J-Pacific Gold Inc.

# INDEPENDENT REVIEW OF THE ZENDA PROJECT, CALIFORNIA, U.S.A.

**Project Number: 3CJ006.00**

SRK Consulting
Engineers and Scientists

# INDEPENDENT REVIEW OF THE ZENDA PROJECT, CALIFORNIA, U.S.A.

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# EXECUTIVE SUMMARY

Steffen, Robertson and Kirsten Consulting (Canada) Inc. ("SRK") has been retained by J-Pacific Gold Inc. ("J-Pacific"), to complete an updated independent review of the Zenda Project, California, in accordance with NI 43-101 guidelines. The update is based on a preliminary assessment of project economics and due diligence completed in 1997 by SRK. No additional data has been produced for the project since this time.

***Geology***

The Zenda deposit consists of epithermal, gold-silver mineralization associated with a structural zone that intrudes the granodiorite intrusive rocks of the Sierra Nevada Batholith. Within this zone, hydrothermal alteration and precious-metal mineralization occur over a structural thickness typically ranging from 15 to 50 metres, along strike for more than 400 metres, and down dip in excess of 200 metres. The structural zone is characterized by a central silicified and sericitized zone grading outward into the hanging wall and footwall into more sericitic and argillic alteration. Gold and silver mineralization in the deposit tends to increase with the degree of silicification, with the central silicified and adjacent sericite zones constituting the majority of the deposit.

***Data***

Recent Exploration of the Zenda deposit has consisted of exploration drilling, sampling of accessible underground workings, and limited surface trenching. The database for the Zenda deposit consists of 94 reverse circulation drill holes, 8 surface trenches, and 2 underground channels representing 3,305 assays. The overall hole to hole spacing is approximately 15-20 metres.

SRK believes the quality of the analytical data is reliable and that the sample preparation, analysis and security measures were carried out in accordance with best practices, industry standards.

***Mineral Resources***

PAH created a computer generated resource model to reflect the geology, alteration and gold and silver mineralization. The three-dimensional block model, with dimensions of 6 metres (20-feet) in plan and 5 metre (15 foot) benches, provides a good representation of the mineralized zone given the current data spacing. The mineral resources for the Zenda Property are summarized in Table i.

**Table i: Classified Mineral Resources for the Zenda Project, after PAH 1997.**

| | Measured | | | Indicated | | | Inferred | | |
|---|---|---|---|---|---|---|---|---|---|
| Cutoff Grade (g/t Au) | Tonnes (X 1000) | Gold Grade (g/t) | Silver Grade (g/t) | Tonnes (X 1000) | Gold Grade (g/t) | Silver Grade (g/t) | Tonnes (X 1000) | Gold Grade (g/t) | Silver Grade (g/t) |
| 0.50 | 1,050 | 1.20 | 17.14 | 1,286 | 1.03 | 13.03 | 541 | 0.93 | 8.91 |
| 0.69 | 812 | 1.37 | 19.88 | 925 | 1.20 | 15.77 | 366 | 1.06 | 10.28 |
| 0.86 | 612 | 1.54 | 23.31 | 660 | 1.37 | 18.85 | 225 | 1.27 | 12.34 |
| 1.03 | 481 | 1.71 | 26.05 | 483 | 1.54 | 21.60 | 135 | 1.47 | 15.77 |
| 1.20 | 363 | 1.92 | 29.48 | 347 | 1.71 | 24.68 | 91 | 1.65 | 17.48 |

Note: Tonnage factors used were 2.20 – 2.32 cubic metres/tonne based on rock alteration type.

SRK have examined this model, and the data and assumptions used in its construction, and believe that the mineralized portions presented by PAH as measured and indicated resources are a fair and reasonable representation of the deposit. In the opinion of SRK, the aforementioned resources conform to CIM, 2000 definitions.

***Preliminary Economic Assessment***

As part of this independent review, SRK made no attempt to convert these resources to reserves, which would require that the reserves be converted from contiguous zones of Indicated and Measured Mineral Resources based on an appropriate mine design and mine plan supported by a pre-feasibility or feasibility study (CIM, 2000). And although the resources are currently known with a sufficient confidence to be converted to a mineral reserve, in fact, there is currently no documented study of mine planning that, in the opinion of SRK, meets the criteria for a pre-feasibility study.

However, as part of the due diligence review in 1997, SRK completed a preliminary assessment (as defined by NI 43-101) of the project economics, based primarily on a review of an internal study prepared by J-Pacific (then Claimstaker Resources Limited or "CRL"), augmented with some modifications by SRK. Although his work has not been updated since 1997, particularly the capital and operating costs, SRK believes that the results of this assessment is relevant information (SRK Draft Report entitled "Zenda Technical Due Diligence Audit, 1997). No additional work or additional data has been produced for the Zenda project since 1997.

Based on the 1997 resource model prepared by PAH, SRK utilized a "floating cone" pit optimization method with cost and design parameters derived by J-Pacific (then CRL) and modified, where appropriate by SRK, to develop an in-pit, "mineable" resource. Using a base case gold price of $US350/oz yielded a "mineable" resource within an open pit of:

**Table ii: In-Pit, "Mineable" Resources**

| ResourceTonnes | Au Grade (g/t) | Ag Grade (g/t) | Waste (Tonnes) | Strip Ratio |
|---|---|---|---|---|
| **847,800** | **1.61** | **27.08** | **309,200** | **0.36:1** |

The approach used to assess the economics of the Zenda Project assumed a much higher mining rate than a deposit of this size would normally support with a consequent higher cash flow and a very short discount period. This is possible as the mine and process facility are being provided at no capital cost to the project, this cost being borne by Saga Exploration for a nominal lease rate, an interest in CRL, and a share of the profits from Zenda. This approach gives the low capital cost benefits of a contractor mine without the burden of contractor contingency and profit.

The results of the preliminary assessment are summarized as follows:

- The mineable resource as stated above is constrained by the total leach capacity of the valley fill leach facility and the absence of any designated waste dump sites. Consequently, the current plan is to place the waste incurred during mining on the leach facility at the end of the mine life. Vector Engineering has designed the leach facility with a total capacity of 1,134,000 tons.
- The mineable resource results in a mine life of 19 months based on a production rate of 2,177 tpd excluding placement of waste on the leach pad at the end of production. There are an additional 272,000 tonnes of ore available to be mined should either additional leaching capacity or an economically feasible waste site be designed and permitted. This would extend the life of the operation by 6 months at the same production rate.
- Investigations into the sensitivity of the pit design to Au price indicate that the pit is robust at lower gold prices. This is due mainly to the fact that most of the ore mined is at the surface with no waste overburden stripping.
- Simulated monthly production schedules of ore tonnes and grade and waste of the resource yields a net present value of $US2.6 million and a discounted cash flow rate of return of 62% at a discount rate of 10%.
- There is little indication of additional exploration potential at Zenda.

***Processing***

SRK has reviewed the process plant flow sheet, design criteria, equipment lists, metallurgical test work, staffing plans, leach pad capital and operating costs, and finds that the plant has been designed to industry standards. The capital and operating cost accuracy are, in SRK's opinion, at a reasonable level of confidence, although both are at the lower end for the cost range typical for this type of operation. Metal recovery is estimated by SRK to be 83% for Au and 38% for Ag.

***Valley Leach Facility***

SRK has reviewed the design specifications and modifications for the valley leach facility as developed by Vector Engineering in "Design Report for the Zenda Mine Project Valley Leach Facility" (Vector, 1989) and "Justification for an Alternative Liner Design at the Zenda Mine Valley Leach Facility in Kern County, California". It is recognized by SRK that a valley leach type facility is the only practical alternative for the Zenda project due to topographical constraints. As noted in the design report, additional work will be required to complete the geotechnical design of the valley leach.

The leach facility is designed so that the amount of waste included in the mineable resource can be placed on top of the ore. It should also be noted that this waste material averages 0.55 g/t Au and 6.86 g/t Ag which should increase overall Au and Ag recovered from the ongoing leaching activities planned, and as such, credits for these recoveries have been applied in the cash flow analysis.

***Environmental Issues and Permitting***

The previous owners of the Zenda Project had as part of their feasibility efforts satisfied most of the federal, state and county permitting requirements. These permits were subsequently transferred along with the property. Outstanding permits and authorizations cannot be obtained until detailed design is completed and submitted for approval. It can be reasonably anticipated that these will be issued without difficulty at the appropriate time. There does not appear to be any environmental issues outstanding, which will impede the construction and operation of Zenda.

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## 1.0. INTRODUCTION AND TERMS OF REFERENCE

Steffen, Robertson and Kirsten Consulting (Canada) Inc. ("SRK") has been retained by J-Pacific Gold Inc. ("J-Pacific"), to complete an updated independent review for the Zenda Project, California. The update is based on a preliminary assessment of project economics and due diligence completed in 1997 by SRK. No additional data has been produced for the project since this time. This report has been prepared in accordance with National Instrument 43-101 (Standards of Disclosure for Mineral Projects).

In preparing this report, Mr. Bill Tanaka, Principal Geological Engineer with SRK, visited the Zenda Property in August, 1997. During this period Mr. Tanaka interviewed project personnel and examined the geology, mineralization, resources, data quality, exploration potential, infrastructure, terrain and access to the Property. In addition, SRK utilized a number of technical reports supplied by J-Pacific.

SRK reviewed a limited amount of correspondence, pertinent maps and agreements to assess the validity and ownership of the mining concessions. However, SRK did not conduct an in-depth review of mineral title and ownership, consequently, no opinion will be expressed by SRK on this subject.

SRK is not an insider, associate or affiliate of J-Pacific and neither SRK nor any affiliate has acted as advisor to J-Pacific or its affiliates in connection with this project. The results of the review by SRK is not dependent on any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings.

## 2.0. PROPERTY DESCRIPTION AND LOCATION

The property is located in Kern County, California, 60 kilometres east of Bakersfield in Township 30 south, Range 33 east, Sections 29 and 30 (Figure 1). The Zenda property is registered in the name of Equinox Resources (California) Inc., which is a wholly owned subsidiary of the J-Pacific Gold Inc. The property comprises of patented lode mining claims and 44 unpatented mineral claims and fee simple lands for a total land area of approximately 405 hectares. Details of the mineral tenure (as of May 31, 2002) are in the following tables:

| Unpatented Lode Mining Claims | | | |
|---|---|---|---|
| **Claim Name** | **BLM Serial No.** | **Claim Name** | **BLM Serial No.** |
| Zenda 1 | CAMC 166996 | Zenda 28 | CAMC 167012 |
| Zenda 2 | CAMC 166997 | Zenda 29 | CAMC 167013 |
| Zenda 3 | CAMC 166998 | Zenda 30 | CAMC 167014 |
| Zenda 5 | CAMC 167000 | Zenda 17 | CAMC 168317 |
| Zenda 6 | CAMC 167001 | Zenda 18 | CAMC 168318 |
| Zenda 7 | CAMC 167002 | Zenda 19 | CAMC 168319 |
| Zenda 8 | CAMC 167003 | Zenda 20 | CAMC 168320 |
| Zenda 9 | CAMC 167004 | Zenda 22 | CAMC 168321 |
| Zenda 10 | CAMC 167005 | Zenda 26 | CAMC 168322 |
| Zenda 15 | CAMC 167008 | Zenda 31 | CAMC 168323 |
| Zenda 16 | CAMC 167009 | Zenda 23 | CAMC 170942 |
| Zenda 21 | CAMC 167010 | Fr Zenda 9 | CAMC 170945 |
| Zenda 27 | CAMC 167011 | Fr Zenda 33 | CAMC 170946 |
| | | | |
| Sections 29-30, T.30S., R.33E., MDM | | | |

| Patented Lode Mining Claims | |
|---|---|
| Zenda | Emmett |
| Zenda Junior | Annie |
| Pearl | Hidden Treasure |
| Pearl Fraction | Mustang |
| | |
| M.S. 5473, Sections 29-30, T.30S, R.33E, MDM | |

J-Pacific also holds two right of way easements that are leased from local property owners, with one expiring January 29, 2007 (Thomas and Barbara Robinson) and the other expiring April 10, 2008 (Ralph and Betty Larimer). These Rights of Way guarantee access to the property from the Caliente Creek Road.

A third right of way with the Bureau of Land Management ("BLM") covering a water pipeline easement lapsed on January 1, 2002. The BLM requested that J-Pacific reapply for the right of way as construction of the pipeline was not completed according to the terms of the original permit.

A 5% Net Smelter Royalty is held by Paramount Gold Corporation, of which a US$300,000 advanced royalty payment has been completed. In addition to this royalty, there is a $US200,000 finder's fee payable at $US2.00 per ounce Au on the NSR.

## 2.1 Permitting

Kern County Planning Commission in the State of California is the lead agency for the permitting of mining projects in this jurisdiction. The project was originally permitted in 1990 by the Kern County Planning Commission under a Conditional Use Permit ("CUP") Number 130-89. The outstanding items under the CUP are:

- Building Permit - location of trailers for the processing plant, office, shop and other support buildings and the foundation slabs upon which they will be constructed
- Air Permit – granted when equipment list is submitted to the County by the Operator
- Power – To reduce expenses and avoid the need for permitting on-site generators (and the related concerns for NOx emissions), Southern California Edison will be employed to bring power to the site.
- Health Permit – application submitted to County upon positive production decision.
- Fire – Operator must supply approved fire fighting equipment and water storage facility upon positive production decision.

Kern County in a letter of November 1996 confirmed that all other conditions to the CUP have been met.

As part of the overall permit is the Water Quality Control Board permit or Waste Discharge Requirements ("WDR's") issued by the State Water Quality Control Board - Central Valley Region. This permit was amended in 1997 to allow us to use PVC liner rather than HDPE and to allow for a carbon column plant rather than the Merryl Crowe plant. The current WDR is Numbered 97-168.

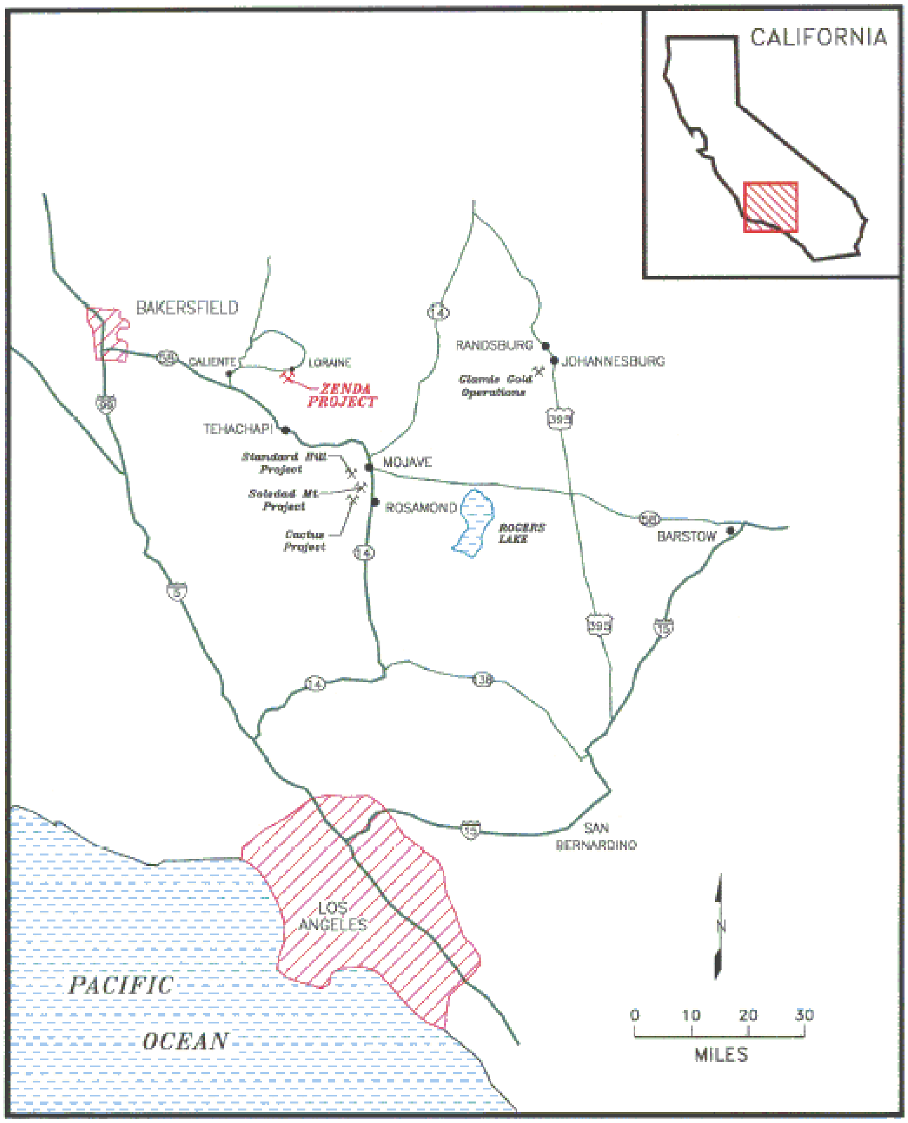


**Figure 1: Location of the Zenda Project (after PAH, 1997).**

# 3.0 ACCESSIBILITY, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

The property is located in Kern County, California, 60 kilometres east of Bakersfield, which has a population of 160,000 and an economy based on oil and gas production and agriculture. Year round access is available to the property east from Bakersfield along Highway 58. The towns of Tehachapi and Mojave are 25 and 45 kilometres further to the east along Highway 58. The mine turnoff is 30 kilometres along the canyon road and is accessed by a 3 kilometre one lane dirt road. Population is sparse throughout the canyon with the towns of Twin Oaks and Loraine several kilometres past the mine turnoff providing gas, general store, tavern and agricultural feed.

The climate is ideally suited for year-round operations and all mining services and support infrastructure is available in Bakersfield and Tehachapi.

The property is situated on the western flank of the Piute Mountains in the extreme southern Sierra Nevada Range (Figure 2). Mine site elevations range from 854 to 1,130 metres above sea level. The site terrain is relatively steep with +30 degree slope gradients. Vegetation is generally sparse as the region is arid with average rainfall of 280 millimetres.

**Figure 2: Typical Terrain and Access Road for the Zenda Project.**

# 4.0 HISTORY

Historically gold mining activities have been intermittent since the 1880s with the last activity occurring in the 1950s. Remnants of a tramway and hardrock mill are located on the patented claims. The old Zenda mine reportedly produced 32,000 ounces (995,000 grams) of gold from 54,000 tons of ore from both glory hole and underground mining. The property remained dormant until Shell Mining Inc., a subsidiary of Shell Oil, acquired an option on the patented claims in 1984, drilling 22 holes during the period 1985 - 1987. Equinox acquired the property from Shell in 1988 free and clear of all royalties and encumbrances, drilling 32 holes in 1988/90 and 13 holes in the early 1990s.

Equinox carried out an extensive exploration program on the property and completed a feasibility study in March 1990. Equinox reported calculated proven and probable geological reserves of 1,107,000 tons at a grade of 0.057 ounces of gold a ton, using a cut-off grade of 0.027 ounces of gold per ton. Equinox also calculated proven and probable reserves of 920,575 tons grading 0.057 ounces of gold per ton with a stripping ratio of 1.33:1.

Equinox had planned to mine at a rate of 1,000 tons a day for about three years, but a production decision was delayed subject to gold rising to about US$400 an ounce. The Corporation had expected that the mine could be put into production after a five-month construction and pre-stripping to expose the gold reserves. Equinox had expected to operate at a rate for 350,000 tons a year and produce about 14,000 ounces of gold and 75,000 ounces of silver annually.

Equinox subsequently merged with Hecla Mining Co. in the spring of 1994. Hecla's objective in acquiring Equinox was to develop the Rosebud mine in Nevada. The Zenda project did not meet Hecla's development criteria and Saga Exploration Co. ('Saga') subsequently acquired the project in 1995, and undertook a detailed review of the Project in 1996. In 1996, Saga drilled an additional 27 holes.

In 1997, Saga entered into a purchase agreement whereby the ownership of the Project was transferred to J-Pacific for share and future share consideration. The two companies have been working co-operatively to bring the Project into production. J-Pacific is responsible for arranging financing for the Project while Saga is the developer of the project and will be the contractor to J-Pacific to operate Zenda.

## 5.0 GEOLOGICAL SETTING

The Zenda Project is located at the southern end of the Sierra Nevada geologic province in the Loraine Mining District. The district is approximately 30 kilometres north of the Garlock Fault, a major regional strike-slip structure that joins into the San Andreas Fault further to the west. The geology of the region is characterized by late Cretaceous to early Tertiary granodiorite intrusives of the Sierra Nevada Batholith and associated roof pendants of Paleozoic Kernville Series metasedimentary rocks. A younger Tertiary igneous event resulted in the local intrusion/extrusion of rhyolite. The rhyolite intrusions in the Zenda area mark the northwestern edge of a large volcanic field which produced large volumes of extrusive lavas in Miocene to Pliocene time. Today, only remnants of the field exist, due to the deep level of erosion of the late Tertiary and Quaternary. Associated with this middle Tertiary intrusive event was local hydrothermal alteration and mineralization found in the Loraine Mining District.

The Zenda deposit consists of epithermal, precious metal mineralization associated with a structural zone that cuts the igneous intrusive rocks. In the deposit area, the granodiorite intrusive rock of the Sierra Nevada Batholith has been intruded by two northeast trending, elongate stocks and numerous narrow dikes of rhyolite porphyry. Precious metal mineralization is associated with a northwest-striking, northeast-dipping structural zone that cuts both the granodiorite and rhyolite intrusives. Within this zone, hydrothermal alteration and precious-metal mineralization occur over a structural thickness typically ranging from 15 to 50 metres, along strike for more than 400 metres, and down dip in excess of 200 metres. The structural zone is characterized by a central silicified and sericitized zone grading outward into the hanging wall and footwall into more sericitic and argillic alteration (Figures 3, 4 and 5).

The highly silicic zone ranges from a massive microcrystalline silica ("jasperoid") to brecciated stockworks of silica veins and veinlets. Sericitic alteration predominates the host rock material within the stockwork zone and is characterized by strong bleaching, pervasive sericite alteration of feldspar and ferromagnesian minerals, and limonite boxworks of disseminated sulfides. Argillic alteration involves strong bleaching, clay alteration of feldspars, common silica veinlets, and limonite concentrations on fractures.

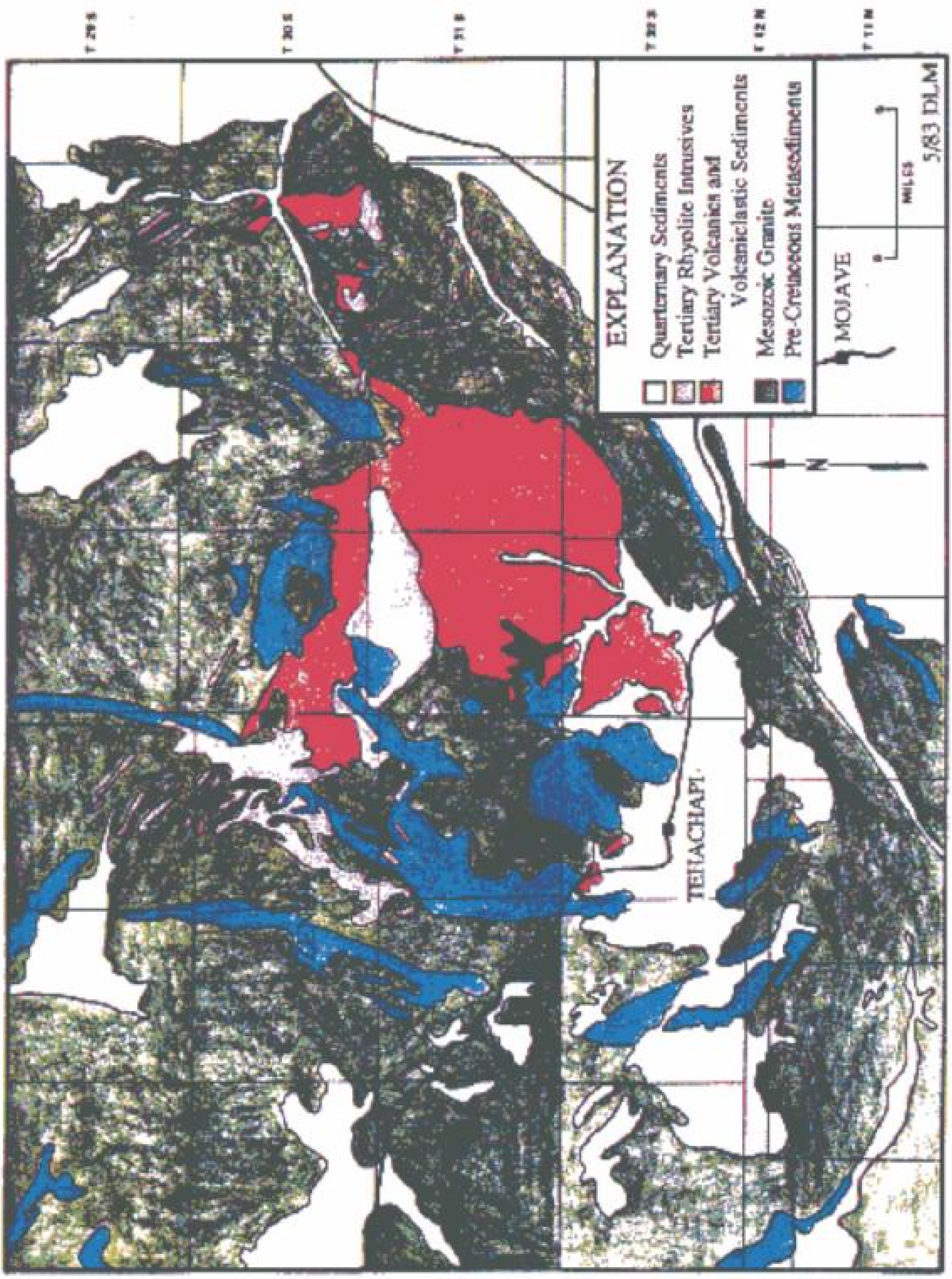


**Figure 3: Regional Geology of the Zenda Project Area (after Edik Ellis, 1987).**

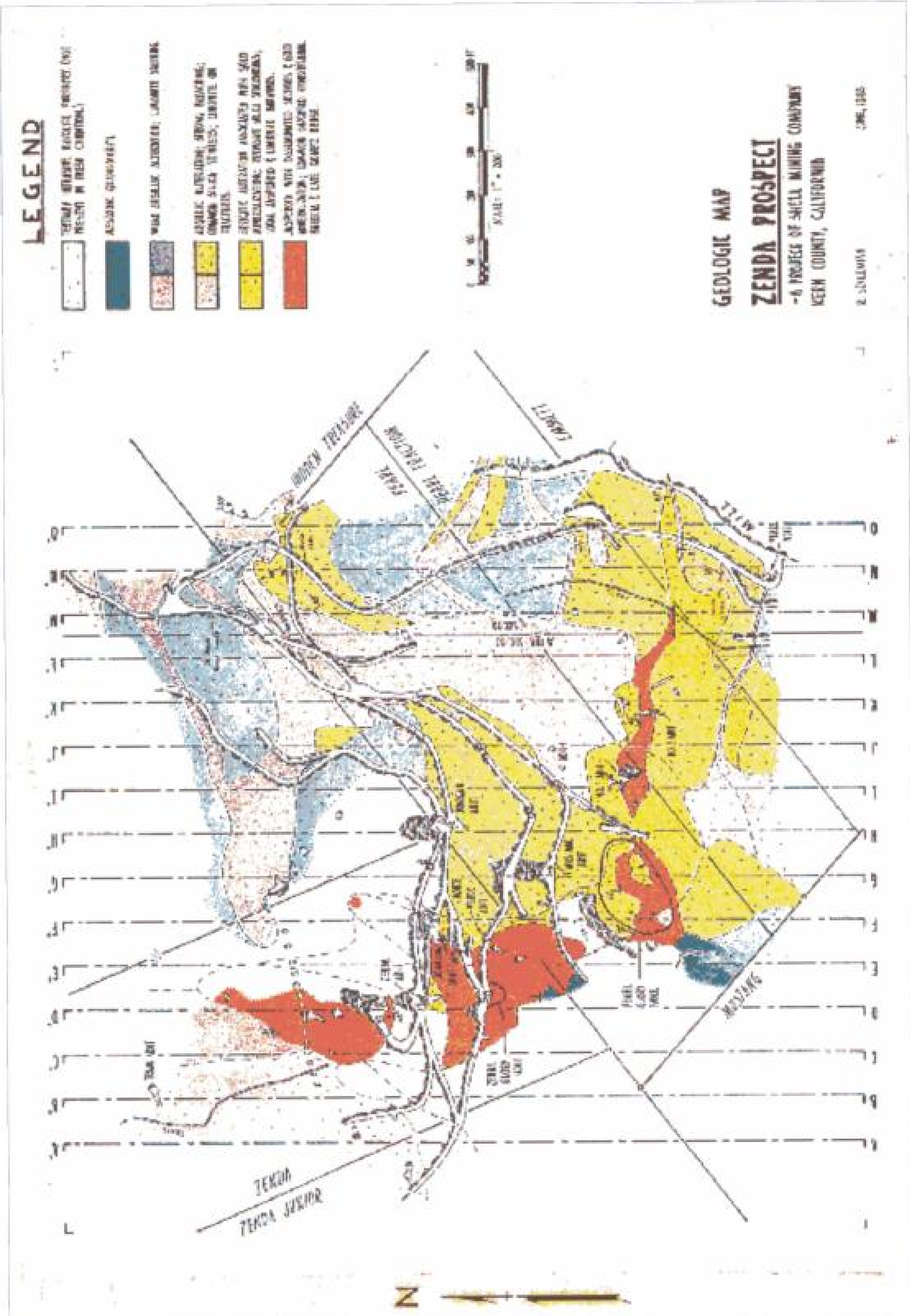


**Figure 4: Geology of the Zenda Project Area (after Edik Ellis, 1987).**

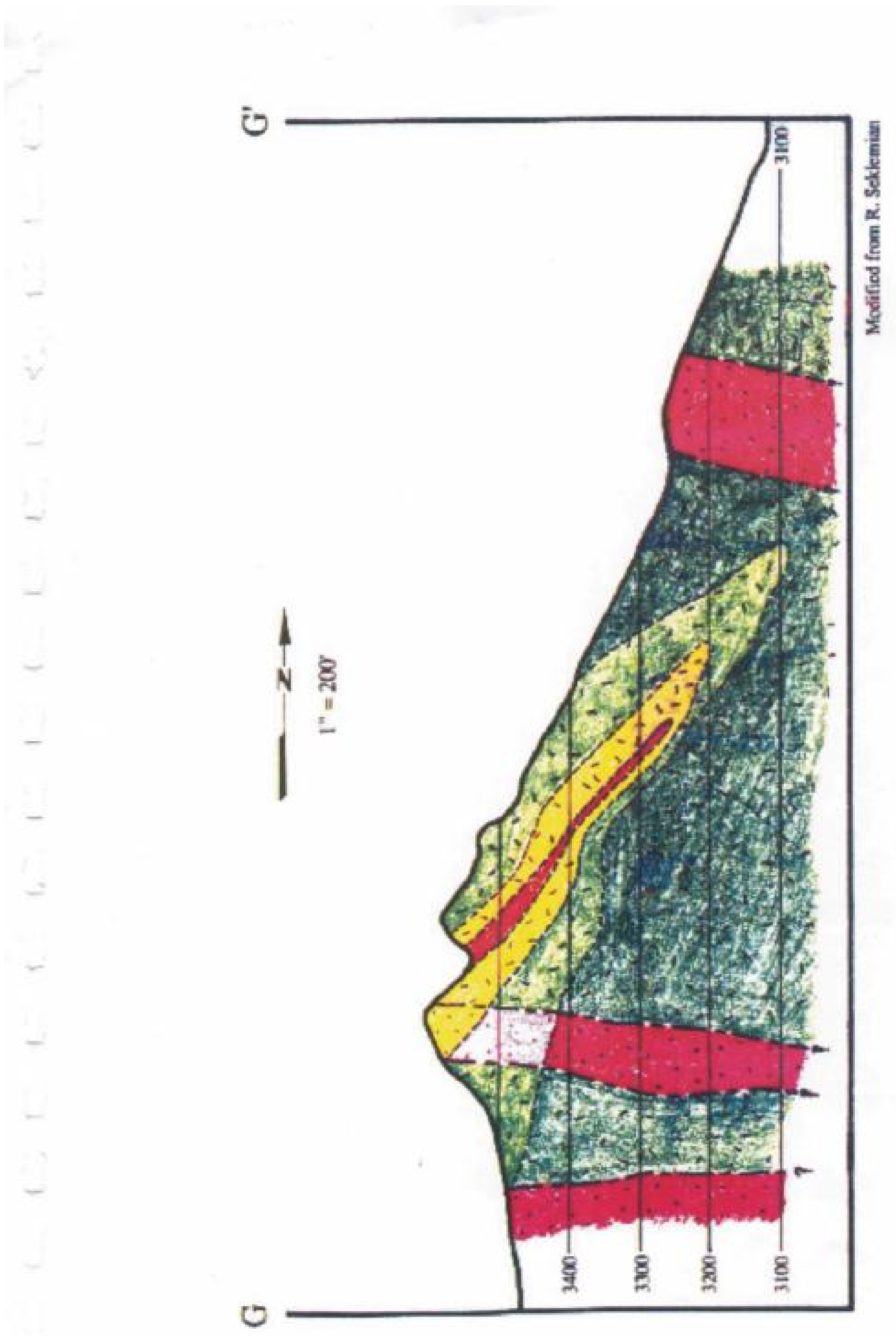


**Figure 5: Typical cross section through the Zenda deposit looking west (after Edik Ellis, 1987).**

# 6.0. GOLD MINERALIZATION

Gold and silver mineralization in the deposit tends to increase with the degree of silicification, with the central silicified (+/- sericite) and adjacent sericite zones constituting the majority of the deposit. High-grade gold and silver values have been noted in close association with intensely silicified stockwork quartz veining (Figure 6). Low- and erratic-grade gold and silver mineralization occurs in the surrounding argillic-altered areas. Original pyrite content of the mineralization was typically less than 5% and has been largely oxidized. Locally, finely disseminated pyrite occurs within the massive silica zones but shows little relationship to gold mineralization. Iron oxides are typically present as boxworks, concentrated on fractures and as local staining. Scanning electron microscope studies by Shell found the gold and silver to occur in electrum particles ranging from 50 to 100 microns in size. The silver to gold ratio is approximately 15 to 1. Elevated levels of antimony and arsenic are present in the deposit, while only trace amounts of base metals are present.

**Figure 6: Silicifed zone outcropping at the Zenda Project.**

# 7.0 EXPLORATION

There has been no exploration completed on the property by J-Pacific since acquisition in 1997.

# 8.0 DRILLING

Recent exploration of the Zenda deposit has consisted of exploration drilling, sampling of accessible underground workings, and limited surface trenching. In the immediate Zenda deposit area, a total of 95 holes have been drilled. Shell drilled 35 holes in the deposit area between 1984 and 1988 (with an additional 13 holes drilled elsewhere on the property). Subsequently, between 1988 and 1989, Equinox drilled 32 holes in the deposit area. Following that, in 1996, Saga Exploration Co. (Saga) drilled an additional 27 holes (Figure 4). All drilling has been conducted using reverse circulation methods typically using air for chip return.

Equinox reassayed a number of the Shell drill holes and found that the first thirteen holes had non-reproducible assay results. Equinox subsequently redrilled the locations of the first thirteen Shell holes (ZD-1 to ZD-13) and deleted the original holes from the drill-hole data base. Check assays of Equinox's redrilled holes have been reproducible (PAH, 1997).

The drill-hole pattern on the Zenda deposit is irregular due to access, topographic considerations, and changes in geologic interpretation. Equinox and Saga have largely in-fill drilled between the holes drilled by Shell.

Drill-hole samples were generally collected by Equinox and Saga at 5-foot intervals. Most of the Shell samples are at 5-foot (1.5 metre) intervals, with a few sampled at 10-foot (3.0 metre) intervals. Chips were collected by the drillers and logged by the geologists. The drilled intervals were logged with regard to rock type, mineralization, and alteration.

Underground samples were obtained along accessible parts of several adits that were driven into the Zenda deposit during the early 1900s. Equinox sampled five adits (T1 to T5 in the PAH database), while Saga sampled three (T6 to T8 in the PAH database). These adits included the Morgan Tunnel, Mrs. Mac Adit, Johnson Shaft, Moute Verde

Adit, and others. The adit samples were collected by Equinox and Saga at 1.5 metre intervals in continuous channels along the adit walls.

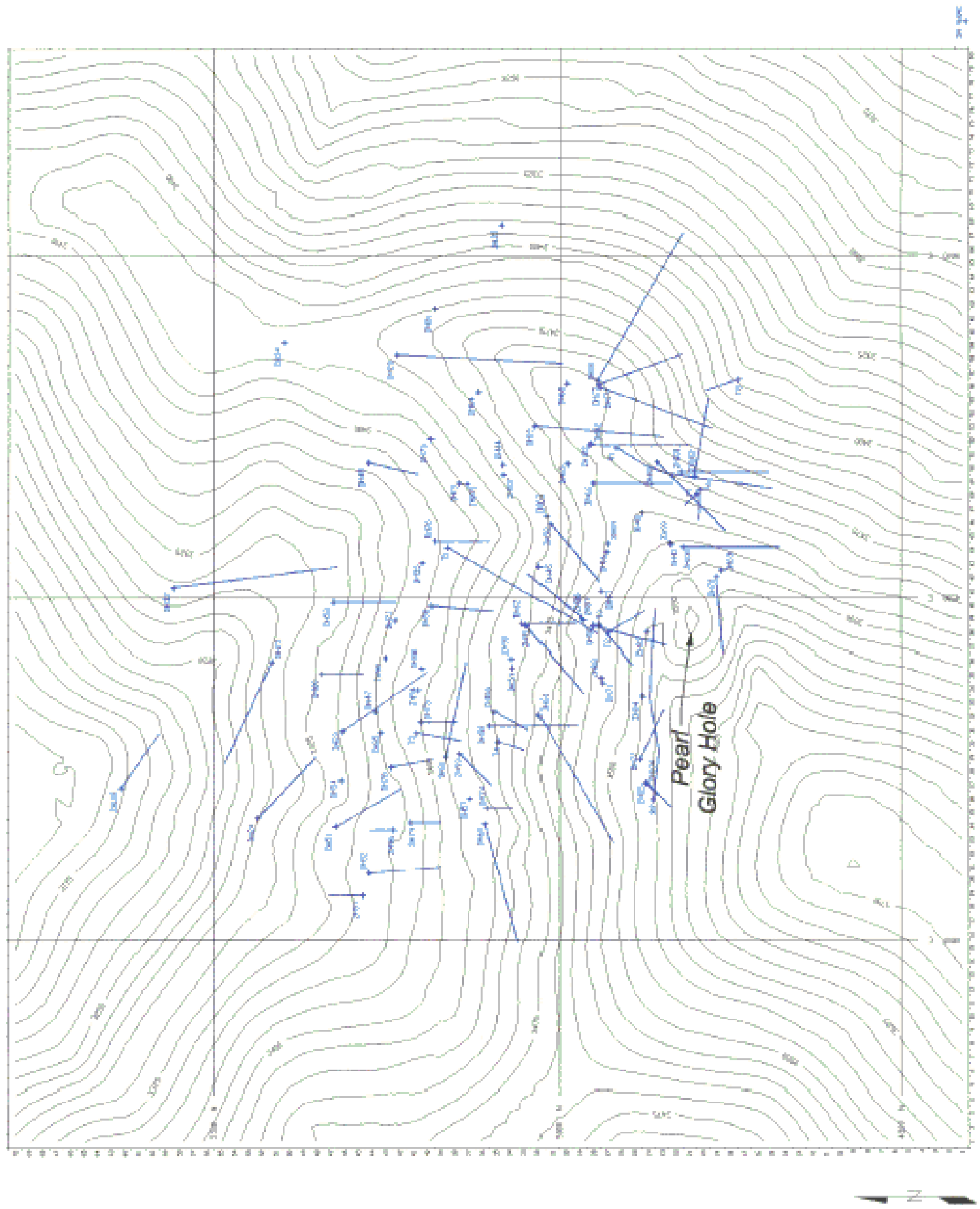


**Figure 7: Drill hole Location Map (after PAH, 1997).**

# 9.0. SAMPLING METHOD AND APPROACH

The deposit has been evaluated for Au and Ag grades from drill hole data with the inclusion of a small number of trench samples and underground channel samples. A total of 94 drill holes, 8 trenches, and 2 underground channels representing 3,305 assays comprises the database used for grade estimation. The overall hole to hole spacing is approximately 15 metres.

SRK examined a total of 52% (1,726) of the total assays (3,305) in the database against the original assay reports and 28 assays representing 1.28% of the database were found to be erroneous. Of those in error only 3 exceeded .034 g/t Au difference, with the greatest error being a discrepancy of .27 g/t Au. All of these errors have been corrected in the database prior to estimation of the resource by PAH in 1997.

Checks of surveyed drill hole collars against topography are for the most part reasonable. The drill hole collars are consistently an average of 2.0 metres lower than the topographic model. This difference is consistent with the steep terrain of the site (approximately 20 degrees on average) given that drill roads and drill pads must be cut into the hill side resulting in drill collar locations excavated several feet below the original topography. A total of 16 drill hole collars are more than 3.0 metres below the topography with the greatest discrepancy being 11.0 metres for drill hole DH47. Errors of this magnitude, where the bulk of collars are consistent with topography, suggest survey error. In areas of steep terrain, a survey error in northing and easting can give a resultant error in elevation. This may be the case, however the error may also lie with the data from which the topographic model was derived, in this case, photogrammetric methods were used which can be complicated by vegetation. Of the 16 drill hole collars which may be considered anomalous, only seven fall within the proposed open pit thereby having the potential to affect the reserve. Of these seven, 3 have assays above the break even cutoff grade (BECG) which may result in incorrect placement of ore grade blocks.

# 10.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

The following has been extracted from the PAH report, 1997.

The majority of the Shell samples were analyzed by Barringer Laboratories in Sparks, Nevada, using one-assay ton of material for the fire assaying of gold and silver. The final series of drill hole samples (ZD-40 to ZD-48) were analyzed by Geo-Monitor, Inc in Hesperia, California, using similar methods. Equinox samples were sent to Acme Analytical Laboratories in Vancouver, British Columbia, where one-half-assay ton (14.59 grams) of the pulverized sample was analyzed by fire-assay methods for gold and silver. PAH note that it is more common to use a one-assay-ton sample for gold fire assay in order to reduce natural grade variance but is not necessarily a problem. Saga samples were analyzed by Legend, Inc laboratories in Reno, Nevada, using fire assaying with an atomic absorption finish on one-assay ton of pulverized material. PAH notes that using an atomic absorption finish is not typical for deposit sampling as higher grade sample grade determination are especially sensitive to atomic absorption equipment calibration.

Equinox conducted a check assay program on drill-hole samples from its own drilling and from the previous Shell drilling. The Shell checks were done on rejects that could be located on the property and were reassayed twice by Acme Laboratories using fire-assay methods on one-assay ton of material. The good reproducibility of the check assays and the poor reproducibility of some of the original Shell assays suggest that an analytical laboratory problem may have existed. Based on these results, Equinox removed the first 13 Shell holes from the database. PAH examined the gold correlation coefficient of 0.78 and that the average gold grade of the Equinox checks was 25% higher than the average of the original Shell samples. Some of the Equinox check assays (that have reproducible results) have replaced the original Shell hole (non-reproducible) values in the computer database to increase data quality.

The Equinox checks of its own assays were conducted on laboratory rejects using fire-assay methods on one-half assay ton of material. A relatively good correlation was present with a coefficient of 0.89 was determined for the gold data, with the average grade of the Equinox check being within 3% of the original Equinox samples. This is an acceptable range of reproducibility.

A screen test was previously conducted by Equinox on 19 samples to determine if course gold was significant in the Zenda deposit. Five-hundred to sic-hundred gram samples from the Shell drilling were pulverized by Acme Analytical Laboratories and sieved through 100-mesh screen size. The amount of metallic gold not passing through the screen was generally less than detectable levels. A few samples had minor gold values, but even these amounted to only a small percentage of the total contained gold. These analyses are substantiated by the lack of visually observed gold during drilling and sampling and by the fact that thee Equinox assays are generally reproducible (not the case where coarse gold is significant).

Tonnage factor testing was conducted by McClelland Laboratories, Inc. in Reno, Nevada, and the results are noted in a report to Equinox dated September 10, 1989. The tests were run-on head samples from two metallurgical bulk samples, one of argillized material and the second of silicified material using a volume displacement method. A sample from each was run in triplicate, with the argillized sample averaging 2.20 grams per cubic centimeter (14.56 cubic feet per ton) and the silicified sample averaging 2.32 grams per cubic centimeter (13.80 cubic feet per ton). PAH notes that these results are less dense than would have been expected for these rock types. The results from earlier Shell tests indicate values of 12.82 cubic feet per ton for quartz-rich material, 13.35 cubic feet per ton for moderate to highly silicified material, and 13.94 cubic feet per ton for altered granite, altered rhyolite, clay rich material, and fault zone material. PAH used factors approximately midway between the Equinox and Shell values but recommends that further testing be conducted to better quantify the tonnage factor to ensure that the appropriate resource/reserve tonnage determinations can be made.

SRK believes the quality of the analytical data is reliable and that the sample preparation, analysis and security measures were carried out in accordance with best practices, industry standards.

# 11.0 DATA VERIFICATION

SRK sent a geologist to the Zenda site with Saga Exploration personnel to collect the selected intervals from sample splits stored on the drill pad, and to observe the chain of custody. A total of 19 samples were found, collected and delivered to Cone Geochemical in the custody of the SRK representative. The condition and location of the sample splits were documented by the SRK representative and were deemed to have been undisturbed since the time of the original drilling.

Cone Geochemical performed fire assay and atomic absorption tests on the samples and the results were compared to the original assays (Table 1). Comparison between the original assays and the check assays showed excellent correlation with a correlation coefficient of 97.6%.

In addition, a simple test was run on all of the samples to check for salting by application of Au in solution. This test was suggested by Cone Geochemical and consisted of the application of dilute HCl to the samples with the solution subsequently assayed. The results of this test were all negative. While this is not by any means a definitive test for sample salting it should be a reliable check against salting by application of Au dissolved in CN or chloride solution.

**Table 1: Comparison of SRK Verification Sampling and Assaying with Saga Exploration Sampling**

| | | | Saga Expl. | | SRK | |
|---|---|---|---|---|---|---|
| Hole | From (m) | To (m) | Au (g/t) | Ag (g/t) | Au (g/t) | Ag (g/t) |
| ZH82 | 1.5 | 3.0 | 0.75 | 8.81 | 0.72 | 7.54 |
| ZH83 | 25.9 | 27.4 | 2.43 | 36.00 | 2.40 | 32.91 |
| ZH84 | 7.6 | 9.1 | 0.55 | 16.18 | 0.72 | 20.91 |
| ZH86 | 9.1 | 10.7 | 2.16 | 143.98 | 2.16 | 154.27 |
| ZH90 | 32.0 | 33.5 | 0.27 | 5.49 | 0.41 | 4.11 |
| ZH91 | 18.3 | 19.8 | 0.38 | 8.57 | 0.48 | 17.14 |
| ZH92 | 13.7 | 15.2 | 6.96 | 63.42 | 11.21 | 63.08 |
| ZH94 | 19.8 | 21.3 | 6.07 | 32.22 | 7.47 | 35.31 |
| ZH95 | 3.0 | 4.6 | 0.38 | 0.00 | 0.55 | 6.51 |
| ZH96 | 18.3 | 19.8 | 0.75 | 10.63 | 0.82 | 13.71 |
| ZH98 | 1.5 | 3.0 | 0.27 | 2.40 | 0.31 | 2.74 |
| ZH99 | 18.3 | 19.8 | 4.73 | 96.67 | 4.70 | 160.44 |
| ZH100 | 7.6 | 9.1 | 10.35 | 292.77 | 12.10 | 290.02 |
| ZH101 | 6.1 | 7.6 | 1.41 | 31.88 | 2.02 | 97.36 |
| ZH102 | 3.0 | 4.6 | 2.74 | 165.92 | 2.47 | 167.98 |
| ZH103 | 7.6 | 9.1 | 0.82 | 4.11 | 1.20 | 8.23 |
| ZH103 | 32.0 | 33.5 | 1.13 | 10.63 | 1.03 | 15.08 |
| ZH106 | 3.0 | 4.6 | 0.96 | 14.06 | 0.82 | 12.68 |
| ZH107 | 33.5 | 35.1 | 3.74 | 11.31 | 3.87 | 10.28 |

# 11.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Two types of ore are to be treated at Zenda. The argillized type consists of 70% of the orebody while the silicified type makes up the remaining portion. The argillized ore contains an abundance of clay fines, it will require agglomeration but is easily crushed. The silicified ore requires no agglomeration but it is hard to crush and has lower recoveries.

The mineralization is mostly oxidized, with remnant sulfides only in the siliceous material. The assay reproducibility of both gold and silver are excellent, suggesting little or no nugget gold.

There have been two series of metallurgical test work done, both at McClelland Laboratories. The samples utilized for both tests were obtained from the old open cut and the underground workings. Given the close nature of the orebody and the extent of the underground workings, it is likely that the samples are representative.

The first series of tests were scoping in nature and set the stage for the second series. The second series of tests were column tests done at 2”, ½” and ¾” sizes for the two ore types. The tests confirmed that the optimum crush size for silicified ore was ½” while the argillized recovered well up to a 2” size. Agglomeration tests indicated that the argillized ores require cement while the silicified ores required only lime for stable agglomerates.

Short term gold recovery in the heap leach will be 79% as utilized in the Zenda economics. The recovery is contingent upon a 100% - ¾” crush and a 120 day leach. Gold recovery will be 83% with the additional time allotted for the 11 month rise and drain period.

Silver recovery in the test columns averaged only 20%; however the cyanide solubility tests at finer grinds and high cyanide strengths averaged +90% recovery. SRK estimates that a 38% Ag recovery is probably achievable.

# 13.0 MINERAL RESOURCE AND RESERVE ESTIMATES

PAH created a computer resource model from computer data and maps and reflects geology, gold, and silver data. The three-dimensional block, with dimensions of 6 metres (20-feet) in plan and 5 metre (15 foot) benches, provides a good representation of the mineralized zone given the current data spacing and approximates potential mineable units. The mineral resources for the Zenda Property are summarized in Table 2.

**Table 2: Classified Mineral Resources for the Zenda Project, after PAH 1997.**

| | Measured | | | Indicated | | | Inferred | | |
|---|---|---|---|---|---|---|---|---|---|
| Cutoff Grade (g/t Au) | Tonnes (X 1000) | Gold Grade (g/t) | Silver Grade (g/t) | Tonnes (X 1000) | Gold Grade (g/t) | Silver Grade (g/t) | Tonnes (X 1000) | Gold Grade (g/t) | Silver Grade (g/t) |
| 0.50 | 1,050 | 1.20 | 17.14 | 1,286 | 1.03 | 13.03 | 541 | 0.93 | 8.91 |
| 0.69 | 812 | 1.37 | 19.88 | 925 | 1.20 | 15.77 | 366 | 1.06 | 10.28 |
| 0.86 | 612 | 1.54 | 23.31 | 660 | 1.37 | 18.85 | 225 | 1.27 | 12.34 |
| 1.03 | 481 | 1.71 | 26.05 | 483 | 1.54 | 21.60 | 135 | 1.47 | 15.77 |
| 1.20 | 363 | 1.92 | 29.48 | 347 | 1.71 | 24.68 | 91 | 1.65 | 17.48 |

Note: Tonnage factors used were 2.20 – 2.30 cubic metres/tonne based on rock alteration type.

SRK have examined this model, and the data and assumptions used in its construction, and believe that the mineralized portions presented by PAH as measured and indicated resources are a fair and reasonable representation of the deposit. In the opinion of SRK, the aforementioned resources conform to CIM, 2000 definitions, where the measured, indicated and inferred resources stated by PAH conform to measured, indicated and inferred mineral resources under CIM, 2000 definitions.

## 14.0 PRELIMINARY ASSESSMENT

As part of this independent review, SRK made no attempt to convert these resources to reserves, which would require that the reserves be converted from contiguous zones of Indicated and Measured Mineral Resources based on an appropriate mine design and mine plan supported by a pre-feasibility or feasibility study (CIM, 2000). And although the resources are currently known with a sufficient confidence to be converted to a mineral reserve, in fact, there is currently no documented study of mine planning that, in the opinion of SRK, meets the criteria for a pre-feasibility study.

However, as part of the due diligence review in 1997, SRK completed a preliminary assessment (as defined by NI 43-101) of the project economics, based primarily on a review of an internal study prepared by J-Pacific (then Claimstaker Resources Limited or “CRL”), augmented with some modifications by SRK. Although his work has not been updated since 1997, particularly the capital and operating costs, SRK believes that the results of this assessment is relevant information (SRK Draft Report entitled "Zenda Technical Due Diligence Audit, 1997). No additional work or additional data has been produced for the Zenda project since 1997.

Based on the 1997 resource model prepared by PAH, SRK utilized a "floating cone" pit optimization method with cost and design parameters derived by J-Pacific (then CRL) and modified, where appropriate by SRK, to develop an in-pit, "mineable" resource. Using a base case gold price of $US350/oz yielded an "mineable" resource within an open pit of:

**Table 3: In-Pit, "Mineable" Resources**

| ResourceTonnes | Au Grade (g/t) | Ag Grade (g/t) | Waste (Tonnes) | Strip Ratio |
|---|---|---|---|---|
| **847,800** | **1.61** | **27.08** | **309,200** | **0.36:1** |

The approach used to assess the economics of the Zenda Project assumes a much higher mining rate than a deposit of this size would normally support with a consequent higher cash flow and a very short discount period. This is possible as the mine and process facility are being provided at no capital cost to the project, this cost being borne by Saga Exploration for a nominal lease rate, an interest in CRL, and a share of the profits from Zenda. This approach gives the low capital cost benefits of a contractor mine without the burden of contractor contingency and profit.

The results of the preliminary assessment are summarized as follows:

- The mineable resource as stated above is constrained by the total leach capacity of the valley fill leach facility and the absence of any designated waste dump sites. Consequently, the current plan is to place the waste incurred during mining on the leach facility at the end of the mine life. Vector Engineering has designed the leach facility with a total capacity of 1,134,000 tonnes.
- The mineable resource results in a mine life of 19 months based on the CRL production rate of 2,177 tpd excluding placement of waste on the leach pad at the end of production. There are an additional 272,000 tonnes of ore available to be mined should either additional leaching capacity or an economically feasible waste site be designed and permitted. This would extend the life of the operation by 6 months at the same production rate.

- Investigations into the sensitivity of the pit design to Au price indicate that the pit is robust at lower gold prices. This is due mainly to the fact that most of the ore mined is at the surface with no waste overburden stripping.
- Simulated monthly production schedules of ore tonnes and grade and waste of the reserve yields a net present value of $US2.6 million and a discounted cash flow rate of return of 62% at a discount rate of 10%.
- There is little indication of additional exploration potential at Zenda.

The average hole-to-hole spacing of 15 metres, in combination with the search parameters determined by PAH, has resulted in most of the blocks in the pit area having a grade assigned with either a measured or indicated probability class. Within the pit determined by SRK, a total of 45,000 tonnes of material above the break-even cut off grade (BECG) was found to be in the inferred category. This material has been grouped with the waste at the average grade of the measured and indicated classes of waste. Waste grades have been reported for the purposes of assigning a grade to diluting material and to give some indication of Au likely to be recovered from the waste once it is placed on the leach heap.

The floating cone parameters used by SRK include a 55 degree inter-ramp highwall angle (Figures 8 and 9). The acceptability of this angle has been confirmed by Call & Nicholas, geotechnical engineers, after examination of the site by Richard Call. The cone parameters targeted minimizing total waste mined while limiting the total tonnage of ore and waste mined to 1,134,000 tonnes indicated by Vector Engineering to be the total capacity of the valley leach facility as designed. In addition, Ag was not considered as contributing to the net value of the blocks in the open pit analysis, but the Ag values which were associated with economic Au mineralization have been reported in the SRK cash flow model.

The reasons for limiting the "in-pit" resource to the above is that no design or cost analysis has been done for either a waste dump or additional leach capacity. Waste haulage from the pit to any likely dump site will be long and will require careful analysis and costing which has not yet been done. Also, acid neutralizing potential testing on both ore and waste samples indicate that the acid generating potential of the waste is high and will likely lead to requirements regarding design of the dumps to seal the material from leaching conditions. Consequently, it is assumed by SRK that all waste associated with mining will be temporarily stockpiled and placed on the heap after ore mining is finished. This requirement limits the total material mined, ore plus waste, to 1,134,000 tons.

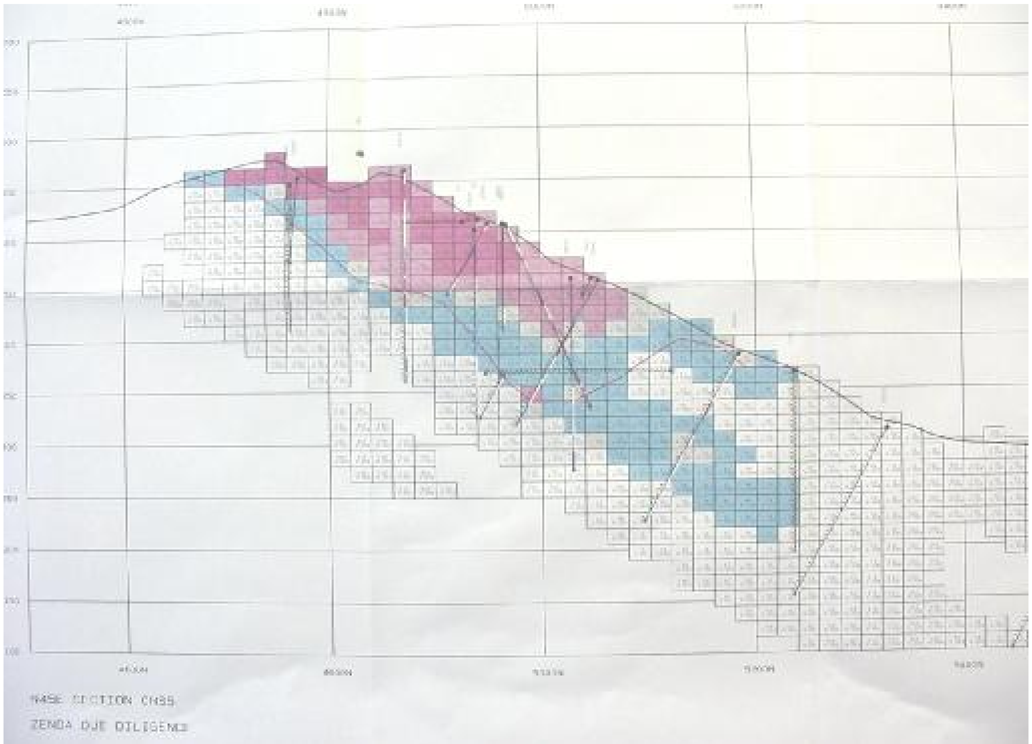

**Figure 8: Northeast cross section, 0NS5, of the Zenda deposit showing open pit extent and block model gold grades (gray >0.01 opt Au, blue > 0.02, pink > 0.03 and red > 0.04) .**

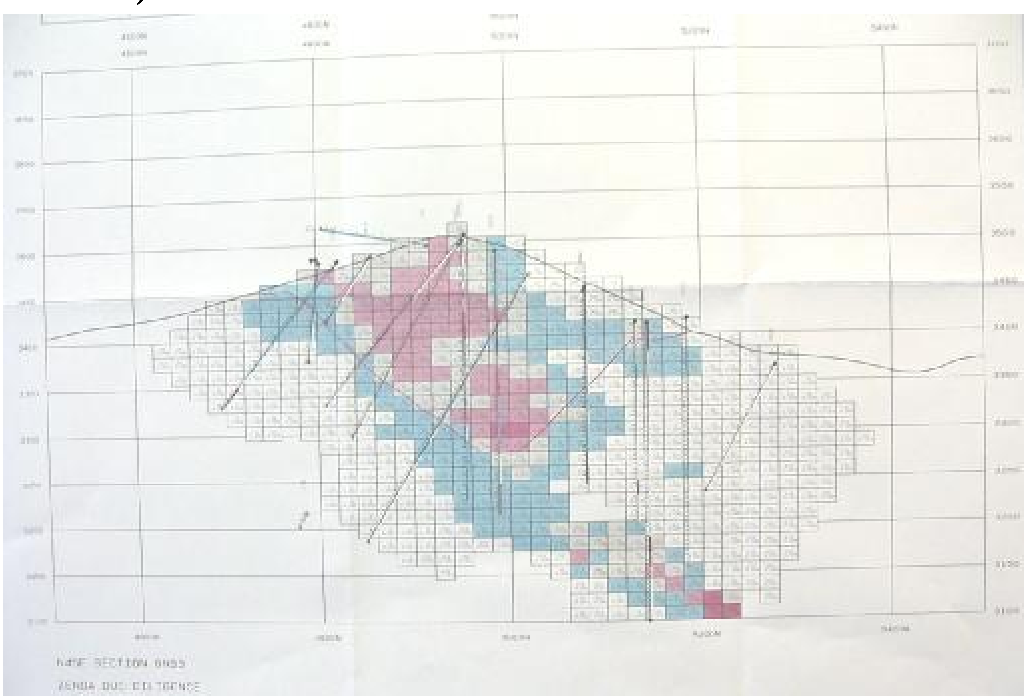

**Figure 9: Northeast cross section, 0NS3, of the Zenda deposit showing pit outline and block model gold grades (gray >0.01 opt Au, blue > 0.02, pink > 0.03 and red > 0.04).**

## 14.1 MINING

Mining at Zenda is planned by truck and shovel using air track drills for blast holes and three 35 tonne trucks for ore and waste haulage. This equipment is owned and will be supplied by Saga as part of their contribution to the project. SRK examined this equipment, (with the exception of the shovel and one truck) and found it in acceptable condition and appropriate for the planned production rates.

The proposed mining rates for the Zenda Project are very high relative to the deposit size. The mining rate is more typical of medium sized deposits and results in the very short mine life and correspondingly high cash flow rate.

The arrangement for Saga Exploration to supply the mine equipment benefits the project by providing the up-front capital savings associated with contract mining but with owner-operator labor cost savings. This arrangement makes possible a mining rate three or more times what would normally be indicated by the deposit size. This methodology reduces the impact of discount rates by shortening the life of the mine and minimizes capital costs. One potential downside to this is that the high rate and short mine life offer little or no time for learning and rectifying start-up problems.

According to Saga, the pit will be mined either on 5 or 6 metre benches using conventional drill and blast, truck and shovel techniques. Much of the ore is relatively soft by virtue of the argillic or sericitic-argillic alteration. Much of the silicic material is also soft having a fair proportion of sericite distributed throughout. The hardest material is represented by a relatively small amount of compact silica found along the western margin of the deposit. On the whole drilling rates and wear on bits and steel should be low.

SRK suggests that the geometry of the ore body will permit 6 metre benches without undue additional dilution. The 6 metre bench would represent savings over the 5 metre benches of approximately 25% on explosive primers, approximately 15% on detonation cord, and approximately 5% on drill bits and steel.

The blastholes are planned with a 6 metre burden and spacing, using either dynamite (CRL) or ANFO (Greg Austin) as the blasting agent. This projects to a per hole basis of over 400 tonnes per blasthole with a 5 metre bench and a total of approximately

3,100 blastholes for the 1,134,000 tons mined. It would be difficult to achieve a reasonable powder factor with this blasthole spacing as an individual, 4 inch diameter by 19 foot long, blasthole will have a volume of only 1.65 cubic feet and thus hold less than 100 lbs of ANFO with no stemming. A realistic maximum powder factor achievable with this spacing would be about 0.20 lb/ton against a more typical 0.70 lb/ton for rock of this nature.

It is considered by SRK that a blast hole burden and spacing of 10 feet is more likely to be necessary for proper breakage depending on what bench height is selected. The 10 foot spacing recommended by SRK will result in 115 tons per blasthole for the 15 foot bench, a total of approximately 12,000 blastholes for the life of the mine, and average of 28 blastholes drilled per day (14 per drill shift).

If a 20 foot bench with 10 foot spacing is used, then a total of approximately 9,000 blastholes will be drilled with 145 tons per drill hole and 22 blastholes drilled per day. ANFO should be the blasting agent. A powder factor of 0.70 lbs/ton will require 470 tons ANFO total for the life-of-mine mine production. The shot muck will be loaded into 35 ton trucks with a 4.5 cubic yard shovel. The ore will be hauled to the crusher site, currently assumed to be sited between the leach facility and the northern rim of the pit.

The close proximity of the pit to the crusher, the overall small area concerned, and the steep topography suggest that haulage distances will be dictated by elevation between the bench being mined and the crusher site. The centroid of mass of the ore and waste mined is at the 1,050 metre elevation. The crusher site will be at the 1,000 metre elevation indicating a minimum average haul distance of 430 metre at an average 10% haul road grade. Switchbacks required to keep the haulage ways on the property and to allow multiple entry points into the pit will add another 60 metres per switchback, and an estimated 150 metres of miscellaneous level haul yield an estimated total average haulage distance for cycle calculations of 760 metres.

#### 14.1.1 Mining Equipment

The mining equipment list includes:

Drill and Blast:

- 2 air track drills with one portable 900 cfm compressor

Load and Haul:

- 1 Northwest 4.5 yd shovel

3 Terex 35 ton mine trucks

Haulage Maintenance

1 Articulated skidder with water tank to be used as water truck

1 Wabco 14' motor grader

Miscellaneous and Stockpile

1 Cat D8H Dozer with ripper

1 Terex 5 yd FEL

Cycle analysis by SRK of the total material to be mined within the planned 19 month period, based on an average haul distance of 760 metres, suggests that the equipment provided by Saga is well matched to the planned production rates and capable of achieving the required productivity with a fair margin of safety. In the absence of specifications on the Northwest shovel, specifications for the similar sized Cat 5080 shovel were used. The cycle analysis suggests that productivity will not suffer from occasional unscheduled downtime.

#### 14.1.2 Ore control

Ore control methodology has not been described in detail for this project. SRK recognize that, due to the geometry of the ore body, ore control for the Zenda project will be a very simple task compared to other small deposits where mineralization is controlled by narrow, vertical structures. Data gathered from blast hole samples will be more useful in comparing tons and grade mined against estimates and in monitoring dilution and plant recovery. It can be assumed from the low stripping ratio that a large proportion of the blast patterns will consist entirely of ore not requiring surveying or staking of dig lines.

#### 14.1.3 Mine Staff and Labor

SRK believes the mine manning as presented by CRL is barely adequate for the proposed productivity. The manning requires that some personnel act in many capacities. For instance, the water truck driver, grader operator, and cat operator are combined in one person. The person designated as "Geologist" will need to handle the surveying, mine planning, and oversee ore control. It is anticipated that the mine manager will have an active role in overseeing the mine operation. Given the small area concerned this manning is feasible, however, SRK in their costing, have added one laborer and one driller's helper to assist in miscellaneous tasks including rod man, blasthole sampling and muck pile staking .

**ZENDA MINE MANNING**

| | | |
|---|---|---|
| **Salary** | | |
| | Mine Manager | 0.25 |
| | Geologist/Engineer | 1 |
| | | |
| | **Total Salary:** | **2** |
| | | |
| **Hourly** | | |
| | Equipment Operator | 1 |
| | Dozer Operator | .5 |
| | Shovel Operator | 1.5 |
| | Truck Driver | 3 |
| | | |
| | Rod Man/Laborer | 1 |
| | | |
| | Lead Driller | 2 |
| | Drill Helper/Sampler | 2 |
| | Blaster | 1 |
| | | |
| | **Total Hourly:** | **12** |

### 14.1.4 Mine Consumables

Mine consumables will consist of drill steel and bits, blasting supplies, and ANFO. As noted above, most of the drilling is likely to be in relatively soft rock with low consumption of bits and steel.

Drill steel and bits are calculated at $US0.08/ ton ore and waste
Blasting supplies are calculated at $US0.073/ ton ore and waste
ANFO is calculated at $US0.168/ ton of ore and waste

### 14.1.5 Mine Operating Cost

Mine operating cost estimates provided by CRL vary from $US1.35/ton of ore and waste from the 1990 study to $US1.67/ton of ore and waste (estimated from the $US2.69/ton ore) from Brad Thiele, P.E. in 1997. An independent operating cost calculation by SRK, exclusive of ownership costs for mining equipment, are shown in Appendix A and estimates a cost for drilling, blasting, mucking and haulage to the crusher of $US1.57/ton ore and waste confirming the $US1.67/ton of ore and waste as reasonable and achievable.

Application of the $US1.67/ton of ore and waste to ore tons only at the stripping ratio of 0.36:1 gives a mine operating cost of $US2.28 per ton of ore. Ownership costs for the mining equipment is not included in this mine operating cost as these are to be borne by Saga.

### 14.1.6 Mine Capital Cost

As the mining equipment is to be supplied to the project by Saga, and as SRK believe the mining equipment listed is appropriate and sufficient, there is no contribution to start-up capital costs from mining equipment.

## 14.2 PROCESSING

For the Due Diligence review, SRK was presented a series of documents, sketches and drawings and an economic study entitled *"Zenda Gold Mine - Capital and Operating Forecast and Assumptions"*. The economic study was carefully detailed, but the assumptions used for the study had to be extracted from the economic study document. During the course of SRK's study, a number of changes were made to the documents, these changes have not yet been introduced into a formal document. From the documentation and conversations with Saga and J-Pacific, it appears that all of the necessary items going into a project have been considered and a viable solution exists, but had not yet been documented in terms of cost or construction schedule.

For the most part, J-Pacific has used low costs for the construction and operations. This implies that experienced people will have to be available. The total project has less than a three year life, there will be little opportunity to "climb the learning curve." The Zenda Project is currently relying heavily on Greg Austin's experience at Nevada heap leaches and his ability to attract former experienced employees. Greg is an experienced mining engineer and mine manager and has the ability to do what is expected of him, but he must have an on-site presence, especially during construction. The current lack of construction specifications, if not corrected could create problems during construction. During construction, a number of activities must occur simultaneously. There will be a number of small decisions to be made because of the engineering deficiencies. The Project Manager can be easily overwhelmed and the project could suffer from delays or having the wrong people make decisions.

A higher level of detail engineering than currently exists will be required for Zenda to obtain a Permit to Construct from the Kern County Air Quality Board. Submission of anything less than the entire detail will only delay the granting of the permit. While it is possible that Kern County would grant the permit with little detail in the three month period suggested by Zenda, SRK's experience at California heap leach operations indicates otherwise.

The Joint-Venture agreement between Zenda and Saga allows for Saga to provide certain equipment to the JV. The equipment is valued, and Saga is paid a monthly lease cost on that value. It is not in SRK's scope to comment on this agreement, but it is in SRK's scope to assure that all the suitable equipment for the project has been accounted for. The Saga equipment lists provided for the study, had a number of deficiencies. Subsequent discussions with Saga have brought agreement between SRK and Saga as to what will be needed and Saga's assurance that the equipment will be supplied FOB the mine site.

#### 14.2.1 Ore Description

Two types of ore are to be treated at Zenda. The argillized type consists of 70% of the orebody while the silicified type makes up the remaining portion. The argillized ore contains an abundance of clay fines, it will require agglomeration but is easily crushed. The silicified ore requires no agglomeration but it is hard to crush and has lower recoveries.

The mineralization is mostly oxidized, with remnant sulfides only in the siliceous material. The assay reproducibility of both gold and silver are excellent, suggesting little or no nugget gold. There have been no definitive mineralogical studies of the ore.

### 14.2.2 Metallurgical Testing

There have been two series of metallurgical test work done, both at McClelland Laboratories. The samples utilized for both tests were obtained from the old open cut and the underground workings. Given the close nature of the orebody and the extent of the underground workings, it is likely that the samples are representative.

The first series of tests were scoping in nature and set the stage for the second series. The second series of tests were column tests done at 2”, ½” and ¾” sizes for the two ore types. The tests confirmed that the optimum crush size for silicified ore was ½” while the argillized recovered well up to a 2” size. Agglomeration tests indicated that the argillized ores require up to 10 lb/ton cement while the silicified ores required only lime for stable agglomerates.

### 14.2.3 Recovery and Regent Use

Short term gold recovery in the heap leach will be 79% as utilized in the Zenda economics. The recovery is contingent upon a 100% - ¾” crush and a 120 day leach. Gold recovery will be 83% with the additional time allotted for the 11 month rise and drain period. Cyanide usage will average 0.7lb/ton. Column tests indicated a 2lb/ton usage, normally heaps use 1/3 of the cyanide projected by columns. The cement usage is budgeted at 10lb/ton. Cement is used both as a binder in agglomeration and as a pH modifier. The siliceous ore if treated alone would require 4lb/ton of cement. There is no practical way to separate the ores.

Silver recovery was projected by J-Pacific at 20%. SRK estimates that a 38% Ag recovery is probably achievable. With the new PAH grade model there is now sufficient data in the reserve to project Ag head grades. Silver recovery in the test columns averaged only 20%, however the cyanide solubility tests at finer grinds and high cyanide strengths averaged +90% recovery.

The feed grade for silver estimated by J-Pacific was derived from the historical 12-1 silver to gold ratio. The column test work indicated preg grades of 8/1 silver to gold. The recovery plant was designed to handle this silver/gold ratio. Actual silver production is estimated to be 3.07 oz silver to 1 oz gold. At this recovery grade, the value of silver is +$US700,000 for the project life.

Given all the data, a projection of an overall 38% silver recovery is not unreasonable. At a 38% recovery and the 12/1 feed ratio, the project would gain $US1,330,000 in cash flow against the J-Pacific estimate of $US700,000.

14.2.4 Crushing- Agglomeration - Stacking

The ore will be crushed to a 100% - ¾" size in a two stage plant. Ore from the mine will be truck dumped or fed from a stockpile by FEL into the receiving hopper. The ROM ore at 16"x0" will be conveyed from the hopper at a controlled rate by an apron feeder to a grizzly screen with 4" openings. The +4" will be fed to a 30x42 diesel driven jaw crusher with a CSS of 4". The crusher discharge and grizzly undersize will be conveyed to a 5'x15' double deck screen with 2" and ¾" decks. Screen oversize from both decks will feed a 54" EC-Jay Cone crusher with a CSS of ¾". The crusher product will be conveyed back to the 5x15 screen to complete the circuit.

The screen bottom deck undersize at 100% - ¾" size, will be conveyor fed to an agglomerating device. The device, yet to be selected, is a drum or a pug mill. Cement at the rate of 10lb/ton, will be added to the ore in the agglomerator. The agglomerated ore at 10% moisture, will be conveyed to the heap by a series of conveyors and stacked in 20-30' lifts with a radial stacker.

14.2.5 Heap Leach pad

The heap leach pad at Zenda will be modified valley leach type. The project is located in extremely steep terrain. The heap leach pad will be formed by removing a narrow ridge and blocking the adjacent arroyo with it. The dam or berm forming the valley leach will be constructed from the material removed from the ridge and mine waste rock. The ridge, after removal, will be utilized as the pond, process plant, laboratory and office site.

The heap leach site has been carefully and well designed by Vector Engineering. The lower portion of the heap, i.e., the solution retaining portion, will be double lined with synthetic liners with a leak detection system between liners. The upper portions of the bowl will be lined with a single synthetic liner with a drain layer immediately underneath it.

The initial pad construction will encompass the lower or bowl section of the valley leach. The bowl sides will be lined as required during production. The initial heap leach construction, because of the difficult site and subsequent strict engineering specification, will demand a high degree of expertise, attention and inspection. The ongoing liner construction, to be built by the Zenda operating crews, will demand the same criteria. For liner protection, the heap must be carefully stacked in lifts from the bottom up. That is, ore cannot be placed directly on the lined slopes and allowed to “slide” down. J-Pacific agree that a competent engineering firm will be responsible for the QA/QC during construction of the leach pad. The heap leach pad, when stacked up to 50 metre height will contain the +800,000 tonne resource.

#### 14.2.6 Leaching

The agglomerated ore will be leached by application of a pH 10.5 weak cyanide solution to the heap by a network of piping and emitters at the rate of 0.004 $gpm/ft^2$. The leachate will be pumped from the heap pad to a small pregnant pond, pumped from the pregnant pond at the rate of 400 gpm through the ADR plant. The ADR plant barrens will gravity flow to a large barren pond. The barren solution will be adjusted for pH and cyanide strength and re-applied to the heap.

#### 14.2.7 Recovery

The carbon plant at Zenda will consist of six, 5’x10’ closed carbon columns. Each column will have a 2 ton carbon capacity. The closed columns are both adsorption, desorption and acid wash vessels. The columns are arranged in series with sufficient valving to allow each column to be anywhere in the series. When each column in the series becomes “loaded”, it is taken out of the circuit (by valving) and stripped with a hot, caustic solution. After stripping is complete, the column is returned to adsorption as the last column in the adsorption series. Acid washing of carbon, when necessary, will occur in the column immediately after stripping.

The desorption circuit and gold recovery circuit will be a set of propane fired heaters, a solution holding tank, and two electrolytic cells, operating in series. Strip solution will be heated to 195 degrees F, caustic added and circulated through the column to be stripped. The pregnant solution will flow to two 2’x2’x3’ electrolytic cells where the dore is deposited on the cathodes. The barren solution from the electrolytic cells will be re-circulated through the heaters and the column under strip.

The “loaded” cathodes will be removed from the electrolytic cells at intervals. The cathodes will be stripped of their steel wool. The steel wool containing the dore, will be shipped to a refiner for smelting and refining. Fresh steel wool will be added to the cathode frames and they will be reinserted into the electrolytic cells. The gold recovery plant will be contained in two 15 metre high cube van trailers. The plants will be built off-site, complete with piping and electrics and transported to the site, ready for external hookups.

#### 14.2.8 Ancillaries

The laboratory and general office will be in trailers, located at the process plant site. Electric power for the project will be provided by So. Cal Edison. The power line will be installed by the utility at a cost of $250,000. Water for process will be supplied by two wells, one near the process site and one in the nearby valley. The budget allows for the new well pumps to be diesel driven but there is a possibility of a hookup to the utility.

A septic system for the site has been designed and budgeted. Security and wildlife fencing has been budgeted for the heap leach pad and the process plant site. Access to the site will be accomplished by upgrading existing roads and trails. Approximately $230,000 has been budgeted for access, exterior and interior. This appears to be adequate to SRK.

#### 14.2.9 Gold Security

Procedures for gold security during collection and transportation of the loaded steel wool will have to be addressed. Direct supervision by the mine manager and/or plant foreman will be necessary. Arming of the personnel involved should be considered.

## 14.3 VALLEY LEACH FACILITY

SRK have reviewed the documents *"Design Report for the Zenda Mine Project Valley Leach Facility"* (Vector, 1989) and *"Justification for an Alternative Liner Design at the Zenda Mine Valley Leach Facility in Kern County, California"* (Vector, 1997). It is recognized that a valley leach type facility is the only practical alternative for the Zenda project due to topographical constraints. The leach pad as presented in the above referenced reports is representative of a 1990 state-of-the-art facility and as such will require some modifications during construction.

Leach facility design has advanced in the last seven years and SRK anticipate that the engineering firm responsible for the QA/QC during construction will make appropriate design adjustments where the need is indicated. SRK recommend that Vector Engineering be given consideration for this role as they will be in the best position with respect to familiarity with the existing design to suggest possible improvements.

The leach facility is perceived by SRK to be the highest potential risk area for the Zenda Project. The difficult topography of the site for construction could result in delays. The single cell configuration means that leakage problems during operation could result in shutdown. It is absolutely essential that the facility be given proper attention during construction and pad loading. The following sections present some of the key issues associated with the design and identify areas where strict supervision will be required.

The liner system for the valley leach facility will consist of a lower 40-mil PVC secondary liner placed on a subgrade of selected native soils, and an upper 40-mil PVC primary liner. A leakage detection and collection system, consisting of an HDPE drain net on the pad floor or internal storage area, and a non-woven geotextile on the side slopes, will be placed between the PVC liners, enabling collection of leakage through the primary liner in an engineered leakage collection sump. Stability analyses and liner compatibility testing have been conducted to evaluate the performance of the liner system under anticipated field conditions. Of primary concern is the potential for leakage of leach solutions due to:

- elevated hydraulic head on the liner system;
- stability of the liner with respect to interface shear strength and potential liner damage resulting from heap displacement;
- potential damage to the liner resulting from pad loading conditions and equipment operation;
- difficult construction and operating conditions.

### 14.3.1 Hydraulic Head and Leakage

The proposed operation of the leach facility will include storage of process solution within the pore space of the leach pad. With hydraulic head on the liner, rates of process solution leakage could potentially exceed those that occur in conventional leach pads where solution head within the heap is maintained at minimum levels. Maximum solution head conditions will exist in the internal storage area at the upstream toe of the rockfill embankment. This area also corresponds to the area where maximum load on the liner system will be developed.

As discussed below, simulation of the anticipated maximum loading condition produced liner damage with a particular liner bedding material below and a particular crushed rock above. Operational precautions during construction and loading must be implemented to mitigate against liner damage. SRK believes that these issues can be adequately addressed by the QA/QC engineers during construction.

### 14.3.2 Stability

Conventional pseudostatic stability analyses by Vector Engineering indicated low factors of safety for potential sliding failure at the liner interface. A dynamic stability analysis was subsequently performed in order to estimate the amount of displacement that could occur in the event of a Magnitude 6 earthquake on the nearby White Wolf Fault. The predicted displacements on the order of 2 to 3 cm were considered by SRK to be within acceptable limits.

Based on a review of the stability analyses, the following comments are offered:

- Stability analyses indicate the potential for displacement of the heap under seismic loading with failure occurring at the liner interface in the internal solution storage area. The seismic stability analyses appears to be based on a 25-year exposure period for which the MCE (or probable maximum earthquake) on the White Wolf Fault was predicted to be Magnitude 6.0. This is acceptable for evaluation of liner integrity, as the leaching operations will be short term in nature. Although outside of the scope of this study, SRK recommends that J-Pacific consider their long term potential liability for the waste rock embankment and the facility given that the MCE for the White Wolf fault is 7.8.
- The strengths assumed in analysis of the valley leach foundation appear to be based on drained as opposed to undrained strength parameters. Foundation materials are reported to include clayey soils derived from the weathering and/or hydrothermal alteration of granitic rock. For these materials, the potential for the development of excess pore water pressures under heap and seismic loading should be considered. The strength of the foundation materials may be overestimated as a result of the adoption of drained strength parameters.

### 14.3.3 Pad Loading Conditions

Liner loading tests were conducted to evaluate the compatibility of the liner system under anticipated maximum and average loading conditions. The overliner to heap interface was simulated with minus ¾- inch crushed rock, with a gradation similar to that anticipated for the crushed ore, and commercially available minus ¾-inch pea gravel.

For the maximum loading condition, the load simulation with ¾-inch crushed rock produced 2 pinholes in a 0.79 $ft^2$ liner sample in areas where a rock particle pinched the PVC liner against the HDPE drain net. Test results indicate that compatible overliner and liner bedding fill materials should be used for the liner subgrade and liner cover to minimize the potential for leaks. As noted by Vector, adoption of a geotextile fabric in contact with the HDPE drain net could also reduce the potential for leaks to be developed. While the 1989 design report states that the overliner cover should be constructed with silicified rhyolite, the 1996 report suggests that no angular material should be used. Alternative materials, preferably argillized/sericitized material from the pit, should be tested for greater suitability for the overliner bedding.

SRK believes that protection of the liner system during pad loading will require careful placement of the ore. Use of a radial stacker is proposed. A suitable cushioning layer must be provided beneath the stacker, and loading operations must proceed from downhill to uphill in order to prevent movement of the stacked ore and failure of the liner system. Training of staff and constant supervision of loading operations will be necessary.

### 14.3.4 Liner Bedding Fill

The most likely source of suitable of liner bedding fill on the site will be from the strongly argillized material available in the pit. The design report cites the use of selected native soils as liner bedding fill on the rockfill embankment. The issue of liner bedding fill is considered critical to the effective operation of the liner system. The liner bedding fill, as well as providing a protective cushion to the liner, must be filter compatible with the rockfill. In the event that a leak is developed, piping of liner bedding fill into the rockfill could undermine the foundation for the liner, resulting in local failure of the liner system and potentially excessive leakage. SRK emphasizes the need for close supervision by the QA/QC team during selection and placement of the liner bedding fill material.

Elsewhere on the leach pad, compacting liner bedding fill in a thin lift parallel to the existing slopes of 2H:1V will be difficult. Use of a geotextile fabric cushion beneath the secondary PVC membrane may reduce the potential for liner damage, however it may also reduce the shear strength of the foundation to liner interface.

### 14.3.5 Construction Conditions

The configuration of the proposed leach pad can be likened to a relatively steep-sided depression with side slopes averaging approximately 2H:1V. This will not allow ore conveying and placing operations to be completed on the pad slopes, nor will it be possible to dump ore over and down the lined side slopes.

SRK therefore believe the operator will be limited to a phased construction approach where the ore is transported over unlined ground to the bottom of the pad, and the liner system under the ore delivery area is constructed in retreat. These considerations will increase the complexity and costs associated with pad construction.

### 14.3.6 Containment Compliance

The Lahontan Water Quality Control Board (WQCB) and Equinox-JV will be responsible for establishing a point of compliance for the containment/leakage of process solutions in the leach pad as outlined in the provisions 9 and 10 of WQCB Order No. 95-104. The WQCB approach is likely to be the establishment of an action leakage rate measured at the LCRS sump.

SRK's experience at other mine sites under Lahontan WQCB jurisdiction suggests that the action leakage rate could be less than the collection and pumping capacity of the LCRS. The compliance criteria for the leach pad should be given careful consideration by Equinox-JV because the one-cell configuration of the leach pad will not be conducive to remedial action should a leak in excess of the compliance criteria occur. Given the design, construction, and loading conditions discussed above, high leakage rates into the LCRS are possible unless great care is taken during construction and loading.

### 14.3.7 Leach Pad Construction Costs

A review of the general earthworks and liner installation costs has been completed by extracting cost items from the Capital and Operating Cost Forecast and Assumptions.

The estimated capital costs directly related to process pond and process area excavation, and the Phase 1 leach pad total approximately $851,900 including approximately $300,000 for previous expenditures on PVC lining material. This equates to a square-foot cost of approximately $3.40 with process area excavation and embankment earthworks, and approximately $2.40 without the major earthworks. These per-foot costs appear to be in the general range of typical leach pad costs, however, several items presented in the Capital and Operating Cost Forecast and Assumptions appear to be underestimated, and no labor costs for ongoing construction activities (Phase 2 pad) appear to be included.

Finish grading for the Phase 1 leach pad was estimated to require 5 man-days at a cost of $405/day for fuel, the equipment operator and a surveyor. Given the difficult working conditions anticipated for pad construction, a significantly higher cost is anticipated for pad grading.

An allowance of $54,300 has been provided for liner bedding materials. The requirement of importing all or a major portion of the liner bedding materials is anticipated as no significant quantities of suitable materials have been identified at the site. A 12-inch layer of compacted bedding fill will require approximately 9,000 cy of material. Costs to obtain the fill could exceed $100,000. The cost estimate does not indicate whether a local quote for bedding fill purchase and hauling has been obtained. The pad finish grading costs will not cover placing, spreading and compacting liner bedding fill.

Incremental costs associated with placement of overburden in the embankment buttress are estimated at $0.30/cy. This cost appears to be insufficient for spreading in thin lifts suitable for compaction, and for fill compaction itself.

The capital cost estimate includes an allowance of $261,000 for supervision and overhead. This is assumed to include expenses for the construction quality assurance monitoring and testing that will be required by the WQCB.

Earthwork costs associated with pad grading cannot be estimated at present as a geotechnical investigation of foundation conditions within the interior of the leach pad area has not been completed. Work to date has been limited primarily to accessible ridge areas and as stated in the Vector design report, additional investigation and testing will be required during the construction phase to supplement available data. In addition, technical specifications for the pad have not been prepared. For the 5.5-acre area that will be lined, construction is anticipated to require, in addition to clearing, grubbing and topsoil salvage:

- scarification and compaction of all areas where suitable foundation materials exist at final grade;
- over excavation of unsuitable foundation materials (similar to the embankment buttress area);
- dozer ripping (or possibly blasting) of rock outcrops;
- borrowing, spreading and compacting fill to smooth the foundation area and fill gullies;
- moisture conditioning and compaction of the reworked foundation areas in preparation for liner bedding placement; and

It is reported that the pond will be founded on competent, unfractured bedrock. Spreading and compacting liner bedding fill will be required in this area. Given the level of uncertainty associated with the pad area and the technical specifications, a labor allowance of $50,000 is suggested for completion of these tasks. Assuming a liner bedding fill layer thickness of 12 inches and a delivered cost of $8.0/cy, costs of up to $71,000 could be incurred for imported liner bedding fill.

Costs for compacting overburden were estimated on the basis of *Means 1995 Heavy Construction Cost Data*. Labor and equipment costs for dozer spreading dumped fill range from $1.13 to $1.86 per cy. Typical compaction costs, assuming 12-inch lifts and three passes are estimated at $0.41/cy. Because the work will be performed with the owner's labor and equipment, lower costs are anticipated. An allowance of $0.75 is therefore recommended by SRK for embankment fill placement.

## 14.4 ENVIRONMENTAL

The Zenda property is comprised of patented lode mining claims, unpatented lode mining claims and surface fee simple lands. The disturbance related to the mine and processing facilities will be located on patented claims and fee simple lands. State and private lands are administered by the Kern County Department of Planning and Development Services (Kern County). A portion of the access road and right-of-way for a water line are located on Federal public lands. The unpatented claims and Federal lands are administered by the U.S. Department of the Interior, Bureau of Land Management, Caliente Resources Area Office (BLM). Kern County is the lead agency for approval of the Zenda Project.

A number of State and Federal permits and approvals are required for the Zenda Project. Various environmental studies were required to provide background information for environmental impact assessments and permitting requirements. Environmental studies and permitting of the mine occurred in the late 1980's by Equinox-1 and applications for most permits and approvals were submitted in 1989. Equinox-JV has kept most of the major permits active or is in the process of updating these permits. Some of the more minor permits have expired. The expired permits and other minor permits and approvals will be acquired during final project planning or during the six to seven month construction period. SRK anticipates that the final permits and approvals will not delay the project.

### 14.4.1 Environmental Baseline Studies

SRK has found that the necessary environmental baseline studies have been completed for the Zenda mine area to provide supporting information for environmental assessments and permit documents.

### 14.4.2 Biological Resources

A study of biota and threatened and endangered species was conducted in 1987 (Moe, 1987). During this survey no animal or plant species protected by Federal or State law were found on the proposed project area, and none were anticipated to be present due to habitat types. The report included recommendations for siting of facilities to avoid impacts to the calico monkey flower, a rare but not threatened species, nesting red-tailed hawks and creek bottom habitats.

The Tehachapi slender salamander has been found along Caliente Creek. No salamanders were found near or on the project site during the 1987 survey. Creekside habitats in the region have been severely damaged by cattle, making them unsuitable for salamander habitat. Additional surveys were conducted in May 1989 and February 1990 for all surface cover suitable for habitation by the salamander, but none were spotted on-site. The California Department of Fish and Game concurred that it was unlikely the Tehachapi slender salamander occurs on-site (Nokes, 1990).

An additional field survey for the Tehachapi slender salamander was conducted on June 7, 1997 to assess potential negative impacts to habitat during construction of the proposed above-ground water pipeline (Hansen, 1997). A small portion of salamander habitat was found along the overall pipeline corridor. Mitigation measures during installation of the pipeline will include the manual installation of an above-ground pipeline along the length of the corridor. Potential habitat for the salamander will be flagged prior to installation, and these areas avoided. SRK considers these measures to be sufficient.

### 14.4.3 Archaeological Resources

An archaeological assessment and impact evaluation was conducted for the project site in 1987 (Sutton, 1987). Three historic sites were located on the project site during the assessment. Two of the sites were mitigated during the assessment. The third site will require mitigation if it will require disturbance by project activities. SRK does not believe that archaeological considerations will pose a problem to the construction and operation of the Zenda Project.

### 14.4.4 Baseline Water Quality

Baseline water quality monitoring of surface water and groundwater has been performed for the project area. Surface water monitoring stations have been established at two sites on Caliente Creek down gradient of the project site, and at six seasonal springs throughout the project area. Five groundwater monitoring wells have been established at the site. Four wells were installed by Equinox-1 in the vicinity of the proposed heap leach facility, and one well was an existing well. Only two of the four wells have encountered water. The other two wells were installed in the event seasonal groundwater levels will rise above the bottom of the wells.

Water samples were collected for laboratory analyses quarterly for one year beginning in September 1989, and have been collected quarterly and semi-annually since September 1995. The surface water quality is good and within primary and secondary drinking water standards for inorganic constituents except for levels of arsenic, manganese, iron and turbidity. The groundwater quality is within primary and secondary inorganic drinking water standards except for levels of arsenic, manganese and iron.

### 14.4.5 Mine Waste Characteristics

WQCB Order No. 95-104 provision 10 requires that Equinox-JV submit for review and approval proposed methods for evaluating the acid generation and metal leaching potential of overburden. Preliminary testing conducted by SRK on waste rock and ore samples indicates acid generating potential in two of three ore samples and two of three waste rock samples. While neutralization potential is typically low, sulfide sulfur content is moderate and ranges from 0.04 to 0.65 percent.

Geochemical testing performed on mine wastes included acid base accounting of one composite overburden sample and two spent ore samples. These samples were also analyzed for heavy metals by the waste extraction procedure. Based on the results of the testing, the overburden and spent ore have been tentatively classified as "Group C" mining wastes in accordance with Chapter 15 of the California Water Regulations. These test results indicate the necessity for the waste incurred during mining be ultimately placed on the leach pad for containment in the absence of any appropriately designed waste dumps. They also suggest that placement of waste rock from the pit into the leach facility containment may require design modifications to mitigate acid generation and metal leaching. This could require the placement of a compacted, low permeability cover on the rockfill buttress, overburden stockpile areas and leach pad.

#### 14.4.6 Additional Studies

Environmental information on the site including geology, topographic features, seismic concerns, hydrology, water quality, geochemical mine waste classification, soils, land use, meteorology, air quality and noise has been compiled, presented and reviewed by SRK in various reports as follows:

- *A Summary of the Zenda Project, Kern County, California, A Project of Mineral Ventures, Shell Mining Company*, Martha J. Edick Ellis, April, 1987.
- Site Description (Parts 10-19) and Information Sheet (Attachment), California Regional Water Quality Control Board, Central Valley Region, *Tentative Order No. 97-__, Waste Discharge Requirements for Equinox Resources (California), Inc., and the U.S. Department of the Interior, Bureau of Land Management, Zenda Mine, Kern County*
- *Application for Surface Mining Permit and/or Reclamation Plan on the Zenda Project to the Kern County Department of Planning and Development Services*, Equinox Resources, Inc., February, 1989.
- *Kern County Department of Planning and Development Services Environmental Assessment Form*, Equinox Resources, Inc. February, 1989.

## 14.5 Permits and Approvals

### 14.5.1 Federal Permits and Approvals

Mining on public lands is performed under authority of the General Mining Laws of the United States. The management and use of public lands under BLM jurisdiction is authorized under the Federal Land Policy and Management Act of 1976 (FLPMA). FLPMA directs non-wilderness public lands under BLM jurisdiction to be managed under principals of multiple use. Section 102 (a) (12) of FLPMA states that "... it is the policy of the United States that the public lands be managed in a manner that recognizes the nation's need for domestic sources of minerals, food, timber, and fiber from the public lands...". FLPMA also requires the regulation of mining operations to prevent undue and unnecessary degradation of public lands. BLM regulations relating to surface management of public lands for compliance with the FLPMA are set forth in 43 CFR 3809. Permit procedures for granting rights-of-way over public lands are set forth in 43 CFR 2800.

Disturbance on public lands is subject to review by the National Environmental Policy Act (NEPA) set forth in 40 CFR 1500. NEPA review is triggered by the submittal of a plan of operations to the BLM.

Equinox submitted a Plan of Operation to the Caliente Resources Area BLM Office (Equinox 19__). The document is undated but it is likely to have been submitted in early 1989.

Mitigation Measure No. 1 of the Conditional Use Permit (discussed in more detail in Section 6.2.2.1 below) requires written verification from the BLM that all BLM requirements have been satisfied. This condition has been satisfied (Denney, 1996). The BLM is in the process of reviewing the recommended mitigation measures to protect Tehachapi slender salamander habitat during pipeline construction in the right-of-way. A Notice to Proceed will be issued following concurrence with the mitigation measures (Estrada, 1997).

### 14.5.2 State Permits and Approvals

#### *14.5.2.1 Conditional Use Permit*

Correspondence by SRK with Kern County indicates that the County has a positive working relationship with Equinox. Almost all necessary permits and approvals have been obtained and minor modifications approved (Denney, 1997).

*Kern County Department of Planning and Development Services Environmental Assessment Form* was completed by Equinox Resources, Inc. and submitted on February 7, 1989. At about the same time, Equinox submitted an *Application for Surface Mining Permit and/or Reclamation Plan* on the Zenda Project to Kern County. A Conditional Use Permit (CUP) (Case No. 4, Map No. 129), has been granted by the Board of Zoning Adjustment, County of Kern, California, as Resolution No. 130-89, July 27, 1989. The findings of the Zoning Board are as follows:

- To allow a surface mining operation and site reclamation plan in accordance with the Surface Mining and Reclamation Act of 1975, in an A (Exclusive Agriculture) District
- To adopt a negative declaration which states that the activity in question will not have a significant effect on the environment. Therefore an environmental impact report is not required under the provisions of the California Environmental Quality Act.

The Zoning Board approved the CUP application with 43 conditions including five mitigation measures. The five mitigation measures are summarized in Table 6.1. A Monitoring Program is specified in the CUP for each of the mitigation measures, and all but one of the mitigation measures have been satisfied.

Nine of the remaining 38 conditions require approval prior to commencement of operations. Three of these nine conditions have been satisfied. The remaining six conditions, including the posting of a surety bond in the amount of $50,000 for reclamation, will be satisfied during final project planning and equipment selection, and should not cause delays in the project schedule.

Twenty-two of the 38 conditions are items that must be satisfied during project construction and operations. These conditions include:

- Compliance with Kern County Health Department noise level standards, and
- Compliance with the Kern County Air Pollution Control District requirements

Seven of the 38 conditions pertain to closure and reclamation of the site. There have been some minor changes in the operating plan since approval of the CUP in 1989. These include the use of PVC in lieu of HDPE for the heap leach pad liner, size of pump for storm water management in the heap leach unit; and the use of a Carbon Column Plant instead of a Merrill Crowe Plant. The Kern County Zoning Ordinance allows minor modifications in approved plans to be approved by the Kern County Planning Director. However, a substantial deviation from an approved plan, including increases in the amount of surface area to be disturbed, must be applied for and considered by the Kern County Board of Zoning Adjustment. This is also specified as Condition 33 of the CUP.

A Negative Declaration, based on the Environmental Assessment Form submitted to Kern County in 1989, was adopted by Kern County. Therefore, an environmental impact report (EIR) was not required. The California Environmental Quality Act now requires all open pit mining operations subject to the permit requirements of the Surface Mining and Reclamation Act of 1975 and utilizing cyanide heap leaching processing to certify the completion of an EIR. Therefore, substantial deviations from the CUP may also require the preparation of an EIR.

#### *14.5.2.2 Air Pollution Control*

Mitigation Measure No. 2 of the CUP requires compliance with the requirements of the Kern County Air Pollution Control District (APCD). Two permits are required from the APCD, an Authority to Construct and a Permit to Operate. Six Authority to Construct approvals were granted to Equinox on October 1, 1990 for the following operations and equipment:

- Gold Ore Crushing, Screening and Stacking Operations;
- One 973 HP IC Engine Powering Crushing Generator;
- Plan Processing and Heap Leach Operation;
- Cement Receiving and Storage Operation;
- Refining Furnace and Crucible; and
- One 973 HP IC Engine Powering Crushing Generator.

The Authority to Construct approvals expired in October 1, 1992, were renewed in 1993, and have since expired. New Authority to Construct approvals will be applied for as soon as final equipment selection has been completed. Discussions with the APCD (Lund, 1997) indicate that the approvals will be straightforward since there is little change in the proposed operations. One operational change that will affect air emissions is the use of electricity in place of propane generators to run most of the crushing machinery, which will reduce proposed emissions of nitrogen oxides.

The regulatory requirement to issue the Authority to Construct approvals is 180 days. However, since the approvals were previously issued and most of the information is already on file, it may be possible to issue the Authority to Construct approvals within a few weeks (Lund, 1997). The Authority to Construct approvals serve as temporary Permits to Operate. The final Permits to Operate are issued following a start-up inspection by the APCD.

#### *14.5.2.3 California Regional Water Quality Control Board Waste Discharge Order*

Chapter 15 of the California Water Regulations contains regulations for waste and site classification and waste management requirements for waste treatment, storage and disposal. Article 7 of Chapter 15 applies to all discharges of mining wastes. Article 5 of Chapter 15 establishes monitoring requirements for waste management units.

A waste discharge permit (order) is required from the California Regional Water Quality Control Board (WQCB), Central Valley Region for disposal of the mining waste at Zenda. The order specifies construction, operation, closure and post-closure maintenance and monitoring of the waste management units.

An Application for Facility Permit/Waste Discharge was submitted to the WQCB, Central Valley Region by Equinox in May 1989. Order No. 90-043, Waste Discharge Requirements was issued on February 23, 1990. On April 28, 1995, Order No. 90-043 was revised by Order No. 95-104 to identify Equinox Resources (California), Inc. as the owner/operator of the Zenda Mine and to update water quality monitoring requirements to reflect changes in Article 5 of Chapter 15 of the California Water Regulations.

A Tentative Order No. 97-__ has been issued to revise Order No. 95-104 to allow the minor changes in the operating plan discussed in Section 6.2.2.1. These include the use of PVC in lieu of HDPE for the heap leach pad liner, size of pump for storm water management in the heap leach unit; and the use of a Carbon Column Plant instead of a Merrill Crowe Plant. A public meeting concerning the tentative order will be held by the WQCB on August 8, 1997, in Bakersfield, California.

#### *14.5.2.4 National Pollutant Discharge Elimination System*

National Pollutant Discharge Elimination System (NPDES) permits are required for all facilities which discharge wastewater into the surface waters of the United States. The NPDES program is mandated by the Water Pollution Act of 1972 as amended by the Water Quality Act of 1987. In 1990, the NPDES program was expanded to include permit application requirements for storm water discharges associated with industrial activity. The Environmental Protection Agency (EPA) has authorized California to administer the NPDES permit program.

There will be no process water discharge from the pit or heap leaching facilities. Discharges of storm water flow from disturbed areas and which comes in contact with waste rock or other significant materials during construction and operations will require coverage under the California WQCB Order No. 91-13-DQ (NPDES General Permit No. CAS000001), amended September 17, 1992. This will require submittal of a Notice of Intent to the WQCB 60 days prior to operation, and preparation of a Pollution Prevention Plan.

#### *14.5.2.5 Other Approvals*

Federal and State requirements for protection of threatened and endangered species and cultural resources have been satisfied.

### 14.5.3 Monitoring

Detailed monitoring requirements are set forth in the WQCB, Central Valley Region, Tentative *Monitoring and Reporting Program No. 97-__ for Equinox Resources (California), Inc., and the U.S. Department of the Interior, Bureau of Land Management, Zenda Mine, Kern County.* Monitoring will include:

- **Visual Monitoring** - Daily visual inspections of the heap leach facilities.
- **Erosion Control** - Annual implementation of erosion control measures prior to the rainy season and annual reporting of measures used to prevent erosion, flooding and contact of surface drainage with waste materials.
- **Leachate Collection and Recovery Systems** - Daily, monthly and quarterly sampling and analysis of leachates from the pregnant pond and heap leach unit.
- **Water Quality Monitoring** - Monthly and quarterly surface water quality monitoring from two monitoring stations in Caliente Creek, six monitoring stations at seasonal springs, one monitoring station at the spillway conduit tank and one monitoring station at the french drain sump. Quarterly and semi-

annual groundwater monitoring of water levels and water quality from five monitoring wells.

- **Solid Waste** - Methods and procedures to assess acid rock drainage potential and metals leaching from waste rock overburden and low grade ore are to be established. Upon closure the geochemical characteristics of representative samples of detoxified spent ore are to be assessed to determine acid generating potential, potential for metals leaching and cyanide content.
- **Water Quality Protection Standards Report** - Submittal of a report demonstrating compliance with Chapter 15 of the California Water Regulations prior to operations to identify concentration limits for constituents of concern, points of compliance and compliance period.
- **Reporting** - Detailed requirements for reporting of monitoring data and any accidental spills or leaks.

SRK believes that the above monitoring requirements will be sufficient for timely detection of environmental impacts from the leach facility.

### 14.5.4 Closure and Reclamation

Proposed disturbance required for construction of the mine components is estimated at 52 acres. Ten acres of this area have been previously disturbed by prior mining operations. Therefore, net new disturbance is estimated at 42 acres. Closure and reclamation of the project site is summarized below:

- **Heap Leach Facility -** The leached ore will be neutralized according to requirements set forth in the Waste Discharge Requirements (Section 8.2.2.3). Final rinse solutions will be evaporated. Piping and exposed liner material will be removed and disposed of off-site in an approved waste management unit or buried within the heap. Side slopes will be regraded to 2 horizontal to 1 vertical or flatter. Topsoil will be placed and the area seeded.
- **Process Pond -** Final rinse solutions will be evaporated. All residual solids and precipitates will be removed and disposed of in an approved waste management unit. The liner material will be folded into the bottom of the pond and the pond regraded to prevent impounding of meteoric waters.
- **Plant Site -** All structures and equipment will be removed and re-used, salvaged or properly disposed of. Non-hazardous piping, concrete rubble or other non-contaminated debris may be buried in the heap or process pond. The plant site will be regraded and seeded.

- **Waste Rock Dump -** The surface of the waste dumps will be graded to prevent ponding of water and scarified to encourage natural revegetation. Side slopes will be left at angle of repose.
- **Pit -** Lower pit slopes will be recontoured and seeded. All pit roads and benches will be ripped and seeded. Safety berms will be established around the upper pit.
- **Roads -** Haul roads will be ripped, recontoured and covered with topsoil to encourage natural revegetation. Existing access roads will be left in a condition similar to the present condition.
- **Revegetation -** Revegetation will occur as recommended by the U.S. Soil Conservation Service. The BLM has recommended a mixture of seeds native to the area (Red Brome, Flat Topped Buckwheat and Red Stemmed Filaree).
- Closure and reclamation is discussed in more detail in the following documents:
- *Submittal of Plan of Operation for Environmental Assessment of the Zenda Project (Kern County, California) to the United States Bureau of Land Management, Caliente Resources Area Office*, Equinox Resources, Inc., 19__.
- *Application for Surface Mining Permit and/or Reclamation Plan on the Zenda Project to the Kern County Department of Planning and Development Services*, Equinox Resources, Inc., February, 1989.

### 14.5.5 Surety Bonds

J-Pacific is required to post the following surety bonds:

**Kern County -** A bond in the amount of $50,000 to guarantee reclamation work will be completed in accordance with the approved reclamation plan (Condition No. 17 of the CUP).

**BLM -** A bond in the amount of $5,000 for the construction and maintenance of the water pipeline in the right-of-way CA 23473.

**WQCB** - Equinox and the WQCB are in the process of negotiating the bond amounts. Tentative bond amounts include $300,000 for closure and $10,000 for corrective actions for all known and reasonably foreseeable discharges.

## 14.6 ECONOMICS

A rather novel approach to mining which involves a very high production rate relative to the deposit size with a minimal capital investment. The resulting gold production rate corresponds more to medium size Au producers in the western US. The low capital investment is made possible by Saga Exploration's commitment to supply all of the mining; crush, convey, and stacking equipment; and most of the process plant. In effect, the project is benefiting with respect to capital cost as if the mine were contract mined, but without the labor, contractor contingency, and profit cost add-ons that a contractor would apply on operating expense.

The Economic Analysis for the Zenda Project was completed for the productivity rate proposed by CRL, the production schedule tons and grade developed by SRK from the most recent PAH model. Sensitivities were investigated for a variety of parameters.

The parameters which were used were as follows:

| | |
|---|---|
| Mineable Resource | 847,000 tonnes ore, 310,000 tonnes waste |
| Stripping Ratio | 0.36:1(tons of waste per ton of ore) |
| Mining Rate | 2,177 tonnes ore/day, 784 tonnes waste/day |
| Average Grade | 1.61 g/t Au |
| | 27.1 g/t Ag |
| Capital Cost | $2.80 million (life of mine) |
| Mining Approach | Owner/Operator Mining |
| Discount Rate | 10% |
| Royalties | 3.14% |
| Tax Rate | State 9.3% |
| | Federal 34% |
| Recoveries | Au 83% |
| | Ag 38% |
| Gold Price | $350 per oz |
| Silver Price | $5 per oz |

It is this approach that produces an indicated NPV of $US2,590,000 and a DCFROR of 62%.

Sensitivities were investigated for the base case, in the areas of:

**Capital Cost Sensitivity**

| % Capital cost | DCF - ROR | NPV @ 10% (1997 US dollars) |
|---|---|---|
| -10 % | 70.7 % | $2,890,000 |
| $2,801,628 | 62.3 % | $2,612,000 |
| +10 % | 54.8 % | $2,334,000 |

**Gold Price Sensitivity**

| Gold Price | DCF - ROR | NPV @ 10% (1997 US dollars) |
|---|---|---|
| -10 % | 41.8 % | $1,821,000 |
| $350 | 62.3 % | $2,612,000 |
| +10 % | 75.3 % | $3,368,000 |

**Mine Operating Cost Sensitivity**

| Mine Operating Cost | DCF - ROR | NPV @ 10% (1997 US dollars) |
|---|---|---|
| -10 % | 66.4% | $2,812,000 |
| $1.67 | 62.3% | $2,612,000 |
| +10 % | 58.3% | $2,412,000 |

**Process Operating Cost Sensitivity**

| Process Operating Cost | DCF - ROR | NPV @ 10% (1997 US dollars) |
|---|---|---|
| -10 % | 68.3% | $2,892,000 |
| $3.22 | 62.3% | $2,612,000 |
| +10 % | 56.4% | $2,333,000 |

**Gold Grade Sensitivity**

| % Capital cost | DCF - ROR | NPV @ 10% (1997 US dollars) |
|---|---|---|
| -10 % | 39.9% | 1,540,000 |
| 0.047 | 62.3% | 2,612,000 |
| +10 % | 75.6% | 3,653,000 |

### 14.6.4 Technical Risks

The risks SRK have identified associated with the pre-production of the leach facility, and construction of the process plant. The risks associated with the early production period are start-up of the process plant with fine tuning the process to achieve optimal recovery and through-put.

It is crucial to understand that the site topography and the nature of the pit and facilities with respect to topography severely limit options for maintaining productivity in any of the operations, mine or process, should some aspect of pre-production activity be held up. The steep topography does not allow for cost effective stockpiling of ore anywhere on site. This constraint places almost all of the construction items on the critical path to productivity from the mine. Any delay in construction of the leach facility or process plant will delay gold production from the mine.

It is also crucial, as I have mentioned, that since the leach facility is a single cell unit, the construction of the leach facility be done properly even if delays are incurred. The correction of problems after ore is placed will be much more costly in both time and money.

The start-up process and learning curve built into both CRL's and SRK's model assume experienced plant operators. If inexperienced operators are used then the learning curve and anticipated gold production are optimistic. The facilities are small and the process is simple and there should be available experienced people to operate the plant. Identification of these individuals by CRL with their qualifications, experience and availability may be an appropriate mandate from Standard Bank.

With respect to mine planning, the ore and waste at Zenda are well defined in PAH's block model from surface drilling data. This definition, in advance of any production, allows for a comprehensive life-of-mine mine plan and production schedule complete with design of access and haulage at any given production period. SRK believes that a production schedule based on monthly pit designs mining the block model will allow CRL to most efficiently evaluate access and haulage alternatives prior to production and ensure smooth, sustainable production from the pit. SRK recommends that CRL acquire an engineer with operations/mine planning experience early in the pre-production development to develop this schedule.

# 15.0 EXPLORATION POTENTIAL

The mineralized structure has been drilled thoroughly in all directions. To the west, north and south, the projection of the altered and mineralized structure has been eroded. To the east, the possible down-dip extension of the mineralized structure results in excessive waste having to be removed in an open-pit, and therefore limits exploration potential. There is no other evidence discovered to date of additional mineralized zones (PAH, 1997).

## 16.0 CONCLUSIONS AND RECOMMENDATIONS

- SRK concludes that the Zenda Project is technically and economically viable with slight modifications to the design and construction plan as presented by J-Pacific.
- SRK concludes that these modifications need not result in significant additional delay or cost to the project as most can be accomplished during the course of QA/QC supervision of construction.
- SRK recommends that a comprehensive feasibility document be prepared by J-Pacific/Saga which incorporates all of the information compiled to date.

This report, **Independent Review of the Zenda Project, California**, has been prepared by:

**STEFFEN. ROBERTSON AND KIRSTEN (CANADA) INC.**

Michael Michaud, P.Geo.
Senior Resource Geologist

# REFERENCES

Denney, Scott, Kern County Planning Department (1996). Letter to Equinox Resources California Inc. in reply to two October 18, 1996 letters from Ford Cannon of Equinox Resources, November.

Denney, Scott, Kern County Planning Department (1997). Personal communication with P. Acker, SRK, July 21.

Edick Ellis, M.J., 1987. *A Summary of the Zenda Project, Kern County, California*. Report prepared by Shell Mining Company.

Equinox Resources (19__). *Submittal of Plan of Operation for Environmental Assessment of the Zenda Project (Kern County, California) to the United States Bureau of Land Management, Caliente Resources Area Office.*

Equinox Resources (1989). *Application for Surface Mining Permit and/or Reclamation Plan on the Zenda Project to the Kern County Department of Planning & Development Services,* February.

Equinox Resources (1996). *Permit and Title Documents, Zenda Mining Project,* November.

Estrada, Rosalinda, Caliente Resource Area BLM (1997). Letter to Ford Cannon, Equinox Resources (CA) Inc., July 30.

Hansen, Robert W. (1997). *Tehachapi Slender Salamander (Batrachoseps stebbinis) Habitat Evaluation, Vicinity of Zenda Mine, Caliente Canyon.* Report prepared for Equinox Resources (Calif.) Inc., June.

Lund, Will, Kern County Air Pollution Control District (1997). Personal communication with P. Acker, SRK, July 29.

Moe, Maynard L, Ph.D., (1987). *Biota/Habitat Report for the Proposed Zenda Project, Kern County, California,* July 10.

Nokes, George D., California Department of Fish and Game (1990). Letter to Mr. John Wright, Equinox Resources, Ltd., March 6.

Pincock Allan & Holt, 1997. *Geologic Resource Estimate for the Zenda Project, Kern County, California*. PAH Project 9171.01.

SRK Consulting, 1997. *Zenda Technical Due Diligence Audit.* Draft Report.

Sutton, Mark Q., Director, Cultural Resource Facility, California State College, Bakersfield (1987). *Environmental Impact Evaluation: An Archaeological Assessment of the Proposed Zenda Mining Project, Kern County, California*, October.

## CERTIFICATE AND CONSENT

### To Accompany the Independent Review of the Zenda Project, California

I, Michael J. Michaud, residing at 43 Eastlawn Street, Oshawa, Ontario do hereby certify that:

1) I am a Senior Geologist with the firm of Steffen Robertson and Kirsten (Canada) Inc. (SRK) with an office at Suite 602, 357 Bay Street, Toronto, Canada.

2) I am a graduate of the University of Waterloo with a HBSc. in Earth Science in 1987 and a MSc. from Lakehead University in 1998, and have practiced my profession continuously since 1987.

3) I am a a fellow with the Geological Association of Canada and a Professional Geoscientist registered with the Association of Professional Engineers and Geoscientists of the province of British Columbia;

4) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Zenda Project or securities of J-Pacific Gold Inc.

5) I am not aware of any material fact or material change with respect to the subject matter of the technical report, which is not reflected in the technical report, the omission to disclose which makes the technical report misleading.

6) I, as the qualified person, am independent of the issuer as defined in Section 1.5 of National Instrument 43-101.

7) I have not had any prior involvement with the property that is subject to the technical report.

8) I have read National Instrument 43-101 and Form 43-101F1 and the technical report has been prepared in compliance with this Instrument and Form 43-101F1.

9) Steffen Robertson and Kirsten (Canada) Inc. was retained by J-Pacific Gold Inc. to prepare an updated independent report for the Zenda project in accordance with National Instrument 43-101.

10) I was co-author of the report.

11) I consent to the filing of the technical report with any stock exhange and other regulatory authority and any publication by them, including electronic publication in the company public files on their web sites accessible by the public, of the Technical Report

PROFESSIONAL GEOSCIENTIST
PROVINCE OF BRITISH COLUMBIA
M. J. MICHAUD

Toronto, Canada
June, 2002

Michael J. Michaud, P.Geo.
Senior Resource Geologist

## CERTIFICATE AND CONSENT

### To Accompany the Independent Review of the Zenda Project, Near Bakersfield, California, USA

I, William F. Tanaka, residing at 318 Wright St, Lakewood, Colorado, USA do hereby certify that:

1) I am a Principal Geological Engineer with the firm of Steffen Robertson and Kirsten (US) Inc. (SRK) with an office at Suite 3000, 7175 W. Jefferson, Lakewood, Colorado USA.

2) I am a graduate of the Colorado School of Mines, with a BSc. in Geological Engineering, 1984, and have practiced my profession continuously since 1984;

3) I am a member of the Society for Mining, Metallurgy and Exploration (SME), and a member of the Australasian Institute for Mining and Metallurgy (AUSIMM);

4) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Zenda Project or securities of Claimstaker Resources Limited.

5) I am not aware of any material fact or material change with respect to the subject matter of the technical report, which is not reflected in the technical report, the omission to disclose which makes the technical report misleading.

6) I, as the qualified person, am independent of the issuer as defined in Section 1.5 of National Instrument 43-101.

7) I have not had any prior involvement with the property that is subject to the technical report.

8) I have read National Instrument 43-101 and Form 43-101F1 and the technical report has been prepared in compliance with this Instrument and Form 43-101F1.

9) Steffen Robertson and Kirsten (Canada) Inc. has been retained by Claimstaker Resources Limited to prepare a report on the Zenda Project in accordance with National Instrument 43-101 and to assist in the preparation of the technical components of the prospectus. The following report is based on our review of project files, discussions with Claimstaker Resources Limited personnel and observation made during a visit to the data room in Reno, and the Zenda Project site on August 1997.

10) I was the co-author of the report.

11) I hereby consent to use of this report and our name in the preparation of a prospectus for submission to any Provincial regulatory authority.

"William F. Tanaka"

Lakewood, Colorado
June 18, 2002

William F. Tanaka,
Principal Geological Engineer