Prepared for:

U.S. ARMY CORPS OF ENGINEERS
AND
BUREAU OF LAND MANAGEMENT
Ely, Nevada Field Office

RESTORATION OF ABANDONED MINE SITES
(RAMS PROGRAM)

FINAL

GOLDEN BUTTE AND EASY JUNIOR MINE SITES 2004/2005 RECLAMATION WORK PLAN

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Prepared by:

MWH
1250 Lamoille Highway, Suite 734
Elko, Nevada 89801
(775) 738-2310

MWH
1475 Pine Grove Road, Ste. 109
Steamboat Springs, Colorado 80477
(970) 879-6260

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ACRONYMS

AHA	Activity Hazard Analysis
bgs	Below Ground Surface
BLM	Bureau of Land Management
CCV	Continuing Calibration Verification
COCR	Chain-of-Custody Record
CRDL	Contract-Required Detection Limits
CRQL	Contract-Required Quantitation Limits
DQO	Data Quality Objective
DRI	Desert Research Institute
EJ	Easy Junior Mine Site
FSP	Field Sampling Plan
GB	Golden Butte Mine Site
gpm	Gallons per Minute
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
ID	Inner Diameter
IDL	Instrument Detection Limits
LLDPE	Linear Low Density Polyethylene
MDL	Method Detection Limits
MSL	Mean Sea Level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MWH	Montgomery Watson Harza
MWHA	MWH Americas, Inc.
MWHC	MWH Constructors, Inc.
MWMP	Meteoric Water Mobility Procedure
MSDS	Material Safety Data Sheets
NDEP	Nevada Department of Environmental Protection
NDOM	Nevada Division of Minerals
NDOW	Nevada Department of Wildlife
OD	Outer Diameter
OSHA	Occupational Safety and Health Administration
PM	Project Manager
PQL	Practical Quantitation Limits
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAMS	Restoration of Abandoned Mine Sites
ROM	Run of Mine
SOW	Scope of Work
SOPs	Standard Operating Procedures
SPLP	Synthetic Precipitation Leaching Procedure
SQL	Sample Quantitation Limit
SWMP	Storm Water Management Plan
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbon
UNR	University of Nevada Reno
USACE	United States Army Corps of Engineers
WRCC	Western Regional Climate Center

EXECUTIVE SUMMARY

GOLDEN BUTTE

The Golden Butte Mine is an abandoned mine site in White Pine County, approximately 45 miles north and 20 miles west of Ely, Nevada. The mine is located on public lands administered by the Bureau of Land Management (BLM). The Golden Butte Mine has been selected for reclamation as part of the United States Army Corps of Engineers (USACE) Restoration of Abandoned Mine Sites (RAMS) program. Closure activities are being directed by the BLM – Ely Field Office. The project is being funded by USACE and surety bonds posted by former operator Alta Gold Company.

Golden Butte was a heap leach gold mine that operated from 1988 until 1996. As a primary component of the 2004/2005 reclamation, the existing heap leach pads will be closed by regrading to a configuration that is more stable and will support soil cover for revegetation. The objective of the vegetated cover is to reduce the amount of water that infiltrates into the leach pad and subsequently interacts with sulfide and other potentially leachable minerals in the pile. Water reporting at the base of the heap leach pad has elevated concentrations of several analytes, including arsenic, antimony, nitrate+nitrite and sulfate, compared to Nevada Profile II standards. Closing the existing heaps will significantly reduce the amount of water that drains from the pads over time. Until the draindown process is complete, residual water will be routed to a series of evaporation basins and an infiltration field for contingency overflow.

This 2004/2005 Reclamation Work Plan (Work Plan) describes reclamation and demonstration activities that will be carried out in order to bring the Golden Butte abandoned mine site to closure. The Work Plan text is supplemented by the attached set of Phase II Design Drawings and Specifications. The principal design elements addressed in drawings are the regrading of the existing heap leach pads, construction of evaporation basins, construction of the leach pad lysimeter and construction of the infiltration field.

Plans and specifications for the following Golden Butte reclamation activities presented in this Work Plan include:

- Leach Pad Regrading, Soil Cover and Seeding;
- Leach Pad Lysimeter Installation;
- Process Ponds Conversion to Evaporation Basins;
- Process Pond Drainage Control Structure Installation;
- Process Ponds Solids Characterization;
- Infiltration Field Percolation Characteristics;
- Infiltration Field Installation;
- Facilities Demolition and Disposal;
- On-site Landfill Construction and Closure;
- Cover Soil Confirmation Sampling;
- Plant-Area Soils Characterization and Disposal; and,
- Waste Rock Pile Reclamation.

Closure activities will be conducted in stages over the construction seasons of 2004 and 2005. Leach pad regrading, cover placement and seeding, as well as lysimeter and infiltration field installation will be carried out in 2004 along with facilities demolition and disposal. Construction of evaporation basins, which comprises the demonstration component of the project, will be completed in 2005. Waste Rock Pile reclamation is an optional item to be completed at a future time as funding permits.

EASY JUNIOR

The Easy Junior Mine Site is also located in White Pine County, approximately 45 miles west and 15 miles south of Ely, Nevada on public lands administered by the BLM – Ely Field Office.

Easy Junior was a heap leach gold mine that operated from 1989 to 1996. The Easy Junior Mine is an abandoned site that has been slated for closure as part of the RAMS program. Closure activities are being directed by the BLM – Ely Field Office. At Easy Junior, the existing heap leach pads will be closed by regrading to a configuration that is more stable and will support soil cover for revegetation. Water reporting at the base of the heap leach pad has elevated concentrations of several analytes, including arsenic and nitrate and to a lesser degree, thallium, sulfate, mercury and selenium compared to Nevada Profile II standards. Closing the existing heaps will significantly reduce the amount of water that drains from the pads over time. As a contingency, residual draindown water will continue to be routed to an infiltration field.

Plans and specifications for the following Easy Junior reclamation activities presented in this Work Plan include:

- Leach Pad Regrading, Soil Cover and Seeding;
- Process Ponds Closure;
- Infiltration Field Repair;
- Facilities Demolition and Disposal;
- On-site Landfill Construction and Closure;
- Plant-Area Soils Characterization; and,
- Waste Rock Pile Reclamation.

Leach Pad regrading, cover placement and seeding, as well as pond closure and site cleanup will be completed during the construction season of 2004. Waste Rock Pile reclamation is an optional item to be completed at a future time as funding permits.

To ensure safety and quality during construction and sampling at both sites, several additional planning documents have been prepared for this Work Plan. These documents clearly define roles and responsibilities of the construction supervision and project management team, so that project objectives and data quality objectives are met. Support documents include: a Quality Assurance Project Plan; Field Sampling Plan; Health and Safety Plan; and a Storm Water Management Plan.

1.0 INTRODUCTION

1.1 GENERAL PROJECT INTRODUCTION

1.1.1 Golden Butte Introduction

The Golden Butte Mine is an abandoned mine site located in White Pine County, Nevada, approximately 45 miles north and 20 miles west of Ely, Nevada within the Basin and Range physiographic province. The site is located on the western slope of the Cherry Creek Range in Butte Valley (see Drawing Set *Cover Sheet)*, at elevations ranging from approximately 6,650 to 7,180 feet above mean sea level (MSL). The site is arid, with average annual precipitation ranging from eight to twelve inches, most occurring as snow. There is no naturally occurring surface water in the project area.

Access to the site is via Nevada State Highway 93, west on County Road 489 on paved and dirt roads through the town of Cherry Creek, then south on the Butte Valley road approximately seven miles to the project site. The site is entirely located on public lands administered by the Bureau of Land Management (BLM).

The following mine components exist at the site: two heap-leach pads (run-of-mine and crushed ore pads); three process ponds (run-of-mine pregnant, crushed ore pregnant, barren ponds); a waste rock pile; an open pit; two water wells; a fresh water pond; and ancillary facilities and debris. The *Golden Butte Site Layout*, shown in Drawing 1, presents the layout of mine facilities. Alta Gold Company began mining operations in 1988. Mining operations ceased in 1991. Leaching operations continued on a seasonal basis until 1996. Gold was extracted via a heap-leach process using cyanide. The site was abandoned after the bankruptcy of Alta Gold.

The Golden Butte Mine site has been selected for reclamation as part of the United States Army Corps of Engineers (USACE) Restoration of Abandoned Mine Sites (RAMS) program. Closure activities are being directed by the BLM – Ely Field Office. The project is being funded by USACE and bonds posted by Alta Gold. At the sites, the existing heap leach pads will be closed by regrading to a configuration that is more stable and will support a soil cover for revegetation. The objective of the vegetated cover is to reduce the amount of water that infiltrates into the leach pad and subsequently interacts with sulfide and other potentially leachable minerals in the pile. Water reporting at the base of the heap leach pad has elevated concentrations of several analytes, including arsenic, antimony, nitrate+nitrite and sulfate, compared to Nevada Profile II standards. Closing the existing heaps will significantly reduce the amount of water that drains from the pads over time. Until the draindown process is complete, residual water will be routed to a series of evaporation basins and an infiltration field for contingency overflow.

This 2004/2005 Reclamation Work Plan (Work Plan) describes reclamation and demonstration activities that will be carried out in order to bring the Golden Butte abandoned mine site to closure. The Work Plan text is supplemented by the attached set of Phase II Design Drawings and Specifications. The principal design elements addressed in the drawings are regrading of the existing heap leach pads, construction of evaporation basins, construction of the leach pad lysimeter and construction of the infiltration field.

Plans and specifications for the following Golden Butte reclamation activities will be presented in this Work Plan:

- Leach Pad Regrading, Soil Cover and Seeding;
- Leach Pad Lysimeter Installation;
- Process Ponds Conversion to Evaporation Basins;

- Process Pond Drainage Control Structure Installation;
- Process Ponds Solids Characterization;
- Infiltration Field Percolation Characteristics
- Infiltration Field Installation;
- Facilities Demolition and Disposal;
- On-site Landfill Construction and Closure;
- Cover Soil Confirmation Sampling
- Plant-Area Soils Characterization and Disposal; and,
- Waste Rock Pile Reclamation.

Each of these tasks is discussed in more detail in Section 4.0.

Closure activities will be conducted in stages over the construction seasons of 2004 and 2005. Leach pad regrading, cover placement and seeding as well as lysimeter and infiltration field installation will be carried out in 2004 along with facilities demolition and disposal. Construction of evaporation basins, which comprises the demonstration component of the project, will be completed in 2005. Waste Rock Pile reclamation is an optional item to be completed at a future time as funding permits.

1.1.2 Easy Junior Introduction

The Easy Junior Mine Site is located on public lands administered by the U.S. Department of Interior, Bureau of Land Management (BLM) - Ely, Nevada, Field Office. The site, shown on the Drawing Set *Cover Sheet*, is located approximately 45 miles west of Ely, Nevada and 15 miles south of U.S. Highway 50 in the foothills of the Pancake Range. It lies within portions of Township 15 North, Range 56 East, sections 4, 5, 8, and 9, in White Pine County.

Access to the site is via Nevada Highway 50 to Railroad Valley, south approximately 15 miles on County Road #5, west 3 miles on Secondary County Road 1179 and south 5 miles on Secondary County Road 1179.

The following mine components exist at the site: one heap-leach pad; three process ponds (storm, barren, and settling ponds); a waste rock pile; an open pit; an infiltration field; one water well; a fresh water pond; and ancillary facilities and debris. The *Easy Junior Site Layout*, shown in Drawing 20, presents the layout of mine facilities. Alta Gold Company began mining operations in 1989 and continued intermittently until 1994. Leaching operations continued on a seasonal basis until 1996. Gold was extracted via a heap-leach process using cyanide. The site was abandoned after the bankruptcy of Alta Gold.

At Easy Junior, the existing heap leach pads will be closed by regrading to a configuration that is more stable and will support a soil cover for revegetation. The objective of the vegetated cover is to reduce the amount of water that infiltrates into the leach pad and subsequently interacts with sulfide and other potentially leachable minerals in the pile. Water reporting at the base of the heap leach pad has elevated concentrations of several analytes, including arsenic and nitrate and to a lesser degree, thallium, sulfate, mercury and selenium compared to Nevada Profile II standards. Closing the existing heaps will significantly reduce the amount of water that drains from the pads over time. As a contingency, residual draindown water will continue to be routed to an infiltration field.

This 2004/2005 Reclamation Work Plan (Work Plan) describes reclamation activities that will be carried out in order to bring the Easy Junior abandoned mine site to closure. The Work Plan text is supplemented by the attached set of Phase II Design Drawings and Specifications. The principal design element addressed in this drawing set is the regrading of the existing heap leach pad.

Plans and specifications for the following Easy Junior reclamation activities are presented in this Work Plan:

- Leach Pad Regrading, Soil Cover and Seeding;
- Process Ponds Closure;
- Infiltration Field Repair;
- Facilities Demolition and Disposal;
- On-site Landfill Construction and Closure;
- Plant-Area Soils Characterization; and,
- Waste Rock Pile Reclamation.

Leach pad regrading, cover placement and seeding, as well as infiltration field restoration, pond closure and site cleanup will be completed during the construction season of 2004. Waste Rock Pile reclamation is an optional item to be completed at a future time as funding permits.

1.2 RESTORATION OF ABANDONED MINE SITES (RAMS) PROGRAM

USACE established the RAMS program in 1998 to assist in restoration and remediation of non-coal abandoned mines. The program addresses environmental and water quality problems caused by drainage and related activities from abandoned, inactive non-coal mines. The program supports activities and priorities of Federal, State, Tribe and nonprofit entities.

The RAMS program is managed through three regional business centers, Western, Mid-continent, and Appalachian, each of which is made up of multiple Corps Districts. The closure work for these sites is being coordinated by the Omaha and Albuquerque Districts of the USACE and the Ely Field Office of the BLM. The RAMS program is funded by federal appropriations through the Corps Civil Works and Support for Others Authorities.

1.3 PURPOSE AND SCOPE

The primary objective of this Work Plan is to provide specifications for physical and chemical stabilization of mine source components to help ensure that waters of the State are not degraded and that environmental risk factors are addressed and minimized to the extent practicable. Other reclamation objectives include protecting public safety, providing a final landform compatible with natural surroundings and promoting revegetation.

The scope of work (SOW) for this Work Plan was developed through close collaboration of several agency groups with notable support from industry and academia. Members of the RAMS team included USACE, BLM, U.S. Bureau of Reclamation, Nevada Division of Minerals (NDOM), Nevada Division of Environmental Protection (NDEP), Nevada Department of Wildlife (NDOW) University of Nevada Reno (UNR), and the Desert Research Institute (DRI).

1.4 WORK PLAN ORGANIZATION

This Work Plan is divided into ten sections and five appendices. Section 1.0 provides an introduction to the Work Plan, the project objectives and scope. Background information for the site is provided in the Section 2.0. Site conditions and a description of mine facilities are presented in Section 3.0. Section 4.0 provides a description of each reclamation task to be completed in these mine closure projects. The project schedule is provided in Section 5.0. Section 6.0 introduces the Quality Assurance Project Plan (QAPP) and highlights key elements for achieving high standards of quality in the project. Section 7.0 introduces the Field Sampling Plan (FSP), which defines sampling methods and standards. A summary of the Health and Safety Plan (HASP) is provided in Section 8.0 and a summary of the Storm Water Management Plan (SWMP) is presented in Section 9.0. Section 10 lists references cited in this document.

Supporting materials are provided in appendices. Appendix A provides Specifications for Construction. The QAPP is presented in Appendix B. Appendix C presents the FSP for the project sampling activities. The HASP is provided in Appendix D. Appendix E provides the SWMP which is designed to mitigate erosion during construction. Finally, Standard Operating Procedures (SOPs) for sampling follow the appendices.

2.0 SITE DESCRIPTIONS

This section provides descriptive information for the sites including climate and geology and water resources.

2.1 CLIMATE

There is no site-specific meteorological data available. Precipitation records were obtained from the Western Regional Climate Data Center (WRCC). On average, the area receives approximately 8 to 12 inches of rain per year. Precipitation at Ely, Nevada has averaged 9.23 inches annually from 1897 to 2000. The 100-year rainfall event is estimated at 2.8 inches over a 24-hour period. Most precipitation occurs during the winter and spring months. The average annual minimum and maximum temperatures from Ely, Nevada are 28.2 and 61.0 degrees Fahrenheit, respectively, and the pan evaporation rate is 48 inches. Average annual potential evaporation based on pan evaporation data from Ruby Lake for 1948 through 2000 is 46 inches (Shevenell, 1996). Ruby Lake is located approximately 30 to 60 miles north of the sites. The sites are subject to 30 to 40 inches per year of net evaporation.

2.2 GOLDEN BUTTE GEOLOGY

The southern Cherry Creek Range consists of Cambrian through Pennsylvanian miogeosynclinal strata with very minor amounts of Tertiary volcanics. The geologic units strike generally north-south, as does most of the faulting in the area. The bedding of the geologic units generally dip westward. Recent interpretation of the faulting indicates that it consists of either high- or low-angle normal faults. The project area is underlain by Devonian Guilmette Limestone through Mississippian Chainman Shale. The northern half of the project area is comprised of the Guilmette Limestone and jasperoid that occurs at or near the contact with the overlying Pilot Shale. The ore deposit occurs near the contact of the Guilmette Limestone and jasperoid (silicified limestone) and the Pilot Shale. The mineral stibnite (Sb_2S_3) is a common accessory mineral associated with the ore deposit and related alteration. The oxidation of pyrite minerals within the ore deposit results in the dissolution of antimony (Sb) in the ore and is likely the source of antimony in site waters (including draindown waters from the heap-leach pads). The overlying Pilot Shale, while generally calcareous, contains thin fissile plates of black, non-calcareous shale that likely contributes to acidic and acid-generating areas observed in the waste rock pile. Porphyritic latite volcanic rocks form the low hills immediately north and west of the site. Also, a rhyolite dike intrudes the limestone south of the project area.

Well borings advanced in the processing area indicate that the site is underlain by a layer of alluvium that thickens from 60 feet on the eastern portion of the site to greater than 300 feet to the west, below which an unaltered porphyritic latite volcanic rock is encountered (mentioned above). A shallow, low-permeability caliche layer has been observed within the soil horizon that has formed on the alluvium.

2.3 GOLDEN BUTTE SURFACE WATER AND GROUNDWATER

There is no naturally-occurring perennial surface water near the project area, with the exception of a seep that exists in the pit and flows down into the pit. Some movement by the highwall has covered portions of the flow channel. There is evidence of use of this seep by mule deer and mourning doves (NDOW, 2003). The existing on-site ponds were constructed for mine operations. Topographic mapping of the site indicates that drainage channels exist in the vicinity of the pads that may carry seasonal and/or intermittent flows.

During operations, five well borings were drilled to depths of between 300 and 385 feet below ground surface (bgs) in the heap-leach pad area to locate mine-process water. These borings extended into the volcanic rock below the alluvium, but no water was encountered. However, groundwater was encountered in two other borings located approximately 0.5 miles upslope from the heap-leach pads and 1.5 miles west of the heap-leach pads. These borings were converted to the East and West Water Wells, respectively, and are described below. The locations of these wells are shown on Drawing 1. The closest drinking water supply well is 12 miles away in the Steptoe Valley.

The geologic log for the East Water Well indicates 60 feet of alluvium overlying fractured to more competent volcanic rock to a total depth of 220 feet. Based on the well completion forms in 1988, static groundwater was recorded at 60 feet bgs at the contact between alluvium and volcanics (Alta Gold, 2000). Additionally, the water level in the East Water Well was measured at 41.6 feet (below top of casing) on November 5, 2002. It is assumed that meteoric water infiltrates through the alluvium and saturates the fractured volcanic rock below.

The geologic log for the West Water Well reports various types of alluvium for the entire length of the boring, with no volcanic rocks encountered (the total depth of boring was 300 feet bgs). Static groundwater was recorded at 70 feet bgs on the well completion form (Alta Gold, 2000). This well was able to provide a sufficient quantity of water to the mine whereas the East Water Well produced insufficient quantities of water for mine processes.

2.4 EASY JUNIOR GEOLOGY

Geologic units at Easy Junior include sedimentary units; the Devonian Guilmette Formation (Devil's Gate Limestone), the Pilot Shale, Joana Limestone, Chainman Shale and Diamond Peak Formation of Mississippian age. Tertiary volcanics and jasperoid (Alta Gold Company, 1989b) are also found at the site.

The ore deposit at Easy Junior was formed in the core of a tightly folded anticline with bounding faults. The faults served as conduits for the ingress of metal-bearing hydrothermal fluids that altered lower members of the Chainman Shale and mineralized the rock with ore-grade gold and associated sulfides.

2.5 EASY JUNIOR SURFACE WATER AND GROUNDWATER

There is no perennial water on or near the project area. The nearest surface water is Bull Creek, located 8.8 miles southeast of the site and on the opposite side of the Pancake Range. The site is outside of the 100-year flood plain.

Water beneath the site occurs from 1,100 to 1,500 feet below ground surface. The water supply for the mine is a well located approximately 4.5 miles south of the mine area. Water in this aquifer is of potable quality.

3.0 PROJECT BACKGROUND

This section provides background information for both sites including previous mining activities, previous reclamation activities, previous studies and a summary of current site conditions.

3.1 GOLDEN BUTTE PREVIOUS MINING ACTIVITIES

The Golden Butte Mine site consisted of one open pit that was used to extract gold-bearing ore within hydrothermally altered rocks located along the western slope of the Cherry Creek Range. The mine is entirely located on public lands administered by the BLM. The pit has a depth of approximately 300 feet and covers an area of approximately 19 acres. Mining was carried out using conventional open-pit mining methods. High-grade ore material was cone crushed to ¾-inch diameter. The crushed product was hauled to the Crushed Ore Heap Leach Pad. Run-of-Mine (ROM) ore was hauled directly from the pit to the ROM leach pad.

Gold was extracted via a heap leach process using cyanide and the resulting solutions were stored in the pregnant leach ponds located downgradient of the leach pads. The gold-rich solutions were then pumped through carbon columns to extract the gold and the remaining solutions were piped to the barren pond. The solution in the barren pond was recycled back to the heap leach pads. Facilities utilized at the mine consisted of the following:

1 - open pit
1 - jaw crusher
2 - cone crushers
1 - screen
1 - waste rock area
1 - ROM heap leach pad
1 - crushed ore heap leach pad
1 - ROM pregnant pond
1 - crushed ore pregnant pond
1 - barren pond
1 - fresh water pond
1 - carbon column processing plant
1 - shop
1 - generator building
1 - reagent mixing building
1 - lime silo

The original co-owners of the project were Silver King Mines and Pacific Silver Corporation. Alta Gold Company began mining at the site in 1988 and continued operations until 1994. Leaching of the ore continued on a seasonal basis until 1996.

3.2 GOLDEN BUTTE PREVIOUS RECLAMATION ACTIVITIES

In 1995, reclamation was started under the direction of the Golden Butte Reclamation Plan (Alta Gold, 1993). However, due to bankruptcy, Alta Gold did not complete reclamation. Reclamation tasks that were undertaken by Alta Gold included:

- Re-contouring and seeding of waste rock disposal area;
- Partial rinsing of leach pads;
- The main processing plant was disassembled and removed from the site; and
- The pit was bermed and the access road was fenced.

3.3 GOLDEN BUTTE PREVIOUS STUDIES

The Golden Butte Mine Site was initially characterized for remedial work in May 2001. Results were summarized in the *Remedial Action Scoping Report* (MWH, 2001). In that report, several constituents were identified in draindown waters that exceeded the Nevada standards. Additional sampling was performed at the site in 2002. Results were reported in the *Final Work Plan, Golden Butte Mine Site Investigation* (MWH, 2002). Using these data, a closure plan was developed, which identified reclamation efforts to be considered with an engineering cost estimate. In the *Final Closure Plan, Golden Butte Mine Site Investigation* (Final Closure Plan) (MWH, 2003), a plan for closure of the site was presented. In 2004, SRK Consultants, under subcontract to MWH, produced the Environmental Assessment for Golden Butte (SRK, 2004a). These materials were used to develop background for this 2004/2005 Reclamation Work Plan.

3.4 GOLDEN BUTTE CURRENT SITE CONDITIONS

There are no current mining or processing activities at the site. The site is visited periodically by BLM and NDEP staff to monitor site conditions. Current site conditions from the Final Closure Plan (MWH, 2003) are summarized below.

3.4.1 Heap-Leach Pads and Draindown Waters

The Crushed Ore Heap Leach Pad at Golden Butte is approximately 13.1 acres in area, built in five 15-foot lifts, with side slopes at approximately 2H to 1V. The Run-Of-Mine Heap Leach Pad is approximately 12.8 acres in area, built in five 15-foot lifts, with side slopes at approximately 2H to 1V. Heap-leach pad materials are generally non-acidic and have low acid-generating potential. Parameters that exceeded Nevada Profile II Standards in draindown waters include:

- Antimony (between one and two orders of magnitude greater than the Nevada Profile II standard and three orders of magnitude greater than the Environmental Protection Agency drinking water standard);
- Nitrate+nitrite (as N), arsenic and sulfate (between one and two orders of magnitude above the Nevada standards); and
- Magnesium, selenium, thallium, total dissolved solids and weak-acid dissociable cyanide (within approximately the same order of magnitude as the Nevada standards).

3.4.2 Process Ponds

Process ponds at Golden Butte have a capacity of approximately three million gallons of water. At the time of this writing, the Barren Pond and the Fresh Water Ponds are dry and the Crushed Ore Pond and Run-Of-Mine Pond are both approximately half full. The ponds are lined with 80-mil HDPE with 3H to 1V side slopes.

Pond waters are alkaline and contain high total dissolved solids (major cations/anions). Parameters that exceeded Nevada Profile II Standards in pond water include:

- Antimony (between two and three orders of magnitude greater than the Nevada Profile II standard, and four orders of magnitude greater than the Environmental Protection Agency drinking water standard);

- Nitrate+nitrite (as N), chloride, sulfate and thallium (between two and three orders of magnitude above the Nevada standards);
- Magnesium, selenium, arsenic, and total dissolved solids (between one and two orders of magnitude above the Nevada standards); and
- Cadmium, silver, iron, weak-acid dissociable cyanide and pH (within the same order of magnitude as the Nevada standards).

3.4.3 Waste Rock Pile

Barren areas on the waste rock pile are generally acidic and have the potential to generate additional acidity. Low pH and high salt concentrations inhibit vegetation in the barren areas. Meteoric water mobility procedure leaching test results for barren areas on waste rock exceed standards for aluminum, antimony, arsenic, beryllium, cadmium, chromium, copper, iron, manganese, nickel, selenium, zinc, fluoride, magnesium, sulfate, total dissolved solids and pH.

Vegetated areas on the waste rock pile are non-acidic and have low acid-generating potential. Meteoric water mobility procedure leaching test results for vegetated areas on waste rock exceed standards (to a lesser magnitude than the barren soil sample) for antimony, manganese, thallium, sulfate and total dissolved solids.

Total metals concentrations in the barren and vegetated soil samples on the waste rock pile were evaluated with respect to human health and wildlife risk. The metals concentrations indicate no imminent and substantial endangerment to human health. The arsenic concentration in the barren soil exceeded the BLM generic wildlife risk management criteria; however the risk is not considered substantial (MWH, 2003).

3.4.4 Groundwater

Groundwater in the area is alkaline, calcium/magnesium-bicarbonate type water. The Nevada Profile II standards were not exceeded in groundwater. Antimony was the only parameter that exceeded the Environmental Protection Agency drinking water standard (by approximately one order of magnitude).

3.4.5 Borrow Source Material

Approximately 15,000 cubic yards of borrow source material were identified on-site, although more colluvial material is available, if necessary. Two, on-site borrow sources were classified as clayey-gravels with hydraulic conductivities of 6.2 x 10^{-4} cm/s (BS-02) and 2.5 x 10^{-4} cm/s (BS-03), respectively. There is an unlimited supply of silt material at an off-site borrow source (BS-01), although this material lacks plasticity and may be unsuitable for cover material. The off-site silt material was classified as a silty-gravel with a hydraulic conductivity of 1.2 x 10^{-4} cm/s. All three borrow sources are suitable for plant growth. Sampling will be undertaken, as part of this Work Plan, to confirm the suitability of the material between the two heap leach pads for use as cover soil.

3.5 EASY JUNIOR PREVIOUS MINING ACTIVITIES

Mining at the Easy Junior Mine began in late 1989 and continued through 1990. The mine was maintained in care and maintenance status during 1991 and 1992; mining operations began again in 1993 and continued through 1994. Both crushed and run-of-mine ore was placed on the heap. Gold was recovered using conventional cyanide leach technology. Pregnant solution was collected in a sump and pumped through carbon columns. Barren solution was collected in a pond and re-circulated back to the heap. Loaded carbon was transported to Alta's Robinson Project for precious metal recovery. Leaching continued through late 1996; cyanide addition to the barren solution was discontinued in October 1996.

The spent heap covers about 26.9 acres and contains about 1.7 million tons of spent ore. Draindown flow varies seasonally between about 0.4 and 2 gallons per minute (gpm). The heap was constructed to a height ranging between 60 and 75 feet above ground surface with side slopes at 2H:1V. The pregnant solution sump and pond, the barren solution pond, and a stormwater pond are located downgradient of the heap as shown on Drawing 20.

Fresh water rinsing of the spent heap began in October 1996 and continued through June 1997. Rinsing was discontinued when the weak acid dissociable cyanide concentrations decreased to 0.1 milligrams per liter and the pH stabilized at 8.1 standard units. Approximately seven million gallons of neutralized draindown fluid was land applied in an area immediately south of the heap (CDM, 2002).

Prior to the completion of reclamation activities, Alta filed for bankruptcy. During the initiation of bankruptcy proceedings, Alta discontinued site reclamation; however, a surety bond was obligated for reclamation purposes.

3.6 EASY JUNIOR PREVIOUS RECLAMATION ACTIVITIES

Alta Gold submitted a reclamation permit application in 1993 and addressed agency comments in 1996; a reclamation permit was issued by the Nevada Division of Environmental Protection (NDEP). A water pollution control permit was issued for the site in 1990 and renewed in 1995. In compliance with the water pollution control permit, a Final Closure Plan was submitted to NDEP in 1995. Some reclamation and closure tasks were initiated at the site including:

- The waste rock pile was sloped and about two thirds of the surface was covered with growth media before the growth media stockpile was consumed;
- A draindown fluid collection system and infiltration field were constructed;
- The pit was bermed and the access road was fenced;
- The crusher superstructure was removed as were most ancillary buildings; and,
- The main processing plant was disassembled and removed from the site.

In September 1998, the draindown fluid was routed to the infiltration field downgradient of the spent heap. The infiltration field is comprised of two six-inch pipes that flow from the northwest and southwest corners of the spent heap. These two pipes join together in a single six-inch pipe subsurface and upstream of a distribution box which daylights at the surface for monitoring and sample collection. Four perforated 1.25-inch diameter pipes exit the distribution box to the west. The four pipes are about 100 feet in length and spaced about 20 feet apart, and were buried about three feet bgs (CDM, 2003b).

Major components not reclaimed include the spent heap, the settling pond, the barren ponds, the stormwater (overflow) pond, the fresh water pond, and the crusher foundation. Building foundations, miscellaneous outbuildings, and piping remain. Haul roads and access roads are intact throughout the site. A fresh water well, located about 4.5 miles south and east of the site and a buried pipeline are still intact. The fresh water well was located at this site because of the inability to locate a reliable water supply on-site at a reasonable depth.

Although the majority of the waste rock pile was reclaimed, about 20 acres on the east side of the pile has no topsoil with little to no vegetation. Vegetation is established over the remaining areas with some bare spots, which appear to be caused by low pH resulting from sulfide oxidation in the pile. Hydrated lime has been selectively placed over barren areas.

3.7 EASY JUNIOR PREVIOUS STUDIES

The Easy Junior Mine Site was most recently characterized for remedial work by CDM in their *Work Plan, Easy Junior Mine Site Restoration Characterization* (CDM, 2002). The site investigation was followed by the *Total Mine Reclamation Cost Estimate Report* (CDM, 2003a). Later in the same year CDM produced both the *Final Investigation Report* (CDM, 2003b) and the *Final Closure Plan* (CDM, 2003c). In 2004, SRK Consultants, under subcontract to MWH, produced the Environmental Assessment for Easy Junior (SRK, 2004b). These documents were used as a source of background material for this 2004/2005 Reclamation Work Plan.

3.8 EASY JUNIOR CURRENT SITE CONDITIONS

There are no current mining or processing activities at the site. The site is visited periodically by BLM and NDEP staff to monitor site conditions. Current site conditions from the restoration characterization (CDM, 2002) and the Environmental Assessment (SRK, 2004b) are summarized below.

3.8.1 Heap-Leach Pads and Draindown Waters

The Heap Leach Pad at Easy Junior is approximately 26.9 acres in area, built in four 20-foot lifts, with side slopes at approximately 2H to 1V. Heap-leach pad materials are generally non-acidic and have low acid-generating potential. Parameters that exceeded Nevada Profile II Standards in draindown waters are indicated in Table 3.1, *Constituents in Draindown Solution Compared to Nevada Water Quality Standards (11/22/02).*

TABLE 3.1
CONSTITUENTS IN DRAINDOWN SOLUTION COMPARED TO NEVADA WATER QUALITY STANDARDS (11/22/02)

Constituent	Nevada Drinking Water Standard (mg/L)	Draindown Solution Concentration (mg/L)
Aluminum	0.05-0.2	0.3
Antimony	0.006	0.007
Arsenic	0.05	0.15
WAD Cyanide	0.2	0.098
Mercury	0.002	0.0059
Nitrate/Nitrate	10	230
Selenium	0.05	0.12
Sulfate	250-500	1,500
Thallium	0.002	0.011
Total Dissolved Solids	500-1,000	3,800

Source: CDM, 2002, Appendix B

3.8.2 Process Ponds

Process ponds at Easy Junior are currently dry. The ponds are lined with 60-mil HDPE with 3H to 1V side slopes. Pond volumes are as listed in Table 3.2, *Easy Junior Pond Specifications.*

TABLE 3.2
EASY JUNIOR POND SPECIFICATIONS

Easy Junior Ponds	Dimensions (LxWxD in feet)	Volume (cubic yards)
Storm Pond	230x320x10	19,800
Barren Pond	230x320x9	17,325
Settling Pond	110x110x8	1,550
Fresh Water Pond	288x288x6	12,288

3.8.3 Waste Rock Pile

Barren areas on the waste rock pile are generally acidic and have the potential to generate additional acidity. Low pH and high salt concentrations inhibit vegetation in barren areas. In 1994 and 1995 approximately 60% of the Waste Rock Pile was reclaimed by Alta Gold. The entire pile was regraded from angle of repose to the current configuration with side slopes at approximately 3H to 1V. Westerly facing slopes and parts of the top of the pile were revegetated by application of cover soil and seed. These treated areas generally display good vegetation success. Areas on the east side of the pile (approximately 20 acres) have had minimal volunteer vegetation, probably due to the lack of fines in the waste rock. Certain areas on the west side, where cover soil was applied too thinly, have experienced sulfide oxidation and have potential to generate acid. Drawing 20 shows the outline of the Waste Rock Pile that has been revegetated.

3.8.4 Borrow Source Material

Approximately 120,000 cubic yards of borrow source material was identified on-site in the growth media stockpile located adjacent to the Heap Leach Pad to the north. Other areas of borrow material were sampled and tested as part of the *Final - Investigation Report* (CDM, 2003b). Borrow source #1, located immediately west of the Waste Rock Pile was used as cover material for reclamation of that site component in 1995. It has since been reclaimed; however, there is essentially an unlimited supply of borrow material at this location.

4.0 RECLAMATION TASKS

This section provides a description of each task the reclamation contractor will perform to reclaim and close Golden Butte and Easy Junior. There are drawings to illustrate each task. The drawings are presented in a separate section that follows the text. Detailed information regarding construction and installation of new facilities is presented in Appendix A, *Specifications*. The QAPP, presented in Appendix B, provides project controls designed to assure data quality and collection of data representative of site conditions. Detailed descriptions of sampling and analysis methodologies associated with each sampling task are provided in the FSP in Appendix C.

The activities to be completed at Golden Butte are to be performed in as many as three separate mobilizations. Major earthworks, including regrading, soil cover and seeding and the installation of the lysimeter and the infiltration field will be conducted in 2004. Construction of the evaporation basins for the demonstration project will likely follow in 2005. Reclamation of the Waste Rock pile is an optional item to be completed at a future time as funding permits.

All activities described for Easy Junior, except Waste Rock Pile reclamation, will be performed during 2004. Reclamation of the Waste Rock will require a separate mobilization in the future as funding permits. Specifications for equipment cleanliness during mobilization/demobilization are presented in Appendix A, Section S.1.1.

4.1 ACCESS CONTROL AND SIGNAGE

Existing berms at the site are sufficient to limit access into the pit areas. Additional signage will be placed on the berms and around the site. The signs and posts will be provided by the BLM/NDOM.

4.2 HAUL/ACCESS ROAD IMPROVEMENTS

The reclamation contractor will be responsible for maintaining haul/access roads at Golden Butte and Easy Junior to allow construction traffic to travel safely and efficiently for the duration of the project.

4.3 CLEARING AND GRUBBING

The reclamation contractor will clear and grub only those areas required to perform the work, with the approval of the Resident Engineer. An archeological survey will be performed for any previously undisturbed areas that will be disturbed during reclamation.

4.4 EROSION CONTROL

Erosion controls are the responsibility of the reclamation contractor. The reclamation contractor will employ the necessary erosion controls to prevent erosion in the construction area. The reclamation contractor will implement and maintain erosion controls during construction operations as described in the *Storm Water Management Plan*, provided in Appendix E.

4.5 DUST CONTROL

The reclamation contractor will make the necessary provisions to control dust during the earthworks operations. The west well at the Golden Butte site is available for use, but it will require a 440 volt power supply for operation. Water for the Easy Junior site will have to be trucked in from an outside source.

4.6 GOLDEN BUTTE REGRADE CRUSHED ORE HEAP LEACH PAD

The existing condition (surveyed topography) of the key reclamation components (heap leach pads and ponds) of the overall site is shown in Drawing 2, *Golden Butte Existing Conditions*.

The existing condition of the Crushed Ore Heap Leach Pad is shown in plan view in Drawing 3, *Golden Butte Crushed Ore Heap Leach Pad Existing Conditions*. The current configuration of the pad has side slopes of approximately 2H:1V and the top is relatively flat. The surface area of the pad is 13.0 acres. Regrading by the reclamation contractor will be required to achieve a side slope configuration that is stable and will support growth media for revegetation. The leach pad materials lie on a 60-mil HDPE liner. The surface area of the liner under the pile is 12.0 acres. The edge of the liner is shown on Drawing 3.

The Crushed Ore Heap Leach Pad will be regraded to a nominal side slope of approximately 3H:1V. This configuration is shown on Drawing 4, *Golden Butte Crushed Ore Heap Leach Pad Regraded Topography*. The top of the pad will be regraded as necessary to cause water to drain to the southeast toward the access ramp. The toe of the regraded pile will not be oversteepened. It will conform to the prescribed 3H:1V slope at a minimum or flatter.

The regrading operation will result in approximately 96 percent of the existing volume of material remaining on the liner. Extending some material beyond the liner during regrading is acceptable.

The extent and depth of material movement on the Crushed Ore Heap Leach Pad is shown on the cut/fill isopach on Drawing 5, *Golden Butte Crushed Ore Heap Leach Pad Cut/Fill Isopach*. On the drawing, areas of cut are indicated with negative contours and areas of fill are indicated with positive contours and shading. The cut/fill volume balance was refined in the Phase II design. Approximately 42,000 cubic yards of cut will be required to regrade the leach pad to a final configuration of 3H:1V according to the Phase II design. The regrade design will be optimized to balance cut and fill during construction. The regrading plan is shown in cross section in Drawing 6, *Golden Butte Crushed Ore Heap Leach Pad Cross-Sections*.

4.7 GOLDEN BUTTE SOIL COVER AND SEED CRUSHED ORE HEAP LEACH PAD

The reclamation contractor will provide the necessary equipment, materials and labor for the placement of 1.5 feet of suitable material over the regraded Crushed Ore Heap Leach Pad. The regraded pad will have a surface area of approximately 13.2 acres. Approximately 33,500 cubic yards of material will be required to cover the regraded pile. The final cover configuration is shown in Drawing 7, *Golden Butte Crushed Ore Heap Leach Pad Final Cover*. Whenever practical, keying cover material into native ground is desired. Seeding shall be performed in accordance with the attached specifications.

4.8 GOLDEN BUTTE LYSIMETER ON CRUSHED ORE HEAP LEACH PAD

A single lysimeter will be installed on the Crushed Ore Heap Leach Pad. The lysimeter will be constructed of 60-mil Linear Low Density Polyethylene (LLDPE), which will be covered with a Geocomposite Drainage Layer. It will be installed at the top of the regraded pad approximately 50 feet from the crest on the east side of the regraded pad near the access ramp. The lysimeter membrane will be placed at an excavated depth of approximately three feet below the top of the regraded surface and sloped at 2% grade toward the east side of the pile. The details of the lysimeter are shown in Drawing 8, *Golden Butte Lysimeter Details*.

Water that infiltrates through the cover over the lysimeter will be captured and conveyed to a monitoring box located on the east side of the pile. Instrumentation and monitoring of the lysimeter will be designed by UNR/DRI under separate contract with USACE. Data from monitoring of the lysimeter will be used to evaluate the effectiveness of the soil cover in preventing infiltration into the pile.

4.9 GOLDEN BUTTE REGRADE RUN OF MINE HEAP LEACH PAD

The existing condition of the Run of Mine (ROM) Heap Leach Pad is shown in plan view in Drawing 9, *Golden Butte ROM Heap Leach Pad Existing Conditions*. The current configuration of the pad has side slopes of approximately 2H:1V and the top is irregular with two relict lobes of an incomplete lift. The surface area of the pad is 12.8 acres. The surface area of the liner under the pile is 12.0 acres. The edge of the liner is shown on Drawing 9.

The reclamation contractor will regrade the ROM Heap Leach Pad to a nominal side slope of approximately 3H:1V, as shown on Drawing 10, *Golden Butte ROM Heap Leach Pad Regraded Topography*. The top of the pad away from the lobes will be regraded to drain to the southeast, toward the ramp. This will require some fill on the top of the existing pad. This fill will be derived from the incomplete lift lobe on the southwest side of the top of the pad.

Extending some material beyond the liner during regrading is acceptable. The regraded pad will have a surface area of approximately 12.8 acres.

Planned movement of material on the ROM Heap Leach Pad is shown using cut/fill isopach in Drawing 11, *Golden Butte ROM Heap Leach Pad Cut/Fill Isopach*. On the drawing, areas of cut are indicated with negative contours and areas of fill are indicated with positive contours and shading. The cut/fill volume balance was refined in the Phase II design. Approximately 44,500 cubic yards of cut will be required to regrade the leach pad to a final configuration of 3H:1V according to the Phase II design. The regrade design will be optimized to balance cut and fill during construction. The regrading plan is shown in cross section in Drawing 12, *Golden Butte ROM Heap Leach Pad Cross-Sections*.

4.10 GOLDEN BUTTE SOIL COVER AND SEED ROM HEAP LEACH PAD

The reclamation contractor will provide the necessary equipment, materials and labor for the placement of 1.5 feet of suitable material over the regraded ROM Heap Leach Pad. The regraded pad will have a surface area of approximately 12.8 acres. Approximately 31,500 cubic yards of material will be required to cover the regraded pile. The final cover configuration is shown in Drawing 13, *Golden Butte ROM Heap Leach Pad Final Cover*. Whenever practical, keying cover material into native ground is desired. Seeding of the ROM Heap Leach Pad will be performed in accordance with the attached specifications.

4.11 GOLDEN BUTTE FACILITY DEMOLITION AND DISPOSAL

Th reclamation contractor will provide the necessary equipment, materials, and labor to consolidate all site debris in the on-site Class III landfill (the former Fresh Water Pond) discussed below. All structures, foundations, equipment and debris will be reduced and disposed of in the Class III landfill. All draindown conveyance channel liners exposed after regrading will be cut away and disposed of in the Class III landfill. Fencing that is not salvaged shall be placed in the Class III landfill. Any batteries or drums with liquid contents **cannot** be placed in the Class III landfill and must be transported and disposed of off site by the contractor. Any soils potentially contaminated with petroleum hydrocarbons **cannot** be placed in the Class III landfill and must be spread in a thin layer, less than one-foot thick, over the heap leach material, on containment, prior to cover placement.

4.12 GOLDEN BUTTE FRESH WATER POND – CLOSED IN PLACE CLASS III LANDFILL

The contractor will provide the necessary equipment, materials and labor to close the Fresh Water Pond in place as a Class III Landfill. The fresh water pipeline from the west water well to the Fresh Water Pond will be plugged at both ends and left in place. Any solids contained in the pond will be left in place and covered with soil and demolition debris as described below.

Site debris and scrap and construction waste material will then be placed in the pond. Concrete slabs are to be broken and left in place with a soil cover. Once all debris have been placed in the pond, the liner will be cut at its perimeter and folded back to cover the fill. The remaining pond volume will be filled using locally available borrow material with a minimum cover thickness of three feet. The top surface will be sloped to promote runoff.

4.13 GOLDEN BUTTE INFILTRATION FIELD INSTALLATION

The reclamation contractor will provide the necessary equipment, materials, and labor to construct an infiltration field in accordance with the specifications in Appendix A. The infiltration field will be located approximately as shown in Drawing 14, *Golden Butte Evaporation Basin Layout Plan View*. The infiltration field will be constructed using a series of trenches and infiltration chambers. The depth and configuration of the trenches will be sufficient to penetrate the shallow caliche layer and not less than three feet below ground surface.

The infiltration field will require an area of approximately 6,000 ft^2 (0.14 acres) using a saturated permeability 1.20 X 10-4 cm/s and an inflow rate of 5 gpm and a factor of safety of 2.0. This saturated permeability is the minimum from the borrow sources reported in the Final Closure Plan (MWH, 2003). Modeled average draindown rates from the reclaimed heap leach pads are in the range of 0.0 to 2.0 gallons per minute.

4.14 GOLDEN BUTTE MATERIAL SCREENING AND STOCKPILE

The contractor will provide the necessary equipment, materials and labor to screen and stockpile fill materials for the evaporation ponds. The description of materials required is provided in the attached specifications for Evaporation Basin Construction. Table 4.1, *Golden Butte Pond Dimensions and Pond Fill Material Volumes* provides the dimensions and volume estimates for process ponds.

TABLE 4.1
GOLDEN BUTTE POND DIMENSIONS AND POND FILL MATERIAL VOLUMES

	Dimensions (LxWxD in feet)	Volume (cubic yards)	Notes
Golden Butte Run of Mine Pond			
Total Pond	220x290x9	16,605	dimensions and volumes from survey and designs
Clean Gravel		1,109	dimensions and volumes from survey and designs
Fines		5,172	dimensions and volumes from survey and designs
Coarse Rock		6,805	dimensions and volumes from survey and designs
Random Fill		3,519	dimensions and volumes from survey and designs
Golden Butte Crushed Ore Pond			
Total Pond	205x290x8	13,863	dimensions and volumes from survey and designs
Coarse Rock		7,777	dimensions and volumes from survey and designs
Random Fill		6,086	dimensions and volumes from survey and designs
Golden Butte Barren Pond			
Total Pond	130x190x8	4,951	dimensions and volumes from survey and designs
Coarse Rock		2,960	dimensions and volumes from survey and designs
Random Fill	13.1	1,991	dimensions and volumes from survey and designs

TABLE 4.1 GOLDEN BUTTE POND DIMENSIONS AND POND FILL MATERIAL VOLUMES			
	Dimensions (LxWxD in feet)	Volume (cubic yards)	Notes
Golden Butte Fresh Water Pond			
Total Pond	90x130x8	2,800	approximate based on plan dimensions and estimated depth
Note:All ponds have side slopes of 3H:1V			

Many of the required materials of the appropriate size and/or gradation may be encountered during regrading of the heap leach pads. Materials are to be stockpiled on containment, on the existing leach pad liner located on the forward apron of each of the regraded heap leach pads. Designs indicate ample room for storage of materials on containment in these locations after regrading.

4.15 GOLDEN BUTTE CRUSHED ORE POND – LOW COST EVAPORATION BASIN

The activities discussed in Section 4.15 through 4.19 are planned for the 2005 construction season.

Waters contained in the Crushed Ore Pregnant Pond will be transferred by the reclamation contractor to the ROM Pregnant Pond and/or the Barren Pond prior to the start of construction. Upon completion of construction of the Crushed Ore Pond Evaporation Basin, the water contained in the ROM Pregnant Pond will be pumped back to the Crushed Ore Pond Evaporation Basin.

Following removal of waters from the pond, solids that have collected in the pond will be characterized by MWH using Synthetic Precipitation Leach Procedure (SPLP) for Nevada Profile II parameters. The test results are required for documentation purposes. Solids will be left in place and incorporated into the construction of the evaporation basin.

Following removal of water from the pond, the HDPE liners in the pond and inflow channels will be inspected. Any damaged areas will be repaired prior to start of placement of fill material. Liner repair work will include patching of pond areas where the liner is intentionally breached during installation of inflow and outflow pipes for the evaporation basin. Liner repairs will be tested in accordance with the specifications.

A six-inch layer of silt from valley borrow area BS-01, or other suitable source, will be placed over the liner as a protective layer prior to construction of the evaporation basin. A one-foot layer of material from the crushed ore heap leach pad will be placed on top of the protective layer. At no time will equipment operating over the liner have less than 1.5-feet of material between the equipment tires or tracks and the liner. Care will be taken to ensure that the liners are not damaged during basin construction.

The reclamation contractor will backfill the bottom of the pond with random fill material to a depth five feet below the top of the pond. A four-foot layer of clean, poorly graded coarse rock will be placed above the random fill.

During construction, the reclamation contractor will divert draindown from the leach pads to be collected and stored in the Barren Pond. Upon completion of the Crushed Ore Evaporation Basin, the reclamation contractor will transfer waters collected or stored in the ROM Pregnant Pond and/or Barren Pond to the Crushed Ore Evaporation Basin.

The reclamation contractor will construct a draindown collection structure at the toe of the Crushed Ore Heap Leach Pad in the location shown in Drawing 14. Draindown water will be transported to the Crushed Ore Pregnant Pond through a solid pipe that will lie in the trough of the inflow channel. The inflow channel will be backfilled with coarse fill and will serve as a redundant flow path in the event that pipe flow is compromised. The pipe will discharge in the basin at the base of the coarse fill material, as shown on Section H, Drawing 15, *Golden Butte Crushed Ore & Barren Pond Evaporation Basin Sections.*

The primary outflow pipe will have an invert slightly below the top of the coarse fill. An overflow spillway will be located above the primary outflow pipe and will have an invert level with the top of the coarse fill. Both the primary outflow and the overflow spillway will discharge to a distribution box installed by the reclamation contractor located on the berm of the Crushed Ore Pregnant Pond. Outflow from the distribution box will be piped to the Barren Pond. The outflow pipe will be buried a minimum of four feet below ground surface. Flow will be monitored by instrumentation specified by UNR/DRI. The distribution box will be sized to allow hand sampling for water quality testing. A sampling port will be installed that could later be used in the future as a wildlife guzzler if permitted by NDEP/NDOW. The distribution box will be covered and insulated to prevent wildlife interaction and freezing.

A two-inch diameter piezometer will be installed to the bottom of the pond at approximately the location shown in Drawing 14. The piezometer will be machine slotted from the bottom to at least one foot above the top of the random backfill. The slotted interval of the piezometer will be wrapped with geotextile. The piezometer can also be used to sample stored water, or drain the basin using a submersible pump.

4.16 GOLDEN BUTTE BARREN POND – LOW COST EVAPORATION BASIN

The reclamation contractor will construct the Barren Pond evaporation basin similar to the Crushed Ore Evaporation Basin. The outflow lines from the ROM and Crushed Ore Pregnant Ponds will each discharge into the Barren Pond in separate pipe lines. The inflow lines will breach the liner of the Barren Pond and enter at the bottom of the coarse fill layer.

Waters contained in the Barren Pond at the start of construction will be transferred by the reclamation contractor to the ROM Pregnant Pond and/or the Crushed Ore Pregnant Pond prior to the start of construction.

Following removal of waters from the pond, solids that have collected in the pond will be characterized by MWH using SPLP for Nevada Profile II parameters. The test results are required for documentation purposes. Solids will be left in place and incorporated into the construction of the evaporation basin.

Following removal of water from the pond, the HDPE liners in the pond and inflow channels will be inspected by the reclamation contractor. Any damaged areas will be repaired by the reclamation contractor prior to start of placement of fill material. Liner repair work will include patching of pond areas where the liner is intentionally breached during installation of inflow and outflow pipes for the evaporation basin. Liner repairs will be tested in accordance with the specifications.

A six-inch layer of silt from valley borrow area BS-01, or other suitable source, will be placed over the liner as a protective layer prior to construction of the evaporation basin. A one-foot layer of material from the crushed ore heap leach pad will be placed on top of the protective layer. At no time will equipment operating over the liner have less than 1.5-feet of material between the equipment tires or tracks and the liner. Care will be taken to ensure that the liners are not damaged during basin construction.

The bottom of the pond will be backfilled with random fill material to a depth five feet below the top of the pond, as shown in Drawing 15. A four-foot layer of poorly graded coarse rock will be placed above the random fill layer.

The primary outflow pipe will have an invert slightly below the top of the coarse fill. An overflow spillway will be located above the primary outflow pipe and will have an invert level with the top of the coarse fill. Both the primary outflow and the overflow spillway will discharge to a distribution box located on the berm of the Barren Pond.

Outflow from the distribution box will be piped to the infiltration field. The outflow pipe will be buried a minimum of four feet below ground surface. Burial to this depth will mitigate freezing in winter as demonstrated in other projects near by. Flow will be monitored by instrumentation specified by UNR/DRI. The distribution box will be sized to allow hand sampling for water quality testing. A sampling port will be installed that could later be used in the future as a wildlife guzzler if permitted by NDEP/NDOW. The distribution box will be covered and insulated to prevent wildlife interaction and freezing.

A two-inch diameter piezometer will be installed to the bottom of the pond at approximately the location shown in Drawing 14. The piezometer will be machine slotted from the bottom to at least one foot above the top of the random backfill. The slotted interval of the piezometer will be wrapped with geotextile. The piezometer can also be used to sample stored water, or drain the basin using a submersible pump.

4.17 GOLDEN BUTTE ROM POND – ADVANCED EVAPORATION BASIN

A draindown collection structure will be constructed at the toe of the ROM Heap Leach Pad in the location shown in Drawing 16, *Golden Butte ROM Pregnant Pond Plan View*. Draindown water will be transported to the ROM Pregnant Pond through a solid pipe that will lie in the trough of the inflow channel. The existing inflow channel will be backfilled with coarse fill and will serve as a redundant flow path in the event that pipe flow is compromised.

Waters contained in the ROM Pregnant Pond at the start of construction will be transferred by the reclamation contractor to the Crushed Ore Pregnant Pond and/or the Barren Pond prior to the start of construction.

The inflow pipe will be equipped with a valve and sampling port (and eventually with monitoring instrumentation prescribed by UNR/DRI). After entering the pond, the inflow distribution pipe will run along the east side of the pond at a grade of one percent down to the south. The inflow distribution pipe will be slotted along the centerline of the west side of the pipe to promote an even distribution of the inflow water along the length of the pond.

The bottom of the pond will be backfilled with random fill material to a depth seven feet below the top of the pond, as shown in Drawing 17, *Golden Butte ROM Pregnant Pond Evaporation Basin Sections*. Above the random backfill, four feet of poorly graded (well sorted) coarse fill will be placed.

Two feet above the bottom of the coarse fill, slotted ventilation pipes will be placed running from the southwest to the northeast. Ventilation pipes will be placed on 20-foot centers across the pond. Vertical standpipes will connect each end of the ventilation pipes to the surface. The southwest standpipes will be covered with a vent cap to prevent rainfall from entering the pipe. The northeast standpipes will be covered with turbine ventilators.

The coarse rock layer will be covered by a geotextile filter fabric overlain by a minimum of 1.5 feet of soil from borrow source BS-01, or an approved equivalent. This layer will serve as the primary evaporation layer. The top of the soil layer will be sloped downward from the east side of the pond to the west side at a one percent grade to promote distribution of the inflow over the maximum area. A six-inch layer of clean, poorly graded gravel will overlay the soil layer. This layer will serve as the inflow distribution layer allowing water to flow freely across the width of the pond. This layer will also mitigate wildlife interaction and inhibit vegetation.

The west end of the pond will contain a one-foot layer of coarse fill that will extend to the surface of the pond. Water that does not infiltrate into the soil layer or evaporate will flow through this drain to the lower coarse fill layer.

The primary outflow from the ROM Pregnant Pond will be a self-priming siphon made from three-inch PVC pipe. The siphon intake will be located within six inches of the bottom of the coarse fill layer. The top of the siphon will be placed even with the top of the coarse fill layer. The siphon will flow into a distribution box located at the toe of the ROM Pregnant Pond berm. A valve located inside the distribution box will control flow from the siphon. Fittings will be placed on the end of the siphon line to enable priming of the siphon using a hand pump. The hand pump can be used for on-demand release of the pond storage.

An overflow spillway will be constructed at the top of fill elevation in the pond. The spillway will flow over the liner and into a buried pipe that flows into the distribution box (same box as siphon discharge). The distribution box will discharge into a pipe flowing to the Barren Pond. The outflow pipe will be buried a minimum of four feet below ground surface.

Flow will be monitored by instrumentation specified by UNR/DRI. The distribution box will be sized to allow hand sampling for water quality testing. A sampling port will be installed that could later be used in the future as a wildlife guzzler if permitted by NDEP/NDOW. The distribution box will be covered and insulated to prevent wildlife interaction and freezing.

A two-inch diameter piezometer will be installed extending through the various layers of fill to the bottom of the pond at approximately the location shown in Drawing 16. The piezometer will be machine slotted from the bottom to at least one foot above the top of the random backfill. The slotted interval of the piezometer will be wrapped with geotextile. The piezometer can also be used to sample stored water, or drain the basin using a submersible pump.

4.18 GOLDEN BUTTE INSTALLATION OF LEACH PAD DRAINAGE COLLECTION STRUCTURES

The reclamation contractor will provide the necessary equipment, materials and labor to capture and convey leach pad draindown to the process ponds. Lined channels that convey draindown from the leach pad to the pregnant ponds will be protected with a layer of silt from BS-01 or other suitable source. Liner material not covered during regrading will be cut away and relocated in the on-site landfill, unless used to store pond fill materials. Near the ponds, the lined channels will be dammed and flow will be funneled to a solid pipe for conveyance to the pond. Solid draindown pipes will be equipped with monitoring instrumentation, shut off valves and sampling ports for possible long-term source for a wildlife guzzler (if water quality permits). Details for drainage collection structures are shown in Drawing 18, *Golden Butte Drainage Collection Structure Details*. Inflow and outflow monitoring instrumentation, as well as site meteorological monitoring instrumentation (weather station) will be developed by UNR/DRI under separate contract with USACE.

4.19 GOLDEN BUTTE WASTE ROCK PILE SOIL COVER AND SEED (2005)

The reclamation contractor will provide the necessary equipment, materials, and labor to neutralize and cover portions of the Waste Rock Pile. Approximately 9 acres of the Waste Rock Pile will require cover and seed. These areas are shown in Drawing 19, *Golden Butte Waste Rock pH Survey*. Local low-pH areas will be amended with hydrated lime at the direction of the Resident Engineer. Areas will also be covered with six inches of borrow soil from BS-03 and revegetated.

4.20 EASY JUNIOR REGRADE HEAP LEACH PAD

Sections 4.20 through 4.26 discuss reclamation activities to be performed at East Junior.

The existing condition of the single large heap leach pad at Easy Junior is shown in plan view in Drawing 21, *Easy Junior Existing Conditions*. The current configuration of the pad has side slopes of approximately 2H:1V and the top is irregular with lobes of a partially completed lift. The surface area of the pad is 26.9 acres. The leach pad materials lie on a 60-mil HDPE liner. The surface area of the liner under the pile is 23.7 acres. The edge of the liner is shown on Drawing 21.

The reclamation contractor will regrade the leach pad to a nominal side slope of approximately 3H:1V. This configuration is shown on Drawing 22, *Easy Junior Regraded Topography*. The top of the pad will be regraded to nearly flat by leveling out the top lift. The top of the regraded pad will slope to the southwest at an angle of approximately one percent. A small rip-rap lined channel will be constructed on the top of the regraded pile that will drain off the pad to the north. As a result of the regrading operation, approximately 99 percent of the existing volume of material will remain on containment. The regraded pad will have a surface area of approximately 26.9 acres. The toe of the regraded pile will not be oversteepened. It will conform to the prescribed 3H:1V slope at a minimum or flatter.

Planned movement of material on the leach pad is shown using cut/fill isopach in Drawing 23, *Easy Junior Cut/Fill Isopach*. On the drawing, areas of cut are indicated with negative contours and areas of fill are indicated with positive contours and shading. The cut/fill volume balance was refined in the Phase II design. Approximately 108,000 cubic yards of cut will be required to regrade the leach pad to a final configuration of 3H:1V according to the Phase II design. The regrade design will be optimized to balance cut and fill during construction. The regrading plan is shown in cross section in Drawing 24, *Easy Junior Cross-Sections*.

4.21 EASY JUNIOR SOIL COVER AND SEED HEAP LEACH PAD

The reclamation contractor will provide the necessary equipment, materials and labor for the placement of one foot of suitable material over the regraded Heap Leach Pad. The regraded pad will have a surface area of approximately 26.9 acres. Approximately 44,000 cubic yards of material will be required to cover the regraded pile. The cover design is shown on Drawing 25, *Easy Junior Final Cover*. Whenever practical, keying cover material into native ground is desired. Seeding will be performed in accordance with the attached specifications.

4.22 EASY JUNIOR CLOSED IN PLACE CLASS III LANDFILL

The contractor will provide the necessary equipment, materials, and labor to consolidate all site debris in the on-site Class III landfill (Fresh Water Pond or one of the Process Ponds). All structures, foundations, equipment and debris will be reduced and disposed of in the Class III landfill. Concrete slabs are to be broken and left in place with a soil cover. All draindown conveyance channel liners exposed after regrading will be cut away and disposed of in the Class III landfill. Fencing that is not salvaged shall be placed in the Class III landfill. Any batteries or drums with liquid contents **cannot** be placed in the Class III landfill and must be transported and disposed of off site by the reclamation contractor. At Easy Junior, there are 3 ea. 5-gallon buckets of oil/sludge, 1 ea. 1-quart container of oil, 3 ea. 1-gallon buckets of paint, 6 ea. Caterpillar batteries, 1 ea. 30-gallon drum of black pearl grease. Most of these materials are located in the power house near the main process ponds. They will be removed by the subcontractor to a suitable repository **off site**. Soils potentially contaminated with petroleum hydrocarbons **cannot** be placed in the Class III landfill and must be spread in a thin layer, less than one-foot thick, over containment on the heap leach pile prior to cover placement.

The contractor will dismantle the steel frame for the power house and leave it on site for salvage by others.

4.23 EASY JUNIOR PROCESS POND CLOSURE

The contractor will provide the necessary equipment, materials and labor to close the existing process ponds and fresh water pond in place. Pond liners will be cut and folded over either under or over facility debris. Existing berm soils will be used to bury the contents resulting in a mounded configuration for positive drainage. Pond solids have been tested and are below TCLP standards for leachable metal/metalloids (CDM, 2003c). They will be buried in place in the closed process ponds. Table 4.2, *Easy Junior Pond Dimensions and Fill Volumes* gives the approximate dimensions and volume estimates for pond configuration at Easy Junior.

TABLE 4.2
EASY JUNIOR POND DIMENSIONS AND FILL VOLUMES

	Dimensions (LxWxD in feet)	Volume (cubic yards)	Notes
Storm Pond	230x320x10	21,600	approximate based on plan dimensions and estimated depth
Barren Pond	230x320x10	21,600	approximate based on plan dimensions and estimated depth
Settling Pond	110x110x8	2,252	approximate based on plan dimensions and estimated depth
Fresh Water Pond	288x288x6	16,232	approximate based on plan dimensions and estimated depth

4.24 EASY JUNIOR LEACH FIELD REPAIR

The existing infiltration field will continue to function post closure at Easy Junior. The reclamation contractor will make improvements to the distribution box. The distribution box will be leveled and stabilized to re-establish even distribution to the four infiltration pipes. No additional improvements will be required.

4.25 EASY JUNIOR TIRE REMOVAL

The reclamation contractor will provide the necessary equipment, materials, and labor to remove from the site the used tires located in a pile adjacent to the Waste Rock Pile. There are approximately 250 tires of variable sizes at this location. NDEP has approved the burial of tires, as a single layer at the base of the on site landfill. Other site debris will be stacked on top of the tires as the landfill is constructed.

4.26 EASY JUNIOR WASTE ROCK PILE SOIL COVER AND SEED (2005)

The reclamation contractor will provide the necessary equipment, materials, and labor to neutralize and cover portions of the Waste Rock Pile. It is estimated that approximately 20 acres require cover. Local low-pH areas will be amended with hydrated lime and/or crushed limestone, at the direction of the Resident Engineer. Areas will also be covered with six inches of an approved borrow soil and revegetated. Reclamation of the waste rock pile is planned for the 2005 construction season.

4.27 EASY JUNIOR FENCE REMOVAL (2005)

The reclamation contractor will provide the necessary equipment, materials, and labor to remove the existing perimeter fence surrounding and within the Easy Junior Mine site and either salvage or disposed of at an off-site landfill. It is estimated that there are 15,600 linear feet of fencing present. This work element will not be undertaken until vegetation has established on the regraded heap leach pile.

5.0 PROJECT SCHEDULE

A project schedule has been prepared for implementation of this Work Plan and is presented in Drawing 26, *USACE/BLM RAMS Golden Butte/Easy Junior 2004 Project Schedule*.

5.1 FIELD INVESTIGATIONS

This Work Plan includes four additional field investigations to confirm site conditions in advance of construction. The investigation work includes:

- Confirmation Sampling of Borrow Source Material between the Heap Leach Pads;
- Confirmation Sampling of Pond Solids Prior to Pond Conversions to Evaporation Basins;
- Confirmation Testing of Percolation Rate in the Proposed Infiltration Field Location; and,
- Post-Reclamation Testing of Potentially Impacted Soils around the Diesel Tank Pad.

Methodologies for this sampling work and associated analytical requirements are detailed in the FSP in Appendix B. Sampling and testing will be carried out before or in the early stages of construction.

5.2 CONSTRUCTION

Construction activities are scheduled to begin on or around August 16, 2004. Construction will start at Golden Butte. First tasks include regrading and soil cover work on the heap leach pads. This will be followed by installation of the lysimeter on the Crushed Ore Heap Leach Pad. The large earthmoving equipment will then mobilize to the Easy Junior site to begin regrading operations. At the same time, at Golden Butte, the infiltration field will be installed and the process pond fill material will be screened and stockpiled. Labor crews will finish general facilities demolition and disposal at Golden Butte and then move to Easy Junior to complete similar activities. Seed placement will occur last at both sites. This late placement of seed was recommended by BLM.

Additional work is scheduled for 2005 or as funds become available. Scheduling of these tasks will take place as the funds become available.

5.3 REPORTS

There will be two iterations of the Construction Report that will be developed after completion of the construction work described in this Work Plan. The Draft Final Construction Report will be submitted within 30 days of the end of construction. The Final Construction Report will be submitted within 10 days after comments are received from interested parties. The submittal date and periods for review are provided on the project schedule. As additional work is completed in 2005, for example, the Golden Butte evaporation basin construction, addenda to the report will be written and submitted for approval.

6.0 QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) specifies project management and organization, identifies the procedures used to assure the accuracy, precision and representativeness of the data collected and assures the procedures provided in the FSP are implemented so that the project Data Quality Objectives (DQOs) are achieved. The QAPP presents an overall description of the methods, responsibilities and procedures associated with the field characterization and construction activities at the Golden Butte and Easy Junior Mines near Ely, Nevada. Accordingly, this QAPP reflects MWH's current corporate standards and procedures for the implementation of these investigations, appropriate regulatory requirements and methods that have developed through experience on similar environmental programs. It is the responsibility of all project personnel either performing or overseeing sampling and analysis activities to adhere to the requirements of this QAPP and supporting project-specific documents.

This section highlights some of the key elements of the QAPP. The QAPP is presented in its entirety in Appendix B.

6.1 PROGRAM MANAGEMENT

6.1.1 Project Organization

Effective project management is key to implementation of the sampling and analysis program. It provides all parties involved with a clear understanding of their role in the investigation and provides the lines of authority and reporting for the project. Key positions and associated responsibilities are outlined below.

Bureau of Land Management Project Manager – Lynn Bjorkland

- Review and approve work plan and deliverables
- Review project technical and data reports
- Provide project oversight

United States Army Corps of Engineers Project Manager – Kim Mulhern

- Assure delivery of data and project deliverable to BLM
- Issue and oversee contractual issues
- Review project technical and data reports
- Provide project oversight

MWH Technical Manager – John Redmond

- Provide oversight of all technical deliverables
- Implement necessary actions and adjustments to accomplish project objectives

MWH Project Quality Assurance Manager – Jay Pennington

- Work closely with the Technical Manager to assure that data are available on time
- Assure that the appropriate field QA samples are collected per project SOPs
- Receive laboratory deliverables and pertinent field data
- Coordinate and oversee electronic data management system

MWH Field Coordinator – Steve Arington

- Assure sampling events are completed and all necessary data are collected
- Verify QA procedures are followed during sample collection and construction
- Report difficulties/complications in sample collection or construction to Technical Manager

- Assure chain-of-custody forms and field books are filled out properly

Analytical Laboratory(s)

- Responsible for off-site analysis of samples
- Deliver analytical results in a timely manner
- Calibrate and maintain laboratory equipment
- Conduct internal QA/QC procedures
- Notify QA Manager when problems occur
- Assure data and QA information are properly recorded
- Assure all custody records are properly completed and handled

6.2 SPECIAL TRAINING REQUIREMENTS/CERTIFICATION

All personnel who enter an abandoned mine site must recognize and understand the potential hazards to health and safety associated with the site. Employees working on sites exposed to hazardous substances, health hazards, or safety hazards; their supervisors; and management responsible for the site will, at all time of assignment to the field, meet at a minimum the Occupational Safety and Health Administration (OSHA) hazardous waste site workers 40-hour training requirement. Additional training requirements specified in the Health and Safety Plan (Appendix D) will be completed as necessary. In addition, personnel responsible for operating mechanical equipment, including pumps, generators, and mixing equipment, will receive the necessary operating instruction on that equipment. Sampling personnel will be trained in the of use industry-standard practices. A qualified geologist or engineer will provide sampling oversight.

6.3 DATA QUALITY OBJECTIVES (DQOs)

DQOs are a series of statements that define the type and quality of samples that will be collected during field work, clarify the objectives of the sampling effort and specify acceptable limits of uncertainty. DQOs are quantitative and qualitative statements that specify the quality of the data required to support decisions during the project. The DQOs were developed following the guidance contained in the document *USEPA Guidance for the DQO Process*, USEPA QA/G-4 (USEPA/600R-96/055).

Project objectives have dictated the sampling and analytical methods and QA/QC procedures that will be followed. The DQO approach was developed by the USEPA as a tool to aid planning and decision-making related to the data collection. A primary objective of this QAPP is to ensure that the collected data are of sufficient quality to support remedial decision-making. The seven-step process for developing DQOs and their remedies is presented in Table 6.1, *Data Quality Objectives*.

TABLE 6.1
DATA QUALITY OBJECTIVES

Task	DQO Step	Investigation Statement	Work Plan Reference
Pond Sediment Sampling	State the Problem	Chemical characteristics of sediments in the Barren, Crushed Ore and Run-of-Mine Ponds are unknown.	Section 7.0
	Identify the Decision	What are the chemical characteristics of the sediments in the process ponds? Are the current plans for containment of the sediments within the ponds consistent with the chemical characteristics?	
	Identify Inputs to the Decision	Analytical results for samples collected from the ponds will be compared to applicable federal and state regulations.	
	Define the Study Boundaries	All sediments are contained within the Barren, Crushed Ore and Run-of-Mine Ponds at the site.	
	Develop a Decision Rule	All sediments will remain within the ponds as currently contained and will be incorporated into the base fill for evaporation systems or closed in place within the pond.	
	Specify the Limits on Decision Error	Limits on analytical error are the internal laboratory DQOs including control limits for MS/MSD and LCS percent recovery, surrogate percent recovery, and detection limits.	
	Optimize the Decision	By collecting one sample from each process pond, sufficient data are expected to be generated to meet the DQOs.	
Borrow Source Analysis	State the Problem	Borrow soils used in cover construction must be substantially similar to soils identified during site characterization.	Section 7.0
	Identify the Decision	Is the borrow soil acceptable as cover material or should other borrow sources be utilized or the cover design modified.	
	Identify Inputs to the Decision	Basic grain size and soil classifications tests will be performed on soils collected from the borrow area prior to cover placement and during cover placement. Data will be compared to results presented in the *Final Closure Plan* (MWH, 2003).	
	Define the Study Boundaries	Potential borrow sources are displayed in the *Final Closure Plan* (MWH, 2003). Additionally, borrow source BS-04 located between the Crushed Ore and Run-of-Mine Heap Leach Pads may be used.	
	Develop a Decision Rule	Acceptability of the borrow source material will be based on the available laboratory data and the professional judgement of the field technician and project engineer.	
	Specify the Limits on Decision Error	Limits on decision errors cannot be assessed for qualitative decisions that rely on the professional judgement of the field technician and project engineer. Limits on analytical error are the internal laboratory DQOs	
	Optimize the Decision	Samples collected before and during cover construction are expected to provide sufficient data to meet the DQOs	

TABLE 6.1
DATA QUALITY OBJECTIVES

Task	DQO Step	Investigation Statement	Work Plan Reference
TPH in Soils Analysis	State the Problem	Soils potentially contaminated with hydrocarbons are expected to exist in the area of the diesel tank pads at both sites. Visibly contaminated soils will be removed prior sampling. Sampling will be conducted to confirm that all contaminated soils have been removed.	Section 7.0
	Identify the Decision	Have all contaminated soils been removed?	
	Identify Inputs to the Decision	Lab analysis for TPH of soil samples collected from removal areas.	
	Define the Study Boundaries	All samples will be collected from areas in the vicinity of the diesel tank pads where soils were removed due to visible hydrocarbon staining.	
	Develop a Decision Rule	If TPH concentration exceeds 100 mg/kg in any sample. Further material will be removed from the area and another sample will be submitted to the laboratory	
	Specify the Limits on Decision Error	Limits on analytical error are the internal laboratory DQOs.	
	Optimize the Decision	Sampling of potentially contaminated areas following removal of material is expected to provide sufficient data to meet the DQOs	

7.0 FIELD SAMPLING PLAN

The Field Sampling Plan (FSP) describes procedures that will be used to assure that samples collected in the field are representative of the physical and chemical characteristics of the site media.

The purpose of sampling activities associated with the FSP is to comply with sampling required in the final closure plans for the sites and confirmation sampling to ensure that the current construction plan complies with the final closure plans.

The following activities are required by the final closure plans:

- Analysis of sludge from process ponds at Golden Butte; and,
- Analysis of soils potentially contaminated with petroleum hydrocarbons at both sites.

The following activities are required for confirmation of the construction plan:

- Characterization of cover soils; and,
- Percolation test of infiltration field.

The Field Sampling Plan is presented in its entirety in Appendix C. All Samples will be collected in accordance with SOP-1, *Soil Sample Collection*, Attachment 1.

7.1 POND SEDIMENT SAMPLING

Solids from the bottom of the Barren, Crushed Ore and Run-of-Mine ponds at the Golden Butte site will be sampled following removal of water contained in the ponds. Data from the analysis of the sediments will be provided to the BLM. Sediments will be incorporated into the evaporation basins as described in the Section 4.0 of this 2004/2005 Reclamation Work Plan.

7.1.1 Sample Collection

Composite samples will be collected from each of the three site process ponds. Each sample will consist of a minimum of four aliquots of approximately equal volume and will contain material from the full depth of solids. The aliquots shall be located over the extent of the solids deposition area and to be representative of all materials present. The composite sample shall contain a minimum of 500 grams of material. Sampling equipment will be rinsed between aliquots and decontaminated between samples.

7.1.2 Sample Analysis

Samples will be tested using SPLP for Nevada Profile II parameters. Nevada Profile II parameters and required detection limits are shown in Table 2.1 of the FSP, Appendix C.

7.2 PETROLEUM HYDROCARBON CONTAMINATED SOILS

Soils potentially contaminated with petroleum hydrocarbons exist in the vicinity of the diesel tank pads at both sites. Visibly impacted soils and construction material will be removed and placed on the heap leach pads. Following removal of contaminated materials, confirmation samples from around the diesel tank pads will be collected and analyzed for extractable Total Petroleum Hydrocarbons (TPH) (EPA M8015) to confirm the removal of all contaminated soils.

Three samples will be collected at each site from areas where contaminated materials were removed. The samples will be collected from the three areas where petroleum contamination is most visible. The samples will be collected from approximately the center of the removal area. The top 0.1 foot of material will be collected over an area necessary to fill the sample container provided by the laboratory.

Additional material will be removed from any area that has a TPH concentration exceeding 100 mg/kg. Following the removal of the additional material, a confirmation sample will be collected from the removal area and submitted to the laboratory for TPH analysis. This procedure will be repeated until all laboratory samples have a TPH concentration of less than 100 mg/kg.

7.3 BORROW SOILS ANALYSIS

Soil samples will be collected from the potential borrow source (BS-04) located between the Crushed Ore and Run-of-Mine Leach Pads at the Golden Butte site. Samples collected from the borrow source will be analyzed for the parameters listed below.

- Particle size analysis, without hydrometer (ASTM D-422)
- Atterburg Limits (ASTM D-4318)

Results of the geotechnical testing will be used to confirm similarity of borrow soil to the soils at borrow sources BS-02 and BS-03.

A minimum of two composite samples will be collected from the borrow source. The samples will be collected from hand dug test pits. The test pits will be dug to a minimum of three feet or to refusal. A representative composite sample will be collected from each the test pit.

7.4 PERCOLATION TEST

A percolation test will be performed in the area of the infiltration field for the purposes of confirming infiltration field sizing calculations at the Golden Butte site. Percolation test procedures are based on Nevada Administrative Code Section 444.796. These procedures are presented in the FSP in Appendix C.

8.0 HEALTH AND SAFETY PLAN

All work performed at the site will be conducted in accordance with the Health and Safety Plan (HASP) that has been prepared specifically for this construction project. Any subcontractor working at the site will be required to prepare a similar Health and Safety Plan to address their specific activities. The subcontractor-specific plans will be consistent with the requirements of this HASP.

A comprehensive HASP has been prepared for this project by the MWH Constructors, who will be supervising construction and implementing the safety plan. The HASP is presented in its entirety in Appendix D.

Some of the hazards associated with construction activities include:

- Exposure to potentially contaminated dust during regrading and other earthworks;
- Exposure to potentially contaminated waste in process ponds;
- Sharp and dangerous scrap and debris on the sites;
- Paints and greases; and,
- Fuels, mechanical fluids, cleaning solvents associated with heavy equipment operation.

In order to address these construction hazards, the contractor has required all full-time construction personnel to complete 40-hour OSHA HAZWOPER training. There will be no need to partition the work are in to hazard zones because there are no specific wares of contamination. There will be no decontamination procedures required at the end of shift work.

Personal protective equipment (PPE) requirements of all workers on site at all times is OSHA Level D (hard hat, safety shoes, safety glasses). Other PPE may include safety vests and hearing protection depending on the specific work task.

A Safety Manual will be available for reference in the Site Trailer at all times. Emergency Response procedures and a map to emergency facilities will be located in the manual and posted on laminated sheets at various locations on the site in case of medical or fire emergency. A First Aid kit and fire extinguishers, and eyewash station will be located in the Site Trailer.

8.1 PURPOSE OF THE PROJECT SAFETY PLAN

This Project HASP applies to construction activities that will be conducted for the USACE Restoration of Abandoned Mine Sites (RAMS) Easy Junior and Golden Butte projects. It establishes general safety requirements, and procedures for the protection of personnel and to prevent and minimize personal injuries, illnesses and physical damage to equipment, supplies and property.

Each subcontractor shall receive a copy of this document. They must ensure that the contents of the plan, relevant to their works, are communicated to their management, supervisors and personnel as is appropriate.

All project personnel MWH Constructors, Inc. (MWHC) and MWH Americas, Inc. (MWHA) personnel and its subcontractors and visitors shall comply with safety requirements of Occupational Safety and Health Act (OSHA), and the requirements of the project safety plan.

8.2 PROJECT SAFETY GOAL

The goal of this project is zero preventable incidents (OSHA recordables, lost workdays, property damage etc.). To achieve this goal, everyone on the project is responsible for eliminating or correcting at risk-behavior or unsafe conditions.

8.3 SITE VISITORS

The MWHC Project Manager with concurrence from the USACE representative may give approval to visitors to enter the project. No visitors will be permitted into the project unescorted. Visitors are required to attend a project safety orientation upon their first visit. Visitors are also required to provide their own personal protective equipment necessary to provide an adequate level of protection for the purpose of their visit. If not, appropriate equipment will be issued at the site, if supplies permit.

8.4 RESPONSIBILITIES OF MWHC

The Project Manager (PM) is responsible for and accountable to senior management for the implementation and enforcement of the project heath and safety plan and the company safety program. In turn all MWHC personnel on the project are responsible for and accountable to the PM for the same.

The General Superintendent/Safety Supervisor has the primary staff responsibility to assist the PM for the implementation and enforcement of the project safety plan and the company safety program. The General Superintendent is further responsible for inspecting the project in order to identify at-risk-behavior and unsafe conditions, which may exist on the project. The PM and/or subcontractors supervisory personnel shall be informed of any at-risk-behavior or unsafe working conditions, and are required to initiate and complete effective corrective action.

8.5 PROJECT INDOCTRINATION

Prior to the first work shift or visit personnel shall receive project specific safety indoctrination given by MWHC Safety Supervisor. Personnel shall be provided with a guide book (Basic Safety Rules For Construction) containing pertinent provisions of the Project Safety Program.

Orientation shall include but not be limited to:

- General safety rules for personal conduct.
- Site contaminates and their hazards
- Substance abuse policy (Zero Tolerance).
- Security and accessibility procedures
- Emergency notification.
- Personal protective equipment and construction dress wear.
- Rule to attend weekly toolbox safety talks.
- Incident reporting.
- Basic project rules for construction activities.

Each person participating in the orientation shall acknowledge receipt of these instructions by filling out the Personal Safety and Health Acknowledgment form located in Attachment C of Appendix D. A copy of this acknowledgement shall be retained on the project to document that the person has been orientated.

8.6 TOOLBOX SAFETY MEETINGS

All site personnel shall attend a weekly toolbox safety meeting held on Monday mornings and sign the meeting roster. Each subcontractor shall conduct the meetings for their personnel. Meetings will cover past activities, plan for new or changed operations, review pertinent aspects of appropriate activity hazard analyses (by trade), establish safe working procedures for anticipated hazards, and provide pertinent safety and health training and motivation. As part of the toolbox safety meeting, employee feedback (comments, questions, health or safety concerns) are welcomed. Meetings shall be documented, including the date, attendance, subjects discussed, and names of individual(s) who conducted the meeting. Meetings will be documented on Safety Meeting Record Form (or equivalent) located in Attachment D of Appendix D.

8.7 FIRST-AID STATION

Each employer shall make available to his/her personnel, first aid services, and shall make provisions for medical care as necessary. The employer shall maintain a first aid kit in accordance with these requirements. In addition, where the eyes or body of any person may be exposed to injurious corrosive materials, dust etc., suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate use.

<u>General Requirements:</u>

- The contents of first aid kits are to be checked by the employer before being sent out to the Project and at least weekly to ensure that the expended items are replaced.
- Emergency telephone numbers, i.e., physician, hospital, and ambulance shall be posted and employers shall have a means to summon for help (cell phone, radio, other).
- Each field vehicle on site, including privately owned vehicles and rented vehicles, that could be used to transport injured personnel to medical facilities will have a copy of the map to the nearest hospital inside the vehicle.

<u>Training Requirements:</u>

- Employers shall have the responsibility of ensuring that at least one employee is first aid and CPR trained and that training can be verified by documentary evidence.

The field first aid station will be established in the immediate vicinity of the construction activities. The station will be field sited, it will be centrally located, but out of the flow of construction traffic. General health and safety equipment will be stored in the field first aid station. Required equipment will include:

- Health and Safety Plan
- Hearing protection
- Field first aid kit
- Eye wash
- Rinse water (10 gallons minimum)
- Rubber gloves
- Fire extinguishers

8.8 PERSONAL PROTECTIVE EQUIPMENT

The dress for this project requires that all personnel shall wear shirts with sleeves and long trousers that are ankle length. Shorts, tank tops, sneakers and other inappropriate work attire are not permitted on this project. On this project all personnel shall wear approved hard hats and steel-toe protective footwear at all times.

It is the responsibility of each employer to evaluate each task and determine the appropriate personal protective equipment required for the task, this information shall be communicated to affected personnel.

General Requirements

- Hard hats shall be worn with the brim point forward.
- Hearing protection shall be provided by the employer and worn by personnel when a person has to shout to be heard when 3 feet or less a way from the person they are communicating with.
- Material Safety Data Sheets (MSDS) shall be referenced to identify the proper chemical resistant protective garments and gloves.

8.9 ACTIVITY HAZARDS ANALYSES

Guidelines for completing Activity Hazard Analyses (AHA) are presented in the safety plan. During the course of the project, the Safety Supervisor will require that members of the work crew complete activity hazard analyses for their specific work tasks. AHA forms are provided in the site Safety Manual. The Safety Supervisor will review the AHA and provide comments and revisions. The completed AHA forms will then be incorporated into the Safety Plan.

8.10 EMERGENCY CONTACTS

A list of emergency telephone numbers (USACE, police, fire, rescue, etc) and non-emergency telephone numbers shall be posted on site. Copies of the telephone list will be provided to subcontractors. In this area 911 service is available to notify police, fire, rescue, etc., of an emergency.

MWH

Elko Office – Jay Pennington	(775) 738-2310
	(775) 777-1543

US Army Corps of Engineers

USACE – Brad Jones (for GB)	(402) 221-4488
USACE – Bruce Jordan (for EJ)	(505) 342-3427

US Bureau of Land Management

BLM – Lynn Bjorklund	(775) 289-1893
Ely BLM Radio Frequency	169.775 (transmit and receive)
Elko BLM Radio Frequency	169.400 (transmit and receive)

Police

Emergency:	911
White Pine County Sheriff Department	(775) 289-8808

Fire

Emergency:	911
White Pine County Emergency	(775) 289-9111

Medical

William Bee Ririe Hospital	(775) 289-3001
White Pine County Sheriff and Ambulance	(775) 289-4833
Elko General	(775) 738-5151
University of Utah (Salt Lake City, UT)	(800) 453-0120
Burn Center – University of Utah	(800) 581-2700

Air Ambulance

Access Air (Elko, NV)	(775) 738-3493
LDS Life Flight (Salt Lake City, UT)	(801) 321-1234
University of Utah (Salt Lake City, UT)	(800) 453-0120

A comprehensive HASP has been prepared for this project by the MWH Constructors, who will be supervising construction and implementing the safety plan. The HASP is presented in its entirety in Appendix D.

9.0 STORM WATER MANAGEMENT PLAN

Sediment control measures to be implemented during construction activities are discussed in detail in Appendix E. The primary sediment control measures to be used at the site include installation of silt fencing, construction of sediment traps, and construction of run-on diversion structures.

Silt fencing will be installed to capture sediment in surface water runoff where the regraded heap leach piles extend beyond the containment berms. Silt fencing will also be used around areas disturbed by site activities including debris removal and pond closures. Sediment traps will be installed at the discharge point from borrow sources. Locations for sediment control structures are shown in Drawings E-1 and E-2 of Appendix E.

Run-on diversion structures will be constructed at Golden Butte as shown in Drawing E-1. The structures will be constructed in a manner that will ensure that any run-off from upgradient of the site will be diverted around the active construction zones. No run-on diversion structures are required at Easy Junior.

All sediment control structures will be inspected on a weekly basis and following storm events. Required maintenance will be performed as soon as possible following identification. The storm water management plan will be amended as necessary by the project engineer during construction to ensure control of site waters.

10.0 REFERENCES

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MWH, 2001. *Remedial Action Scoping Report – Golden Butte Mine.* USACE Contract No. DACW05-00-D-0021, September 12, 2001.

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