CONSTRUCTION REPORT
SELECTIVE SOURCE RESPONSE ACTION
CONTRACT 50-0398-1-11003
2001-2002
NEW WORLD MINING DISTRICT
RESPONSE AND RESTORATION PROJECT

USDA Forest Service
Gallatin National Forest
Bozeman, Montana

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FINAL CONSTRUCTION REPORT

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INTRODUCTION

This contract was the first major action for the New World Mining District Response and Restoration Project (NWMR&R). The New World Mining District is an area near Cooke City, Montana, impacted by historical mining activities. The NWMR&R Project is a non-time critical CERCLA removal action with the goal of achieving the highest and best water quality practicably attainable within the district. The first major action within the district was analyzed and proposed with the Selective Source Response Action Engineering Evaluation/Cost Analysis (EE/CA) issued in January 2001. The EE/CA proposed removing seven selected mine waste rock dumps and tailings in and near streams throughout the district and placing the waste rock in a lined repository. This contract implements the selected alternative from the EE/CA and the resulting Action Memorandum.

The objectives of this contract were to remove scattered mine waste dumps and deposit them in a central repository. Major work components of this contract included:

- Construction of a lined mine waste rock repository
- Removal of seven mine waste dumps and tailings to the repository
- Restoration of the mine waste dump and tailings sites
- Construction of the Upper Connect Road No. 3226 for future work
- Miscellaneous equipment work within the district

The USDA Forest Service (USDA-FS) issued a Request for Proposals (RFP) in November 2000 using negotiated contract procedures where the contract award is based on the best value to the government, not necessarily the low bid. The technical evaluation team evaluated contractor proposals in early December 2001 resulting in the identification of the most highly qualified firms. About this time, the Montana Department of Environment Quality (DEQ) advised the USDA-FS the selected site for the lined repository was not acceptable. The USDA-FS selected a site acceptable to DEQ and redesigned the repository included in the original RFP. The USDA-FS then entered into negotiations with the most highly qualified contractors for changes in the original contractor proposals and increased costs caused by the changed repository location. The final contract was awarded in April 2001 based on a best value determination at a price $310,000 over the initial contractor proposal. The increase in price was due solely to the relocation of the repository.

CONTRACT DATA

CONTRACT NAME: Selective Source Response Action, New World Mine Reclamation Phase I
CONTRACT NUMBER: 50-0398-1-11003
CONTRACT AWARD DATE: April 2, 2001
CONTRACT CLOSURE: March 14, 2003
CONTRACTORS: 2001 IT Corporation, Centreville, VA
2002 Shaw Group, Overland, KS
ORIGINAL CONTRACT AMOUNT: $2,070,840.07
FINAL CONTRACT AMOUNT: $2,042,440.64
(Appendix A)
ORIGINAL CONTRACT TIME: 105 days
CONTRACT TIME USED: 452 days
DESIGNER: Maxim Technologies
CONTRACTING OFFICER: William M. Pfeifer
CONTRACTING OFFICER'S REPRESENTATIVE: Frank C. Ehernberger

REPORT ORGANIZATION

Overall contract performance and major problems are summarized below. Construction activities, problems encountered, and resolution for each project component are also described below. The initial and final contract quantities and costs are displayed in Appendix A. Contract modifications and changes are summarized in Appendix B. Work Orders are summarized in Appendix C. Digital photographs of contract activities are include as a viewable CD in Appendix E. Initial and final as-built drawings are contained in the final contract files. Digital files of the contract drawings are also held in the final contract files.

OVERALL PERFORMANCE AND MAJOR PROBLEMS

The IT Corporation approached the project in a professional and aggressive manner. Generally, the crews were well organized. Equipment was well maintained, there was a positive safety program, and the company maintained good community relations. After award of the contract, but before work started, the contractor notified the CO there was a mistake in their bid. The contractor offered to reduce its price for several pay items amounting to a contract price reduction of $41,673.00, which the government accepted (Modification #1).

Several major problems affected performance on the contract. The contractor fell behind schedule and was not able to complete the repository within the contract time. Consequently, the repository needed to be winterized and work carried over to the 2002 field season. There were several significant delays in the work:

- The quarry subcontractor failed to perform at the beginning of the project, requiring the prime contractor to assume the quarry work. This loss of time delayed repository completion by about 6 days.

- The liner subcontractor was about 5 days late arriving for the bottom liner installation in August.
- A rain event for nearly a week in September slowed operations because wet waste was placed in the repository when both the superintendent and Q/C manager were off site. When the Q/C manager returned, about 6 days were lost during the drying and reshaping process.
- The liner subcontractor was about 5 days late arriving for the top liner installation in early October.

A total of about 22 days were lost due to these causes. If these delays had not occurred, the project would have been completed by October 1, 2001. The contract time eventually over ran by 350%. At contract closure, the government assessed actual damages amounting to $73,578.95. These actual damages included additional contract administration and inspection costs, repository and sump monitoring, and sump water disposal when the contractor could not or did not perform.

In January, 2002, the IT Group, parent company of IT Corporation, filed for Chapter 11 bankruptcy. The Shaw Group assumed ownership of the IT Group. During this transition, the government had no individual or company to contact to determine the status and eventual outcome of the contract. In late May, 2002, the Shaw Group notified the government they were assuming the contract and would be completing the work. In the bankruptcy transition, management employees familiar with this contract were lost. Final 2001 records, surveys, and quantity measurements were lost. This caused problems with the determination of final quantities for final payment. Several pay items had to be estimated for final payment because the contractor measurements were lost. Construction progress surveys were also lost in the transition including the final subgrade and floor of the repository. The Shaw Group did aggressively proceed with the project and completed the work on August 31, 2002. The Shaw Group provided final as built surveys and drawings of the repository and dump removal sites. It then took about 6 months to negotiate and agree on final quantities, costs and damages to the government.

REPOSITORY CONSTRUCTION

The major components of the repository construction include development of the rock quarry, construction of a 12,000 cubic meters (m^3) shot rock toe buttress, subgrade shaping and compaction, installation of a 1 hectare (ha) bottom liner system with toe drains and sump, waste rock placement, placement of 5,700 square meters (m^2) temporary cover liner, installation of 3,000 m^2 permanent cover liner system, 6,600 m^3 cover soil, and miscellaneous fencing, roadways, and revegetation.

Quarry Development

Quarry development started on June 7, 2001, with a subcontractor designated to build the access road and quarry development. The subcontractor apparently lacked experience in similar work. In the first week of operation various pieces of equipment got stuck in the quarry area, the pioneer road to the quarry was destroyed due to muddy conditions, and the subcontractor took a short cut to the quarry across wetlands (Work Order (WO) D).

The contractor was required to rehabilitate the damaged wetlands by blending the equipment tracks and sprigging willows in the damaged area. The prime contractor dismissed the subcontractor on June 18 and assumed the work planned to be subcontracted.

Due to the damage the subcontractor caused to the quarry access road, the contractor was authorized to build a temporary access road for about 100 m. This access road was then reclaimed and revegetated when rock haul was completed.

Rock haul caused the Lulu Pass Road to break up on the one kilometer segment between the quarry and the repository. On June 30 to July 2, 2001, eight sections of road were sub excavated and stabilized with geotextile overlain with 600mm of shot rock (Modification 2).

Repository Buttress

Construction started June 15 with the clearing and grubbing of the area, and finishing of the buttress subgrade. Initial work was slowed due to 2 ft. of snow that fell on the site on June 13. The survey subcontractor, setting construction control with a GPS unit, initially staked the repository 7m south of the design location. The repository and buttress were re-staked at the design location before much earthwork had been completed.

The geotextile initially furnished to the project did not comply with the specified GT-1 geotextile. It was determined the geotextile furnished to the project (Type II-A) would suffice for the buttress/subgrade interface, but would not be suitable for use in the repository liner system. The contractor was authorized to use the Type II-A geotextile under the buttress (WO G).

The buttress construction proceeded to near completion on July 17, when the contractor's survey indicated the buttress was at design grade. The government performed a Q/A spot check survey, which revealed the buttress

subgrade and finish elevations were 1m to 1.5m high in the middle 60m of the buttress. There apparently had been an error in marking the construction control stakes in this area. After conferring with the designers, the contractor was given the option of removing the buttress rock, excavating the subgrade to the design elevations, and replacing the buttress; or leaving the buttress at the constructed grades and not including the buttress rock above design elevations in the final pay quantities for buttress rock. The contractor opted for the second option with the provision that the depth of the toe drain would be between 1m and 2m (designed for 1m) with a minimum grade toward the sump of 1% (WO J). The actual depth of the toe drain in the section averaged 1.4m. The contractor subsequently placed about 1700m^3 of rock for which there was no payment. This change in the buttress elevation increased the capacity of the repository by an estimated 10,000m^3.

Repository Subgrade

The repository subgrade excavation and finishing started June 24 after the first lifts of buttress rock were placed. The contractor opted to delay stripping and excavation of the subgrade so the buttress rock would serve as sediment control if there were a major rain event when the area was stripped bare. This was an efficient and wise method of controlling sediment on the site even though there were no significant storm events while the subgrade was exposed.

During the initial topsoil stripping and stockpiling operation it was determined the design stockpile site included a wetland in the lower end. Reducing the stockpile site to avoid the wetlands did not provide adequate room for stockpiling the topsoil and subgrade soil. The contractor was authorized a second stockpile site near the southwest corner of the repository (WO I).

The contract provided for payment of the topsoil and subgrade excavation as measured in stockpiles. This was not feasible because as the soil was being placed in stockpile it was also being removed for use at other locations such as culvert backfill, site roads, and waste dump site restoration. It became apparent early in the stockpiling operations there would only be about 5000m^3 in stockpile when subgrade excavation was completed, and the soil stockpiles were used for work on other sites. At least 7,000m^3 of soil in stockpile was needed for the cover soil of the repository. The government agreed with the contractor that additional cover soil needed for completion of the repository would be obtained by scalping the staging area northwest of the repository. It was also agreed the contractor would be due an increase in cover soil price due to the added costs of stripping and hauling from the staging area source. The stripping of cover soil occurred in 2002, after the Shaw Group assumed the contract. Despite several requests by the government to negotiate additional costs associated with the cover soil change, Shaw did not submit a request for a price adjustment as provided by the contract. There was not a cost adjustment for the change in cover soil source.

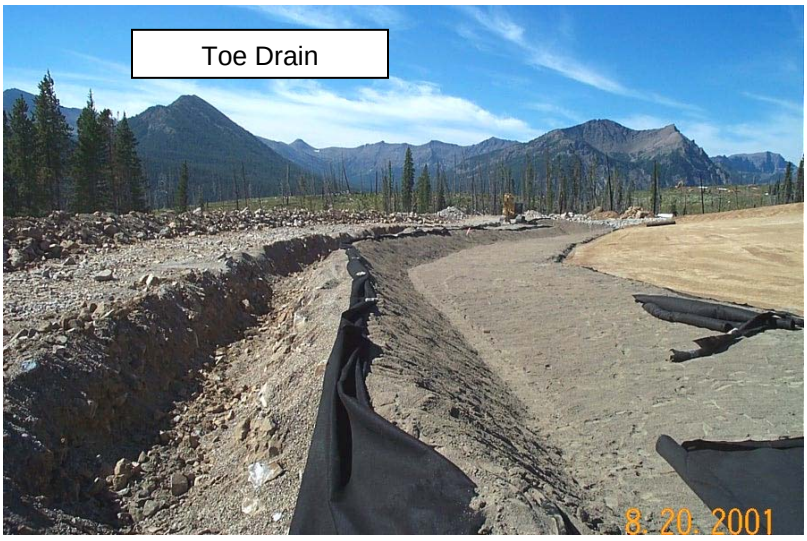
The rock outcrop identified on the drawings in the lower middle of the floor of the repository was somewhat larger and harder than anticipated. The contractor tried to rip the rock with a dozer for about 10 days, but eventually had to blast the rock. The repository subgrade was finished, compacted and ready for bottom liner deployment on August 14.

Drain rock was placed as designed on the uphill face of the buttress and extending out on the surface of the buttress to serve as a cushion for the bottom liner system. The contractor noted that because there was no geotextile separator between the rock buttress and drain rock, we could expect an over run on the drain rock quantity. An estimated 150 tons of drain rock was placed and paid for but infiltrated into the buttress rock.

Bottom Liner

The bottom liner deployment began August 18. The liner subcontractor apparently had other commitments and did not arrive on August 14 as planned. Liner system deployment proceeded as designed with all tests passing. The liner system was inspected by the subcontractor's Q/C technician, the contractor's Q/C manager, and a Maxim technician for the government. Destruct samples all passed without deviation. Weather was ideal during the liner deployment with the only problem being occasional wind gusts which tended to billow the liner during deployment and throw laborers about like rag dolls. The liner crew had to extensively sand bag the liner until it was anchored.

The contractor began to run out of the specified GT-1 geotextile used for various layers in the bottom liner system. The contractor and the government had noted that the GT-1 quantity was over running as the liner deployment had progressed. After consultation with the designers, the contractor was authorized to use Type II-A geotextile as the separator between the sand layers and the waste rock (WO L). Type II-A geotextile is readily available in the region while GT-1 sources are not in the region. The contractor was warned to keep his measurements of Type II-A separate from measurements of GT-1 for payment purposes.



The repository toe drain system and sump were constructed as designed with the only deviations in elevation being in the middle zone caused by the buttress elevation change. In this middle zone the toe drain depth (subgrade to buttress surface) increased from the designed 1m to 1.4m to 2m deep. Type 1 bottom liner system, with sand layer over drain rock, extends from the buttress to elevation 2557.5 on the floor. The bottom liner system deployment was completed August 23. Final drainage systems were completed on the floor of the repository August 24.

Although the contractor and subcontractor were observed measuring the bottom liner system quantities including GCL, HDPE, geocomposite, and geotextile, measurements were never provided to the government. This problem was discussed with the contractor in late October, 2001. The contractor indicated at that time they would provide the measurements and quantities. These records were apparently lost during the bankruptcy transition in the winter of 2002. Final payments were based on conservative best estimates by the COR. Most of the geosynthetics installed during the bottom liner deployment appeared to be over running original contract quantities to one degree or another during construction, but the contractor was not compensated for these over runs due to a lack of records.

Waste Rock Placement

Waste rock placement in the repository began August 24. The contractor had earlier requested to stockpile mine waste rock at the repository staging area while the bottom liner system was being deployed. This was authorized with the provision that the stockpiled waste rock was covered to prevent dust from blowing from the stockpile and prevent rain from saturating the waste stockpile (WO I).

Screened soil from the soil stockpile was placed as operations cover over the Type 1 bottom liner. The contractor was authorized to use select mine waste, primarily sands from upper Rommel Tailings, as operations cover over the Type 2 bottom liner.

On August 26, the contractor was advised to be ready to deploy the specified construction cover in the event storms were forecast. The contractor had submitted samples of the construction liner, which were subsequently approved earlier in the project. The superintendent said they did not have the construction cover material on site, but they would protect the waste as it was being placed in the repository.

Waste rock placement began by drifting the waste rock from the stockpile towards the toe of the repository, mixing the waste rock with slimes being hauled concurrently from Rommel, and compacting the material in horizontal lifts. Grade stakes were deployed to assure a minimum cover of 1m over the liner during the dozing and hauling operation. Compaction testing was kept current.

All went well until September 6 when both the superintendent and the Q/C manager left the project for Colorado, leaving an acting superintendent and an acting Q/C manager. On September 6 the first of several rain events occurred that slowed waste haul and placement operations. The contractor shutdown operations for a day to let conditions dry and improve.

Liming Operation

On September 9, operations resumed even though afternoon thunder showers were occurring nearly daily. Slimes being placed from Rommel were wetter than previously, and the surface of the waste rock in the repository was too wet for adequate compaction. The acting superintendent was advised the material was obviously not meeting compaction requirements, compaction tests were not being taken, and that lime needed to be applied to the slimes from Rommel. The project superintendent and project Q/C manager returned to the site on September 18. They immediately undertook stirring and applying lime to dry the waste in the repository. Liming and drying proceeded to the point where compaction was effective. Compaction testing resumed, with waste rock compaction brought into compliance about September 25.

Waste placement in the repository was completed October 1. Final shaping of waste was completed October 5, including the sand cushion on the face.

Top Liner

The top liner deployment began late on October 9 after the liner subcontractor crew arrived during the first of several snow events. After the snow melted the liner crew was able to place most of the permanent top cover liner system. Another snow event started October 11 and continued until the morning of October 13. The contractor attempted to clear snow from the deck, face and toe of the repository with equipment, snow blowers, and snow shovels. Another snow storm started late on October 13 and continued through October 14. These storms prevented placing the temporary liner in accordance with specifications. On October 15, with continuing intermittent snow flurries forecast, the contractor and the government decided to winterize the repository as best as possible (WO O).

The winterization process agreed upon was to place the temporary liner on the deck and west face after removing as much snow as possible. Testing of the liner was foregone because moisture and temperature limitations were not being met. The liner seams were fusion welded where moisture would allow welding. Other areas along the crest were tack welded and/or extrusion welded. To anchor the bottom of the permanent liner already placed but not welded to the bottom liner, a layer of sand was placed at the interface, geocomposite covered the sand and operations cover soil was placed to a depth of about 3m. The temporary cover/bottom liner interface was anchored with an earth berm. Berms 600mm deep and 4m wide were placed along the crest of the deck to prevent the temporary liner from billowing in winter winds. Various temporary diversion ditches were built to lead water away from the repository cover. The fencing around the repository was completed except for two sections needed for access to complete the repository. These fence sections received temporary fencing. All major work on other

sites on the project was completed. Winterization of the repository was completed on October 19.

Repository Sump

The repository sump was accumulating water when the repository work was closed on October 19. It was assumed this water was generated from melting snow from the snow events immediately before and during the repository winterization. The water continued to accumulate until it reached a static level of 36" in the winter of 2001-02. This water was removed in April, 2002, and disposed by making snow (Maxim Technical Report, April 12, 2002). During the runoff period in May 2002, water rose to a level of 69 inches, the top or crest of the repository sump. This indicated water was seeping through the cover liner, probably at the temporary top/bottom liner interface. After spring runoff, the sump water level receded to a level of 36 inches. This reduction of water indicated there was a leak in the sump.

Repository Completion

Final repository completion started on July 22, 2002, after the Shaw Group assumed responsibility of the contract. One of the primary goals of the 2002 work was to find and repair the leak in the repository sump. Through discussions with employees involved in winterization the previous fall and observations of the government inspectors, it was suspected the most likely area for a leak was at the west end of the sump. This was an area that equipment became mired in mud while building temporary berms during winterization.

The contractor uncovered the top/bottom liner interface at this location using a smooth bit on an excavator and hand labor. It was discovered that the sump crest had caved inward and slumped down some 30 inches. This would be the same level as the recorded leak. Apparently the equipment had damaged the structure in the previous fall not by direct contact but by pushing a load of soil toward the structure which then caused the sump crest to collapse inward toward the drain gravel fill. The contractor proceeded to expose the damaged area, peel back the top liner, excavate inside and outside the bottom liner to check for damage, then rebuild the liner support on the outside as well as replace the drain gravel fill. The top and bottom liners were repaired, tested, and welded together. An extra layer of top temporary liner was then welded onto this interface to give added protection to the corner.

The contractor proceeded to expose the perimeter of the top/bottom liner interface and check for damage. The interface was pressure washed to assist with inspection. All dimples in the liner, which could be indications of pinhole damage, were either vacuum tested or patched with an extrusion weld. The surface of the permanent top cover was carefully inspected to find and patch pinholes made by rocks during the winter. The

berms were removed from the west and south crest of the deck, revealing severe damage to the temporary liner placed the previous year. This area received a second layer of liner welded to the top liner rather than attempt to identify and patch the damaged liner. The diversion berm cover on the west interface was welded on both sides and to the bottom liner to assure a tight seal, rather than the designed sandbag anchor. The contractor elected to weld the full perimeter of the top/bottom interface rather than the lap and cover interface as designed, although more costly. This welded perimeter provides a tighter interface seal than the lap and cover system.

During the winter of 2001-02, it was found that the face of the repository waste had been built at about a 1:3 slope. The designed slope was 1:4. The 1:4 slope is the design slope needed for the cover soil to be stable under saturated conditions. The obvious solution to the slope error would be to remove the cover already placed, lay the waste back to the designed 1:4 slope, and replace the cover. This would be somewhat risky because it would require the waste rock to be exposed and disturbed, and most of the cover already placed would not be salvageable. Through discussions with designers and the contractor's geotechnical engineer, it was decided to place the cover soil on the permanent cover slope of 1:3, but to build the finish surface of the cover soil at 1:3.5 (Modification 9). This modification increased the cover soil and drain gravel quantities, but the contractor was not compensated for the increase because the change was caused by a construction error. Cover soil was placed and compacted over the permanent cover liner. The slopes were drill seeded, fertilized, and erosion mat placed. All other disturbed areas in the repository site were either seeded and hydromulched or drill seeded and straw mulched. Work was completed on the repository on August 31, 2002.

The repository fence partially collapsed along the toe of the buttress during the winter of 2001-02. It was determined the collapse was probably due to snow loads drifting off the buttress surface or highmarking by snowmobiles in the winter. The fence subcontractor

installed poles along the top of the wire mesh between the posts, and tied the mesh to the poles to prevent future damage (Modification 8).

The sump continued to accumulate water after the sump was repaired. After reaching a depth of 66 inches, the contractor pumped the sump during the week of August 29. During the pumping operation, water levels were monitored to establish a volume to depth relationship (Appendix D). The sump continued to accumulate water the next month, although at a slower rate than in August. On October 9, the water had reached a depth of 26.5" when the sump was pumped by the government to assure maximum capacity for the sump through the following winter. Water levels need to be monitored with periodic pumping for the next few years as water drains from the waste.

MINE WASTE DUMP REMOVALS

General Waste Rock Activities

Initial work for the mine waste dump removal required inspection and improvement of the access roads for haul. The original design anticipated hauling the Small Como and Spaulding dumps down the Daisy Pass road. The contractor requested, and was authorized, to haul the Spaulding waste rock down the Como switchbacks and over the Lulu Pass road provided the Como switchbacks received minimal improvements. This change decreased the miles of road maintenance the contractor needed to perform overall, but increased the amount of maintenance needed on the Lulu Pass road (Fisher Creek) during waste rock haul. During waste rock haul, the contractor continuously watered and graded the Lulu Pass road. The Lulu Pass road also needed spot stabilization at soft spots in the road due to the increased haul traffic. The Sheep Mountain road to the Tredennick dumps was minimally improved for the off highway haul trucks. The access to Rommel Tails only required installation of a temporary creek crossing near the repository, then clearing of an old logging road of slash and debris.

The contractor was authorized to haul waste rock from the various dumps and stockpile the waste rock at the repository with the stipulation the stockpiled waste rock would be covered at night or when rain was imminent (WO I). The stockpiling of the waste rock allowed the contractor to move waste rock from the high elevation dumps before the repository floor was ready to receive waste rock. The contractor received several warnings from the COR for not covering the stockpile at night and weekends. After several weeks, coving the stockpile became routine, and covering the pile was no longer a problem.


Truck Convoy

Cat 330 and Cat 325 excavators loaded waste from the sites into Volvo 25 ton articulated all wheel drive trucks for haul to the

repository. The contractor elected to convoy the waste haul traffic by sending the trucks in groups of 3 to 5 over the Lulu Pass Road to the repository. This greatly facilitated the traffic flow and helped with the safety of public traffic on the road.

The four percolation basins were installed as designed at the dump sites. The COR noted the quantities of drain rock and geotextile used were nearly twice what would have been expected based on the contract design. This was attributed to the percolation basins being sited on slopes rather than flat ground, and to the fact that the basin wall slopes sloughed flatter than the design anticipated. Since payment for the percolation basins was on a lump sum basis, there was no adjustment in contract costs for the increased materials need for the basins.

The site drainage channels were installed essentially as designed, with some changes in type of channel and contractor deviations. Individual site descriptions below elaborate on these adjustments. Reclamation of the sites, including fertilizing, liming, seeding and erosion mats, was performed as designed with little deviation.

The final quantity of waste placed in the repository was 24,508 m^3, 6,728 m^3 more than the design estimate of 17,780 m^3 compacted in place. During waste haul operations, the contractor and the COR noted the waste rock volume seemed to be overrunning at several of the sites. Although the contractor was not required to measure the quantity of waste removed from each site, the contractor's haul records provide an estimate of the amount of waste actually removed from each site. Table 1 shows the estimated the design versus actual quantities.

Table 1
Waste Volume Variations by Site

Waste Dump	Design Volume Estimate (m^3)	Estimated Volume Removed (m^3)
Rommel Tailings	13,730	19,800
Spaulding Dumps	2,560	4,600
Lower Tredennick Dump	2,610	4,000
Middle Tredennick Dumps	620	650
Upper Tredennick Dumps	375	800
Soda Butte Tailings Dump	330	440
Small Como Dump	310	300
Total	20,682	30,000
Design adjustment for sub-excavation	24,789	

The design anticipated a shrinkage of about 39% from the bank volume at the dump sites (24,789 m^3) to compacted embankment volume in the repository (17,780 m^3). Based on the estimated truck volumes (30,000 m^3) and the measured in-place volume in the repository (24,508 m^3), it appears the actual shrinkage was about 21%. Future waste rock removal projects should consider using a shrinkage of about 20%, although the texture of waste material on this project varied from clay slimes to large cobles. Texture of earthen material has a significant effect on the shrinkage during compaction.

Rommel Tails

Work began July 9, 2001, with initial excavation and stockpiling of waste on the north end of the site. The tailings materials at this end of the site were predominately free draining sands. The dozer encountered saturated conditions about four feet below the surface, which was near the streambed elevation. Stockpiling of the sandy material continued, with the intention of allowing the sand to drain once heaped into a stockpile. Removal of the tailings continued intermittently through the season, with final tailings removed to the repository on September 25, 2001.

The contractor installed the 300 mm bypass pipe as designed along the east flank of the site, diverting the stream inflows around the work area to the outlet. The contractor proceeded to install drain sumps as needed at the approximate locations shown on the drawings. The sump design was modified somewhat by the contractor by adding a geotextile wrap around the perforated sump pipe. This essentially eliminated all turbidity in the water. Water pumped from the sumps was found to be within required water quality standards. The contractor was allowed to pump water from the easterly sumps directly into the 300 mm bypass pipe, with T's installed in the pipe as needed. This eliminated the need for the east sediment basin (Mod. 7). The depression at the west sediment basin was found to be highly permeable, eliminating the need for an outfall pipe; the water percolated into the ground nearly as fast as it was pumped into the basin. Flows downstream of the sediment basin were monitored by the government to assure subsurface water remained within standards.

Excavation and removal of the tailings proceeded from the north (upper) end of the site towards the lower end throughout the season. About a third of the way from the upper end, the excavators encountered a native soil dam and bedrock that had been buried in the tails. It is surmised that this was the initial tailing impoundment dam which was flooded when the impoundment was expanded by construction of the lower dam.

Excavation continued from the north end toward the dam at the south end of the site. Native material was fairly easy to identify. The tails/native contact usually had a one to two inch thick decomposed black organic mat. Once exposed, the native soils dried quickly, allowing equipment to drive on the soil within a matter of hours. About half way through the site, the tails turned from a sand to a saturated silt, then to a saturated clay slime. The slimes were sloppy enough that they would not support equipment.

Excavators needed to work off pads built with the logs removed from the site, ramping down as needed to access truck load outs on the native soil. With the slimes being about 35 feet deep at the lower end, the excavators needed to make multiple passes taking about ten foot bites into the slimes on each pass.

Final excavation of the lower dam revealed two structures. The initial lower dam was apparently built about 15 feet high. It is surmised that once the original tailings pond filled, the a second dam about 20 feet high was built over the original dam. This second dam partially covered slimes, making the native dam material largely unusable for final shaping of the site.

Final shaping of the tailings site began September 25, 2001, with the slopes and stockpile pad on the southwest side being pushed toward the north to recreate what appeared to be the original natural ground shape. Channel work proceeded from the north by shaping the channel subgrade as staked by Mark Story, Gallatin Forest Hydrologist, and the COR. The inlet end of the channel built out with grades of 15 % to 17%, as opposed to the designed 10% maximum grades. To prevent head cutting on these steeper grades, three equally spaced 1m deep riprap cutoff barriers were installed under the Type A channel for both forks of the inlet channel. Coir channel banks were constructed using three steel angle iron forms which slipped under the coir and backfilled, then were pulled out by an excavator. Construction of the coir banks involved a 325 excavator, a track mounted skid steer, and about 5 laborers for 5 days, completing the work on October 11, 2001. As seeding and erosion mats were placed on the site, an excavator scattered logs and stumps, obtained from the clearing slash piles, over the site. Final seeding and mulching of the reclaimed access road was completed October 15, 2001.

Volume of tails removed is estimated at 19,800 m^3 based on truck count vs. the designed 13,700 m^3. Item 4.7, regrading of the site, was not measured by the contractor as required. The COR estimated the actual regrading quantity was about 3,800 m^3 vs. the original contract

quantity of 2,465 m^3. Because the contractor failed to survey the site and calculate the actual quantity of regrading, no change in quantity was made for final payment.

Spaulding Dump

Work started July 17 with construction of the access roads. In addition to the designated access road, the COR authorized the contractor to build a lead out road down the fall line from the dumps to the Lulu Pass Road provided this new road was rehabilitated as prescribed in the contract (WO I).

Waste haul started on July 19, with waste loaded into trucks with an end loader, which in turn was fed by a dozer. This was not a particularly efficient operation due to the small working area of the site. Within a few days, the contractor replaced the dozer/loader combination with a 325 excavator, greatly improving cycle time of the trucks. Some artifacts (old pipes and timbers) were initially mixed in with the waste rock. After one warning, the operators learned to separate the artifacts and leave them on site. This learned attitude facilitated the historic preservation actions on all sites. Waste haul was intermittent because work was being performed on other sites simultaneously. Waste removal was completed on August 2.

The dozer feeding the loader buried the collapsed portal to the Lower Spaulding Adit during the first few days (the portal was not designated for protection in the contract). Since the USDA Forest Service desired to investigate the adit in the future, the contractor attempted to uncover the portal with an excavator. When the portal excavation started to yield a volume of spooge, the COR directed the operator to plug the portal until adequate sediment controls could be installed. The COR later attempted to dig out the portal using the equipment rental terms of the contract. After several hours of digging, the COR determined the adit was caved for an unknown distance, and the portal was then backfilled.

The middle adit backfill, percolation basin and overflow channel were completed on September 20 essentially as designed. The contractor thought the seeding subcontractor was responsible for mixing the soil amendments into the native soil 300mm, resulting in a delay until the prime and sub could reach terms on who would do the work. The contractor proceeded with mixing amendments at this site and others using a grader with scarifiers. Seeding, fertilizing, liming, and erosion mats were completed on the site on October 4.

Small Como Dump
Waste rock haul began July 18, and was completed July 19. The COR changed the adjacent channel treatment from Type A (coir lined) to rock drainage due to the relatively high runoff noted in the early summer (WO M). During construction of the channels, the contractor's operators became a little over enthused and built the westerly channel about 6m wide instead of the designed 2.9m width. The COR did not require the contractor to remove the riprap, but did advise the contractor they as placed about 3 times as much riprap as required. Soil amendments, seeding and erosion mats were completed on October 4.

Lower Tredennick Dump
Work on Lower Tredennick started July 23 with installation of erosion control and construction of the access road. Waste haul started July 30, and continued intermittently until completion on September 13. Haul from this site was sporadic as trucks were occasionally diverted to other sites. Haul was suspended on August 10 until the repository bottom liner was placed because the waste rock stockpile site at the repository had reached capacity. Haul resumed August 30 when the repository was ready to receive waste. During waste rock haul, sludge from the Glengarry Mine settling pond was mixed with the Lower Tredennick waste and hauled to the repository. This helped consolidate the soupy sludge to contain it in the trucks and assist with placement in the repository.

During waste rock excavation, a crib log retaining wall was uncovered in the lower one third of the dump. This apparently was part of a load out platform used during active mining. The excavator operator made a valiant attempt to preserve the retaining wall, but the rotten logs collapsed when pulling waste from around it. The contractor did an excellent job of protecting the various other historic features on and around the site.

As waste rock was removed from the steep east side of the dump trailing down to Polar Star Creek, the native material was revealed to be scree. The COR deleted revegetation treatment of this slope. The percolation basin was installed September 13. Water draining from the adit caused the back wall of the basin to slough continuously. The contractor devised a method of holding the back wall in place with equipment while drain rock was placed in the basin. Due to this sloughing and the slope the percolation basin was placed on, it is estimated nearly 70 m^3 of drain rock was needed for this basin, three times the

neat line design quantity.

Final soil amendments, seeding, erosion mat and distribution of artifacts was completed on October 4.

Middle Tredennick Dump

Waste rock removal began on August 8. Removal work sporadic with trucks being diverted to other sites as needed, and removal was completed on August 10. The contractor protected the historic foundation in the middle of the site during waste rock removal, but accidentally ran an excavator across the foundation when installing the stream protection bank. This did not appear to affect the integrity of the site considering that Mary Beth did not even notice it.

The percolation basin was installed September 14. Bedrock was encountered under a foot of native soil, but the rock was soft enough to continue excavation of the basin to the designed dimensions. Since the basin is formed in bedrock, it is doubtful it will actually percolate any adit drainage into the ground. The percolation basin runoff channel was changed from a riprap B-B channel to a Type A coir lined channel because the channel grades are about 2% to 4%. Stream bank reclamation with coir fabric was completed on September 26, with final soil amendments, seeding and erosion mats completed on October 1.

Upper Tredennick Dumps

In late July, the COR and contractor reviewed the designed location of the new access road to the Upper Tredennick dumps. The sub-alpine area was still saturated going through spring breakup. The COR recommended adjusting the Upper Tredennick treatment to in-situ work without removal of the dumps. It was decided to continue with the dump removal. By August 3, the sub-alpine

meadow area had dried considerably. The contractor tested the haul access by running several empty off highway trucks cross-country from the Sheep Mountain Road to the dumps. The COR determined haul access could be accomplished without excavation with the only impact being two wheel tracks across the meadow.

The Polar Star Creek crossing was installed on the Sheep Mountain Road by placing a dozen green logs in the streambed and covering them with geotextile. This was sufficient to protect the stream banks and water quality during the waste rock removal. Two dry stream channels on the haul road were protected with logs and geotextile. Waste rock haul from Upper Tredennick commenced on August 6, and was completed on August 8.

The two open upper adits were backfilled between August 8 and August 10. The contractor was authorized to tram backfill riprap cross country from the upper leg of the Sheep Mountain Road 300m to a point immediately above the adit portals using a small loader. Laborers picked rock along the Sheep Mountain Road filling the loader bucket by hand, and then the rock was trammed cross-country to the adits. The adit portals were excavated by hand and backfilled with the rock dumped above the portals.

The percolation basin was installed per design on September 14. The COR deleted the riprap percolation channel B-B treatment because the native material was coarse talus, with no more channel protection needed (WO M). The native ground under Upper Tredennick dump 1 and 2 was too rocky to support vegetation, so amendments and treatment of this part of the site were deleted.

The rest of the Upper Tredennick site received amendments, seeding and erosion mat per specifications on October 1. The Upper Tredennick two-track road received a modified treatment of scarifying the truck wheel tracks and seeding. Amendments and fertilization were not included because there was no excavation of the road, and the native topsoil was sufficient for revegetation of the road.

Soda Butte Tails

Removal of this site was straightforward. The 200m access road was built along an old logging skid trail on August 8 by removing slash and logs with minimal excavation. Excavation and haul of the tails and retaining dam commenced on August 10 and finished the next day, August 11. The COR noted the material from the dam appeared to be high quality topsoil rather than waste or overburden. This material was also hauled to the repository.

The Type A drainage, soil amendments, seeding and erosion mats were installed as designed. The access road was fertilized, seeded and mulched with straw. Final closure of the access was completed on October 5 by pulling logs and stumps over the road location.

UPPER CONNECT ROAD CONSTRUCTION

Upper Connect Road was designed to connect the Daisy Pass Road to the Lulu Pass Road. It was included in this contract in anticipation it would be needed for haul of the Spaulding Dumps to the repository over Daisy Pass, as well as for future removal contracts. Since the contractor elected to haul the Spaulding Dumps down the Como Switchbacks and Lulu Pass Road, the Upper Connect Road was not needed for this project. The contractor suggested deleting the Upper Connect Road from this contract, but because the road would be needed for future actions, the government decided not to delete the road from this contract.

Clearing of the road limits began July 26, with the contractor hauling stumps and slash from the Upper Connect road to a slash pile near the repository. The COR advised the superintendent the specifications allowed the road clearing debris to be scattered outside the road construction limits. The superintendent responded that he needed something to keep his labor crew busy. Within a few days, the contractor proceeded with scattering of the clearing debris rather than hauling it.

The labor crew installed a CMPA scheduled for sta. 0 + 953 on July 27. The pipe size installed at 0+953 was scheduled to be installed at 1+064. The COR advised the superintendent that, although the installation was good, the crew had installed the wrong size and length of pipe and therefore it would need to be replaced with the proper culvert size and length. The COR showed the superintendent the English-Metric conversion

table in the standard specifications so the pipe crew could avoid similar mistakes in the future.

Road construction proceeded sporadically through the season as equipment was available. Most of the road was built as designed with only a few exceptions. A boggy section was encountered between 0+572 and 0+598 on August 21. The COR directed the contractor to import a 750mm lift of reject shot rock from the quarry for this section. Compensation for this stabilization was accounted for under the equipment rental terms of the contract.

The culvert crew encountered extensive Flathead Sandstone about 400mm below the road surface when attempting to install the 450mm CMP scheduled for sta. 0+777. The COR investigated the area using a backhoe under equipment rental, finding the sandstone extended nearly 100m along this road segment. The culvert was deleted because the sandstone lined ditch could carry water to the culvert at sta. 0+877. The culvert crew, for some unknown reason, installed a skewed 15.6m (52 ft.) long culvert in lieu of the staked 9.2m (30 ft.) culvert at sta. 0+369. The contractor was advised of the error, and given the option of cutting and resetting the culvert at the proper 90º angle or leaving the culvert as installed without payment for the extra length. The additional 6.4m of culvert were not included in the final pay quantities for culverts.

Finish grading on the road was completed on September 16. Final seeding, fertilizing and hydromulching of the slopes was completed on October 5.

MISCELLANEOUS EQUPMENTAL RENTAL WORK

The contractor and the government anticipated early in the contract that unforeseen conditions and other needs for use of the contractor's equipment could be encountered. The COR and contractor negotiated hourly rates for the equipment on site so the equipment could be used at the direction of the government (Mod. 3 and 4). This section describes the various tasks for which directed hourly work was used.

Como Raise Excavation 7/22: 12.5 hours Cat 330 excavator and 1 hour Volvo Int. Tool Carrier to unload mine timbers and excavate the Como Raise at the direction of the government (WO K). (Ref. Maxim Technical Report "Reopening and Assessment of Glengarry Mine," 11/15/01)

Daisy Pass Road Culvert Cleaning 7/30: 4 hr Cat 416 backhoe to clean out inlets of two culverts on Daisy Pass Road (WO K).

Glengarry Dump Investigation 8/1: 4 hr. Cat 416 backhoe excavating test pits on the Glengarry Mine Dump.

Upper Connect Road Stabilization 8/21: 2 hr. Volvo 25 trucks, 2 hr. Cat 330 excavator to load, haul and place shot rock on boggy area on the Upper Connect Road.

Grade Daisy Pass Road 9/6-9/8: 28 hr. Cat 14H grader to grade the Daisy Pass Road to repair storm damage and preserve the road over the winter.

Glengarry Adit Diversion 9/10: 1.5 hr. Cat 416 backhoe to change the diversion of the adit flow to the settling ponds.

McLaren Adit Investigation 9/12: 4 hr. Cat 416 backhoe to break into the back of the drift 15 ft. from the portal for government investigation. Provide minor improvements to drill access road below the McLaren Adit.

McLaren Adit Opening 9/15-9/16: 11 hr. Cat 330 Exc., 3.5 hr. Volvo trucks, 5 hr. labor team, 5 hr. foreman, 5 hr. pump to open the McLaren Adit portal, install and line 2 settling ponds, and divert adit water during opening operations (Mod. 6). (Ref Maxim Technical Report "McLaren Adit Assessment," Jan. 10, 2003).

Daisy Moraine Test Pits 9/15: 4.5 hr. Cat 330 Exc. digging test pits on Daisy Moraine.

Moonscape Test Pits 9/17: 3 hr. Cat 330 Exc. digging test pits on Moonscape.

Como Raise Backfill 9/18-9/20: 5 hr. Cat 416 backhoe, 6 hr. Volvo IT, 30 hr. Volvo trucks importing fill and backfilling around Como Raise cribbing.

McLaren Pit Testing & Drill Support 10/3-10/4: 12.5 hr. Cat 330 Exc. for various small test pits and towing drill through mud below McLaren Pit.

McLaren Drill Support 10/9: 1.5 hr. Cat D7 dozer towing drill truck through mud below McLaren Pit.

The total cost for miscellaneous added work was $13,968.

RECOMMENDATIONS

1. **Repository Sump:** Continue with monitoring of the repository sump.

2. **Pay Item Measurements**: The contractor's Quality Control (Q/C) was generally excellent with very good response to occasional problems. The contractor provided appropriate supporting data for pay items which were easily measured, such as scale tickets for aggregates and materials. However, the contractor failed to provide on site measurements for geosynthetics placed the first season. This was in part due to internal problems with the liner subcontractor who apparently was supposed to keep records and layouts of the geosynthetics as placed. Shortly after the season ended, the subcontractor on site liner superintendent resigned from the company and took all on site project records with him. This, and then the bankruptcy of the contractor (IT) left a gap in available records and measurements for the geosynthetics actually placed. The Shaw Group, who assumed contract responsibility from IT in 2002, met the contract requirements for quantity measurements as best they could, but many records were lost in the transition between the two companies. It must be noted that the loss of actual quantity measurements was to the benefit of the government because rough measurements by the COR during construction of the base liner indicated geosynthetics quantities were about 10% to 20% over contract design quantities. The contractor was paid only for design quantities for those items lacking documented measurements.

> **Recommendation:** The COR needs to require the contractor to provide a copy of all interim and final measurements within 24 hours after they have been made.

3. **Surveys:** The contract required the contractor to survey and provide as-built drawings for every phase of the repository construction and the final site plans of the mine dumps treated. The surveyor for IT doing the mapping provided hardcopy drawings of the repository and dumps, but they were lacking in some detail such as elevations and precise locations of some culture. The survey digital files provided were in a GPS format which was not usable by the government to pull up the detailed information needed. After the IT bankruptcy, the subcontract surveyor was not paid and consequently refused to provide digital data converted to a usable format. The Shaw Group, in 2002, did provide detailed as built survey mapping and digital files in AutoCad format of the finished repository site.

> **Recommendation:** Strengthen contract language to require very specific items, locations, and elevations to be included in the contractor surveys, and specify the exact digital formats which will be acceptable to the government.

4. **Subcontractor relations:** Most of the first year subcontractors were not supported by the IT site superintendent. The superintendent did not provide contract interpretations, equipment support, and specific contract requirements to the subcontractors. Consequently the subcontractors often went to the COR asking for direction and assistance. The COR initiated several contractor-subcontractor meetings to assure there was a common understanding of contract requirements and specifications as well as

coordination of activities, and to make the superintendent redeem the contractor's responsibilities for oversight of subcontractors. These meetings were needed for the survey, fencing, and revegetation subcontractors.

> **Recommendation:** Strengthen the contract clauses requiring approval of subcontractors and submittal of subcontracting plans to require the contractor to use a teaming approach when subcontractors arrive on site. The teaming requirements can be found in the FAR, and should be modified to fit the specific contract.

APPENDICES

A. Schedule of Items

B. Summary of Contract Modifications

C. Summary of Work Orders

D. Repository Depth/Volume Chart

E. Digital Photographs (CD)

SELECTIVE SOURCE RESPONSE ACTION FINAL CONSTRUCTION REPORT
Appendix A, Original and Final Schedule of Items

				Awarded Schedule			Final Schedule		
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1	**MOBILIZATION**								
1.1	Mobilization 601 (01) Mobilization	LSQ	ls	1	$88,900.00	$88,900.00	1	$88,900.00	$88,900.00
1.2	Erosion Control 204 (19) Soil Erosion and Pollution Control	LSQ	ls	1	$3,582.00	$3,582.00	1	$3,582.00	$3,582.00
1.3B	Equipment Rental 637(01)B Volvo L70C Tool Carrier	AQ	hr				1	$69.00	$69.00
1.3C	Equipment Rental 637(01)C 25 ton Off Road Dump Truck	AQ	hr				2	$98.00	$196.00
1.3D	Equipment Rental 637(01)D 2000 Gal Water Truck	AQ	hr				0	$61.00	$0.00
1.3E	Equipment Rental 637(01)E Cat 330BL Track Excavator	AQ	hr				27	$97.00	$2,619.00
1.3F	Equipment Rental 637(01)F Cat 416B Rubber Tire Backhoe	AQ	hr				14	$65.00	$910.00
1.3G	Equipment Rental 637(01)G Cat D8R Dozer w/ U-blade	AQ	hr				1.5	$116.00	$174.00
1.3J	Equipment Rental 637(01)J IR SD100D Tamping Foot Roller	AQ	hr				0	$77.00	$0.00
1.3K	Equipment Rental 637(01)K Jumping Jack	AQ	hr				0	$48.00	$0.00
1.3L	Equipment Rental 637(01)L Cat 14H Grader	AQ	hr				28	$104.00	$2,912.00
1.3M	Equipment Rental 637(01)M Cat 325 Excavator	AQ	hr				0	$95.00	$0.00
1.3N	Equipment Rental 637(01)N Cat D6 LGP w/ 6 way	AQ	hr				0	$100.00	$0.00
1.4	McLaren Adit Opening Modification 6	LSQ	ls				1	$3,166.00	$3,166.00

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1.5	Glengarry Raise Backfill Modification 6	LSQ	ls				1	$3,922.00	$3,922.00
2	**CONNECT ROAD CONSTRUCTION**								
2.1	Construction Staking 171 (02)(c) Precision E Method III	DQ	km	1.51	$3,212.00	$4,850.12	1.51	$3,212.00	$4,850.12
2.2	Clearing and Grubbing 201 (01) Slash Disposal = Tops and limbs Method 4, 7, 10; Stumps Method 5, 7, 10; Logs Method 8.	DQ	ha	1	$3,965.00	$3,965.00	1	$3,965.00	$3,965.00
2.3	Excavation 203 (01) Placement Method 1	DQ	m^3	2764	$3.10	$8,568.40	2764	$3.10	$8,568.40
2.4	Silt Fence 204 (07)	DQ	m	80	$1.00	$80.00	0	$1.00	$0.00
2.5	Rip Rap - Class 3 251 (01) Placement Method A	AQ	m^3	30	$73.00	$2,190.00	12	$73.00	$876.00
2.6	Recondition Existing Road 306 (01) Compaction A	AQ	km	0.28	$4,260.00	$1,192.80	0.28	$4,260.00	$1,192.80
2.7	450 mm CMP 1.62 mm Thickness for Steel 603 (01)A Method C	DQ	m	73.2	$126.00	$9,223.20	62	$126.00	$7,812.00
2.8	710 mm Span x 510 mm Rise CMPA 1.62 mm Thickness for Steel 603 (02)A Method C	DQ	m	8.6	$218.00	$1,874.80	11	$218.00	$2,398.00
2.9	970 mm Span x 690 mm Rise CMPA 1.62 mm Thickness for Steel 603 (02)B Method C	DQ	m	22	$283.00	$6,226.00	0	$283.00	$0.00
2.10	1060 mm Span x 740 mm Rise CMPA 1.62 mm Thickness for Steel 603 (02)C Method C	DQ	m	19.6	$302.00	$5,919.20	46.2	$302.00	$13,952.40

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2.12	Furnish and Install Road Closure Device 640 (01) Type Gate Size 4 meters	AQ	ea	2	$2,357.00	$4,714.00	2	$2,357.00	$4,714.00
2.13	Seeding 625 (02) Dry Method (with mulch)	DQ	ha	0.29	$6,500.00	$1,885.00	0.29	$6,500.00	$1,885.00
3	**WASTE DUMP RECLAMATION**								
3.1	Clearing and Grubbing 201(03) Slash treatment method for tops and limbs Method 4; Stumps Method 4; Logs Method 4; Utilization of Timber Method 2.	LSQ	ls	1	$3,010.00	$3,010.00	1	$3,010.00	$3,010.00
3.2	Upgrade Existing Sheep Mountain Road 306 (01) Reconditioning of roadbed, Compaction Method A	DQ	km	0.62	$7,032.00	$4,359.84	0.8	$7,032.00	$5,625.60
3.3	Construct New Access Roads 249 (01) Composite Road Construction	DQ	km	0.63	$13,107.00	$8,257.41	0.63	$13,107.00	$8,257.41
3.4	Recondition Lulu and Daisy Pass Road Improvements 306 (02) Reconditioning of Road Bed, Compaction Method A	LSQ	ls	1	$5,965.00	$5,965.00	1	$5,965.00	$5,965.00
3.5	Construct Adit Closure 641 (01) Close Adit	AQ	ea	4	$772.00	$3,088.00	4	$772.00	$3,088.00
3.6	Construct Mine Discharge Percolation Basin 642 (01) Percolation Basin	AQ	ea	4	$3,079.00	$12,316.00	4	$3,079.00	$12,316.00
3.7	Construct Drainage Channel 643 (01) Drainage Channel	AQ	m	225	$52.00	$11,700.00	129	$52.00	$6,708.00
3.8	Preserve Historic Features and Dispose of Debris 202 (01) Removal of Structures and Obstructions	LSQ	ls	1	$8,571.00	$8,571.00	1	$8,571.00	$8,571.00
3.9	Regrade Dumps and Place Topsoil 624 (01) Furnishing and placing topsoil	AQ	m^2	5,600	$4.70	$26,320.00	8,481	$4.70	$39,860.70

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3.10	Construct Middle Tredennic Stream Bank 644 (01) Middle Tredennic Stream Bank Construction	AQ	m	10	$550.00	$5,500.00	10	$550.00	$5,500.00
3.11	Construct Type A Stream Channel 645 (01) Type A Stream Channel	AQ	m	50	$79.00	$3,950.00	23	$79.00	$1,817.00
3.12	Reclaim Access Roads 210 (02) Treatment of Existing Roadway, Method A	DQ	km	0.63	$790.00	$497.70	0.63	$790.00	$497.70
3.13	Seeding and Mulching Reclaimed Access Roads and Dumps 625 (02) Seeding, Dry Method (with mulch)	AQ	ha	1.12	$29,510.00	$33,051.20	1.11	$29,510.00	$32,756.10
3.14	Non-Combustible Material Disposal 202(06) Removal of Non-Combustible Material	AQ	mt	10	$148.00	$1,480.00	0	$148.00	$0.00
4	**ROMMEL AND SODA BUTTE TAILINGS POND RECLAMATION**								
4.1	Clearing and Grubbing 201 (03) Slash treatment method for tops and limbs Method 4; Stumps Method 4; Logs Method 4; Utilization of Timber Method 2..	LSQ	ls	1	$13,087.00	$13,087.00	1	$13,087.00	$13,087.00
4.2	Upgrade Existing Access Roads 306 (01) Reconditioning of roadbed, Compaction Method A	DQ	km	0.27	$4,418.00	$1,192.86	0.39	$4,418.00	$1,723.02
4.3	450 mm CMP 1.62 mm Thickness for Steel 603 (01)B Method C	AQ	m	8	$186.00	$1,488.00	8	$186.00	$1,488.00
4.4	Construct New Access Roads 249 (01) Composite Road Construction	DQ	km	0.7	$18,281.00	$12,796.70	0.7	$18,281.00	$12,796.70
4.5	Install Stream Dewatering System 647 (01) Install Stream Dewatering System	LSQ	ls	1	$24,904.00	$24,904.00	1	$16,188.00	$16,188.00
4.6	Install Groundwater Dewatering Sumps 648 (01) Install Groundwater Dewatering Sumps	AQ	AQ	5	$3,539.00	$17,695.00	4	$3,539.00	$14,156.00

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4.7	Regrade Excavated Tailings Areas and Rommel Dam 649 (01) Regrade Excavated Tailings Areas	AQ	m^3	2,465	$3.25	$8,011.25	2,465	$3.25	$8,011.25
4.8	Construct Type A Stream Channel 645 (01) Type A Stream Channel	AQ	m	95	$75.00	$7,125.00	65	$75.00	$4,875.00
4.9	Construct Type B Stream Channel 646 (01) Type B Stream Channel	AQ	m	260	$311.30	$80,938.00	263	$311.30	$81,871.90
4.10	Reclaim Access Roads 210 (02) Treatment of Existing Roadway, Method A	AQ	km	0.7	$1,467.00	$1,026.90	0.7	$1,467.00	$1,026.90
4.11	Seeding and Mulching Reclaimed Access Roads and Tailings Areas 625 (02) Seeding, Dry Method (with mulch)	AQ	ha	1.57	$29,992.00	$47,087.44	1.88	$29,992.00	$56,384.96
4.12	Furnish and Install Road Closure Device 607 (03) Type Gate Size 4 meters	AQ	ea	1	$2,020.00	$2,020.00	1	$2,020.00	$2,020.00
5	**REPOSITORY CONSTRUCTION AND WASTE REMOVAL, HAUL, AND PLACEMENT**								
5.1	Site Preparation 201 (03), Slash treatment method for tops and limbs Method 7; logs Method 8; stumps Method 7; Utilization of Timber Method 2.	LSQ	ls	1	$4,774.00	$4,774.00	1	$4,774.00	$4,774.00
5.4	Topsoil Stripping 203 (19) Topsoil (stockpiled)	AQ	m^3	13,000	$3.15	$40,950.00	13,000	$3.15	$40,950.00
5.5	Subgrade Preparation – Grading 203 (04), Excavation, placement method 4	LSQ	ls	1	$3,186.00	$3,186.00	1	$3,186.00	$3,186.00
5.6	Subgrade Preparation – Place Material From Topsoil Stockpile, As Needed 203 (08) Borrow excavation, placement method 4	AQ	m^3	1,590	$8.70	$13,833.00	1,590	$8.70	$13,833.00
5.7	Drainage Gravel 304 (14), Placing aggregate, Compaction A	AQ	mt	1,890	$51.75	$97,807.50	2,710	$45.65	$123,711.50

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Bid Item No.	**Description**	**Method of Meas.**	**Pay Unit**	**Orig. Qty.**	**Orig. Unit Price**	**TOTAL**	**Revised Qty.**	**Revised Unit Price**	**TOTAL**
5.8	Drainage Sand 304 (14), Placing aggregate, Compaction A	AQ	mt	3,550	$52.20	$185,310.00	3,810	$45.40	$172,974.00
5.9	Geosynthetic Clay Liner 651 (01) Geosynthetic Clay Liner	AQ	m^2	5,345	$7.70	$41,156.50	5,821	$7.70	$44,821.70
5.10	High Density Polyethylene (HDPE) Liner, 60 mil 652 (01) HDPE Liner	AQ	m^2	13,970	$7.80	$108,966.00	12,852	$7.80	$100,245.60
5.11	Operations Cover 203(11), Embankment, Placement method 2	AQ	m^3	3,040	$12.95	$39,368.00	2,630	$12.95	$34,058.50
5.12	Excavate, Load, Haul and Place Mine Waste 203 (11) Embankment, Placement Method 4, modified	AQ	m^3	17,780	$11.30	$200,914.00	24,508	$11.30	$276,940.40
5.13	Geotextile GT-1 221 (01) Earthwork geotextile, Type GT-1	AQ	m^2	12,583	$3.05	$38,378.15	13,612	$3.05	$41,516.60
5.15	Leachate Collection Sump 650 (01) Install Leachate Collection Sump	LSQ	ls	1	$6,330.00	$6,330.00	1	$6,330.00	$6,330.00
5.18	Place Coversoil on Final Cover 624 (04) Placing topsoil	AQ	m^3	6,600	$5.45	$35,970.00	6,085	$5.45	$33,163.25
5.19	Construction Cover Liner 656 (01) ConstructionCover Liner	LSQ	ls	1	$22,025.00	$22,025.00	0	$22,025.00	$0.00
5.20	Seeding and Mulching Topsoil Stockpile, and Staging Areas 625 (02) Seeding, Dry Method (with mulch)	AQ	ha	1.8	$6,437.00	$11,586.60	2.14	$6,437.00	$13,775.18
5.21	Seeding and Mulching Final Cover 625 (02) Seeding, Dry Method (with mulch)	AQ	ha	0.5	$33,637.00	$16,818.50	0.4	$33,637.00	$13,454.80
5.22	Woven Wire Repository Fence and Gate 655 (01) Install Woven Wire Fence and Gate	AQ	m	510	$88.50	$45,135.00	499	$88.50	$44,161.50
5.22A	Top Fence Rail 655 (01) Install Woven Wire Fence and Gate	LSQ	ls				1	$4,500.00	$4,500.00

SELECTIVE SOURCE RESPONSE ACTION FINAL CONSTRUCTION REPORT
Appendix A,
Original and Final Schedule of Items

				Awarded Schedule			Final Schedule		
Bid Item No.	**Description**	**Method of Meas.**	**Pay Unit**	**Orig. Qty.**	**Orig. Unit Price**	**TOTAL**	**Revised Qty.**	**Revised Unit Price**	**TOTAL**
5.23	Lime Amendment 656 (01) Amend Tailings with Calcium Oxide Product	AQ	mt	735	$119.00	$87,465.00	597	$119.00	$71,043.00
5.24	Provide and Place Rock Embankment 252(01) Special Rock Embankment	AQ	m^3	12,200	$24.75	$301,950.00	11,475	$24.75	$284,006.25
5.25	Geocomposite 605 (03) Geocomposite Drain Sheet	AQ	m^2	22,400	$7.10	$159,040.00	19,870	$7.10	$141,077.00
5.26	Filter Sand 304 (14), Placing aggregate, Compaction A	AQ	mt	810	$62.00	$50,220.00	908.3	$54.60	$49,593.18
5.27	Temporary Liner 652(01) HDPE Liner	AQ	m^2	5,700	$8.45	$48,165.00	5,891	$8.45	$49,778.95
5.28	Road Surfacing 304(14), Placing Aggregate, Compaction B	AQ	mt	490	$46.70	$22,883.00	566.6	$46.70	$26,460.22
5.29	Road Stabilization 203(22) Road Stabilization	AQ	m				232	$75.00	$17,400.00
	Actual Damages Adjustment	LSQ	ls				-1	$73,578.95	-$73,578.95
TOTAL						$2,070,840.07			$2,042,440.64

SELECTIVE SOURCE RESPONSE ACTION FINAL CONSTRUCTION REPORT
Appendix B, Summary of Contract Modifications

Mod No.	Date	Description	Cost
1	06/25/01	After award, IT project manager advised CO of a mistake in bid. IT proposed reducing the unit price of Item 5.7 Drain Gravel, Item 5.8 Drainage Sand, and Item 5.26 Filter Sand. The CO accepted.	-$41,663
2	06/29/01	Adds Item 5.29 Road Stabilization. Portions of Lulu Pass Road were breaking up under haul traffic. This Item added stabilization of selected segments by sub-excavating poor soils, placing geotextile, and backfilling with shot rock from the quarry.	+$18,750
3	07/05/01	Adds equipment rental rates and estimated future use to the schedule for equipment on site.	+$15,840
4	08/10/01	Adjusts equipment rental rates and estimated time based on changes of equipment on site.	-$730
5	08/30/01	Actual Quantity adjustments for various items completed including Upper Connect CMP's, and road upgrade mileage.	+$3,799
6	09/22/01	Adds lump sum Items 1.4 McLaren Adit Opening & 1.5 for Como Raise Backfill as directed. Adjusts contract time for added work and waste rock overruns.	+$7,088
7	08/12/02	Massive Actual Quantity Adjustments and negotiated unit price adjustments for work completed through October 2001 covering all aspects of the project.	+$15,630
8	08/16/02	Adds Item 5.22A Top Fence Rail to reinforce the repository fence which partially collapsed over the previous winter.	+$4,500
9	09/01/02	Summary of many design changes to the repository cover which were offered by the new contractor to expedite completing the work and were to the benefit of the government.	$0
10	02/21/03	Final contract quantity adjustments for actual quantities, negotiated quantities which the contractor failed to measure, and actual damages for exceeding the contract time.	-$51,613

SELECTIVE SOURCE RESPONSE ACTION FINAL CONSTRUCTION REPORT
Appendix C, Summary of Contract Work Orders

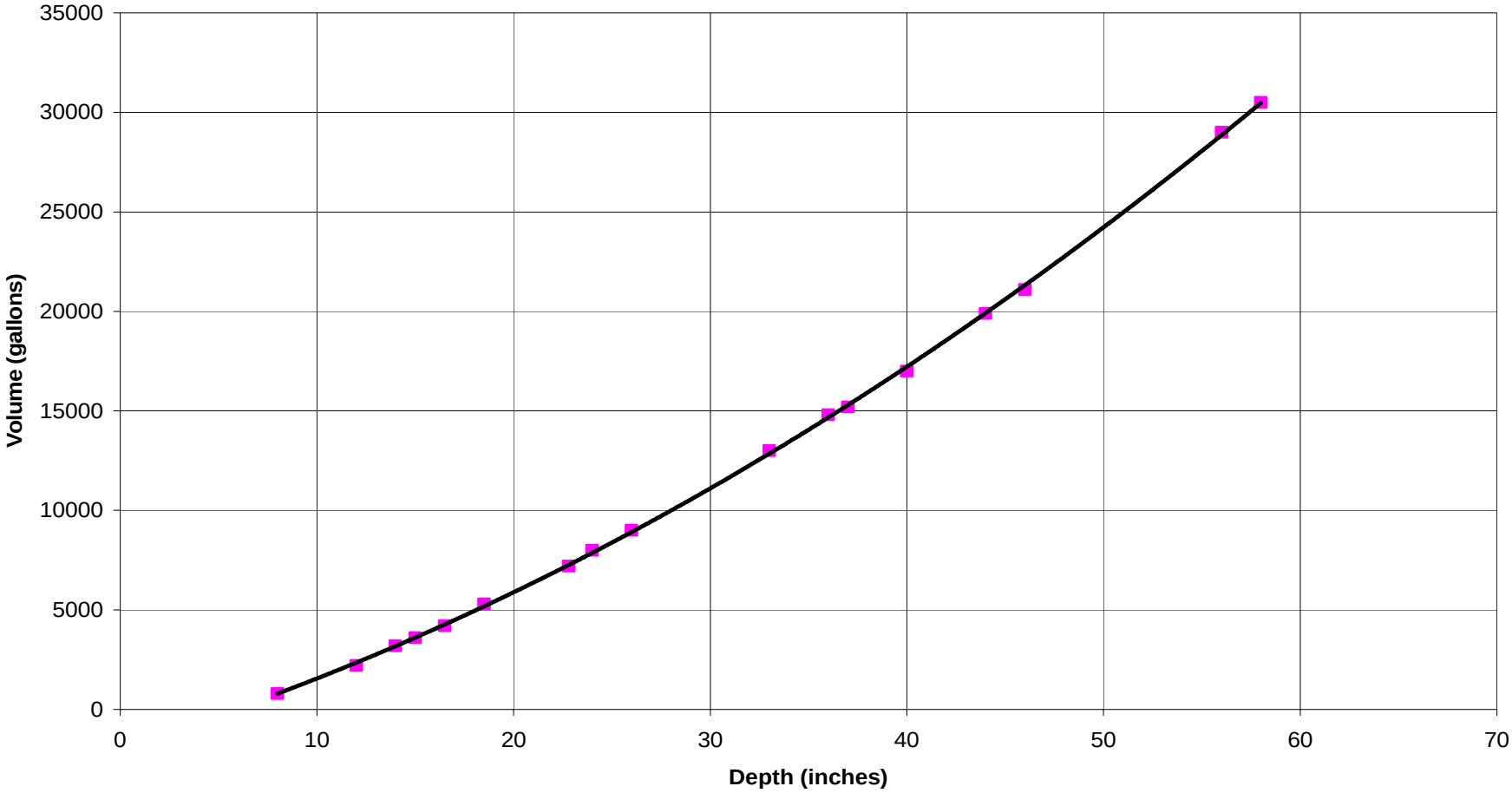
WO No.	Date	Description
A	06/07/01	Authorization of fuel storage tank, approval of erosion control plan, and agreement for the quarry access road relocation.
B	06/19/01	Adjustment in the quarry limits, slash stockpile area, and topsoil stockpile area.
C	06/19/01	Change in the repository soil stockpile limits and addition of a soil stockpile area on the west side of the repository. Caused by identification of wetlands in part of the designed soil stockpile area.
D	06/19/01	Notice of Non-Compliance because the quarry development subcontractor drove an excavator through wetlands which were designated as off limits. Directed contractor to perform mitigation of hand removal of ruts and sprigging of native willows in the damaged area.
E	06/20/01	Authorization to build a temporary access to the quarry with reclamation requirements. Caused by the quarry subcontractor tearing up the quarry access road location unnecessarily.
F	06/29/01	Directed to repair the Lulu Pass Road at negotiated prices. Includes stabilization details. Follow-up of cost adjustments on Mod. 2.
G	07/06/01	Authorize the use of Type 1A geotextile under the repository rock buttress in lieu of the specified GT-1. The contractor did not have the proper geotextile delivered to the project at the beginning of work. Determined there is no increase in cost for the change in geotextile type.
H	07/17/01	Notice of Non-Compliance for widening the Lulu Pass Road through Como Switchbacks without authorization, unnecessarily side casting rock and dirt over the native vegetation. Directed mitigation and corrective actions including retrieving the sidecast material, re-establishment of drainage, and extra revegetation measures.
I	07/17/01	Approval for contractor to stockpile waste rock at the repository with stipulations, including covering the stockpile at night and weekends. Approval of contractor's proposed exit road from Spaulding Dumps with stipulations. Approval of proposed access road to Lower Tredennick Dumps.
J	07/18/01	Agreement to change the design repository toe drain and buttress finish elevations on the easterly side of the buttress. Contractor incorrectly surveyed and incorrectly interpreted drawings and stakes causing the subgrade to be about 2m high in this area.
K	07/25/01	Direction and receipt for backfill Glengarry (Como) Raise and culvert cleaning on Daisy Pass Road with compensation based on Mod. 3.
L	08/29/01	Authorization to use Amoco 4510 in lieu of Amoco 4516 (GT-1) between the sand and operations cover layers in the repository. Adjustment in price to be reflected in a future contract modification. As it turned out, Amoco 4510 cost more than Amoco 4516 thus there was no change in unit price for this geotextile.
M	09/19/01	Directed changes in surface drainage types & locations for Small Como, Spaulding, Lower Tredennick, Middle Tredennick, and Upper Tredennick with compensation with Actual Quantity (AQ) adjustments. Authorization to change the repository gate from woven wire to chain link. Authorization for the contractor to use a small talus slope on Como Switchbacks, with stipulations, as a source for channels on Spaulding.

SELECTIVE SOURCE RESPONSE ACTION FINAL CONSTRUCTION REPORT
Appendix C
Summary of Contract Work Orders

WO No.	Date	Description
N	09/25/01	Directed minor changes in the repository top cover liner. Directed minor adjustment in the repository fence location with compensation reflected in the AQ adjustment for fencing. Authorized use of a heavier erosion blanket for Small Como, Middle Tredennick, Rommel, and the repository because the contractor ran out of the lighter weight fabric.
O	10/16/01	Directed repository winterization requirements.
P	07/19/02	Release of the fuel storage area (WO A) from Shaw Group because URS was assuming responsibility on the McLaren Contract.
Q	09/01/02	At contractor's (Shaw) request, notice of completion of work with exceptions: 1) Extrusion welding of 6 very small tears in the top temporary liner, and 2) Pumping of the repository sump if the water level exceeded 24 inches by September 30.

Appendix D, Sump Volume/Depth Relationship

Sump Volume/Depth Relationship



Digital photographs are viewable on the enclosed CD Disk
The CD also contains this report and contract As-Built Autocad drawings