were decontaminated from lead and arsenic dust.

Phase II Removal Action #3 continued the actions initiated under Phase I. These actions included: constructing a fence around and reapplying a dust suppression polymer to the Existing Waste Stockpile; removing creosote-contaminated sludge from one more residential property; decontaminating rails removed and stockpiled by the landowner near a residence; removing the surface lead and creosote contamination on the upper terrace of the SSS; and removing the mixture of high lead content cinders and creosote-contaminated material that was located on the banks of the Arkansas River. Phase II was completed on November 1, 1995.

To assist in the activities of Removal Action #3, EPA signed an Administrative Order on Consent (AOC) (CERCLA 95-08) (Removal Action #4) with Butala on January 10, 1995, to provide in-kind services. Butala provided equipment and personnel to assist in the excavation and on-site stockpiling of contaminated soils. Butala's work began on February 27, 1995 and ended on June 8, 1995.

EPA initiated a fund-lead time-critical removal action (Removal Action #5) on November 1, 1995 to provide alternative water supplies to residences affected by the spread of zinc in the groundwater below the CoZinCo facility. Removal Action #5 was completed on February 8, 1996.

EPA conducted community interviews on September 1-2, 1992. A community relations plan was developed, based, in part, upon the results of the community interviews, and finalized on December 15, 1993. Several fact sheets have been published and distributed to the local area to inform the citizenry of EPA's activities at the SSS.

EPA released a Cleanup Proposal, describing the results of the Engineering Evaluation/Cost Analysis of the SSS OU1 and EPA's preferred alternative, to the public in a fact sheet dated September 1995. The public comment period ended on October 5, 1995.

2.0 SSS OU1 AND NTCRA IMPLEMENTATION BACKGROUND

This section describes the primary preconstruction events leading from the point of the CD execution through EPA's approval of the RAWP, the last SOW submittal required before

NTCRA implementation. These preconstruction events and associated milestone dates are detailed in the schedule provided as Figure 2A.

2.1 Description of Selected Remedy

As outlined in the CD's AM, the selected remedy for the OU1 includes containment of impacted soil at the smelter subsite, subsequent implementation of institutional controls and groundwater monitoring. Soils impacted with metals within the smelter subsite were to be excavated and consolidated, along with impacted soils stockpiled on-site from Removal Action #3, under a 24-inch-thick soil cover having an aerial extent of approximately 5-to-15.8 acres. The constituents of concern (COCs) and NTCRA goals and levels for impacted materials excavated and consolidated on-site were as follows:

- Lead – 2,235 milligram per kilogram (mg/kg) or greater; and
- Arsenic – 387 mg/kg or greater.

The final soil cover was to: have a high percentage of clays and silts; be sloped at approximately 3-to-5 percent to promote surface water drainage; and be fertilized and revegetated with native plant species suitable for the project site.

The selected remedy includes institutional controls which would consist of access and property land-use restrictions. The purpose of these institutional controls is to prevent access to the general public and maintain the effectiveness of the NTCRA.

The selected remedy also includes five years of post-construction monitoring of four monitoring wells to evaluate the performance and effectiveness of the RA. As identified in the AM, the purpose of the soil cover system is two-fold: to provide a barrier minimizing exposure to impacted materials; and to minimize infiltration through impacted materials. To evaluate the effectiveness of the soil cover system, one additional monitoring well was to be installed to complete the post-construction monitoring well network. This monitoring well network is intended to provide data to determine the effectiveness of the soil cover system with respect to limiting infiltration and associated transport of COCs and other analytes into groundwater. The soil cover will be considered protective if the well water quality data meets previously determined levels that were set for a range of metal and semi-volatile organic compounds identified in the AM.

2.2 Removal Design Investigation

A Removal Design Work Plan [RDWP (EMC^2-Exponent 2001)] was developed to define plans and schedules for implementation of the removal design tasks as identified in the SOW. EPA and CDPHE approved the RDWP on July 24, 2001. A Design Sampling and Analysis Plan (Exponent 2001), approved by EPA and CDPHE on November 13, 2001, was developed to define the methods and procedures used in the field investigation to complete the NTCRA removal design. The SSS OU1 removal design site investigation work was performed in November–December 2001 and a second phase was initiated in April-May 2002. The results of the site investigation work were summarized in a Design Investigation Report [DIR (Exponent

2003)]. The purpose of the design investigation was to delineate the extent of any remaining lead and arsenic soil impacts throughout the SSS to identify all impacted soil areas that required removal and consolidation within SSS OU1. The results of the DIR were used to delineate the lateral and vertical extent of these soil removal areas. EPA and CDPHE approved the Draft DIR on December 17, 2002 and the Final DIR was submitted in February 2003.

2.3 Removal Design

Based on the results of the removal design investigation work outlined in the DIR and the requirements of the CD's AM and SOW, a Final Removal Design Report (EMC^2 2003b) was prepared to provide the framework (e.g., construction specifications and drawings, health and safety and construction quality assurance (QA)/quality control (QC) requirements) for conducting the NTCRA. The FRDR was approved by the EPA and CDPHE on May 15, 2003.

2.4 Removal Action Work Plan

As required by the CD's SOW, a RAWP was developed to update the RDWP to provide procedures and schedules for effective administration and implementation of the NTCRA and requirements for the NTCRA close-out. The RAWP included a Removal Action Site Health and Safety Plan (SHSP), as required by the SOW, to specify health and safety requirements for the NTCRA implementation.

3.0 SUMMARY OF CONSTRUCTION ACTIVITIES

NTCRA construction activities began in June 2003 and were completed in September 2003. Figure 2B provides an as-built construction schedule, which details the major construction activities and project timeline for the NTCRA.

NTCRA construction activities can be divided into six main phases: (1) Project Start-Up, (2) Site Preparation/Mobilization, (3) Impacted Material Consolidation, (4) Cover Soil Placement/ Channel Construction, (5) Revegetation and (6) Site Cleanup/Demobilization. These six individual construction phases are discussed below.

3.1 Project Start-Up

3.1.1 Removal Action Contractor and Oversight Contractor

PDC solicited bids to perform the NTCRA construction work from several contractors in April 2003. The general contractor bid was awarded to ACA Products, Inc. (RA Contractor) of Buena Vista, Colorado in May 2003. The removal design and NTCRA Oversight Contractor performing the construction oversight/documentation was EMC^2's Denver, Colorado and Phoenix, Arizona offices.

3.1.2 Permits

In accordance with the CD, no on-site permits were required in order to perform the NTCRA construction work. Although not a permit requirement, an Air Pollutant Emission Notice (APEN) was completed for filing with the CDPHE to meet the chemical and action-specific Applicable or Relevant and Appropriate Requirements (ARARs) outlined in the FRDR.

The RA Contractor was responsible for obtaining temporary mining and hauling permits in order to develop and haul material from the off-site borrow area. Prior to start-up of construction activities, PDC developed a Construction Stormwater Management Plan for the NTCRA work prior to mobilization in June 2003, as a requirement of the Colorado Discharge Permit System for potential construction area stormwater discharges.

3.1.3 Access Agreements

Prior to start-up of construction activities, access agreements were obtained from two property owners in order to perform the NTCRA construction work. Butala executed an 'Access Agreement Form' with PDC on June 13, 2003 in order to perform work in Soil Removal Areas 1 and 2. Tri-State executed a 'Conditional Consent To Access' agreement with PDC on June 17, 2003 in order to perform work in Soil Removal Areas 3 and 4. Copies of the executed agreements are provided in Appendix A of this report. Access to allow work within the SSS OU1 smelter subsite (i.e., inside the fenced area containing the Consolidation Area and Soil Removal Areas 5, 6 and 7) was a condition of the CD executed between PDC and E&R and did not require a separate access agreement to perform the construction work. No other access agreements were required to perform the NTCRA construction work.

3.1.4 General Construction Health and Safety Requirements

Health and safety requirements were addressed in the SHSP (EMC^2 2003d). All site personnel were trained regarding the SHSP requirements and required to execute an acknowledgement form that they understood and would abide by the SHSP requirements.

Initially, personal protective equipment (PPE) included a half face, air-purifying respirator, safety boots, coveralls, and gloves were required when working within SSS OU1 soil removal areas and the Consolidation Area for the first week of operations. After the first week, air monitoring results demonstrated that contaminant and dust concentrations were low enough to downgrade PPE to remove the need for half face respirators.

Multiple hazards were present during the SSS OU1 removal action activities. In addition to the SHSP, focused Job Safety Analysis (JSA) forms were developed to inform site workers about specific project-related hazards and the approaches used to protect on-site personnel. JSA forms spelled out specific hazards encountered by on-site personnel for all activities performed during completion of the NTCRA, such as transportation to and from the site, unloading of materials and equipment, performance of specific jobs, operating equipment, and working in the area of equipment. JSA forms were provided to and were required to be read by all on-site personnel.

Extensive ambient, work area (i.e., along the edges of soil removal areas and the Consolidation Area), personnel and real time air monitoring were performed. Section 3.1.4.1 describes this air monitoring.

No major health and safety problems were encountered during construction.

3.1.4.1 Air Monitoring

The SHSP Air Monitoring Plan was used to identify and quantify potential worker exposure at all SSS OU1 RA work locations and to evaluate potential migration of constituents of concern [i.e., metals and particulate matter equal to or less than 10 microns in particle size (PM-10)]. Air monitoring data was used to document the effectiveness of dust suppression techniques and the level of PPE required for on-site personnel.

Clean air and pollution control was met through extensive PM10, real-time, personnel and perimeter (i.e., on the edges of soil removal areas and the Consolidation Area) air monitoring performed. Dust control was maintained through the project duration by use of standard engineering and construction practices such as watering roads and work areas, covering and/or limiting load sizes during transport and staging at the Consolidation Area, restricting vehicle speeds and other best management practices. PM10, real-time and personnel/perimeter air monitoring activities and results are summarized as follows:

- *Ambient Air PM10 and TSP Air Monitoring* - high volume air samples were collected for 24-hour periods along upwind and downwind perimeter locations and analyzed for particulates less than 10 microns wide (PM10), total suspended particles (TSP), arsenic, cadmium, chromium, lead, and zinc. Action levels were as follows: PM10 = 0.15 mg/m^3, TSP = 0.5 mg/m^3, arsenic = 0.005 mg/m^3, cadmium = 0.0025 mg/m^3, chromium = 0.25 mg/m^3, lead = 0.03 mg/m^3, and zinc = 7.5 mg/m^3. Ambient air PM10 and TSP monitoring results are provided in Appendix B-1. No occurrences were reported where concentrations exceeded action levels.
- *Real Time Air Monitoring* – real time air monitoring was performed multiple times per week using a Miniram portable sampling device. The Miniram recorded real time airborne dust concentrations. The action level applied to this monitoring was 1.0 mg/m^3 suspended particles per volume of air. Real time air monitoring results are provided in Appendix B-2. On 6/18/03, 6/20/03, and 7/11/03, real time particulate concentrations exceeded the 1.0 mg/m^3 action level. As a result, additional watering was performed until particulate concentrations were at safe levels.
- *Personnel and Work Area Air Monitoring* – personnel air monitoring was performed for selected equipment operators or workers in and around the active construction site to document that employees were not being exposed to COCs above respective action levels. For each test date a stationary sample was taken at selected work areas where impacted materials were being handled (i.e., at soil removal areas and the Consolidation Area). In addition, samples were also taken from monitors placed on the workers themselves. One blank sample was also analyzed for baseline comparison. All sample

results were evaluated against the action levels for arsenic (0.005 mg/m^3), cadmium (0.0025 mg/m^3), chromium (0.25 mg/m^3), lead (0.03 mg/m^3), zinc (7.5 mg/m^3), total particulates (7.5 mg/m^3), quartz, and coal tar pitch volatiles (0.1 mg/m^3). Personnel air monitoring results are provided in Appendix B-3. Coal tar pitch volatile concentrations exceeded the 0.1 mg/m^3 action levels for an equipment operator and truck drivers wearing the personnel air monitor. Operations for the equipment operator and truck driver were evaluated and as there were no coal tar pitch volatile action level exceedences for personnel monitored on the ground, it was considered that the elevated readings were due to heavy equipment/vehicle exhaust and not from coal tar pitch emissions from handling the impacted soils. All other results were below action levels discussed above.

Laboratory back-up sheets for air monitoring results are not included in this report. All laboratory sheets and QA/QC reports are on file with EMC^2's Phoenix office master file.

3.2 Site Preparation/Mobilization

The RA Contractor mobilized to the site on June 9, 2003 and began setup of temporary office facilities, electric power and water. Site preparation work involved site-wide surface water management and erosion control. Surface water management and erosion controls implemented included silt fence, sediment traps, check dams, minor temporary regrading and other measures to prevent or reduce surface water runoff during construction activities. On June 11 and 12, 2003, silt fencing was placed along the entire southern section of the existing fenceline of the smelter subsite to contain sediment in surface water runoff during construction activities.

3.3 Impacted Material Consolidation

The demolition debris, soils with elevated metals concentrations within the smelter subsite, a small volume of smelter impacted materials located on the historic wood treating subsite and an Existing Waste Stockpile of impacted soils from a previous removal action, were excavated and consolidated within a Consolidation Area located within the SSS OU1 boundary, as described below.

3.3.1 Existing Waste Stockpile Regrading

Located within the designated Consolidation Area footprint was a historical Existing Waste Stockpile of impacted material generated from OU2 remedial action activities. This stockpile contained approximately 37,000 cubic yards (CY) of material. Prior to regrading the Existing Waste Stockpile, several existing structures within the Consolidation Area footprint required demolition. Existing structures located within the Consolidation Area footprint that were demolished included a one-story wood-frame 1,200-square foot building, a small 30-square foot wood shed, and miscellaneous concrete footings, foundations and structures. From June 16, 2003 through July 3, 2003, an estimated 23,000 CY of impacted material was leveled from the Existing Waste Stockpile and regraded/placed within the Consolidation Area footprint. Approximately 14,000 CY of the Existing Waste Stockpile was left in place, since it was already located within the footprint of the Consolidation Area. The regrading work was performed using dozers placing maximum nine-inch-thick loose lifts, or the minimum allowed by particle size or

existing demolition debris. Each lift was compacted with a minimum of two passes using a pad-foot vibratory roller. All lifts were compacted to 90 percent of the material's maximum dry density, at +/- 3 percent of the material's optimum moisture content. The final lift of impacted material was compacted to 95 percent of the material's maximum dry density, at +/- 3 percent of the material's optimum moisture content.

3.3.2 Soil Removal Areas

From June 16, 2003 through June 27, 2003, impacted material from seven removal areas was excavated and consolidated along with the Existing Waste Stockpile within the Consolidation Area. Dozers were used to excavate the soil removal areas and stockpile the material for hauling to the Consolidation Area. Front-end loaders and backhoes were used to load the material into dump trucks for transport and placement at the Consolidation Area. Table 1 below summarizes the approximate quantity of impacted material excavated from each removal area:

Table 1 – Soil Removal Areas Summary

Area	Excavation Quantity (CY)
Soil Removal Area 1	189
Soil Removal Area 2	296
Soil Removal Area 3	2,771
Soil Removal Area 4	288
Soil Removal Area 5	748
Soil Removal Area 6	691
Soil Removal Area 7	483
Total	**5,466**

Pre-determined excavation depths were established for the soil removal areas based on soil sample results presented in the DIR. Final depths of excavation were determined from verification sampling. Following excavation to the pre-determined depth, verification sampling was performed to ensure that all impacted material had been removed from the soil removal areas. Results of the verification sampling is discussed in Section 4.2.2. Upon completion of excavation and verification sampling, all soil removal areas were backfilled with clean borrow soils, imported from an off-site borrow area located approximately five miles west of Poncha Springs, Colorado. Geotechnical, environmental and agricultural testing was performed to determine if the soils were suitable as an NTCRA construction material and capable of sustaining vegetation. Imported cover soil testing and analytical results are discussed in Section 4.2.1. Approximately 5,466 CY of clean imported borrow soil was hauled and placed in the soil removal area excavations to restore the areas to original grade. All soil removal areas were revegetated, as described below.

3.4 Cover Soil Placement/Channel Construction

Once all impacted materials were consolidated and regraded within the Consolidation Area, surface water channel construction and cover soil placement followed. These activities are discussed below.

3.4.1 Channel Construction

From July 9, 2003 through July 18, 2003, the surface water channel, located along the north and west side of the Consolidation Area, was constructed as a minimum two-foot deep, triangular channel sloped at approximately 1.17 percent. The purpose of the surface water channel is to capture and divert all upgradient surface water run-on around the Consolidation Area. The surface water channel will reduce long term Operation and Maintenance (O&M) of the soil cover system by preventing upgradient watershed surface water from flowing across the Consolidation Area. A discharge apron was constructed at the end of the surface water channel on July 31, 2003, which consisted of rock riprap material placed over a geotextile. The purpose of the discharge apron is to dissipate and transition concentrated surface water flow from the channel into existing natural drainage downgradient of the Consolidation Area.

A dozer and trackhoe was used to construct the surface water channel. General fill was used to construct the surface water channel and surface water channel berm and this fill adhered to the material specifications outlined for cover soil. The majority of the surface water channel was constructed in areas of cut requiring excavation and regrading to form the channel subgrade. All cut materials for channel work were placed in the Consolidation Area under the two foot soil cover. The channel subgrade was over-excavated to allow for placement of a minimum six inch topsoil layer on the west and north side of the channel centerline and a minimum 24 inch cover soil layer on the east and south side of the channel centerline. Approximately 12 CY of 6-inch D50 riprap spread over two layers of 7-ounce nonwoven geotextile was used to construct the discharge apron at the outlet of the surface water channel. The as-built channel length is 745.5 feet and the overall channel slope is 1.17 percent. Following construction, the surface water channel was revegetated as described below.

3.4.2 Cover Soil Placement

From July 7, 2003 through August 1, 2003, a 24-inch-thick-soil cover layer was placed over the entire surface of impacted material within the Consolidation Area and to the centerline of the surface water channel. The as-built Consolidation Area has an aerial extent of approximately 4.73 acres, including the top cover surface and side slopes. The soil cover system was comprised of a single 24-inch-thick layer of soil material characterized as sandy loam in accordance with the U.S. Department of Agriculture (USDA) textural classification. All cover soil material was imported using haul trucks from the Poncha Springs borrow area. Cover soil was placed using dozers in a minimum of three 8-inch lifts. Compaction of cover soil was performed by dozer tracking with a minimum of two passes per lift. Based on 'before and after' surveys of the Consolidation Area, approximately 16,861 in-place CY of cover soil was hauled and placed at the Consolidation Area.

The Consolidation Area's top cover surface was sloped at a grade of approximately one percent to promote surface water run-off and minimize erosion. The AM indicated that the soil cover would be sloped at 3-to-5 percent. However, SOW Section 4.4.1 allowed for the results of a hydrologic model to guide the design of the cover system, "which may not conform to the exact specifications outlined in the AM." Based on hydrologic modeling outlined in the FRDR, the difference in infiltration reduction for a 24-inch-thick soil cover system is statistically insignificant when comparing a one percent versus five percent grade. Therefore, a one-percent grade was used for the top of the Consolidation Area. The Consolidation Area's side slopes were constructed at an approximately four-horizontal-to-one vertical slope.

Following cover soil placement, the final operation of dozer tracking was performed up and down the slopes such that all internal track marks were perpendicular to the direction of the slope. The final surface was graded smoothly into adjacent topography to promote run-off and minimize ponding/puddling of surface water. Grading was performed such that surface water run-off flows primarily to the south to mirror pre-construction drainage conditions.

3.5 Revegetation

The Consolidation Area, Soil Removal Areas 2, 3, 4, 5, 6 and 7 and all disturbed areas were revegetated by hydroseeding following the completion of cover soil placement. These areas were fertilized and seeded with native perennial grass and plant species suitable for the project site. Soil Removal Area 1 was not revegetated at the request of the property owner, Butala.

Revegetation work was performed from September 16, 2003 through September 18, 2003. Revegetation activities for the Consolidation Area and on-site and off-site soil removal areas included hydraulic seeding using seed mix, fertilizer and mulch. Revegetation operations were performed in two primary stages in the following order: a) seedbed preparation; and b) hydraulic application of seed, fertilizer, mulch and tackifier, as required by the application type.

For hydroseeding, seedbed preparation was by dozer tracking to provide an adequate seeding media for hydraulic seeding. Dozer tracking was completed prior to seeding and along the contour to prevent erosion. Excessively tight soils were loosened to a minimum depth of 6 inches to facilitate seed germination. Disking, harrowing, or tilling of the soil was done at right angles to the natural flow of water on the slopes, unless otherwise directed. Seedbeds were examined to determine if an adequate seedbed had been prepared prior to commencement of seeding operations.

Due to the limited availability in September 2003 of specific seed types specified in the FRDR, the FRDR seed mix was revised to include two seed substitutions as recommended by the Colorado State University (CSU) Forest, Rangeland and Watershed Stewardship Department (FRWSD). The FRDR seed mix was revised as follows: western wheatgrass (agropyron smithii) was used as a substitute for mutton bluegrass (poa fenderleriana) and slimstem muhly (muhlenbergia fillculmis); and sulfur buckwheat (erigonum umbellatum) was used as a substitute for annual buckwheat (eriogonum annum). Upon further review of the FRDR seed mix, the CSU FRWSD also recommended that pine needlegrass (achantherum pinetorum) be removed from the

seed mix altogether since it would not be successful in growing at the altitude of Salida. Table 2 below provides the final seed mix that was used for revegetation of the Consolidation Area, soil removal areas and all disturbed areas:

Table 2 - Final Seed Mix

Species	Common Name	Percent	oz/acre	lbs/acre
Poa secunda	Sandberg bluegrass	5.5	1.1	0.070
Koeleria macrantha	Prairie junegrass	16.7	1.7	0.104
Achnatherum hymenoides	Indian ricegrass	11.1	10.0	0.624
Hesperostipa comata	Needleandthread	11.1	2.2	0.139
Bouteloua gracilis	Blue grama	11.1	0.6	0.035
Sporobolus cryptandrus	Sand dropseed	5.5	1.1	0.070
Agropyron smithii	Western wheatgrass	11.1	14.1	0.879
Elymus elymoides	Bottlebrush Squirreltail	16.7	2.8	0.174
Artemisia frigida	Fringed sagebrush	5.6	1.1	0.070
Ribes cereum	Wax currant	2.8	1.1	0.070
Eriogonum unbellatum	Sulfur Buckwheat	2.8	1.9	0.117
	TOTAL	**100.0**	**37.7**	**2.352**

Based on borrow soil analyses performed by the CSU Soil, Water and Plant Testing Laboratory, fertilizer was applied at a rate of 40-pounds-per-acre nitrogen, 60-pounds-per-acre phosphorous and 40-pounds-per-acre potassium. The seed mix was applied at a rate of 2.352 pounds-per-acre as shown in Table 2, above. Per the Construction Specifications, cellulose mulch was applied at a rate of 2,000 pounds-per-acre and tackifier was applied at a rate of 40 pounds-per-acre. Based on boundary surveys of the revegetated areas, approximately 10.8 acres were revegetated.

3.6 Site Cleanup/Demobilization

The RA Contractor initially demobilized all construction equipment and temporary office facilities that were no longer required for the project during the week of August 4, 2003. Final demobilization occurred after revegetation activities were completed on September 18, 2003. As part of site cleanup, all temporary access/haul roads were removed and reclaimed following project completion. Final reclamation activities included regrading the areas to pre-existing conditions and revegetating all staging and other areas disturbed by the construction work. Prior to completing demobilization, all rubbish and debris generated by construction operations, all

equipment, surplus materials, supplies and incidentals used for project work were removed from the site.

3.7 Construction Modifications, As-Built Drawings and Project Photographs

During the NTCRA construction, several minor field modifications were made that varied from the Construction Specifications outlined in the FRDR. However, overall requirements of the selected remedy as designed in the FRDR were achieved. Specific construction modifications are summarized as follows:

- Surface Water Channel Slope – since the manner in which the RA Contractor regraded the impacted soils required an additional one foot of cover soil material to be placed in the northeast corner of the Consolidation Area to achieve the final one-percent final surface slope, the starting mean sea level elevation of the surface water channel was revised from 7141 to 7142.7, changing the overall surface water channel slope from 1.00% to 1.17%;
- Surface Water Channel Length - the final surface water channel length was reduced to 745.5 feet, approximately 125 feet shorter than designed in the FRDR in order to allow continued vehicular access through the existing fence gate (without relocating the gate) and also to accommodate lesser as-built quantities (i.e., versus design quantity estimates) required because the Consolidation Area southern extent was shifted to the north approximately 30 feet;
- Surface Water Channel Alignment - the surface water channel alignment was field-fit and shifted to the east to avoid an existing guy wire from an existing electric power pole in the northwest corner of the Consolidation Area;
- Consolidation Area – consistent with the FRDR allowance to field-fit the Consolidation Area, the southern toe of the Consolidation Area was shifted north approximately 30 feet from the design point because of the lesser than estimated final quantity of impacted materials placed in the Consolidation Area. This field modification reduced the size of the Consolidation Area by approximately 0.4 acres;
- Consolidation Area Cover Soil Thickness – due to inadequate grade control in constructing the final impacted material surface on the northern half of the Consolidation Area, more than two feet of cover soil was required on the northern half of the Consolidation Area in order to achieve the designed minimum top surface slope of one-percent;
- Surface Water Discharge Apron – two layers of 7-ounce nonwoven geotextile were placed beneath the 6-inch D50 rock riprap material rather than one layer of 8-ounce nonwoven geotextile as designed. This material substitute was approved in order for the RA Contractor to use existing geotextile material that was readily available that met the project requirements. Two layers of 7-ounce geotextile provides adequate separation and filtration beneath the rock riprap material;

- Soil Removal Area 7 – Soil Removal Area 7 was extended north approximately 40 feet to the as-built southern toe of the Consolidation Area because the DIR indicated that impacted material existed laterally through this area of the smelter subsite. The Soil Removal Area 7 extension area was excavated to a depth of 6 inches consistent with the excavation depth of the original boundary of Soil Removal Area 7;
- Soil Removal Area 6 – based on soil verification results, Soil Removal Area 6 was excavated to 24 inches rather than six inches as designed. Verification sampling indicated that impacted material existed at a depth of six inches. EPA and CDPHE approved to excavate Soil Removal Area 6 to the maximum required depth of 24 inches based on the 24-inch excavation depth of adjacent Soil Removal Area 5;
- Seed Mix Substitutions – as discussed in Section 3.5 above, the final seed mix for use in revegetating the Consolidation Area, Soil Removal Areas and disturbed areas was revised from the design seed mix due to the unavailability of certain seed species as a result of crop failures.

All construction modifications are reflected in the As-Built Construction Drawings, which are included in Appendix C. The As-Built Construction Drawings provide documentation that the NTCRA was constructed as designed and meets the requirements of the FRDR. Specific As-Built Construction Drawings that were developed include the following sheets:

- Sheet 1 - Title Sheet;
- Sheet 2 - As-Built Site Conditions;
- Sheet 3 - As-Built Soil Removal Areas and Revegetation Documentation;
- Sheet 4 - As-Built Profile, Cross-Sections and Details; and
- Sheet 5 - As-Built Consolidation Area Plan View, Soil Cover Thickness and Test Pit Documentation.

To further document the NTCRA construction activities, project photographs are provided in Appendix D to document site conditions before, during and after construction for each of the primary work areas.

3.8 Chronology of Events

Figure 2B provides a detailed chronology of major construction activities and milestones and associated dates starting with the execution of the NTCRA Pre-Construction Meeting and ending with the Final Walk-Through and Certification Inspection.

4.0 PERFORMANCE STANDARDS AND CONTRUCTION QUALITY CONTROL

Performance standards for the project were specified in the Action Memorandum and construction quality control requirements were specified in the FRDR's Construction Specifications and Drawings and Construction QA/QC Plan.

4.1 Performance Standards Specified in the Action Memorandum

Performance standards are defined as the soil cleanup standards and other measures of achievement of the SSS OU1 NTCRA remedial action goals as set forth in Section V of the AM and Section 4.7.3 of the SOW. Table 3 below outlines the performance standards compared with the performance results.

Table 3 – Performance Standards Compared with Performance Results

Performance Standards (Remedial Action Objectives/Cleanup Goals)	Performance Results
Excavate and consolidate all metals-impacted soils within the smelter subsite (OU1) and historic wood-treating subsite (OU2) with levels above the soil cleanup standards of 2,235 mg/kg for lead and 387 mg/kg for arsenic, along with impacted soils stockpiled on-site under a 24-inch-thick soil cover system having an aerial extent of 5 to 15.8 acres.	Soil sampling identified seven soil removal areas that were above soil cleanup standards. All metals-impacted soils above these soil clean-up standards were excavated and consolidated, along with the Existing Waste Stockpile, under a 24-inch-thick soil cover system having an aerial extent of 4.73 acres.
Construct a soil cover system sloped at 3-to-5 percent comprised of an 18-inch-thick infiltration reduction layer overlain with 6-inch-thick topsoil layer capable of sustaining vegetation.	In accordance with the EPA-approved FRDR, the cover system was sloped at one percent and was comprised of a 24-inch-thick sandy loam layer capable of sustaining vegetation. Based on hydrologic computer modeling presented in the FRDR, the soil cover system is predicted to provide nearly 100% infiltration reduction.
Construct a soil cover system which avoids features which concentrate runoff drainage or allows surface water run-on from off-site areas.	A surface water channel was constructed along the north and west side of the soil cover system to divert surface water run-on from off-site areas around the Consolidation Area.
Fertilize and seed the soil cover system with perennial grass species suitable for the project site.	The soil cover system was hydroseeded with fertilizer, tackifier, mulch and native perennial grass species suitable for the project site.
Inspect the surface of the soil cover system on a periodic basis and make repairs where damage arises.	In accordance with the FRDR's O&M Plan, the surface of the soil cover system will be inspected on a periodic basis for five years and repairs made where damage arises.
Maintain institutional controls including access and property land-use restrictions. Access restrictions to include maintaining an existing fence around the perimeter of the smelter subsite.	The existing fence around the smelter subsite has been maintained and will be inspected on a periodic basis. Additional institutional controls implemented include a restrictive covenant running with the land allowing future access to evaluate the remedy effectiveness and perform other actions as may be necessary to protect the remedy, as well as identifying the extent of the Consolidation Area and continued use of the site as industrial.

Table 3 – Performance Standards Compared with Performance Results

Performance Standards (Remedial Action Objectives/Cleanup Goals)	Performance Results
Demonstrate that the soil cover system is effective by showing that site groundwater quality data meets the protective levels set forth in Section V.A.1 of the AM.	Per the FRDR's Post-Construction Monitoring Plan, one additional monitoring well was installed to complete the monitoring well network and the first sampling event occurred in September 2003. Monitoring for the COCs identified in the AM and SOW will continue for five years to determine if the soil cover system is effective.
Comply with all FRDR chemical-specific, action-specific and location-specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considereds (TBCs) during NTCRA construction activities.	Per the ARARs identified in the FRDR, an APEN was filed with CDPHE, decibel levels were maintained below maximum levels and water well installation regulations were followed. In addition, extensive air monitoring was performed to limit exposure of workers to airborne particulate matter and metals and to document the effectiveness of dust suppression techniques and the level of PPE required for on-site personnel. SHSP and Occupational Safety and Health Administration requirements were met through use of PPE and verification of appropriate worker training/certifications.

4.2 Construction Quality Control Documentation

Construction quality control requirements were identified in the FRDR's Construction Specifications and Drawings and Construction QA/QC Plan (EMC^2 2003a). The following sections discuss the construction QA/QC requirements maintained for each of the major NTCRA components to document that the NTCRA components were constructed to meet the project specifications.

4.2.1 Borrow Area Material Requirements/Testing

The Construction Specifications required that the borrow area material to be used as cover soil for the Consolidation Area and backfill for the soil removal areas be characterized as a loam or a sandy, silty or clay loam in accordance with the USDA's textural classification. Seven soil classification tests were performed at different locations in the borrow area to document that these requirements were met. If soil sample results did not indicate a loam, sandy, silty or clay loam USDA classification, that portion of the borrow area was not used as a cover soil source. Results of the cover soil sampling are provided in Appendix E-1. As shown in Appendix E-1, one sample collected from the southwest area of the borrow area (i.e., Sample ID - H4) was classified as a loamy sand material, which did not meet the project specifications, and was therefore not used as a cover soil source. All other sampled locations of the borrow area were classified as a sandy loam material, which met the project specifications and were used as cover soil and backfill material. One additional soil classification test was performed on a second borrow source that provided material for several areas determined by survey to have less than the two foot minimum Consolidation Area soil cover thickness. This additional sample indicted the second borrow source was classified as a sandy loam material and therefore acceptable to use as

cover soil material. Appendix E-1 provides a summary table as well as the laboratory reports of all soil classification tests performed on samples collected from the two borrow sources.

4.2.2 Soil Removal Areas Excavation, Verification Sampling and Backfilling

Soil removal areas were excavated and backfilled with clean soil to either a six-inch or 24-inch depth. The depth of excavation and backfill was verified in the field by the On-Site Engineer using physical checks (e.g., grade level checks, grade staking, stringline measurements across the excavation, etc.) of the open excavation and the field checks were noted in the field log book.

Verification (confirmation) sampling was performed to ensure that all impacted material was removed from the five soil removal areas that required excavation to a depth of six inches (i.e., Soil Removal Areas 1, 2, 4, 6 and 7). Soil removal areas 3 and 5 were scheduled to be excavated to the maximum depth of 24 inches, thereby not requiring verification sampling. After soil was removed to a depth of six inches in the five, six-inch depth removal areas, two composite samples, comprised of five closely located grab sub-samples, were randomly collected from each removal area and analyzed by AZC Laboratories, Inc of Steamboat Springs, Colorado to document that all impacted material had been removed. Results of verification sampling are provided in Appendix E-2. As shown in the sample summary table included in Appendix E-2, arsenic and lead concentrations were below soil cleanup standards at all soil removal areas except Soil Removal Area 6. Soil Removal Area 6 had arsenic and lead concentrations of 1,030 mg/kg and 16,100 mg/kg, respectively, both of which exceed the soil cleanup standards of 387 mg/kg for arsenic, and 2,235 mg/kg for lead. Rather than excavate an additional six inches of material and then collecting verification samples at the 12-inch depth, the EPA and CDPHE approved excavating Soil Removal Area 6 to the maximum required total depth of 24 inches, consistent with the 24-inch excavation depth of adjacent Soil Removal Area 5. No backfilling of the soil removal areas took place until verification sample analytical results indicated that all impacted material had been removed from these five soil removal areas. Following verification sampling, Soil Removal Areas 1, 2, 4, and 7 were backfilled with six inches of clean cover soil and Soil Removal Areas 3, 5 and 6 was backfilled with 24 inches of clean cover soil. Appendix E-2 provides the laboratory analytical results sheets for all verification sampling that was performed.

4.2.3 Impacted Material Consolidation and Compaction Testing

Construction QA/QC procedures during consolidation, placement and regrading of impacted materials in the Consolidation Area included: verifying placement of material lift thicknesses through periodic visual grade checks using standard surveying, or rod and level procedures; and verifying that the compaction and moisture content of every acre-lift of fill material placed met the project specifications. Each lift was compacted with a minimum of two passes using a pad-foot vibratory roller, as required by the Construction Specifications, to form a dense fill as determined through visual inspection of the soil surface by the On-Site Engineer. Inspections involved walking the placed surfaces of the Consolidation Area, as well as observation of construction equipment across the Consolidation Area.

In accordance with the Construction Specifications, all impacted material was compacted in nine-inch-maximum lifts to 90 percent of the material's maximum dry density, at ± 3 percent of the material's optimum moisture content (i.e., as determined by the American Society of Testing and Materials D-698, Standard Proctor test). The final lift was compacted to 95 percent of the material's maximum dry density, at ± 3 percent of the material's optimum moisture content.

Field compaction testing was performed by Mountain Engineering and Testing, Inc. of Salida, Colorado using a Troxler nuclear density gauge. Prior to field compaction testing, four Standard Proctor tests were performed to determine the maximum dry density and optimum moisture content of the four visually-distinct types of impacted material to be placed in the Consolidation Area. The measured field dry densities and moisture contents were then compared to the proctor results for the applicable soil type in order to determine the percent compaction.

Results of field compaction testing are provided in Appendix E-3. Due to the arid conditions of the project site, the consolidated impacted soils contained relatively low in-situ moisture contents (i.e., less than approximately 3 percent). As a result, initial compaction testing of the first lifts indicated that the addition of water was required in order to achieve the compaction and moisture content specifications. As shown in the summary table in Appendix E-3, Test No. 1 and Test No. 1A were not within 3% of optimum moisture content and therefore did not pass compaction testing. To resolve the problem, additional water was added to the soil using a water truck in this area and the soil recompacted. Test No. 1B confirmed that soil was within specifications. Similarly, final lift Test No. 11 was not within 3% of optimum moisture and was not above the required 95% compaction for a final lift. This lift was reworked with the addition of water and compacted further. Test No. 11A testing results confirmed that this compacted soil was within specifications. All other tests performed met the project specifications on the initial effort to compact the soil. Based on RA Contractor weekly progress reports, approximately 400,000 gallons of water was placed on the Consolidation Area during the impacted materials consolidation phase of the project to moisture condition the impacted materials, as well as maintain dust control.

4.2.4 Surface Water Channel and Apron Construction

Verification of surface water channel construction was performed by the On-Site Engineer using standard surveying, rod and level and physical measurement of channel dimensions and confirmed by the final survey. For the surface channel discharge apron, the RA Contractor installed the geotextile within the discharge apron upon acceptance of the subgrade and apron dimensions by the On-Site Engineer. The accepting surface for geotextile placement was free of cavities, depressions, or projecting rocks. Geotextile overlaps were a minimum of 12-inches on both side and end overlaps. Inspection of overlaps was performed by the On-Site Engineer during geotextile placement to verify compliance with specifications. All overlaps were shingled in the direction of flow. If the geotextile had to be cut to fit the installation, the cuts were made neat, trim, and in a single uniform straight line. All geotextile seams were heat bonded with a propane torch to provide a secure bond between geotextile panels.

The selection and placement of discharge apron rock riprap material met the size and integrity required. Approval of the selected material was inspected by the On-Site Engineer and involved visible checks and blows with a hammer for material integrity. A representative sample of the rock riprap material was hand-measured in the field to document that the material met the project requirements for a 6-inch D50 riprap. In addition, the material supplier (Butala) submitted a letter of certification that the riprap materials ranged in size from 4-to-8 inches. The material supplier for the geotextile, Amoco Fabrics and Fibers Company, also submitted letters of certification for the geotextile material (ProPex 4552) used for the discharge apron. Appendix E-4 provides copies of these letters of certification, documenting the riprap and geotextile materials used for the construction of the discharge apron.

4.2.5 Cover Soil Placement Thickness Checks

The On-Site Engineer was present during all cover soil placement to verify cover soil placement procedures. Cover soil was approved by the On-Site Engineer prior to placement. A two-foot layer of dozer track compacted cover soil was placed over the consolidated impacted material. Verification of cover soil thickness was determined through visual observation, measurement of the open face of the cover soil being placed, or hand dug test pits to confirm placement of two-feet of cover soil. In addition, the intersecting points of a 100-foot-by-100-foot grid were surveyed on the surface of the cover soil layer to ensure that no single point was less than the specified layer thickness of two feet minimum. Sheet 5 of the As-Built Construction Drawings provided in Appendix C provides documentation that the specified two foot cover soil layer thickness minimum was achieved over the entire surface of the Consolidation Area.

4.2.6 Revegetation

As discussed in Section 3.5 above, the CSU Soil, Water and Plant Testing Laboratory evaluated borrow soil quality for revegetation. Based on this information, a 40-60-40 nitrogen-phosphorous-potassium fertilizer application rate (in pounds per acre) was recommended by CSU. The CSU Forest, Rangeland and Watershed Stewardship Department also provided recommendations to revise the original specified seed mix due to the unavailability of specific seed species as discussed in Section 3.5. In order to document that revegetation operations met the project requirements, the On-Site Engineer observed and photographed the revegetation operations, documented the type and amount of fertilizer, seed, mulch and tackifier used and kept notes in the field log book.

Appendix E-5 provides documentation that the revegetation materials meet the project specifications. Items included in Appendix E-5 include the following: CSU's laboratory analytical results and fertilizer recommendations; a letter from Granite Seed Company which certifies that the seed mix is true to label and has been tested by a fully accredited seed testing laboratory using rules sanctioned by the Association of Official Seed Analysts; letters of certification for the fertilizer, mulch and tackifier; and an inventory summary of materials used for the revegetation phase of the project.

5.0 FINAL INSPECTION AND CERTIFICATIONS

5.1 Inspections

The pre-final walkthrough meeting and pre-certification inspection was held on August 12, 2003, with EPA, CDPHE, PDC, EMC^2, and RA Contractor attending. The remaining punch-list items identified at the meetings were as follows:

- Place additional soil cover material to achieve the minimum 2-foot thick soil cover thickness requirement in six deficient areas identified by the final survey of the Consolidation Area; and
- Finish dozer-tracking the surface of the surface water channel in preparation for revegetation.

The RA Contractor completed these punch list items prior to demobilization in September 2003.

The final walkthrough meeting and final certification inspection was held on November 21, 2003, with EPA, CDPHE, EMC^2 representing PDC and the RA Contractor attending. The revegetated surface of the reclaimed Consolidation Area was closely inspected by EPA and CDPHE. Run-off from the upgradient Butala property had created minor erosion at one location on the north slope entering the surface water channel. Channel sediment deposition was noted only in a small, localized area of the surface water channel. A few silt fence panels had sagged or broken. The site entry gate was vandalized and vehicle tire tracks were observed along the Consolidation Area side slopes and top surface. Corrective actions are in progress, as part of routine monitoring and maintenance, to correct these issues and to minimize or prevent future site trespassing to protect the remedy's integrity. No non-conformances or deficiencies were noted during final walkthrough and final certification inspection – all work met or exceeded the FRDR requirements. Following the final walk through, a Remediation Completion Fact Sheet was submitted by PDC for EPA's and CDPHE's use to announce the successful completion of the NTCRA to the public.

6.0 OPERATION AND MAINTENANCE ACTIVITIES

O&M activities planned for the SSS OU1 will consist of groundwater monitoring of four monitoring wells and periodic site inspections for a period of five years.

6.1 Groundwater Monitoring

The Post-Construction Monitoring Plan (Exponent 2002) outlined in the FRDR will consist of five years of groundwater monitoring to demonstrate the integrity of the NTCRA after construction. The monitoring network initially will consist of four shallow groundwater monitoring wells. Three of these wells will be located hydrologically downgradient of the Consolidation Area, and the other will be located upgradient of the Consolidation Area. EPA-MW-1 will be monitored for one or two sampling events to confirm that it is not affected (i.e.,

confirm that it is not located downgradient from the Consolidation Area), after which this well will be used to monitor water levels only.

In accordance with the AM and SOW, samples will be analyzed for 16 parameters identified below. Monitoring will be conducted for a five-year period. Groundwater samples will be collected semi-annually (June and September) for the first two years, and annually (in September) for the following three years. After five years, if it is determined that the soil cover has been effective at limiting migration of the above chemicals to groundwater, post-construction monitoring will cease and the monitoring wells will be abandoned.

Well maintenance will consist of redevelopment of groundwater monitoring wells in the event of siltation of any well. Abandonment of wells that are not part of the groundwater monitoring network may occur immediately after construction of the NTCRA, and wells within the monitoring network may be abandoned on cessation of the monitoring program. Well abandonment will be performed in accordance with the Well Abandonment Plan provided as Appendix A to the RAWP.

All chemical analyses will be performed by a laboratory contracted by PDC and pre-approved by both EPA and CDPHE. Samples will be analyzed for the 16 parameters identified in the AM and SOW. Upon completion of data validation procedures, upgradient and downgradient analytical results will be compared to each other, as well as to the levels set for 12 parameters in the AM. Four additional parameters identified in the SOW to be monitored, for which no protection levels were set, include cadmium, chromium, copper and zinc. Protection levels for the remaining 12 parameters identified in the AM are as follows:

- Arsenic – 0.05 mg/L [maximum contaminant level (MCL)]
- Manganese – 840 μg/L (risk-based level)
- Antimony – 0.006 mg/L (MCL)
- Pentachlorophenol – 0.001 mg/L (MCL)
- Benzo(a)pryene – 0.0002 mg/L (MCL)
- Benzo(b)fluoranthene – 0.092 μg/L (risk-based level)
- Benzo(k)fluoranthene – 0.92 μg/L (risk-based level)
- Chrysene – 9.2 μg/L (risk-based level)
- Dibenz(a,h)anthracene – 0.0092 μg/L (risk-based level)
- Indeno(1,2,3-cd)pyrene – 0.092 μg/L (risk-based level)
- Benz(a)anthracene – 0.092 μg/L (risk-based level)
- Lead – 0.05 mg/L (MCL) (0.015 mg/L – action level/Safe Drinking Water Act).

In accordance with the SOW, after data validation is completed for each monitoring event, a data report will be prepared and provided to EPA and CDPHE within 90 days of the sampling event.

In concert with the sampling events, data reports will be submitted semi-annually for the first two years, and annually for the following three years. Data summary reports will contain the following information:

- A summary of the field sampling effort, including any deviations from the Post-Construction Monitoring Plan.
- A summary of the results of the sampling, including tables of field and analytical data; field notes and chain-of-custody forms will be included as appendices.
- A summary of data validation and data quality.
- A summary of the evaluation of analytical data described above.
- An electronic copy of the laboratory data in ASCII format.

6.2 Site Inspections and Maintenance

The O&M Plan outlined in the FRDR will consist of periodic site inspections for a period of five years to document the integrity of the NTCRA components after construction. Per the O&M Plan, components that will be inspected include the following:

- Consolidation Area Soil Cover System – will be inspected for evidence of stressed or inadequate vegetation, excessive erosion, seeps, gullying, depressions, rills, rutting and exposure of impacted materials.
- Surface Water Channel and Discharge Apron – will be inspected for evidence of stressed or inadequate vegetation, excessive erosion or siltation, buildup of miscellaneous debris and depressions.
- Erosion Control Measures (BMPs) – will be inspected for damage until vegetation is established and BMPs are removed.
- Institutional Controls – will be inspected for damage to fencing and missing signage.
- Groundwater Monitoring Wells – will be inspected for evidence of well casing/concrete pad damage/corrosion.

Inspection checklist forms will be developed and completed during the routine inspections and will include the following information: inspector name, company name, date, time, results of inspection, evidence of erosion, stressed or inadequate vegetation, and any additional observations, list of maintenance or repairs required, evidence of siltation or debris in channel, list of minor maintenance performed during inspection.

Any minor damage to the NTCRA system components will be repaired during routine O&M inspections (e.g., any debris found in the surface water channel will be cleaned out and removed, any damaged fencing or signs will be repaired or replaced). Major corrective measures required (e.g., to repair major erosional damage, gullying, washouts) will be implemented as soon as possible flowing the inspections.

Following construction, periodic O&M inspections will be performed along with the scheduled groundwater monitoring well sampling events or as required based on site conditions for a period of five years. Monitoring status reports, including the O&M inspection checklists, will be prepared and submitted along with Quarterly Progress Reports.

6.3 Institutional Controls

As required by the CD, institutional controls shall be maintained to protect the health and welfare of the users of the property and set conditions that restrict future land use and development activities on the property, as necessary to prevent exposure to impacted materials left on site in the Consolidation Area. The CD required that a 'Declaration of Covenants and Conditions and Restrictions' (CC&Rs) be filed by E&R, the owner of the smelter subsite property. E&R recorded this CC&R declaration with the Chafee County Clerk and Recorder on November 21, 2001. These CC&Rs: are intended to maintain the integrity of the NTCRA; allow access to perform any necessary NTCRA follow-up activities (e.g., inspections, well monitoring, O&M); prohibit residential uses of the property; restrict activities that could adversely effect the NTCRA; restrict access to the general public; and control property transfers such that institutional controls transfer with the land.

Access restrictions include maintaining an existing fence around the perimeter of the smelter subsite. The fence is six-foot high, chain-linked with a barbed-wire top. Fencing and signage will be inspected and maintained on a periodic basis. The protectiveness of this remedy relies upon the continued commercial/industrial use of the property to maintain the integrity of the soil cover system.

7.0 SUMMARY OF PROJECT COSTS

Table 4 below provides a summary of the costs for each major cost element and a comparison of the actual project costs with the AM estimate of project costs.

Table 4 – Estimated vs. Actual Project Costs

Cost Item	AM Estimate (1996 $$)	Actual Cost (2003 $$) (1)
Pre-Consent Order Costs	Not Provided	$130,500
Direct Capital Construction Costs	$310,100	$398,000
Indirect Capital Costs (2)	$186,060	$593,000
Operation and Maintenance Costs (3)	$891,576	$99,000
Total	**$1,387,736**	**$1,220,500**

AM = Action Memorandum, dated September 27, 1996.

Notes:

(1) 'Actual Cost' are from the point of Consent Decree execution through final inspection completion, excluding Pre-Consent Order costs.

(2) 'Indirect Capital Costs' include engineering, science, administrative and legal, contractor indirects and contingency (contingency included in 'AM Estimate' only).

(3) 'AM Estimate' O&M costs include present worth of 30-year operation and maintenance period. Costs include administrative and legal, environmental monitoring, and site maintenance. 'Actual Cost' O&M costs is estimated projecting a cost for five years, with no present value consideration.

8.0 FIVE YEAR REVIEW REQUIREMENTS

Because the remedy results in impacted materials remaining on-site which prevents unrestricted land use, a review of the NTCRA will be conducted in September 2008 to document that the remedy continues to provide adequate protection of human health and environment. PDC will develop and issue this Five Year Review Report to the EPA and CDPHE.

9.0 OPERABLE UNIT CONTACT INFORMATION

As recommended by the EPA Close Out Procedures for NPL Sites guidance, this section includes the names and contact information for the EPA, CDPHE, PDC and RA representatives involved with the NTCRA.

PDC Project Manager:

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Phoenix, AZ 85004
Phone: (602) 366-8592

EPA Project Manager:

Mr. Stan Christensen
Remedial Project Manager
EPA Region 8
999 18th Street, Suite 300
Denver, CO 80202
Phone: (303) 312-6694

CDPHE Project Manager:

Mr. Martin O'Grady
Geologist
Colorado Dept. of Public Health & Environment
4300 Cherry Creek Drive South
Denver, CO 80246
Phone: (303) 692-3366

Design/Construction Oversight Contractor Project Manager:

Mr. Moe Pasha
Project Coordinator
EMC²
6909 South Holly Circle, Suite 202
Centennial, CO 80112
Phone: (303) 384-0430

NTCRA Contractor Project Manager:

Mr. Matt Litvay
Project Manager
ACA Products, Inc.
P.O. Box 1887
Buena Vista, CO 81211
Phone: (719) 395-3790

10.0 REFERENCES

EMC^2 and Exponent, 2001. Removal Design Work Plan, Smeltertown Superfund Site Operable Unit No. 1 Salida, Colorado. July 6, 2001.

EMC^2, 2003a. Construction Quality Assurance/Quality Control Plan, Smeltertown Superfund Site, Operable Unit No. 1. April 9, 2003.

EMC^2, 2003b. Final Removal Design Report, Smeltertown Superfund Site Operable Unit No. 1 Salida, Colorado. April 11, 2003.

EMC^2, 2003c, Removal Action Work Plan, Smeltertown Superfund Site Operable Unit No. 1 Salida, Colorado. May 30, 2003.

EMC^2, 2003d. Removal Action Site Health and Safety Plan, Smeltertown Superfund Site Operable Unit No. 1. June 11, 2003.

EPA, 1995. Final Engineering Evaluation/Cost Analysis Feasibility Study, Smeltertown Superfund Site – Smelter Subsite. July 14, 1995.

EPA, 1996. Action Memorandum/Enforcement, Request for Removal Action at Smeltertown Smelter Subsite (Operable Unit #1), Salida, Chaffee County, Colorado, signed September 27, 1996.

EPA, 1997. Smeltertown Superfund Site (OU NO.1) Removal Work Plan Statement of Work. August 1997.

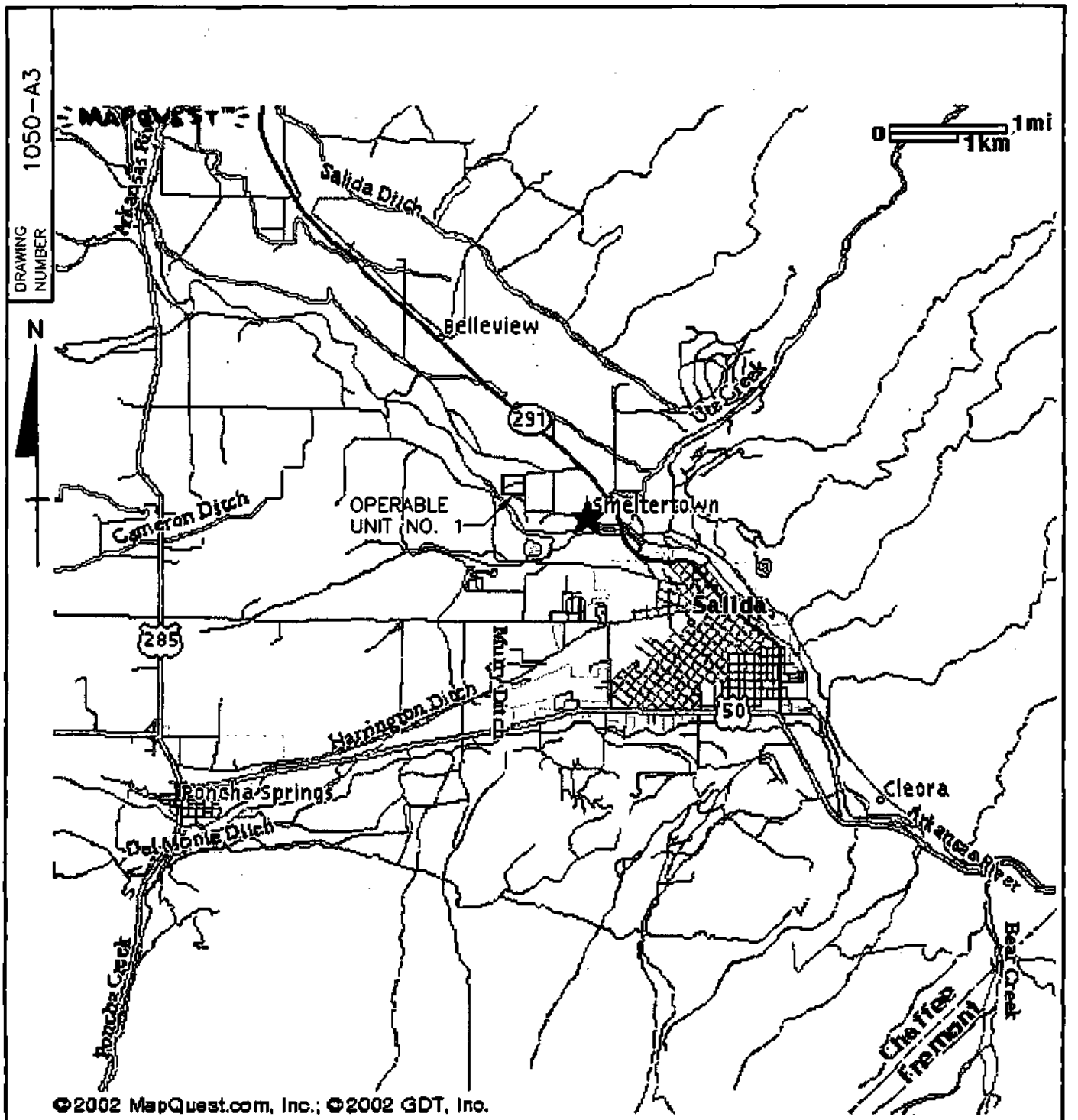
EPA, 2000. EPA 540-R-98-016, OSWER Directive 9320.2-09A-P, Close Out Procedures for National Priorities List Sites. January 2000.

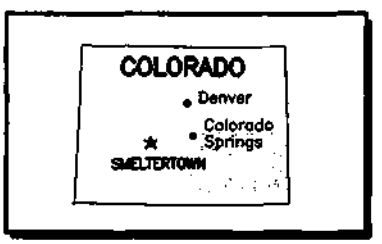
Exponent, 2001. Non-Time Critical Removal Action Design, Sampling and Analysis Plan: Smeltertown Superfund Site, Operable Unit No. 1, Salida, Colorado. October 2001.

Exponent, 2002. Post-Construction Monitoring Plan for the Non-Time Critical Removal Action: Smeltertown Superfund Site, Operable Unit No. 1. December 2002.

Exponent, 2003. Design Investigation Report: Smeltertown Superfund Site, Operable Unit No. 1, Salida, Colorado. February 14, 2003.

DRAWING NUMBER 1050-A3





SITE LOCATION MAP
SMELTERTOWN SUPERFUND SITE
OPERABLE UNIT NO. 1
SALIDA, COLORADO

PREPARED FOR

PHELPS DODGE CORPORATION
PHOENIX, ARIZONA

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
1	9/26/03	ISSUED FOR REMOVAL ACTION CLOSE-OUT REPORT.	C.L.V.	T.S.L.	J.M.F.

Emc² Serving the Engineering and Environmental Needs of Industry
Offices in Bozeman MT, Denver CO, and Phoenix AZ

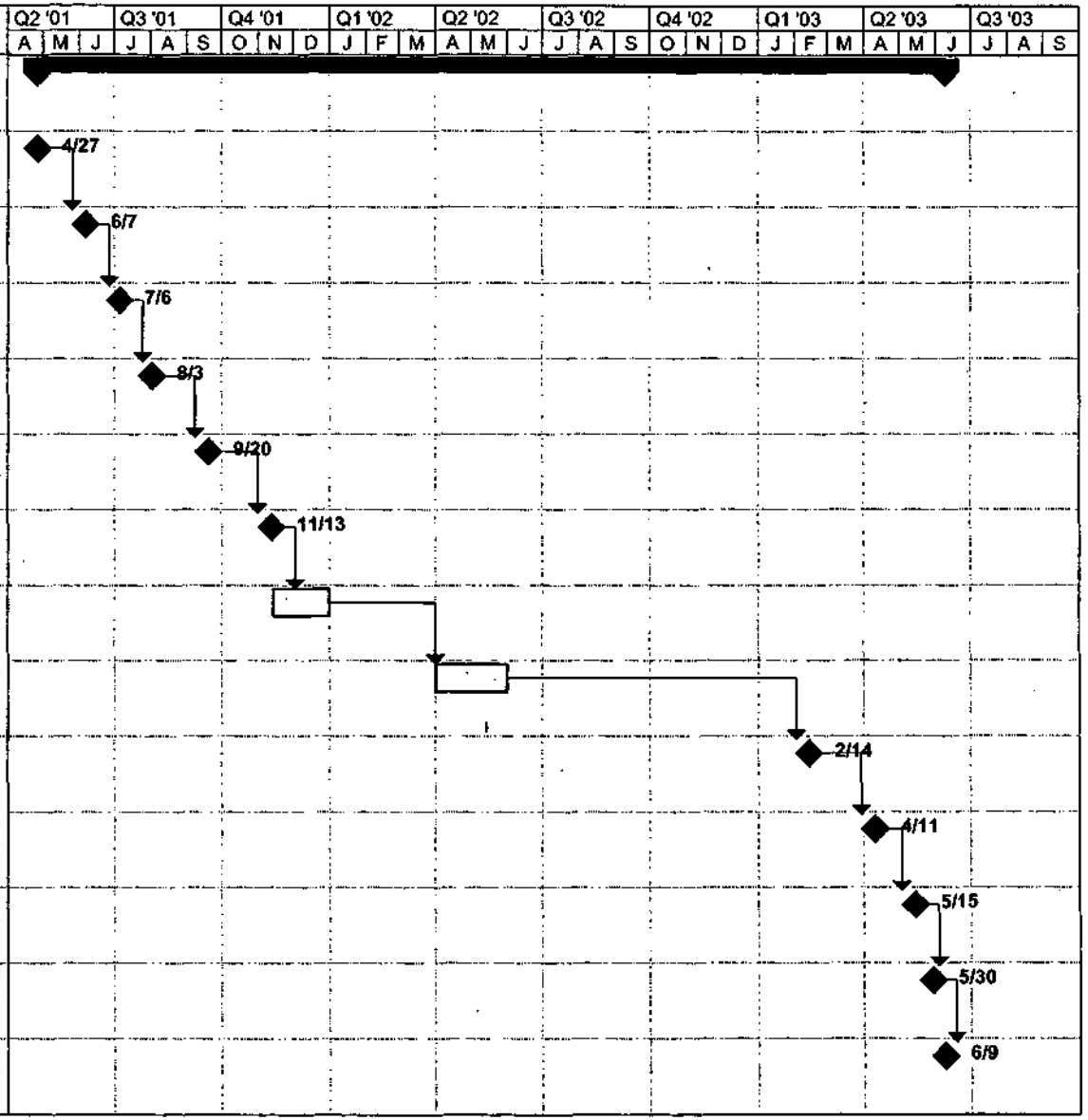
DATE: 9/26/03
SCALE: N.T.S.

FIGURE 1

DRAWING NUMBER 1050-A3

Figure 2-A
Pre-Construction Chronology of Events Project Schedule
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

ID	Task Name	Duration	Start	Finish
1	**NTCRA Pre-Construction**	552 days	Fri 4/27/01	Mon 6/9/03
2	Consent Decree for the OU1 Executed	1 day	Fri 4/27/01	Fri 4/27/01
3	'Notice to Proceed' Correspondence Submitted by EPA t o PDC	1 day	Thu 6/7/01	Thu 6/7/01
4	Removal Design Work Plan (RDWP) Submitted	1 day	Fri 7/6/01	Fri 7/6/01
5	Design Sampling and Analysis Plan (DSAP) and Field Investigation Quality Assurance Plan (QAPP) Submitted	1 day	Fri 8/3/01	Fri 8/3/01
6	RDWP Approved	1 day	Thu 9/20/01	Thu 9/20/01
7	DSAP and QAPP Approved	1 day	Tue 11/13/01	Tue 11/13/01
8	Phase I of Removal Design Investigation Soild Sampling Completed	34 days	Wed 11/14/01	Mon 12/31/01
9	Phase II of Removal Design Investigation Soild Sampling Completed	45 days	Mon 4/1/02	Fri 5/31/02
10	Design Investigation Report (Final) Submitted	1 day	Fri 2/14/03	Fri 2/14/03
11	Final Removal Design Report (FRDR) Submitted	1 day	Fri 4/11/03	Fri 4/11/03
12	FRDR Approved	1 day	Thu 5/15/03	Thu 5/15/03
13	Removal Action Work Plan (RAWP) Submitted	1 day	Fri 5/30/03	Fri 5/30/03
14	RAWP Approved	1 day	Mon 6/9/03	Mon 6/9/03



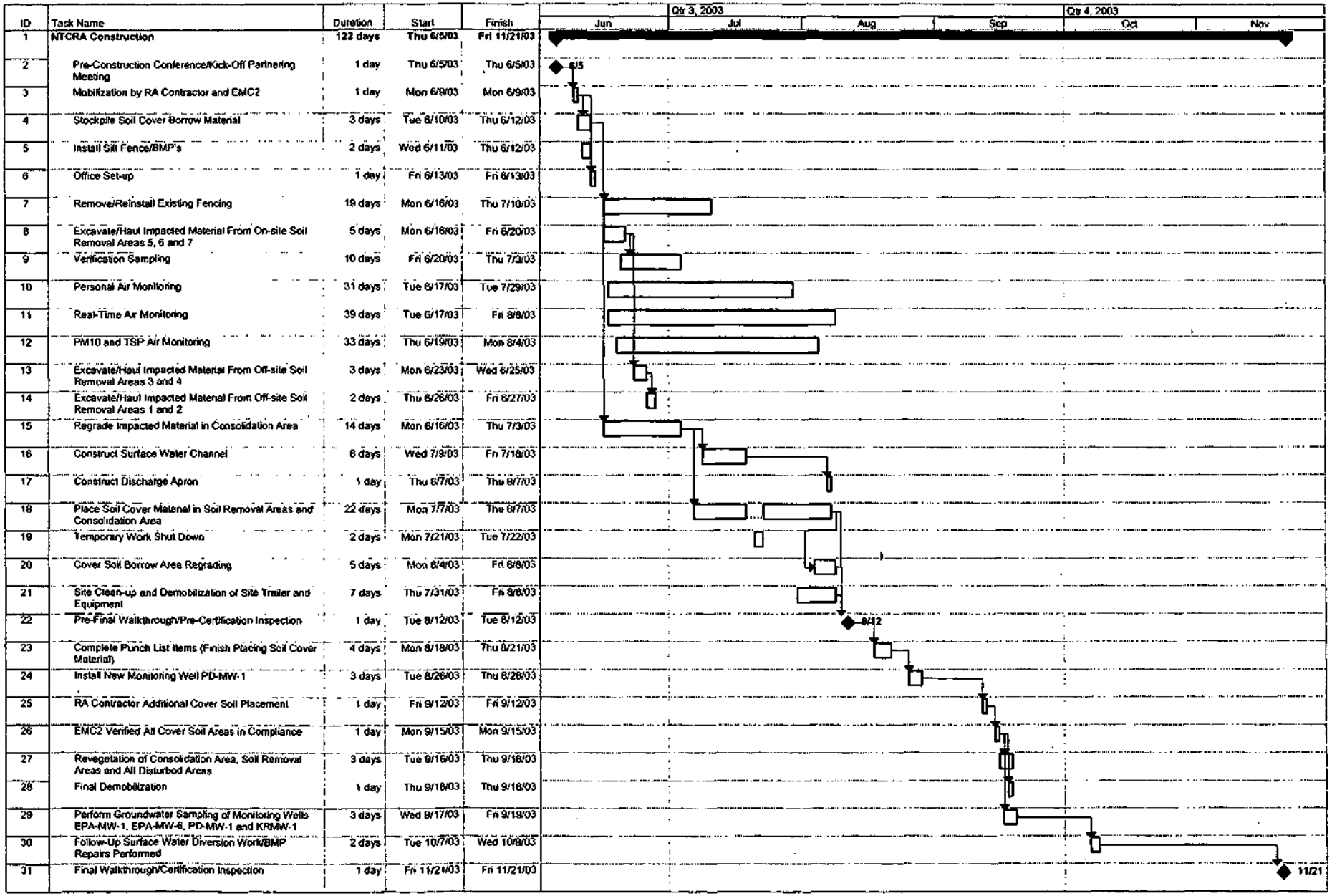
Project: Chronology Schedule A
Date: Tue 3/30/04

Task Milestone Summary

Chronology Schedule A.mpp

Emc²

Figure 2-B
Construction Chronology of Events Project Schedule
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado



ID	Task Name	Duration	Start	Finish
1	NTCRA Construction	122 days	Thu 6/5/03	Fri 11/21/03
2	Pre-Construction Conference/Kick-Off Partnering Meeting	1 day	Thu 6/5/03	Thu 6/5/03
3	Mobilization by RA Contractor and EMC2	1 day	Mon 6/9/03	Mon 6/9/03
4	Stockpile Soil Cover Borrow Material	3 days	Tue 6/10/03	Thu 6/12/03
5	Install Silt Fence/BMP's	2 days	Wed 6/11/03	Thu 6/12/03
6	Office Set-up	1 day	Fri 6/13/03	Fri 6/13/03
7	Remove/Reinstall Existing Fencing	19 days	Mon 6/16/03	Thu 7/10/03
8	Excavate/Haul Impacted Material From On-site Soil Removal Areas 5, 6 and 7	5 days	Mon 6/16/03	Fri 6/20/03
9	Verification Sampling	10 days	Fri 6/20/03	Thu 7/3/03
10	Personal Air Monitoring	31 days	Tue 6/17/03	Tue 7/29/03
11	Real-Time Air Monitoring	39 days	Tue 6/17/03	Fri 8/8/03
12	PM10 and TSP Air Monitoring	33 days	Thu 6/19/03	Mon 8/4/03
13	Excavate/Haul Impacted Material From Off-site Soil Removal Areas 3 and 4	3 days	Mon 6/23/03	Wed 6/25/03
14	Excavate/Haul Impacted Material From Off-site Soil Removal Areas 1 and 2	2 days	Thu 6/26/03	Fri 6/27/03
15	Regrade Impacted Material in Consolidation Area	14 days	Mon 6/16/03	Thu 7/3/03
16	Construct Surface Water Channel	8 days	Wed 7/9/03	Fri 7/18/03
17	Construct Discharge Apron	1 day	Thu 8/7/03	Thu 8/7/03
18	Place Soil Cover Material in Soil Removal Areas and Consolidation Area	22 days	Mon 7/7/03	Thu 8/7/03
19	Temporary Work Shut Down	2 days	Mon 7/21/03	Tue 7/22/03
20	Cover Soil Borrow Area Regrading	5 days	Mon 8/4/03	Fri 8/8/03
21	Site Clean-up and Demobilization of Site Trailer and Equipment	7 days	Thu 7/31/03	Fri 8/8/03
22	Pre-Final Walkthrough/Pre-Certification Inspection	1 day	Tue 8/12/03	Tue 8/12/03
23	Complete Punch List Items (Finish Placing Soil Cover Material)	4 days	Mon 8/18/03	Thu 8/21/03
24	Install New Monitoring Well PD-MW-1	3 days	Tue 8/26/03	Thu 8/28/03
25	RA Contractor Additional Cover Soil Placement	1 day	Fri 9/12/03	Fri 9/12/03
26	EMC2 Verified All Cover Soil Areas in Compliance	1 day	Mon 9/15/03	Mon 9/15/03
27	Revegetation of Consolidation Area, Soil Removal Areas and All Disturbed Areas	3 days	Tue 9/16/03	Thu 9/18/03
28	Final Demobilization	1 day	Thu 9/18/03	Thu 9/18/03
29	Perform Groundwater Sampling of Monitoring Wells EPA-MW-1, EPA-MW-6, PD-MW-1 and KRMW-1	3 days	Wed 9/17/03	Fri 9/19/03
30	Follow-Up Surface Water Diversion Work/BMP Repairs Performed	2 days	Tue 10/7/03	Wed 10/8/03
31	Final Walkthrough/Certification Inspection	1 day	Fri 11/21/03	Fri 11/21/03

Project: Chronology Schedule B
Date: Tue 3/30/04

Task Milestone Summary

APPENDIX A

ACCESS AGREEMENT FORMS

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

CONDITIONAL CONSENT TO ACCESS

Tri-State Generation and Transmission Association, Inc. ("Tri-State"), the owner of the property located in the southwest quarter of Section 30, Township 50 North, Range 9 East, ("Property") herby consents and grants access to the employees, contractors, and authorized representatives of Phelps Dodge Corporation ("PDC"), to the aforementioned Property, excluding the area within the fenced substation yard, to perform a remedial action during the period of June to September 2003, for the purpose of conducting the following activities:

1. Remedial Action Guidelines – the remedial action shall be performed in accordance with the U.S. Environmental Protection Agency and Colorado Department of Public Health and Environment approved Smeltertown Superfund Site Operable Unit No. 1 Final Remedial Design Report ("FRDR"), as copied to Tri-State's Karl Myers on March 5, 2003.

2. Remedial Action Required - as identified on Figure 2 of the FRDR, the remedial action includes removal of metals impacted soils to an initial depth of 2.0 feet and 0.5 feet in 'Area 3' and 'Area 4', respectively, located on the Tri-State property. Area 3 is approximately 37,415 square feet and Area 4 is approximately 15,543 square feet in surface area. The maximum depth of excavation required by the FRDR is 2.0 feet. Accordingly, confirmation sampling will be performed in Area 4. If confirmation samples at the 0.5 foot depth indicate impacted materials remain, excavation may proceed to a maximum depth of 2.0 feet in Area 4. The impacted soils will be excavated, hauled and placed in a Consolidation Area to be located within the adjacent SSS OU1 property boundary. The excavations will be backfilled with clean imported borrow soils and all disturbed areas on Tri-State's property will be revegetated.

In accepting this consent, it is Tri-State's understanding that:

3. PDC shall give 48 hours prior notice (telephone is acceptable) before entering the property to perform remedial work to enable Tri-State representatives to be present to observe on-site activities and sampling. Telephone notice should be made to Mr. Bob Auguston at (970) 249-4501 or Barbara Walz at (303) 452-6111.

4. PDC will provide Tri-State with a copy of any analytical data collected from the Property.

5. PDC acknowledges that it has been fully advised by Tri-State that electric conductors that are on and above the premises are not insulated and now conduct and transmit and will continue to conduct and transmit electric current. PDC shall inform all of its employees, contactors, and authorized representatives who enter upon the premises pursuant to the provisions of this Consent of Access of such risk and the dangers involved, and PDC enters the Property at its own risk; and,

6. PDC shall defend, indemnify and hold harmless Tri-State and its directors, officers, shareholders, and employees against and in respect of any losses arising out of or

relating to the injury or death of any person (including but not limited to PDC), or the loss of or damage to any property that results from any act or omission by PDC, its employees, contractors, and authorized representatives under this agreement.

Tri-State realizes that these actions by PDC are undertaken pursuant to its response and enforcement responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9604. In giving this consent, Tri-State is not responding to any threats nor is it relying upon additional promises, representations, or claims, either oral or written, made by any PDC Representative.

Tri-State Generation and Transmission Association, Inc.

Date: 6/17/03

Name: Jerry A Walker

Title: Vice President, Environmental Services

PDC
By Its Authorized Representative

Date: _____

Name: Richard N Holm

Title: Director E&N Dept.

ACCESS AGREEMENT

This Agreement is made this __ day of JUNE, 2003 between PHELPS DODGE CORPORATION (PDC) and FRANK BUTALA / BUTALA CONSTRUCTION COMPANY (BUTALA) (Owner) (collectively, the "Parties") regarding certain acreage, as identified in ATTACHMENT A, that is owned by BUTALA (the "Property").

1. Access. The Owner grant PDC, including its employees, agents, representatives, consultants, contractors, successors and assigns, and the Colorado Department of Public Health and Environment (CDPHE) and the U.S. Environmental Protection Agency (EPA), including its authorized representatives and contractors, license to enter the Property for the purpose of performing certain remedial actions, as described in Attachment A. At Owner's request, PDC shall provide results of any tests performed on samples taken from the Property by PDC, and any reports regarding the Property submitted by PDC to CDPHE and EPA..

2. Termination. This license shall terminate within five (5) business days of PDC' receipt of written notice of termination from Owner.

3. Notice. PDC shall provide oral or written notice to Owner at least twenty-four (24) hours prior to entering the Property.

4. Compliance with Law. PDC shall ensure that all activities performed on the Property by PDC, including its employees, agents, representatives, consultants, contractors, successors and assigns, shall be conducted in a safe and workmanlike manner and in compliance with all applicable laws and regulations.

5. Restoration of Property. Within a reasonable time after completion of the activities authorized by this Agreement, PDC shall remove all equipment brought onto the Property as well as any waste or other materials generated by its activities on the Property pursuant to this Agreement. In addition, PDC shall, as necessary, restore the Property to substantially the same condition as existed prior to the performance of its activities authorized by this Agreement. PDC shall not be obligated to restore or repair damage to the Property caused by the Owner or any third parties. During performance of the activities authorized by this Agreement, any excavated or drilled materials that may lawfully be stored on the Property may be stored on the Property in a location suitable to Owner.

6. Insurance. During the term of this Agreement, PDC and its contractors shall maintain at their own cost at least the following insurance coverage for activities conducted on the

Property: Comprehensive General Liability: $1,000,000 per occurrence and $1,000,000 aggregate; Automobile: $1,000,000 aggregate; Worker's Compensation: Statutory Limits. Owner shall promptly notify PDC of any claim or loss incurred on the Property that could be subject to such insurance policies, and shall cooperate in providing proper notice and documentation of any such claim to the appropriate insurance carrier.

7. Miscellaneous.

a. This Agreement shall be governed by and construed in accordance with the laws of the State of Arizona.

b. This Agreement is intended only for the benefit of the Parties, and there shall be no third-party beneficiaries to this Agreement.

c. This Agreement shall inure to the benefit of, be binding upon, and be enforceable by the Parties and their respective successors and assigns.

d. If any portion of this Agreement is declared to be invalid or unenforceable, such declaration shall not affect the validity or enforceability of the remainder of this Agreement, and the Agreement shall be construed as nearly as possible as if such invalidity or non-enforceability had not been declared.

e. Any notice required to be given under this Agreement shall be provided to the following persons:

If to Owner:	If to Phelps Dodge Corporation:
Mr. Frank Butala, President	Mr. James E. Humphrey
Butala Construction Company	Manager of Environmental Remediation
7625 West U.S. Highway 50	One North Central Avenue
Salida, Colorado 81201-9344	Phoenix, Arizona 85004
(719) 539-2521 / (719) 539-3435	(602) 366-8592 / (505) 538-4501

f. This Agreement may not be modified except in writing by the Parties.

IN WITNESS WHEREOF, the Parties have executed this Agreement to be effective as of the date first above written.

PHELPS DODGE CORPORATION	BUTALA CONSTRUCTION COMPANY
By:_____	_____
Its:_____	_____

ATTACHMENT A
ACCESS AGREEMENT TO PERFORM REMOVAL ACTION WORK

The Smeltertown Superfund Site (SSS) Operable Unit No. 1 (OU1) removal action is defined in the SSS OU1 Final Removal Design Report (FRDR) approved by the U.S. Environmental Protection Agency and Colorado Department of Public Health and Environment. The SSS OU1 removal action will require access to the property noted below.

Property Owner: Frank Butala

Property Address: 9000 CO Road 152, Salida, CO

Property Legal Description: Tract of Land Being in NE4SW4 S2NE4 N2SE4 SE4NW4 SE4SE4 25-50-9 PT NW4SW4 30-50-9, B460 P343 B487 P196 B487 P199 B487 P202 B487 P204 Includes 3683245 00 040.

Removal Action Required: As identified on Figure 2 of the FRDR, copied to Mr. Butala on May 21, 2003, the removal action includes removal of metals impacted soils to an initial depth of 0.5 feet in 'Area 1' and 'Area 2' located on the Butala property. Area 1 is approximately 10,204 square feet and Area 2 is approximately 15,984 square feet in surface area. Confirmation sampling will be performed to document a clean excavation bottom has been achieved. If confirmation samples at the 0.5 foot depth indicate impacted materials remain, excavation may proceed to a maximum depth of 2.0 feet. The impacted soils will be excavated, hauled and placed in a Consolidation Area to be located within the adjacent SSS OU1 property boundary. The excavations will be backfilled with clean imported borrow soils and all disturbed areas on the Butala property will be revegetated.

Removal Action Schedule: The removal action excavation work on the Butala Property is scheduled to be completed in June 2003, backfill operations are scheduled to be completed in June-July 2003 and revegetation is scheduled to be completed in July-August 2003.

APPENDIX B

AIR MONITORING LABORATORY RESULTS

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

APPENDIX B-1 – PM10, TSP and Metal Ambient Air Monitoring Laboratory Results Summary

APPENDIX B-2 - Real Time Air Monitoring Results Summary

APPENDIX B-3 – Personnel and Work Area Air Monitoring Laboratory Results Summary

APPENDIX B-1

PM10, TSP AND METAL AMBIENT AIR MONITORING LABORATORY RESULTS SUMMARY

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

Table B-1

PM10, TSP and Metal Ambient Air Monitoring Laboratory Results Summary

Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Location	Sample ID	Constituent of Concern	Lab Results (mg/filter) (1)	Time (minutes)	Flow Rate (ft^3/min)	Volume (m^3)	Concentration (mg/m^3)	Action Limit (mg/m^3)
6/19/03	SW	6804354	PM10	15.6	680.4	49	944	0.017	0.15
		6804355	TSP	68.6	680.4	55.5	1,069	0.064	0.5
		6804355	Arsenic	ND	680.4	55.5	1,069	ND	0.005
		6804355	Cadmium	ND	680.4	55.5	1,069	ND	0.0025
		6804355	Chromium	ND	680.4	55.5	1,069	ND	0.25
		6804355	Lead	ND	680.4	55.5	1,069	ND	0.03
		6804355	Zinc	0.054	680.4	55.5	1,069	0.000	7.5
	NE	6804356	PM10	46.5	1,440	51	2,080	0.022	0.15
		6804357	TSP	198.5	1,440	47.5	1,937	0.102	0.5
		6804357	Arsenic	ND	1,440	47.5	1,937	ND	0.005
		6804357	Cadmium	ND	1,440	47.5	1,937	ND	0.0025
		6804357	Chromium	ND	1,440	47.5	1,937	ND	0.25
		6804357	Lead	0.55	1,440	47.5	1,937	0.000	0.03
		6804357	Zinc	0.32	1,440	47.5	1,937	0.000	7.5
	Blank	6804358	PM10	ND	—	—	—	—	—
		6804358	TSP	ND	—	—	—	—	—
		6804358	Arsenic	ND	—	—	—	—	—
		6804358	Cadmium	ND	—	—	—	—	—
		6804358	Chromium	ND	—	—	—	—	—
		6804358	Lead	ND	—	—	—	—	—
		6804358	Zinc	0.014	—	—	—	—	—
6/23/03	SW	7370003	PM10	64.6	1,440	42.5	1,733	0.037	0.15
		7370004	TSP	258.1	1,440	49	1,998	0.129	0.5
		7370004	Arsenic	ND	1,440	49	1,998	ND	0.005
		7370004	Cadmium	ND	1,440	49	1,998	ND	0.0025
		7370004	Chromium	0.01	1,440	49	1,998	0.000	0.25
		7370004	Lead	0.12	1,440	49	1,998	0.000	0.03
		7370004	Zinc	0.14	1,440	49	1,998	0.000	7.5
	NE	7370001	PM10	111.5	1,440	53	2,161	0.052	0.15
		7370002	TSP	338.7	1,440	48	1,957	0.173	0.5
		7370002	Arsenic	ND	1,440	48	1,957	ND	0.005
		7370002	Cadmium	ND	1,440	48	1,957	ND	0.0025
		7370002	Chromium	0.013	1,440	48	1,957	0.000	0.25
		7370002	Lead	0.77	1,440	48	1,957	0.000	0.03
		7370002	Zinc	0.96	1,440	48	1,957	0.000	7.5
	Blank	7370005	PM10	ND	—	—	—	—	—
		7370005	TSP	ND	—	—	—	—	—
		7370005	Arsenic	ND	—	—	—	—	—
		7370005	Cadmium	ND	—	—	—	—	—
		7370005	Chromium	0.0067	—	—	—	—	—
		7370005	Lead	ND	—	—	—	—	—
		7370005	Zinc	ND	—	—	—	—	—
6/24/03	SW	7370006	PM10	64.4	1,440	43.5	1,774	0.036	0.15
		7370007	TSP	242.1	1,440	51	2,080	0.116	0.5
		7370007	Arsenic	ND	1,440	51	2,080	ND	0.005
		7370007	Cadmium	ND	1,440	51	2,080	ND	0.0025
		7370007	Chromium	ND	1,440	51	2,080	ND	0.25
		7370007	Lead	0.12	1,440	51	2,080	0.000	0.03
		7370007	Zinc	0.12	1,440	51	2,080	0.000	7.5
	NE	7370008	PM10	99.9	1,440	56.5	2,304	0.043	0.15
		7370009	TSP	286.9	1,440	49	1,998	0.144	0.5
		7370009	Arsenic	ND	1,440	49	1,998	ND	0.005
		7370009	Cadmium	ND	1,440	49	1,998	ND	0.0025
		7370009	Chromium	ND	1,440	49	1,998	ND	0.25
		7370009	Lead	1.2	1,440	49	1,998	0.001	0.03
		7370009	Zinc	0.68	1,440	49	1,998	0.000	7.5

Table B-1
PM10, TSP and Metal Ambient Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Location	Sample ID	Constituent of Concern	Lab Results (mg/filter) (1)	Time (minutes)	Flow Rate (ft^3/min)	Volume (m^3)	Concentration (mg/m^3)	Action Limit (mg/m^3)
6/24/03 (Con't.)	Blank	7370010	PM10	ND	—	—	—	—	—
		7370010	TSP	ND	—	—	—	—	—
		7370010	Arsenic	ND	—	—	—	—	—
		7370010	Cadmium	ND	—	—	—	—	—
		7370010	Chromium	ND	—	—	—	—	—
		7370010	Lead	ND	—	—	—	—	—
		7370010	Zinc	ND	—	—	—	—	—
6/26/03	SW	7370011	PM10	53.7	1,440	40	1,631	0.033	0.15
		7370012	TSP	195	1,440	57	2,324	0.084	0.5
		7370012	Arsenic	ND	1,440	57	2,324	ND	0.005
		7370012	Cadmium	ND	1,440	57	2,324	ND	0.0025
		7370012	Chromium	ND	1,440	57	2,324	ND	0.25
		7370012	Lead	0.17	1,440	57	2,324	0.000	0.03
		7370012	Zinc	0.22	1,440	57	2,324	0.000	7.5
	NE	7370013	PM10	44.5	1,440	51	2,080	0.021	0.15
		7370014	TSP	78.7	780	47	1,038	0.076	0.5
		7370014	Arsenic	ND	780	47	1,038	ND	0.005
		7370014	Cadmium	ND	780	47	1,038	ND	0.0025
		7370014	Chromium	ND	780	47	1,038	ND	0.25
		7370014	Lead	0.15	780	47	1,038	0.000	0.03
		7370014	Zinc	0.46	780	47	1,038	0.000	7.5
	Blank	7370015	PM10	ND	—	—	—	—	—
		7370015	TSP	ND	—	—	—	—	—
		7370015	Arsenic	ND	—	—	—	—	—
		7370015	Cadmium	ND	—	—	—	—	—
		7370015	Chromium	ND	—	—	—	—	—
		7370015	Lead	ND	—	—	—	—	—
		7370015	Zinc	0.011	—	—	—	—	—
7/8/03	SW	7370016	PM10	79.2	1,440	43.5	1,774	0.045	0.15
		7370016	TSP	(2)	—	—	—	—	0.5
		7370016	Arsenic	ND (3)	1,440	43.5	1,774	ND	0.005
		7370016	Cadmium	ND (3)	1,440	43.5	1,774	ND	0.0025
		7370016	Chromium	ND (3)	1,440	43.5	1,774	ND	0.25
		7370016	Lead	0.12 (3)	1,440	43.5	1,774	0.000	0.03
		7370016	Zinc	0.099 (3)	1,440	43.5	1,774	0.000	7.5
	NE	7370018	PM10	135.8	1,440	44	1,794	0.076	0.15
		7370018	TSP	(2)	—	—	—	—	0.5
		7370018	Arsenic	ND (3)	1,440	44	1,794	ND	0.005
		7370018	Cadmium	ND (3)	1,440	44	1,794	ND	0.0025
		7370018	Chromium	ND (3)	1,440	44	1,794	ND	0.25
		7370018	Lead	0.23 (3)	1,440	44	1,794	0.000	0.03
		7370018	Zinc	0.34 (3)	1,440	44	1,794	0.000	7.5
	Blank	7370019	PM10	ND	—	—	—	—	—
		7370019	TSP	ND	—	—	—	—	—
		7370019	Arsenic	ND	—	—	—	—	—
		7370019	Cadmium	ND	—	—	—	—	—
		7370019	Chromium	ND	—	—	—	—	—
		7370019	Lead	ND	—	—	—	—	—
		7370019	Zinc	ND	—	—	—	—	—
7/17/03	SW	7370022	PM10	40.6	1,440	39	1,590	0.026	0.15
		7370023	TSP	111.3	1,440	48	1,957	0.057	0.5
		7370023	Arsenic	ND	1,440	48	1,957	ND	0.005
		7370023	Cadmium	ND	1,440	48	1,957	ND	0.0025
		7370023	Chromium	ND	1,440	48	1,957	ND	0.25
		7370023	Lead	0.049	1,440	48	1,957	0.000	0.03
		7370023	Zinc	0.08	1,440	48	1,957	0.000	7.5

Table B-1

PM10, TSP and Metal Ambient Air Monitoring Laboratory Results Summary

Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Location	Sample ID	Constituent of Concern	Lab Results (mg/filter) (1)	Time (minutes)	Flow Rate (ft^3/min)	Volume (m^3)	Concentration (mg/m^3)	Action Limit (mg/m^3)
7/17/03 (Con't)_	NE	7370024	PM10	42.5	1,440	51	2,080	0.020	0.15
		7370025	TSP	90.7	1,440	44	1,794	0.051	0.5
		7370025	Arsenic	ND	1,440	44	1,794	ND	0.005
		7370025	Cadmium	ND	1,440	44	1,794	ND	0.0025
		7370025	Chromium	ND	1,440	44	1,794	ND	0.25
		7370025	Lead	0.097	1,440	44	1,794	0.000	0.03
		7370025	Zinc	0.2	1,440	44	1,794	0.000	7.5
	Blank	7370026	PM10	ND	—	—	—	—	—
		7370026	TSP	ND	—	—	—	—	—
		7370026	Arsenic	ND	—	—	—	—	—
		7370026	Cadmium	ND	—	—	—	—	—
		7370026	Chromium	0.038	—	—	—	—	—
		7370026	Lead	ND	—	—	—	—	—
		7370026	Zinc	ND	—	—	—	—	—
7/24/03	SW	7370027	PM10	55.6	1,440	45	1,835	0.030	0.15
		7370028	TSP	191.7	1,440	54	2,202	0.087	0.5
		7370028	Arsenic	ND	1,440	54	2,202	ND	0.005
		7370028	Cadmium	ND	1,440	54	2,202	ND	0.0025
		7370028	Chromium	ND	1,440	54	2,202	ND	0.25
		7370028	Lead	0.12	1,440	54	2,202	0.000	0.03
		7370028	Zinc	0.14	1,440	54	2,202	0.000	7.5
	NE	7370029	PM10	103.7	1,440	49	1,998	0.052	0.15
		7370030	TSP	347.2	1,440	53	2,161	0.161	0.5
		7370030	Arsenic	ND	1,440	53	2,161	ND	0.005
		7370030	Cadmium	ND	1,440	53	2,161	ND	0.0025
		7370030	Chromium	ND	1,440	53	2,161	ND	0.25
		7370030	Lead	0.13	1,440	53	2,161	0.000	0.03
		7370030	Zinc	0.21	1,440	53	2,161	0.000	7.5
	Blank	7370031	PM10	ND	—	—	—	—	—
		7370031	TSP	ND	—	—	—	—	—
		7370031	Arsenic	ND	—	—	—	—	—
		7370031	Cadmium	ND	—	—	—	—	—
		7370031	Chromium	ND	—	—	—	—	—
		7370031	Lead	ND	—	—	—	—	—
		7370031	Zinc	ND	—	—	—	—	—
7/31/03	SW	7370032	PM10	47.9	1,440	55	2,243	0.021	0.15
		7370033	TSP	247.9	1,440	52	2,120	0.117	0.5
		7370033	Arsenic	ND	1,440	52	2,120	ND	0.005
		7370033	Cadmium	ND	1,440	52	2,120	ND	0.0025
		7370033	Chromium	ND	1,440	52	2,120	ND	0.25
		7370033	Lead	0.19	1,440	52	2,120	0.000	0.03
		7370033	Zinc	0.18	1,440	52	2,120	0.000	7.5
	NE	7370034	PM10	29.4	1,440	51.5	2,100	0.014	0.15
		7370035	TSP	68.5	168	48.5	231	0.297	0.5
		7370035	Arsenic	ND	168	48.5	231	ND	0.005
		7370035	Cadmium	ND	168	48.5	231	ND	0.0025
		7370035	Chromium	ND	168	48.5	231	ND	0.25
		7370035	Lead	ND	168	48.5	231	ND	0.03
		7370035	Zinc	0.07	168	48.5	231	0.000	7.5
	Blank	Q3088466	PM10	ND	—	—	—	—	—
		Q3088466	TSP	ND	—	—	—	—	—
		Q3088466	Arsenic	ND	—	—	—	—	—
		Q3088466	Cadmium	ND	—	—	—	—	—
		Q3088466	Chromium	ND	—	—	—	—	—
		Q3088466	Lead	ND	—	—	—	—	—
		Q3088466	Zinc	ND	—	—	—	—	—

Table B-1

PM10, TSP and Metal Ambient Air Monitoring Laboratory Results Summary

Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Location	Sample ID	Constituent of Concern	Lab Results (mg/filter) (1)	Time (minutes)	Flow Rate (ft^3/min)	Volume (m^3)	Concentration (mg/m^3)	Action Limit (mg/m^3)
8/5/03	SW	Q3088467	PM10	64.7	1,440	46	1,876	0.034	0.15
		Q3088467	TSP	(2)	—	—	—	—	0.5
		Q3088467	Arsenic	ND (3)	1,440	46	1,876	ND	0.005
		Q3088467	Cadmium	ND (3)	1,440	46	1,876	ND	0.0025
		Q3088467	Chromium	ND (3)	1,440	46	1,876	ND	0.25
		Q3088467	Lead	0.13 (3)	1,440	46	1,876	0.000	0.03
		Q3088467	Zinc	0.088 (3)	1,440	46	1,876	0.000	7.5
	NE	Q3088469	PM10	34.4	1,420	46	1,850	0.019	0.15
		Q3088469	TSP	(2)	—	—	—	—	0.5
		Q3088469	Arsenic	ND (3)	1,420	46	1,850	ND	0.005
		Q3088469	Cadmium	ND (3)	1,420	46	1,850	ND	0.0025
		Q3088469	Chromium	ND (3)	1,420	46	1,850	ND	0.25
		Q3088469	Lead	ND (3)	1,420	46	1,850	ND	0.03
		Q3088469	Zinc	0.074 (3)	1,420	46	1,850	0.000	7.5
	Blank	LAB BLANK	PM10	ND	—	—	—	—	—
		LAB BLANK	TSP	ND	—	—	—	—	—
		LAB BLANK	Arsenic	ND	—	—	—	—	—
		LAB BLANK	Cadmium	ND	—	—	—	—	—
		LAB BLANK	Chromium	ND	—	—	—	—	—
		LAB BLANK	Lead	ND	—	—	—	—	—
		LAB BLANK	Zinc	ND	—	—	—	—	—

mg = milligram; ft^3/min = cubic feet per minute; m^3 = cubic meters; mg/m^3 = milligram per cubic meter; PM10 = particulate matter equal to or less than 10 microns in particle size; TSP = Total Suspended Particulate; ND = Not Detected; SW = Southwest (upwind) PM10/TSP monitoring machine location; NE = Northeast (downwind) PM10/TSP monitoring machine location.

Notes:

(1) Results for Arsenic, Cadmium, Chromium, Lead, and Zinc are only shown for TSP samples because PM10 samples only represent particle sizes less than 10 microns in width.

(2) TSP air monitoring machine not in service due to damage or mechanical failure. No TSP results obtainable for this date.

(3) TSP filter unable to be used for total metals testing due to machine damage/failure. PM10 filter results were used instead.

APPENDIX B-2

REAL TIME AIR MONITORING RESULTS SUMMARY

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

Table B-2
Real-Time Air Monitoring Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Week	Date	Time	Location	Readings Taken By	Maximum Reading (mg/m^3) (1)	Action Level (mg/m^3)	Comments	Corrective Action Taken
Week One (6/16/03 - 6/20/03)	6/17/03	AM	Area 7	Walsh	0.119	1.0	Concentrations ranged from 0.003 - 0.119 mg/m^3	
			Area 5	Walsh	NA	1.0		
			Consolidation Area	Walsh	NA	1.0		
		PM	Area 7	Walsh	0.020	1.0	Concentrations ranged from 0.003 - 0.020 mg/m^3	
			Area 5	Walsh	0.057	1.0	Concentrations ranged from 0.012 - 0.057 mg/m^3	
			Consolidation Area	Walsh	0.196	1.0	Concentrations ranged from 0.018 - 0.196 mg/m^3	
	6/18/03	AM	South side of field trailer	Walsh	> 1.0	1.0		Dust suppressed with water truck
			Roller Area	Walsh	0.014	1.0		
			Area 5	Walsh	0.039	1.0		
			Consolidation Pile	Walsh	0.039	1.0	Concentrations ranged from 0.012 - 0.039 mg/m^3	
		PM	South side of field trailer	Walsh	NA	1.0		
			Roller Area	Walsh	0.019	1.0		
			Area 5	Walsh	0.012	1.0	Concentrations ranged from 0.003 - 0.012 mg/m^3	
			Consolidation Pile	Walsh	0.233	1.0	Concentrations ranged from 0.189 - 0.233 mg/m^3	
	6/19/03	AM	Consolidation Area	Walsh	0.238	1.0	Concentrations ranged from 0.001 - 0.238 mg/m^3	
			Area 5	Walsh	0.054	1.0	Concentrations ranged from 0.001 - 0.054 mg/m^3	
			Area 6	Walsh	NA	1.0		
		PM	Consolidation Area	Walsh	0.046	1.0	Concentrations ranged from 0.013 - 0.046 mg/m^3	
			Area 5	Walsh	0.247	1.0	Concentrations ranged from 0.006 - 0.247 mg/m^3	
			Area 6	Walsh	0.287	1.0	Concentrations ranged from 0.023 - 0.287 mg/m^3	
	6/20/03	AM	Consolidation Area	Walsh	1.287	1.0	Ranged from 0.003 - 1.287 mg/m^3 (peaked for 1-2 seconds)	Dust suppressed with water truck
			Area 6	Walsh	0.248	1.0	Concentrations ranged from 0.008 - 0.248 mg/m^3	
			Area 7	Walsh	NA	1.0		
		PM	Consolidation Area	Walsh	0.892	1.0	Concentrations ranged from 0.008 - 0.892 mg/m^3	
			Area 6	Walsh	NA	1.0		
			Area 7	Walsh	1.054	1.0	Ranged from 0.011 - 1.054 mg/m^3 (peaked for 8 seconds)	Dust suppressed with water truck
Week Two (6/23/03 - 6/27/03)	6/23/03	AM	Consolidation Area	Walsh	0.338	1.0	Concentrations ranged from 0.025 - 0.338 mg/m^3	
			Area 4	Walsh	0.468	1.0	Concentrations ranged from 0.044 - 0.468 mg/m^3	
		PM	Consolidation Area	Walsh	0.281	1.0	Concentrations ranged from 0.020 - 0.281 mg/m^3	
			Area 4	Walsh	0.365	1.0	Concentrations ranged from 0.080 - 0.365 mg/m^3	
	6/24/03	AM	Consolidation Area	Walsh	0.215	1.0	Concentrations ranged from 0.027 - 0.215 mg/m^3	
			Area 3	Walsh	0.418	1.0	Concentrations ranged from 0.033 - 0.418 mg/m^3	
		PM	Consolidation Area	Walsh	NA	1.0		
			Area 3	Walsh	NA	1.0		
	6/25/03	PM	Northern edge of Removal Area 3	EMC^2	0.56	1.0	Loader loading A30 haul truck 25 feet south.	
			Area 3 & 4	EMC^2	0.26	1.0	Roller compacting area 3/4 soil.	
			North end of Consolidation Area	EMC^2	0.04	1.0	Dozer placing impacted soil.	
			Consolidation Area	EMC^2	0.37	1.0	Haul truck driving through consolidation area.	
	6/26/03	PM	Removal Area 2	EMC^2	0.22	1.0	Excavator stockpiling soil.	
			Area 2	EMC^2	0.18	1.0	Excavator loading haul truck.	
			Consolidation Area	EMC^2	0.58	1.0	D8 regrading.	
			Consolidation Area	EMC^2	0.18	1.0	Roller compacting lifts.	
			Area 2	EMC^2	0.26	1.0	Haul truck driving within 5 feet.	
	6/27/03	PM	Consolidation Area	EMC^2	0.802	1.0	Haul truck driving by within 15 feet.	
			Area 6	EMC^2	0.339	1.0	Excavator loading haul truck.	

Table B-2
Real-Time Air Monitoring Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Week	Date	Time	Location	Readings Taken By	Maximum Reading (mg/m^3) (1)	Action Level (mg/m^3)	Comments	Corrective Action Taken
Week Three (6/30/03 - 7/4/03)	6/30/03	PM	Consolidation Area	EMC²	0.958	1.0	D8 regrading within 8 feet.	
			Surface Channel	EMC²	0.644	1.0	Loader creating subgrade within 10 feet.	
	7/1/03	AM	NW corner of Consolidation Area	Walsh	NA	1.0	Loader and backhoe excavating.	
		PM	NW corner of Consolidation Area	Walsh	0.05	1.0	Concentrations ranged from 0.000 - 0.050 mg/m^3	
	7/2/03	PM	Consolidation Area	EMC²	0.575	1.0	D8 regrading within 20 feet.	
			Consolidation Area	EMC²	0.693	1.0	Motor grader regrading within 15 feet.	
			Consolidation Area	EMC²	0.08	1.0	Roller compacting within 10 feet.	
	7/3/03	PM	Consolidation Area	EMC²	0.277	1.0	Measured within 15 feet downwind of operating D8.	
			Consolidation Area	EMC²	0.73	1.0	Measured within 15 feet downwind of loader regrading work.	
Week Four (7/7/03 - 7/11/03)	7/7/03	PM	Removal Area 2	EMC²	0.38	1.0	Measured within 20 feet downwind of D6 placing cover soil.	
	7/8/03	AM	Area 3	Walsh	NA	1.0		
			SE corner of Consolidation Area	Walsh	NA	1.0	Front loader operating.	
		PM	Area 3	Walsh	0.137	1.0	Concentrations ranged from 0.013 - 0.137 mg/m^3	
			SE corner of Consolidation Area	Walsh	0.271	1.0	Concentrations ranged from 0.012 - 0.271 mg/m^3	
	7/9/03	PM	Area 3	EMC²	0.943	1.0	Measured within 50 feet downwind of operating dump truck and dump work.	
			Consolidation Area	EMC²	0.274	1.0	Measured within 50 feet downwind of motor grader regrading work.	
	7/10/03	PM	Area 3	EMC²	0.65	1.0	Measured within 50 feet downwind of operating D8 dump work.	
	7/11/03	PM	Removal Area 6	EMC²	**1.301**	1.0	Measured within 40 feet downwind Dump work.	Dust suppressed with water truck
			Surface Channel	EMC²	0.295	1.0	Measured within 20 feet downwind of grader cutting surface.	
Week Five (7/14/03 - 7/18/03)	7/14/03	PM	Removal Area 7	EMC²	0.845	1.0	Measured within 50 feet downwind of D8 placing cover soil.	
			Surface Channel	EMC²	0.747	1.0	Measured within 30 feet downwind of loader constructing subgrade.	
	7/15/03	AM	Area 7	Walsh	0.544	1.0	Concentrations ranged from 0.019 - 0.544 mg/m^3	
			SE corner of Consolidation Area	Walsh	0.116	1.0	Concentrations ranged from 0.022 - 0.116 mg/m^3	
		PM	Area 7	Walsh	NA	1.0	Loader operating.	
			SE corner of Consolidation Area	Walsh	NA	1.0	Trucks dumping soil	
	7/16/03	AM	Consolidation Area	EMC²	0.064	1.0	Measured within 15 feet downwind of D8 placing cover soil.	
			Consolidation Area	EMC²	0.061	1.0	Measured within 20 feet downwind of haul truck dumping.	
	7/17/03	AM	Surface Channel	EMC²	0.24	1.0	Measured within 15 feet downwind of excavator placing soil.	
Week Six (7/21/03 - 7/25/03)	7/23/03	PM	Consolidation Area	EMC²	0.859	1.0	Measured within 50 feet downwind of D8 placing cover soil.	
	7/24/03	AM	South side of Consolidation Area	Walsh	NA	1.0		
		PM	South side of Consolidation Area	Walsh	0.05	1.0	Concentrations ranged from 0.000 - 0.050 mg/m^3	
	7/25/03	PM	Consolidation Area	EMC²	0.53	1.0	Measured within 40 feet downwind of operating D8 and dump work	
Week Seven (7/28/03 - 8/1/03)	7/28/03	PM	NE corner of Consolidation Area	EMC²	0.718	1.0	Measured within 30 feet downwind of D8 placing cover soil.	
	7/29/03	PM	NE corner of Consolidation Area	EMC²	0.287	1.0	D8 and dump truck working within 50 feet upwind	
	7/31/03	PM	Consolidation Area	EMC²	0.027	1.0	Measured 20 feet downwind of two haul trucks dumping.	
	8/1/03	PM	Consolidation Area	EMC²	0.463	1.0	Measured within 20 feet downwind of haul truck dumping cover soil.	
Week Eight (8/4/03 - 8/8/03)	8/4/03	PM	Consolidation Area	EMC²	0.561	1.0	Measured within 20 feet downwind of motor grader preparing surface.	
	8/5/03	PM	Surface Water Channel	EMC²	0.258	1.0	Measured within 15 feet downwind of D8 placing cover soil	
	8/6/03	PM	South Boundary of Consolidation Area	EMC²	0.14	1.0	Measured within 20 feet downwind of motor grader placing cover soil	
	8/7/03	PM	Southern End of Consolidation Area	EMC²	0.156	1.0	Measured within 15 feet downwind of motor grader smoothing surface.	
	8/8/03	PM	Consolidation Area	EMC²	0.054	1.0	Measured within 20 feet downwind of motor grader removing buried cable.	

mg/m^3 = milligram per cubic meter; NA = no readings taken; Walsh = Walsh Environmental Scientists and Engineers

Notes:

(1) Maximum readings shown in bold and highlighted exceed the action level of 1.0 mg/m^3 as established in the SSS OU1 Removal Action Site Health & Safety Plan

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APPENDIX B-3

PERSONNEL AND WORK AREA AIR MONITORING LABORATORY RESULTS SUMMARY

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

Table B-3
Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
6/17/03	Work Area Monitor (By Areas 7 and 5 - Adjacent to Consolidation Area)	03061803-002	6-17-A-M	Arsenic	< 0.2		729	< 0.00027	0.005
				Cadmium	< 0.2			< 0.00027	0.0025
				Chromium	< 0.5			< 0.00069	0.25
				Lead	< 0.3			< 0.00041	0.03
				Zinc	< 0.5			< 0.00069	7.5
		03061803-008	6-17-A-D	Total particulates	90		692	0.13	7.5
				Crystaline silica:					
				Quartz (3)	14.6	16.2%		0.0211	1.5
				Cristobalite	< 15			< 0.022	-
				Tridymite	< 30			< 0.043	-
		03061803-005	6-17-A-CT	*Coal tar pitch volatiles:*			726		
				Benzene soluble fraction	36			0.05	0.1
	Personnel (Open Cab Roller on Consolidation Area)	03061803-001	6-17-P-M	Arsenic	< 0.2		724	< 0.00028	0.005
				Cadmium	< 0.2			< 0.00028	0.0025
				Chromium	< 0.5			< 0.00069	0.25
				Lead	< 0.3			< 0.00041	0.03
				Zinc	< 0.5			< 0.00069	7.5
		03061803-007	6-17-P-D	Total particulates	339		798	0.425	7.5
				Crystaline silica:					
				Quartz (3)	39.6	11.7%		0.0496	1.9
				Cristobalite	< 15			< 0.019	-
				Tridymite	< 30			< 0.038	-
		03061803-004	6-17-P-CT	*Coal tar pitch volatiles:*			775		
				Benzene soluble fraction	< 20			< 0.026	0.1
	Blank	03061803-003	6-17-B-M	Arsenic	< 0.2		-	-	-
				Cadmium	< 0.2			-	-
				Chromium	< 0.5			-	-
				Lead	< 0.3			-	-
				Zinc	< 0.5			-	-
		03061803-009	6-17-B-D	Total particulates	32		-	-	-
				Crystaline silica:					
				Quartz (3)	< 6			-	-
				Cristobalite	< 15			-	-
				Tridymite	< 30			-	-
		03061803-006	6-17-B-CT	*Coal tar pitch volatiles:*			-		
				Benzene soluble fraction	< 20			-	-

Table B-3
Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
6/18/03	Work Area Monitor (By Area 5 and Consolidation Area)	03061903-002	6-18-A-M	Arsenic	< 0.2		832	< 0.00024	0.005
				Cadmium	< 0.2			< 0.00024	0.0025
				Chromium	< 0.5			< 0.00060	0.25
				Lead	0.58			0.0007	0.03
				Zinc	< 0.5			< 0.00060	7.5
		03061903-005	6-18-A-D	Total particulates	265		833	0.318	7.5
				Crystaline silica:					
				Quartz (3)	16.8	6.3%		0.0201	2.9
				Cristobalite	< 15			< 0.018	-
				Tridymite	< 30			< 0.036	-
		03061903-008	6-18-A-CT	*Coal tar pitch volatiles:*			836		
				Benzene soluble fraction	39			0.047	0.1
	Personnel (Open Cab Roller on Consolidation Area)	03061903-001	6-18-P-M	Arsenic	< 0.2		628	< 0.00032	0.005
				Cadmium	< 0.2			< 0.00032	0.0025
				Chromium	< 0.5			< 0.00080	0.25
				Lead	0.56			0.0009	0.03
				Zinc	< 0.5			< 0.00080	7.5
		03061903-004	6-18-P-D	Total particulates	204		646	0.316	7.5
				Crystaline silica:					
				Quartz (3)	19.9	9.8%		0.0308	2.2
				Cristobalite	< 15			< 0.023	-
				Tridymite	< 30			< 0.046	-
		03061903-007	6-18-P-CT	*Coal tar pitch volatiles:*			670		
				Benzene soluble fraction	60			0.09	0.1
	Blank	03061903-003	6-18-B-M	Arsenic	< 0.2		-	-	-
				Cadmium	< 0.2			-	-
				Chromium	< 0.5			-	-
				Lead	< 0.3			-	-
				Zinc	< 0.5			-	-
		03061903-006	6-18-B-D	Total particulates	< 30		-	-	-
				Crystaline silica:					
				Quartz (3)	< 6			-	-
				Cristobalite	< 15			-	-
				Tridymite	< 30			-	-
		03061903-009	6-18-B-CT	*Coal tar pitch volatiles:*			-		
				Benzene soluble fraction	< 20			-	-

Table B-3
Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
6/23/03	Work Area Monitor (By Areas 3 and 4)	03062402-002	6-23-A-M	Arsenic	< 0.2		685	< 0.00029	0.005
				Cadmium	< 0.2			< 0.00029	0.0025
				Chromium	< 0.5			< 0.00073	0.25
				Lead	0.74			0.00011	0.03
				Zinc	2.38			0.00347	7.5
		03062402-005	6-23-A-D	Total particulates	103		530.5	0.194	7.5
				Crystaline silica:					
				Quartz (3)	19.7	19.1%		0.0371	1.3
				Cristobalite	< 15			< 0.028	-
				Tridymite	< 30			< 0.057	-
		03062402-008	6-23-A-CT	*Coal tar pitch volatiles:*			769.3		
				Benzene soluble fraction	< 20			< 0.026	0.1
	Personnel (Water Truck Operator)	03062402-001	6-23-P-M	Arsenic	< 0.2		800	< 0.00025	0.005
				Cadmium	< 0.2			< 0.00025	0.0025
				Chromium	< 0.5			< 0.00062	0.25
				Lead	1.33			0.00166	0.03
				Zinc	1.66			0.00208	7.5
		03062402-004	6-23-P-D	Total particulates	605		780.1	0.776	7.5
				Crystaline silica:					
				Quartz (3)	61.1	10.1%		0.0783	2.1
				Cristobalite	< 15			< 0.019	-
				Tridymite	< 30			< 0.038	-
		03062402-007	6-23-P-CT	*Coal tar pitch volatiles:*			727.4		
				Benzene soluble fraction	< 20			< 0.027	0.1
	Blank	03062402-003	6-23-B-M	Arsenic	< 0.2		-	-	-
				Cadmium	< 0.2			-	-
				Chromium	< 0.5			-	-
				Lead	< 0.3			-	-
				Zinc	< 0.5			-	-
		03062402-006	6-23-B-D	Total particulates	< 30		-	-	-
				Crystaline silica:					
				Quartz (3)	< 6			-	-
				Cristobalite	< 15			-	-
				Tridymite	< 30			-	-
		03062402-009	6-23-B-CT	*Coal tar pitch volatiles:*			-		
				Benzene soluble fraction	< 20			-	-

Table B-3
Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
6/24/03	Work Area Monitor (By Area 3)	03062512-002	6-24-A-M	Arsenic	< 0.2		673.3	< 0.00030	0.005
				Cadmium	< 0.2			< 0.00030	0.0025
				Chromium	< 0.5			< 0.00074	0.25
				Lead	1.45			0.00215	0.03
				Zinc	5.19			0.00771	7.5
		03062512-005	6-24-A-D	Total particulates	149		641.2	0.232	7.5
				Crystaline silica:					
				Quartz (3)	17.4	11.7%		0.0271	1.9
				Cristobalite	< 15			< 0.023	-
				Tridymite	< 30			< 0.047	-
		03062512-008	6-24-A-CT	*Coal tar pitch volatiles:*			743.7		
				Benzene soluble fraction	< 20			< 0.027	0.1
	Personnel (Dump Truck Operator)	03062512-001	6-24-P-M	Arsenic	< 0.2		749.8	< 0.00027	0.005
				Cadmium	< 0.2			< 0.00027	0.0025
				Chromium	< 0.5			< 0.00067	0.25
				Lead	0.47			0.00063	0.03
				Zinc	0.77			0.001	7.5
		03062512-004	6-24-P-D	Total particulates	250		808.8	0.309	7.5
				Crystaline silica:					
				Quartz (3)	24.4	9.8%		0.0302	2.2
				Cristobalite	< 15			< 0.019	-
				Tridymite	< 30			< 0.037	-
		03062512-007	6-24-P-CT	*Coal tar pitch volatiles:*			827.6		
				Benzene soluble fraction	< 20			< 0.024	0.1
	Blank	03062512-003	6-24-B-M	Arsenic	< 0.2		-	-	-
				Cadmium	< 0.2			-	-
				Chromium	< 0.5			-	-
				Lead	< 0.3			-	-
				Zinc	< 0.5			-	-
		03062512-006	6-24-B-D	Total particulates	< 30		-	-	-
				Crystaline silica:					
				Quartz (3)	< 6			-	-
				Cristobalite	< 15			-	-
				Tridymite	< 30			-	-
		03062512-009	6-24-B-CT	*Coal tar pitch volatiles:*			-		
				Benzene soluble fraction	< 20			-	-

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Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
7/1/03	Work Area Monitor (Consolidated Area, SW Corner)	03070207-002	7-1-A-M	Arsenic	< 0.2		694.1	< 0.00029	0.005
				Cadmium	< 0.2			< 0.00029	0.0025
				Chromium	< 0.5			< 0.00072	0.25
				Lead	< 0.3			< 0.00043	0.03
				Zinc	< 0.5			< 0.00072	7.5
		03070207-005	7-1-A-D	Total particulates	112		641	0.175	7.5
				Crystaline silica:					
				Quartz (3)	25	22.3%		0.039	1.1
				Cristobalite	< 15			< 0.023	-
				Tridymite	< 30			< 0.047	-
		03070207-008	7-1-A-CT	*Coal tar pitch volatiles:*			713		
				Benzene soluble fraction	< 20			< 0.028	0.1
	Personnel (Front-End Loader Operator)	03070207-001	7-1-P-M	Arsenic	< 0.2		905.2	< 0.00022	0.005
				Cadmium	< 0.2			< 0.00022	0.0025
				Chromium	< 0.5			< 0.00055	0.25
				Lead	0.91			0.001	0.03
				Zinc	0.58			0.00064	7.5
		03070207-004	7-1-P-D	Total particulates	613		797.3	0.769	7.5
				Crystaline silica:					
				Quartz (3)	77.3	12.6%		0.0969	1.8
				Cristobalite	< 15			< 0.019	-
				Tridymite	< 30			< 0.038	-
		03070207-007	7-1-P-CT	*Coal tar pitch volatiles:*			887.8		
				Benzene soluble fraction	< 20			< 0.023	0.1
	Blank	03070207-003	7-1-B-M	Arsenic	< 0.2		-	-	-
				Cadmium	< 0.2			-	-
				Chromium	< 0.5			-	-
				Lead	< 0.3			-	-
				Zinc	< 0.5			-	-
		03070207-006	7-1-B-D	Total particulates	< 30		-	-	-
				Crystaline silica:					
				Quartz (3)	< 6			-	-
				Cristobalite	< 15			-	-
				Tridymite	< 30			-	-
		03070207-009	7-1-B-CT	*Coal tar pitch volatiles:*			-		
				Benzene soluble fraction	< 20			-	-

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Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
7/8/03	Work Area Monitor (By Area 3)	03070901-002	7-8-M-A	Arsenic	< 0.2		873	< 0.00023	0.005
				Cadmium	< 0.2			< 0.00023	0.0025
				Chromium	< 0.5			< 0.00057	0.25
				Lead	< 0.3			< 0.00034	0.03
				Zinc	< 0.5			< 0.00057	7.5
		03070901-007	7-8-D-A	Total particulates	104		821	0.127	7.5
				Crystaline silica:					
				Quartz (3)	19	18.3%		0.0231	1.3
				Cristobalite	< 15			< 0.018	-
				Tridymite	< 30			< 0.037	-
		03070901-012	7-8-V-A	*Coal tar pitch volatiles:*			860		
				Benzene soluble fraction	114			0.133	0.1
	Personnel (Dump Truck Operator)	03070901-001	7-8-M-P01	Arsenic	< 0.2		697	< 0.00029	0.005
				Cadmium	< 0.2			< 0.00029	0.0025
				Chromium	< 0.5			< 0.00072	0.25
				Lead	0.71			0.001	0 03
				Zinc	1.09			0.00156	7.5
		03070901-006	7-8-D-P01	Total particulates	251		703	0.357	7.5
				Crystaline silica:					
				Quartz (3)	33	13.1%		0.0469	1.8
				Cristobalite	< 15			< 0.021	-
				Tridymite	< 30			< 0.043	-
		03070901-011	7-8-V-P01	*Coal tar pitch volatiles:*			701		
				Benzene soluble fraction	2340			3.34	0.1
	Personnel (Dump Truck Operator)	03070901-003	7-8-M-P02	Arsenic	< 0.2		752	< 0.00027	0.005
				Cadmium	< 0.2			< 0.00027	0.0025
				Chromium	< 0.5			< 0.00066	0.25
				Lead	< 0.3			< 0.00040	0.03
				Zinc	< 0.5			< 0.00066	7.5
		03070901-008	7-8-D-P02	Total particulates	149		753	0.198	7.5
				Crystaline silica:					
				Quartz (3)	24.2	16.2%		0.0321	1.5
				Cristobalite	< 15			< 0.020	-
				Tridymite	< 30			< 0.040	-
		03070901-013	7-8-V-P02	*Coal tar pitch volatiles:*			734		
				Benzene soluble fraction	54			0.074	0.1

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Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
7/8/03 (Continued)	Personnel (Dump Truck Operator)	03070901-004	7-8-M-P03	Arsenic	< 0.2		856	< 0.00023	0.005
				Cadmium	< 0.2			< 0.00023	0.0025
				Chromium	< 0.5			< 0.00058	0.25
				Lead	< 0.3			< 0.00035	0.03
				Zinc	< 0.5			< 0.00058	7.5
		03070901-009	7-8-D-P03	Total particulates	174		885	0.197	7.5
				Crystaline silica:					
				Quartz (3)	27.8	16.0%		0.0314	1.5
				Cristobalite	< 15			< 0.017	-
				Tridymite	< 30			< 0.034	-
		03070901-014	7-8-V-P03	*Coal tar pitch volatiles:*			866		
				Benzene soluble fraction	35			0.04	0.1
	Blank	03070901-005	7-8-M-B	Arsenic	< 0.2		-	-	-
				Cadmium	< 0.2			-	-
				Chromium	< 0.5			-	-
				Lead	< 0.3			-	-
				Zinc	< 0.5			-	-
		03070901-010	7-8-D-B	Total particulates	< 30		-	-	-
				Crystaline silica:					
				Quartz (3)	< 6			-	-
				Cristobalite	< 15			-	-
				Tridymite	< 30			-	-
		03070901-015	7-8-V-B	*Coal tar pitch volatiles:*			-		
				Benzene soluble fraction	< 20			-	-

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Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
7/15/03	Work Area Monitor (By Area 7, South of Consolidation Area)	03071601-001	7-15-M-A	Arsenic	< 0.2		951	< 0.00021	0.005
				Cadmium	< 0.2			< 0.00021	0.0025
				Chromium	< 0.5			< 0.00053	0.25
				Lead	0.9			0.00094	0.03
				Zinc	< 0.5			< 0.00053	7.5
		03071601-006	7-15-D-A	Total particulates	341		922	0.37	7.5
				Crystaline silica:	-	-			
				Quartz (3)	48.1	14.1%		0.0522	1.7
				Cristobalite	< 15			< 0.016	-
				Tridymite	< 30			< 0.033	-
		03071601-011	7-15-V-A	*Coal tar pitch volatiles:*			943		
				Benzene soluble fraction	< 20			< 0.021	0.1
	Personnel (Dozer Operator)	03071601-002	7-15-M-P01	Arsenic	< 0.2		924	< 0.00022	0.005
				Cadmium	< 0.2			< 0.00022	0.0025
				Chromium	< 0.5			< 0.00054	0.25
				Lead	0.69			0.00074	0.03
				Zinc	< 0.5			< 0.00054	7.5
		03071601-007	7-15-D-P01	Total particulates	446		930	0.48	7.5
				Crystaline silica:					
				Quartz (3)	33.5	7.5%		0.036	2.0
				Cristobalite	< 15			< 0.016	-
				Tridymite	< 30			< 0.032	-
		03071601-012	7-15-V-P01	*Coal tar pitch volatiles:*			935		
				Benzene soluble fraction	42			0.045	0.1
	Personnel (Dump Truck Operator)	03071601-003	7-15-M-P02	Arsenic	< 0.2		772	< 0.00026	0.005
				Cadmium	< 0.2			< 0.00026	0.0025
				Chromium	< 0.5			< 0.00065	0.25
				Lead	< 0.3			< 0.00039	0.03
				Zinc	< 0.5			< 0.00065	7.5
		03071601-008	7-15-D-P02	Total particulates	192		771	0.249	7.5
				Crystaline silica:					
				Quartz (3)	12.7	6.6%		0.0165	2.8
				Cristobalite	< 15			< 0.019	-
				Tridymite	< 30			< 0.039	-
		03071601-013	7-15-V-P02	*Coal tar pitch volatiles:*			773		
				Benzene soluble fraction	66			0.085	0.1

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Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
7/15/03 (Continued)	Personnel (Dump Truck Operator)	03071601-004	7-15-M-P03	Arsenic	< 0.2		759	< 0.00026	0.005
				Cadmium	< 0.2			< 0.00026	0.0025
				Chromium	< 0.5			< 0.00066	0.25
				Lead	< 0.3			< 0.00040	0.03
				Zinc	< 0.5			< 0.00066	7.5
		03071601-009	7-15-D-P03	Total particulates	297		788	0.377	7.5
				Crystaline silica:					
				Quartz (3)	7.3	2.4%		0.0092	4.7
				Cristobalite	< 15			< 0.019	-
				Tridymite	< 30			< 0.038	-
		03071601-014	7-15-V-P03	*Coal tar pitch volatiles:*			757		
				Benzene soluble fraction	120			0.159	0.1
	Blank	03071601-005	7-15-M-B	Arsenic	< 0.2		-	-	-
				Cadmium	< 0.2			-	-
				Chromium	< 0.5			-	-
				Lead	< 0.3			-	-
				Zinc	< 0.5			-	-
		03071601-010	7-15-D-B	Total particulates	< 30		-	-	-
				Crystaline silica:					
				Quartz (3)	10.9			-	-
				Cristobalite	< 15			-	-
				Tridymite	< 30			-	-
		03071601-015	7-15-V-B	*Coal tar pitch volatiles:*			-		
				Benzene soluble fraction	< 20			-	-

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Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
7/24/03	Work Area Monitor [South Side (middle) of Consolidation Area]	03072511-001	7-24-M-A	Arsenic	< 0.2		943	< 0.00021	0.005
				Cadmium	< 0.2			< 0.00021	0.0025
				Chromium	< 0.5			< 0.00053	0.25
				Lead	< 0.3			< 0.00032	0.03
				Zinc	< 0.5			< 0.00053	7.5
		03072511-006	7-24-D-A	Total particulates	83		936	0.089	7.5
				Crystaline silica:					
				Quartz (3)	8.9	10.7%		0.0095	2.0
				Cristobalite	< 15			< 0.016	-
				Tridymite	< 30			< 0.032	-
		03072511-011	7-24-V-A	*Coal tar pitch volatiles:*			945		
				Benzene soluble fraction	30			0.032	0.1
	Personnel (Director of Incoming Dump Trucks)	03072511-002	7-24-M-P01	Arsenic	< 0.2		940	< 0.00021	0.005
				Cadmium	< 0.2			< 0.00021	0.0025
				Chromium	< 0.5			< 0.00053	0.25
				Lead	< 0.3			< 0.00032	0.03
				Zinc	< 0.5			< 0.00053	7.5
		03072511-007	7-24-D-P01	Total particulates	528		950	0.556	7.5
				Crystaline silica:					
				Quartz (3)	71.6	13.6%		0.0754	1.7
				Cristobalite	< 15			< 0.016	-
				Tridymite	< 30			< 0.032	-
		03072511-012	7-24-V-P01	*Coal tar pitch volatiles:*			951		
				Benzene soluble fraction	< 20			< 0.021	0.1
	Personnel (Dump Truck Operator)	03072511-003	7-24-M-P02	Arsenic	< 0.2		865	< 0.00023	0.005
				Cadmium	< 0.2			< 0.00023	0.0025
				Chromium	< 0.5			< 0.00058	0.25
				Lead	< 0.3			< 0.00035	0.03
				Zinc	< 0.5			< 0.00058	7.5
		03072511-008	7-24-D-P02	Total particulates	170		796	0.214	7.5
				Crystaline silica:					
				Quartz (3)	6.9	4.1%		0.0087	3.7
				Cristobalite	< 15			< 0.019	-
				Tridymite	< 30			< 0.038	-
		03072511-013	7-24-V-P02	*Coal tar pitch volatiles:*			854		
				Benzene soluble fraction	90			0.11	0.1

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Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
7/24/03 (Continued)	Personnel (Dump Truck Operator)	03072511-004	7-24-M-P03	Arsenic	< 0.2		850	< 0.00024	0.005
				Cadmium	< 0.2			< 0.00024	0.0025
				Chromium	< 0.5			< 0.00059	0.25
				Lead	< 0.3			< 0.00035	0.03
				Zinc	< 0.5			< 0.00059	7.5
		03072511-009	7-24-D-P03	Total particulates	187		872	0.214	7.5
				Crystaline silica:					
				Quartz (3)	24.9	13.3%		0.0286	1.7
				Cristobalite	< 15			< 0.017	-
				Tridymite	< 30			< 0.034	-
		03072511-014	7-24-V-P03	*Coal tar pitch volatiles:*			861		
				Benzene soluble fraction	< 20			< 0.023	0.1
	Blank	03072511-005	7-24-M-B	Arsenic	< 0.2		-	-	-
				Cadmium	< 0.2			-	-
				Chromium	< 0.5			-	-
				Lead	< 0.3			-	-
				Zinc	< 0.5			-	-
		03072511-010	7-24-D-B	Total particulates	< 30		-	-	-
				Crystaline silica:					
				Quartz (3)	< 6			-	-
				Cristobalite	< 15			-	-
				Tridymite	< 30			-	-
		03072511-015	7-24-V-B	*Coal tar pitch volatiles:*			-		
				Benzene soluble fraction	< 20			-	-

Table B-3
Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
7/30/03	Work Area Monitor [South Side (middle) of Consolidation Area]	03073101-001	7-30-M-A	Arsenic	< 0.2		790	< 0.00025	0.005
				Cadmium	< 0.2			< 0.00025	0.0025
				Chromium	< 0.5			< 0.00063	0.25
				Lead	< 0.3			< 0.00038	0.03
				Zinc	< 0.5			< 0.00063	7.5
		03073101-006	7-30-D-A	Total particulates	35		768	0.046	7.5
				Crystaline silica:					
				Quartz (3)	< 6			< 0.0078	7.5
				Cristobalite	< 15			< 0.020	-
				Tridymite	< 30			< 0.039	-
		03073101-011	7-30-V-A	*Coal tar pitch volatiles:*			831		
				Benzene soluble fraction	< 20			< 0.024	0.1
	Personnel (Consolidation Area - Directing Incoming Dump)	03073101-002	7-30-M-P01	Arsenic	< 0.2		859	< 0.00023	0.005
				Cadmium	< 0.2			< 0.00023	0.0025
				Chromium	< 0.5			< 0.00058	0.25
				Lead	< 0.3			< 0.00035	0.03
				Zinc	< 0.5			< 0.00058	7.5
		03073101-007	7-30-D-P01	Total particulates	155		875	0.177	7.5
				Crystaline silica:					
				Quartz (3)	29.3	18.9%		0.0335	1.3
				Cristobalite	< 15			< 0.017	-
				Tridymite	< 30			< 0.034	-
		03073101-012	7-30-V-P01	*Coal tar pitch volatiles:*			878		
				Benzene soluble fraction	< 20			< 0.023	0.1
	Personnel (Dump Truck Operator)	03073101-003	7-30-M-P02	Arsenic	< 0.2		807	< 0.00025	0.005
				Cadmium	< 0.2			< 0.00025	0.0025
				Chromium	< 0.5			< 0.00062	0.25
				Lead	< 0.3			< 0.00037	0.03
				Zinc	< 0.5			< 0.00062	7.5
		03073101-008	7-30-D-P02	Total particulates	96		859	0.11	7.5
				Crystaline silica:					
				Quartz (3)	14.1	14.7%		0.0164	1.6
				Cristobalite	< 15			< 0.017	-
				Tridymite	< 30			< 0.035	-
		03073101-013	7-30-V-P02	*Coal tar pitch volatiles:*			861		
				Benzene soluble fraction	30			0.035	0.1

Table B-3
Personnel and Work Area Air Monitoring Laboratory Results Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Date	Sample Type	Laboratory Sample No.	Client Sample No.	Constituent of Concern	Total Result (µg)	Percentage (%)	Air Volume (L)	Air Concentration (mg/m^3) (1)	Action Level (mg/m^3) (2)
7/30/03 (Continued)	Personnel (Dump Truck Operator)	03073101-004	7-30-M-P03	Arsenic	< 0.2		726	< 0.00028	0.005
				Cadmium	< 0.2			< 0.00028	0.0025
				Chromium	< 0.5			< 0.00069	0.25
				Lead	< 0.3			< 0.00041	0.03
				Zinc	< 0.5			< 0.00069	7.5
		03073101-009	7-30-D-P03	Total particulates	< 30		691	< 0.043	7.5
				Crystaline silica:					
				Quartz (3)	< 6			< 0.0087	7.5
				Cristobalite	< 15			< 0.022	-
				Tridymite	< 30			< 0.043	-
		03073101-014	7-30-V-P03	*Coal tar pitch volatiles:*			745		
				Benzene soluble fraction	1450			**1.95**	0.1
	Blank	03073101-005	7-30-M-B	Arsenic	< 0.2		-	-	-
				Cadmium	< 0.2			-	-
				Chromium	< 0.5			-	-
				Lead	< 0.3			-	-
				Zinc	< 0.5			-	-
		03073101-010	7-30-D-B	Total particulates	< 30		-	-	-
				Crystaline silica:					
				Quartz (3)	< 6			-	-
				Cristobalite	< 15			-	-
				Tridymite	< 30			-	-
		03073101-015	7-30-V-B	*Coal tar pitch volatiles:*			-		
				Benzene soluble fraction	24			-	-

µg = microgram, L = Liters, mg/m^3 = milligrams per cubic meter

Notes:

(1) Air Concentration sample results presented in bold and highlighted exceed Action Levels.

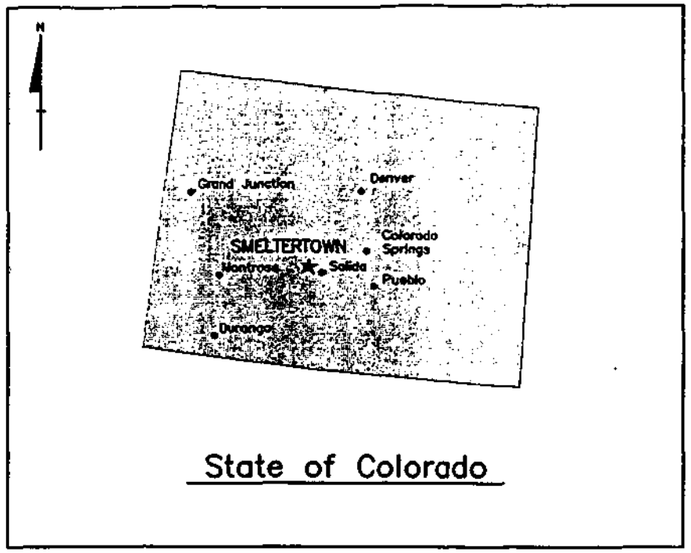
(2) Action Levels as reported in Removal Action Site Health and Safety Plan, Smeltertown Superfund Site - Operable Unit No. 1, June 11, 2003.

(3) For action level comparison, Quartz was used for total silica dust concentration. Action level determined by using the following: Action Level = 30mg/m3 / (% silica dust + 4)

APPENDIX C

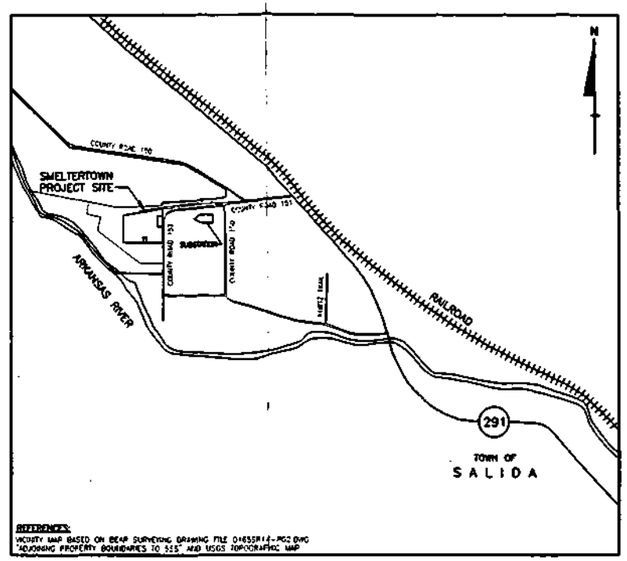
AS-BUILT CONSTRUCTION DRAWINGS

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado



LOCATION MAP
NOT TO SCALE

INDEX OF DRAWINGS		
SHEET NO.	DRAWING NO.	TITLE
1 OF 5	1050-E12	TITLE SHEET
2 OF 5	1050-E13	AS-BUILT SITE CONDITIONS
3 OF 5	1050-E14	AS-BUILT SOIL REMOVAL AREAS AND REVEGETATION DOCUMENTATION
4 OF 5	1050-E15	AS-BUILT PROFILE, CROSS-SECTIONS AND DETAILS
5 OF 5	1050-E16	AS-BUILT CONSOLIDATION AREA PLAN VIEW, SOIL COVER THICKNESS AND TEST PIT DOCUMENTATION



VICINITY MAP
SCALE IN MILES
1/4 0 1/4 1/2

AS-BUILT CONSTRUCTION DRAWINGS SMELTERTOWN SUPERFUND SITE OPERABLE UNIT NO. 1

PREPARED FOR

PHELPS DODGE CORPORATION PHOENIX, ARIZONA

COLORADO REGISTERED
TRAVIS SHAW LeBLANC
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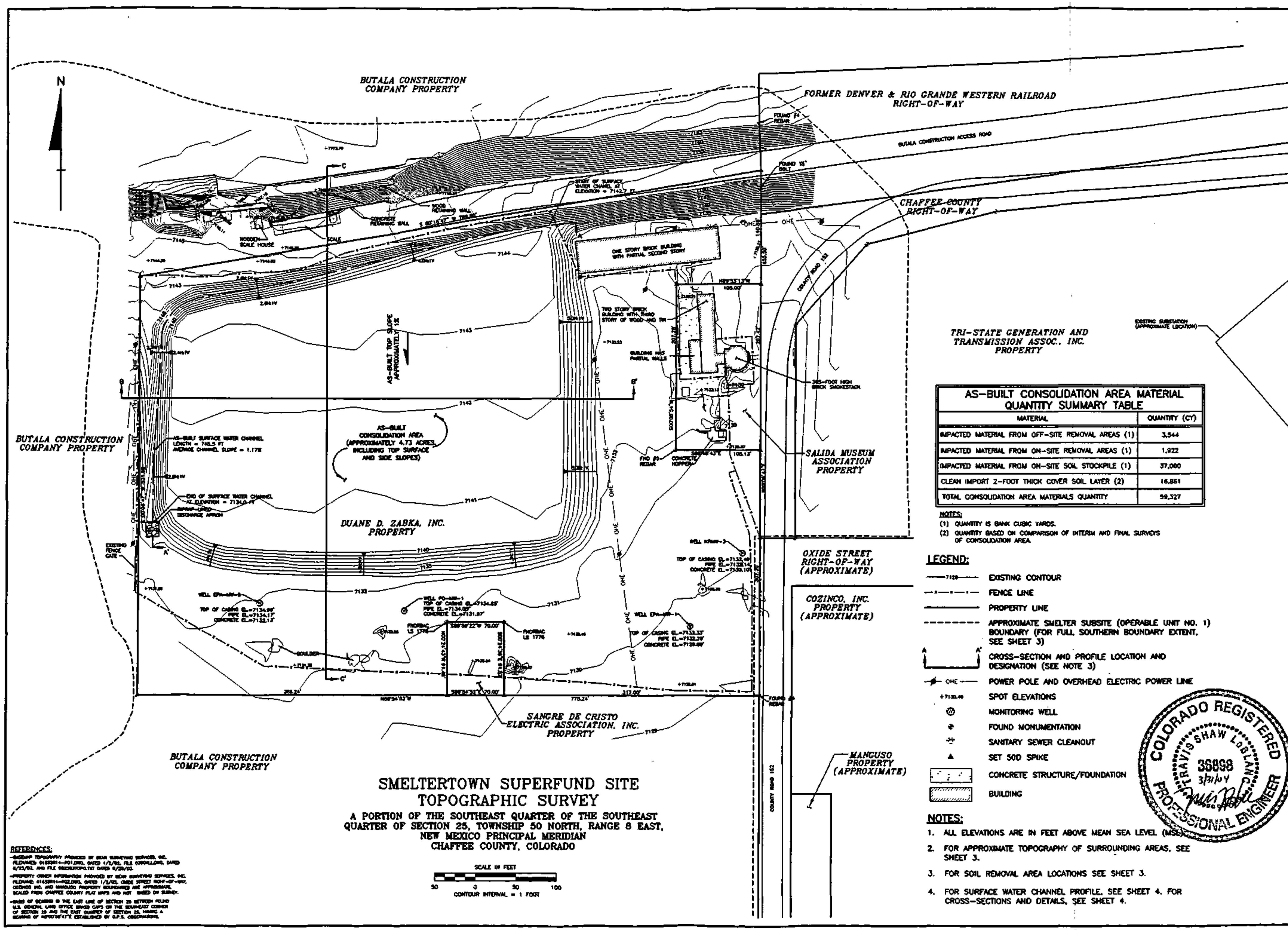
TITLE SHEET
SMELTERTOWN SUPERFUND SITE
OPERABLE UNIT NO. 1
PREPARED FOR
PHELPS DODGE CORPORATION

SHEET 1 OF 5

Drawn:	C.L.V.
Checked:	J.M.F.
Approved:	T.S.L.
Date:	3/31/04
Drg. No.	1050-E12

ISSUED FOR REMOVAL ACTION CLOSE-OUT REPORT.

Revision: REV 1



SMELTERTOWN SUPERFUND SITE
TOPOGRAPHIC SURVEY

A PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 25, TOWNSHIP 50 NORTH, RANGE 8 EAST, NEW MEXICO PRINCIPAL MERIDIAN
CHAFFEE COUNTY, COLORADO

AS-BUILT CONSOLIDATION AREA MATERIAL QUANTITY SUMMARY TABLE

MATERIAL	QUANTITY (CY)
IMPACTED MATERIAL FROM OFF-SITE REMOVAL AREAS (1)	3,544
IMPACTED MATERIAL FROM ON-SITE REMOVAL AREAS (1)	1,922
IMPACTED MATERIAL FROM ON-SITE SOIL STOCKPILE (1)	37,000
CLEAN IMPORT 2-FOOT THICK COVER SOIL LAYER (2)	16,861
TOTAL CONSOLIDATION AREA MATERIALS QUANTITY	59,327

NOTES:
(1) QUANTITY IS BANK CUBIC YARDS.
(2) QUANTITY BASED ON COMPARISON OF INTERIM AND FINAL SURVEYS OF CONSOLIDATION AREA.

LEGEND:

- EXISTING CONTOUR
- FENCE LINE
- PROPERTY LINE
- APPROXIMATE SMELTER SUBSITE (OPERABLE UNIT NO. 1) BOUNDARY (FOR FULL SOUTHERN BOUNDARY EXTENT, SEE SHEET 3)
- CROSS-SECTION AND PROFILE LOCATION AND DESIGNATION (SEE NOTE 3)
- POWER POLE AND OVERHEAD ELECTRIC POWER LINE
- SPOT ELEVATIONS
- MONITORING WELL
- FOUND MONUMENTATION
- SANITARY SEWER CLEANOUT
- SET 50D SPIKE
- CONCRETE STRUCTURE/FOUNDATION
- BUILDING

NOTES:

1. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (MSL).
2. FOR APPROXIMATE TOPOGRAPHY OF SURROUNDING AREAS, SEE SHEET 3.
3. FOR SOIL REMOVAL AREA LOCATIONS SEE SHEET 3.
4. FOR SURFACE WATER CHANNEL PROFILE, SEE SHEET 4. FOR CROSS-SECTIONS AND DETAILS, SEE SHEET 4.

COLORADO REGISTERED PROFESSIONAL ENGINEER TRAVIS SHAW LeBLANC 36898 3/31/04

REFERENCES:
-BASEMAP TOPOGRAPHY PROVIDED BY BEAR SURVEYING SERVICES, INC. [illegible]
-PROPERTY OWNER INFORMATION PROVIDED BY BEAR SURVEYING SERVICES, INC. [illegible] OXIDE STREET RIGHT-OF-WAY, COZINCO INC. AND MANCUSO PROPERTY BOUNDARIES ARE APPROXIMATE, SCALED FROM CHAFFEE COUNTY PLAT MAPS AND NOT BASED ON SURVEY.
-BASIS OF BEARING IS THE EAST LINE OF SECTION 25 BETWEEN FOUND U.S. GENERAL LAND OFFICE BRASS CAPS ON THE SOUTHEAST CORNER OF SECTION 25 AND THE EAST QUARTER OF SECTION 25, HAVING A BEARING OF [illegible] ESTABLISHED BY G.P.S. OBSERVATIONS.

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AS-BUILT SITE CONDITIONS SMELTERTOWN SUPERFUND SITE OPERABLE UNIT NO. 1
PREPARED FOR
PHELPS DODGE CORPORATION

SHEET 2 OF 5

Drawn:	C.L.V.
Checked:	J.M.F.
Approved:	T.S.L.
Date:	3/31/04
Dwg. No.	1050-E13

ISSUED FOR REMOVAL ACTION CLOSE-OUT REPORT.
Revision: REV 2

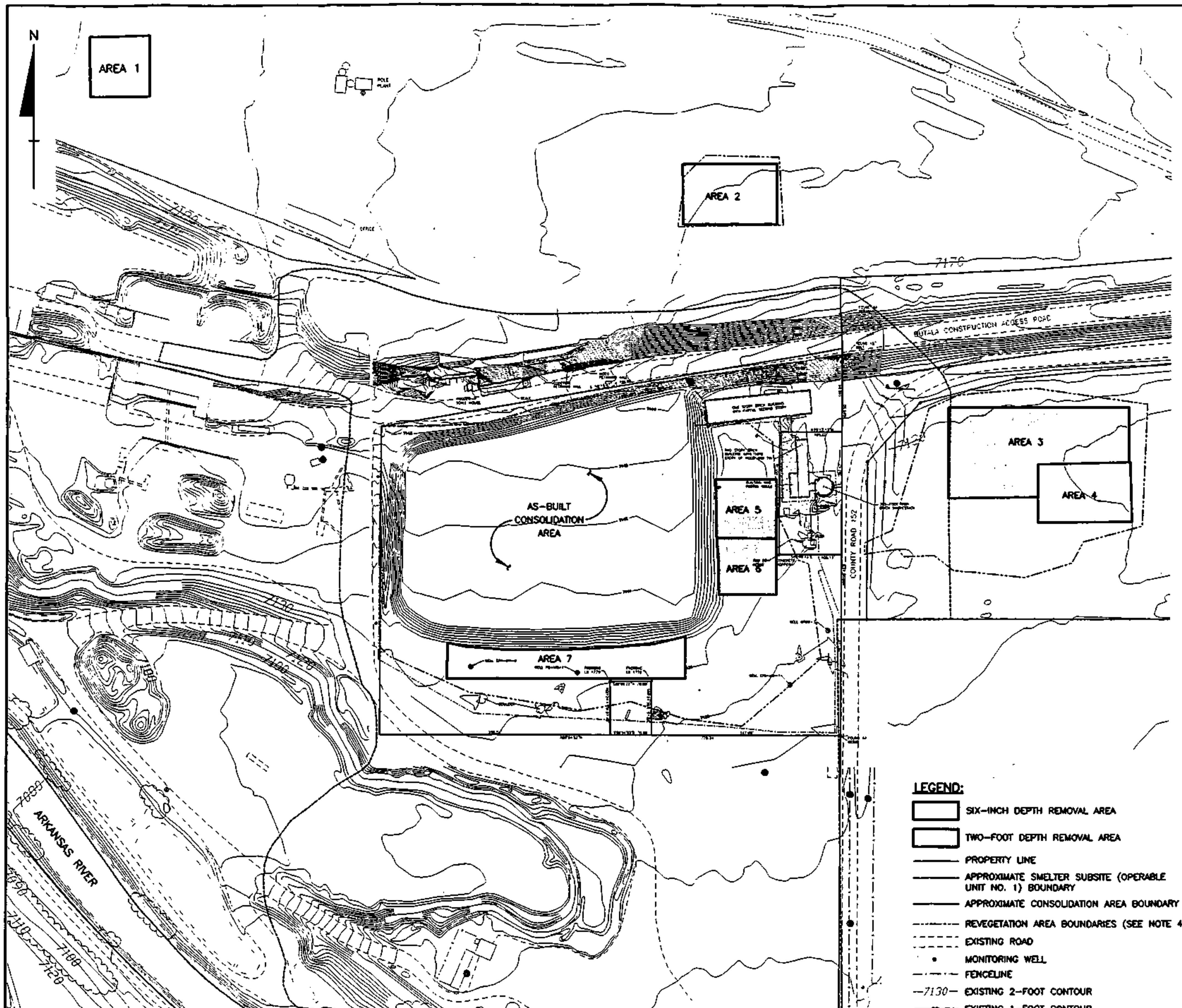

TABLE 1 – AS-BUILT SOIL REMOVAL AREAS SUMMARY				
AREA	AREA NO.	AERIAL EXTENT (SF)	REMOVAL DEPTH (FT)	REMOVAL QUANTITY (CY)
OFF-SITE SOIL REMOVAL AREAS	1	10,204	0.5	189
	2	15,984	0.5	296
	3	37,415	2.0	2,771
	4	15,543	0.5	288
ON-SITE SOIL REMOVAL AREAS	5	10,093	2.0	748
	6	9,329	2.0	691
	7	26,089	0.5	483
TOTAL REMOVAL QUANTITY				5,466

NOTE: ALL REMOVAL QUANTITIES ARE BANK CUBIC YARDS.

TABLE 2 – AS-BUILT SEED MIX				
SPECIES	COMMON NAME	PERCENT	OZ/ACRE	LBS/ACRE
Poa secunda	Sandberg bluegrass	5.5	1.1	0.070
Koeleria macrantha	Prairie junegrass	16.7	1.7	0.104
Achnatherum hymenoides	Indian ricegrass	11.1	10.0	0.624
Hesperostipa comata	Needleandthread	11.1	2.2	0.139
Bouteloua gracilis	Blue grama	11.1	0.6	0.035
Sporobolus cryptandrus	Sand dropseed	5.5	1.1	0.070
Agropyron smithii	Western wheatgrass	11.1	14.1	0.879
Elymus elymoides	Bottlebrush squirreltail	16.7	2.8	0.174
Artemisia frigida	Fringed sagebrush	5.6	1.1	0.070
Ribes cereum	Wax currant	2.8	1.1	0.070
Eriogonum umbellatum	Sulfur buckwheat	2.8	1.9	0.117
	TOTAL	100.0	37.7	2.352

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3/31/04

LEGEND:

- SIX-INCH DEPTH REMOVAL AREA
- TWO-FOOT DEPTH REMOVAL AREA
- PROPERTY LINE
- APPROXIMATE SMELTER SUBSITE (OPERABLE UNIT NO. 1) BOUNDARY
- APPROXIMATE CONSOLIDATION AREA BOUNDARY
- REVEGETATION AREA BOUNDARIES (SEE NOTE 4)
- EXISTING ROAD
- MONITORING WELL
- FENCELINE
- 7130 EXISTING 2-FOOT CONTOUR
- EXISTING 1-FOOT CONTOUR

NOTES:

1. SOIL REMOVAL AREAS 1 THROUGH 6 BOUNDARIES ARE IDENTICAL TO THOSE IDENTIFIED IN THE FINAL REMOVAL DESIGN REPORT (FRDR). THE FRDR'S SOIL REMOVAL AREA 7 WAS INCREASED DURING CONSTRUCTION BY EXTENDING THE NORTHERN BOUNDARY TO THE SOUTHERN TOE OF THE AS-BUILT CONSOLIDATION AREA. SEE TABLE 1 FOR SUMMARY OF AS-BUILT SOIL REMOVAL AREAS.
2. ALL EXCAVATED MATERIAL FROM ON-SITE AND OFF-SITE SOIL REMOVAL AREAS WERE HAULED AND PLACED IN THE CONSOLIDATION AREA BENEATH A TWO-FOOT THICK SOIL COVER.
3. FOR DELINEATION OF SMELTERTOWN SUPERFUND SITE ADJACENT PROPERTY OWNERS, SEE SHEET 2.
4. THE ENTIRE CONSOLIDATION AREA, SOIL REMOVAL AREAS AND ALL DISTURBED AREAS (TOTAL OF 10.8 ACRES) WERE REVEGETATED IN ACCORDANCE WITH THE CONSTRUCTION SPECIFICATIONS. SOIL REMOVAL AREA 1 WAS NOT REVEGETATED AT THE REQUEST OF THE PROPERTY OWNER. SEE TABLE 2 FOR SEED MIX USED TO REVEGETATE THESE AREAS.

SCALE IN FEET
80 0 80 160
CONTOUR INTERVAL VARIES (1-TO-2 FOOT INTERVALS)

REFERENCES:

-BASEMAP TOPOGRAPHY PROVIDED BY BEAR SURVEYING SERVICES, INC. FILENAMES: [illegible]-PC1.DWG, DATED 1/2/02, FILE 03SMALL.DWG, DATED 8/25/03, AND FILE 08230JTOPO.TXT DATED 8/25/03.

-TWO-FOOT CONTOUR INTERVAL BASEMAP TOPOGRAPHY OF SURROUNDING AREA IS BASED ON 1993 AERIAL SURVEY AS PROVIDED BY U.S. ENVIRONMENTAL PROTECTION AGENCY ON 8/14/01 FILENAME: BASEMAP.ZIP.

-SMELTER SUBSITE (OPERABLE UNIT NO. 1) BOUNDARY BASED ON FIGURE 1-2 OF THE EE/CA DATED 7/[illegible]/02.

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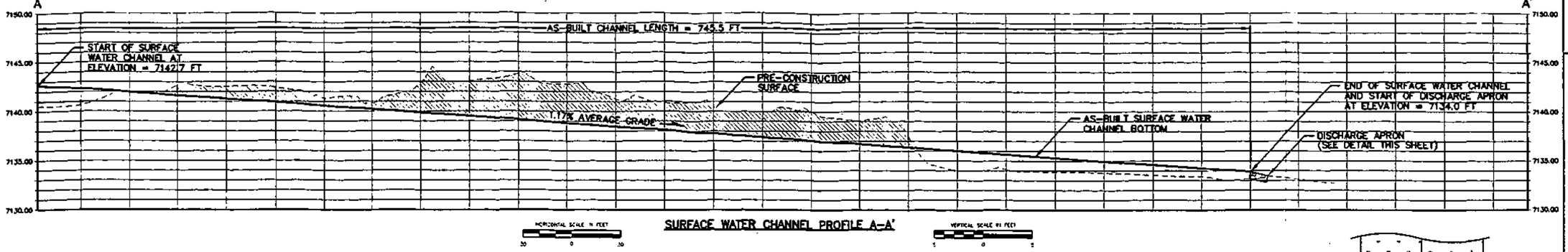
AS-BUILT SOIL REMOVAL AREAS AND REVEGETATION DOCUMENTATION
SMELTERTOWN SUPERFUND SITE
OPERABLE UNIT NO. 1
PREPARED FOR
PHELPS DODGE CORPORATION

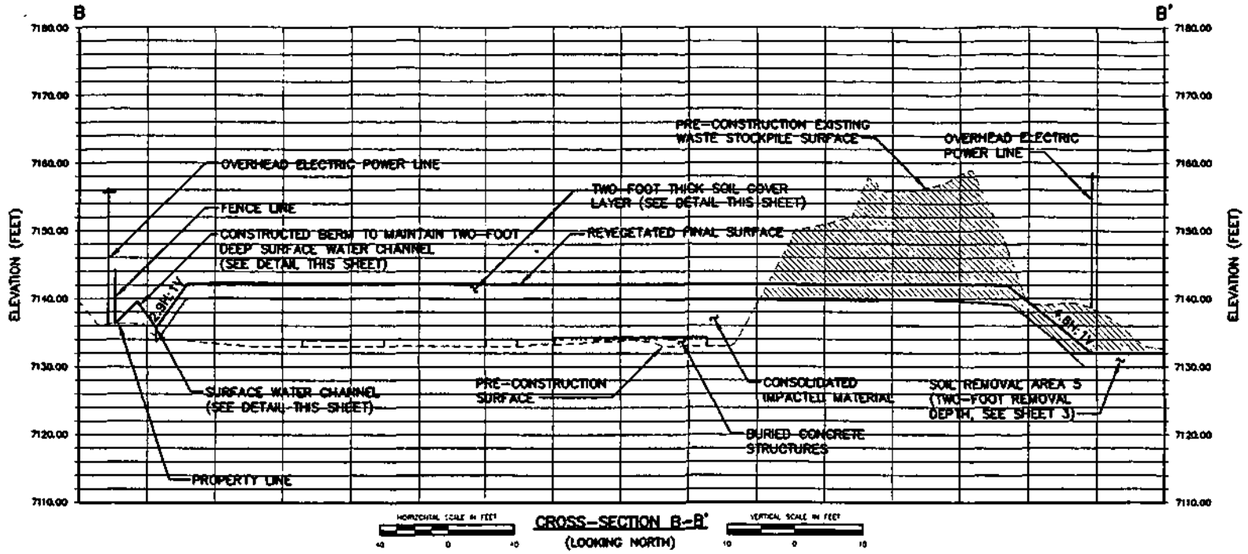
SHEET 3 OF 5

ISSUED FOR REMOVAL ACTION CLOSE-OUT REPORT.
Revision: REV 2

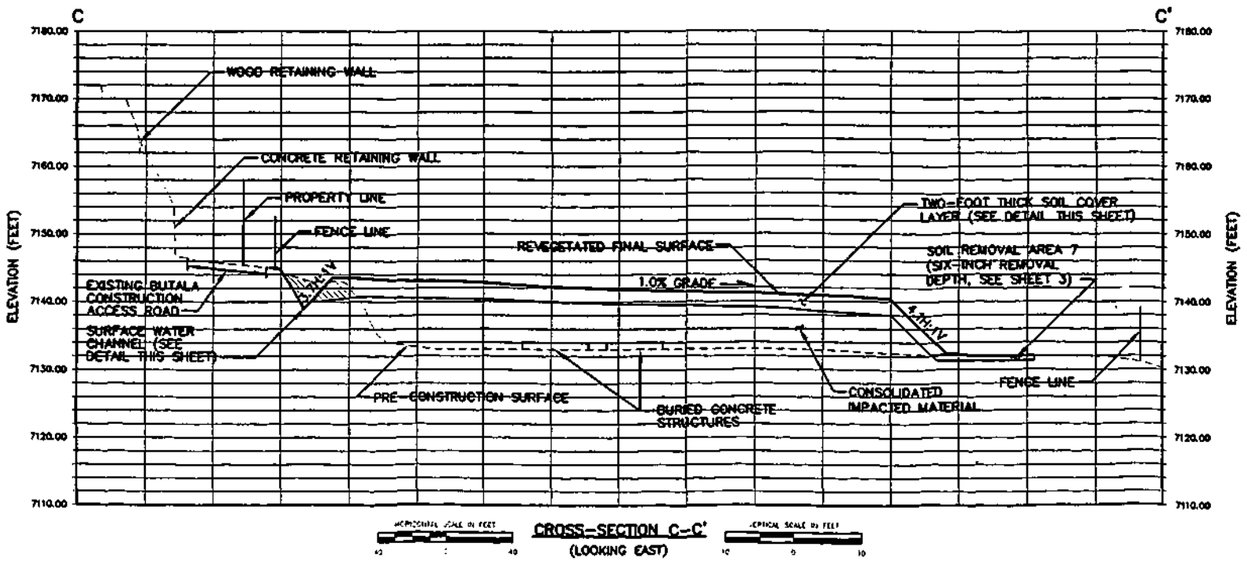
Drawn: C.L.V.
Checked: J.M.F.
Approved: T.S.L.
Date: 3/31/04
Dwg. No. 1050-E14



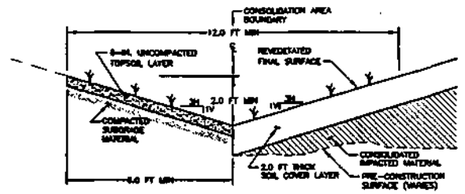
SURFACE WATER CHANNEL PROFILE A-A'



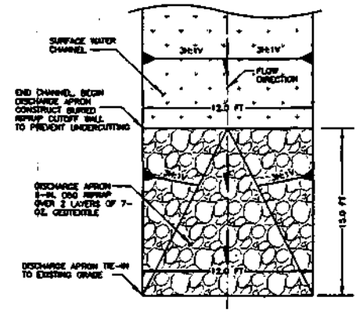
CROSS-SECTION B-B'
(LOOKING NORTH)



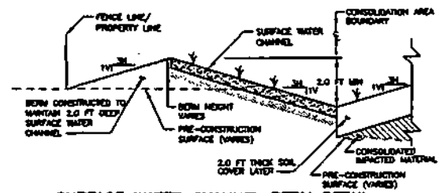
CROSS-SECTION C-C'
(LOOKING EAST)



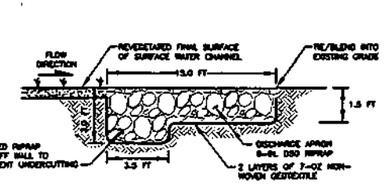
SURFACE WATER CHANNEL CROSS-SECTION
(NOT TO SCALE)
(TYPICAL)



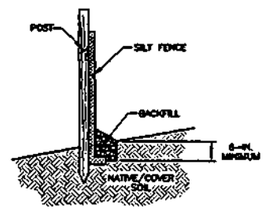
DISCHARGE APRON PLAN VIEW
(NOT TO SCALE)



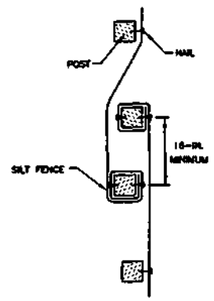
SURFACE WATER CHANNEL BERM DETAIL
(NOT TO SCALE)
(TYPICAL)



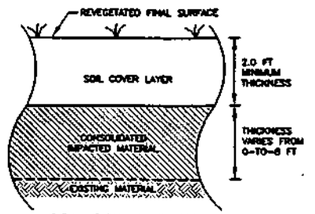
DISCHARGE APRON CROSS-SECTION
(NOT TO SCALE)



SILT FENCE INSTALLATION DETAIL
(NOT TO SCALE)
(TYPICAL)



SILT FENCE SPLICE DETAIL
(NOT TO SCALE)
(TYPICAL)



SOIL COVER DETAIL
(NOT TO SCALE)
(TYPICAL)

LEGEND:

FILL AREAS CUT AREAS RIPRAP

NOTES:

1. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (MSL).
2. FOR PROFILE AND CROSS-SECTIONS LOCATIONS, SEE SHEET 2.

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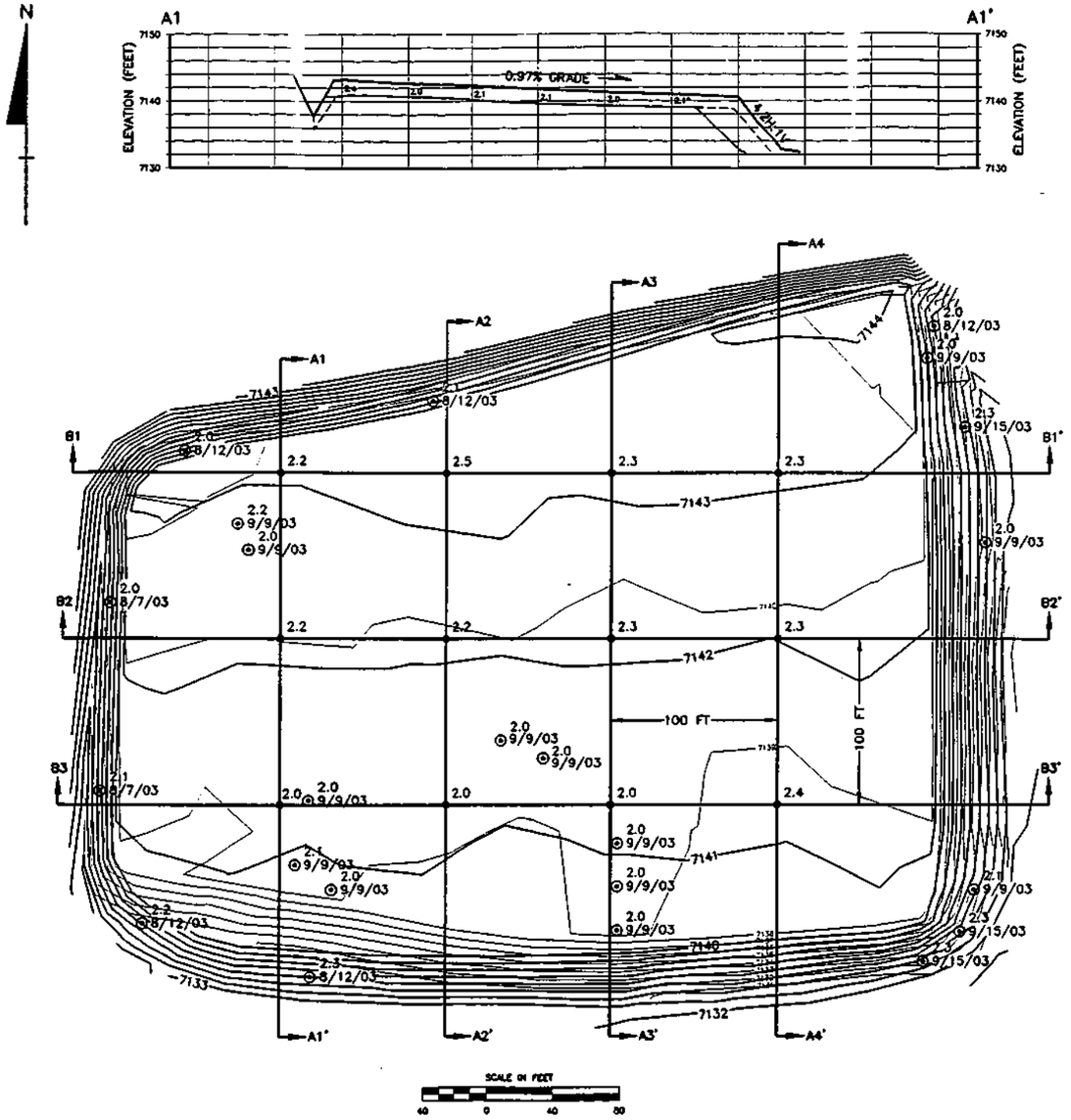
AS-BUILT PROFILE, CROSS-SECTIONS AND DETAILS
SMELTERTOWN SUPERFUND SITE
OPERABLE UNIT NO. 1
PREPARED FOR
PHELPS DODGE CORPORATION

SHEET 4 OF 5

Drawn:	C.L.V.	Date:	3/31/04	Revision:	REV 2
Checked:	J.M.F.	Dwg. No.	1050-E15		
Approved:	T.S.L.				

ISSUED FOR REMOVAL ACTION CLOSE-OUT REPORT.



PLAN VIEW LEGEND:

- ● 2.0 — HEIGHT (IN FEET) BETWEEN TOP OF IMPACTED MATERIAL SURFACE AND FINAL SURFACE SURVEYS
- ⊙ 2.0 9/9/03 — HAND-DUG TEST PIT LOCATION, MEASURED SOIL COVER THICKNESS (IN FEET) AND MEASUREMENT DATE
- —7132— TOP OF IMPACTED MATERIAL SURFACE CONTOURS
- —7140— FINAL SURFACE CONTOURS (TOP SURFACE OF SOIL COVER LAYER)
- B3 B3' — CROSS-SECTION LOCATION AND IDENTIFICATION (SEE THIS SHEET FOR CROSS-SECTIONS)

CROSS-SECTION LEGEND:

- 2.2 — HEIGHT (IN FEET) BETWEEN TOP OF IMPACTED MATERIAL AND FINAL SURFACE SURVEYS
- 2.0* — MEASURED THICKNESS (IN FEET) OF SOIL COVER BASED ON HAND-DUG TEST PITS
- ——— TOP OF IMPACTED MATERIAL SURFACE
- ——— FINAL SURFACE (TOP SURFACE OF SOIL COVER LAYER)
- - - - - - ESTIMATED SURFACE OF IMPACTED MATERIAL PRIOR TO PLACEMENT OF SOIL COVER LAYER (I.E., THE IMPACTED MATERIAL SURFACE WAS ALTERED AFTER SURVEYING WAS PERFORMED)

REFERENCES:
- INTERIM SURFACE CONTOURS PROVIDED BY BEAR SURVEYING SERVICES, INC. FILENAME: 030808ALL.DXF, DATED 7/15/03.
- FINAL SURFACE CONTOURS PROVIDED BY BEAR SURVEYING SERVICES, INC. FILENAMES: 030908ALL.DWG, DATED 9/25/03 AND FILE 092303TEPS.TXT DATED 9/25/03.

COLORADO REGISTERED TRAVIS SHAW LaBLANC 36898 3/31/04 PROFESSIONAL ENGINEER

Emg²
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Offices in Bozeman MT, Denver CO, and Phoenix AZ

AS-BUILT CONSOLIDATION AREA PLAN VIEW, SOIL COVER THICKNESS AND TEST PIT DOCUMENTATION
SMELTERTOWN SUPERFUND SITE
OPERABLE UNIT NO. 1
PREPARED FOR PHELPS DODGE CORPORATION

SHEET 5 OF 5

Drawn:	C.L.V.	ISSUED FOR REMOVAL ACTION CLOSE-OUT REPORT.	Revision:	
Checked:	J.M.F.		REV 1	
Approved:	T.S.L.			
Date:	3/31/04			
Dwg. No.	1050-E16			

APPENDIX D

PROJECT PHOTOGRAPHS

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

Color Photo(s)

The following pages contain color that does not appear in the scanned images.

To view the actual images, please contact the Superfund Records Center at (303) 312-6473.

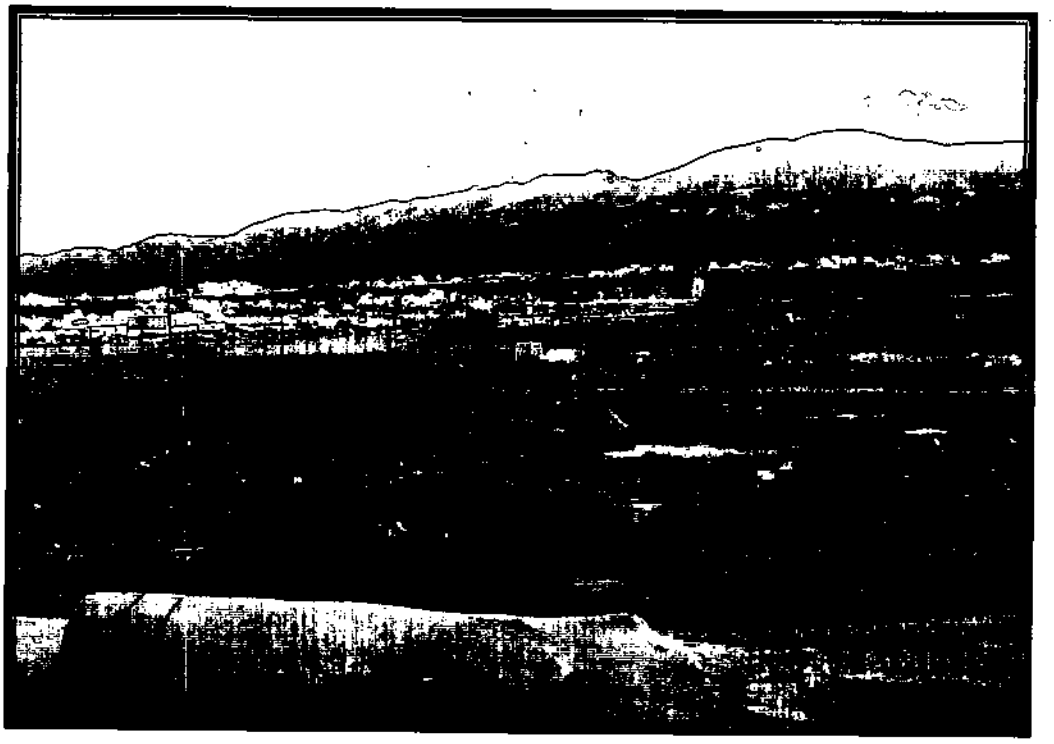


Photo 1: Consolidation Area — Looking South (December 6, 2001—Existing Waste Stockpile, Structures and Debris Prior to Construction)

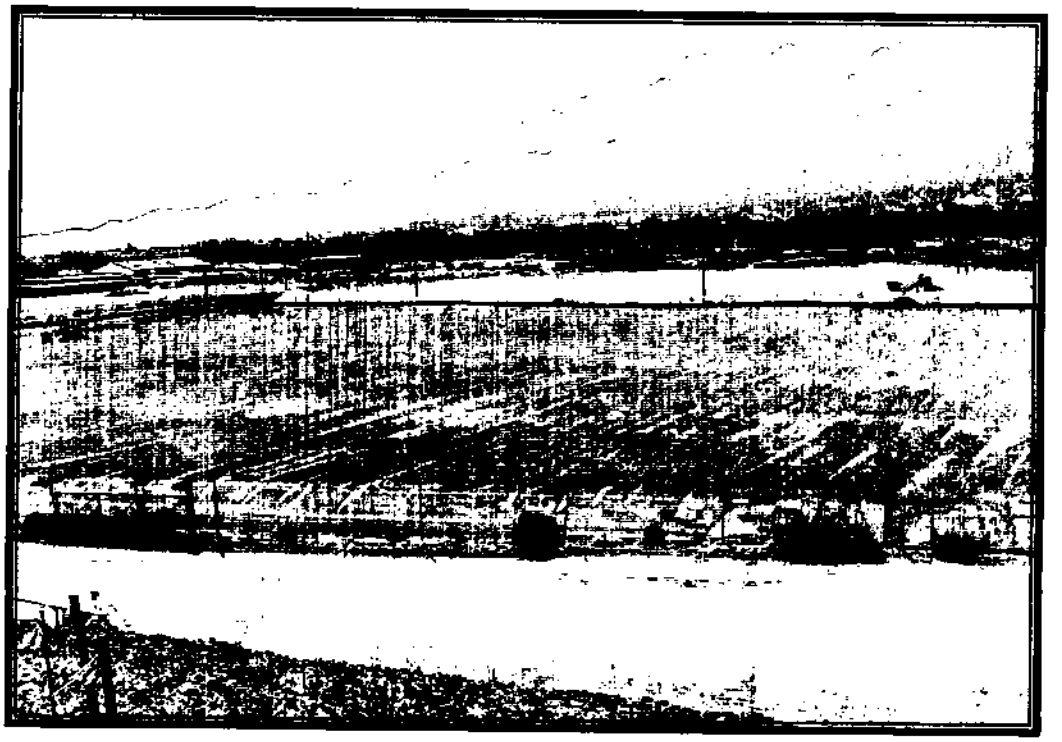


Photo 2: Consolidation Area—Looking South (August 13, 2003—Final Soil Cover After Construction)

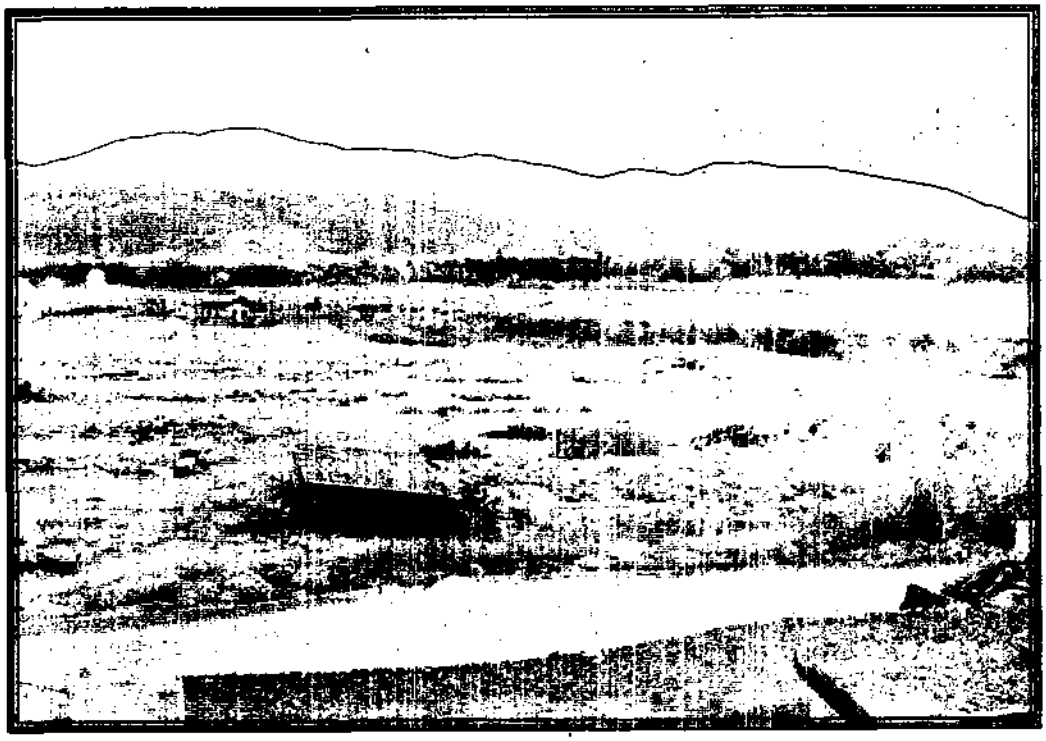


Photo 3: Consolidation Area —Looking Southwest (December 6, 2001—Existing Structures and Debris Prior to Construction)

Photo 4: Consolidation Area—Looking Southwest (August 13, 2003—Final Soil Cover After Construction)

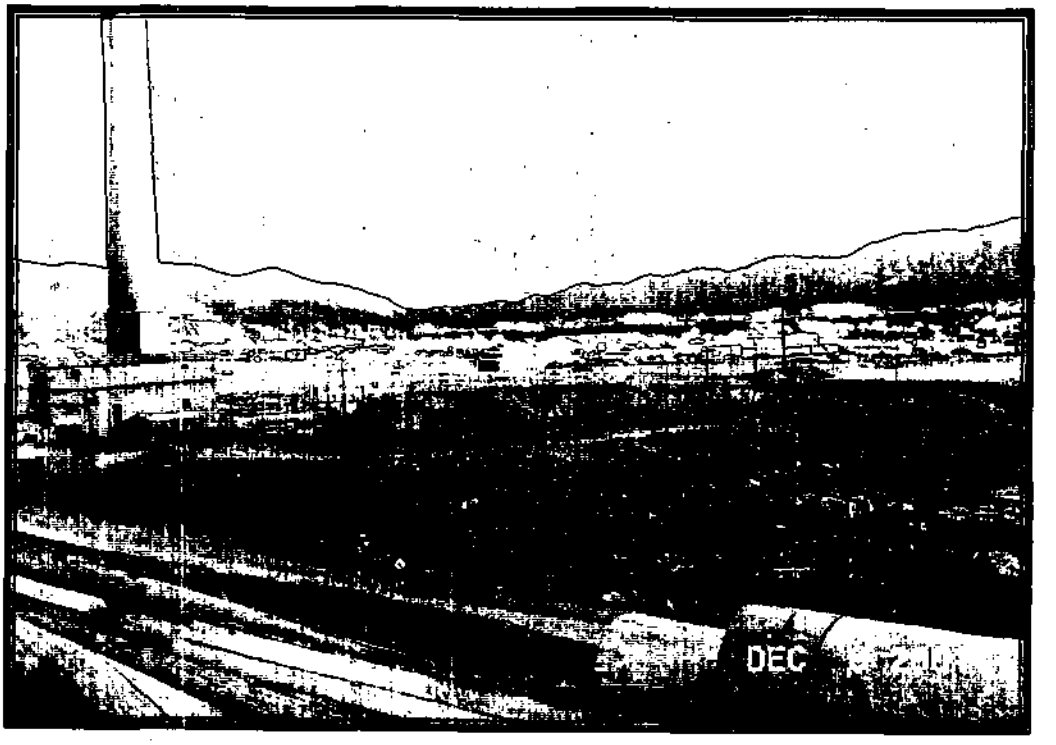


Photo 5: Consolidation Area — Looking Southeast (December 6, 2001—Existing Waste Stockpile Prior to Construction)

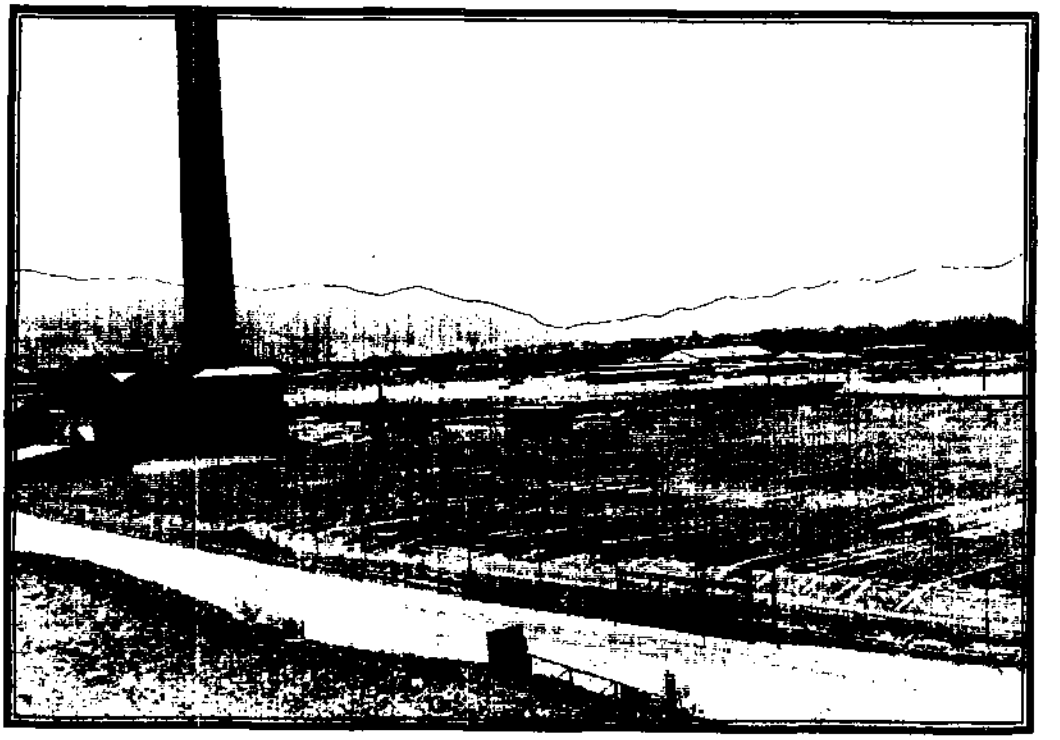


Photo 6: Consolidation Area—Looking Southeast (August 13, 2003—Final Soil Cover After Construction)

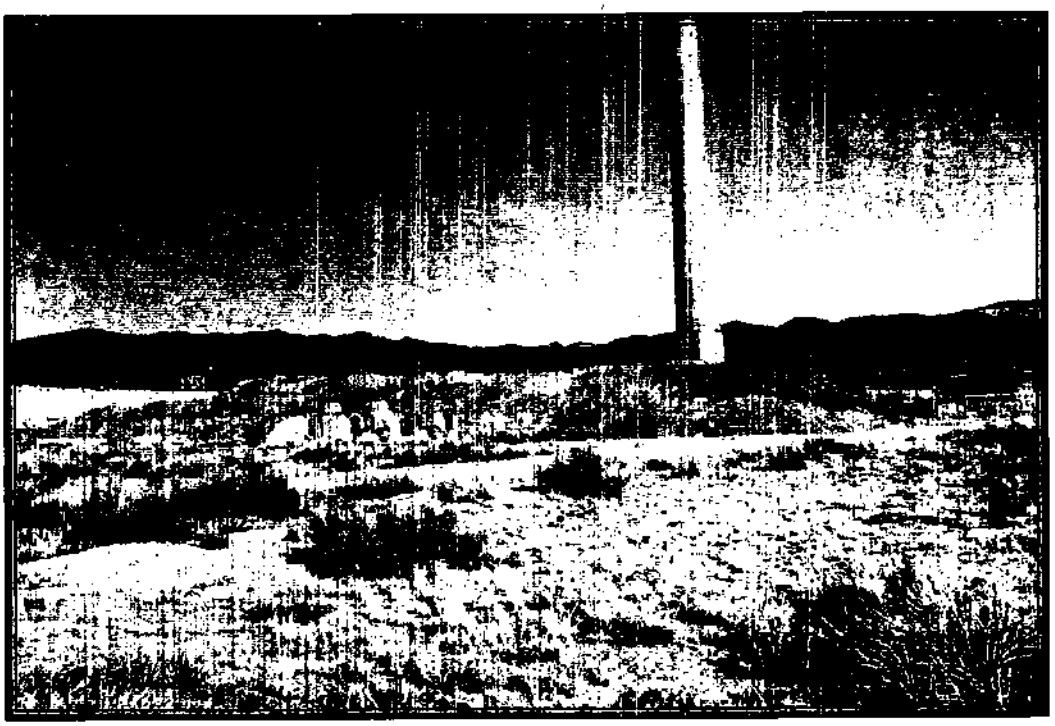


Photo 7: Existing Waste Stockpile—Looking Northeast (December 6, 2001—Prior to Construction)

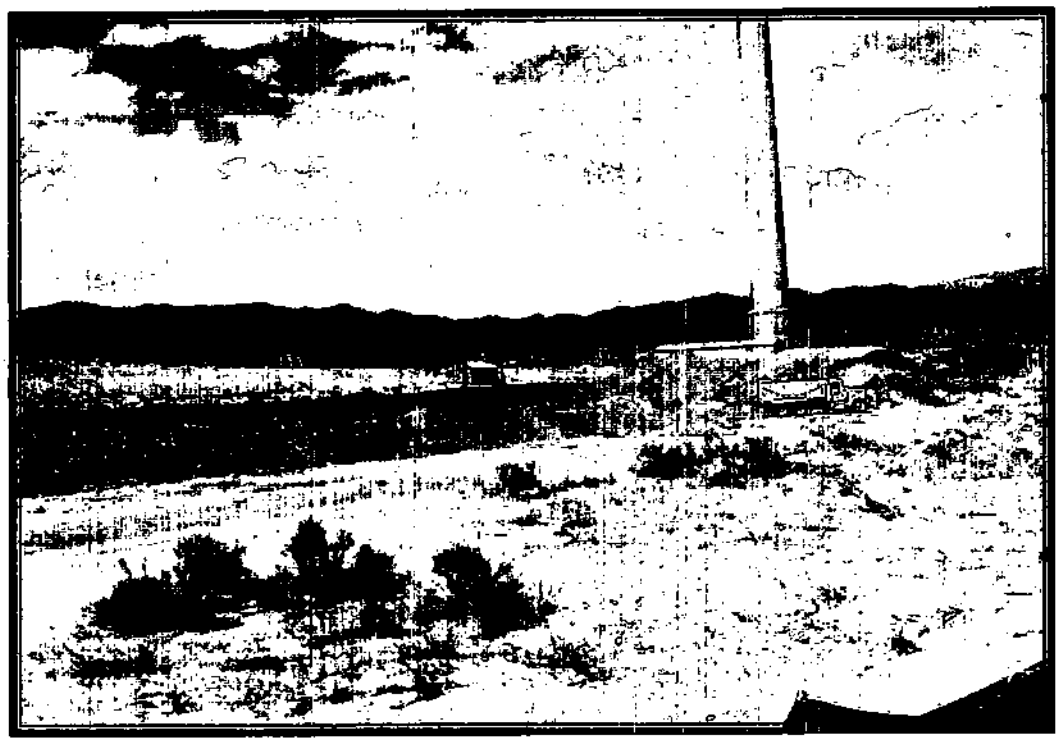


Photo 8: Existing Waste Stockpile—Looking Northeast (June 24, 2003—During Regrading Operations)

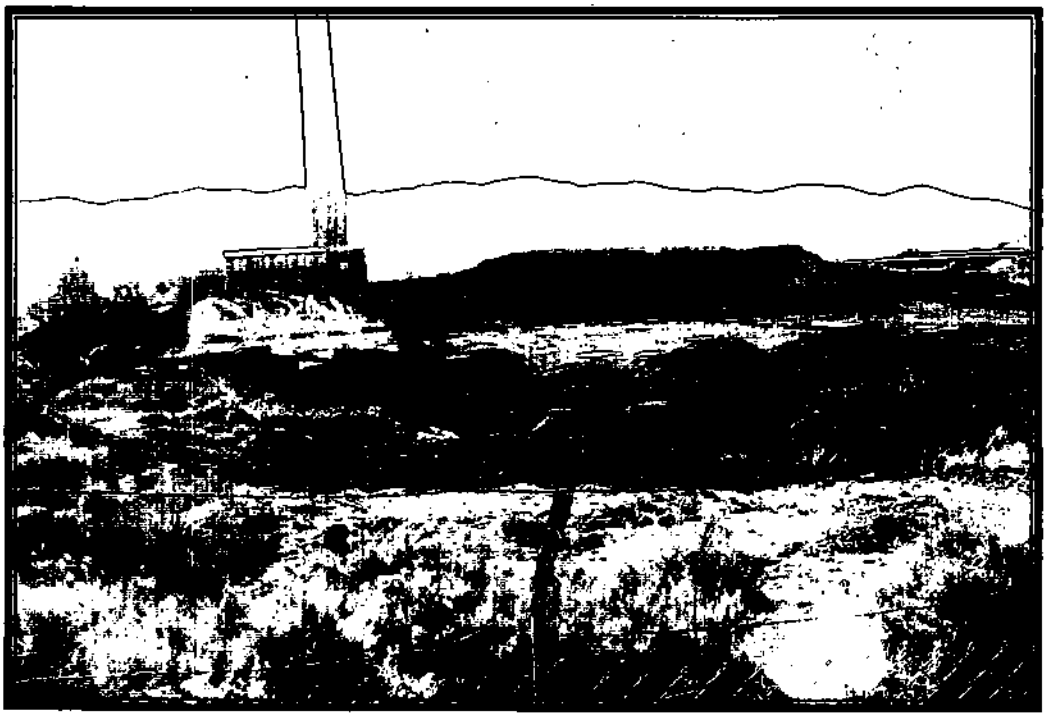


Photo 9: Consolidation Area—Looking East (June 20, 2003—During Regrading Operations)

Photo 10: Consolidation Area— Looking East (July 1, 2003—During Surface Water Channel Construction)

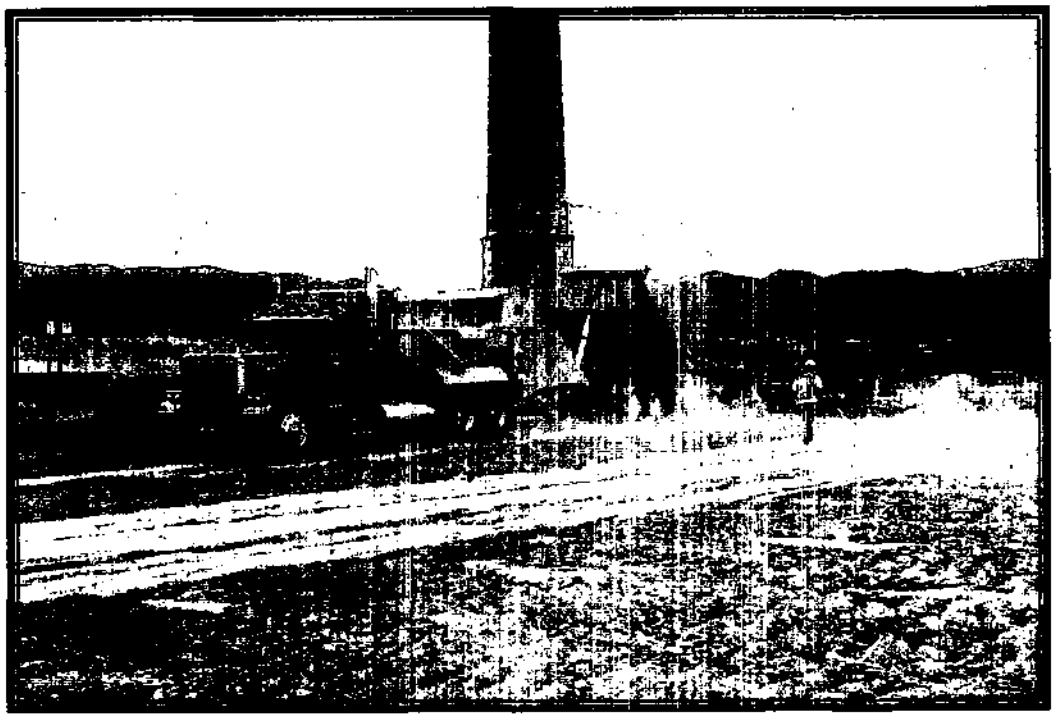


Photo 11: Consolidation Area—Looking Northeast (July 23, 2003—During Placement of Cover Soil Material)

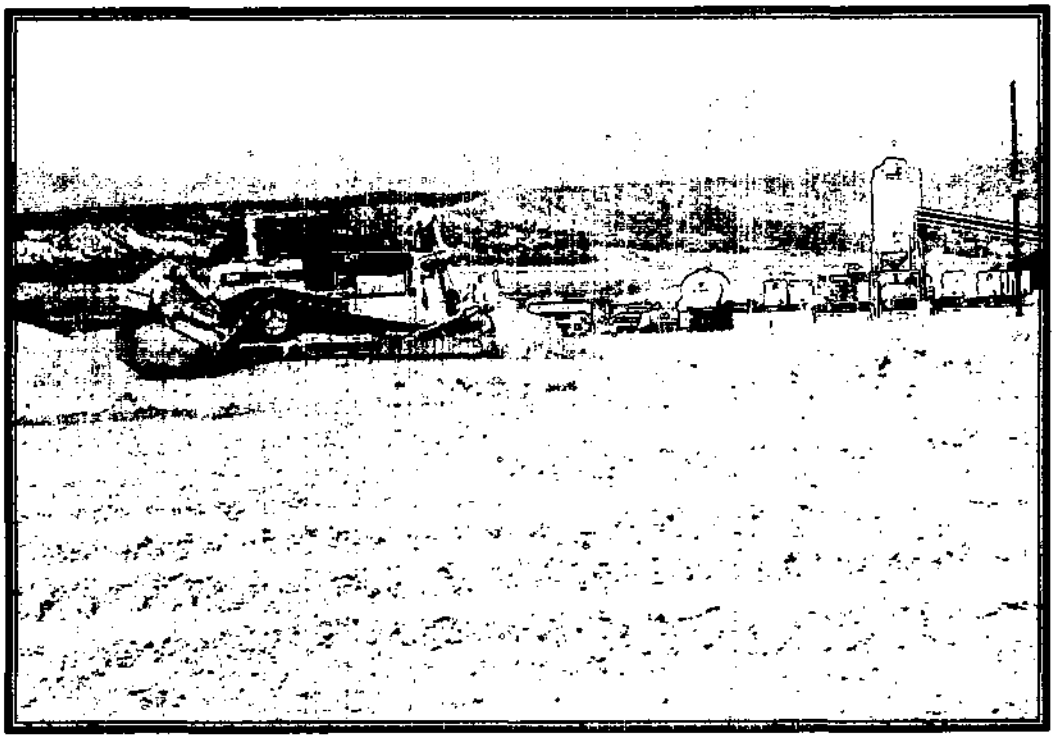


Photo 12: Consolidation Area—Looking West (July 24, 2003—During Placement of Cover Soil Material)

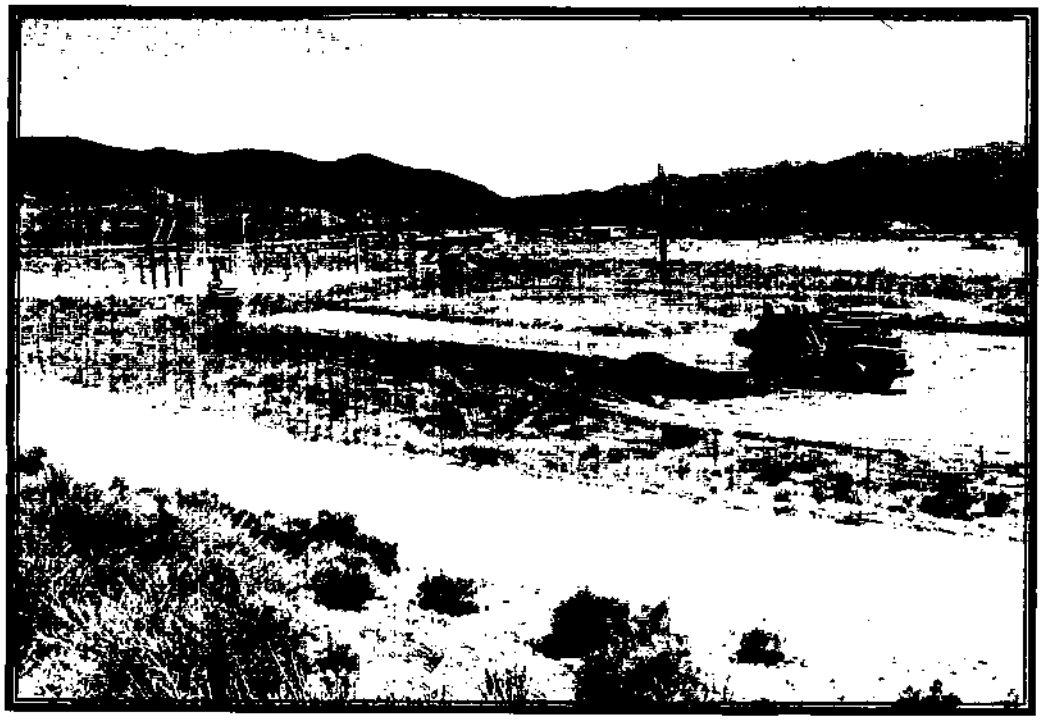


Photo 13: Soil Removal Areas 3 and 4—Looking Southeast (June 25, 2003—During Removal of Impacted Soil Material)

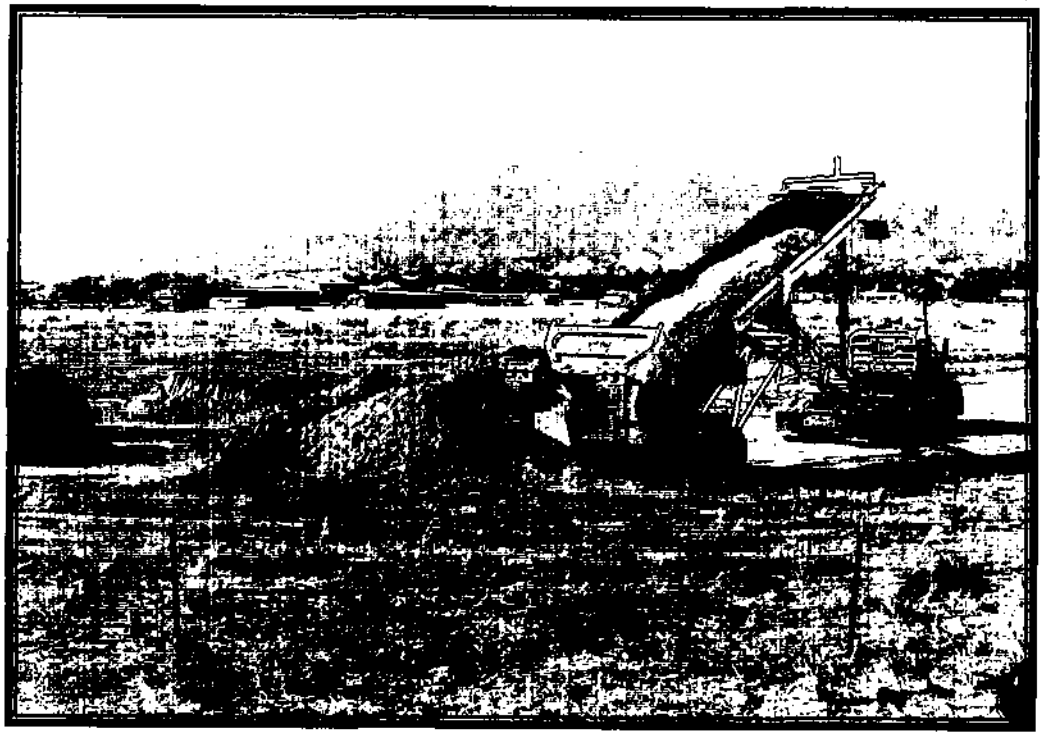


Photo 14: Soil Removal Areas 3 and 4—Looking South (July 11, 2003—During Placement of Clean Backfill Material)

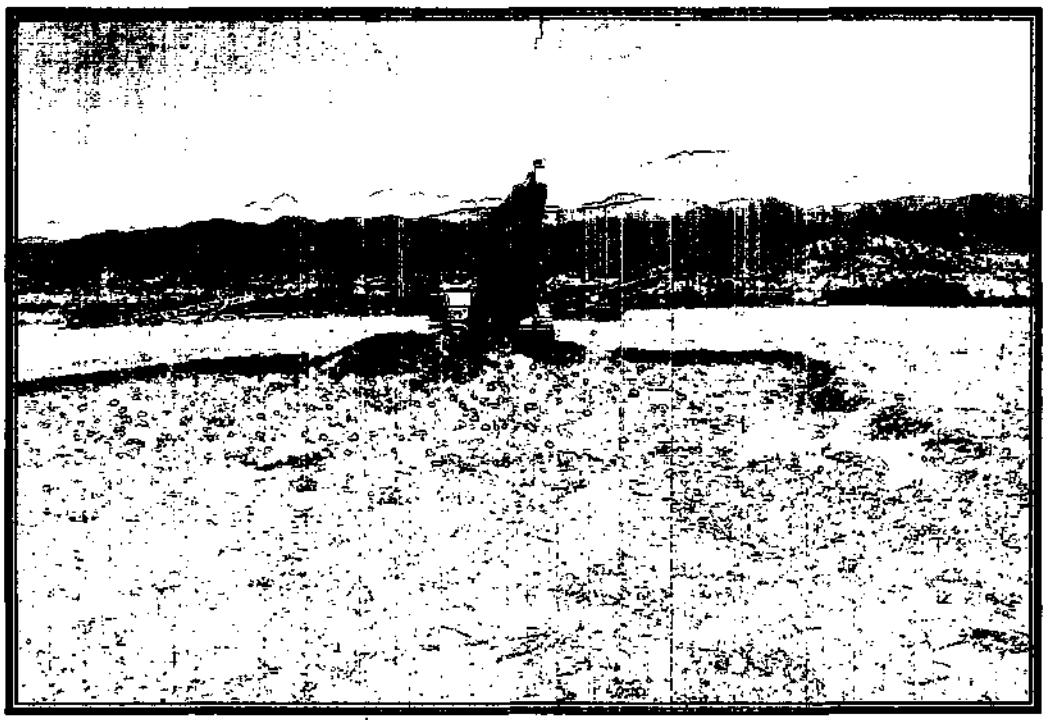


Photo 15: Soil Removal Area 2—Looking East (June 26, 2003—During Removal of Impacted Soil Material)

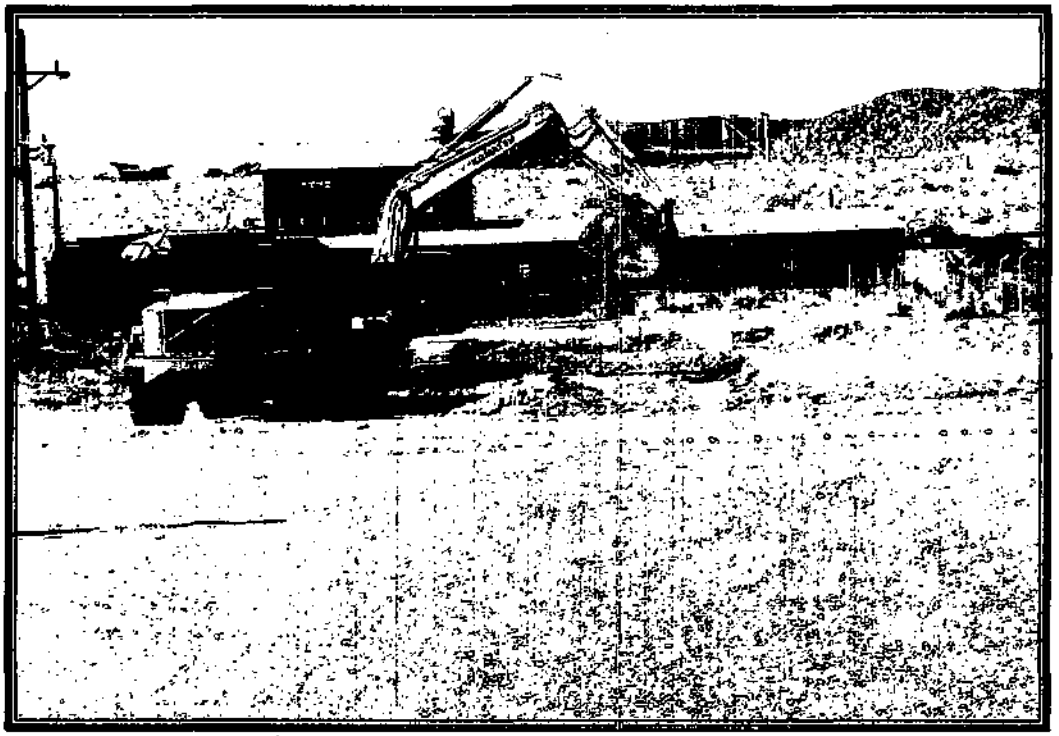


Photo 16: Soil Removal Area 6—Looking North (June 27, 2003—During Removal of Impacted Soil Material)

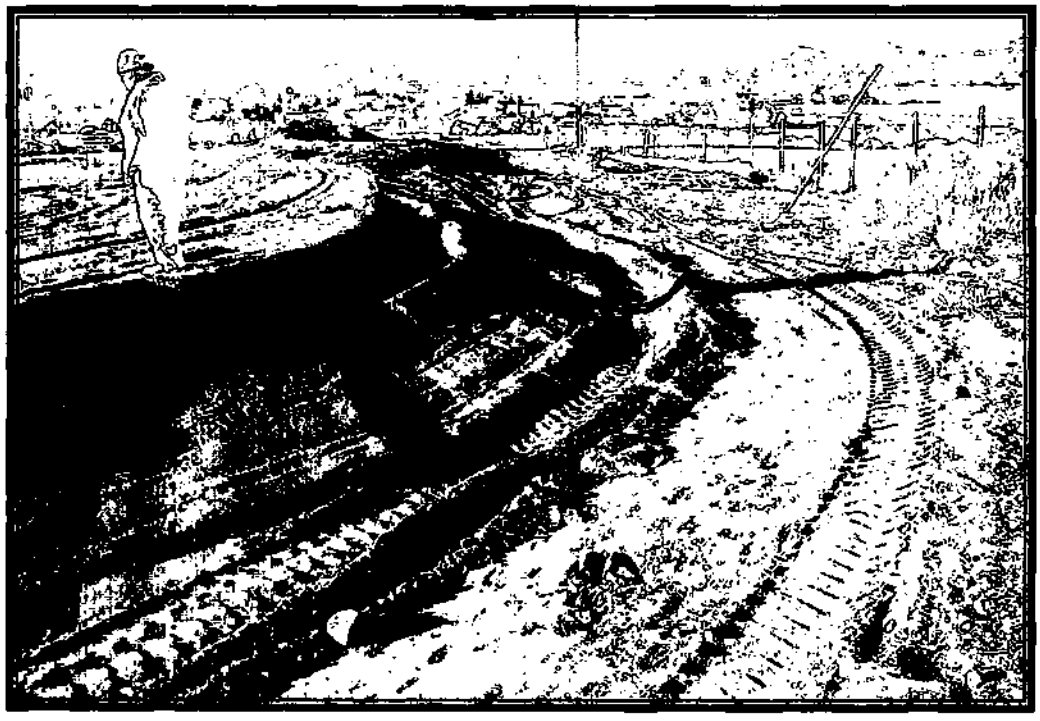


Photo 17: Surface Water Channel—Looking South (July 2, 2003—During Construction)

Photo 18: Surface Water Channel—Looking South (August 7, 2003—After Construction)

Photo 19: Discharge Apron—Looking West (August 7, 2003—During Placement of Geotextile Material)

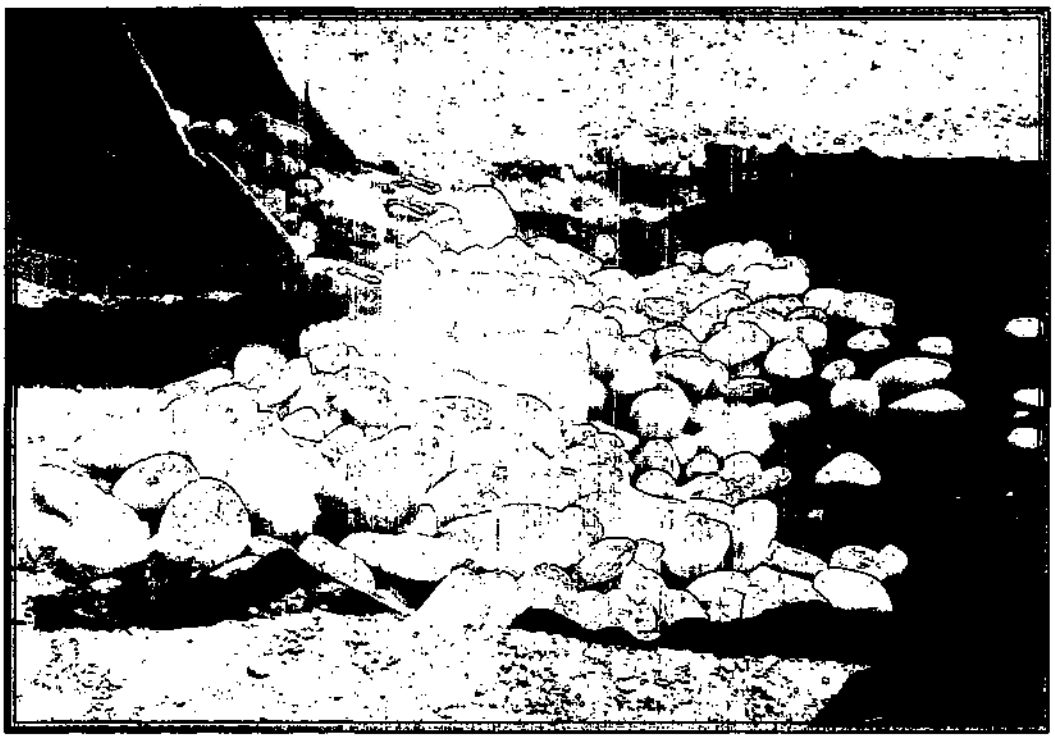


Photo 20: Discharge Apron—Looking East (August 7, 2003—During Placement of 6-Inch D50 Rock Riprap Material)

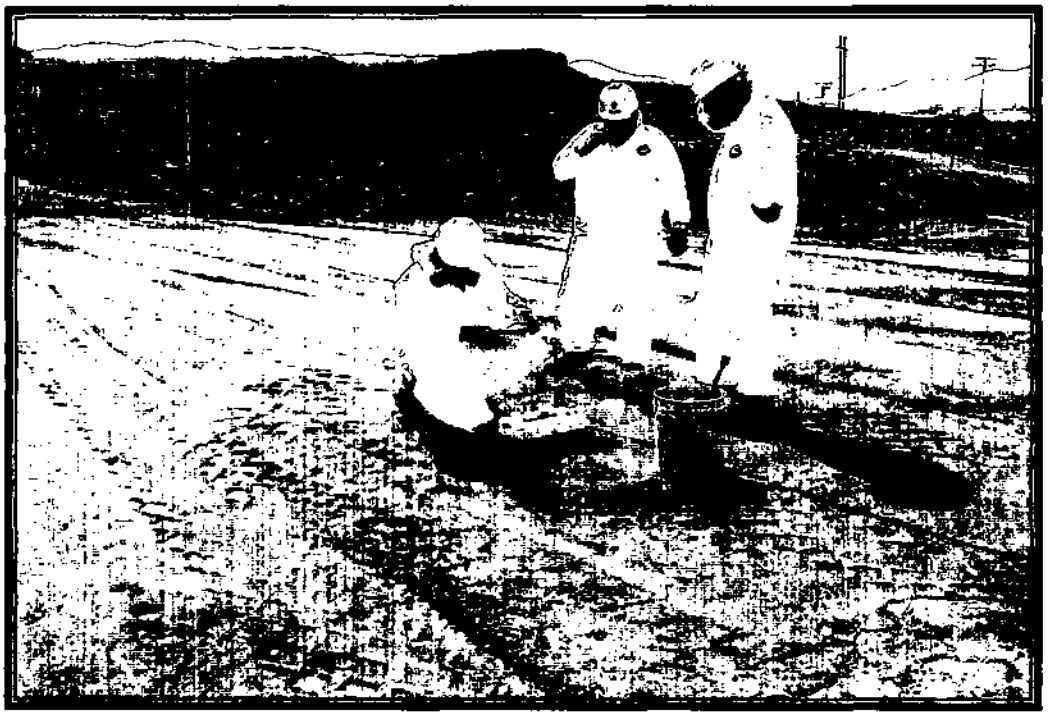


Photo 21: Consolidation Area —Looking East (June 19, 2003—During Field Compaction Testing of Initial Lift of Impacted Material)

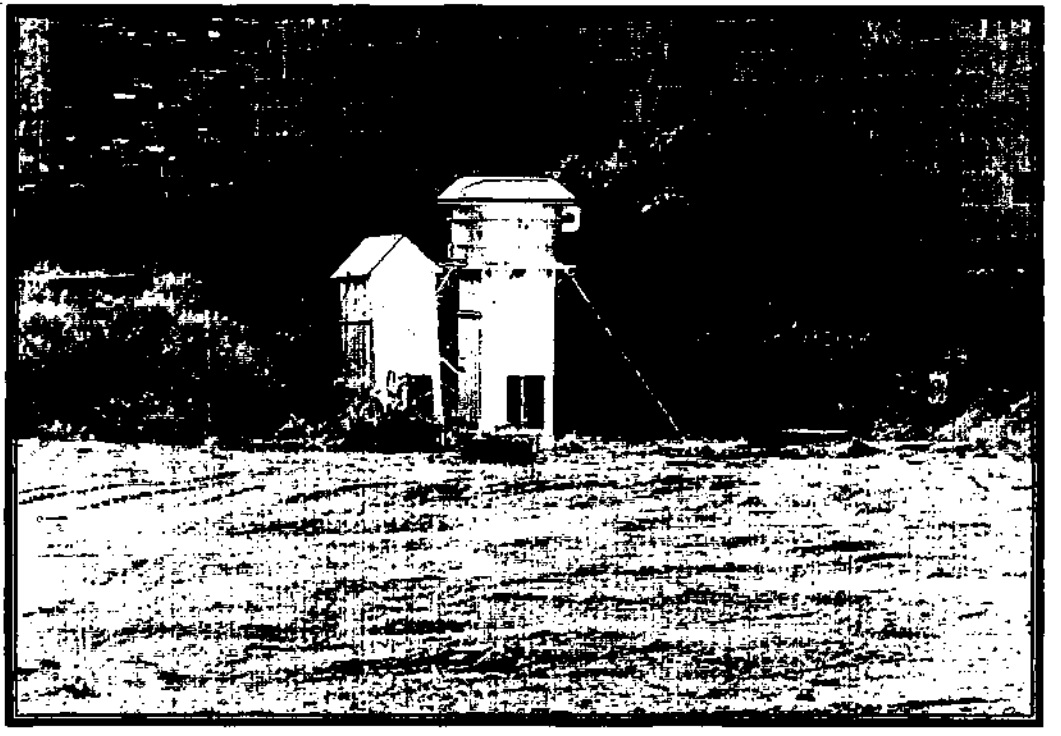


Photo 22: PM10/TSP Air Monitoring Equipment—Northeast (downwind) location (June 20, 2003—During Construction)

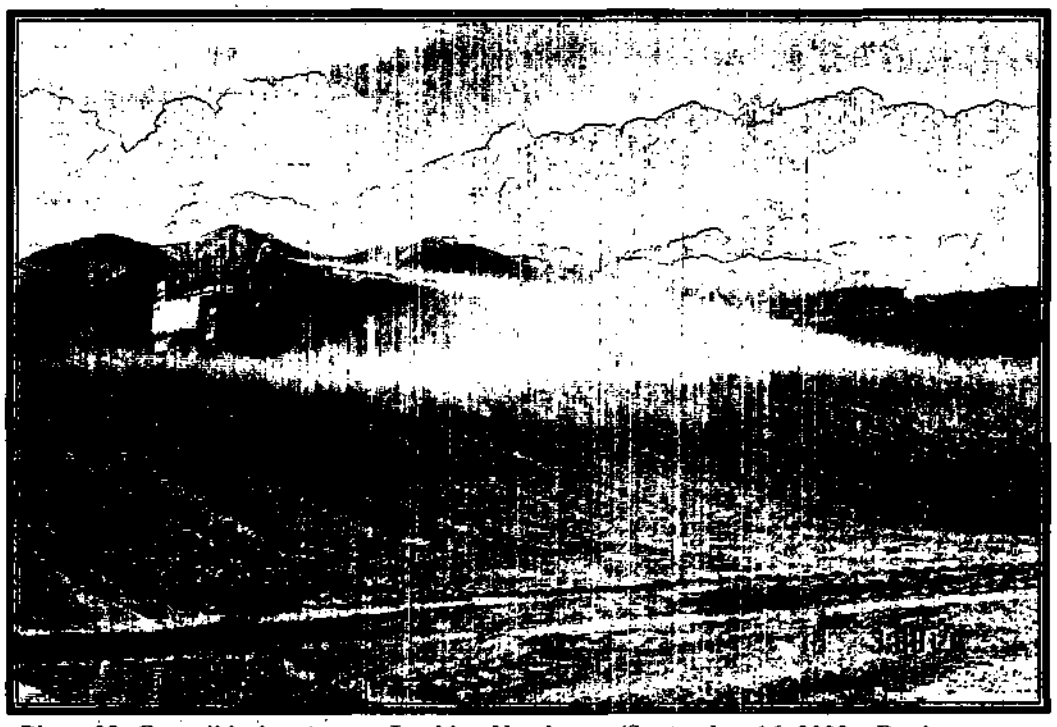


Photo 23: Consolidation Area —Looking Northwest (September 16, 2003—During Hydroseeding Operations of the Final Soil Cover)

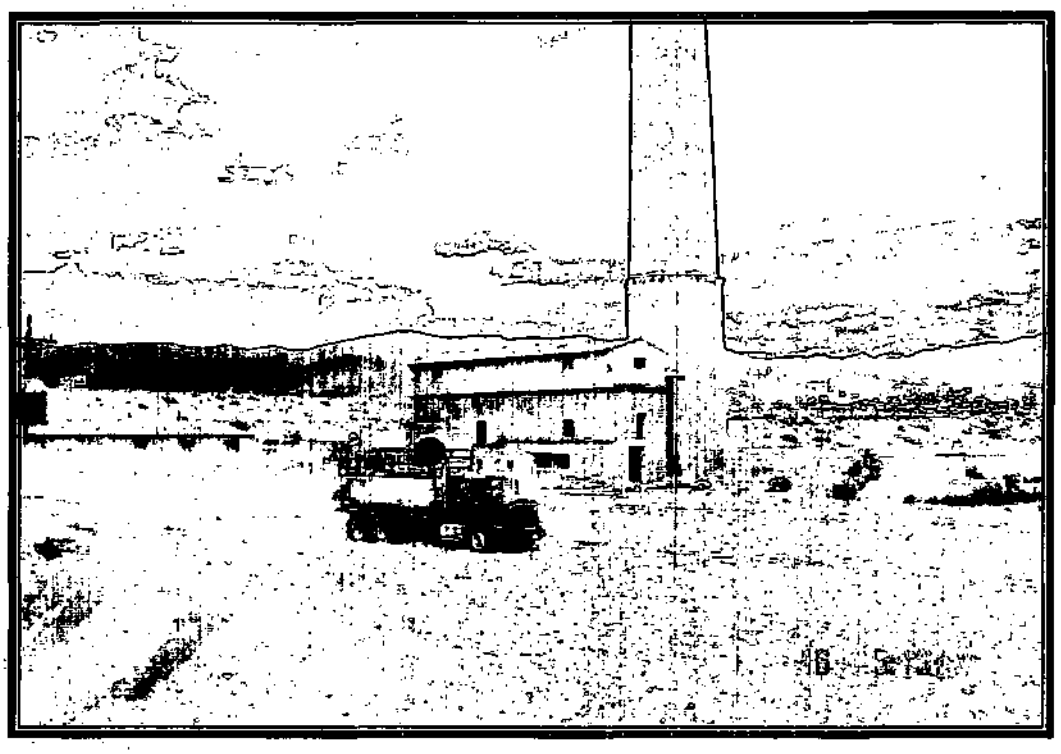


Photo 24: Consolidation Area —Looking Northeast (September 16, 2003—During Hydroseeding Operations of the Final Soil Cover)

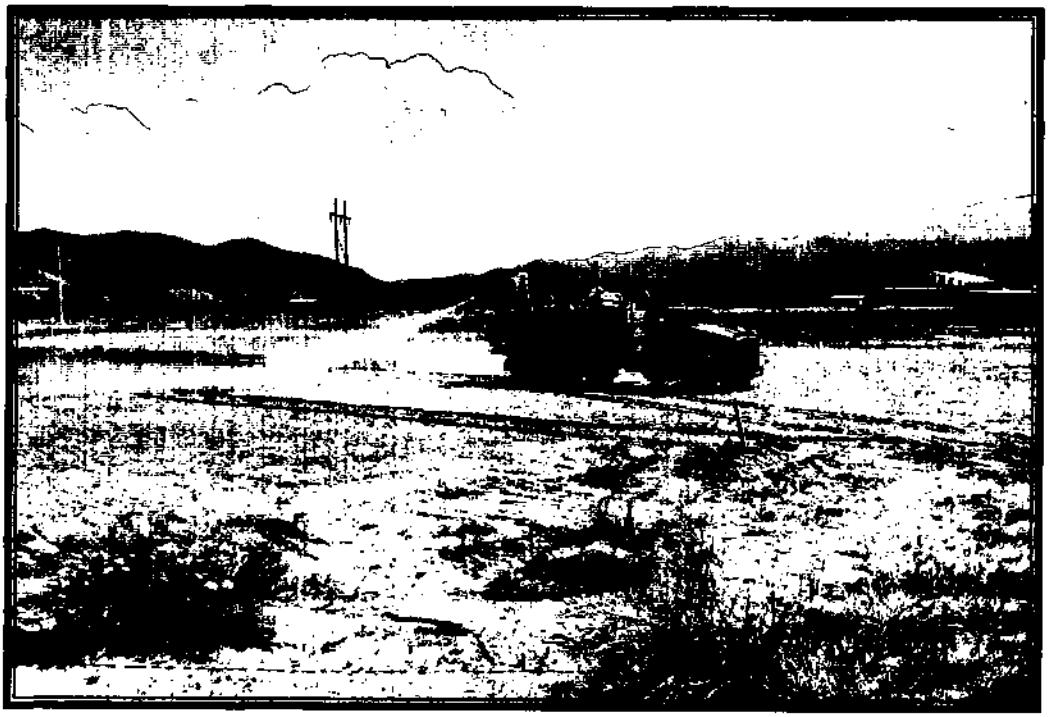


Photo 25: Soil Removal Areas 3 and 4—Looking Southeast (September 16, 2003—During Hydroseeding Operations)

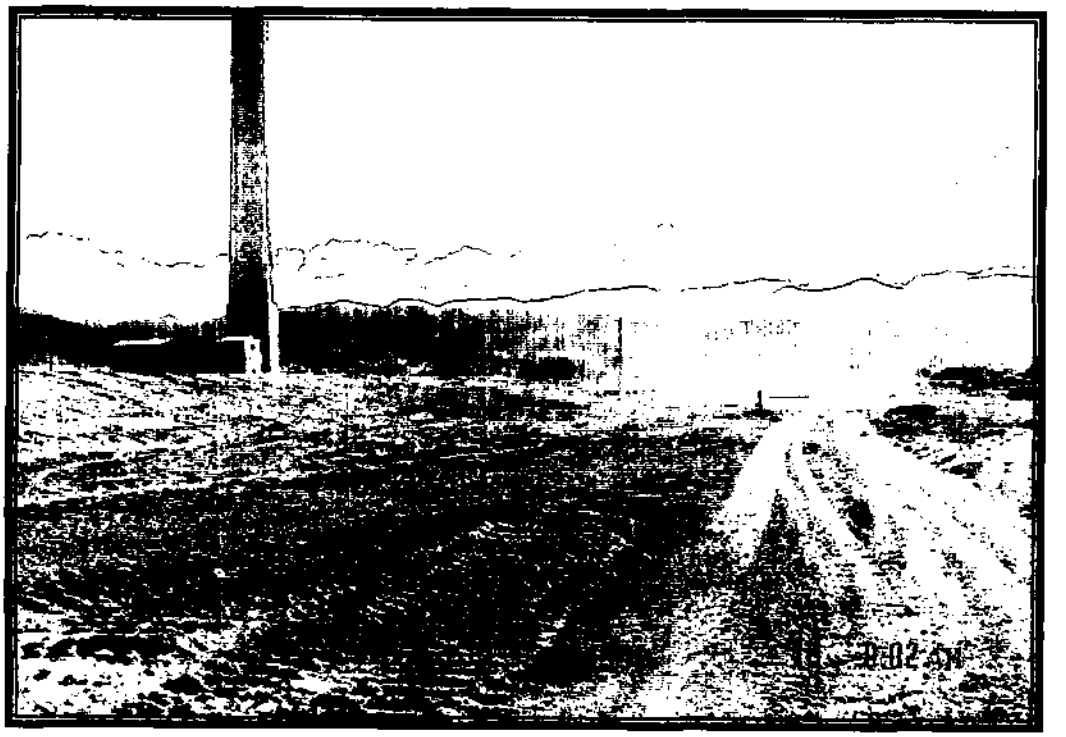


Photo 26: Soil Removal Area 7—Looking East (September 16, 2003—During Hydroseeding Operations)

APPENDIX E

CONSTRUCTION QUALITY CONTROL DOCUMENTATION

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

APPENDIX E-1 – Cover Soil Borrow Material Testing Summary and Laboratory Analytical Results Sheets

APPENDIX E-2 - Verification Sampling Laboratory Results Summary and Laboratory Analytical Reports

APPENDIX E-3 – Field Compaction Testing Summary and Laboratory Analytical Results Sheets

APPENDIX E-4 – Discharge Apron Materials Documentation/ Certification

APPENDIX E-5 – Revegetation Materials Documentation/Certification

APPENDIX E-1

COVER SOIL BORROW MATERIAL TESTING SUMMARY AND LABORATORY ANALYTICAL RESULTS SHEETS

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

Table E-1
Cover Soil Borrow Material Testing Summary
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

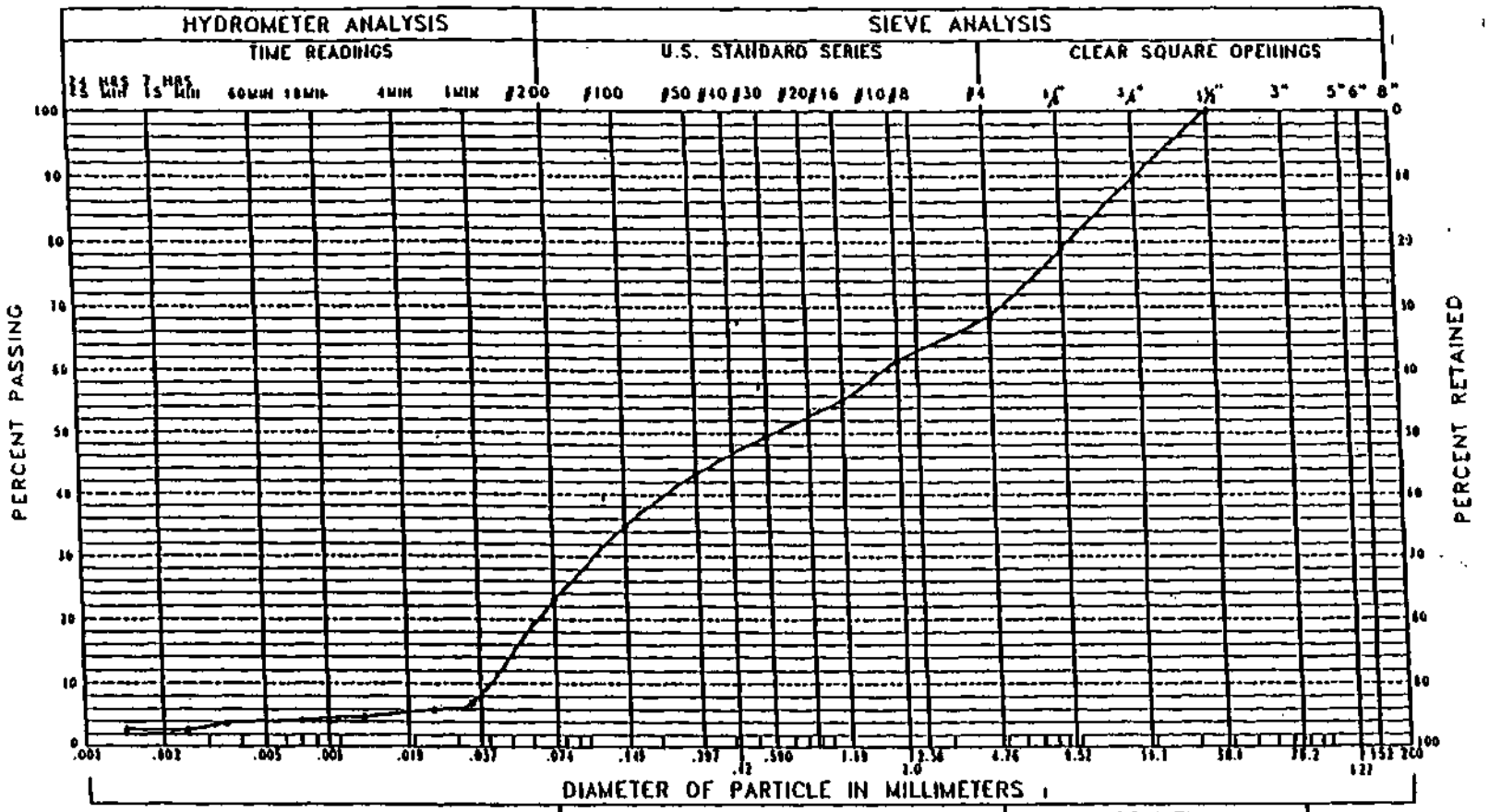
Lab Sheet Figure No.	Location	Percent Sand (%)	Percent Silt (%)	Percent Clay (%)	USDA Classification	Pass/ Fail
H1	North Stockpile	74	21	5	Sandy Loam	Pass
H2	Central Stockpile	72	22	6	Sandy Loam	Pass
H3	South Stockpile	74	22	4	Sandy Loam	Pass
H4	Southwest Area	83	13	4	Loamy Sand	Fail
H5	North Central Area	71	22	7	Sandy Loam	Pass
H6	Southeast Area	74	20	6	Sandy Loam	Pass
H7	East of Stockpile	71	23	6	Sandy Loam	Pass
TEST 2	RA Contractor Stockpile	69	24	7	Sandy Loam	Pass

USDA = U. S. Department of Agriculture.

Note: Sand, silt and clay percentages are based on the following particle-size limits as described under the USDA soil classification system: sand-size: 2.0 to 0.05 mm in diameter; silt-size: 0.05 to 0.002 mm in diameter; and clay-size: smaller than 0.002 mm in diameter.

Laboratory Analytical Results Sheets

Mountain Engineering & Testing
Smeltertown Superfund Site – Operable Unit No. 1



CLAY TO SILT	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

GRAVEL 39 % SAND 45 % SILT 13 % CLAY 3 %

PERCENTAGE CALCULATED FOR USDA CLASSIFICATION SAND 74 % SILT 21 % CLAY 5 %

SAMPLE OF SANDY LOAM FROM BORROW AREA, NORTH STOCKPILE

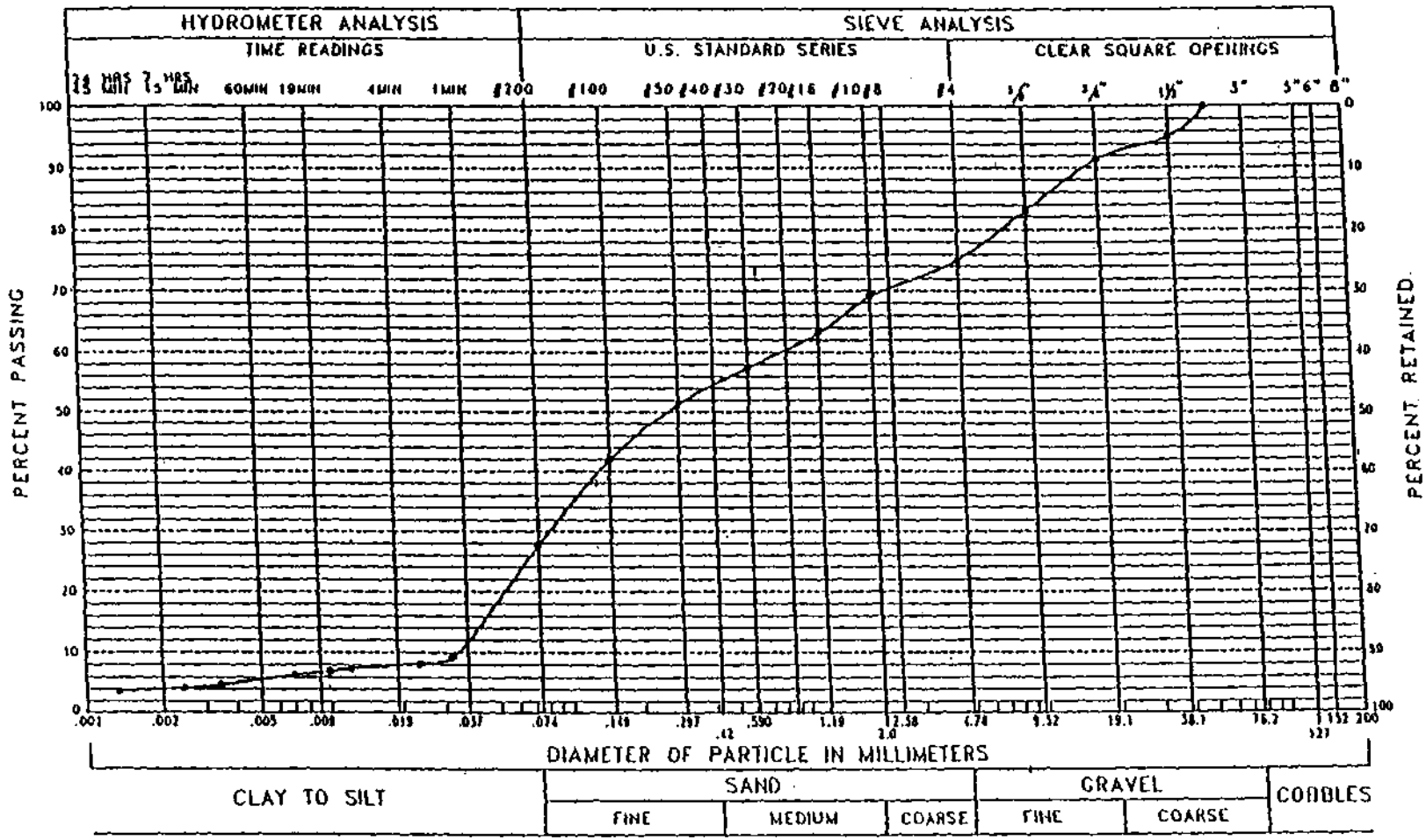
MOUNTAIN
ENGINEERING & TESTING
1637 G STREET, SALIDA, CO 81201
PH 719.539.2312 FX 719.530.9111

EMC2
SMELTERTOWN SUPERFUND SITE

BORROW PIT MATERIAL - NORTH AREA

PROJECT NO	DRAWN / REV	BY
23130	7/11/03	TJK
FILE	SCALE	FIGURE H1

8/1



GRAVEL 31 % SAND 50 % SILT 15 % CLAY 4 %

PERCENTAGE CALCULATED FOR USDA CLASSIFICATION SAND 72 % SILT 22 % CLAY 6 %

SAMPLE OF SANDY LOAM FROM BORROW AREA, CENTRAL STOCKPILE

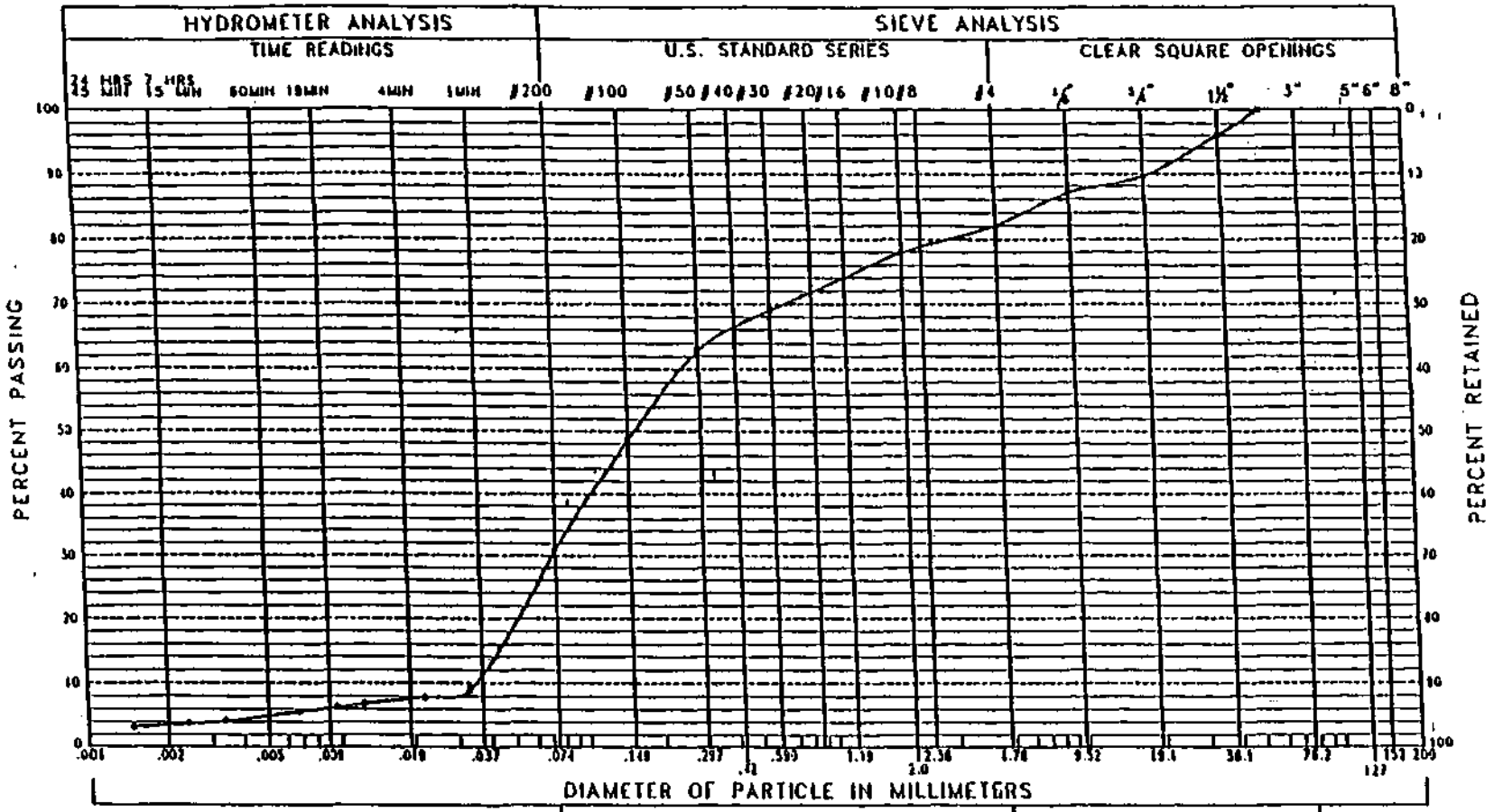
MOUNTAIN
ENGINEERING & TESTING
1637 G STREET, SALIDA, CO 81201
PH 719.539.2312 FX 719.530.9111

EMC2
SMELTERTOWN SUPERFUND SITE

BORROW PIT MATERIAL - CENTRAL AREA

PROJECT NO	CREATED / REV	BY
23130	Revised 7/11/03	TJK
FILE	SCALE	FIGURE
		112

2/7



CLAY TO SILT	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

GRAVEL 21 %	SAND 59 %	SILT 17 %	CLAY 3 %
PERCENTAGE CALCULATED FOR USDA CLASSIFICATION	SAND 74 %	SILT 22 %	CLAY 4 %

SAMPLE OF SANDY LOAM

FROM BORROW AREA, SOUTH STOCKPILE

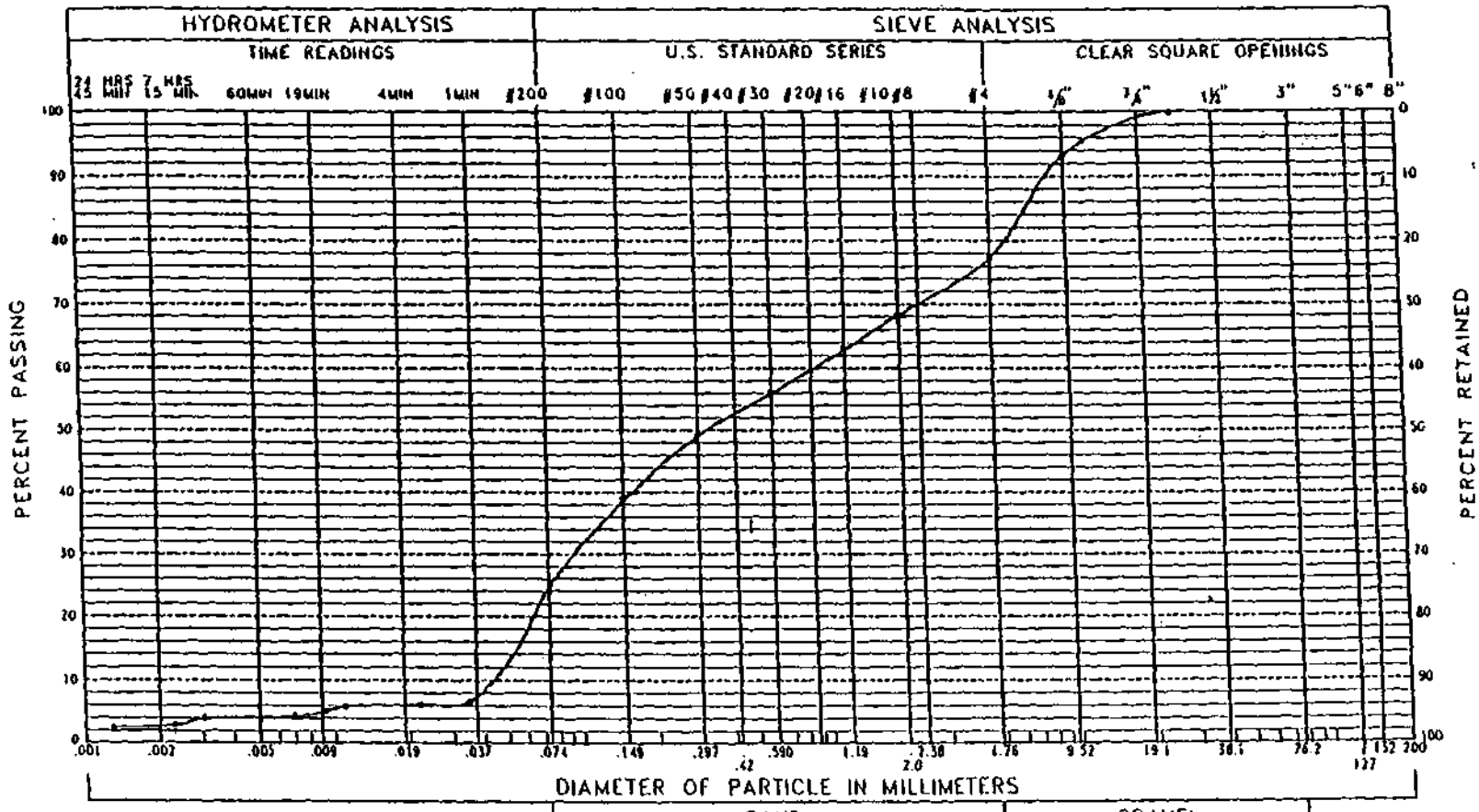
MOUNTAIN
ENGINEERING & TESTING
1637 G STREET, SALIDA, CO 81201
PH 719.539.2312 FX 719.530.9111

EMC2
SMELTERTOWN SUPERFUND SITE

BORROW PIT MATERIAL - SOUTH AREA

PROJECT NO.	CAD NO. / REV	BY
23130	Revised 7/11/03	TJK
FILE	SCALE	FIGURE T13

3/8



GRAVEL 33 % SAND 55 % SILT 9 % CLAY 3 %

PERCENTAGE CALCULATED FOR USDA CLASSIFICATION SAND 83 % SILT 13 % CLAY 4 %

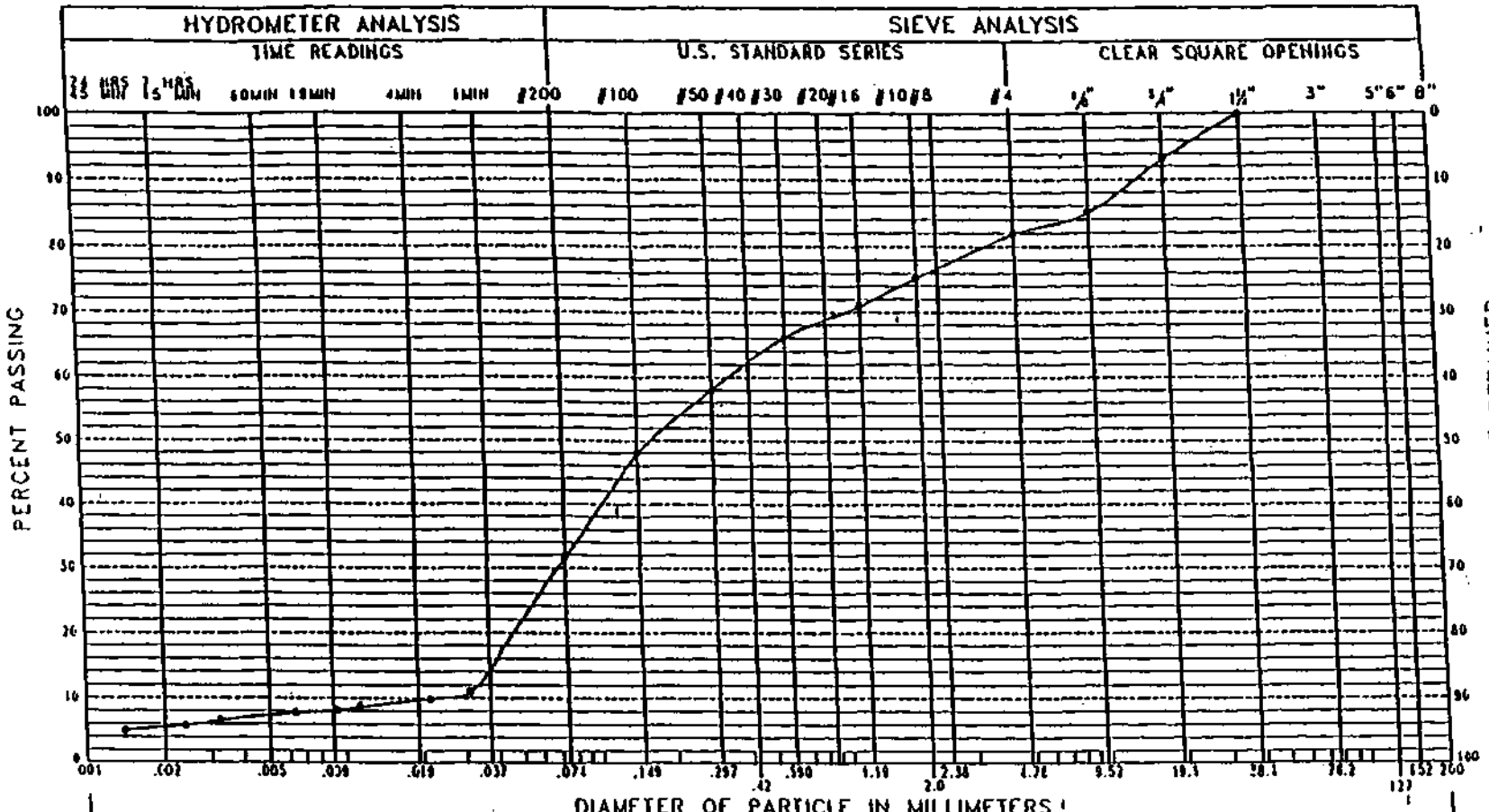
SAMPLE OF LOAMY SAND FROM BORROW AREA, SOUTHWEST AREA

MOUNTAIN
ENGINEERING & TESTING
1537 G STREET, SALIDA, CO 81201
PH 719.539.2312 FX 719.530.9111

EMC2
SMELTERTOWN SUPERFUND SITE

BORROW PIT MATERIAL - SOUTHWEST AREA

PROJECT NO	CREATED / REV	BY
23130	Revised 7/11/03	TJK
DWG	SCALE	FIGURE
		114



GRAVEL 26 % SAND 53 % SILT 16 % CLAY 5 %

PERCENTAGE CALCULATED FOR USDA CLASSIFICATION SAND 71 % SILT 22 % CLAY 7 %

SAMPLE OF SANDY LOAM

FROM BORROW AREA, NORTH CENTRAL AREA

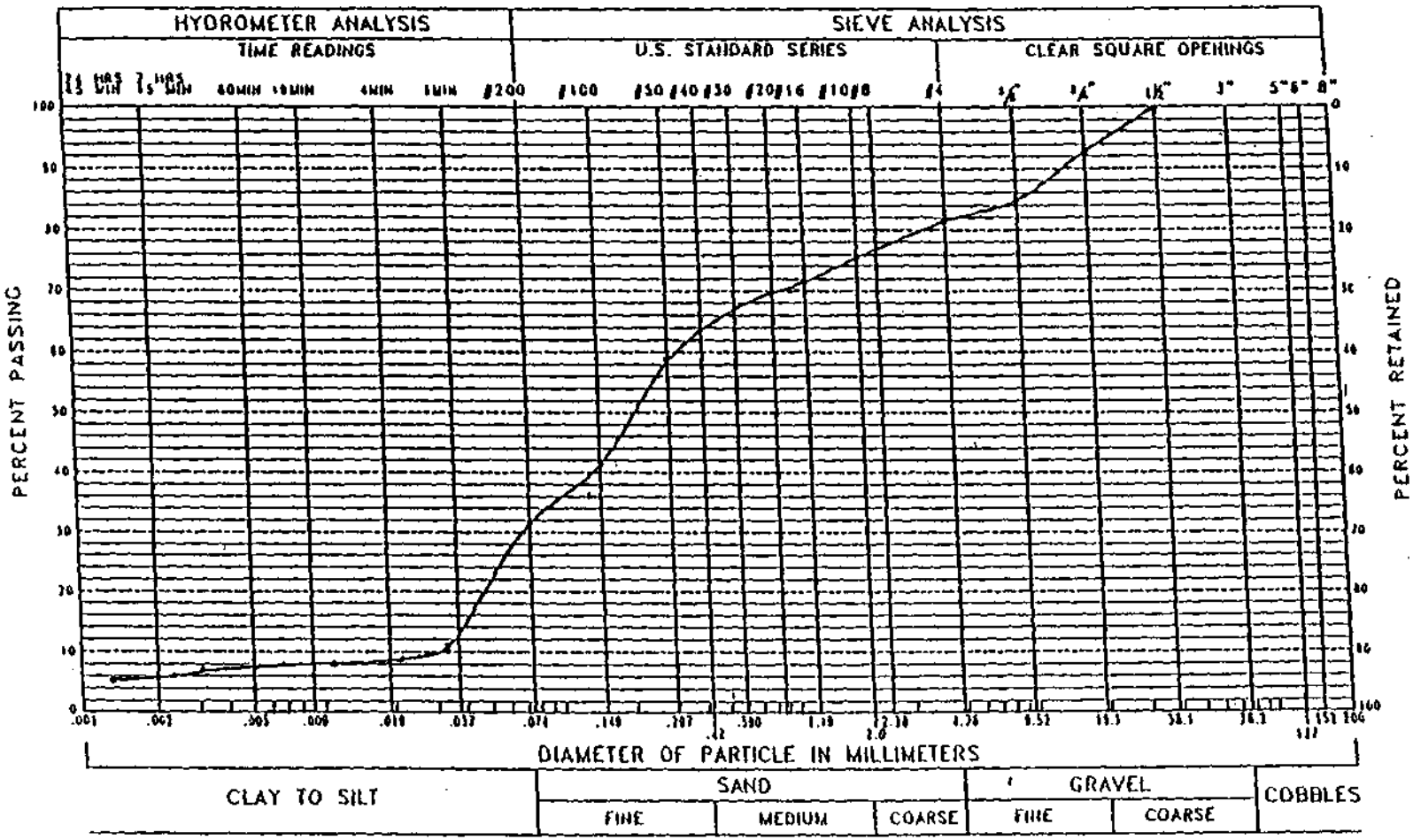
MOUNTAIN
ENGINEERING & TESTING
1637 G STREET, SALIDA, CO 81201
PH 719.539.2312 FX 719.530.9111

EMC2
SMELTERTOWN SUPERFUND SITE

BORROW PIT MATERIAL - NORTH CENTRAL AREA

PROJECT NO	CREATED / REV	BY
23130	Revised 7/11/03	TJK
FILE	SCALE	FIGURE
		F15

9/5



GRAVEL 23 % SAND 57 % SILT 15 % CLAY 5 %

PERCENTAGE CALCULATED FOR USDA CLASSIFICATION SAND 74 % SILT 20 % CLAY 6 %

SAMPLE OF SANDY LOAM

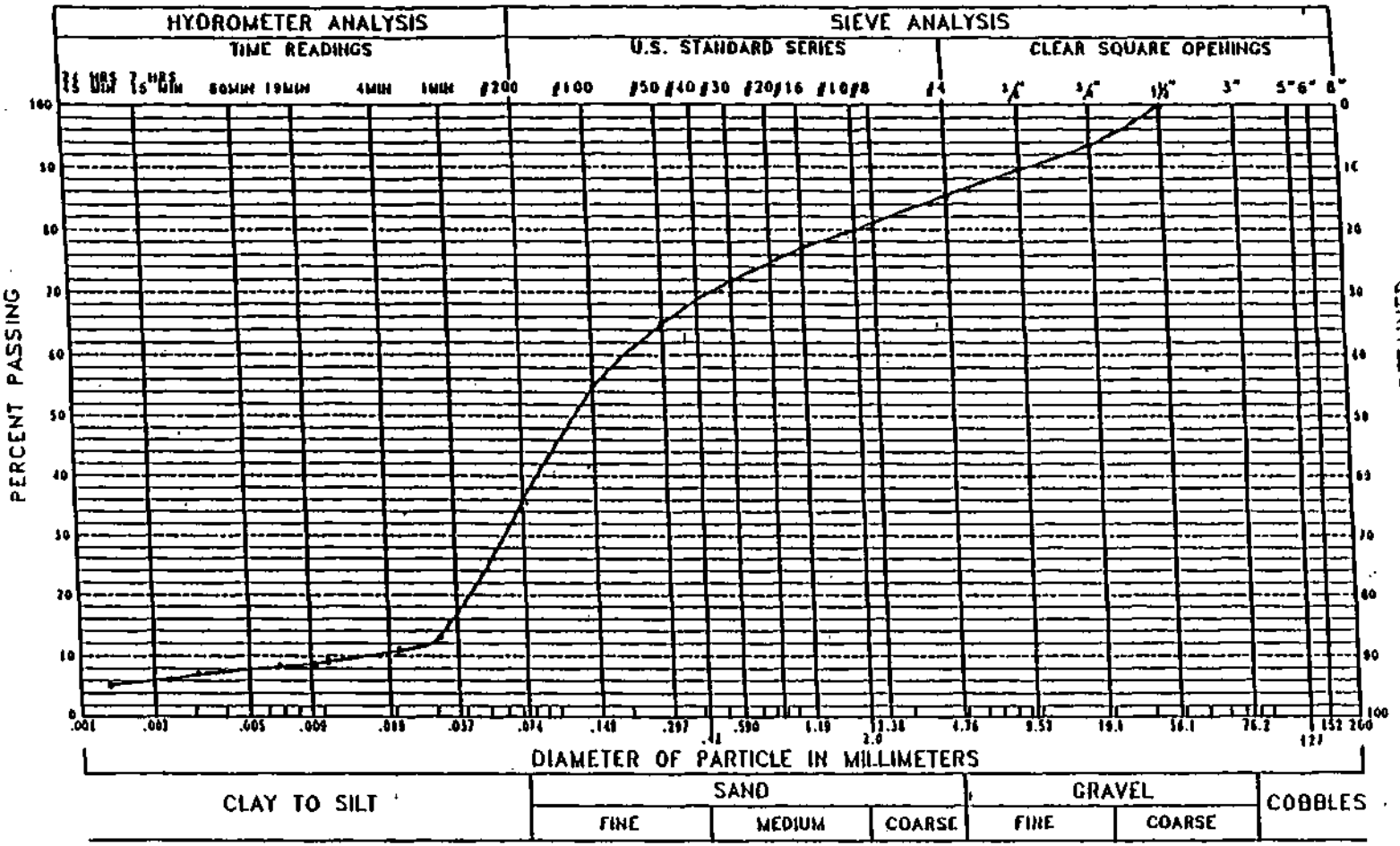
FROM BORROW AREA, SOUTHEAST AREA

MOUNTAIN
ENGINEERING & TESTING
1637 G STREET, SALIDA, CO 81201
PH 719.539.2312 FX 719.530.9111

EMC2
SMELTERTOWN SUPERFUND SITE

BORROW PIT MATERIAL - SOUTHEAST AREA

PROJECT NO.	CREATED / R/U	BY
23130	Revised 7/11/03	TJK
DWG	CHKD	FIGURE 16



GRAVEL 21 %	SAND 56 %			SILT 18 %		CLAY 5 %	
PERCENTAGE CALCULATED FOR USDA CLASSIFICATION	SAND 71 %			SILT 23 %		CLAY 6 %	

SAMPLE OF SANDY LOAM

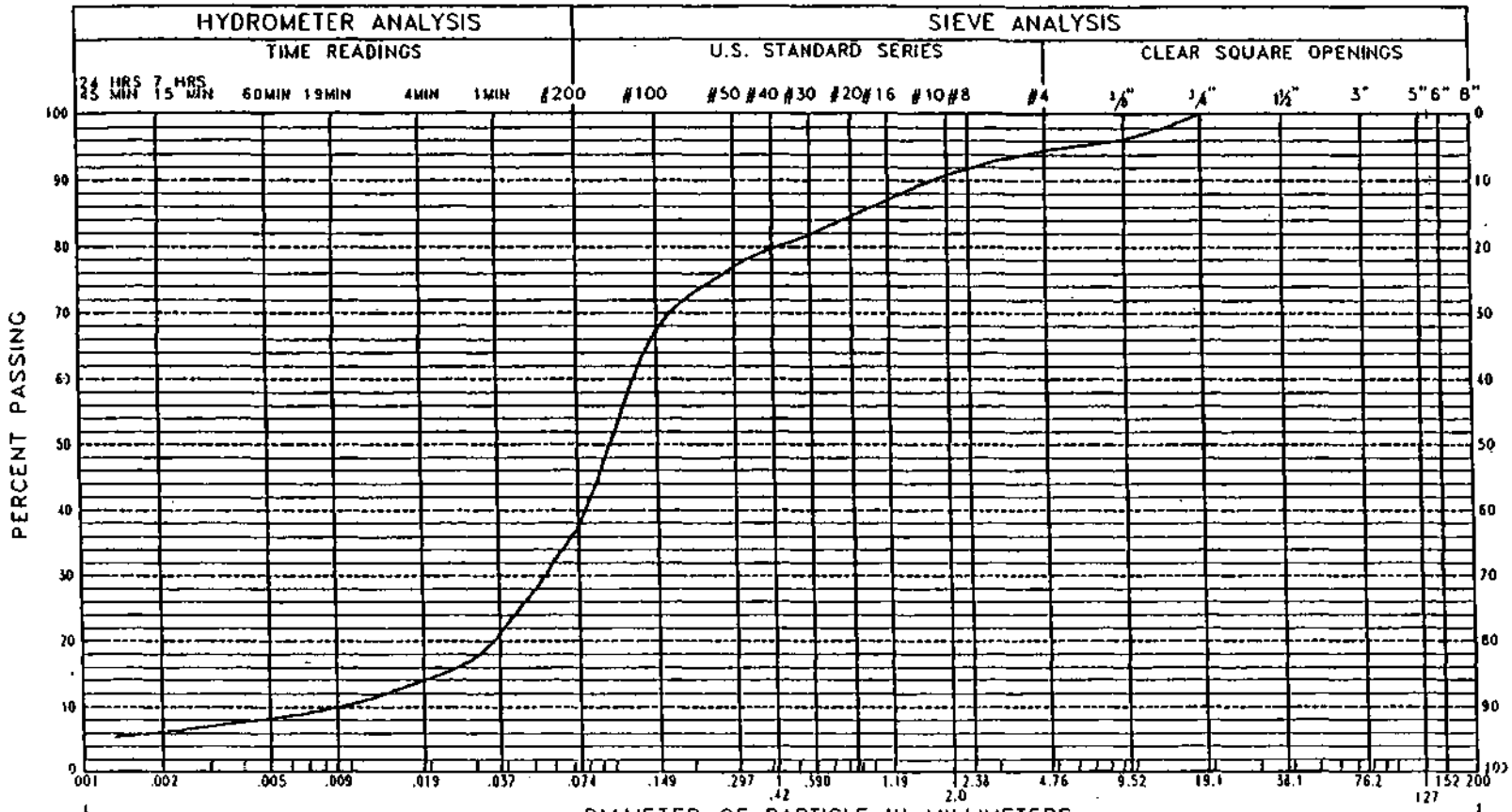
FROM BORROW AREA, EAST OF STOCKPILE

MOUNTAIN
ENGINEERING & TESTING
1537 G STREET, SALIDA, CO 81201
PH 719.539.2312 FX 719.530.9111

EMC2
SMELTERTOWN SUPERFUND SITE

BORROW PIT MATERIAL - EAST OF STOCKPILE

PROJECT NO	CREATED / REV	BY
23130	7/16/03	TJK
PRC	SCALE	FIGURE 117



GRAVEL 9 % SAND 63 % SILT 22 % CLAY 6 %

PERCENTAGE CALCULATED FOR USDA CLASSIFICATION SAND 69 % SILT 24 % CLAY 7 %

SAMPLE OF TOPSOIL

USDA CLASSIFICATION SANDY LOAM

MOUNTAIN
ENGINEERING & TESTING
1537 G STREET, SALIDA, CO 81201
PH 719.539.2312 FX 719.530.9111

ACA
SMELTERTOWN SUPERFUND SITE

BORROW PIT MATERIAL - UNKNOWN AREA

PROJECT NO.	CREATED / REV.	BY
23193	REV - 10/16/03	TJK
FILE	SCALE	FIGURE
		TEST 2

APPENDIX E-2

VERIFICATION SAMPLING LABORATORY RESULTS SUMMARY AND LABORATORY ANALYTICAL REPORTS

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

Table E-2

Verification Sampling Laboratory Results Summary

Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Sample Identification	Depth Interval (inches) (1)	Sample Date	Analysis Date	Total Metal Results (mg/kg) (2)	
				Arsenic	Lead
Removal Area 6 South	0-6	6/20/03	6/24/03	9	609
Removal Area 6 North (3)	0-6	6/20/03	6/24/03	**1,030**	**16,100**
Removal Area 7 East	0-6	6/20/03	6/24/03	ND	62
Removal Area 7 West	0-6	6/20/03	6/24/03	ND	141
West AREA 4 6 INC	0-6	6/24/03	6/30/03	ND	205
East AREA 4 6 INC	0-6	6/24/03	6/30/03	ND	148
Removal Area 1 6" WST	0-6	6/27/03	7/2/03	12	261
Removal Area 1 6" EST	0-6	6/27/03	7/2/03	ND	23
Removal Area 2 WST 6"	0-6	6/27/03	7/2/03	5	11
Removal Area 2 EST 6"	0-6	6/27/03	7/2/03	6	46
RA 7 Ext 6-inch West	0-6	7/3/03	7/9/03	4	87
RA 7 Ext 6-inch East	0-6	7/3/03	7/9/03	11	421

mg/kg = milligrams-per-kilogram; ND = not detected

Notes:

(1) Depth interval based on the post-excavation ground surface within the soil removal areas prior to backfilling (i.e., all verification samples were collected from a 0-to-6-inch depth interval within the excavated soil removal areas prior to backfilling).

(2) Sample results presented in bold and highlighted exceed Smeltertown Superfund Site Non-Time Critical Removal Action goals of 387 mg/kg Arsenic and 2,235 mg/kg Lead.

(3) No further verification sampling was required for this area because the decision was made to excave the area to the maximum required remediation depth of 24 inches.

Laboratory Analytical Reports

ACZ Laboratories, Inc.
Smeltertown Superfund Site – Operable Unit No. 1

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

Tony Lucero
Climax Molybdenum, Henderson Operations
P.O. Box 68
Empire, CO 80438

June 24, 2003

cc: Travis Lablanc, Ryan Norkoli

Project ID: CX2158
ACZ Project ID: L41732

Tony Lucero:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on June 23, 2003. This project has been assigned to ACZ's project number, L41732. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 10.0. The enclosed results relate only to the samples received under L41732. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

This report shall be used or copied only in it's entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after July 24, 2003. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years. Please notify your Project Manager if you have other needs.

If you have any questions, please contact your Project Manager or Customer Service Representative.

S. Habermehl 24/Jun/03

Scott Habermehl, Project Manager, has reviewed and accepted this report in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac

ACIL

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: REMOVAL AREA 6 SOUTH

ACZ Sample ID: *L41732-01*
Date Sampled: *06/20/03 00:00*
Date Received: *06/23/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP	9	B	*	mg/Kg	4	20	06/24/03 10:23	scp
Lead, total (3050)	M6010B ICP	609		*	mg/Kg	4	20	06/24/03 10:23	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	95.0			%	0.1	0.5	06/23/03 12:36	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							06/23/03 13:26	lrm

* Please refer to Extended Qualifier Report for details.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: REMOVAL AREA 6 NORTH

ACZ Sample ID: *L41732-03*
Date Sampled: *06/20/03 00:00*
Date Received: *06/23/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XC	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP	1030	*		mg/Kg	4	20	06/24/03 10:43	scp
Lead, total (3050)	M6010B ICP	16100	*		mg/Kg	4	20	06/24/03 10:43	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XC	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	93.5			%	0.1	0.5	06/23/03 13:42	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XC	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							06/23/03 15:52	lrm

** Please refer to Extended Qualifier Report for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: REMOVAL AREA 7 EAST

ACZ Sample ID: *L41732-04*
Date Sampled: *06/20/03 00:00*
Date Received: *06/23/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQC	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP		U	*	mg/Kg	8	40	06/24/03 15:35	scp
Lead, total (3050)	M6010B ICP	62		*	mg/Kg	4	20	06/24/03 10:47	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XQC	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	98.1			%	0.1	0.5	06/23/03 14:48	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQC	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							06/23/03 16:41	lrm

** Please refer to Extended Qualifier Report for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: REMOVAL AREA 7 WEST

ACZ Sample ID: *L41732-05*
Date Sampled: *06/20/03 00:00*
Date Received: *06/23/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP		U	*	mg/Kg	4	20	06/24/03 10:50	scp
Lead, total (3050)	M6010B ICP	141		*	mg/Kg	4	20	06/24/03 10:50	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	95.8			%	0.1	0.5	06/23/03 15:54	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							06/23/03 17:30	lrm

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Reference

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	*Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.*
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	*Initial Calibration Verification standard*	*MSD*	*Matrix Spike Duplicate*
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Types Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
R	Poor spike recovery accepted because the other spike in the set fell within the given limits.
T	High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL.
U	Analyte was analyzed for but not detected at the indicated MDL.
V	High blank data accepted because sample concentration is 10 times higher than blank concentration
W	Poor recovery for Silver quality control is accepted because Silver often precipitates with Chloride.
X	Quality control sample is out of control.
Z	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	*Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.*
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Climax Molybdenum, Henderson Operations

ACZ Project ID: *L41732*

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L41732-01	WG158000	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
L41732-03	WG158000	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
L41732-04	WG158009	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
	WG158000	Lead, total (3050)	M6010B ICP	M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
L41732-05	WG158000	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Climax Molybdenum, Henderson Operations

ACZ Project ID: L41732
Date Received: 6/23/03
Received By: CORYD

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			√
2) Are the custody seals on the cooler intact?			√
3) Are the custody seals on the sample containers intact?			
4) Is there a Chain of Custody or other directive shipping papers present?	√		
5) Is the Chain of Custody complete?	√		
6) Is the Chain of Custody in agreement with the samples received?	√		
7) Is there enough sample for all requested analyses?	√		
8) Are all samples within holding times for requested analyses?	√		
9) Were all sample containers received intact?	√		
10) Are the temperature blanks present?		√	
11) Are the trip blanks (VOA and/or Cyanide) present?			√
12) Are samples requiring no headspace, headspace free?			√
13) Do the samples that require a Foreign Soils Permit have one?			√

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (for any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id		Temp (°C)	Rad (µR/hr)
BOX		20.6	13

Notes

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Climax Molybdenum, Henderson Operations

ACZ Project ID: L41732
Date Received: 6/23/03
Received By: CORYD

Sample Container Preservations

SAMPLE	CLIENT ID	R < 2	G < 2	Y < 2	YG< 2	B < 2	BG< 2	O < 2	T >12	P >12	N/A	RAD
L41732-01	REMOVAL AREA 6 SOUTH										√	
L41732-03	REMOVAL AREA 6 NORTH										√	
L41732-04	REMOVAL AREA 7 EAST										√	
L41732-05	REMOVAL AREA 7 WEST										√	

L41732

10/37

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: Travis Lablanc	Address: 7220 North 16th
Company: EMC²	Phoenix, AZ
E-mail: tlablanc@emc-squared.net	Telephone: (602) 331-3859

Copy of Report to:

Name: Ryan Norkoli	E-mail: rnorkoli@emc-squared
Company: EMC²	Telephone: (602) 549-9173

Invoice to:

Name: ~~Joe Flynn~~ PD Corporate	Address: ~~7220 North 16th St. Ste.~~
Company: ~~EMC²~~	~~Phoenix, AZ~~
E-mail: ~~JFlynn@emc-squared.net~~	Telephone: ~~(602) 331-3859~~

Scott Habermill

PROJECT INFORMATION

Quote #:
Project/PO #:
Shipping Co.:
Tracking #:
Reporting State for compliance testing:

ANALYSES REQUESTED (attach list or use quote number)

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	EPA Method 6010B As	EPA Method 6010B Pb						
Removal Area 6-South 6-inch	6/20/03	SO	1	X	X						
Removal Area 6-North 6-inch	6/20/03	SO	1	X	X						
Removal Area 7-East 6-inch	6/20/03	SO	1	X	X						
Removal Area 7-West 6-inch	6/20/03	SO	1	X	X						

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

24-hr TAT

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME	PAGE
Ryan Norkoli	6/20/03 1600			
		E. French	6/23/03 1000	of

FRMQA021.10.01.04

White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

Anne Beierle
Climax Molybdenum, Henderson Operations
P.O. Box 68
Empire, CO 80438

July 01, 2003

cc: Tony Lucero, Travis Lablanc, Ryan Norkoli

Project ID: CX2158
ACZ Project ID: L41767

Anne Beierle:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on June 25, 2003. This project has been assigned to ACZ's project number, L41767. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 10.0. The enclosed results relate only to the samples received under L41767. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

This report shall be used or copied only in it's entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after August 01, 2003. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years. Please notify your Project Manager if you have other needs.

If you have any questions, please contact your Project Manager or Customer Service Representative.

S. Habermehl 01/Jul/03

Scott Habermehl, Project Manager, has reviewed and accepted this report in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac

ACIL

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: West AREA 4 6 INC

ACZ Sample ID: *L41767-01*
Date Sampled: *06/24/03 10:00*
Date Received: *06/25/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP		U		mg/Kg	4	20	06/30/03 10:03	wfg
Lead, total (3050)	M6010B ICP	205			mg/Kg	4	20	06/30/03 10:03	wfg

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	96.8			%	0.1	0.5	06/25/03 15:50	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							06/25/03 16:48	lrm

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: East AREA 4 6 INC

ACZ Sample ID: *L41767-02*
Date Sampled: *06/24/03 10:10*
Date Received: *06/25/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP		U		mg/Kg	8	40	06/30/03 10:06	wfg
Lead, total (3050)	M6010B ICP	148			mg/Kg	8	40	06/30/03 10:06	wfg

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	96.4			%	0.1	0.5	06/25/03 15:55	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							06/25/03 16:52	lrm

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Reference

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	*Verifies the validity of the calibration.*

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
R	Poor spike recovery accepted because the other spike in the set fell within the given limits.
T	High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL.
U	Analyte was analyzed for but not detected at the indicated MDL.
V	High blank data accepted because sample concentration is 10 times higher than blank concentration
W	Poor recovery for Silver quality control is accepted because Silver often precipitates with Chloride.
X	Quality control sample is out of control.
Z	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Climax Molybdenum, Henderson Operations

ACZ Project ID: *L41767*

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION

No extended qualifiers associated with this analysis

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Climax Molybdenum, Henderson Operations
CX2128

ACZ Project ID: L41767
Date Received: 6/25/03
Received By: CORYD

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			√
2) Are the custody seals on the cooler intact?			√
3) Are the custody seals on the sample containers intact?			√
4) Is there a Chain of Custody or other directive shipping papers present?	√		
5) Is the Chain of Custody complete?	√		
6) Is the Chain of Custody in agreement with the samples received?	√		
7) Is there enough sample for all requested analyses?	√		
8) Are all samples within holding times for requested analyses?	√		
9) Were all sample containers received intact?	√		
10) Are the temperature blanks present?	√		
11) Are the trip blanks (VOA and/or Cyanide) present?			√
12) Are samples requiring no headspace, headspace free?			√
13) Do the samples that require a Foreign Soils Permit have one?			√

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id		Temp (°C)	Rad (μR/hr)
BOX		19.3	14

Notes

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Climax Molybdenum, Henderson Operations
CX2128

ACZ Project ID: L41767
Date Received: 6/25/03
Received By: CORYD

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	Y < 2	YG< 2	B < 2	BG< 2	O < 2	T >12	P >12	N/A	RAD
L41767-01	REMOVAL AREA 4 6 INC										√	
L41767-02	REMOVAL AREA 4 6 INC										√	

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

L41767

CHAIN of CUSTODY

Report to:

Name: Travis LaBlanc
Company: EMC²
E-mail: TLaBlanc@EMC-Squared.net
Address: 7220 N 16th St Ste. E Phoenix, AZ 85020
Telephone:

Copy of Report to:

Name: Ryan Norkoli
Company: EMC²
E-mail: rnorkoli@emc-squared.net
Telephone:

Invoice to:

Name: Phelps Dodge Corporati
Company:
E-mail:
Address:
Telephone:

PROJECT INFORMATION

Quote #: ~~Called~~
Project/PO #:
Shipping Co.: Contact-Scott Habermehl
Tracking #:
Reporting State for compliance testing:

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	EPA 6010B - As	EPA 6010B - Pb
Removal Area 4 Grinch west	6/26/03 1000	SO	1	X	X
Removal Area 4 Grinch east	6/26/03 1010	SO	1	X	X

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

ASAP - TAT

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Ryan Norkoli	6/26/03	CJO	6/26/03 1000

PAGE Of

FRMQA021.10.01.04

White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

Anne Beierle
Climax Molybdenum, Henderson Operations
P.O. Box 68
Empire, CO 80438

July 02, 2003

cc: Ryan Norkoli, Tony Lucero, Travis LaBlanc

Project ID: CX2158
ACZ Project ID: L41846

Anne Beierle:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on June 30, 2003. This project has been assigned to ACZ's project number, L41846. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 10.0. The enclosed results relate only to the samples received under L41846. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

This report shall be used or copied only in it's entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after August 02, 2003. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years. Please notify your Project Manager if you have other needs.

If you have any questions, please contact your Project Manager or Customer Service Representative.

S. Habermehl 02/Jul/03

Scott Habermehl, Project Manager, has reviewed and accepted this report in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac

ACIL

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: REMOVAL AREA 1 6"WST

ACZ Sample ID: *L41846-01*
Date Sampled: *06/27/03 14:25*
Date Received: *06/30/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP	12	B	*	mg/Kg	4	20	07/02/03 9:44	scp
Lead, total (3050)	M6010B ICP	261		*	mg/Kg	4	20	07/02/03 9:44	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	98.5			%	0.1	0.5	07/01/03 12:00	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							07/01/03 13:15	lrm

** Please refer to Extended Qualifier Report for detail*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: REMOVAL AREA 1 6"EST

ACZ Sample ID: *L41846-02*
Date Sampled: *06/27/03 14:30*
Date Received: *06/30/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP		U	*	mg/Kg	4	20	07/02/03 9:48	scp
Lead, total (3050)	M6010B ICP	23		*	mg/Kg	4	20	07/02/03 9:48	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	97.3			%	0.1	0.5	07/01/03 13:00	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							07/01/03 14:00	lrm

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: REMOVAL AREA 2 EST6"

ACZ Sample ID: *L41846-03*
Date Sampled: *06/27/03 07:15*
Date Received: *06/30/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP	6	B	*	mg/Kg	4	20	07/02/03 9:52	scp
Lead, total (3050)	M6010B ICP	46		*	mg/Kg	4	20	07/02/03 9:52	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	95.2			%	0.1	0.5	07/01/03 14:00	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							07/01/03 14:45	lrm

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: REMOVAL AREA 2 WST6"

ACZ Sample ID: *L41846-04*
Date Sampled: *06/27/03 07:20*
Date Received: *06/30/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP	5	B	*	mg/Kg	4	20	07/02/03 9:56	scp
Lead, total (3050)	M6010B ICP	11	B	*	mg/Kg	4	20	07/02/03 9:56	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	97.4			%	0.1	0.5	07/01/03 15:00	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Digestion - Hot Plate	M3050B ICP							07/01/03 15:30	lrm

** Please refer to Extended Qualifier Report for detail.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Reference

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as *Minimum Reporting Limit*. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
R	Poor spike recovery accepted because the other spike in the set fell within the given limits.
T	High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL.
U	Analyte was analyzed for but not detected at the indicated MDL.
V	High blank data accepted because sample concentration is 10 times higher than blank concentration
W	Poor recovery for Silver quality control is accepted because Silver often precipitates with Chloride.
X	Quality control sample is out of control.
Z	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Climax Molybdenum, Henderson Operations

ACZ Project ID: *L41846*

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L41846-01	WG158356	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
L41846-02	WG158356	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
L41846-03	WG158356	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
L41846-04	WG158356	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Climax Molybdenum, Henderson Operations
CX2158

ACZ Project ID: L41846
Date Received: 7/1/03
Received By: tonya

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			√
2) Are the custody seals on the cooler intact?			√
3) Are the custody seals on the sample containers intact?			√
4) Is there a Chain of Custody or other directive shipping papers present?	√		
5) Is the Chain of Custody complete?	√		
6) Is the Chain of Custody in agreement with the samples received?	√		
7) Is there enough sample for all requested analyses?	√		
8) Are all samples within holding times for requested analyses?	√		
9) Were all sample containers received intact?	√		
10) Are the temperature blanks present?		√	
11) Are the trip blanks (VOA and/or Cyanide) present?			√
12) Are samples requiring no headspace, headspace free?			√
13) Do the samples that require a Foreign Soils Permit have one?			√

Exceptions: If you answered no to any of the above questions, please describe.

N/A

Contact (For any discrepancies, the client must be contacted).

N/A

Shipping Containers

Cooler Id		Temp (°C)	Rad (µR/hr)
BOX		16.4	13

Notes

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Climax Molybdenum, Henderson Operations
CX2158

ACZ Project ID: L41846
Date Received: 7/1/03
Received By: tonya

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	Y < 2	YG< 2	B < 2	BG< 2	O < 2	T >12	P >12	N/A	RAD
L41846-01	REMOVAL AREA 1 6"WST										√	
L41846-02	REMOVAL AREA 1 6"EST										√	
L41846-03	REMOVAL AREA 2 EST6"										√	
L41846-04	REMOVAL AREA 2 WST6"										√	

L41846

07/01/03

L41767

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name:	Travis LaBlanc	Address:	7220 North 16th St. Ste. E Phoenix AZ 85020
Company:	EMC²		
E-mail:	tlablanc@emc-squared.net	Telephone:	602-331-3859

Copy of Report to:

Name:	Ryan Norkoli	E-mail:	rnorkoli@emc-squared.net
Company:	EMC²	Telephone:	602-549-9173

Invoice to:

Name:	PDC L41767	Address:	
Company:			
E-mail:	Project: Smeltertown	Telephone:	

PROJECT INFORMATION

Quote #:	
Project/PO #:	
Shipping Co.:	
Tracking #:	
Reporting State for compliance testing:	

ANALYSES REQUESTED (attach list or use quote number)

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	EPA Method 6010B As	EPA Method 6010B Pb						
Removal Area 1 6-inch West	6/27/03 1425	SO	1	X	X						
Removal Area 1 6 inch East	6/27/03 1430	SO	1	X	X						

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

ASAP TAT

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME	PAGE
Ryan Norkoli	6/27/03	T. [illegible]	06/28/03 1330	of

FRMQA021.10.01.04

White - Return with sample. Yellow - Retain for your records.

L41846

29/37

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

~~06/01/03~~ L41767

CHAIN of CUSTODY

Report to:

Name: Travis LaBlanc
Company: EMC²
E-mail: tlablanc@emc-squared.net

Address: 7220 North 16th St. Ste. E
Phoenix, AZ 85020
Telephone: (602) 331-3859

Copy of Report to:

Name: Ryan Norkoli
Company: EMC²

E-mail: rnorkoli@emc-squared.net
Telephone: (602) 549-9173

Invoice to:

Name: PDC - Smeltertown
Company:
E-mail: ACZ Contact: Scott Habermehl

Address: Project Number - L41767
Telephone:

PROJECT INFORMATION

Quote #:
Project/PO #:
Shipping Co.:
Tracking #:
Reporting State for compliance testing:

ANALYSES REQUESTED (attach list or use quote number)

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	EPA Method 6010B As	EPA Method 6010B Pb
Removal Area 2-East 6-inch	6/2/03 715	SO	1	X	X
Removal Area 2-West 6-inch	6/2/03 720	SO	1	X	X

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

24-hour TAT

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Ryan Norkoli	6/2/03 1130	T. Antolick	06/3/03 1330

PAGE 1 OF 1

FRMQA021.10.01.04

White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

Anne Beierle
Climax Molybdenum, Henderson Operations
P.O. Box 68
Empire, CO 80438

July 10, 2003

cc: Ryan Norkoli, Travis LaBlanc, Tony Lucero

Project ID: CX2158
ACZ Project ID: L41931

Anne Beierle:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on July 07, 2003. This project has been assigned to ACZ's project number, L41931. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 10.0. The enclosed results relate only to the samples received under L41931. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

This report shall be used or copied only in it's entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after August 10, 2003. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years. Please notify your Project Manager if you have other needs.

If you have any questions, please contact your Project Manager or Customer Service Representative.

S. Habermehl 10/Jul/03

Scott Habermehl, Project Manager, has reviewed and accepted this report in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: RA 7 EXT 6-INCH WEST

ACZ Sample ID: *L41931-01*
Date Sampled: *07/03/03 09:40*
Date Received: *07/07/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP	4	B	*	mg/Kg	4	20	07/09/03 9:43	scp
Lead, total (3050)	M6010B ICP	87		*	mg/Kg	4	20	07/09/03 9:43	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	97.1			%	0.1	0.5	07/07/03 16:40	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972							07/07/03 16:30	lrm
Crush and Pulverize	USDA No. 1, 1972							07/08/03 8:30	lrm
Digestion - Hot Plate	M3050B ICP							07/08/03 14:00	lrm

* Please refer to Extended Qualifier Report for detail.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Climax Molybdenum, Henderson Operations
Project ID: CX2158
Sample ID: RA 7 EXT 6-INCH EAST

ACZ Sample ID: *L41931-02*
Date Sampled: *07/03/03 09:45*
Date Received: *07/07/03*
Sample Matrix: *Soil*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6010B ICP	11	B	*	mg/Kg	4	20	07/09/03 9:47	scp
Lead, total (3050)	M6010B ICP	421		*	mg/Kg	4	20	07/09/03 9:47	scp

Soil Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Solids, Percent	CLPSOW390, PART F, D-98	97.3			%	0.1	0.5	07/07/03 17:00	lrm

Soil Preparation

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972							07/07/03 16:45	lrm
Crush and Pulverize	USDA No. 1, 1972							07/08/03 9:00	lrm
Digestion - Hot Plate	M3050B ICP							07/08/03 14:30	lrm

* *Please refer to Extended Qualifier Report for detail.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Reference

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of Interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
R	Poor spike recovery accepted because the other spike in the set fell within the given limits.
T	High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL.
U	Analyte was analyzed for but not detected at the indicated MDL
V	High blank data accepted because sample concentration is 10 times higher than blank concentration
W	Poor recovery for Silver quality control is accepted because Silver often precipitates with Chloride.
X	Quality control sample is out of control.
Z	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Climax Molybdenum, Henderson Operations ACZ Project ID: *L41931*

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L41931-01	WG158624	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
			M6010B ICP	ZH	Serial Dilution evaluated and failed due to potential matrix interference.
L41931-02	WG158624	Arsenic, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not evaluated because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
			M6010B ICP	ZH	Serial Dilution evaluated and failed due to potential matrix interference.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Climax Molybdenum, Henderson Operations
PDC-L41846 SMELTTOWN

ACZ Project ID: L41931
Date Received: 7/7/03
Received By: bethf

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			√
2) Are the custody seals on the cooler intact?			√
3) Are the custody seals on the sample containers intact?			√
4) Is there a Chain of Custody or other directive shipping papers present?	√		
5) Is the Chain of Custody complete?	√		
6) Is the Chain of Custody in agreement with the samples received?	√		
7) Is there enough sample for all requested analyses?	√		
8) Are all samples within holding times for requested analyses?	√		
9) Were all sample containers received intact?	√		
10) Are the temperature blanks present?		√	
11) Are the trip blanks (VOA and/or Cyanide) present?			√
12) Are samples requiring no headspace, headspace free?			√
13) Do the samples that require a Foreign Soils Permit have one?			√

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id		Temp (°C)	Rad (µR/hr)
BOX		23.4	16

Notes

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Climax Molybdenum, Henderson Operations
PDC-L41846 SMELTTOWN

ACZ Project ID: L41931
Date Received: 7/7/03
Received By: bethf

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	Y < 2	YG< 2	B < 2	BG< 2	O < 2	T >12	P >12	N/A	RAD
L41931-01	RA 7 EXT 6-INCH WEST										√	
L41931-02	RA 7 EXT 6-INCH EAST										√	

L41931 7/7/03
L41846

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: Travis LaBlanc
Company: EMC²
E-mail: tlablanc@emc-squared.net
Address: 7220 North 16th St. Ste E
Phoenix, AZ 85020
Telephone: (602) 331-3859

Copy of Report to:

Name: Ryan Norkoli
Company: EMC²
E-mail: rnorkoli@emc-squared.net
Telephone: (602) 549-9173

Invoice to:

Name: PDC - 141846
Company: Project: Smeltertown
E-mail:
Address:
Telephone:

PROJECT INFORMATION

Quote #: PDC 141846
Project/PO #: Project: Smeltertown
Shipping Co.:
Tracking #: Contact: Scott Habermehl
Reporting State for compliance testing:

ANALYSES REQUESTED (attach list or use quote number)

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	EPA Method 6010 B As	EPA Method 6010 B Pb
Removal Area 7 extension Grinchwest	7/3/03 9:10	SO	1	X	X
Removal Area 7 extension Grinch East	7/3/03 9:15	SO	1	X	X

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

ASAP TAT

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Ryan Norkoli	7/3/03	E. Stench	7/7/03 10:30

PAGE 1 Of 1

FRMQA021.10.01.04

White - Return with sample. Yellow - Retain for your records.

APPENDIX E-3

FIELD COMPACTION TESTING SUMMARY AND LABORATORY ANALYTICAL RESULTS SHEETS

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

Table E-3
Field Compaction Testing Summary (1)
Smeltertown Superfund Site Operable Unit No. 1 - Salida, Colorado

Test Date	Test Number	Location	Lift No.	Field Dry Density (pcf)	Field Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction	Soil Type (Proctor No.) (2)	Pass/Fail	Notes
6/19/03	1	210 ft. South, 235 ft. East of Northwest Corner (BM)	1	104.6	4.6	111.4	10.9	93.9	SP-SM (P1)	Fail	Not within +/- 3% of optimum moisture
6/20/03	1A	Retest of Test Number 1	1	109.5	4.3	111.4	10.9	98.3	SP-SM (P1)	Fail	Not within +/- 3% of optimum moisture
6/23/03	1B	Retest of Test Number 1A	1	108.3	8.0	111.4	10.9	97.2	SP-SM (P1)	Pass	
6/19/03	2	110 ft. South, 240 ft. East of Northwest Corner (BM)	1	119.6	3.5	119.6	6.5	100.0	SM (P3)	Pass	
6/19/03	3	70 ft. South, 160 ft. East of Northwest Corner (BM)	1	111.8	8.3	111.4	10.9	100.0	SP-SM (P1)	Pass	
6/19/03	4	20 ft. South, 160 ft. East of Northwest Corner (BM)	1	121.8	5.6	119.6	6.5	100.0	SM (P3)	Pass	
6/20/03	5	20 ft. South, 185 ft. East of Northwest Corner (BM)	2	112.8	6.1	119.6	6.5	94.3	SM (P3)	Pass	
6/20/03	6	125 ft. South, 60 ft. East of Northwest Corner (BM)	2	115.7	6.3	119.6	6.5	96.7	SM (P3)	Pass	
6/23/03	7	100 ft. South, 200 ft. East of Northwest Corner (BM)	3	109.2	4.4	119.6	6.5	91.3	SM (P3)	Pass	
6/26/03	8	250 ft. South, 50 ft. East of Northwest Corner (BM)	1	123.1	7.8	127.7	9.8	96.4	SW-SM (P4)	Pass	
6/26/03	9	90 ft. South, 60 ft. East of Northwest Corner (BM)	3	126.5	9.0	127.7	9.8	99.1	SW-SM (P4)	Pass	
6/26/03	10	20 ft. South, 120 ft. East of Northwest Corner (BM)	4	112.4	9.6	111.4	10.9	100.0	SP-SM (P1)	Pass	
6/26/03	11	15 ft. South, 390 ft. East of Northwest Corner (BM)	FL	104.9	7.2	111.4	10.9	94.2	SP-SM (P1)	Fail	Not within +/- 3% of optimum moisture and not above 95% compaction (final lift)
6/27/03	11A	Retest of Test Number 11	FL	109.1	8.0	111.4	10.9	97.9	SP-SM (P1)	Pass	
6/26/03	12	140 ft. South, 210 ft. East of Northwest Corner (BM)	4	106.5	8.2	111.4	10.9	95.6	SP-SM (P1)	Pass	
6/27/03	13	200 ft. South, 130 ft. East of Northwest Corner (BM)	4	116.8	6.8	119.6	6.5	97.6	SM (P3)	Pass	
6/27/03	14	100 ft. South, 100 ft. East of Northwest Corner (BM)	5	121.1	7.2	127.7	9.8	94.8	SW-SM (P4)	Pass	
6/27/03	15	70 ft. South, 225 ft. East of Northwest Corner (BM)	FL	113.8	7.1	119.6	6.5	95.1	SM (P3)	Pass	
6/27/03	16	100 ft. South, 380 ft. East of Northwest Corner (BM)	FL	114.7	7.8	119.6	6.5	95.9	SM (P3)	Pass	
7/1/03	17	205 ft. South, 210 ft. East of Northwest Corner (BM)	4	115.0	4.7	119.6	6.5	96.2	SM (P3)	Pass	
7/1/03	18	230 ft. South, 50 ft. East of Northwest Corner (BM)	3	128.1	7.2	127.7	9.8	100.0	SW-SM (P4)	Pass	
7/1/03	19	180 ft. South, 300 ft. East of Northwest Corner (BM)	5	117.0	4.0	119.6	6.5	97.8	SW-SM (P4)	Pass	
7/2/03	20	220 ft. South, 410 ft. East of Northwest Corner (BM)	FL	110.1	8.5	111.4	10.9	98.8	SP-SM (P1)	Pass	
7/2/03	21	160 ft. South, 240 ft. East of Northwest Corner (BM)	FL	117.5	6.2	119.6	6.5	98.2	SM (P3)	Pass	
7/2/03	22	70 ft. South, 130 ft. East of Northwest Corner (BM)	FL	126.1	7.0	127.7	9.8	98.7	SW-SM (P4)	Pass	
7/2/03	23	230 ft. South, 45 ft. East of Northwest Corner (BM)	5	123.8	6.9	127.7	9.8	96.9	SW-SM (P4)	Pass	
7/10/03	24	260 ft. South, 380 ft. East of Northwest Corner (BM)	FL	125.9	6.8	127.7	9.8	98.6	SW-SM (P4)	Pass	
7/10/03	25	260 ft. South, 250 ft. East of Northwest Corner (BM)	FL	117.2	4.3	119.6	6.5	97.9	SM (P3)	Pass	
7/10/03	26	260 ft. South, 40 ft. East of Northwest Corner (BM)	FL	116.3	3.8	119.6	6.5	97.2	SM (P3)	Pass	

pcf = pounds per cubic foot, % = percent, FL = Final Lift

Notes:

(1) All field compaction testing was performed by Mountain Engineering & Testing, Inc. using a Troxler nuclear density gauge.

(2) SP-SM indicates poorly graded sand with silt and gravel soil type. SM indicates silty sand with gravel soil type. SW-SM indicates silty sand. P1, P3 and P4 correspond to the applicable Proctor tests that define the field density and moisture content requirements for various soil types.

Laboratory Analytical Results Sheets

Mountain Engineering & Testing
Smeltertown Superfund Site – Operable Unit No. 1

MOUNTAIN
ENGINEERING & TESTING
1537 G Street, Salida, CO 81201
PH: (719) 539-2312 FX: (719) 530-9111

Client:	Emc 2	Job Name:	Smeltertown Superfund Site
	7220 N. 16th St., Suite E	Job Number:	23130
	Phoenix, AZ 85020	Report Number:	1
		Date:	6/19/03
		Field Technician:	Tom Karnuta, P.G.
ATTN:	Travis LaBlanc	Weather:	Clear/79 Degrees F

SUMMARY OF SOIL COMPACTION TEST RESULTS

Test Date	Test Number	Location	Lift No.	Field Dry Density (pcf)	Field Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction	Pass/ Fail	Soil Type/ Notes
6/19/03	1	210' South, 235' East of Northwest Corner (BM)	1	104.6	4.6	111.4	10.9	93.9	F	SP-SM (P1)
6/19/03	2	110' South, 240' East of Northwest Corner (BM)	1	119.6	3.5	119.6	6.5	100	P	SM (P3)
6/19/03	3	70' South, 160' East of Northwest Corner (BM)	1	111.8	8.3	111.4	10.9	100	P	SP-SM (P1)
6/19/03	4	20' South, 160' East of Northwest Corner (BM)	1	121.8	5.6	119.6	6.5	100	P	SM (P3)

SPECIFICATIONS: 90% Maximum Dry Density at +/- 3% of the Optimum Moisture Content

COMMENTS: Sample of material to run Standard Proctor obtained from Ryan Norkoli, (P-1 and P-3) attached.

REVIEWED BY: Richard W. Brown, P.E.

MOUNTAIN
ENGINEERING & TESTING
1537 G Street, Salida, CO 81201
PH: (719) 539-2312 FX: (719) 530-9111

Client:	Emc 2	Job Name:	Smeltertown Superfund Site
	7220 N. 16th St., Suite E	Job Number:	23130
	Phoenix, AZ 85020	Report Number:	2
		Date:	6/20/03
		Field Technician:	Tom Kamuta, P.G.
ATTN:	Travis LaBlanc	Weather:	Clear/70 Degrees F

SUMMARY OF SOIL COMPACTION TEST RESULTS

Test Date	Test Number	Location	Lift No.	Field Dry Density (pcf)	Field Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction	Pass/ Fail	Soil Type/ Notes
6/20/03	5	20' South, 185' East of Northwest Corner (BM)	2	112.8	6.1	119.6	6.5	94.3	P	SM (P3)
6/20/03	6	125' South, 60' East of Northwest Corner (BM)	2	115.7	6.3	119.6	6.5	96.7	P	SM (P3)
6/20/03	1A	Retest of Test Number 1	1	109.5	4.3	111.4	10.9	98.3	F	SP-SM (P1)

SPECIFICATIONS: 90% Maximum Dry Density at +/- 3% of the Optimum Moisture Content

COMMENTS:

REVIEWED BY: Richard W. Brown, P.E.

8/2

MOUNTAIN
ENGINEERING & TESTING
1537 G Street, Salida, CO 81201
PH: (719) 539-2312 FX: (719) 530-9111

Client:	Emc 2	Job Name:	Smeltertown Superfund Site
	7220 N. 16th St., Suite E	Job Number:	23130
	Phoenix, AZ 85020	Report Number:	3
		Date:	6/23/03
		Field Technician:	Tom Kamuta, P.G.
ATTN:	Travis LaBlanc	Weather:	Warm/Breezy/74 Degrees F

SUMMARY OF SOIL COMPACTION TEST RESULTS

Test Date	Test Number	Location	Lift No.	Field Dry Density (pcf)	Field Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction	Pass/ Fail	Soil Type/ Notes
6/23/03	1B	Retest of Test No. 1A	1	108.3	8.0	111.4	10.9	97.2	P	SP-SM (P-1)
6/23/03	7	100' South, 200' East of Northwest Corner (BM)	3	109.2	4.4	119.6	6.5	91.3	P	SM (P3)

SPECIFICATIONS: 90% Maximum Dry Density at +/- 3% of the Optimum Moisture Content

COMMENTS:

REVIEWED BY: Richard W. Brown, P.E.

3/8

MOUNTAIN
ENGINEERING & TESTING
1537 G Street, Salida, CO 81201
PH: (719) 539-2312 FX: (719) 530-9111

Client:	Emc 2	Job Name:	Smeltertown Superfund Site
	7220 N. 16th St., Suite E	Job Number:	23130
	Phoenix, AZ 85020	Report Number:	4
		Date:	6/26/03
		Field Technician:	Tom Kamuta, P.G.
ATTN:	Travis LaBlanc	Weather:	Clear/Breezy/70 Degrees F

SUMMARY OF SOIL COMPACTION TEST RESULTS

Test Date	Test Number	Location	Lift No.	Field Dry Density (pcf)	Field Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction	Pass/ Fail	Soil Type/ Notes
6/26/03	8	250' South, 50' East of Northwest Corner (BM)	1	123.1	7.8	127.7	9.8	96.4	P	SW SM (P4)
6/26/03	9	90' South, 60' East of Northwest Corner (BM)	3	126.5	9.0	127.7	9.8	99.1	P	SW SM (P4)
6/26/03	10	20' South, 120' East of Northwest Corner (BM)	4	112.4	9.6	111.4	10.9	100	P	SP SM (P1)
6/26/03	11	15' North, 390' East of Northwest Corner (BM)	FL	104.9	7.2	111.4	10.9	94.2	F	SP SM (P1)
6/26/03	12	140' South, 210' East of Northwest Corner (BM)	4	106.5	8.2	111.4	10.9	95.6	P	SP SM (P1)

SPECIFICATIONS: 90% Maximum Dry Density at +/- 3% of the Optimum Moisture Content. Final Lift - 95% Maximum Dry Density at +/- 3% of the Optimum Moisture Content

COMMENTS: Lift numbers estimated by Ryan Norkoli. Sample of material to run Standard Proctor (P4) obtained from Ryan Norkoli.

FL = Final Lift

REVIEWED BY: Richard W. Brown, P.E.

7/8

MOUNTAIN
ENGINEERING & TESTING
1537 G Street, Salida, CO 81201
PH: (719) 539-2312 FX: (719) 530-9111

Client:	Emc 2	Job Name:	Smeltertown Superfund Site
	7220 N. 16th St., Suite E	Job Number:	23130
	Phoenix, AZ 85020	Report Number:	5
		Date:	6/27/03
		Field Technician:	Tom Kamuta, P.G.
ATTN:	Travis LaBlanc	Weather:	Clear/75 Degrees F

SUMMARY OF SOIL COMPACTION TEST RESULTS

Test Date	Test Number	Location	Lift No.	Field Dry Density (pcf)	Field Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction	Pass/ Fail	Soil Type/ Notes
6/27/03	13	200' South, 130' East of Northwest Corner (BM)	4	116.8	6.8	119.6	6.5	97.6	P	SM (P3)
6/27/03	14	100' South, 100' East of Northwest Corner (BM)	5	121.1	7.2	127.7	9.8	94.8	P	SW SM (P4)
6/27/03	15	70' South, 225' East of Northwest Corner (BM)	FL	113.8	7.1	119.6	6.5	95.1	P	SM (P3)
6/27/03	11A	Retest of Test No. 11	FL	109.1	8.0	111.4	10.9	97.9	P	SM (P1)
6/27/03	16	100' South, 360' East of Northwest Corner (BM)	FL	114.7	7.8	119.6	6.5	95.9	P	SM (P3)

SPECIFICATIONS: 90% Maximum Dry Density at +/- 3% of the Optimum Moisture Content. Final Lift - 95% Maximum Dry Density at +/- 3% of the Optimum Moisture Content

COMMENTS: Lift numbers estimated by Ryan Norkoli. Sample of material to run Standard Proctor (P4) obtained from Ryan Norkoli.

FL = Final Lift

REVIEWED BY: Richard W. Brown, P.E.

8/5

MOUNTAIN
ENGINEERING & TESTING
1537 G Street, Salida, CO 81201
PH: (719) 539-2312 FX: (719) 530-9111

Client:	Esnc 2	Job Name:	Smeltertown Superfund Site
	7220 N. 16th St., Suite E	Job Number:	23130
	Phoenix, AZ 85020	Report Number:	6
		Date:	7/1/03
		Field Technician:	Tom Kamuta, P.G.
ATTN:	Travis LaBlanc	Weather:	Clear/75 Degrees F

SUMMARY OF SOIL COMPACTION TEST RESULTS

Test Date	Test Number	Location	Lift No.	Field Dry Density (pcf)	Field Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction	Pass/ Fail	Soil Type/ Notes
7/1/03	17	205' South, 210' East of Northwest Corner (BM)	4	115.0	4.7	119.6	6.5	96.2	P	SM (P3)
7/1/03	18	230' South, 50' East of Northwest Corner (BM)	3	128.1	7.2	127.7	9.8	100	P	SW SM (P4)
7/1/03	19	180' South, 300' East of Northwest Corner (BM)	5	117.0	4.0	119.6	6.5	97.8	P	SW SM (P4)

SPECIFICATIONS: 90% Maximum Dry Density at +/- 3% of the Optimum Moisture Content. Final Lift - 95% Maximum Dry Density at +/- 3% of the Optimum Moisture Content

COMMENTS:

REVIEWED BY: Richard W. Brown, P.E.

8/?

MOUNTAIN
ENGINEERING & TESTING
1537 G Street, Salida, CO 81201
PH: (719) 539-2312 FX: (719) 530-9111

Client:	Emc 2	Job Name:	Smeltertown Superfund Site
	7220 N. 16th St., Suite E	Job Number:	23130
	Phoenix, AZ 85020	Report Number:	7
		Date:	7/2/03
		Field Technician:	Tom Karmula, P.G.
ATTN:	Travis LaBlanc	Weather:	Clear/77 Degrees F

SUMMARY OF SOIL COMPACTION TEST RESULTS

Test Date	Test Number	Location	Lift No.	Field Dry Density (pcf)	Field Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction	Pass/ Fail	Soil Type/ Notes
7/2/03	20	220' South, 410' East of Northwest Corner (BM)	FL	110.1	8.5	111.4	10.9	98.8	P	SP SM (P1)
7/2/03	21	160' South, 240' East of Northwest Corner (BM)	FL	117.5	6.2	119.6	6.5	98.2	P	SM (P3)
7/2/03	22	70' South, 130' East of Northwest Corner (BM)	FL	126.1	7.0	127.7	9.8	98.7	P	SW SM (P4)
7/2/03	23	230' South, 45' East of Northwest Corner (BM)	5	123.8	6.9	127.7	9.8	96.9	P	SW SM (P4)

SPECIFICATIONS: 90% Maximum Dry Density at +/- 3% of the Optimum Moisture Content. Final Lift - 95% Maximum Dry Density at +/- 3% of the Optimum Moisture Content

COMMENTS: FL = Final Lift

REVIEWED BY: Richard W. Brown, P.E.

7/8

MOUNTAIN
ENGINEERING & TESTING
1537 G Street, Salida, CO 81201
PH: (719) 539-2312 FX: (719) 530-9111

Client:	Emc 2	Job Name:	Smeltertown Superfund Site
	7220 N. 16th St., Suite E	Job Number:	23130
	Phoenix, AZ 85020	Report Number:	8
		Date:	7/10/03
		Field Technician:	Tom Karnuta, P.G.
ATTN:	Travis LaBlanc	Weather:	Clear/79 Degrees F

SUMMARY OF SOIL COMPACTION TEST RESULTS

Test Date	Test Number	Location	Lift No.	Field Dry Density (pcf)	Field Moisture (%)	Maximum Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction	Pass/ Fail	Soil Type/ Notes
7/10/03	24	260' South, 380' East of Northwest Corner (BM)	FL	125.9	6.8	127.7	9.8	98.6	P	SW SM (P4)
7/10/03	25	260' South, 250' East of Northwest Corner (BM)	FL	117.2	4.3	119.6	6.5	97.9	P	SM (P3)
7/10/03	26	260' South, 40' East of Northwest Corner (BM)	FL	116.3	3.8	119.6	6.5	97.2	P	SM (P3)

SPECIFICATIONS: 90% Maximum Dry Density at +/- 3% of the Optimum Moisture Content. Final Lift - 95% Maximum Dry Density at +/- 3% of the Optimum Moisture Content

COMMENTS: FL = Final Lift

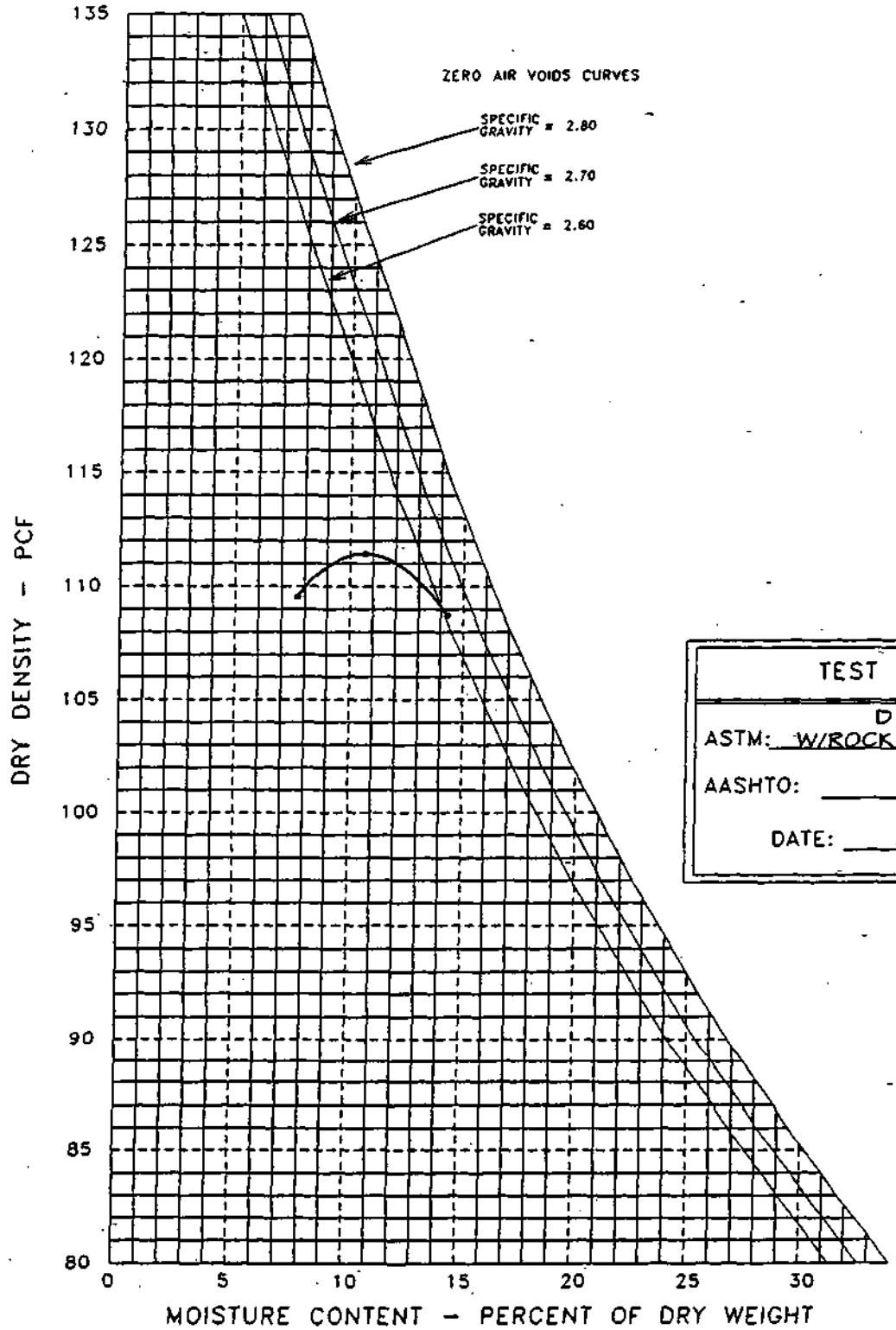
REVIEWED BY: Richard W. Brown, P.E.

8/8

Standard Proctor Tests

Laboratory Analytical Results Sheets

Mountain Engineering & Testing
Smeltertown Superfund Site – Operable Unit No. 1



TEST METHOD
D 698 B
ASTM: W/ROCK CORRECTION
AASHTO:
DATE: JUNE-18-03

MAXIMUM DRY DENSITY: 111.4 PCF OPTIMUM MOISTURE CONTENT: 10.9%

SOIL TYPE: SP-SM SAMPLE No. 1 - REDDISH BROWN	GRAVEL: 42 SAND: 51 SILT AND CLAY (-200): 7	Liquid Limit: NP Plasticity Index: NP
LOCATION: SMELTERTOWN, 37,000 CY STOCKPILE	BORING NO.: N/A	DEPTH: N/A

PROJECT NO.			
23130	MOUNTAIN ENGINEERING & TESTING	MOISTURE / DENSITY CURVE	FIGURE P1

LABORATORY COMPACTION TEST FORM

Client: Emc2 Date: 6/17/03

Project No.: 23130

Project Name: Smeltertown Superfund Site

Boring No.:		Sampled By:	Ryan Norkoli
Sample No.:	P1	Date:	6/16/03
Depth:			
Test Method: (underline one)	ASTM D 698 ASTM D 1557 AASHTO T 180	Grading (underline one)	A B C

Test No.	1	2	3	4	5	6	7
Water added to test point	N/A	N/A	N/A				
Wt. of Mold and Wet Soil (g)	4110	4216	4234				
Wt. of Mold (g)	2426	2426	2426				
Wt. of Wet Soil (g)	1684	1790	1808				
Wet Density (pcf)	112.5	119.6	120.8				
Dish Number	N/A	N/A	N/A				
Wt. of Dish and Wet Soil (g)	1684	1790	1808				
Wt. of Dish and Dry Soil (g)	1530	1564	1520				
Wt. of Dish (g)	TARE	TARE	TARE				
Wt. of Moisture Loss (g)	154	226	288				
Wt. of Dry Soil (g)	1530	1564	1520				
Moisture Content (%)	10.1	14.5	18.9				
Dry Density (pcf)	102.2	104.5	101.6				

Notes: ACTUAL VOLUME OF MOUNTAIN ENGINEERING & TESTINGS LAB PROCTOR MOLD IS EQUAL TO 1/30.3 FT^3

Performed By: DJG Date: 6/18/03 Reviewed By: TK

MOUNTAIN ENGINEERING & TESTING

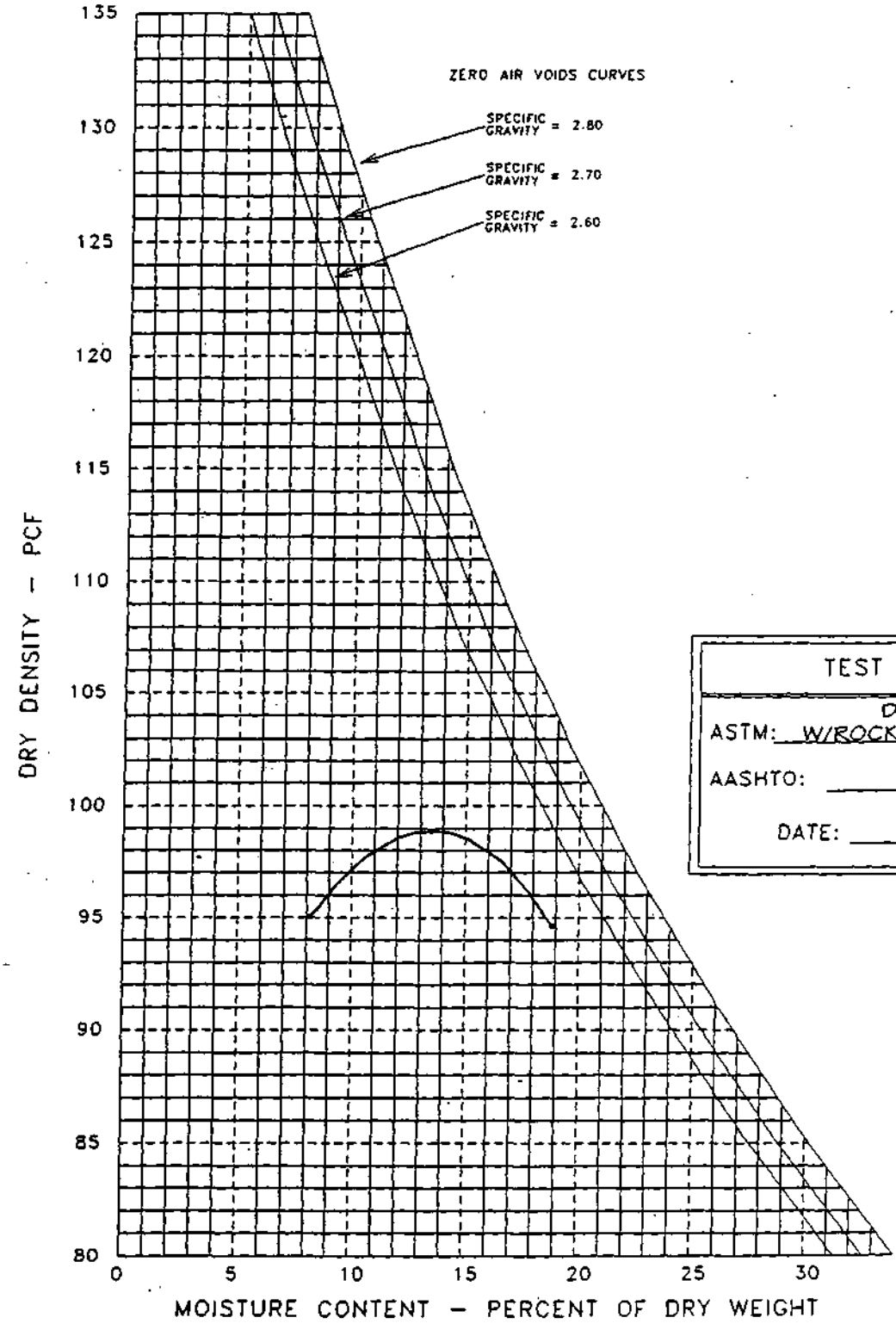
Rock Correction for Proctor Samples
ASTM D 4718 Proctor P1

Point 1		Point 2	
Splitting Sieve:	3/4"	Splitting Sieve:	3/4"
Wet wt Retained	5443 g	Wet wt Retained	5443 g
Wet wt Passing	16329 g	Wet wt Passing	16329 g
Total Wet wt.	21772 g	Total Wet wt.	21772 g
MC +#4 sieve	0.8%	MC +#4 sieve	0.8%
MC -#4 sieve	6.0%	MC -#4 sieve	6.0%
Dry wt Retained	5399.80 g	Dry wt Retained	5399.80 g
Dry wt Passing	15404.72 g	Dry wt Passing	15404.72 g
Total Dry wt.	20804.52 g	Total Dry wt.	20804.52 g
Dry % Retained	26.0%	Dry % Retained	26.0%
Dry % Passing	74.0%	Dry % Passing	74.0%
SpGr +#4 sieve	2.2 g/cm3	SpGr +#4 sieve	2.2 g/cm3
SpGr -#4 sieve	2.2 g/cm3	SpGr -#4 sieve	2.2 g/cm3
MDD of portion passing	102.2 pcf	MDD of portion passing	104.5 pcf
OMC of portion passing	10.1%	OMC of portion passing	14.5%
MDD corrected for total sample	109.5 pcf	*MDD corrected for total sample*	111.4 pcf
OMC corrected for total sample	7.7%	OMC corrected for total sample	10.9%

Point 3	
Splitting Sieve:	3/4"
Wet wt Retained	5443 g
Wet wt Passing	16329 g
Total Wet wt.	21772 g
MC +#4 sieve	0.8%
MC -#4 sieve	6.0%
Dry wt Retained	5399.80 g
Dry wt Passing	15404.72 g
Total Dry wt.	20804.52 g
Dry % Retained	26.0%
Dry % Passing	74.0%
SpGr +#4 sieve	2.2 g/cm3
SpGr -#4 sieve	2.2 g/cm3
MDD of portion passing	101.6 pcf
OMC of portion passing	18.9%
MDD corrected for total sample	108.9 pcf
OMC corrected for total sample	14.2%

Terms Used

wt	weight
MC	Moisture Content
SpGr	Specific Gravity
MDD	Maximum Dry Density
OMC	Optimum Moisture Content



TEST METHOD
ASTM: D 698 B W/ROCK CORRECTION
AASHTO:
DATE: JUNE-18-03

MAXIMUM DRY DENSITY: 98.8 PCF OPTIMUM MOISTURE CONTENT: 13.3%

SOIL TYPE: SM SAMPLE No. 2 - BLACK	GRAVEL: 26 SAND: 62 SILT AND CLAY (-200): 12	Liquid Limit: NP Plasticity Index: NP
LOCATION: SMELTERTOWN, 37,000 CY STOCKPILE	BORING NO.: N/A	DEPTH: N/A

PROJECT NO. 23130	MOUNTAIN ENGINEERING & TESTING	MOISTURE / DENSITY CURVE	FIGURE P2

4/12

LABORATORY COMPACTION TEST FORM

Client: Emc2 Date: 6/17/03

Project No.: 23130

Project Name: Smeltertown Superfund Site

Boring No.:		Sampled By:	Ryan Norkoli
Sample No.:	P2	Date:	6/17/03
Depth:			
Test Method: (underline one)	ASTM D 698 ASTM D 1557 AASHTO T 180	Grading (underline one)	A B C

Test No.	1	2	3	4	5	6	7
Water added to test point	N/A	N/A	N/A				
Wt. of Mold and Wet Soil (g)	3900	4052	4066				
Wt. of Mold (g)	2428	2428	2428				
Wt. of Wet Soil (g)	1472	1624	1638				
Wet Density (pcf)	98.3	108.5	109.3				
Dish Number	N/A	N/A	N/A				
Wt. of Dish and Wet Soil (g)	1472	1624	1638				
Wt. of Dish and Dry Soil (g)	1343	1404	1340				
Wt. of Dish (g)	TARE	TARE	TARE				
Wt. of Moisture Loss (g)	129	220	298				
Wt. of Dry Soil (g)	1343	1404	1340				
Moisture Content (%)	9.6	15.7	22.2				
Dry Density (pcf)	89.7	93.8	89.4				

Notes: ACTUAL VOLUME OF MOUNTAIN ENGINEERING & TESTINGS LAB PROCTOR MOLD IS EQUAL TO 1/30.3 FT^3

Performed By: DJG Date: 6/18/03 Reviewed By: TK

MOUNTAIN ENGINEERING & TESTING

5/12

Rock Correction for Proctor Samples
ASTM D 4718 Proctor P2

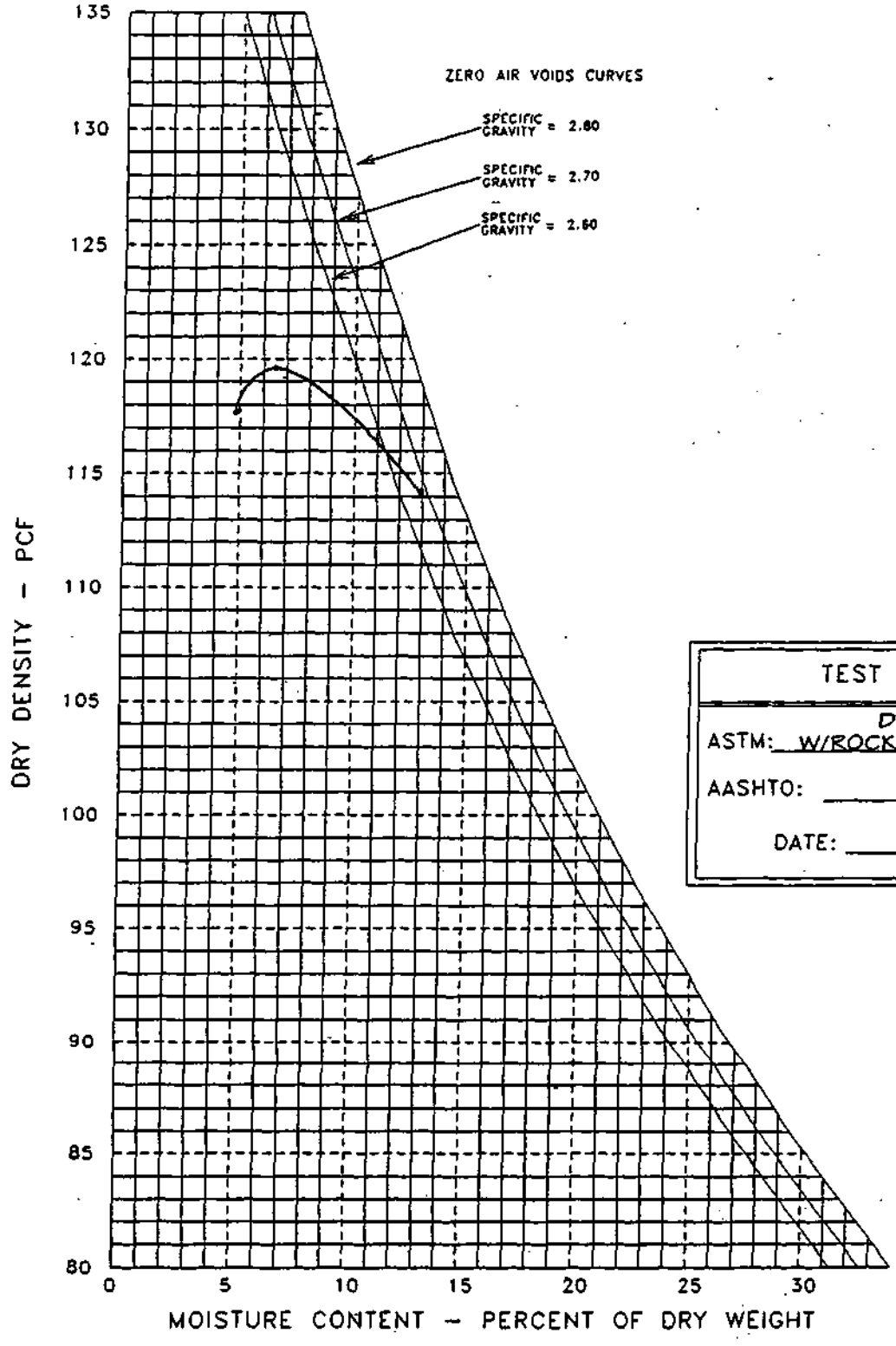
Point 1		
Splitting Sieve:	3/4"	
Wet wt Retained	3175	g
Wet wt Passing	17463	g
Total Wet wt.	20638	g
MC +#4 sieve	0.8%	
MC -#4 sieve	6.0%	
Dry wt Retained	3149.80	g
Dry wt Passing	16474.53	g
Total Dry wt.	19624.33	g
Dry % Retained	16.1%	
Dry % Passing	83.9%	
SpGr +#4 sieve	2.2	g/cm3
SpGr -#4 sieve	2.2	g/cm3
MDD of portion passing	89.7	pcf
OMC of portion passing	9.6%	
MDD corrected for total sample	95.0	
OMC corrected for total sample	8.2%	

Point 2		
Splitting Sieve:	3/4"	
Wet wt Retained	3175	g
Wet wt Passing	17463	g
Total Wet wt.	20638	g
MC +#4 sieve	0.8%	
MC -#4 sieve	6.0%	
Dry wt Retained	3149.80	g
Dry wt Passing	16474.53	g
Total Dry wt.	19624.33	g
Dry % Retained	16.1%	
Dry % Passing	83.9%	
SpGr +#4 sieve	2.2	g/cm3
SpGr -#4 sieve	2.2	g/cm3
MDD of portion passing	93.8	pcf
OMC of portion passing	15.7%	
MDD corrected for total sample	98.8	
OMC corrected for total sample	13.3%	

Point 3		
Splitting Sieve:	3/4"	
Wet wt Retained	3175	g
Wet wt Passing	17463	g
Total Wet wt.	20638	g
MC +#4 sieve	0.8%	
MC -#4 sieve	6.0%	
Dry wt Retained	3149.80	g
Dry wt Passing	16474.53	g
Total Dry wt.	19624.33	g
Dry % Retained	16.1%	
Dry % Passing	83.9%	
SpGr +#4 sieve	2.2	g/cm3
SpGr -#4 sieve	2.2	g/cm3
MDD of portion passing	89.4	pcf
OMC of portion passing	22.2%	
MDD corrected for total sample	94.7	
OMC corrected for total sample	18.8%	

Terms Used

wt	weight
MC	Moisture Content
SpGr	Specific Gravity
MDD	Maximum Dry Density
OMC	Optimum Moisture Content



TEST METHOD
ASTM: D 698 B W/ROCK CORRECTION
AASHTO:
DATE: JUNE-18-03

MAXIMUM DRY DENSITY: 119.6 PCF OPTIMUM MOISTURE CONTENT: 6.5%

SOIL TYPE: SM SAMPLE No. 3 - LIGHT BROWN TO GRAY	GRAVEL: 19 SAND: 66 SILT AND CLAY (-200): 15	Liquid Limit: NP Plasticity Index: NP
LOCATION: SMELTERTOWN, 37,000 CY STOCKPILE	BORING NO.: N/A	DEPTH: N/A

PROJECT NO. 23130	MOUNTAIN ENGINEERING & TESTING	MOISTURE / DENSITY CURVE	FIGURE P3

LABORATORY COMPACTION TEST FORM

Client: Emc2 Date: 6/17/03

Project No.: 23130

Project Name: Smeltertown Superfund Site

Boring No.:		Sampled By:	Ryan Norkoli
Sample No.:	P3	Date:	6/16/03
Depth:			
Test Method: (underline one)	ASTM D 698 ASTM D 1557 AASHTO T 180	Grading (underline one)	A B C

Test No.	1	2	3	4	5	6	7
Water added to test point	2%	4%	6%				
Wt. of Mold and Wet Soil (g)	4244	4320	4342				
Wt. of Mold (g)	2428	2428	2428				
Wt. of Wet Soil (g)	1816	1892	1910				
Wet Density (pcf)	121.3	126.4	127.6				
Dish Number	N/A	N/A	N/A				
Wt. of Dish and Wet Soil (g)	1816	1892	1910				
Wt. of Dish and Dry Soil (g)	1720	1754	1664				
Wt. of Dish (g)	N/A	N/A	N/A				
Wt. of Moisture Loss (g)	96	138	246				
Wt. of Dry Soil (g)	1720	1754	1664				
Moisture Content (%)	5.6	7.9	14.8				
Dry Density (pcf)	114.9	117.1	111.1				

Notes: ACTUAL VOLUME OF MOUNTAIN ENGINEERING & TESTINGS LAB PROCTOR MOLD IS EQUAL TO 1/30.3 FT^3

Performed By: DJG Date: 6/18/03 Reviewed By: TK

MOUNTAIN ENGINEERING & TESTING

Rock Correction for Proctor Samples
ASTM D 4718 Proctor P3

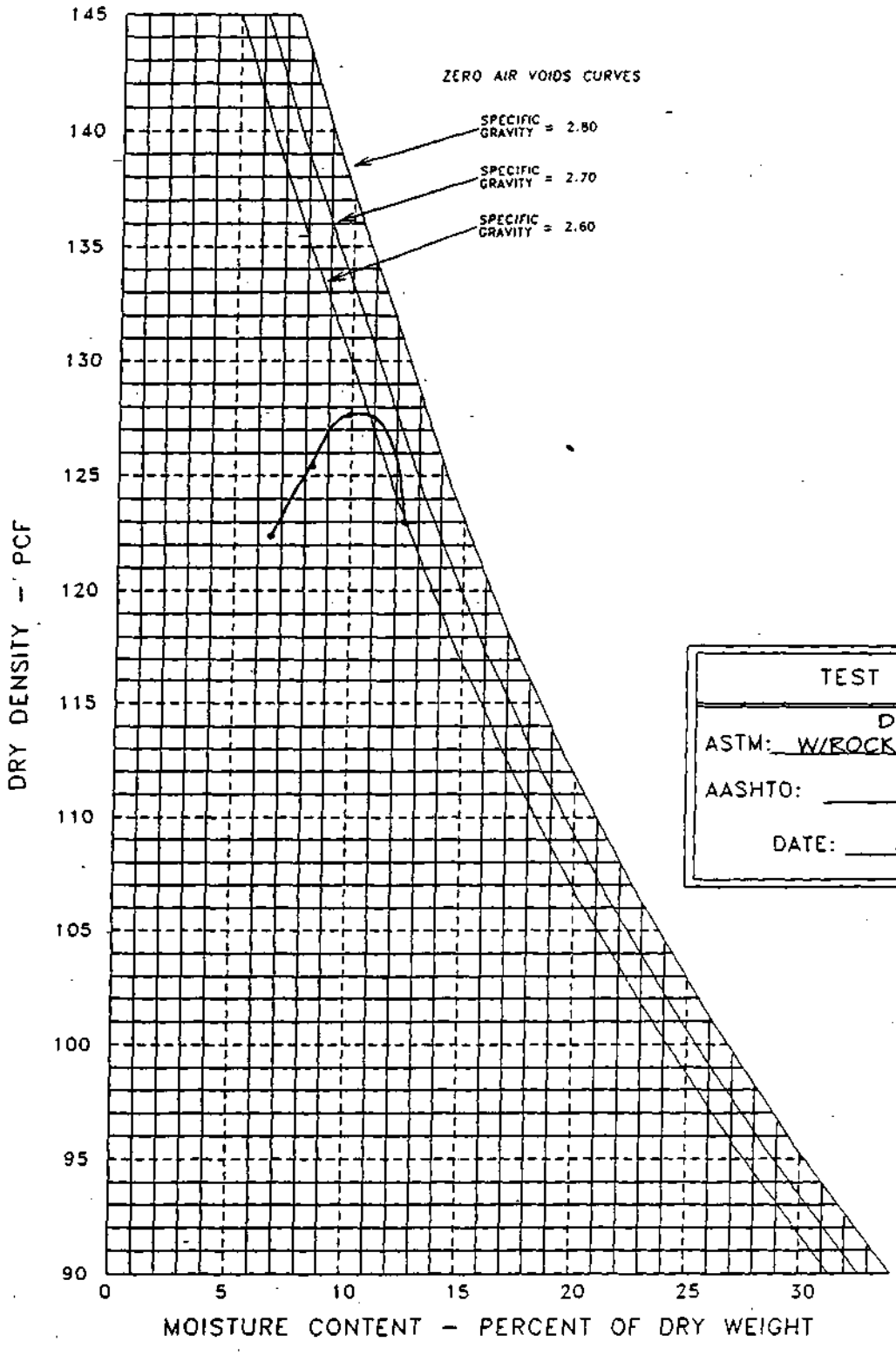
Point 1		
Splitting Sieve:	3/4"	
Wet wt Retained	2722 g	
Wet wt Passing	16556 g	
Total Wet wt.	19278 g	
MC +#4 sieve	0.8%	
MC -#4 sieve	3.0%	
Dry wt Retained	2700.40 g	
Dry wt Passing	16073.79 g	
Total Dry wt.	18774.18 g	
Dry % Retained	14.4%	
Dry % Passing	85.6%	
SpGr +#4 sieve	2.2 g/cm3	
SpGr -#4 sieve	2.2 g/cm3	
MDD of portion passing	114.9 pcf	
OMC of portion passing	5.6%	
MDD corrected for total sample		117.7
OMC corrected for total sample		4.9%

Point 2		
Splitting Sieve:	3/4"	
Wet wt Retained	2722 g	
Wet wt Passing	16556 g	
Total Wet wt.	19278 g	
MC +#4 sieve	0.8%	
MC -#4 sieve	3.0%	
Dry wt Retained	2700.40 g	
Dry wt Passing	16073.79 g	
Total Dry wt.	18774.18 g	
Dry % Retained	14.4%	
Dry % Passing	85.6%	
SpGr +#4 sieve	2.2 g/cm3	
SpGr -#4 sieve	2.2 g/cm3	
MDD of portion passing	117.1 pcf	
OMC of portion passing	7.9%	
MDD corrected for total sample		119.6
OMC corrected for total sample		6.5%

Point 3		
Splitting Sieve:	3/4"	
Wet wt Retained	2722 g	
Wet wt Passing	16556 g	
Total Wet wt.	19278 g	
MC +#4 sieve	0.8%	
MC -#4 sieve	3.0%	
Dry wt Retained	2700.40 g	
Dry wt Passing	16073.79 g	
Total Dry wt.	18774.18 g	
Dry % Retained	14.4%	
Dry % Passing	85.6%	
SpGr +#4 sieve	2.2 g/cm3	
SpGr -#4 sieve	2.2 g/cm3	
MDD of portion passing	111.1 pcf	
OMC of portion passing	14.8%	
MDD corrected for total sample		114.2
OMC corrected for total sample		12.8%

Terms Used

wt	weight
MC	Moisture Content
SpGr	Specific Gravity
MDD	Maximum Dry Density
OMC	Optimum Moisture Content



TEST METHOD
D 698 B
ASTM: W/ROCK CORRECTION
AASHTO:
DATE: JUNE-24-03

MAXIMUM DRY DENSITY: 127.7 PCF OPTIMUM MOISTURE CONTENT: 9.8%

SOIL TYPE: SW-SM SAMPLE No. 4	GRAVEL: 32 SAND: 57 SILT AND CLAY (−200): 11	Liquid Limit: NP Plasticity Index: NP
LOCATION: SMELTERTOWN, AREAS 3 AND 4	BORING NO.: N/A	DEPTH: N/A

PROJECT NO. 23130	MOUNTAIN ENGINEERING & TESTING	MOISTURE / DENSITY CURVE	FIGURE P4

10/12

LABORATORY COMPACTION TEST FORM

Client: Emc2 Date: 6/23/03

Project No.: 23130

Project Name: Smeltertown Superfund Site

Boring No.:		Sampled By:	Ryan Norkoli
Sample No.:	P4	Date:	6/23/03
Depth:			
Test Method: (underline one)	ASTM D 698 ASTM D 1557 AASHTO T 180	Grading (underline one)	A B C

Test No.	1	2	3	4	5	6	7
Water added to test point	N/A	N/A	N/A	N/A			
Wt. of Mold and Wet Soil (g)	4246	4344	4426	4382			
Wt. of Mold (g)	2426	2426	2426	2426			
Wt. of Wet Soil (g)	1820	1918	2000	1956			
Wet Density (pcf)	121.6	128.1	133.6	130.7			
Dish Number	N/A	N/A	N/A	N/A			
Wt. of Dish and Wet Soil (g)	1820	1918	2000	1956			
Wt. of Dish and Dry Soil (g)	1672	1722	1764	1678			
Wt. of Dish (g)	TARE	TARE	TARE	TARE			
Wt. of Moisture Loss (g)	148	196	236	278			
Wt. of Dry Soil (g)	1672	1722	1764	1678			
Moisture Content (%)	8.9	11.4	13.4	16.6			
Dry Density (pcf)	111.7	115.0	117.8	112.1			

Notes: ACTUAL VOLUME OF MOUNTAIN ENGINEERING & TESTINGS LAB PROCTOR MOLD IS EQUAL TO 1/30.3 FT^3

Performed By: DJG Date: 6/23/03 Reviewed By: TK

MOUNTAIN ENGINEERING & TESTING

Rock Correction for Proctor Samples
ASTM D 4718 Proctor P4

Point 1		
Splitting Sieve:	3/4"	
Wet wt Retained	5831	g
Wet wt Passing	15259	g
Total Wet wt.	21090	g
MC +#4 sieve	0.8%	
MC -#4 sieve	4.4%	
Dry wt Retained	5784.72	g
Dry wt Passing	14615.90	g
Total Dry wt.	20400.62	g
Dry % Retained	28.4%	
Dry % Passing	71.6%	
SpGr +#4 sieve	2.6	g/cm3
SpGr -#4 sieve	2.6	g/cm3
MDD of portion passing	111.7	pcf
OMC of portion passing	8.9%	
MDD corrected for total sample	122.5	
OMC corrected for total sample	6.6%	

Point 2		
Splitting Sieve:	3/4"	
Wet wt Retained	5831	g
Wet wt Passing	15259	g
Total Wet wt.	21090	g
MC +#4 sieve	0.8%	
MC -#4 sieve	4.4%	
Dry wt Retained	5784.72	g
Dry wt Passing	14615.90	g
Total Dry wt.	20400.62	g
Dry % Retained	28.4%	
Dry % Passing	71.6%	
SpGr +#4 sieve	2.6	g/cm3
SpGr -#4 sieve	2.6	g/cm3
MDD of portion passing	115.0	pcf
OMC of portion passing	11.4%	
MDD corrected for total sample	125.3	
OMC corrected for total sample	8.4%	

Point 3		
Splitting Sieve:	3/4"	
Wet wt Retained	5831	g
Wet wt Passing	15259	g
Total Wet wt.	21090	g
MC +#4 sieve	0.8%	
MC -#4 sieve	4.4%	
Dry wt Retained	5784.72	g
Dry wt Passing	14615.90	g
Total Dry wt.	20400.62	g
Dry % Retained	28.4%	
Dry % Passing	71.6%	
SpGr +#4 sieve	2.6	g/cm3
SpGr -#4 sieve	2.6	g/cm3
MDD of portion passing	117.8	pcf
OMC of portion passing	13.4%	
MDD corrected for total sample	127.7	
OMC corrected for total sample	9.8%	

Point 4		
Splitting Sieve:	3/4"	
Wet wt Retained	5831	g
Wet wt Passing	15259	g
Total Wet wt.	21090	g
MC +#4 sieve	0.8%	
MC -#4 sieve	4.4%	
Dry wt Retained	5784.72	g
Dry wt Passing	14615.90	g
Total Dry wt.	20400.62	g
Dry % Retained	28.4%	
Dry % Passing	71.6%	
SpGr +#4 sieve	2.6	g/cm3
SpGr -#4 sieve	2.6	g/cm3
MDD of portion passing	112.1	pcf
OMC of portion passing	16.6%	
MDD corrected for total sample	122.9	
OMC corrected for total sample	12.1%	

Terms Used

wt	weight
MC	Moisture Content
SpGr	Specific Gravity
MDD	Maximum Dry Density
OMC	Optimum Moisture Content

APPENDIX E-4

DISCHARGE APRON MATERIALS DOCUMENTATION/CERTIFICATION

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

bp

Amoco Fabrics and Fibers Company
260 The Bluffs
Austell GA 30168
Phone 800-445-7732

May 21, 2003

Vance Brothers
P O Box 369
Aurora CO 80040-0369

Job Reference:

B/L# 153551
Shipper # 1022449

Amoco Fabrics and Fibers Company hereby certifies that ProPex 4552 shipped to you May 19, 2003, on AFFC order # VBD-0504, meets the following minimum average roll values:

Property	Test Method	Minimum Average Roll Value (English)	Minimum Average Roll Value (Metric)
Grab Tensile	ASTM-D-4632	180 lb	.800 kN
Grab Elongation	ASTM-D-4632	50 %	50 %
Mullen Burst	ASTM-D-3786	330 psi	2270 kPa
Puncture	ASTM-D-4833	105 lb	.465 kN
Trapezoidal Tear	ASTM-D-4533	75 lb	.330 kN
UV Resistance	ASTM-D-4355	70 % at 500 hr	70 % at 500 hr
AOS	ASTM-D-4751	70 sieve	0.212 mm
Permittivity	ASTM-D-4491	1.5 sec^{-1}	1.5 sec^{-1}
Flow Rate	ASTM-D-4491	110 $gal/min/ft^2$	4470 $L/min/m^2$

Amoco Fabrics and Fibers Company manufactures all the nonwoven geotextile fabric certified above. The values are a result of testing conducted in on-site laboratories at the time of production. All test methods used are ASTM or industry standards. Test data is retained in the Quality Control files at Amoco's production facility.

Kay W. Williams

Kay W. Williams
Production Analyst/Quality Assurance Manager
Amoco Fabrics and Fibers Company

ckb

From: Berry, Alan A <berryra@bp.com>
To: <mlitvay@acaproducts.com>
Sent: Tuesday, August 05, 2003 4:29 PM
Subject: *Amoco Nonwoven Style 4552*

Dear Matt,

Regarding the Superfund project we discussed this afternoon, please be advised that Amoco Nonwoven Style 4552 fabric is a nominal 7 ounces per square yard in weight.

As an industry, civil engineering related fabrics are measured more by performance specifications rather than by a given weight. The most common application where a weight specification is critical, is when the product is used for protection, as with a landfill liner.

Please let me know if you have any other questions.

Best Regards,

Alan Berry
Regional Sales Manager
BP Amoco Fabrics and Fibers Company
Austell, GA

770-335-7951(cell)

DIAL 719-539-2522
719-539-6378
FAX 719-539-2523

BUTALA CONSTRUCTION

POST OFFICE BOX 907
SALIDA, COLORADO 81201

August 5, 2003

ACA Products
Buena Vista, CO 81211

To Whom it May Concern:

This is to acknowledge an agreement by Butala Sand & Gravel to provide a requested amount of Rock material that has been grizzly screened to a 4" to 8" range, to ACA of Buena Vista, Colorado. Payment for this material @ $18.00 per ton will be made by ACA to Butala Sand & Gravel.

Sincerely,

Jack Watkins
Butala Construction

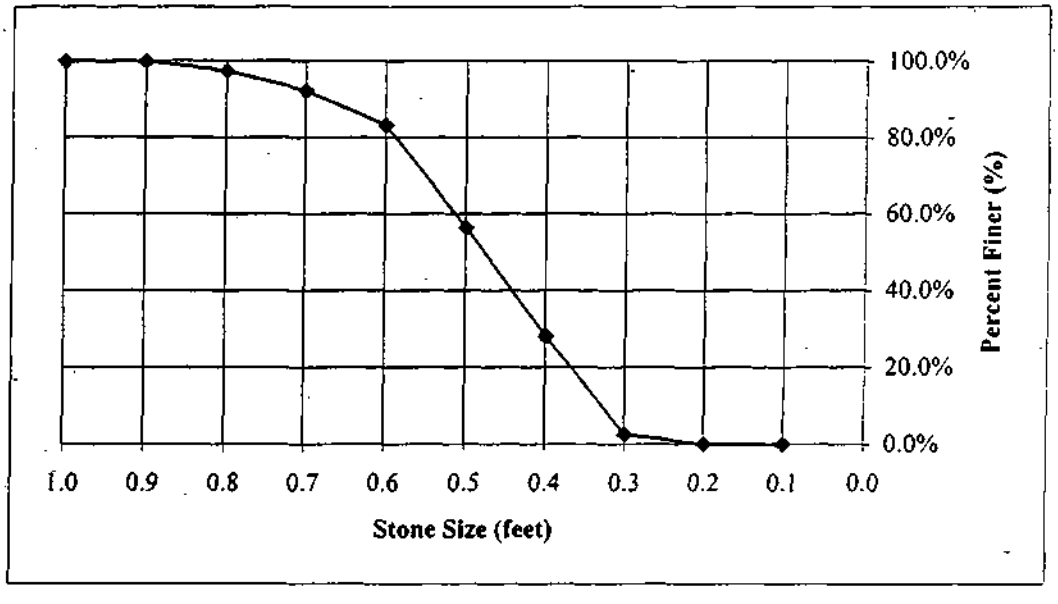
Discharge Apron Riprap Materials QA/QC Summary (1)
Smeltertown Superfund Site - Operable Unit No. 1
Salida, Colorado

Stone Size (feet)	Rock Count	Percent of Total	Percent Finer
0.1	0	0.0%	0.0%
0.2	0	0.0%	0.0%
0.3	2	2.6%	2.6%
0.4	20	25.6%	28.2%
0.5	22	28.2%	56.4% (2)
0.6	21	26.9%	83.3%
0.7	7	9.0%	92.3%
0.8	4	5.1%	97.4%
0.9	2	2.6%	100.0%
1.0	0	0.0%	100.0%
Total	**78**	-	-

Notes:

(1) Rock count data based on field measurements performed by EMC^2 on August 7, 2003. Gradation of a randomly selected 3'x3'x0.5' sample area of rock riprap material was determined based on the sizes of the individual stone particles.

(2) D50, the diameter corresponding to 50% finer in the particle size distribution based on size-range grading, is approximately 0.5 feet, which meets project specifications for 6-in D50 riprap.



APPENDIX E-5

REVEGETATION MATERIALS DOCUMENTATION/CERTIFICATION

Final Removal Action Close-Out Report
Smeltertown Superfund Site - Operable Unit No.1
Salida, Colorado

Ryan Norkol/EMC
7220 North 16th Street Suite E
Phoenix AZ 85020

Colorado State University
Soil, Water and Plant Testing Laboratory
Natural & Environmental Sciences Bldg - A319
Fort Collins, CO 80523-1120

(970) 491-5061 FAX: 491-2930

DATE RECEIVED: 06-26-2003
DATE REPORTED: 07-10-2003

BILLING:

RESEARCH SOIL ANALYSIS

Lab #	Sample ID #	paste pH	paste EC mmhos/cm	Lime Estimate	% OM	AB-DTPA Extract ppm NO_3-N	P	K	Zn	Fe	Mn	Cu	Texture Estimate
R5159	North # 1	7.9	0.9	High	2.0	2.8	1.0	99.9	0.26	2.7	1.0	2.5	Sandy Loam
R5160	Central # 2	7.9	0.6	High	1.9	5.2	1.1	113	0.36	4.8	1.2	3.1	Sandy Loam
R5161	South # 3	7.8	0.4	High	2.5	4.2	1.0	95.7	0.21	3.7	1.0	2.7	Sandy Loam

Lab #	Sample ID #	plant species	irrigated	Fertilizer Suggestion lb/A N	P_2O_5	K_2O
R5159	North # 1	native	no	40	60	40
R5160	Central # 2	native	no	40	60	40
R5161	South # 3	native	no	40	60	40

Granite Seed Company
1697 West 2100 North
Lehi, Utah 84043
801-768-4422

44094

147958 2/6

DATE SHIPPED: 09/15/2003

SOLD TO:
WESTERN STATES RECLAMATION
3756 IMPERIAL STREET
FREDERICK, CO 80516

PROJECT NAME: BUENA VISTA - AKA
SEED MIX NUMBER: 44094

Letter of Certification

This memo is written to certify that this seed mix is true to label and has been duly tested by a fully accredited seed testing labratory using rules sanctioned by the Association of Offical Seed Analysts. The specifications of the seed used in the mix are as follows:

Common Name	Variety	Origin	Lot#	Purity	Germ + Dorm.	%PLS
SANDBERG BLUEGRASS	VNS	WA	POSA -30499	94.49	95	89.77
PRAIRIE JUNEGRASS	VNS	WA	KOCR -29512	98.73	89	87.87
INDIAN RICEGRASS	RIMROCK	WA	ORHY -29552	99.59	99	98.59
NEEDLE & THREAD GRAS	VNS	MT	STCO -28895	95.40	93	88.72
BLUE GRAMA	BAD RIVER	MN	BOGR -27428	98.60	93	91.70
SAND DROPSEED	VNS	CO	SPCR -30454	98.75	96	94.80
WESTERN WHEATGRASS	ROSANA	WA	AGSM -30500	96.14	92	88.45
BOTTLEBRUSH SQUIRREL	VNS	WA	SIHY -30452	97.49	93	90.67
FRINGED SAGEBRUSH	VNS	MT	ARFR -29286	87.47	70	61.23
SULFUR BUCKWHEAT	VNS	ID	ERUM -28920	51.04	74	37.77
WAX CURRENT	VNS	UT	RICE2-27029	90.07	66	59.45

Furthermore, we certify that said seed was packed as follows:

Number of Bags	Bulk Lbs. Per Bag
10	2.83
1	1.37

The number of pounds and percent of bulk for this mix are as follows:

Common Name	Lot#	Total Bulk Lbs.	Total PLS Lbs.	% Bulk Lbs.
SANDBERG BLUEGRASS	POSA -30499	0.82	0.74	2.76
PRAIRIE JUNEGRASS	KOCR -29512	1.24	1.09	4.19
INDIAN RICEGRASS	ORHY -29552	6.65	6.55	22.40
NEEDLE & THREAD GRAS	STCO -28895	1.64	1.46	5.54
BLUE GRAMA	BOGR -27428	0.40	0.37	1.35
SAND DROPSEED	SPCR -30454	0.78	0.74	2.61
WESTERN WHEATGRASS	AGSM -30500	10.44	9.23	35.18
BOTTLEBRUSH SQUIRREL	SIHY -30452	2.02	1.83	6.79
FRINGED SAGEBRUSH	ARFR -29286	1.20	0.73	4.05
SULFUR BUCKWHEAT	ERUM -28920	3.25	1.23	10.96
WAX CURRENT	RICE2-27029	1.24	0.73	4.17

If you have any questions, please call.

Sincerly,
Granite Seed Co.

AMERICAN PRIDE CO-OP

September 11, 2003

Western States Reclamation
Jamie S.
Fax 303-833-4447

To Whom It May Concern:

Job Specifications call for 40# available nitrogen, 60# available phosphate and 40# available potassium per acre on 10.5 acres.

American Pride COOP can provide Supercrop fertilizer as follows:

1. 0-0-60 Muriate of potash (14 x 50lb.)
2. 46-0-0 Urea (8 x 50lb.)
3. 18-46-0 Diamonium phosphate (28 x 50lb.)

which will meet job requirements when applied on said site (10 ½ acres) and guaranteed to blend, bag and label according to the Colorado Department of Agriculture fertilizer rules and regulations.

Respectfully,

Steve Yurich

SPY/oer

Profile™

TERRA-MULCH

DATE

ATT:
COMPANY
ADDRESS
CITY, STATE & ZIP

REF: TERRA-MULCH CELLULOSE FIBER CERTIFICATION

TO: STATE OR FED AGENCY, PROJECT OWNER, ETC

WE CERTIFY THAT TERRA-MULCH CELLULOSE FIBER MULCH COMPLIES WITH THE FOLLOWING PRODUCT SPECIFICATIONS:

PHYSICAL PROPERTIES

MOISTURE CONTENT	12% +-3
ORGANIC CONTENT	93.0% +-3
ASH CONTENT	7.0% +-3
pH RANGE	7.0 +-2
WATER HOLDING CAPACITY	1080% MIN

PACKAGING

NET WEIGHT 50 LB BALE, SHIPPED 40 BALES PER 42 x 48 PALLET WITH UV PALLET COVER

IF WE CAN BE OF FURTHER SERVICE, PLEASE DON'T HESITATE TO CALL ON US.

VERY SINCERELY,

KEVIN SPITTLE
V-P

PROFILE Products LLC – 750 LAKE COOK ROAD – SUITE 440 – BUFFALO GROVE, IL 60089
800-726-6371 – 847-215-1144 – FAX 847-215-0577
www.terra-mulch.com

RANTEC CORPORATION

P.O. BOX 729,
HWY 14 WEST, RANCHESTER, WY 82839
PH 307-655-9565 FAX 307-655-9528

CERTIFICATE OF COMPLIANCE

RANTEC Super Tack

Rantec Super Tack is a coarse granulation high viscosity blend formulated specifically for ease of mixing. The key performance properties are quick dispersion, through special additives, followed by very rapid hydration between 15 to 60 minutes after initial hydration.

Minimum product specifications ensured by Rantec are listed below.

Product Specifications		Analysis Method
Moisture	8.0-12%	B-M-2.01
Protein	5.8% Maximum	B-P-2.01
pH	5.2 to 6.5	C-P-2.01
Granulation		
Through 100 mesh	90% Minimum	B-M-1.03
Through 200 mesh	30% Maximum	
Through 325 mesh	20% Maximum	
Viscosity		
2 Hour	4800 cps Minimum	B-V-1.03B

Recommended Specification Language: A non-toxic, biodegradable organic tackifier such as Super Tack shall be used on this project at the minimum application rate shown on Table 1, below. Super Tack has a minimum water holding capacity of 6.5 times by weight of dry material. Such tackifier shall be a natural galactomannan based hydrocolloid treated with dispersant agents for easy field mixing. Super Tack shall be applied at 10 to 15 lb per 1000 gallons of water depending on machine capacity. When used as an overspray on straw, Super Tack shall be used at the rate of 40 lb in 1000 gallons per acre with the use of 150 to 300 lb of mulch as a marker.

Table 1 Use Levels

Slope:	Flat	4:1	3:1	2:1	1:1
Lb/Acre	40	45	50	60	70

Smeltertown Superfund Site - Operable Unit No. 1
Salida, Colorado

Revegetation Material Inventory	Year: 2003
Project: Smeltertown Superfund Site - Operable Unit No. 1	Product/Manufacturer: Consolidation and Surrounding Areas Revegetation/See Below for Product and Manufacturer
Project No.: 1050	Location: Salida, Colorado

Delivery Date	Description		Manufacturer or Supplier	Q.C. DOCS		Pass/Fail	Date Placed
	Product Type	Total		Date Received	Date Checked		
9/16/03	10 bags (2.83 lbs. (bulk)/bag) Revised Seed Mix	28.3 lbs. (bulk)	Granite Seed	9/16/03	9/16/03	Pass	9/16/03 - 9/17/03
9/16/03	1 bag (1.37 lbs. (bulk)/bag) Revised Seed Mix	1.37 lbs. (bulk)	Granite Seed	9/16/03	9/16/03	Pass	9/16/03 - 9/17/03
9/16/03	8 bags (50 lbs./bag) 46-0-0 Urea Fertilizer	400 lbs.	American Pride Co-op	9/12/03	9/12/03	Pass	9/16/03 - 9/17/03
9/16/03	28 bags (50 lbs./bag) 18-46-0 Diamonium Phosphate Fertilizer	1,400 lbs.	American Pride Co-op	9/12/03	9/12/03	Pass	9/16/03 - 9/17/03
9/16/03	14 bags (50 lbs./bag) 0-0-62 Potassium Chloride Fertilizer	700 lbs.	American Pride Co-op	9/12/03	9/12/03	Pass	9/16/03 - 9/17/03
9/16/03	Tackifier (40 lbs./acre)	400 lbs.	Rantec Corporation	9/12/03	9/12/03	Pass	9/16/03 - 9/17/03
9/16/03	400 bags (50 lbs./bag) Cellulose Fiber Hydromulch (2,000 lbs./acre)	20,000 lbs.	PROFILE Products, LLC	9/11/03	9/11/03	Pass	9/16/03 - 9/17/03

lbs. = pounds

EMG²