9 OPERATIONS: SURFACE MINING

9.1 MINE DEVELOPMENT & PIT SEQUENCING

Midas Gold plans for conventional open pit mining operations at the Project. Open pit mining was selected as the preferred and only viable option for the extraction of the ore, based on the environmental, technical and economic assessment of alternatives summarized in Appendix G. Three open pits are planned: Yellow Pine, Hangar Flats and West End (see Figure 8-1) as well as reclaiming and reprocessing legacy tailings from the Meadow Creek valley.

9.1.1 Pit Sequencing

The general sequence of mining will be the Yellow Pine deposit first, Hangar Flats deposit second, and the West End deposit third; although there will also be some overlap in the open pit development and operations. This mining sequence is substantially influenced by the plan to restore the original gradient of the EFSFSR using development rock from the West End pit to backfill the Yellow Pine pit, by the need to balance the process plant grade and different ore types, and the need to maintain a stable workforce and equipment requirements.

9.1.2 Open Pit Ore Mining Rate and Period

Surface mining is expected to occur for approximately 12-15 years following the initial site cleanup, which includes the removal of the previously mined development rock in and around the Yellow Pine pit, and the pre-stripping and pre-production activities. Targeted total daily ore production from the open pit operations is expected to average approximately 22,000 tons of ore per day to the ore processing facility, but will likely range from approximately 20,000 to 25,000 tons per day[8],and will vary based on the deposits' geometry and grade.

9.1.3 Open Pit Development Rock Mining Rate

Development rock removal will occur concurrent to ore mining; development rock is defined as rock that contains no commercial antimony, gold or silver values. During the pre-stripping and pre-production period (the initial three years of activities), daily development rock production from the open pit operations is expected to range from 40,000 to 50,000 tons per day. As the mine reaches full production, the daily development rock production is expected to range from approximately 90,000 to 100,000 tons per day. Daily development rock production will vary based on the mine plan and the deposits' geometry and grade.

9.1.4 Legacy Tailings Removal

During the early Project schedule, Midas Gold plans to remove and reprocess legacy tailings that remain uncontained in the Meadow Creek valley; these tailings are currently covered with approximately 50 feet of spent heap leach ore. The legacy tailings lie within the planned footprint of the proposed Hangar Flats DRSF and will be excavated, hauled to a re-pulping facility in dump trucks, mixed (re-pulped) with recycled process water from the new TSF, then pumped as slurry via a pipeline to the ore processing facility.

[8] Operating mines typically are able to optimize the throughput at the site's ore processing facilities during operations, which often result in an increase of as much as 10% over time.

The legacy tailings re-pulping / pumping facility will be an enclosed, heated structure located within the limits of the legacy tailings area. Trucks will place excavated tailings into a dump pocket at the facility, where a screen grizzly will be used to remove large debris, with the tailings passed through the grizzly into a feed hopper. The hopper will empty onto a belt feeder which will discharge onto a vibrating screen with spray. From there, the undersize material will pass through the screen into a pump feed box from where a slurry pump will pump the re-pulped tailings to the ore processing plant via a pipeline located in the same lined corridor as the main tailings and water reclaim pipelines. Oversize material from the grizzly and screen will be periodically removed.

Removal of these legacy tailings results in the removal of a potential source of metals leaching into the groundwater, since the legacy tailings contain significant amounts of pyrite and stibnite (containing sulfur, arsenic and antimony). Removal of these tailings will also provide added storage space for development rock in the Hangar Flats DRSF.

The legacy tailings will be excavated in an upgradient to downgradient direction. Surface water channels will be installed prior to excavation to limit meteoric water from contacting the tailings and disturbed spent heap leach ore. To limit exposure of the legacy tailings material to meteoric water during excavation, removal of the overlying spent ore will be advanced as needed to facilitate excavation of the tailings for subsequent ore processing. Meteoric water that does contact the legacy tailings and disturbed spent ore will be collected and pumped to the ore processing facility or TSF.

This advance compensation activity will mitigate ongoing harmful legacy water quality impacts in the watershed caused by the legacy tailings pile. It is consistent with the Presidential Memorandum. Ultimately, the construction of a new engineered TSF will create durable mitigation and environmental management at the site.

9.2 MINING PROCEDURES & TECHNIQUES

Open pit mining methods will include drilling, blasting[9], loading and hauling. Ore and development rock will be extracted from approximately 20-foot high benches. The mining sequence will include the following:

- Site preparation (see Section 8.1);
- Blast-hole drilling;
- Loading blast holes;
- Blasting;
- Ore control; and,
- Ore and development rock loading and haulage.

Discussion about these procedures follows.

9.2.1 Blast-Hole Drilling

Most of the rock to be extracted at the Project will be competent *in situ* solid rock. Drilling and blasting (using explosives) will be required to break the rock into loose fragments suitable for mining shovels and/or frontend loaders to dig and load into trucks. The purpose of blasting is to break the rock in place, with minimum blasted rock displacement; minimal displacement is important for ore control.

[9] Blasting may not be required for loading glacial till or alluvium.

Before blasting, holes will be drilled into the rock by mining equipment known as blast-hole drills (see Section 17.2 for a typical blast-hole drill rig photo). The holes will be drilled in a pattern in the area of the mine bench designated for blasting. The pattern will generally be comprised of evenly spaced holes approximately 10 to 15 feet apart and to the bottom of the bench (approximately 20 feet deep); drill density and depth may vary depending on the orientation of ore and development rock. The diameter of the drill holes will typically range from 4 to 8 inches in diameter, depending on the type of blast-hole drill.

9.2.2 Loading Blast Holes

Once the blast-hole pattern has been drilled, the holes will be checked to ensure that they have been drilled to the proper depth. This "quality-control" task will ensure that the blasts are effective and result in evenly blasted rock. Under-blasted rock can result in poor digging conditions because the rock material has not been effectively broken.

The holes are then loaded with blasting agents. A cast primer, tied to detonating cord, will be lowered down each hole to hang about 2 to 3 feet from the bottom of the hole. It is planned that ANFO (ammonium nitrate and fuel oil), or similar product, will be used, and this bulk explosive will be placed down the hole around the cast primer and detonating cord. On occasion, when damp conditions are encountered in blast holes, a blasting emulsion may be used to ensure appropriate detonation and rock fracturing.

The hole will be filled with ANFO, or equivalent, to a predetermined depth. The upper part of the hole will be filled with stemming materials, which are rock cuttings from the drilling. This stemming acts as a "plug" that directs the explosive energy into the surrounding rock.

After the blast holes have been loaded, the detonating cords will be tied together using devices designed to detonate the charges in a pre-determined sequence.

9.2.3 Blasting

Blasting will be limited to certain times during the day, depending on production requirements. Generally, blasts are initiated either near midday or during the mid to late afternoon. This timing ensures that the blasting activities are controlled to daytime hours and will minimize disturbance to wildlife and employees living on site. Estimated explosive usage is set forth in Section 12.3.

Whenever a blast is scheduled, a designated safe "blast zone" will be cleared of personnel and equipment. Access into a blast zone is strictly controlled, with temporary barriers and guards in place prior to and during detonation. Once the blast zone is confirmed to be fully cleared of personnel and equipment, the blast will then be initiated remotely, from a location that is safe for the operator and other personnel. Midas Gold will comply with the blasting requirements of the Mine Safety and Health Administration (MSHA).

After the blast pattern has been detonated, qualified Midas Gold personnel will inspect the blast site to ensure that all explosives have detonated. If any undetonated explosives are found, they will be properly managed in accordance with MSHA blasting requirements before work is re-initiated at the site. When the blast supervisor is satisfied that the blast site is safe, the area will be released for continued production work.

9.2.4 Ore Sampling & Control

The basic geometry of ore and development rock, and the related decision regarding whether to develop a Project, is determined by resource modelling based on relatively widely spaced drill holes. In contrast, production drilling is spaced much more closely. The resolution necessary for ore/grade control is provided by assays from blast holes. Assays include gold/silver/antimony grades and metallurgical characteristics and environmental characterization necessary for proper processing and material designation.

Blast patterns will be determined based on resource models and the physical characteristics of the rock, and the holes' locations/depths are uploaded to a GPS system mounted on each blast hole drill prior to drilling the blast holes. The actual drilled blast hole locations are recorded by the GPS units and the cuttings retrieved from each hole are manually sampled. The assays from blast hole cutting samples provide a good indication of the grade distribution of the material in the blast area, and this information can be used to validate the results of the mine plans. Midas Gold will perform the assay work at the offsite laboratory which forms part of the SGLF.

The assay results from the blast hole sampling will be used by site geologists and engineers to delineate each blast pattern into ore and development rock zones using statistics and observed geology. The ore zones will be further delineated according to grade and metallurgical properties, with development rock being characterized for proper placement in the development rock storage facility or for use in pit backfilling. Midas Gold surveyors will stake the ore and development rock zones using coded placards attached to survey lath. In addition, the information will be uploaded to the on-board navigation system on the mining shovels or front-end loaders to aid the operators in distinguishing the type of material that is being removed.

9.2.5 Ore & Development Rock Loading & Haulage

With blasting and ore control work completed, the area with the blasted material is ready for excavation. Midas Gold will use frontend loaders or shovels to load broken (blasted) ore and development rock material into off-highway haul trucks (see Section 17.2 for typical frontend loader, shovel, and off-highway haul truck photos). Depending on the mining schedule, development rock will be hauled and disposed at various locations as discussed in Section 9.3. Ore will be hauled directly to the primary crusher (see Section 17.2 for a typical jaw crusher photo) or the run-of-mine ore stockpile area adjacent to the primary crusher (see Section 10.1.1).

In addition to the loading and haulage equipment, other equipment will also be working at the site. Bulldozers (rubber-tired and/or tracked) and graders will keep the bench floor level, clean up any spillage from the loading operation, and provide a safe driving surface (see Section 17.2 for typical bulldozer and grader photos). Water trucks will spray the pit floor and haulage roads to minimize dust for safe, efficient operations.

As the front end loader or shovel digs, a display in the cab of the loading unit (in combination with the staked placards) will inform the loading unit operator what material (ore for ore processing or development rock) is being excavated. Material routing is normally controlled through the fleet dispatching computer, with occasional confirmation made by verbal communication between the truck driver and loading unit or dispatch operator. Each haul truck will be equipped with a Global Positioning System (GPS) and a display screen; these tools will provide the truck driver with the information necessary to deliver the loaded material to the proper destination.

Once the truck is full, it will leave the loading unit (front-end loader or shovel) and transport its load to the specified destination. This may be the primary crusher, a stockpile adjacent to the crusher, a mined-out pit, or a development rock storage facility. The truck will dump its load and return to the mine pit to collect another load. This cycle will continue 24 hours a day, 365 days a year.

9.3 DEVELOPMENT ROCK HANDLING & PLACEMENT

Development rock is important material and necessary for the restoration of the site. Approximately 350 million tons will be excavated and, among other things, used in reconstruction of the valley currently occupied by the Yellow Pine pit, and the restoration of the EFSFSR to its estimated pre-mining course. In addition, development rock will provide material for the construction of the TSF and the substantial downstream buttress that will ensure its long-term stability. Therefore, development rock handling and storage will be an integral part of the mining operation. Development rock will be mined every year of the life of the Project and, will be placed in the following facilities:

- Hangar Flats DRSF and TSF buttress;
- Fiddle DRSF;
- TSF embankment;
- West End DRSF; and,
- Yellow Pine pit DRSF.

These areas are shown on Figure 8-1. Table 9-1 summarizes the estimated tonnage for each destination area.

Table 9-1, Development Rock Destination and Estimated Tonnage

Hangar Flats DRSF & Buttress	Fiddle DRSF	Tailings Embankment	West End DRSF	Yellow Pine Pit DRSF	Total
70,000	85,000	60,000	25,000	110,000	350,000

Notes:
(1) Estimates are in 1,000's of tons.
(2) Some limited amounts of development rock will be used to construct haul roads and pad areas for site facilities. In addition, some development rock may be crushed and screened for use as road surfacing material and/or concrete aggregate.

Midas Gold will use development rock to construct the TSF embankment, which will be constructed by the downstream method, resulting in a high degree of stability (see Section 11.2 and Appendix G). In addition, the Hangar Flats DRSF will overlap the downstream side of the TSF and serve as a buttress, considerably increasing the factor of safety of the facility (see Section 11.2). Yellow Pine development rock will be placed in the TSF embankment, the Fiddle DRSF and the Hangar Flats DRSF and TSF buttress. Development rock from the Hangar Flats pit will be placed in the Hangar Flats DRSF and TSF buttress. Development rock from the West End pit will be placed in the West End DRSF or used to fill the Yellow Pine Pit to prepare for re-contouring to approximate pre-mining topography and relocation of the EFSRSF through that area.

DRSFs will generally be constructed from the bottom up by hauling rock from active mining areas via trucks to the appropriate DRSF. The material will be placed on an active working base and expanded upward as the facility expands. This method provides control over material placement and establishes an access road to upper levels of the facility as each layer is placed. This methodology also allows for construction of approximate final facility reclamation surface configuration and will allow for concurrent reclamation of DRSFs.

An adaptive management strategy will be used to establish an Adaptive Development Rock Management Plan which will provide active management for development rock produced and stored across the mine site during operations. This plan will provide flexibility in management, storage, and use of excavated development rock. Geochemical properties of development rock were established during baseline testing and additional test work will continue during mine operations as needed to support adaptive management for material use and placement. The continued testing and adaptive management strategy will provide data to support proper storage locations for neutral metal leaching rock or in the event potentially acid generating (**PAG**) development rock is encountered during mining operations. Yellow Pine DRSF and the TSF embankment are likely facilities where PAG storage cells could be utilized in the event such materials are encountered.

Storm water and streams in the vicinity of the various DRSF areas will be diverted around the facilities; similarly, water from seeps and springs below the DRSFs will be intercepted through the construction of French drains, or similar, to inhibit contact between water and the development rock in order to minimize sediment and metals entering the water. Water that contacts development rock will be directed to geomembrane-lined ponds, and the water will be pumped for re-use in the ore processing facility or treated to appropriate discharge standards and discharged, if necessary.

9.4 MINE SUPPORT FACILITIES

The Project will require surface infrastructure and miscellaneous facilities to support surface mining and underground exploration activities (see Figure 8-1). Project related structures will be sided or painted and roofed in neutral colors to limit visual impacts. This section describes the following support infrastructure:

- Mine administration office;
- Mine maintenance;
- Haul roads;
- Fuel storage; and,
- Explosives storage.

Specifics on these support infrastructure and facilities follow.

9.4.1 Mine Administration Office

The administration building will either be of modular or pre-engineered construction and placed on a concrete foundation. The building will have offices for management, administration, engineering, geology, information-technology, supply chain, environmental, and safety personnel, along with a reception area, conference and training rooms, utility room, restrooms, and miscellaneous storage space.

9.4.2 Mobile Equipment Maintenance & Truck Wash

As safety is a priority, it will be important to have properly functioning vehicles and equipment in excellent working order. To achieve this, mobile equipment will require regular maintenance, so Midas Gold will construct a maintenance workshop with several bays for equipment maintenance and repair, along with areas for electrical maintenance and a truck wash facility. The truck wash will include an oil/water separation system and appropriate water treatment facilities to facilitate reuse of the wash water. Sufficient space surrounding the maintenance facilities will be provided for equipment parking (mainly mine haul truck parking) and supply storage.

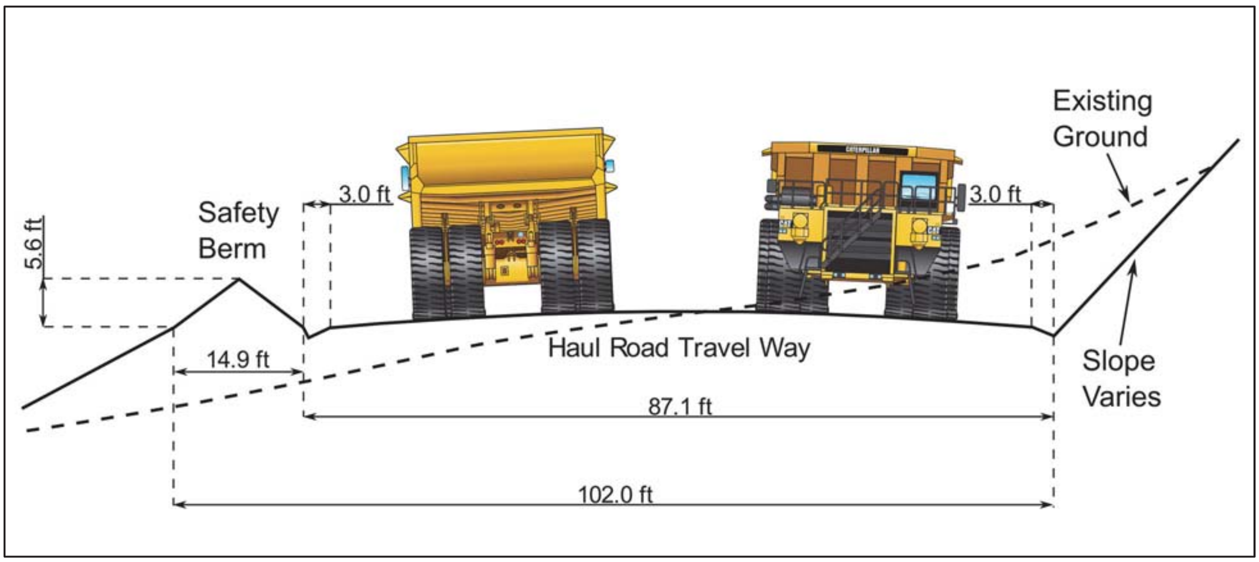
The main maintenance workshop facility (used for surface mine equipment) will have offices for supervisors and maintenance staff, along with a conference room, utility room, restrooms, and miscellaneous storage space. A facility for small vehicle maintenance (pick-ups, maintenance trucks, vans, buses, etc.) will be constructed adjacent to the main shop.

9.4.3 Haul Roads

Haul roads will be required to transport ore, development rock and reclamation materials from mining or storage areas for ongoing use in restoration activities, to the ore processing plant, to development rock storage facilities, or to transport vehicles to the mobile equipment maintenance shop.

The haul roads will be built by qualified personnel in compliance with MSHA regulations. Midas Gold will employ a maintenance team in order to maintain the haul roads to ensure safe, efficient haulage operations and to minimize fugitive dust emissions in accordance with the air quality operating permit requirements of IDEQ. Figure 9-1 presents a typical mine haul road cross-section.

Figure 9-1, Typical Haul Road Cross-Section



Midas Gold will generally limit haul road grades external to the pits to overall gradients of 10% or less, which is optimal for efficient haulage.

In order to maintain a high level of water quality, roads will be designed to minimize transfer of dust and sediment to water channels. Drainage channels will be incorporated into roadway construction to direct drainage along the inside edge of the roadway. These channels will route precipitation and snowmelt runoff to sediment control structures. BMPs outlined in the IDL manual of Best Practices for Mining in Idaho (IDL, 1992) will be utilized for sediment control.

Culverts will be installed where haul roads cross drainages. Culvert inlets and outlets will be lined with rock riprap, or equivalent, as needed to prevent erosion and protect water quality. Culverts will be placed at a minimum grade of approximately 1% to maintain water flow. Each culvert will be sized, and installation will be designed to convey design stormwater flows in accordance with Forest Service and

Valley County standards. The combination of stable roadside drainage channels and rock riprap at culverts will serve to protect water quality by reducing limiting erosion during runoff associated with high precipitation events. Typical culvert details are provided on Figure 7-3.

All features of the Stibnite Gold Project have been designed to protect and enhance the fishery, including the road system. Any crossings of known fish-bearing streams will be constructed to support fish passage, with either appropriately designed and constructed culverts or bridges. Typical bridge details are provided on Figure 7-4; a photo of a typical bridge is provided in Appendix E.

9.4.4 Fuel Storage for Surface Operations

Midas Gold plans to use aboveground tanks for storage of fuels and other fluids, including gasoline, diesel fuel, lubricants, coolants, hydraulic fluids and propane at the Project site. Storage amounts are addressed in Section 12.3.

Environmental protection is a top priority for Midas Gold and storage facilities will be constructed with appropriate and redundant protection systems in place. The bulk fueling tanks will be located within a concrete lined secondary containment facility that is capable of holding a minimum of 110% of the largest tank volume located at the fueling station and/or will utilize self-contained tanks with built-in secondary containment. While the new bulk fueling station(s) are being constructed, contractors will utilize Midas Gold’s existing fueling facilities.

The storage tank facility for gasoline, diesel fuel and propane will be located near the maintenance shop with additional propane storage at the ore processing facility area, the truck shop facility, the underground portal areas, and the Stibnite Lodge. Additional detail on this storage facility is provided in Section 12.3.1.

Midas Gold aims to hire locally and use local businesses for Project requirements whenever practicable (see Section 3.1). In keeping with this philosophy, Midas Gold will contract preferentially with local or regional suppliers to deliver diesel fuel, gasoline and propane to the site on a routine basis.

Mobile off-highway mining and support equipment will use diesel fuel, or potentially compressed natural gas (**CNG**), while certain mobile equipment, primarily non-highway licensed vehicles used solely at the operation site, will use gasoline.

In order to minimize fuel transportation, Midas Gold light vehicles will also be fueled in Cascade from a commercial fuel supply facility before travelling to site. These vehicles include the vans and buses used to transport employees to the Project site. Some gasoline storage will be maintained at the Project site to fuel those gasoline vehicles that generally remain on site.

Building heat and hot water for the Stibnite Lodge and other site facilities (and some generators) will use propane, which will also be used to heat underground ventilation air during cold and freezing weather conditions.

9.4.5 Explosives Storage

Explosive blasting agents will be used in the mining process and will be handled by qualified personnel in a safe manner.

A mixture of fuel oil (diesel) and ammonium nitrate (**ANFO**) is one of the primary explosives used in blasting of rock. Blasting emulsions also may be used on occasion for wet blast holes or for specialty blasting. Each component of bulk explosive material, such as ANFO, is not explosive in isolation, so safe storage of such materials involves maintaining an appropriate physical distance between them. The fuel oil (diesel) component of ANFO will be stored in aboveground tanks, placed within a concrete-lined secondary containment facility. Qualified personnel will mix the ammonium nitrate with diesel fuel oil to create ANFO in the diesel fuel oil storage facility (the **ANFO Facility**) which will be located near the main haul road and a safe distance away from the administration facilities, process facility, truck shop facility and fuel storage area.

The ammonium nitrate component of ANFO will be stored in silos within a fenced and gated site a safe distance away from the diesel storage site. Similarly, explosive magazines for detonating cord, cast primers and blasting caps will also be located in a separate, fenced and gated site away from the ANFO area and other mine surface facilities. Estimated explosive storage amounts are set forth in Section 12.3.

A highly qualified team of certified explosives personnel will ensure that explosives storage on site complies with applicable Department of Homeland Security (**DHS**), Bureau of Alcohol, Tobacco, Firearms and Explosives (**BATFE**), and MSHA regulations. Trained and certified personnel will comply with MSHA regulations in any transport, storage, handling and use of explosives and any components of explosives.

Federal, state and county roads/highways will be used by qualified outside suppliers to transport explosives to the Project site. Midas Gold will contract only with those explosive transport vehicle operators licensed by the U.S. Department of Transportation.

9.5 SURFACE MINE EQUIPMENT

The major surface mining mobile equipment to be used at the Project is set forth in Table 9-2; similarly, Table 13-1 and Table 10-1 provide underground and process plant mobile equipment lists, respectively. This equipment list may be modified during the Project, depending on site-specific conditions and needs.

Table 9-2, Projected Surface Mine Mobile Equipment List

Surface Mine Mobile Equipment Type	Estimated Number of Units
Blast-Hole Drills (Cat MD6290 or equivalent)	1-5
Pioneer Drill (Cat MD 5150 or equivalent)	1-3
Front-End Wheel Loader (Cat 994 or equivalent with 20-25 yd^3 bucket)	1-4
Front-End Loader (Cat 990 or equivalent)	1-3
Haul Trucks (Cat 789 or equivalent with 200-ton capacity)	3-20
Haul Trucks (Cat 740 or equivalent)	3-5
Dozers (D10 or equivalent)	2-5
Dozers (D6 or equivalent)	1-2
Water Trucks (Cat 777 chassis or equivalent)	1-2
Motor Graders (Cat 160M or equivalent)	2-3
Excavator (Cat 349 or equivalent)	1-2
Low-Boy Tractor (Cat 777 chassis or equivalent)	1-2
Vibratory Compactor (Cat CS76 or equivalent)	1-2
Mobile Light Plants	6-10
Fuel Service Truck	1-2
Mechanics Service Truck	2-3
Lube Service Truck	1-2
Welding Service Truck	2-3
Boom Truck	1-2

Surface Mine Mobile Equipment Type	Estimated Number of Units
Skid Steer Truck	1-3
Tire Handler Truck	1-2
Crew Vans	4-8
Pickups	15-25
ATVs & UTVs	20-25

Notes:

(1) The range in the number of equipment units is due to the gradual build-up of operations over the first several years of operations. Haul trucks will be added throughout the life of the project as pit depths and haul distances increase.

(2) Midas Gold will utilize earthmoving contractors and their equipment on an as-needed basis to handle small or short (time duration) projects.

(3) Table 7-1 and Table 10-1 provide additional mobile equipment required for the Project.