

**FINAL DRAFT  
CONSTRUCTION REPORT  
FOR THE  
TOSTON SMELTER RECLAMATION PROJECT  
TOSTON, MONTANA  
MT DEQ CONTRACT NO. 409001**

Prepared for:

**Montana Department of Environmental Quality  
Mine Waste Cleanup Bureau  
P.O. Box 200901  
Helena, Montana 59620-0901**

Prepared by:

Tetra Tech EMI Inc.  
7 West 6th Avenue, Suite 612  
Helena, Montana 59601

(406) 442-5588

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## ACRONYMS AND ABBREVIATIONS

CY	Cubic Yards
DEQ	Department of Environmental Quality
EEE/CA	Expanded Engineering Evaluation and Cost Analysis
GCL	Geosynthetic Clay Liner
GDF	Geocomposite Drainage Fabric
mg/kg	Milligrams per kilogram
MWCB	Mine Waste Cleanup Bureau
NCP	National Contingency Plan
ppm	Part per million
RI	Reclamation Investigation
TtEMI	Tetra Tech EM Inc.

## 1.0 INTRODUCTION

Tetra Tech EM Inc. (TtEMI) received task orders No. 31 and No. 42 from the Montana Department of Environmental Quality (DEQ)/Mine Waste Cleanup Bureau (MWCB) to provide construction supervision and construction report preparation for the reclamation construction activities at the Toston Smelter site. This construction report includes documentation of reclamation activities implemented during the Toston Smelter Reclamation Project.

### 1.1 PROJECT DESCRIPTION

The Toston Smelter is an abandoned smelter site previously listed second on the Montana DEQ/MWCB Priority Site List. The Toston Smelter site is approximately 7.5 acres containing several old foundations, smelter waste, and smelter slag that were deposited in the Missouri River and on its banks. In 2008 all reclamation and construction activities were completed except for vegetation and fencing, which were completed in 2009.

Final reclamation construction activities consisted of the following work:

- Construction of haul roads from the smelter site to the repository site.
- Excavation of the repository site and stockpiling of cover soil.
- Excavating 32,662 cubic yards of smelter waste and contaminated stream channel sediment, and transporting it to the repository for disposal. Excavation and placement of smelter waste and stream channel sediment was bid as two separate bid items (No. 9 and No. 10). However, during construction substantially more stream channel sediment was removed than was anticipated. It would have been extremely difficult to quantify the additional sediment that was removed based on a survey of the stream channel excavation. As the two bid items were bid at the same cost, it was decided to pay for the additional stream channel sediment under the smelter waste bid item with the quantity based on an in-place survey of the repository.
- Placing fill and cover soil and grading the smelter site.
- Reconstructing the river bank.
- Construction of the repository multi-layer cap, including installation of geosynthetic clay layer (GCL), geocomposite drainage fabric (GDF), and a 24-inch thick layer of cover soil.
- Fertilizing, seeding and mulching approximately 9.8 acres of disturbance.
- Building a perimeter fence at the repository site.

## **1.2 PROJECT LOCATION**

The Toston Smelter site is located one mile south of the town of Toston, Montana, in Section 26, Township 5 North, Range 2 East, Montana principle meridian. The project area is dominated by the Missouri River on the west side, the Burlington Northern railroad on the east side and the Big Spring Ditch which cuts through the center of the smelter site. The Toston Smelter site is at 3,934 feet above mean sea level on the east bank of the Missouri River.

## **1.3 PROJECT HISTORY AND CONTAMINATION**

In the early 1880s large amounts of silver-gold ore were stockpiled at mines in the Radersburg Mining District because the ore was unsuitable for the wet-process mills in the area. In June 1885 William L. Austin constructed the Toston Smelter for experimental purposes to determine if the matting process was applicable to the silver-gold ores in Montana. In 1886 the original sandstone blast furnace was replaced with a Herreshoff cast iron, water-jacketed blast furnace. The smelter used locally obtained coal, limestone, and pyrite to fuel the smelter and flux the ores. The smelter produced matte that was shipped off site for refining, and slag that was disposed of on the banks of and in the Missouri River. At peak production in 1888, the smelter worked around the clock reducing 100 tons of ore into one 20-ton carload of matte. By the end of 1888, the smelter ceased operation. The smelter was in existence until 1899. After 1899, the smelter was dismantled and the rail spur tracks were removed (TtEMI 1998).

In 1998 the DEQ/MWCB completed a Reclamation Investigation (RI) of the site. Samples of surface water from the Missouri River upstream and downstream of the site and groundwater from the three wells closest to the site were collected in April 1998. The samples were analyzed for metals and water quality parameters. In 1995 the arsenic concentration in samples from the Helm domestic well and the Missouri River exceeded the WQB-7 human health water quality standard for arsenic (18 micrograms per liter [ $\mu\text{g/L}$ ]). The grab sample from the squatter's well exceeded the WQB-7 human health water quality standards for iron (300  $\mu\text{g/L}$ ) and manganese (50  $\mu\text{g/L}$ ). The samples from the hand dug Helm well and the Missouri River downstream from the site exceeded the WQB-7 human health water quality standards for mercury (0.14  $\mu\text{g/L}$ ). However, the mercury results from all the samples indicate that the exceedances were likely due to analytical variability and that the results from all the samples were near the human health standard (0.14  $\mu\text{g/L}$ )(MDEQ 1995).

An Expanded Engineering Evaluation and Cost Analysis (EEE/CA) was completed based on the information developed during the RI. Evaluation of the laboratory results and the human health and ecological risk assessments presented in the original EEE/CA (Tetra Tech 1999) suggests that the primary contaminants of concern for site characterization at the Toston Smelter site are arsenic, copper, lead, and zinc. Peak concentrations of these metals within the samples are as follows:

- Arsenic: 16,700 mg/kg
- Copper: 833 mg/kg
- Lead: 130,000 mg/kg
- Zinc: 5,430 mg/kg in the slag

Additional soil samples were taken to further define the extent of contamination at the Toston Smelter site and are described in Addendum No. 1 to the EEE/CA (Tetra Tech 2008). The results of this sampling were similar to that noted above.

#### **1.4 PROJECT OBJECTIVES**

The primary objective of the Toston Smelter Reclamation Project was to protect human health and the environment in accordance with DEQ Recreational Cleanup Goal Levels. Specifically, the reclamation action selected was implemented to limit human and environmental exposure to the contaminants of concern, and reduce the mobility of those contaminants to prevent impacts to the Missouri River.

## **2.0 RESPONSIBLE PARTIES**

The following sections provide an outline of responsible parties for the Toston Smelter Reclamation Project, including state coordinators and private contractors.

### **2.1 DEQ/MWCB COORDINATION**

The DEQ/MWCB Project Manager for the Toston Smelter Reclamation Project was Devin Clary. Her address, phone and fax numbers are:

DEQ/MWCB  
P.O. Box 200901  
Helena, Montana 59620-0901  
Phone: (406) 841-5029  
Fax: (406) 841-5024

### **2.2 RECLAMATION AND ENGINEERING PLAN**

TtEMI was responsible for the engineering design and preparation of the reclamation specifications. The Project Manager/Engineer was Gary Sturm, P.E. TtEMI's address, phone and fax numbers are:

Tetra Tech EMI Inc.  
7 West 6th Avenue  
Suite 612, Power Block Building  
Helena, Montana 59601  
Phone: (406) 442-5588  
Fax: (406)442-7182

### **2.3 CONSTRUCTION MONITORING**

TtEMI performed the construction monitoring for this project. Gary Sturm, P.E. of TtEMI was the construction project engineer. Colin McCoy of TtEMI was the Resident Project Representative (RPR) who provided full-time construction oversight. DJ&A PC (DJA) of Missoula, Montana conducted surveys for volume measurements. Pioneer Technical Services of Helena, Montana completed compaction testing on waste placed in the repository.

## **2.4 CONTRACTOR**

The successful low bidder for the construction project was Trapper Peak Construction, Inc., of Willow Creek, Montana. The on-site superintendents for the 2008 and 2009 construction seasons were Riley Malone and Brian Larsen. The contractor's address, phone and fax numbers are:

Trapper Peak Construction, Inc.  
306 Broadway  
Willow Creek, MT 59760  
Phone: (406) 285-6609  
Fax: (406) 285-4614

## **3.0 RECLAMATION CONSTRUCTION EVENTS**

The following sections present the notable events and contract dates for the Toston Smelter Reclamation Project.

### **3.1 PRE-BID CONFERENCE**

The Toston Smelter Reclamation Project pre-bid conference was held at the site on July 22, 2008. The purpose of the pre-bid conference was to familiarize prospective bidders with the various locations and aspects of the work and to allow prospective bidders to ask questions concerning the project.

DEQ/MWCB personnel, TtEMI personnel, potential prime contractors, potential subcontractors, and potential material vendors and suppliers attended the conference.

### **3.2 BID OPENING**

Bids were opened by DEQ/MWCB at their office, 1100 North Last Chance Gulch in Helena, Montana on August 6, 2008. Nine qualified bids were received. The bids ranged from \$385,941.00 to \$980,468.34 compared to the Engineer's estimate of \$620,240.00. The bid tabulations are included in Appendix A.

### **3.3 CONTRACT AWARD**

A notice of award was issued to the low bidder, Trapper Peak Construction, Inc., on August 29, 2008.

### **3.4 CONTRACT AGREEMENT**

Trapper Peak Construction executed a contract agreement on September 18, 2008, under DEQ Contract No. 409001. DEQ/MWCB issued the Notice to Proceed to the contractor on September 18, 2008, for immediate start-up. The agreement stated that the contractor was to complete all specified work within 90 calendar days. However, work was not finished within 90 days and a change order was approved extending the time period by 38 days.

### **3.5 CONSTRUCTION START-UP**

A pre-construction meeting was held on September 8, 2008, at the Montana Department of Environmental Quality, Last Chance Gulch administration building. The purpose of the 2008 pre-construction meeting was to establish a working understanding among the parties as to the work, the requirements of the contract documents, schedules, and procedures for handling shop drawings and other submittals, processing applications for payment, and maintaining required records.

Meeting attendees were:

Devin Clary, DEQ  
Gary Sturm, P.E., TtEMI  
Colin McCoy, TtEMI  
Riley Malone, Trapper Peak Construction Owner  
Sheila Malone, Trapper Peak Construction

The pre-construction meeting minutes are in Appendix B. The contractor began mobilizing to the site on September 18, 2008.

### **3.6 CHANGE ORDERS AND WORK DIRECTIVES**

Six change orders and two work directives were written for the Toston Smelter Reclamation Project. Copies of the change orders and related documentation are in Appendix C.

Work Directive No. 1 was issued on October 31, 2008. It directed the Contractor to use on-site, pit-run gravel in lieu of the specified bank protection riprap. This directive was issued to increase safety, and reduce traffic and environmental impacts associated with the import of off site stone.

Work Directive No. 2, issued on December 30, 2008, directed the Contractor to modify the location and construction of the diversion ditches at the repository site. This directive was issued to provide better run-on control at the site.

Change Order No. 1, executed on November 12, 2008, compensated the contractor for extra effort required to excavate slag along the river edge, and increased the contract cost by \$20,000 and extended the contract date by ten calendar days.

Change Order No. 2, executed on December 4, 2008, changed the contract to include the placement of five root wads along the river bank, and placement and compaction of approximately 2000 cubic yards of additional fill along the west side of Big Spring Ditch. This change order increased the contract cost by \$13,000 and extended the contract date by five calendar days.

Change Order No. 3, executed on December 29, 2008, compensated the contractor for placing eighteen large rocks in the floodplain to reduce potential vehicle damage. This change order increased the contract cost by \$900 and extended the contract date by 15 calendar days.

Change Order No. 4, executed on January 11, 2009, was added to replace a well that was destroyed along the river bank and reconcile water usage. It increased the contract cost by \$35,100.

Change Order No. 5, executed on January 23, 2009, reconciled contract pay quantities to reflect the actual quantities of work completed on each pay item. It was added to reflect the amount of waste placed in the repository and the amount of cap base placed on the repository. Quantities were determined based on a survey conducted by DJ&A. This change order increased the contract cost by \$167,906.94 and extended the contract date by eight calendar days.

Change Order No. 6, executed on May 15, 2009, was added to reflect the actual amount of fencing constructed at the repository site. It increased the contract cost by \$945.

The six change orders for this project totaled \$237,641.94. This was an increase of 61.6 percent over the original contract price.

### **3.7 WEATHER DAYS AND WORK SUSPENSIONS**

There were several weather days and work suspensions during construction in 2008. Weather days were issued for days on which work could not be conducted due to adverse site conditions. A list of weather days are below:

- Work was halted on November 21, 2008, due to snow at the site.
- Work was halted on December 15-17, 2008, due to snow and freezing temperatures at the site.
- Work was halted on December 30, 2008, due to freezing temperatures.
- Work was halted on January 2, 2008, due to freezing temperatures.

A winter work suspension was issued for the period of January 16, 2009 to April 1, 2009. A second Notice to Proceed dated March 29, 2009 was issued to Trapper Peak Construction, Inc instructing the Contractor to resume work no later than April 1, 2009. Trapper Peak Construction, Inc was instructed to complete the work by 5:00 pm on April 6, 2009.

In addition to the weather days, work was stopped at the Contractor's discretion on the following holidays:

- Work was halted on November 27, 2008, at the discretion of the contractor for the Thanksgiving holiday.
- Work was halted December 22-25, 2008, due to cold weather and at the discretion of the contractor, the Christmas holiday.
- Work was halted on January 1, 2009, at the discretion of the contractor for the New Years holiday.

### **3.8 REQUESTS FOR PAYMENT**

Trapper Peak made five requests for payment during the project. Copies of these payment requests are in Appendix D.

Payment Request No. 1 was for the period September 18 through September 26, 2008. The total amount paid, including 1% State withholding, less retainage was \$34,102.50. Payment Request No. 1 was approved November 6, 2008.

Payment Request No. 2 was for the period September 27 through October 31, 2008. The total amount paid, including 1% State withholding, less retainage was \$152,428.45. Payment Request No. 2 was approved December 9, 2008.

Payment Request No. 3 was for the period November 1 through December 31, 2008. The total amount paid, including 1% State withholding, less retainage, was \$222,234.45. Payment Request No. 3 was approved January 16, 2009.

Payment Request No. 4 was for the period January 1 through January 16, 2009. The total amount paid, including 1% State withholding, less retainage, was \$166,711.64. Payment Request No. 4 was approved March 2, 2009.

Payment Request No. 5 was for the period January 16, 2009 through May 14, 2009. The total amount paid, including 1% State withholding and retainage, was \$48,315.90. Payment Request No. 5 was approved June 10, 2009.

### **3.9 SUBSTANTIAL COMPLETION**

Trapper Peak reached Substantial Completion on January 22, 2009. Gary Sturm (TtEMI), Devin Clary (DEQ/MWCB), and Riley Malone (Trapper Peak Construction, Inc) conducted a site inspection on January 16, 2009. One outstanding item (Bid Item #27) was noted during the site inspection and a punch list was provided to Trapper Peak Construction, Inc. A copy of the Certificate of Substantial Completion is provided in Appendix E.

### **3.10 CLOSEOUT DOCUMENTATION**

Trapper Peak Construction, Inc completed the outstanding work item on April 3, 2009. A final site inspection was conducted on April 22, 2009. Attendees at the final site inspection included:

- Devin Clary, DEQ/MWCB
- Gary Sturm, TtEMI
- Colin McCoy, TtEMI
- Riley Malone, Trapper Peak Construction, Inc
- Tom Helm, Landowner

Construction closeout forms were fully executed on or before May 15, 2009. In addition to Change Order No. 6 and the Final Payment Request, the following forms were executed:

- Certificate of Completion
- Affidavit on Behalf of Contractor
- Consent of Surety Company to Final Payment
- Certificate of Acceptance

Copies of these executed forms are in Appendices D and E.

### **3.11 FINAL PAYMENT**

The final payment of \$48,315.90 to Trapper Peak was approved by John Koerth of DEQ/MWCB on June 10, 2009.

## 4.0 CONSTRUCTION

The following section summarizes construction activities and describes the project plan, major equipment, and construction activities.

### 4.1 DESCRIPTION OF THE PROJECT PLAN

Final reclamation construction activities consisted of the following work:

- Excavation of the repository base.
- Excavating 32,662 cubic yards of smelter waste and contaminated stream channel sediment and transporting them to the repository for disposal.
- Reconstructing 680 feet of river bank, including placing root wads.
- Applying cover soil, grading, and contouring the disturbed areas.
- Installing the GCL and GDF, and placing 24 inches of cover soil on the repository.
- Reconstructing the gravel access road along the irrigation ditch.
- Installing the well destroyed during excavation.
- Applying erosion control matting to the river bank.
- Constructing rock-lined diversion ditches around the repository for erosion control.
- Applying fertilizer, seed, and mulch, and vegetating approximately 9.8 acres of disturbed land.
- Constructing 1,550 linear feet of fence.

### 4.2 MAJOR EQUIPMENT LIST

An abbreviated list of equipment used on the Toston Smelter Reclamation Project is presented in Table 1.

**TABLE 1  
MAJOR EQUIPMENT LIST  
TOSTON SMELTER RECLAMATION PROJECT**

<b>Description</b>	<b>Number</b>	<b>Description</b>	<b>Number</b>
CAT D8R Dozer	1	CAT D5H Dozer	1
CAT 930 Loader	1	Water Truck	1
CAT 725 Hauler	1	Komatsu 300 Hauler	2
CAT 330C Excavator	1	CAT 320 Excavator	1
Fuel Truck	1	Kenworth Dump Truck	1
CAT 637 Scraper	1	Bobcat	1

### 4.3 CONSTRUCTION ACTIVITIES

Copies of the on-site inspector's daily logs, daily reports, and meeting notes are in Appendix F. These daily logs detail site conditions and reclamation activities during construction. Compaction test results are in Appendix H. Weekly summaries of construction and oversight activities are provided below.

**September 15-19, 2008:** The contractor mobilized equipment to the site on September 18-19. Repository boundaries were staked by contractor's surveyor (Pioneer).

**September 22-26, 2008:** The repository base was excavated with an excavator and CAT D8R. Top soil and cover soil were stockpiled near the repository. Haul roads were improved by the contractor using pit run excavated near the site with an excavator. The railroad crossing was improved by Burlington Northern Santa Fe Railway.

**September 29 to October 3, 2008:** Smelter waste was excavated and hauled to the repository and graded in one foot lifts with a CAT D5H and CAT D8R. Contaminated silt was stockpiled next to the repository to use as a cushion layer beneath the liner. Pioneer Technical Services performed compaction testing at the repository.

**October 6-10, 2008:** Smelter waste was excavated and hauled to the repository and graded in one foot lifts with a CAT D5H.

**October 13-17, 2008:** Smelter waste was excavated and hauled to the repository and graded in one foot lifts with a CAT D5H.

**October 20-24, 2008:** Smelter waste and contaminated river sediments were excavated and hauled to the repository and graded in one foot lifts with a CAT D8R. Pioneer Technical Services performed compaction testing at the repository.

**October 27-31, 2008:** Contaminated river sediments were excavated and hauled to the repository. The river bank and floodplain were graded, and riprap was placed on the river bank using an excavator.

**November 3-7, 2008:** Waste was excavated and hauled to the repository. The river bank was reconstructed. Root wads were placed in the river bank. Cover soil was placed on excavated areas, and the repository was graded.

**November 10-14, 2008:** The stockpiled cushion layer was placed on the repository. Cover soil was placed on excavated areas using a scraper. Final grading and compaction of the repository was completed. Rocks and other sharp objects were removed from the repository surface. The contractor began installing GCL and GDF, and began applying cover soil to the repository with haul trucks and an excavator.

**November 17-22, 2008:** Installation of GCL and GDF, and cover soil application to the repository continued. Gravel was placed on the reconstructed access road. November 21 was a weather day. Work was performed at the site on Saturday, November 22.

**November 24-28, 2008:** Installation of GCL and GDF and cover soil application to the repository continued. November 27 and 28 were not worked due to the Thanksgiving holiday.

**December 1-5, 2008:** Installation of GCL and GDF at the repository continued. Cover soil application to the repository continued. Several tears in the liner were patched.

**December 8-12, 2008:** Installation of the GCL and GDF was finished. There was continued placement of cover soil on the repository. Erosion control matting was installed along the river bank. Final grading and seeding of the excavated areas were completed. The irrigation well removed in the excavation area during excavation was installed.

**December 15-19, 2008:** Cover soil continued to be placed on the repository. December 18 was the only day worked.

**December 22-26, 2008:** Cover soil continued to be placed on the repository. December 26 was the only day work was performed due to weather and the Christmas holiday.

**December 27, 2008 to January 2, 2009:** Cover soil placement on the repository was completed. The repository surface was seeded and straw mulch was applied by the contractor and landowner and crimped using a CAT D5H. The contractor's surveyor performed a final survey.

**January 5-9, 2009:** Straw mulch was placed on the disturbed areas by the landowner and contractor. The haul road to the repository was reclaimed using a grader. The final survey was performed by DJ&A. The final inspection was performed by DEQ, Tetra Tech, and the Contractor.

**January 12-16, 2009:** Substantial completion was issued for the site on January 22. A Temporary Suspension of work was issued on January 16 halting work until April 1.

**March 16-20, 2009:** The contractor began building perimeter fence at the repository, outside of the contract dates.

**March 30 to April 3, 2009:** The second notice to proceed was issued on March 29, 2009. The contractor completed fencing the repository.

**April 21-24, 2009:** The Montana Conservation Corps planted trees on the Smelter site. The final inspection was done April 22.

#### **4.4 QUANTITIES USED**

Work items were bid on a lump sum, actual quantity, and unit price basis. Table 2 lists each bid item, the bid item unit price, the estimated quantity, the actual quantity, and the units of measurement. Actual quantities were verified by construction oversight personnel after the final survey was performed by DJ&A. This included verification of unit lengths and areas.

## **5.0 PROJECT COSTS**

### **5.1 PAY REQUESTS**

Five pay requests were processed for the construction of the Toston Smelter Reclamation Project. A summary of construction costs and copies of signed pay request forms are in Appendix D.

### **5.2 TOTAL PROJECT COSTS**

The cost for completing the Reclamation Investigation and the original EECA in 1999 was \$38,538.10. In 2000, a bid package was prepared for \$24,942.34; however, the project was not bid. An Expanded Engineering Evaluation and Cost Analysis Addendum, Reclamation Design and Bid Package Preparation were completed in 2008 at a cost of \$59,300.27. The cost for engineering services and construction administration totaled \$93,131.93. Total Engineering costs for the project were \$215,912. The Contractor's original bid was \$385,941, with six change orders that increased the cost by \$237,851.94. The total project construction cost for the Toston Smelter Reclamation Project was \$623,792.94. The cost of the entire project was \$839,705.

An analysis of the site characterization, and engineering and construction costs for the project is in Table 2.

**TABLE 2**

**QUANTITIES SUMMARY  
TOSTON SMELTER RECLAMATION PROJECT  
BROADWATER COUNTY, MONTANA**

Description	Bid Item	Unit	Unit Price	Estimated Quantity	Actual Quantity	Actual Quantity as a Percentage of Bid Quantity	Cost of Actual Quantity
Mobilization, Demobilization, Bonding, and Insurance	1	LS	20,000.00	1	1	100%	\$20,000.00
Provide Water	2	KGAL	20.00	1,000	2,680	268%	\$53,600.00
Silt Fence	3	LF	2.50	100	0	0%	\$0.00
Silt Barrier	4	LF	2.00	250	250	100%	\$500.00
Construct Road Improvements	5	LS	5,000.00	1	1	100%	\$5,000.00
Clearing and Grubbing	6	LS	7,000.00	1	1	100%	\$7,000.00
Repository Excavation and Embankment	7	CY	2.00	4,800	6,003	125%	\$12,006.00
Prepare Repository Sub grade	8	SY	1.25	6,900	6,900	100%	\$8,625.00
Excavate, Haul, Place and Compact Smelter Waste in Repository	9	CY	6.25	13,000	31,162	240%	\$201,012.50
Excavate, Haul, Place and Compact Contaminated Sediment in Repository	10	CY	6.25	500	500	100%	\$3,125.00
Smelter Brick Separation and On-Site Handling	11	TON	140.00	5	0	0%	\$0.00
Prepare Repository Cap Base	12	SY	1.00	7,100	8,100	114%	\$8,100.00
Install Repository Cap GCL Layer	13	SY	6.46	8,300	9,472	114%	\$61,189.12
Install Repository Cap Geocomposite Drainage Layer	14	SY	6.31	8,300	9,472	114%	\$59,768.32
Place Repository Cover Soil	15	CY	2.00	4,800	7,141	149%	\$14,282.00
Construct Repository Run-on Ditches	16	LF	6.00	530	530	100%	\$3,180.00
Fertilize and Seed Repository	17	AC	900.00	2	2.3	115%	\$2,070.00
Straw Mulch Repository	18	AC	900.00	2	2.3	115%	\$2,070.00
Grade Smelter Site	19	AC	1,200.00	5	7.5	150%	\$9,000.00
Place River Channel Gravel	20	CY	40.00	500	500	100%	\$20,000.00
Construct River Bank and Floodplain	21	LF	10.00	680	680	100%	\$6,800.00
Place Smelter Site Cover Soil	22	CY	2.00	7,500	14,520	194%	\$29,040.00
Reconstruct Gravel Road	23	LF	30.00	1,000	1,125	113%	\$33,750.00
Fertilize and Seed Smelter Site	24	AC	900.00	5	7.5	150%	\$6,750.00
Straw Mulch Smelter Site	25	AC	900.00	5	7.5	150%	\$6,750.00

**TABLE 2**  
**(Continued)**  
**QUANTITIES SUMMARY**  
**TOSTON SMELTER RECLAMATION PROJECT**  
**BROADWATER COUNTY, MONTANA**

Description	Bid Item	Unit	Unit Price	Estimated Quantity	Actual Quantity	Actual Quantity as a Percentage of Bid Quantity	Cost of Actual Quantity
Fertilize and Seed River Bank and Floodplain	26	AC	900.00	0.1	0	0%	\$90.00
Four-Wire Farm Fence	27	LF	4.50	1,340	1,550	116%	\$6,975.00
Obliterate and Reclaim Temporary Roads	28	LS	7,500.00	1	1	100%	\$7,500.00
Excavation of in river and near bank slag	CO 1-1	HR	250.00	0	80	NA	\$20,000.00
Placement of root wad	CO 2-1	Each	600.00	0	5	NA	\$3,000.00
Placement of ditch side backfill	CO 2-2	Each	5.00	0	2,000	NA	\$10,000.00
Placement of large rocks on floodplain	CO 3-1	Each	50.00	0	18	NA	\$900.00
Replacement of destroyed riverside well.	CO 4-1	Each	1,500.00	0	1	NA	\$1,500.00
Increase Smelter Site Seed Mix	CO 5-16	LB	6.00	35	70	200%	\$210.00
<b>Total Change Order Costs</b>							<b>\$237,851.94</b>
<b>Total Construction Costs</b>							<b>\$385,941.00</b>
<b>Total Construction Costs</b>							<b>\$623,792.94</b>

Notes:

AC            Acres  
CY            Cubic yards  
EA            Each  
KGAL        Thousand gallons  
LF            Linear feet  
LS            Lump sum  
SY            Square yard  
TON         Ton  
HR           Hour

**TABLE 3**

**ANALYSIS OF INVESTIGATION AND ENGINEERING COSTS INCURRED  
TOSTON SMELTER RECLAMATION PROJECT  
BROADWATER COUNTY, MONTANA**

<b>INVESTIGATION AND ENGINEERING SERVICES</b>	<b>AMOUNT</b>	<b>PERCENTAGE OF TOTAL CONSTRUCTION COSTS</b>
RI and EEE/CA (1998)	\$38,538	6.2%
Bid Package (2000)	\$24,942	4.0%
EEE/CA Addendum, Design Engineering and Bid Specification Preparation (2008)	\$59,300	9.5%
Engineering Services and Construction Administration (2008-2009)	\$93,132	14.9%
<b>Total Engineering Costs</b>	<b>\$215,912</b>	<b>34.6%</b>
<b>CONSTRUCTION SERVICES</b>	<b>AMOUNT</b>	<b>PERCENTAGE OF TOTAL CONSTRUCTION COSTS</b>
Trapper Peak Construction, Inc., Contract	\$385,941	61.9%
Change Orders	\$237,852	28.3%
<b>Total Construction Costs</b>	<b>\$623,793</b>	
<b>Total Project Costs</b>	<b>\$839,705</b>	

## **6.0 PROJECT SUMMARY**

Construction for the Toston Smelter Reclamation Project began on September 18, 2008 and was shut down for the winter on January 22, 2009 when substantial completion was issued. Work began again on April 1, 2009 and was certified complete by the final inspection on April 22, 2009. The project included removing 32,662 cubic yards of smelter waste and contaminated sediment from the Toston Smelter Site on the bank of the Missouri River and placing the waste in an unlined, capped repository. The successful bidder for the contract was Trapper Peak Construction, Inc. of Willow Creek, Montana. The original contract bid was \$385,941. It was completed with two work directives and six change orders, which resulted in a change in the total construction cost of \$237,852. Total construction costs were \$623,793. Total engineering costs were \$215,912. The total project cost for the project was \$839,705. The Toston Smelter site addressed by this action has been reclaimed according to the contract design and specifications. Exposure hazards associated with this site have been mitigated to the extent feasible. Project completion forms are in Appendix E.

### **6.1 SITE MAINTENANCE**

Seeding and mulching of the site was completed in January 2009. The site will be checked by DEQ/MWCB periodically, according to a schedule to be set by the DEQ/MWCB. Reclaimed areas are susceptible to erosion prior to the establishment of vegetation, and should be monitored for signs of soil movement, sloughing, and channeling. Any areas exhibiting signs of erosion, prior to the establishment of vegetation, should be repaired. These repairs would likely include the replacement of cover soil, reseeding, and the application of straw mulch. Areas where vegetation is not vigorous may be reseeded and mulched. Construction of additional straw bale barriers may be helpful to limit erosion in susceptible areas.

### **6.2 DRAWINGS AND PHOTO LOG**

As-constructed drawings are in Appendix G. A photographic log of the construction activities is in Appendix I.

## REFERENCES

- Tetra Tech EM Inc. (TtEMI). *Reclamation Investigation Report for the Toston Smelter Site*. Prepared for the Mine Waste Cleanup Bureau, Montana Department of Environmental Quality. November 1998.
- Tetra Tech EM Inc. (TtEMI). *Expanded Engineering Evaluation/and Cost Analysis for the Toston Smelter Site*. 1999.
- Tetra Tech EM Inc. (TtEMI). *Addendum No. 1 to the Expanded Engineering Evaluation/Cost Analysis for the Toston Smelter Site*. June 2008.

**APPENDIX A**  
**BID TABULATIONS**

**APPENDIX B**

**2008 PRE-CONSTRUCTION MEETING MINUTES**

**APPENDIX C**  
**CHANGE ORDERS AND WORK DIRECTIVES**

**APPENDIX D**  
**PAYMENT REQUEST FORMS**

**APPENDIX E**  
**PROJECT COMPLETION FORMS**

**APPENDIX F**  
**DAILY CONSTRUCTION REPORTS**

**APPENDIX G**  
**AS-CONSTRUCTED DRAWINGS**

**APPENDIX H**  
**REPOSITORY COMPACTION REPORTS**

**APPENDIX I**  
**CONSTRUCTION PROGRESS PHOTOGRAPHS AND LOG**