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# INSPIRATION MINES INCORPORATED



PLAN OF OPERATION  
FOR THE  
**AUSTIN GOLD VENTURE**  
Lander County, Nevada  
TOIYABE NATIONAL FOREST  
AUSTIN RANGER DISTRICT

July 26, 1985

Plan of Operation  
For The  
Austin Gold Venture  
Lander County, Nevada

Date: July 26, 1985

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INSPIRATION MINES INC. OPERATING PLAN  
AUSTIN GOLD VENTURE

1.0 Introduction

This Plan of Operations is hereby submitted to the Austin Ranger District office of the U.S. Forest Service, United States Department of Agriculture in compliance with federal regulations regarding "Surface Management of Public Lands Under U.S. Mining Laws," 36 CFR Part 228. This Plan of Operations describes the mining operation to be conducted in Lander County, Nevada, by Inspiration Mines Inc. (IMI), P. O. Box 1559, Claypool, Arizona 85532. The key management person is Keith J. Droste, Senior Manager, Projects and Development. Questions may also be directed towards Messrs. Tom Larsen, Manager, Environmental Affairs, and William Brooks, Director Process Engineering.

The Austin Gold Venture is a joint venture formed by FMC Corporation, Minerals Division and Inspiration Mines Inc. IMI is the operator.

The Austin Gold Venture is supported by preliminary and conceptual engineering, the details of which may be changed or modified as the project commences and runs towards completion. This Plan of Operations is a fair and accurate description of the current plan for the Austin Gold Venture using current technology and engineering design methods accepted by the mining industry.

The proposed Austin Gold Venture involves the operation of a mine and processing facility for gold. The Project is located in Lander County, Nevada, approximately ten (10) miles south of Austin, Nevada. (See Figure 1). The planned operation will mine and process approximately 350,000 tons per year of ore by flotation and agitated cyanide leach methods. The plant will produce 55,000 ounces of gold. Detailed mining studies have been conducted by American Mine Services, Inc. and feasibility and preliminary engineering studies have also been completed by IMI and K. D. Engineering. These studies are summarized and integrated into this Plan of Operations.

2.0 Overview of Proposed Project

2.1 Description of the Discovery

The Austin Gold Venture - Quito Prospect was discovered by FMC Corporation in 1980. The gold deposits are located in a window of the Roberts Mountains Thrust. Rocks in the mine area include Cambrian to Devonian, eastern facies, carbonate rocks exposed through a window in transitional to western facies, siliceous rocks of the Valmy Formation.

Known ore-grade mineralization is controlled by the intersection of steeply dipping faults with structurally prepared (by thrusting) favorable host lithologies. The eastern facies rocks are the best hosts, however, thick

LOCATION MAP OF  
AUSTIN GOLD VENTURE

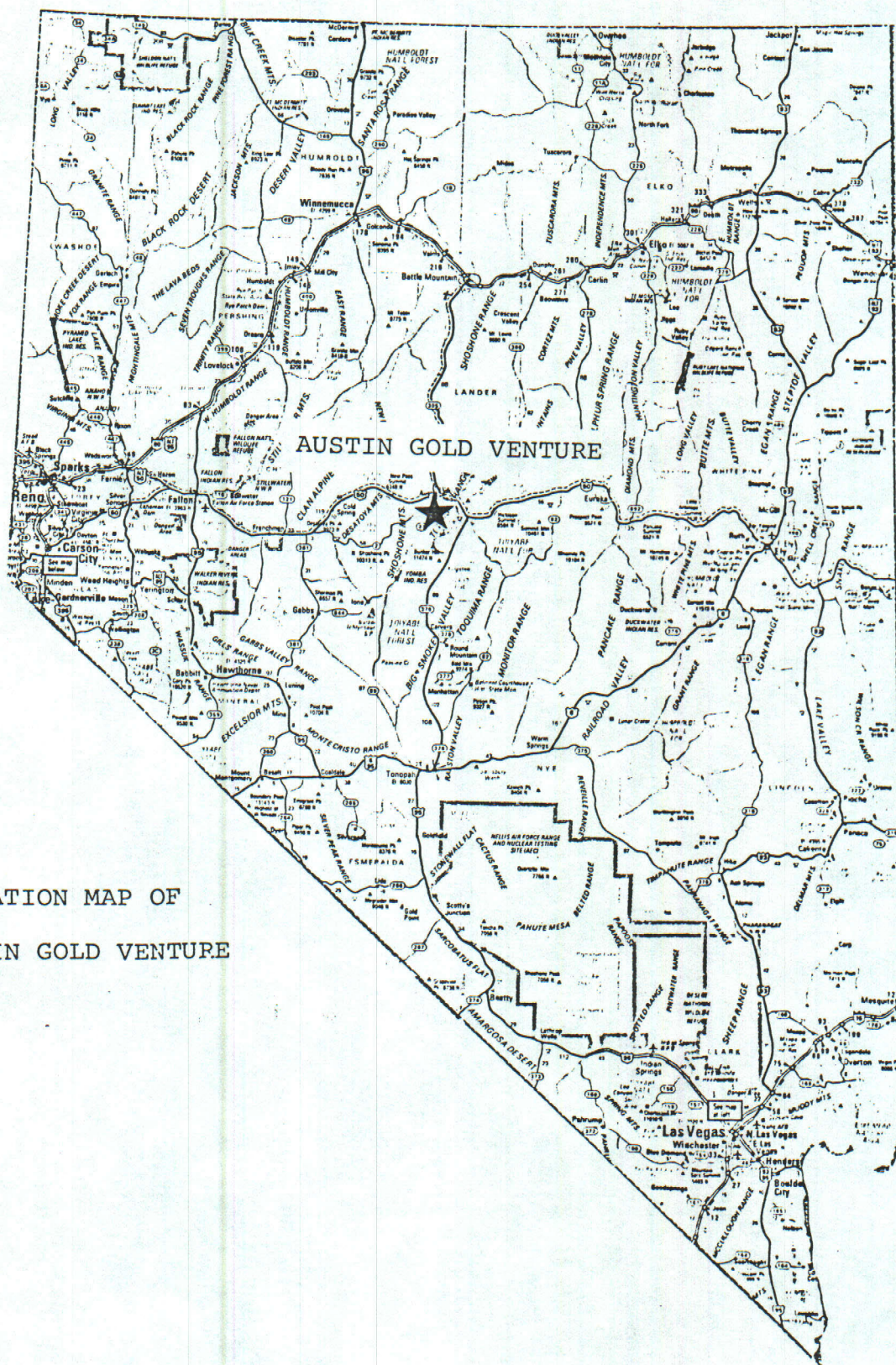


FIGURE 1

intercepts assaying trace amounts of gold have been drilled in the western facies rocks. Weak gold mineralization has been encountered throughout the claim block in zones of geologic and geochemical favorability.

## 2.2 Description of the Claim Block

The Austin Gold Venture - Quito claim group is located in the Toiyabe National Forest; T.17,18N., R.43, 44E., MDPM, in Lander County, Nevada. Access to the property is by county and U.S.F.S. roads up Dry Canyon and Birch Creek in the Toiyabe Range, approximately 10 miles south of Austin.

FMC staked 648 unpatented lode claims in 1980 through 1983. FMC leases one block of four patented claims and one mill site; and one non-contiguous patented claim. (See Figure 2.)

## 2.3 Area of Concern

The proposed operations will directly impact 439 acres of the approximate 2720 acres defined as the area of concern. This Plan of Operations only concerns the activities conducted within this 439 acre area. Exploration is being conducted on the mineral claim block outside of the area of concern. The exploration activities occurring presently consist of detailed geologic investigation followed by drilling in the areas recognized to be anomalous. This activity is specifically addressed in IMI's exploration Plan of Operations.

## 2.4 Ongoing Exploration in Area of Concern.

A condemnation/exploration drilling program to determine possible locations for a dump site is underway. The locations chosen for dump and mill sites will be addressed in sections 3.1.2 and 3.2 - 3.7.

Drilling, as closely spaced as 50 foot centers along "fences" (drill roads established along topographic contours) oriented normal to ore trends, has been completed at the mine site. The drilling is by the method of down hole hammer drilling with reverse circulation sample recovery. This method is accepted by the industry as a reliable method of sampling deposits of this type.

Exploration to determine further definition and possible extensions of the ore zones will continue within the area of concern. This exploration is covered under IMI's exploration Plan of Operations, previously submitted.

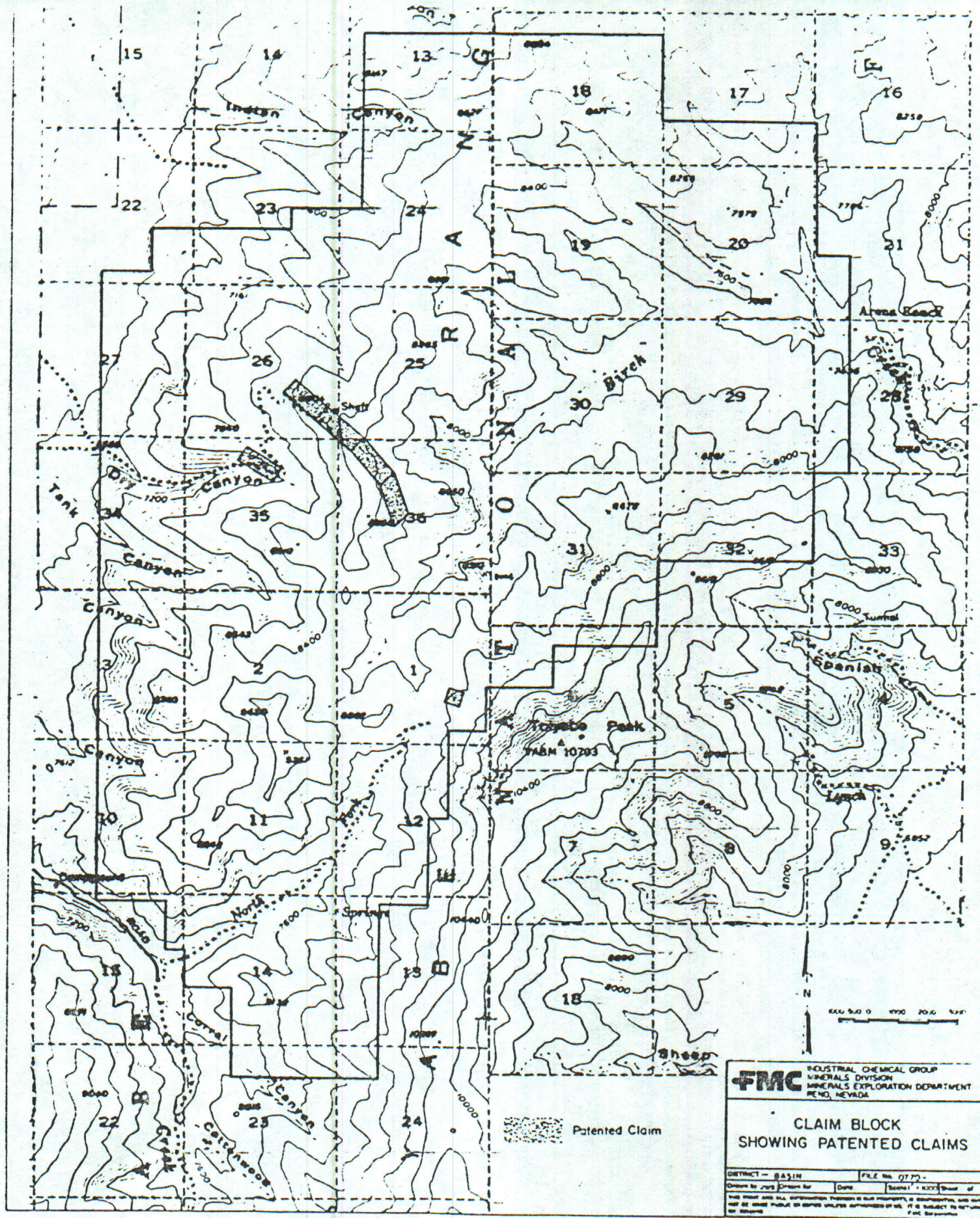


FIGURE 2

## 2.5 Mine, Mill and Tailings Layout

The proposed mine site is located approximately 10 miles south of Austin within the Birch Creek drainage, which flows toward Big Smoky Valley. The proposed mine will be developed between elevation of 8550 and 8000 FASL. Figure 3 displays the proposed mine, mill and tailing layout. The first stage of mining will begin at the crest of an easterly trending spur ridge which projects from the Toiyabe Range west ridge line into Birch Creek.

Operations for the Austin Gold Venture will mine 350,000 tons of gold ore per year. All mining will be by open-pit methods, using front end loaders and trucks for loading and hauling. The ore can be mined at a stripping ratio of approximately 11:1.

The plant will process approximately 350,000 tons per year of ore and will produce 55,000 ounces of gold. The proposed plant site is located to the west of the mine site at an elevation of 6300 FASL, in the Reese River Valley. Figure 4 is a simplified flowsheet of the mill process to be employed at the facility. Figure 5 is a plot plan for the mill and Figure 6 is a general millsite and tailing impoundment plan.

The tailing impoundment basin is located northwest of and below the mill site, on the Toiyabe Range pediment. The most suitable terrain was chosen for this facility, and the choice will be supported by geotechnical data. (See Figures 3 and 6.)

## 2.6 Life Expectancy of Project

The Austin Gold Venture will have an expected life of five years based on the present estimate of ore reserves potential. According to the proposed operation, 350,000 tons of gold ore will be mined per year on a 3 shifts per day, 5 days per week, 52 weeks per year work schedule. The plant facilities will operate 7 days per week, 3 shifts per day.

## 3.0 Description of Project

### 3.1 Mining Operations

#### 3.1.1 Starter Pit Size (Estimated 14 acres) and Operations

The following preliminary assumptions were made by

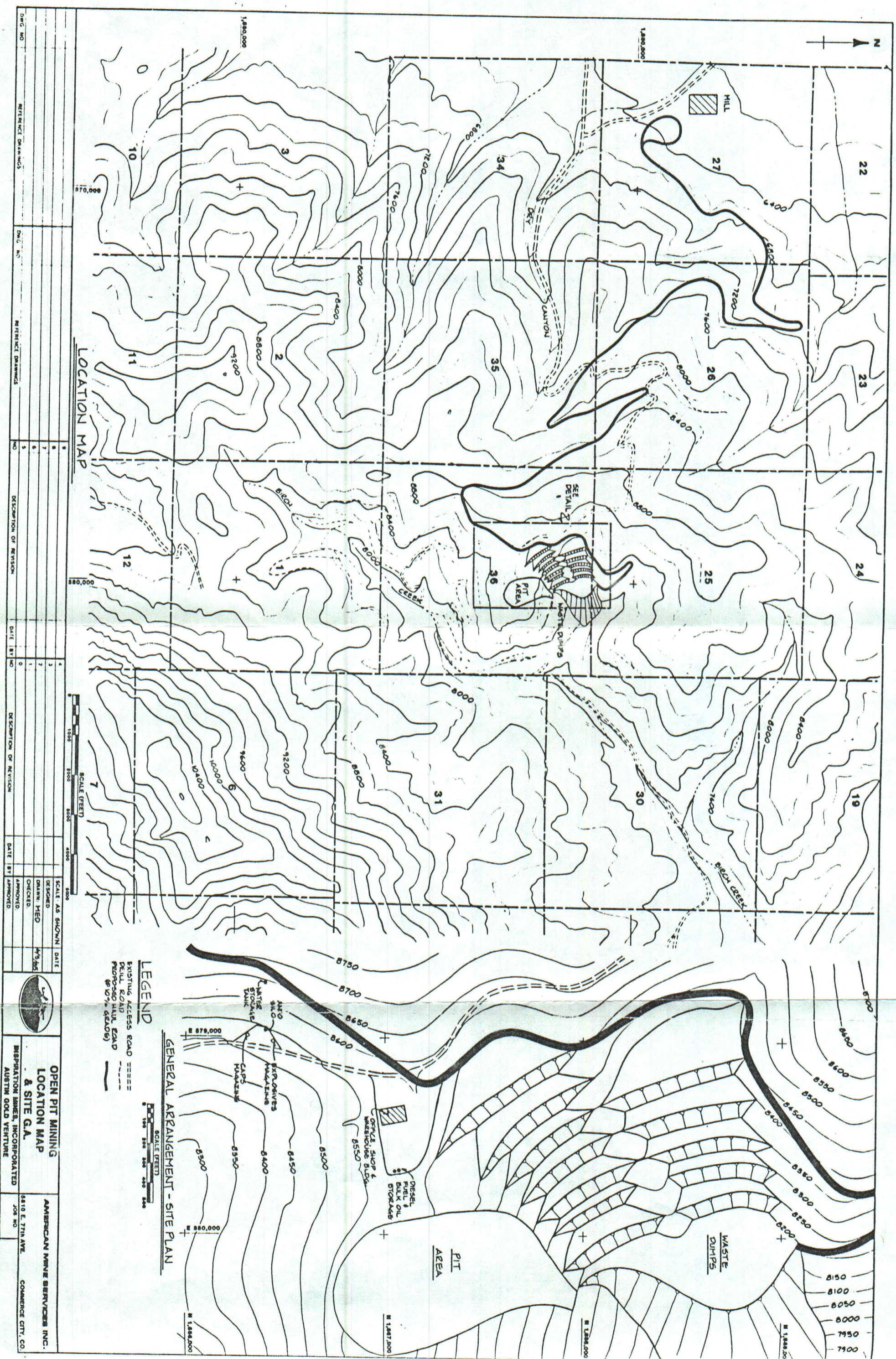


FIGURE 3



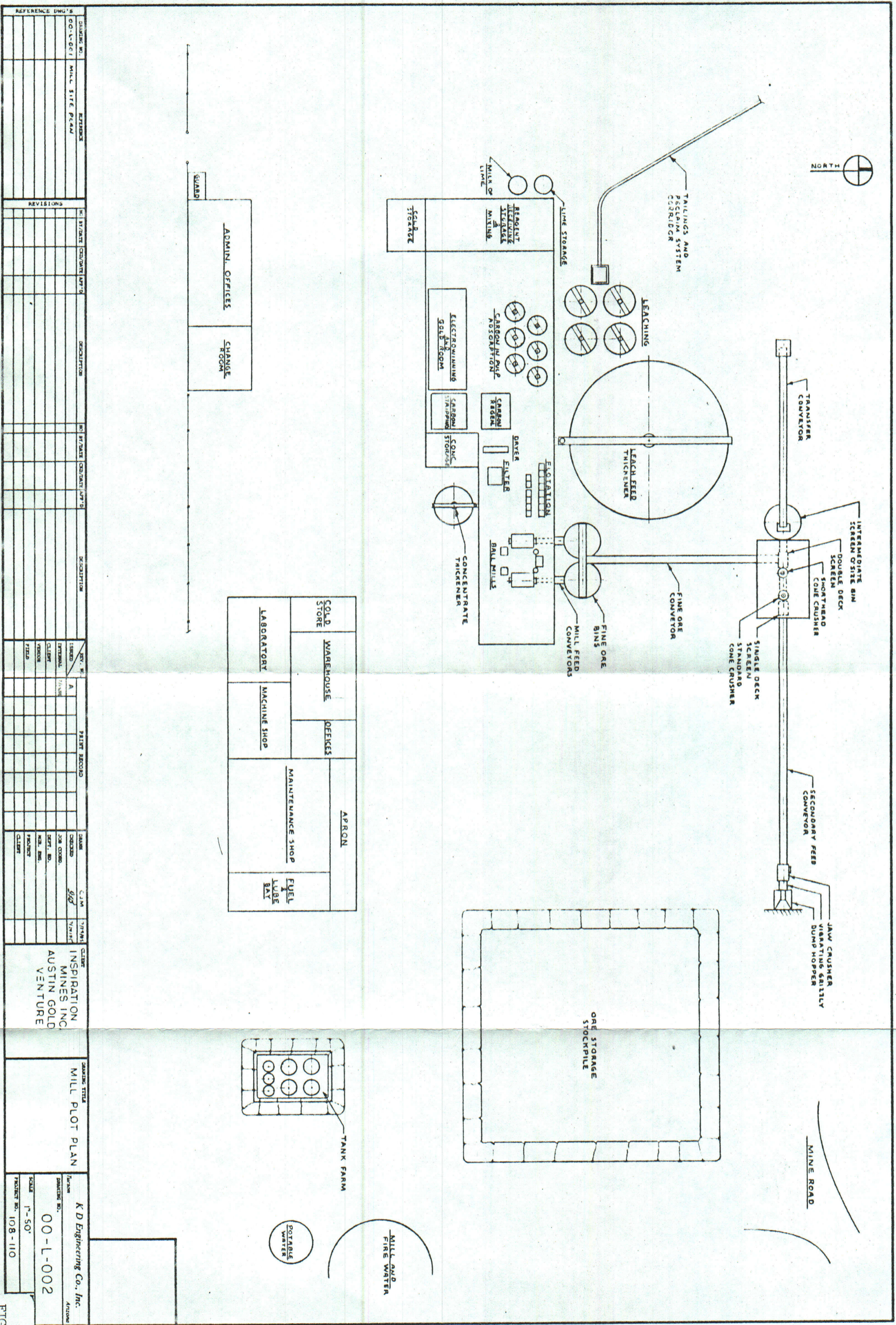
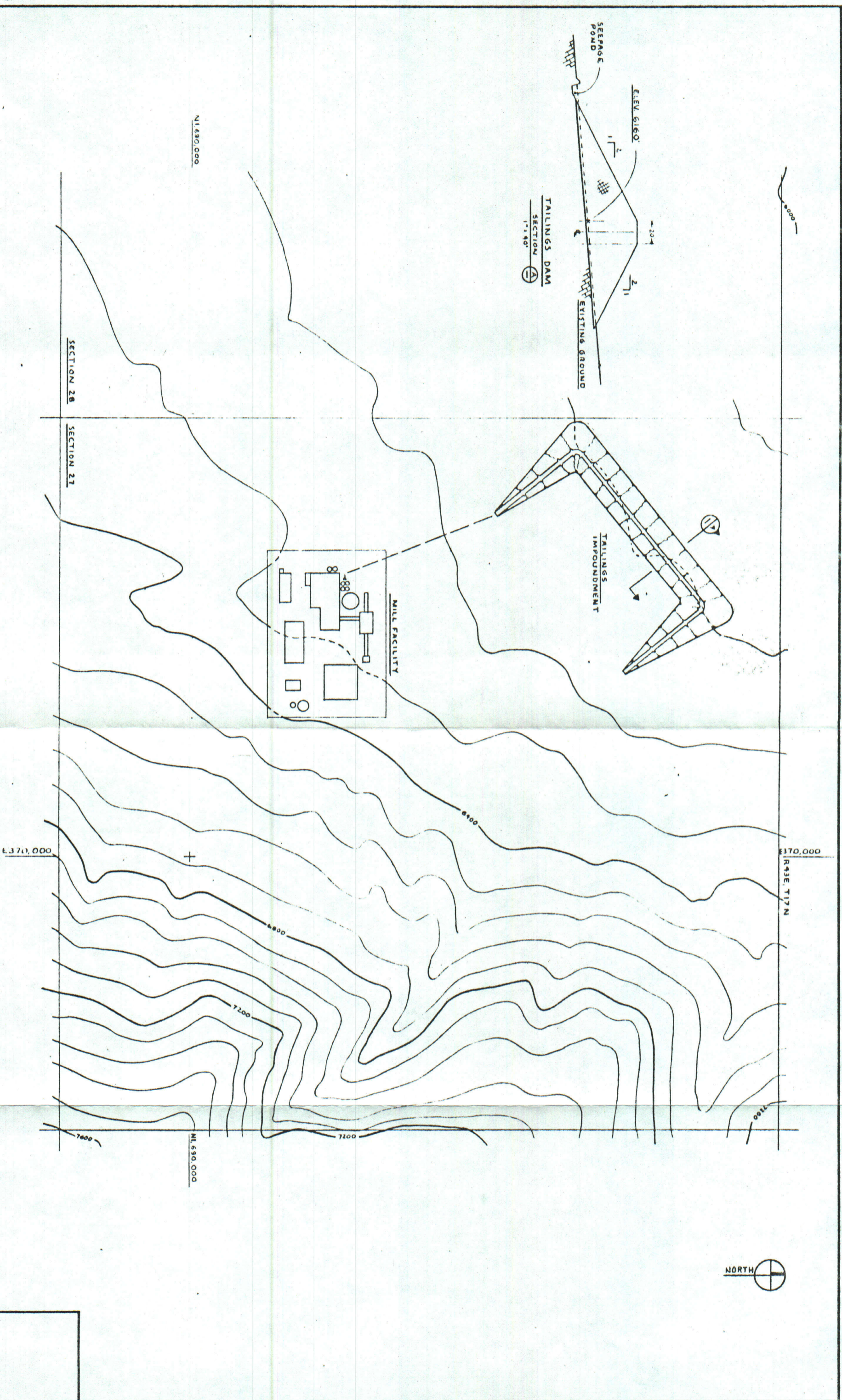


FIGURE 5



REFERENCE DWG'S									
DRAWING NO.	00-L-002	MILL PLOT PLAN	REVISION						

IMI and consultants in determining pit limit for the starter pit, based on the minable reserves:

Mining Bench Height: 10'  
Overall Pit Slope: 50 degrees with 20 ft. safety berm every 60 ft.  
Minimum Pit Operating Area: 50' x 100'  
Haul Roads: 45 ft. wide at 10% maximum gradient; switch backs minimum inside radius = 100 ft.

Pit development will begin at an elevation of 8550 FASL with stripping of approximately 583,000 BCY of waste during a six month construction period.

Review of sampling data obtained from 2500 ft. of underground workings and geologic interpretation of drilling results indicates that ore occurs in runs, commonly between 10 feet and 20 feet wide and up to 600 feet long. Each pit bench may include up to three ore runs.

Ore will be mined first by drilling and blasting a slot in the ore and excavating the broken ore with a backhoe.

The backhoe will excavate and stockpile the ore in a windrow for later recovery by the loading and hauling crews.

Waste will be ripped and dozed into piles which will be moved to the dump area by the loading and hauling crews.

Open pit mining has been scheduled for three shifts per day and five days per week. This schedule provides effective use of the capital-intensive haulage and excavating equipment and will minimize lost time due to engine starting problems during inclement weather.

### 3.1.2 Waste Rock Dumps (49 acres)

An average of 3 million tons of waste rock must be mined and disposed of during each year at the presently indicated stripping ratios in the starter pit. The waste rock dump is located as close to the mine as possible. The dump (6.4 million tons shown) is located immediately north of the mine (See Figure 3).

Assumptions used in conceptual dump design were:  
Angle of Repose of Waste Rock: 37 degrees  
Swell Factor (from in-situ to dumped): 65%  
Dump Levels: 50 foot lifts.

A catchment basin will be constructed below the toe of the lowest dump level to prevent siltation in Birch Creek.

### 3.1.3 Major Equipment Application

The selection of major mining equipment is dependent upon the suitability of such equipment in small surface mines, as well as serviceability and interchangeability of parts.

The 7.0 yard loader - 35 ton truck combination was selected because the incremental increase in operating cost/ton ore is small; this equipment size is most readily available on the used market; and operational flexibility is retained.

The equipment spread for the 1000 tons per day production rate consists of Cat 988 loaders, Cat 769 trucks, and Cat D-9L dozer-rippers; or equivalent. Production Requirements are:

Nominal Rate - tons/day milled	1,000
Annual Production - ore tons	350,000
Daily Mine production	
Ore - Tons	1,400
Waste - Tons	12,509
Waste - BCY	5,513
Trucks - Ore	40
Trucks - Waste	357

Cycle calculations, used to determine equipment specifications and fleet sizes, are based on haulage distances of 31,680 feet (six miles) to the mill and 1,500 feet to the waste dump. Application of 3% rolling resistance results in an average gradient of -4% to the mill and +10% for the return trip.

All diesel-power production equipment must be turbo charged to compensate for the planned 8,000+foot working elevation.

It is estimated, from the cycle analysis, that each truck can haul 7 loads of ore to the mill per shift or 58 loads of waste to the dump. Because the waste haul is short, each loader can only service two trucks.

The proposed equipment spread will permit virtually all of the ore to be hauled to the mill on day shift; a definite advantage during the winter months.

Most of the rockwork within the pit will be in Ordovician age Lower Antelope Valley limestone; some mining will be in Ninemile shale, and a minor amount in western facies Valmy cherts and siltstones. Because of the structural complexity of the district, the limestones are extremely contorted and all rocks are highly fractured.

It is anticipated that all rock units encountered in the pit can be ripped, with a substantial savings in rock handling costs.

Ripping rates have been estimated for a seismic velocity of 6,000 feet per second with ripping and dozing at the rate of 1266 BCY/shift using a D9L dozer/ripper.

A system of drilling and blasting a 10 feet deep trench and use of a backhoe to excavate the ore, prior to removal of the waste, is planned.

Although this is an inefficient method of moving the rock, it is expected to result in optimum separation of waste from the ore and minimize loss of ore reserves through excessive dilution or inadvertent transfer to the waste dumps.

Air track drills, supported by 600 CFM compressors, will be used to drill 3 inch diameter blast holes. Burden is estimated at 6.5 feet, spacing at 5 feet, and necessary sub-drilling at 1.95 feet. Use of this pattern with 4.6 feet of stemming in the collar results in a powder factor of 1.0 pounds of explosives per ton ore. Sixty four holes must be drilled and blasted per day to meet the 1400 tons ore per day schedule.

Each crew can drill and blast 35 holes per shift.

Broken ore will be excavated using a 1 3/8 cubic yard backhoe and piled in a windrow beside the ore trench.

The backhoe can excavate ore at an estimated rate of 897 tons per shift.

The open pit has a "key hole" so that all waste can be trucked to the dumps at a level grade. This design eliminates the need to provide sumps and pumping facilities within the pit.

The highwall has been designed for an overall slope of 50° with a 20 foot wide safety berm every 60 feet and the intermediate wall sloping at 2:1. Artificial support is not anticipated.

Currently, the types of equipment selected for the Austin Gold Venture include:

<u>Maximum Number</u>	<u>Description *</u>	<u>Nominal Size</u>
6	Cat 769C Truck	35 ton
3	Cat 988C Wheel Loader	7 yd
1	Cat 225 Backhoe	1 3/8 yd
4	Cat D9 Dozer with Ripper	460 HP
1	Cat 14G Grader	180 HP
1	Air Track Drill	
1	Portable Compressor	600 CFM
1	Snow Plow	
1	Powder Truck	
1	Water Truck	
1	Fuel & Lube Truck	
1	Flat Bed Truck	
1	Mechanics Truck	
8	Pickup Trucks	
1	Fork Lift	
1	Generator	200 KW
1	Generator	150 KW
1	Shop Compressor	
1	Ambulance	
2	Crew Van	

\*(identified as CAT designation or equivalent)

The major equipment used may change somewhat throughout the life of the mine.

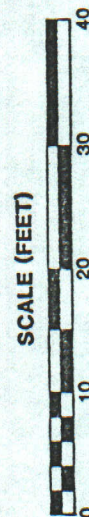
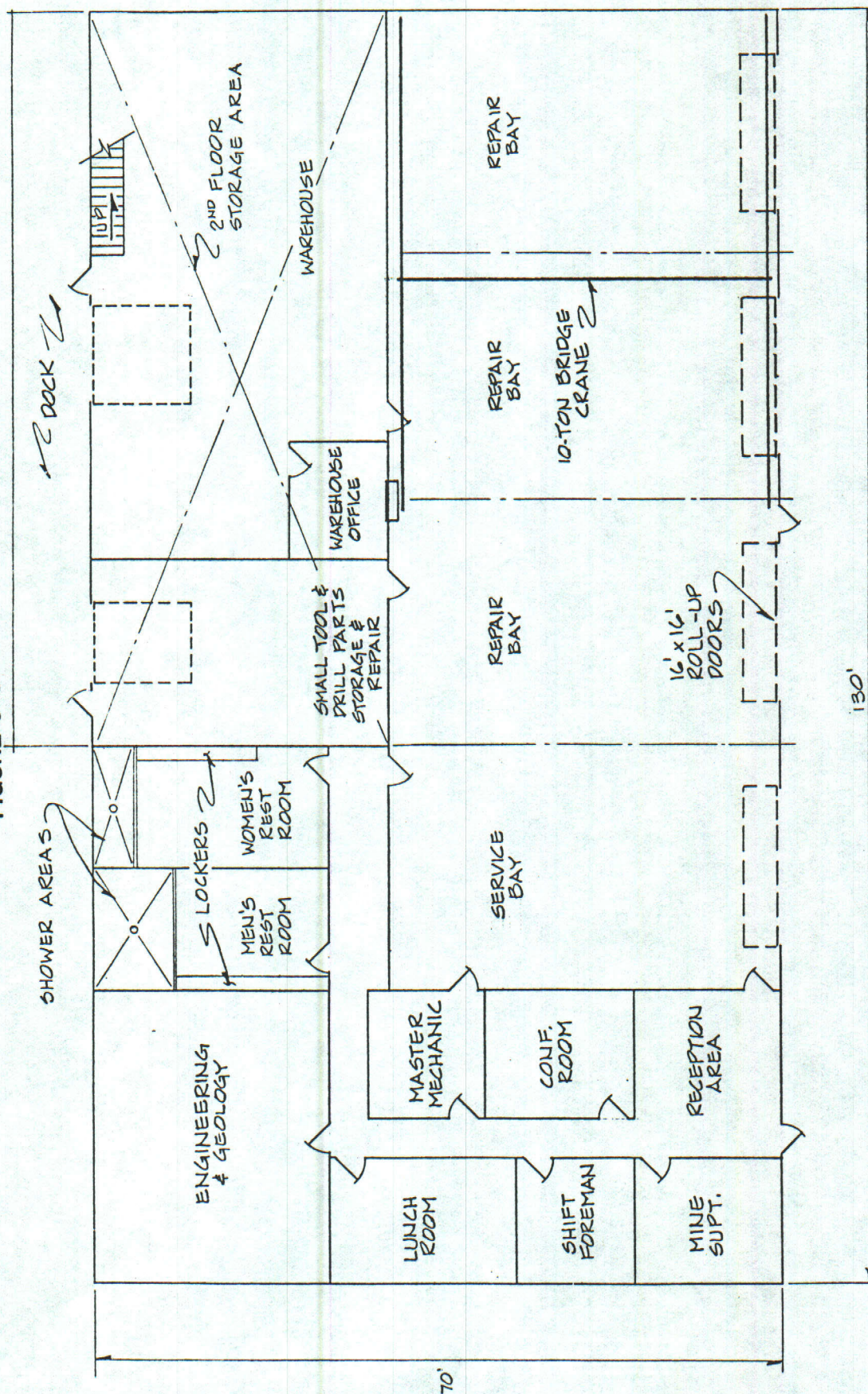
#### 3.1.4 Blasting Supplies

Ammonium Nitrate-Fuel Oil (ANFO) has been chosen as the bulk explosive. Blasting supplies will be stored at locations identified on the Location and General Arrangement Open Pit Site Plan, Figure 3.

#### 3.1.5 Mine Site Facilities

Mine site facilities for the open pit will consist of a combined office-maintenance-warehouse and changeroom building. (See Figure 7). Storage areas will be provided for diesel fuel and bulk oil storage. Power will be provided by diesel generators. Communications will be by radio-telephone.

FIGURE 5-3



# GENERAL ARRANGEMENT OFFICE/SHOP/WAREHOUSE BUILDING

FIGURE 7

The sewage system will use septic tanks and leach fields. Propane will be used to heat the buildings.

Space in the building has been provided for three 25 feet wide repair bays and one service bay. Two repair bays are serviced by a 10 ton bridge crane.

The mine warehouse will stock high turnover items and has been designed with an upper level to provide additional floor space.

Individual offices have been provided for senior staff personnel; open area design has been used for the engineering group. Lunchroom and conference room space is available.

Separate shower-changeroom and restroom facilities have been provided for male and female employees.

### 3.2 Coarse Ore Storage Stockpile (Refer to Figures 4,5, and 6 for processing graphics)

Ore is delivered from the mine by 35 ton ore trucks to either the run-of-mine (ROM) stockpile or directly to the primary crusher ore feed hopper. The ROM stockpile is 200 ft by 200 ft. and will provide storage capacity for 6,000-8,000 tons of ore. This will accomodate the plant for up to one week, should the mine be shut down, and will also provide for ore blending, if necessary.

### 3.3 Crushing Plant and Fine Ore Storage

Run of mine ore will be fed to a 100 ton capacity primary crusher feed hopper either directly by the mine trucks or from the stockpile using a variable speed feeder. A water spray will be installed at the dump pocket for dust suppression.

The ROM ore is reclaimed from the dump hopper by an apron feeder which feeds a vibrating grizzly. The grizzly oversize feeds a jaw crusher and the grizzly undersize and crusher discharge are collected on the secondary crusher feed belt. Dust from the primary crushing area is controlled by water sprays located at all ore transfer points.

The secondary crusher feed belt discharges to a single deck vibrating screen in the secondary crusher building. The screen undersize is collected on the intermediate transfer conveyor while the screen oversize is fed to the secondary standard cone crusher. The crusher discharge is combined with the screen undersize and conveyed to the intermediate ore bin. The intermediate material is reclaimed from the bin by a variable speed conveyor and fed to a double deck vibrating screen. The undersize from the

bottom deck passes directly to the fine ore feed conveyor and the oversize from both decks is fed to a tertiary shorthead cone crusher. The tertiary crusher discharge is combined with the secondary crusher discharge and recycles to the intermediate ore storage bin.

Water sprays will be used throughout the crushing plant for dust control.

### 3.4 Processing Facility-Flotation Mill

A substantial percentage of the values in the ore are bound in a sulfide material that must be recovered by flotation. The grinding and flotation circuits are discussed below.

#### 3.4.1 Grinding

The ore from the crushing plant is stored in two fine ore storage bins with adequate capacity to feed the grinding circuit during weekends and crusher maintenance shut downs.

The fine ore is reclaimed from each bin by a variable speed feeder belt. The feeders discharge to the ball mill feed conveyors, each fitted with a standard belt scale. The feed to each ball mill is continuously sampled by an automatic sampler located at the ball mill feed belt transfer point.

Each of the overflow type ball mills discharge to a cyclone feed sump and the slurry is pumped to a bank of cyclones. The cyclone underflow recirculates to the ball mill feed and the cyclone overflow is gravity fed to the rougher flotation circuit.

Some of the flotation reagents, particularly milk of lime, are added to the circuit at the ball mill feed.

#### 3.4.2 Flotation

The cyclone overflow is diluted to 30-32 percent solids, if necessary, before entering the rougher flotation circuit. Any additional reagents required are also added at this point. The rougher flotation concentrate is pumped to the first cleaner flotation circuit. The first cleaner concentrate advances to the recleaner flotation section and the first cleaner tailings are recycled to the head of rougher flotation. Rougher tailings are gravity fed to the leach feed thickener.

The recleaner concentrate is gravity fed to the concentrate thickener and the tailings are recycled to the first cleaner feed. Additional reagents can be stage added as necessary throughout the flotation circuit. There are no emissions requiring control in this area.

#### 3.4.3 Concentrate Dewatering

The recleaner concentrate is gravity fed to the feed well of the concentrate thickener. The thickener overflow is recycled to the leach feed thickener and the thickener underflow is pumped to the concentrate disc or pressure filter. The filtered concentrate is fed by belt conveyor to the concentrate storage building. The filtrate is recycled to the flotation concentrate thickener. The storage building will be designed to store about a one week production of concentrate.

A pressure filter has been recommended in this circuit because the vacuum filter concentrate has a very high moisture content, making it difficult to handle.

### 3.5 Processing facility - Leach Plant

The tailings from flotation are leached in a cyanide leaching circuit with carbon in pulp recovery of the precious metals. The following text describes this part of the circuit.

#### 3.5.1 Cyanide Leaching

The flotation rougher tailings flow by gravity to the leach feed thickener. The overflow is recycled to the mill water tank and the underflow is pumped to the first agitated leach vessel where it is combined with tailings impoundment return water, lime to adjust the pH to 10.5 to 11.0, sodium cyanide and excess air to provide proper oxidizing conditions. The material is leached for 10-12 hours in four leach tanks. The slurry flows by gravity from one tank to the next and overflow from the last leach tank is pumped to the first carbon in-pulp vessel located inside the mill building.

The four leaching vessels are located outside of the mill building on a concrete bounded pad to contain spillage. All spillage is pumped to the No. 1 leach tank. In case of severe tank failure, the material can be pumped to the tailings header where it will gravity flow to the tailings impoundment. Tanks can be by-passed by a valving system to permit shutdown as required for maintenance.

### 3.5.2 Carbon in Pulp (CIP) System

The carbon-in-pulp circuit consists of six agitated tanks in series with a counter-current flow carbon system. The slurry flows by gravity from tank to tank through in-pulp screens. The screen surfaces are continuously swept by a bubble curtain to prevent plugging by carbon. The carbon is transferred counter-currently at regular intervals by air lifts or recessed impeller pumps. Carbon inventory is monitored and controlled by manual sampling and screening to maintain a pre-determined inventory of carbon in each agitated vessel.

The slurry from the last CIP vessel passes over a safety screen and then flows by gravity to the tailing impoundment located northwest of the process facility. Carbon recovered on the safety screen is recycled to the last CIP vessel.

Slurry and carbon are removed from the first CIP vessel at regular intervals. The loaded carbon is recovered and washed on a screen and then rinsed on one additional screen before being advanced to the stripping columns. Depending on the chemistry of the leach solution, the loaded carbon will contain from 50-150 troy oz per ton of gold. The amount of silver and copper in solution will effect gold loading.

Fresh activated carbon is added to the circuit in the last CIP vessel after being attrition scrubbed and screened to prevent undersized, pregnant solution robbing carbon from being added to the circuit. Undersized carbon (nominal minus 16 mesh Tyler) from all carbon recovery circuits is rejected to the tailings pond.

The CIP area is bounded by concrete stem walls to contain spills. Intermittent spillage is pumped by sump pump to the No. 1 CIP tank. Catastrophic failures can be pumped to either the tailings header box or to an emergency sedimentation pond. Tanks can be bypassed by a valving system.

### 3.5.3 Carbon Stripping and Electrowinning

The loaded carbon is placed in one of three pressurized stripping columns. When a column is loaded the carbon is stripped using hot caustic cyanide solution under relatively low pressure. Fifteen to twenty bed volumes of hot strip solution are required to thoroughly strip the values from the carbon. A system of heat exchangers recovers heat from the hot pregnant solution to preheat the barren solution entering the columns. The pregnant solution is further cooled in a heat exchanger using recycled water from a cooling tower.

The actual volume of strip solution required will be determined by the actual loading level of the carbon and the amount of silver and copper that is loaded. The loading level and stripping efficiency are also affected in a negative way by carbon fouled with calcium carbonate and silicates. Regeneration of the carbon is discussed in Section 3.5.4 below.

The cooled pregnant electrolyte is passed through a series of fiberglass electrolytic cells using fiberglass cathode baskets loosely packed with steel wool and stainless steel plates for anodes. The cathode baskets are removed at regular intervals, with the contents extracted and placed in an iron dissolver using sulfuric acid as a lixiviant. The gold bearing sludge from the dissolver is filtered in a vacuum filter along with the sludge from the electrowinning tanks. The filtrate is pumped through additional carbon adsorption columns to remove trace amounts of precious metals that may be contained. The iron bearing solution from this facility is neutralized with lime and rejected to the tailings impoundment.

The filtered residue is dried and prepared for smelting in the dore smelting area.

#### 3.5.4 Carbon Regeneration

This study assumes reactivation of 100 percent of the carbon after each cycle. This may not be necessary but all equipment should be sized to handle all of the inventory everytime it is passed through the circuit. Pilot plant testing, if conducted, will dictate the actual regeneration requirements.

The stripped carbon is removed from the stripping column by pressure transfer, air lifts or it can be pumped as a slurry. The carbon is pumped to an acid wash, consisting of agitated conditioning vessels, and is thoroughly washed with either nitric or hydrochloric acid. A bleed stream from the wash circuit is neutralized and rejected. The acid washed carbon is dried then reactivated in an inert or reducing atmosphere at a relatively high temperature (in excess of 600°C) then quenched. The carbon is then subjected to a high intensity attrition scrubber to break down marginal carbon particles. After attritioning the carbon is screened before being returned to the circuit, thus eliminating the introduction of undersize carbon to the CIP circuit. Undersize carbon is rejected to the CIP tailings.

### 3.5.5 Dore Smelting

The dried residue from the electrowinning area is charged to an electric induction furnace with appropriate fluxing material including measured amounts of soda ash, niter, silica and borax. The charge is melted, the slag is poured off and dore bars are poured directly.

The slag from the smelting operation is crushed and can be reground and tabled or reground and returned to the milling circuit, depending on the nature of the entrapped values. Standard procedure is to regrind the slag and process it by gravity for recovery of free metal. Depending on the content, the remaining slag may be sent to a smelter for silver recovery.

### 3.6 Process Plant Facilities

Most of the structure for the plant will be of pre-engineered steel except for areas requiring additional security.

The crusher building, mill building, office, warehouse and shops will be constructed of pre-engineered and painted steel. The electrowinning room and melting room will be constructed of reinforced concrete block.

### 3.7 Tailings Disposal (Figure 6)

The tailings from the No. 4 leach tank are delivered by gravity through a high density polyethylene pipe to the tailing impoundment. The tailing impoundment is built entirely of borrow material from the inside of the impoundment and will be designed to eventually contain 1.0 million tons of solids at 80 percent ultimate density plus adequate free board to contain the process water for several weeks of operation without recycle. The pipeline and dike are discussed below.

#### 3.7.1 Pipeline

A header box will be located at an appropriate location on the north side of the mill building. The pipe, high density polyethylene, will be used to transport the material from the box to the tailings impoundment located northwest of the plant. The pipeline will run along the top of the west and north sides of the dike, and a perimeter discharge system will be employed.

The pipe on the north side of the dike will be fitted with an appropriate number of tapping saddles and spigoting valves to permit selective deposition of

tailings. This will be done to allow the operator to maintain control of the location of the reclaim water pond over the life of the project.

### 3.7.2 Dam Construction

The proposed construction of the dike would be a centerline construction of compacted fill from within the impoundment area. This will permit increasing the volume of the impoundment at the same time the dam is being constructed and reduce the overall volume requirements for the dike. Based on preliminary calculations, it appears that the entire dike will require less than 400,000 cubic yards of material.

The borrow material will be placed in layers and compacted. The area to be covered will be cleaned of shrubs, trees, etc. before the first layer is placed. An intercepting sump at the base of the dam will be constructed to trap any potential seepage from the main dam. Seepage, if any, will be pumped back into the impoundment and returned to the leach circuit.

An excavated area will be located on the far southern edge of the impoundment to serve as a reclaim water reservoir. The floating barge return water pump will be located in this area.

### 3.8 Chemical Handling

The process facility will use varying amounts of the following reagents:

- Lime ( $\text{CaO}$ )
- Sodium Cyanide ( $\text{NaCN}$ )
- Sodium Hydroxide ( $\text{NaOH}$ )
- Cresylic Acid
- Potassium Amyl Xanthate
- Nitric and Sulfuric Acid
- Flocculant
- Flux (Borax, Niter, Silica etc.)

Lime will be delivered in bulk pneumatic trucks. Pebble lime will be pneumatically unloaded with the truck compressor into an 25-ton silo equipped with a baghouse for dust control. The lime can be slaked by a packaged lime slaker or a small grinding mill and cyclone can be set up to produce the milk of lime. The milk of lime will be stored in an agitated tank fitted with appropriate pumps.

Sodium cyanide will be delivered in 3,000-pound sealed flow bins or 55 gallon drums. An agitated tank is used for makeup of a 20 percent sodium cyanide solution. If flow bins are used, water is first added to the tank with enough

caustic to produce a 1 percent caustic solution. The flow bin is then placed on a stand on top of the tank and the bottom of the bin is opened. A recycle pump will pump the solution to the flow bin, and the solution will recirculate until the cyanide eggs are dissolved. The resultant 20 percent solution is transferred to a storage tank. If the cyanide is delivered in drums, the cyanide eggs are placed in a basket hanging inside the agitated tank. The solution is pumped through the basket until the eggs are dissolved.

Caustic, cresylic acid and amyl xanthate, will be delivered in 55 gallon drums. The material will be mixed in batch tanks and pumped to the appropriate areas by centrifugal chemical pumps. Acids will be received in returnable carboys (stainless steel or polypropylene).

Flocculants will be delivered in sealed bags or a high strength liquid in 55 gallon drums. These will be mixed daily and will be pumped into the appropriate head tanks.

### 3.9 Sewage Waste and Solid Waste Disposal

All sewage is collected by an underground sewer system and piped to a septic tank. The effluent from the septic tank is discharged into a leach field.

The location of a landfill area will be determined in future engineering. The landfill will be used for trash and other debris generated by workers and certain mining activities. Fuel oil will be contained in a tank behind the maintenance shop. Tires will be removed as salvage and reagent containers will be recycled.

## 4.0 Ancillary Projects

### 4.1 Electric Power

Power will be supplied to the Austin Gold Venture mill by Sierra Pacific Power Company at 120 kilovolts to the primary substation. Sierra Pacific will be asked to construct the 3.5 mile overhead line to the plant site and will provide primary metering facilities. (See Figure 8.)

The primary substation includes a 7.5 MVA transformer, an outdoor 4.16 kilovolt metal clad switchgear, and is enclosed by chain link fencing.

In-plant power distribution is 4.16 kilovolts to the north and south substations. Each of these substations has two outdoor 1000 KVA transformers with 480 V switchgear housed in concrete masonry rooms. Utilization voltage for the motors and lighting is 480 volts and 120 volts, respectively. Power supply to the crushing plant and ball mill motors is directly from the primary substation at 4160 volts. Overhead power at 4.16 kilovolts is supplied to the

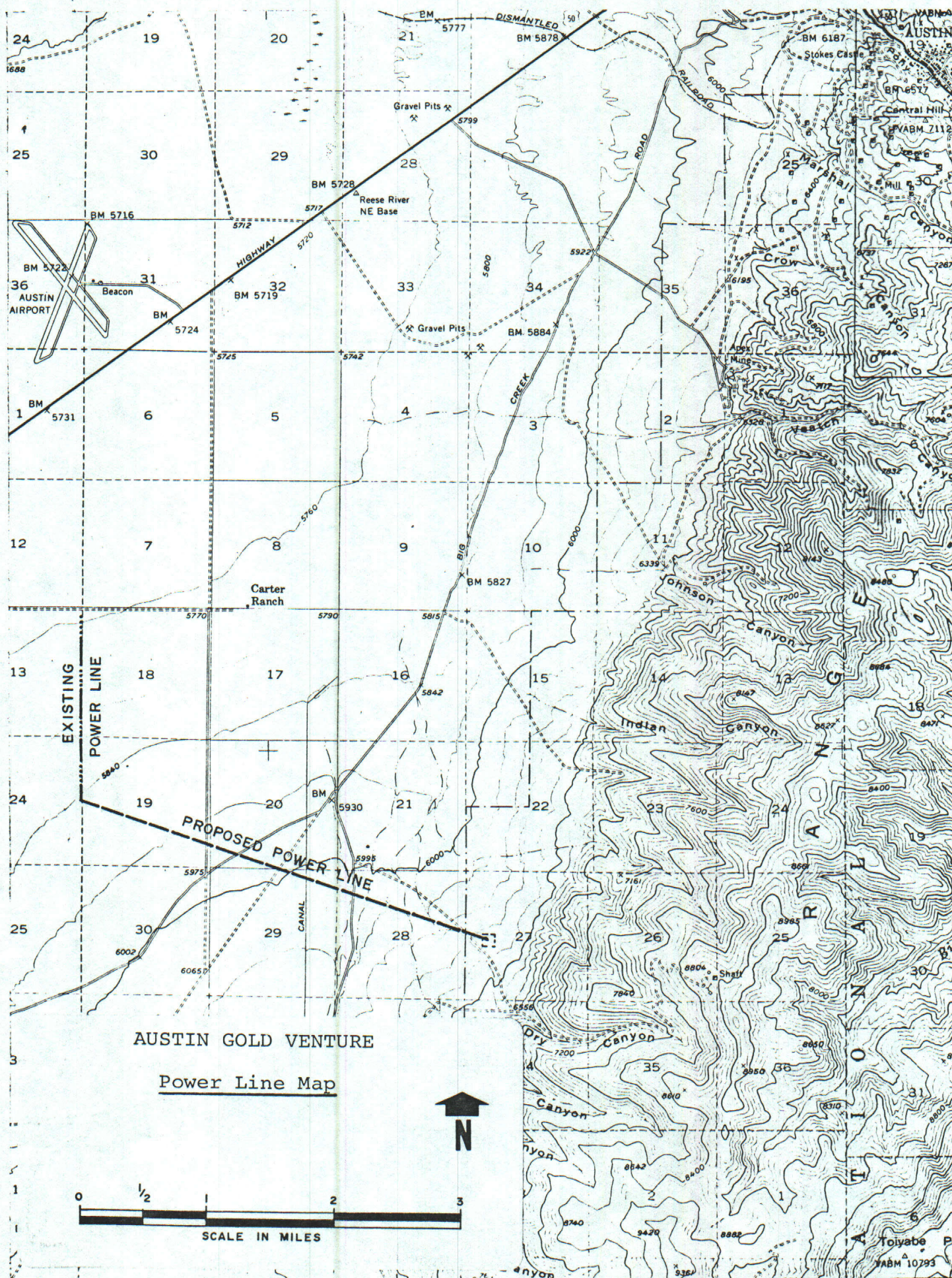


FIGURE 8

reclaim pumps at the tailings dam. Two 500-kilowatt standby diesel engine generators provide emergency power to critical areas in case of power outage.

A separate environmental assessment on the proposed powerline corridor would be prepared by Sierra Pacific Power Company. Right of way must be obtained from the U.S. Bureau of Land Management, Department of the Interior.

#### 4.2 Wellfield Development

The water source for the Austin Gold Venture mill has not been finalized. It is probable that an adequate water supply can be developed near the mill site; therefore, water well development will be coincident with the placement of monitor wells at the tailing impoundment.

### 5.0 Power and Access Roads

#### 5.1 Powerline

Power for plant site operations would be delivered by a 3.5 mile power line that would be constructed as a feed from the existing Sierra Pacific transmission line at the east quarter corner of Section 24, Township 18 North, Range 42 East.

#### 5.2 Access Roads

Access to the plant site is via U.S. Highway 50 for approximately two miles west of Austin, Nevada to the Big Creek road junction. The Big Creek road which lies south of Highway 50, would be graveled for 7.5 miles to the Dry Canyon road junction and improvements would be extended for approximately one mile to the plant site.

### 6.0 Emission-Pollution Control

The control of emissions from the plant area are discussed below and details are provided in Tables 1 and 2.

#### 6.1 Control of Fugitive Dust from Roads and Disturbed Surfaces

Roads and disturbed surfaces within the area of concern will be either watered or treated with a dust suppression chemical to control fugitive dust. The specific chemical suppressant has not been determined as of this time. The specific control used will be determined in consultation with the Nevada State Air Quality Officer.

## 6.2 Particulate Emissions

The particulate emissions from the crushing and milling facility are estimated for each point source. The estimates are in two categories: Uncontrolled (Refer to Table 1), and Controlled (Refer to Table 2). Uncontrolled estimates are based on data for emissions from the sources when control devices are not installed. The controlled estimates are based on conservative efficiency ratings of the installed operating control devices (Tables 1 and 2 are keyed to the flowsheet, Figure 4). It is expected that after detailed analysis of the emission controls these tables will be refined. Therefore, these are preliminary estimates only.

Table - 1 AIR EMISSIONS FOR AUSTIN GOLD VENTURE  
Uncontrolled (lb/day)

Source					
<u>ID</u>	<u>Source</u>	<u>Dust</u>	<u>Acid</u>	<u>Hydro Carbon</u>	<u>ACFM Discharge of Air Ft</u>
A-1	Dump Hopper	110	-	-	-
A-2	Primary Crusher & Grizzly	1,644	-	-	25,000 30
A-3	Secondary & Tertiary Crusher	2,375	-	-	36,000 40
A-4	Fine Ore Bin	1,058	-	-	16,000 50
A-6	Smelting Furnace	2	-	-	7,575 50
A-7	Gasoline Storage Tank	-	-	4.80	- -
A-8	Propane Storage Tank	-	-	1.20	- -
A-9	Diesel Storage Tank	-	-	.30	- -
A-10	Laboratory-Dust Stack	5	-	-	5,000 25
	Acid Stack	-	15	-	1,500 25
	Solvent Stack	-	-	3.00	5,000 25
	Furnace Stack	1	-	-	10,000 25
A-11	Lime Silo	12	-	-	500 50
A-12	Lime Slaker And Slurry Tank	10	-	-	300 50
A-13	Sulfuric Acid Storage	-	5	-	- 30
A-14	Nitric Acid Storage	-	5	-	- 30
A-15	Slag Handling	1	-	-	1,000 50
Totals		5,218	25	9.30	107,875

Table 2 - AIR EMISSIONS FOR AUSTIN GOLD VENTURE  
Controlled (lb/day)

<u>ID</u>	<u>Source</u>	<u>Dust</u>	<u>Hydro Acid</u>	<u>Control Carbon</u>	<u>Device</u>	<u>Emission Reduction</u>
A-1	Dump Hopper	55.00	-	-	Water Spray	50-95%
A-2	Primary Crusher & Grizzly	82.00	-	-	Water Spray	50-95%
A-3	Secondary & Tertiary Crushe	119.00	-	-	Water Spray	50-95%
A-4	Fine Ore Bin	53.00	-	-	Water Spray	50-95%
A-6	Smelting Furnace	.01	-	-	Baghouse	99%
A-7	Gasoline Storage Tank	-	-	4.80	-	-
A-8	Propane Storage Tank	-	-	1.20	-	-
A-9	Diesel Storage Tank	-	-	.30	-	-
A-10	Laboratory - Dust Stack	.25	-	-	Wet Scrubber	95%
	Acid Stack	-	1.50	-	Wet Scrubber	90%
	Solvent Stack	-	-	3.00	Wet Scrubber	90%
	Furnace Stack	.10	-	-	Baghouse	90%
A-11	Lime Silo	.12	-	-	Baghouse	50%
A-12	Lime Slaker and Slurry Tank	5.00	-	-	Water Spray	50%
A-13	Sulfuric Acid Storage	-	5.00	-	-	-
A-14	Nitric Acid Storage	-	5.00	-	-	-
A-15	Slag Handling	.01	-	-	Baghouse	99%
Total		314.49	11.50	9.30		

### 6.3 Control of Groundwater Discharges

Birch Creek represents a surface water resource in the mine area. A few dry stream courses exist on the Quito claims, which carry runoff waters intermittently. However, this surface water does not join any larger water bodies.

The Project mill and tailing impoundment is designed as a closed loop system with no anticipated discharge to surface or ground waters absent catastrophic and extreme storm events. The tailing impoundment will be designed with a zero discharge objective.

Percolation of precipitation through waste rock piles is another source which could possibly affect the ground water. It is extremely unlikely that any water quality standards would be violated as a result of the Austin Gold Venture operation.

### 6.4 Reclamation

It is the intention to reclaim the project where conditions and current reclamation technology permit and as required by the U.S.F.S. and Nevada state agencies. A third party consulting firm will be selected by the Austin Ranger District office, U.S.F.S. to prepare an environmental assessment. IMI will work with this consulting firm to develop a reclamation plan consistent with the long term management objectives of the U.S.F.S., the standards in 36 CFR Part 228 and which meets the requirement of state air quality.

## 7.0 Preconstruction Environmental Considerations and Analysis

Prior to the commencement of construction of the mine and mill, IMI is required to comply with numerous state and federal environmental laws and regulations. The proposed area of concern and ancillary project areas will be surveyed for archaeological resources and threatened and endangered species. Other natural resources such as wildlife, soils, and the recreational potential of the area will be evaluated.

This Plan of Operations is being submitted as the first phase of the National Environmental Policy Act review process, which is required of every major project on federal lands. In the review process all environmental issues and impacts will be addressed, evaluated, and where necessary mitigated to minimize the project's potential impact on the human environment. The product of this review process will be an environmental document and a project that is managed and operated in a manner that has a minimal influence on the environment outside of the project site.

## 8.0 Summary Schedule

The development plan for the Austin Gold Venture is to design and construct a mine and an ore processing facility at the lowest capital cost and in a reasonable time frame consistent with the project's design criteria and specifications, established industrial standards, and necessary environmental considerations.

American Mine Services, Inc. and K.D. Engineering Co., Inc. have developed summary development schedules currently anticipated for the completion of the project. (Figures 9 and 10). These schedules are based on the expectation that all permits will be approved without undue delay.

## 9.0 Housing the Work Force

### 9.1 Construction Work Force

It is expected that the construction work force will range from 150 to 200 during the peak periods of development (Figure 11).

Accommodating these construction workers in a relatively remote area such as Austin may be difficult. Facilities for housing the work force exist within the communities surrounding Austin to a radius of about 117 miles. Austin, closest to the project site (10 miles) has only limited accommodations. However, Battle Mountain, Tonopah and Fallon, 97, 127 and 116 miles distant respectively, have sufficient accommodations and the travel distances, are feasible for short term construction.

### 9.2 Operating Work Force

The operating work force consists of approximately 114 workers. Facilities for housing the project work force will be available within these communities and smaller ones nearby. Houses or apartments for rent are not abundant and provisions were included in feasibility study cost estimates for construction of 80 trailer spaces.

Although a lengthy work commute is not uncommon in the construction and mining industries, contracts will encourage contractors to provide worker bussing, so as to reduce traffic on the generally good quality roads.

### 9.3 Construction and Operation Labor Sources

The basic labor source for construction and operation workers will be in cities located within the Reno-Salt Lake City belt of Nevada-Utah.

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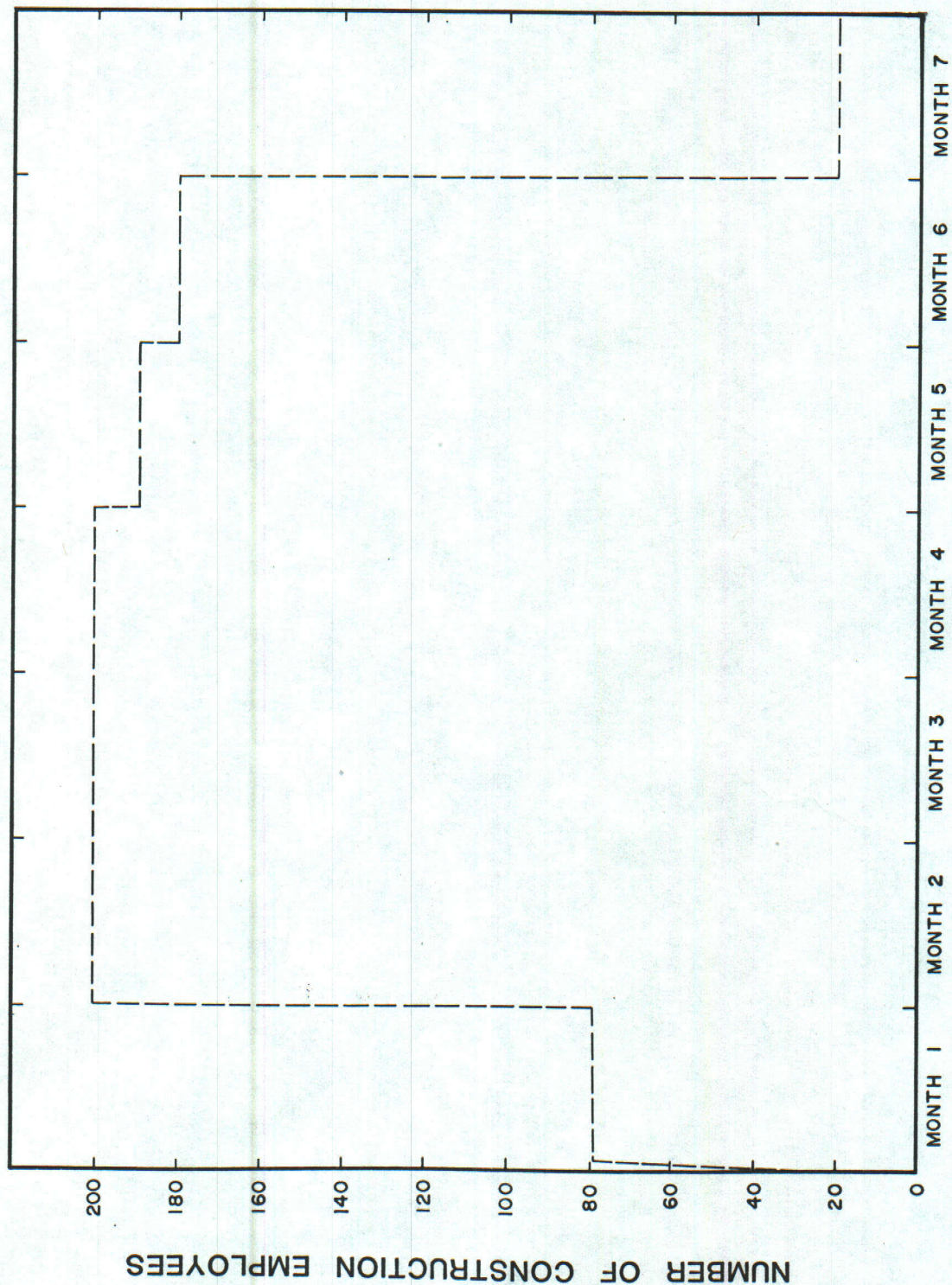
Figure 9

# INSPIRATION MINES, INCORPORATED AUSTIN GOLD VENTURE PROJECT SCHEDULE - PLANT CONSTRUCTION

ACTIVITY	YEAR 1				YEAR 2				YEAR 3				YEAR 4				YEAR 5			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Site Preparation and Concrete																				
Steel Fabrication and Erection																				
Equipment Installation																				
Piping, Electrical, Instrumentation																				
Tailings Dam Construction																				
Checkout																				
Start-up and Production																				

FIGURE 10

**INSPIRATION MINES, INCORPORATED AUSTIN GOLD VENTURE  
PROJECT SCHEDULE - PLANT CONSTRUCTION  
- MANPOWER -**





United States  
Department of  
Agriculture

Forest  
Service

Toiyabe National Forest  
Austin Ranger District  
Box 130 Austin, NV 89310

Reply to: 1950 NEPA  
Austin Gold Venture

Date: September 4, 1985

Dear Reviewer:

The Austin Ranger District, Toiyabe National Forest has received a Notice of Intent/Basic Operating Plan for a proposed development of Austin Gold Ventures gold mine by Inspiration Mines, Incorporated. A briefing document for the proposed project has been prepared and is enclosed with this letter.

The tentative schedule of activities includes:

Sept. 19	Briefing with Nevada State Agencies and Lander County Officials
October 1	Public Meeting in Austin, Nevada to review proposal and alternatives
October 18	Approval of finalized list of issues, concerns and criteria
December 1	Technical reports on alternatives and effects reviewed
February 1	Forest Service issues Decision Notice on Project

Due to the uncertainty surrounding the need to prepare an Environmental Impact Statement, a Notice of Intent (NOI) will not be filed at this time. However, the scoping requirements at 40 CFR 1501.7 that are required after an NOI has been filed will be utilized during the Environmental Assessment process to help determine the need for an EIS.

Comments and or questions may be submitted to the Forest Service at the following addresses:

Forest Supervisor  
Toiyabe National Forest  
1200 Franklin Way  
Sparks, Nevada 89431

District Ranger  
Toiyabe National Forest  
Austin Ranger District  
Austin, Nevada 89310

Sincerely,

MONT E. LEWIS, JR.  
District Ranger



**BRIEFING DOCUMENT  
FOR THE PROPOSED  
AUSTIN GOLD VENTURE PROJECT**

**INTRODUCTION**

On July 26, 1985, the Forest Service, Austin Ranger District, Toiyabe National Forest received a Plan of Operations for the proposed development of Austin Gold Ventures gold mine by Inspiration Mines, Incorporated (Inspiration). Inspiration is proposing to construct and operate a gold mine at the head waters of Birch Creek, along the ridge line of the Toiyabe Range. A mill would be constructed and operated at the foot of the range on the west side adjacent to Dry Canyon. According to the submitted Plan of Operation's the entire project would be on Forest Service administered lands. In accordance with Forest Service regulations, "Surface Management of Public Lands Under U.S. Mining Laws" 36 CFR Part 228 and the implementing regulations for the National Environmental Policy Act (NEPA), the Forest Service is preparing an Environmental Assessment (EA) to determine the potential environmental impacts of the proposed mine and mill development and to determine if an Environmental Impact Statement (EIS) is required.

The Forest Service encourages interested persons, organizations, and agencies to assist in the environmental assessment process by providing written or verbal comments on the issues and concerns that should be addressed in the EA. This briefing document provides an overview of the proposed Austin Gold Ventures Project and the alternatives under consideration. It also provides a preliminary determination of the resources likely to be affected by the proposed project and the issues to be addressed in the EA. Comments on this briefing document, the scope of the EA or other aspects of the proposed Plan of Operations may be submitted to the Forest Service at the following addresses:

Mr. R. M. "Jim" Nelson  
Supervisor's Office  
Toiyabe National Forest  
1200 Franklin Way  
Sparks, Nevada 89431

OR

Mr. Mont Lewis  
Toiyabe National Forest  
Austin Nevada District  
P.O. Box 130  
Austin, Nevada 89310

Additionally, a public information meeting will be held to provide further information regarding the proposed project and to gather public contribution to the EA process. Persons wishing to comment verbally may do so at this meeting to be held at:

Old Lander County Court House  
Austin, Nevada  
Tuesday, October 1, 1985  
7:00 - 9:00

All written and verbal comments on the scope of the EA must be received by October 11, 1985.

LOCATION MAP OF  
AUSTIN GOLD VENTURE

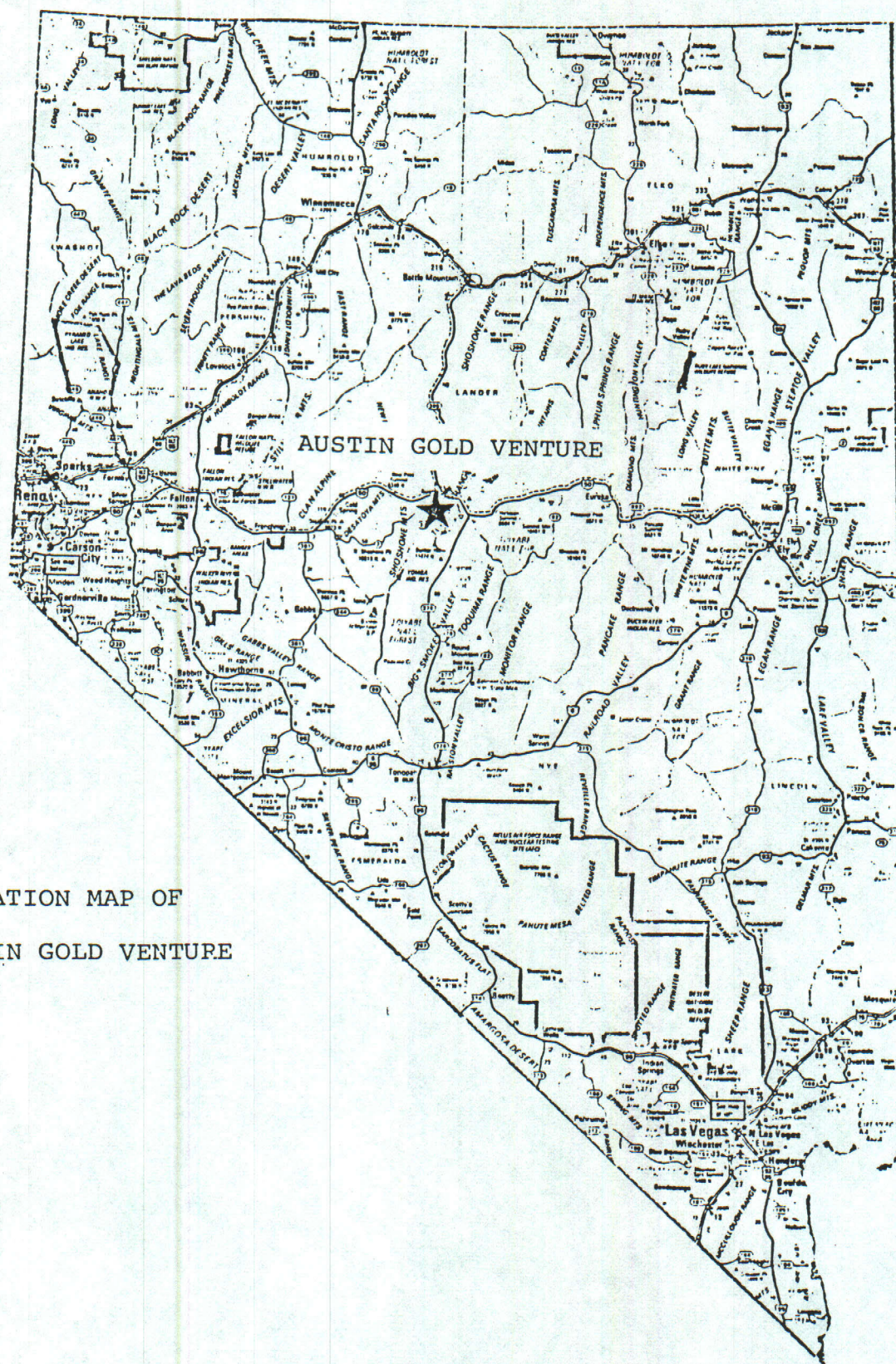


FIGURE 1

## PROJECT OVERVIEW

The proposed Austin Gold Ventures Project would involve the construction, operation, and abandonment of an open pit gold mine and mill. The project would be located in Lander County, Nevada approximately 10 miles south of Austin (Figure 1). It is proposed that Inspiration would mine a 1,750,000 ton gold ore body at a rate of 350,000 tons of ore per year and process this ore in the mill by a sequence of flotation and cyanide agitation leaching methods. The mill would produce 55,000 ounces of gold per year over the currently projected 5 years of operation. The entire project, including construction, operation, and abandonment, would have an estimated life of 7 years.

The initial construction effort for the project would commence in January 1986 at the earliest. The main construction would begin in the Spring of 1986 and continue for 6 months. The peak construction force would require approximately 200 workers. The mine and mill operations would begin in July 1986 and employ approximately 114 persons.

The project components would consist of an open pit mine, waste rock disposal area, ore storage stockpile, mill and processing facilities, tailings dam and impoundment, electric power transmission system, a haul road, access roads, and water wells and a pipeline. A preliminary map of the proposed project is shown on Figure 2.

The proposed open pit mine would be the source of approximately 6.4 million tons of waste rock which would be deposited in a waste dump adjacent to the mine. The ore would be hauled down a six mile haul road to the mill site. The ore would be crushed, then treated with flotation methods to produce a concentrate that would be shipped to a copper smelter. The flotation tailings would be treated in an agitated cyanide leach circuit to remove the remaining gold. This gold would be stripped from the cyanide solution by carbon columns and ultimately reduced to gold dore on site. The tailings from the mill would be pumped to an adjacent tailings impoundment (Figure 3). The tailings impoundment would be designed to permanently contain the tails and would be reclaimed and stabilized at the end of the mine's life. During the life of the operation, water impounded behind the tailings dam would be recycled through the mill for conservation purposes. The tailings impoundment would be designed to prevent contamination of the surface and ground water of the Reese River Valley.

## ALTERNATIVES

Alternatives to the project's design, as shown here, have not been discussed in Inspiration's Plan of Operations. As a result of the environmental and engineering analyses of the project, alternative locations for the tailings impoundment, the waste rock dumps, and the haul road may be developed. However, due to the steepness of the terrain it is unlikely that many alternatives will be developed. The following are some of the potential alternatives that may be addressed in the EA.

1. Mining alternatives include underground verses open pit methods.
2. Ore transportation alternatives include the proposed haulage road verses transporting the ore through the ridge of the Toiyabe Range via an adit to the west side of the range and then down to the mill by a road.

3. Mill and tailings impoundment site alternatives include the following:
  - a. Location of the mill and tailings impoundment near the meadows along Birch Creek.
  - b. Location of the mill at the ridge line.
  - c. Location of the mill at the large turn about half way up Dry Canyon.
  - d. Locate the tailings impoundment about half way up Dry Canyon.

### **ISSUES AND CONCERNS**

Issues, concerns and potential areas requiring mitigations have been tentatively identified as follows:

1. **Potential Effects of Climate on the Project:**
  - a. What effects do high intensity thunderstorms and rain-on-snow have on location and design of the roads, waste dumps and mine pit.
  - b. Where can the roads be located to maximize year long use with minimal snow removal and haul distance.
2. **Soils and Reclamation:**
  - a. What effect will available soils productivity have on reclamation.
  - b. Will the inherent erodability of the soils affect design of pit and operation of the pit, roads or waste dump.
3. **Visual Concerns:**
  - a. What effect will the proposed roads and facility have on the existing visual quality from US 50.
4. **Social, Cultural and Economic Effects of the Project:**
  - a. What cultural resources exist on the site and what is their significance.
  - b. What effect will the proposal have on socioeconomic values in Lander, Eureka and Churchill counties.
  - c. What effect will the project have on plans or programs of other agencies in Lander County.
5. **Effects of Project on Biological Resources:**
  - a. Are threatened and endangered species affected.
  - b. What will the effect be on the riparian habitats of Birch Creek
  - c. What will the effect be on deer winter range in Dry Canyon and Birch Creek canyons.
  - d. What will be the effect on the fisheries of Birch Creek.

**6. Potential Effects on Water Rights and Quality:**

- a. What will the effects be on the water quality of Birch Creek.
- b. Will cyanide in the milling process affect ground water quality.
- c. Will Birch Creek have a change in its flow regime as a result of the project's development.
- d. What water rights are required.
- e. How much water is need, where is its source, and is a pipeline required.

**7. Air Quality Concerns:**

- a. What will be the effects of the project on the air quality of Reese River and Smokey Valley.
- b. Is dust from the tailings a significant problem and how can it be minimized.

**8. Effects on Land Use:**

- a. What effect will the project have on the Crested Wheat Seeding area at the mouth of Dry Canyon.
- b. How will the project affect public use of the Big Creek Road.
- c. How do we maintain public access to Dry Canyon and Birch Creek Canyon.
- d. What impacts will the project have on existing livestock?
- e. What borrow source is needed.
- f. Will survey monuments, Corners, and Witness Trees be affected.
- g. Are right-of-ways need for the Big Creek Road, pipeline or powerline.

**9. Effects on Public Utilities and Services:**

- a. What does the mill require in terms of power and how is it to be provided.
- b. How is sanitary and solid waste to be disposed and what are the state requirements.





- Environmental Consulting • Developmental Planning •
- Public Relations • Project Management •

**ROY L. FAVERTY**

Environmental Consultant

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