

**TECHNICAL REPORT  
AND  
RESOURCE ESTIMATE  
ON THE  
TUVATU GOLD PROPERTY  
VITI LEVU, FIJI**

**Latitude 17<sup>0</sup> 42' 49" South  
Longitude 177<sup>0</sup> 34.5' 39" East**

**For**

**X-Tal Minerals Corp.**

**by**

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TECHNICAL REPORT No 186**

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## EXECUTIVE SUMMARY

This report is a technical review of the geology, exploration and current Mineral Resource Estimate for the Tuvatu Gold Project (Tuvatu) located near Nadi on the island of Viti Levu, Fiji.

X-Tal Minerals Corp. (the “**Company**” or “**X-Tal**”), a public company listed on the NEX Exchange under the symbol XMT.H, and AER entered into a definitive Merger Agreement (the “**Agreement**”) dated November 1, 2010 to complete a business combination (the “**Transaction**”) in which the Company will acquire all of the outstanding shares of AER. The combined entity will focus on generating shareholder value through the exploration and development of its mineral projects in Fiji. (X-Tal News Release Nov 2, 2010)

Pursuant to the terms of the Agreement, all of the common shares of AER shall become exchangeable for common shares of the Company on a basis of one (1) common share of AER for one (1) common share of X-Tal. AER and X-Tal currently have 21,108,543 and 6,300,001 common shares outstanding, respectively. The Company will also complete a name change to Lion One Metals Limited and plans to graduate from the NEX to the TSX Venture Exchange (“**TSXV**”).

In conjunction with the Transaction, the Company will carry out a concurrent private placement (the “**Financing**”) of up to \$10,000,000. The Company has agreed to pay cash commissions of up to 6% of the gross proceeds raised, and issue agent’s warrants of up to 6% of the number of shares sold. In addition, the Agent has the option (the “**Agents’ Option**”) to sell up to that number of additional Units which is equal to 15% of the number of Units sold pursuant to the Offering at a price equal to the Issue Price. The Agents’ Option may be exercised at any time within 30 days after the closing date of the Offering.

The Transaction is subject to shareholder approval, and will be voted upon at the Annual Meeting of the Company on December 21, 2010. The Agreement will result in a reverse takeover of the Company subject to shareholder and regulatory approval, including approval of the TSXV.

The Transaction is also subject to the approval of the AME shareholders.

The main asset of AER is the Tuvatu mine tenements located on the island of Viti Levu, Fiji. The Tuvatu tenements are held by AER through its 100% owned Fijian subsidiary, Lion One Resources Inc. (“**Lion One**”), which owns the Tuvatu Gold Mining Company (“**TGM**”). TGM was a subsidiary of Emperor. Lion One holds 3 Special Prospecting Licences (SPL) located near Nadi, Fiji.

At the request of Mr. Walter Berukoff, Chairman of X-Tal, P&E Mining Consulting Inc. (P&E) was commissioned to prepare an Independent Technical Report on the Tuvatu Gold Project compliant with standards of NI 43-101F1. Tuvatu encompasses the concessions SPL 1283, SPL 1296 and SPLA 1465 which are located 24 kilometres northeast of the town of Nadi, in the western part of Viti Levu, Fiji. The tenements total an area of 105.65 square kilometres. The tenements are located in the upper reaches of the Sabeto Valley within a NNE trending zone of shoshonitic volcanic rocks and minor associated intrusions defined by a series of gravity lows and mineralization occurrences. The Tuvatu Mine is situated approximately 1 kilometre southwest of the historic Kingston copper-gold mine. The area contains steep, rugged country accessed via the Sabeto Road. In wet weather, four wheel drive vehicles are required to access

the tenements. Creeks and adjacent areas are generally thickly vegetated while the spurs and ridges are dominated by open grasslands with deep soils.

The local geology is dominated by a sequence of volcanoclastic units intruded by a monzonite intrusive stock. Gold mineralization in the Tuvatu area is dominantly hosted in monzonite units but also occurs in the volcanic units. The mineralization is structurally-controlled and is considered to have a close association with the emplacement of the monzonite intrusive body. It occurs as sets and networks of narrow veins and cracks, with individual veins generally ranging from 1 to 200 mm wide. Zones of veining which comprise the lodes may be up to 5 m wide. A number of different lode structures were identified in the resource area including eleven lodes in the Upper Ridges area, two lodes in the Murau area, three lodes in the West area, two lodes in the Tuvatu area and the flatmakes in the SKL area. In addition a number of other lodes have been identified in the local area but remain untested.

Historical activities began with prospecting during the early part of the last century, followed by some pitting and limited underground work from 1945 to 1952. Modern exploration began with Aquitane Fiji exploring the area from 1977 to 1979. In 1987, Geopacific Ltd. (“Geopacific”) pegged out SPL1283 and SPL1296 in the area and investigated a soil anomaly previously identified by Aquitane Fiji. Geopacific discovered the outcrop of what is now called the Tuvatu Mine in the vicinity of this anomaly.

Emperor Mines Limited (“Emperor”) entered into an option agreement with Geopacific in December 1995 and subsequently exercised its option to purchase 100 % of SPL1283 and SPL1296 in June 1997. Emperor then incorporated TGM to operate the property.

From 1995 to 2001, TGM conducted several phases of exploration including significant underground development and exploration and completed an in-house mining study (scoping study). Overall, TGM completed 51,484 m of diamond core and 9,265 m of reverse circulation surface drilling, as well as 13,407 m of underground drilling. A total of 1,341 m of decline, strike and rise development were also completed in the mine area including a 600 m long access decline from the valley floor that intersects the Upper Ridges lodes 240 m below surface.

Work on the project by TGM was suspended in late 2000 as part of a general cost-cutting exercise related to low gold prices and subsequent work was limited to regional exploration. Emperor, including the TGM subsidiary, was sold to Westech Gold Pty Ltd. (“Westech”) on March 27, 2007 which transferred the assets to Lion One.

During 2008, Lion One conducted exploration on a number of highly prospective mineralized zones which had been discovered in 2002-2003 and re-established in 2008. Work included mapping and geochemical sampling and the drilling of two diamond drill holes. A number of new mineralized structures were also discovered. A total of 826 samples were collected for geochemical analysis. The two surface diamond drill holes were drilled to test the Nubunidike / Hornet Creek / 290 Vein system with inconclusive results.

The Tuvatu Project was visited by Mr. F. H. Brown M.Sc. (Eng.), CPG, Pr.Sci.Nat. of P&E in July 2010, Mr. Brown selected drill core from a constrained sample database for data verification purposes.

The P&E 2010 Resource Estimate has an effective date of August 1, 2010.



Gold assay and data entry were checked and the use of the historic data was validated. A NI 43-101 compliant resource estimate using these data and a 2.0 g/t Au cut-off established Indicated and Inferred Resources as follows:

**Mineral Resource estimate at a 2.0 g/t Au cutoff<sup>1,2</sup> as of August 1, 2010**

	Indicated			Inferred		
	Tonnes x 1000	Grade g/t	Au ozs x 1000	Tonnes x 1000	Grade g/t	Au ozs x 1000
Sulphides	760	7.05	172	2,502	5.78	465
Oxides	0	0	0	116	4.15	15
<b>TOTAL</b>	<b>760</b>	<b>7.05</b>	<b>172</b>	<b>2,618</b>	<b>5.71</b>	<b>480</b>

(1) Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.

(2) The quantity and grade of reported inferred resources in this estimation are conceptual in nature. There is no guarantee that all or any part of the Mineral Resource will be converted into Mineral Reserve.

P&E have not established a mineral reserve estimate for the Tuvatu deposit. The mineral reserve estimate used by Emperor for their in-house 2000 feasibility study is historical in nature and should not be relied upon. P&E have not verified or approved the reserve estimate. It should be further noted that the historical resource estimate used by Emperor as the basis of the pre-feasibility study has been superseded by the NI 43-101 compliant resource estimate that is the subject of this report. A revision of the historic Emperor in-house feasibility study based on the current P&E 2010 mineral resource estimate is recommended.

Recommendations have been made to both increase the confidence levels (and hence resource categories) and for the targeting of areas of possible extension of the mineralized system beyond the current resources. The prospects that surround the Tuvatu deposit contain numerous mineralized veins and are considered especially permissive for potentially hosting epithermal style mineralization. Further detailed exploration is warranted and strongly recommended. Further recommendations include:

- The resource models suggest that gold mineralization occurs as plunging structures in the plane of the lodes; therefore these structures are likely relatively continuous and should support selective mining. P&E recommends that a program of confirmation drilling be conducted to verify the location and extent (especially at depth) of these structures.
- Additional underground drilling should be initiated once the existing decline is re-commissioned, in order to upgrade large sections of Inferred resources to the Indicated level of confidence.
- P&E noted high levels of silver in core sections selected as confirmatory check samples, and recommends that a larger number of core samples be assayed to confirm the silver content.
- The geometry of mineralization will require grade control spacing of at least 10 m intercepts within the plane of the lodes in order to facilitate selective mining. There is little current evidence that significant mineralization occurs outside of the quartz veins, though this should be demonstrated conclusively by confirmatory drilling.

- The Nubunidike, Ura Creek, Korobebe, and Sawasawa East Prospects have been investigated by recent exploration activity but remain underexplored. Systematic follow-up exploration activity is recommended
- P&E is of the opinion that recent and historical exploration has demonstrated that the mineralized system within SPL1283 and SPL1296 is an extension of the main Tuvatu epithermal system and as such is prospective for the discovery of additional gold lodes of a similar nature to that at the current Tuvatu Mine development. It is recommended that an aggressive exploration be undertaken.

Based on the conclusions reached by P&E a multi-phased, results driven work program is recommended to move the project forward to possible production. The Phase I work program will commence in early 2011 and together with the Phase II program will possibly be extended over three calendar years and involve the following work items

### **Phase I Program**

The Phase I exploration program will involve initiation of de-watering activities for the Tuvatu decline in advance of a detailed Scoping Study. The Scoping Study will consist of a resource drilling program, environmental and social baseline studies, initial mine design and mine development studies, a trial stoping program, a geotechnical engineering program, preliminary mine facility and infrastructure layout designs, initial metallurgical and processing test work, tailings storage facility engineering, materials handling assessment, power and utilities study, equipment selection and approvals and license procurement activities.

If results of the scoping study warrant, underground pre-development work, of the Tuvatu resource area will be initiated: Work will consist of underground rehabilitation activities including scaling and rock bolting, mapping of underground workings, resource drilling, additional underground development, trial stoping, and geotechnical assessment.

If results of the scoping study are positive it is recommended that consideration be given to conducting a full feasibility study.

A proposed budget of US\$ 5,145,000 is required to complete this Phase I work program as continuing results dictate.

### **Phase II Program**

This phase of work will consist of surface exploration activities covering the entire concession area. In detail this will include reconnaissance mapping, prospecting, sampling, heavy mineral geochemical surveying, high energy stream sediment survey and geophysical surveying and modelling. As results warrant the exploration work will be extended to the remaining Tuvatu concessions where reconnaissance mapping, prospecting, sampling, heavy mineral geochemical surveying, high energy stream sediment survey and geophysical surveying and modelling. This will be followed by a continuing program of advanced surface exploration work covering the entire concession area. Surface diamond drilling, trenching and sampling, reconnaissance mapping, prospecting, heavy mineral geochemical surveying, high energy stream sediment survey and geophysical surveying and modelling will be conducted

A proposed budget of US\$ 1,165,000 is estimated as needed to complete this Phase II work program..

## **1.0 INTRODUCTION**

### **1.1 TERMS OF REFERENCE**

The following report was prepared to provide a National Instrument 43-101 (“NI 43-101”) compliant Technical Report and independent Resource Estimate of the gold-telluride mineralization contained in the Tuvatu Deposit located near Nadi on the island of Viti Levu, Fiji (the “Property”). The Tuvatu tenements are held by American Eagle Resources Inc. (“AER”) through its 100 % owned Fijian subsidiary Lion One Resources Inc. (“Lion One”). Lion One holds three special prospecting licences (“SPL”) covering the Tuvatu deposit and surrounding ground.

This report was prepared by P&E Mining Consultants Inc. (“P&E”) at the request of Mr. Walter Berukoff, Chairman of X-Tal. X-Tal is a junior exploration company based in Vancouver, British Columbia, Canada. Its registered corporate office is located in British Columbia at:

311 West 1<sup>st</sup> Street  
North Vancouver, BC, V7M 1B3  
Tel: 604-998-1250  
Fax: 604-998-1253

This report has an effective date of October 1, 2010.

Mr. Fred H. Brown, MSc. (Eng), CPG, Pr.Sci.Nat., a qualified person under the regulations of NI 43-101, conducted a site visit to the Property during the period 9-14 July 2010. An independent verification sampling program was conducted by Mr. Brown at that time.

In addition to the site visit, P&E carried out a study of all relevant parts of the available literature and documented results concerning the Property and held discussions with technical personnel from the Company regarding all pertinent aspects of the project. The reader is referred to those data sources, which are outlined in the References section of this report, for further detail.

The present Technical Report is prepared in accordance with the requirements of NI 43-101 and form NI 43-101F1 of the Ontario Securities Commission (“OSC”) and the Canadian Securities Administrators (“CSA”). The mineral resources in the estimate are considered compliant with the Canadian Institute of Mining, Metallurgy and Petroleum (“CIM”) Standards on Mineral Resources and Reserves, Definitions and Guidelines prepared by the CIM Standing Committee on Reserve Definitions and adopted by CIM Council December 11, 2005.

The purpose of the current report is to provide an independent, NI 43-101 compliant, Technical Report and Resource Estimate on the Tuvatu gold-telluride deposit Fiji. P&E understands that this report will be used in support of a listing application on the TSX Venture Exchange (“TSXV”) and that X-Tal intends that this report satisfy Part 4 Section 4.2 (1) j (1) of Canada’s NI 43-101 Standards of Disclosure for Mineral Projects as this will be first major report on this Property. The report may also be used to support public equity financings.

## 1.2 SOURCES OF INFORMATION

This report is based, in part, on internal company technical reports, and maps, published government reports, company letters and memoranda, and public information as listed in the References section 20.0 at the conclusion of this report. Several sections from reports authored by other consultants have been directly quoted or summarized in this report, and are so indicated where appropriate.

It should be noted that the author has drawn heavily upon selected portions or excerpts from material contained in a draft version of a unpublished NI 43-101 compliant report prepared in 2009 by Andrew Vigar, FAusIMM of Mining Associates Pty Ltd (“MA”). This report contains a comprehensive overview of the Tuvatu Property and much of the material in the current document has drawn heavily upon the Vigar (2009) report:

Vigar, A.J., 2009 titled “A Technical Review of Exploration and Resource Estimates of the Tuvatu Gold Deposit Viti Levu, Republic of Fiji”. Prepared by Mining Associates Pty Ltd. for American Eagle Resources Inc. and dated February, 2009.

A similar draft report by Lutherborrow, C.H., 2010 titled “Independent Technical Report – the Tuvatu Gold Deposit” prepared by Zilloc Pty Ltd., and dated January 20, 2010 was also drawn upon during the preparation of the current report. Like the report by Vigar (2009) this document is an in-house draft version of an unpublished report prepared for American Eagle Resources Inc.

## 1.3 UNITS AND CURRENCY

Unless otherwise stated all units used in this report are metric. Gold assay values are reported in grams per tonne (“g Au/t”) and copper assay values are reported in percent (“%”), unless some other unit is specifically stated. The US\$ is used throughout this report unless otherwise specifically stated.

## 1.4 GLOSSARY AND ABBREVIATION OF TERMS

In this document, in addition to the definitions contained heretofore and hereinafter, unless the context otherwise requires, the following terms have the meanings set forth below.

“\$” and “US\$”	means the currency of the United States.
“A\$”	means the currency of Australia.
“AAS”	means Atomic Absorption Spectroscopy.
“AER”	means American Eagle Resources Inc.
“AA”	is an acronym for Atomic Absorption, a technique used to measure metal content subsequent to fire assay.
“asl”	means above sea level.
“Au”	means gold.
“CIM”	means the Canadian Institute of Mining, Metallurgy and Petroleum.
“cm”	means centimetres.
“CSA”	means the Canadian Securities Administrators.
“DCP”	means an acronym for Direct Coupled Plasma, a technique used to measure metal content subsequent to fire assay.
“E”	means east.
“el”	means elevation level.

“F\$	means Fijian dollar.
“Ga	means gigayears, a unit of a billion years.
“g/t Au”	means grams of gold per tonne
“g Au/t”	means grams of gold per tonne.
“ha”	means Hectare.
“km”	means kilometre.
“LAWG”	means the Landowners Affairs Working Group established by TGM
“Lion One”	means Lion One Resources Inc. a 100% owned Fijian subsidiary of AER
“LOU”	means Land Owning Unit as it is applied to native rights.
“m”	means metre.
“M”	means million.
“MA”	means Mining Associates Pty Ltd an Australian mining consulting Company.
“Ma”	means millions of years.
“MIGA”	means Multilateral Investment Guarantee Agency.
“mm”	means millimetres.
”MRD”	means the Mineral Resources Department of the Fijian government.
“Mt”	means millions of tonnes.
“N”	means north.
“NE”	means northeast.
“NI”	means National Instrument.
“NLTB”	means Native Land Trust Board.
“NTS”	means National Topographic System.
“NW”	means northwest.
“NSR”	means an acronym for net smelter return, which is the amount actually paid to the mine or mill owner from the sale of ore, minerals and other materials or concentrates mined and removed from mineral properties, after deducting certain expenditures as defined in the underlying smelting agreements.
“oz/T”	means ounces per short ton.
“P&E”	means P&E Mining Consultants Inc.
“Property”	means the Tuvatu Gold-Telluride Deposit.
“ppm”	means parts per million.
“S”	means south.
“SE”	means southeast.
“SEDAR”	means the System for Electronic Document Analysis and Retrieval.
“SPL”	means the Special Prospecting Licences issued by the government of Fiji.
“SW”	means southwest.
“t”	means tonnes (metric measurement).
“t/a”	means tonnes per year.
“TGM”	means Tuvatu Gold Mining Company a subsidiary of Lion One.
“TN”	means True North
“tpd”	means tonnes per day.
“TSXV”	means the TSX Venture Exchange.
“US\$”	means the currency of the United States.
“UTM”	means Universal Transverse Mercator.
“VGM”	means Vatukoula Gold Mines plc
“W”	means west.

## **2.0 RELIANCE ON OTHER EXPERTS**

P&E has assumed, and relied on the fact, that all the information and existing technical documents listed in the References section of this report are accurate and complete in all material aspects. While we carefully reviewed all the available information presented to us, we cannot guarantee its accuracy and completeness. We reserve the right, but will not be obligated to revise our report and conclusions if additional information becomes known to us subsequent to the date of this report.

In general, copies of the tenure documents, operating licenses, permits, and work contracts were not reviewed and an independent verification of land title and tenure was not performed. P&E has not verified the legality of any underlying agreement(s) that may exist concerning the licenses or other agreement(s) between third parties but has relied on, and believes it has a reasonable basis to rely upon, Mr. Kafoa Muaror principal of Muaror & Co, Suva, Fiji, the legal counsel for X-Tal in Fiji, to have conducted the proper legal due diligence. In this regard, P&E has received a copy of the legal title opinion letter from the law firm confirming Lion One's ownership of the relevant SPLs.

Regarding matters of permitting and related local environmental issues, P&E has relied upon and believes it has a reasonable basis to rely upon, Mr. George Niumataiwalu, Consultant to Lion One in Fiji.

Land tenure and other select technical data as noted in the report were provided by AER and P&E has relied on the integrity of such data.

A draft copy of the report has been reviewed for factual errors by the client and P&E has relied on X-Tal's and AER's knowledge of the Property in this regard. All statements and opinions expressed in this document are given in good faith and in the belief that such statements and opinions are not false and misleading at the date of this report.

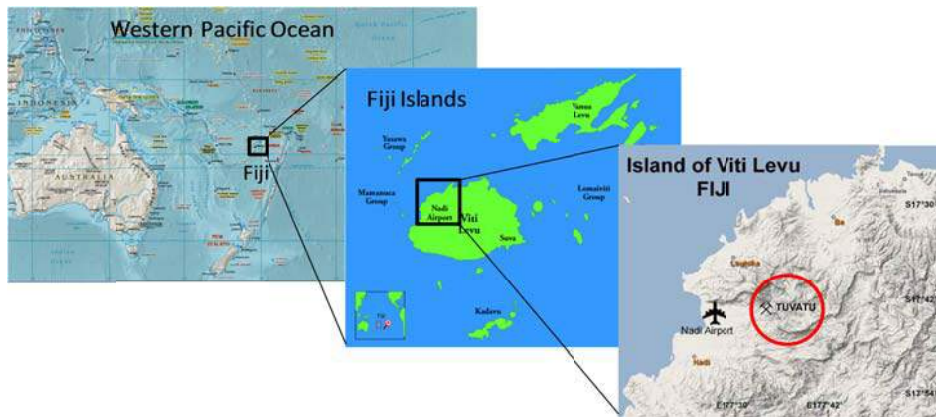
### 3.0. PROPERTY DESCRIPTION AND LOCATION

The following section has drawn heavily upon material contained within the report by Vigar (2009)

#### 3.1 TUVATU PROPERTY LOCATION

Tuvatu is located within the South Pacific Ocean on the island of Viti Levu, one of some 320 islands comprising the Fiji archipelago (Figure 3-1). The geographic centre of the Tuvatu property is approximately situated at 17° 42'49" S Latitude and 177°34'39" E Longitude.

**Figure 3-1: Global Location of the Tuvatu Property**



Locally, the Tuvatu Property is situated in the upper reaches of Sabeto Valley approximately 24 km northeast of Nadi on the west coast of Viti Levu, and 15 km from the Nadi International Airport (Figure 3-2).

#### 3.2 PROPERTY DESCRIPTION AND TENURE

The Tuvatu Gold Property comprises three contiguous SPLs totalling 10,565 ha, held 100 % by TGM (Table 3.1 and Figure 3-2 and Figure 3-3).

A schedule of tenements has been provided by Lion One Limited. The tenements' status has not been independently verified by P&E, apart from obtaining copies of the recently approved 3 year extensions of the SPLs received by X-Tal from the Fiji Director of Mines who is the legal administer of mining titles.

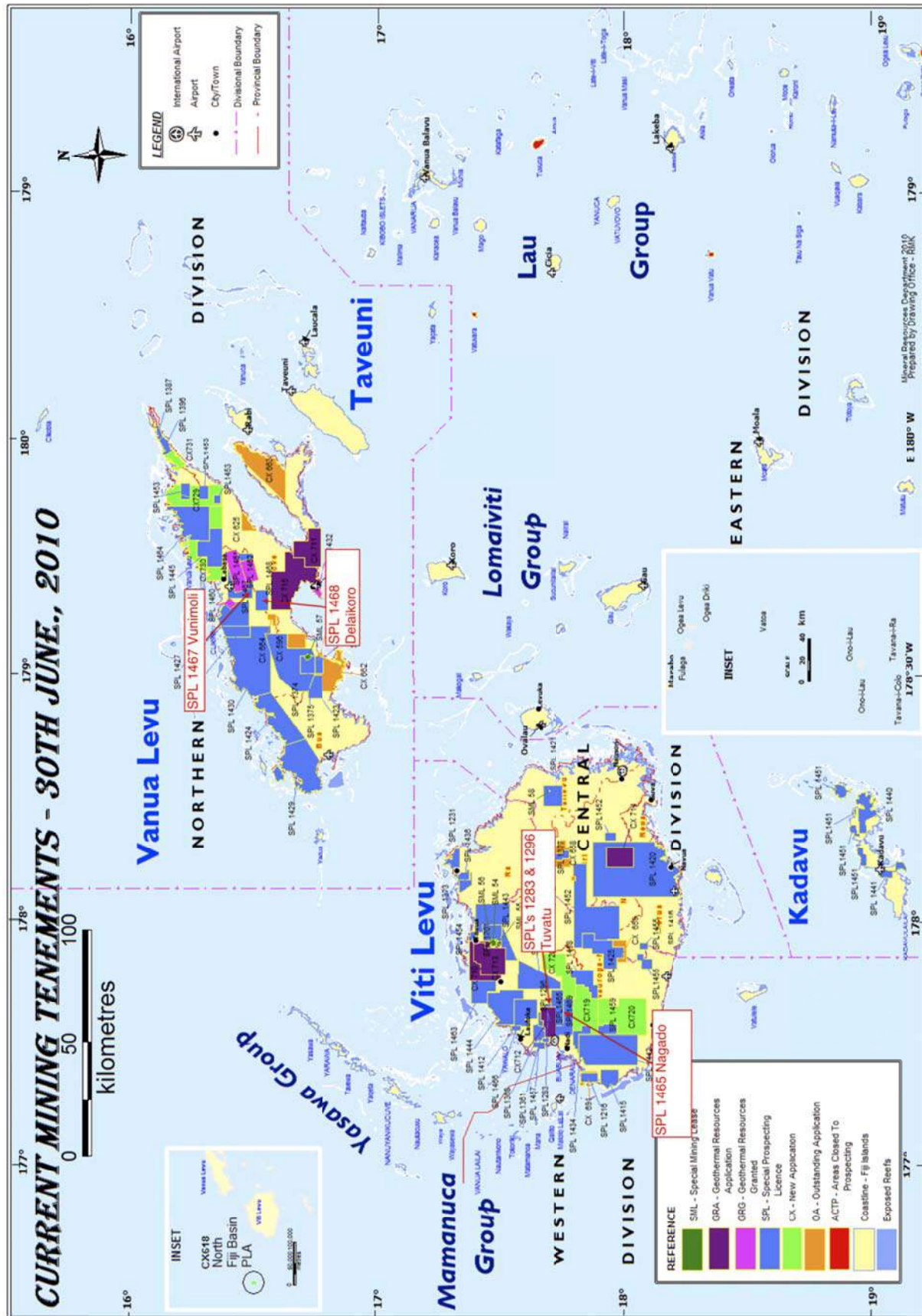
The tenement boundaries of the SPLs are not surveyed in the field; rather the geographic coordinates of the boundaries are described on the tenement maps as specified by MRD when the licenses were granted. There are surveyed trig stations throughout the island from which the tenement boundaries are measured using the bearings and distances as specified in the title documents.



**Table 3.1: Tuvatu Tenement details**

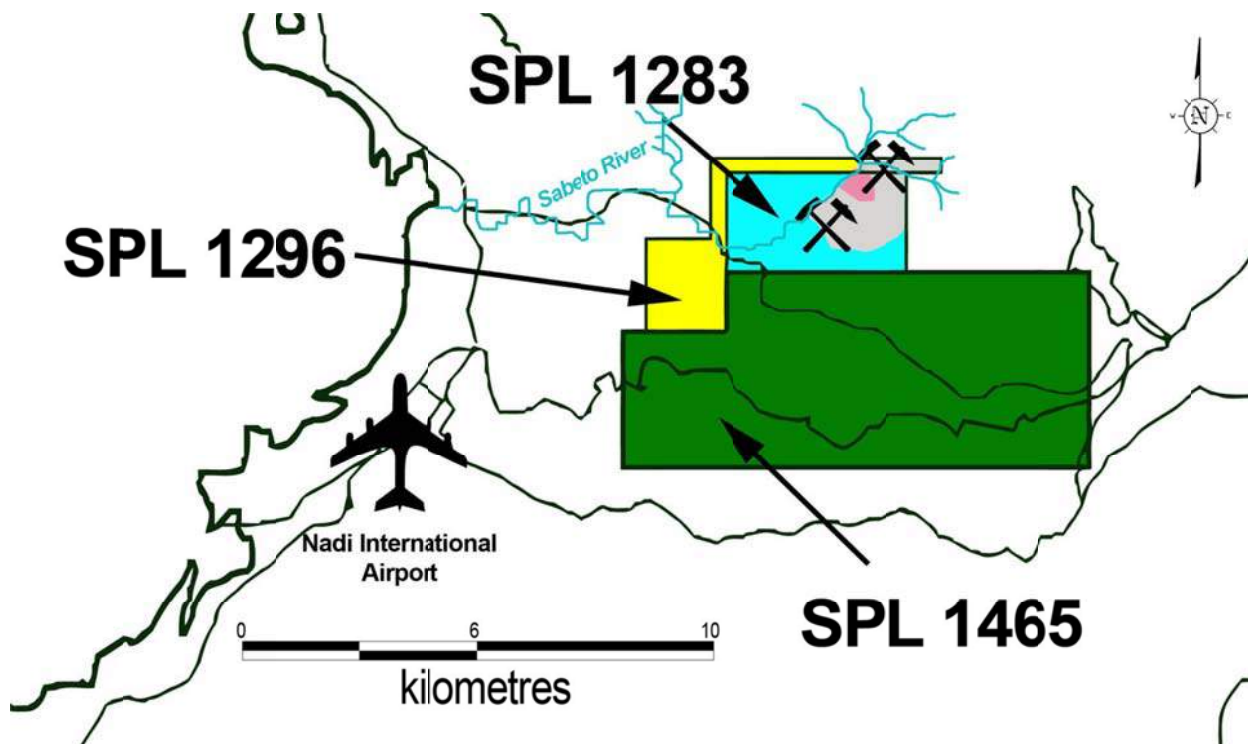
<b>SPL Number</b>	<b>Area hectares</b>	<b>Annual Expenditure Required</b>	<b>Date of Grant</b>	<b>Term</b>	<b>Interest</b>
SPL1283 Tuvatu	1,951	FJD\$700,000	Oct. 14, 2010	July 1, 2010 to June 30, 2013	100%
SPL1296 Tuvatu	1,315	FJD\$700,000	Oct. 14, 2010	July 1, 2010 to June 30, 2013	100%
SPL 1465 Nagado	8,900	FJD\$600,000	Oct. 14, 2010	July 1, 2010 to June 30, 2013	100%
<b>TOTAL</b>	<b>12,166</b>	<b>FJD\$2,000,000</b>			

Figure 3-2: Current Mining Tenements



As shown in Figure 3-3 the Tuvatu tenements are contiguous. The Tuvatu Mine is located within tenement SPL1283.

**Figure 3-3: Tenement Location Map Tuvatu Property as of June 2010**



(Sourced from AER 2010 Powerpoint Presentation)

### 3.2.1 OWNERSHIP

The Vatukoula Mine (and surrounding mineral tenements including the Tuvatu Property) was an early discovery made by prospector Bill Borthwick on Lololevu Creek on the Island of Viti Levu in 1932. Three companies operating separately controlled early production following a small initial gold rush. Although discovered in 1932 and subsequently mined by 3 separate companies it was not until 1958 that Emperor Gold Mines (“**Emperor**”) became sole operator of the Vatukoula Mine and held an exclusive interest in the surrounding mineral deposits including the Tuvatu Property.

The mine was closed by Emperor Gold Mines in 1983. From 1983 until 1991, the Vatukoula Mine was operated through a joint venture comprised of Emperor (80%) and Western Mining Corporation (Fiji) (20%). Emperor once again assumed full ownership of the Vatukoula Mine (and surrounding mineral tenements including the Tuvatu Property) after 1991 despite control of Emperor passing to Durban Roodeport Deep Ltd. (“**DRD**”). DRD, through Emperor, opted to divest its Fijian assets including the Vatukoula Mine (and surrounding mineral tenements including the Tuvatu Property) prior to selling its major position in Papua New Guinea to Barrick Gold Corporation.

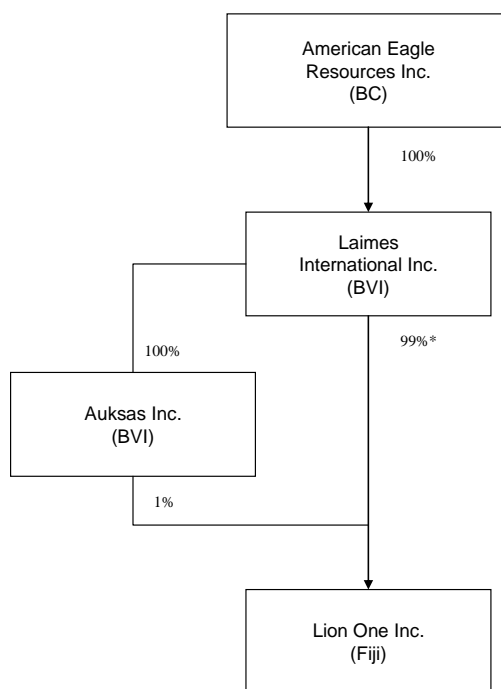
On March 27, 2007, DRD sold all of its Fiji assets, including the Vatukoula Mine (and surrounding mineral tenements including the Tuvatu Property), to Westech Gold Pty Ltd. (“**Westech**”) of Australia. The Tuvatu Property was held by a subsidiary of DRD, the Tuvatu Gold Mine Company (“**TGM**”). Westech, unable to finance the venture on its own, sought the

assistance of Red Lion Management Ltd. (“**Red Lion**”). Red Lion financed and obtained key concessions to the Vatukoula Mine, which included, amongst other interests, the Tuvatu Property, through Viso Gero Global Inc. (“**Viso Gero**”).

The Vatukoula Mine was subsequently apportioned and sold by Red Lion to AIM-listed British company River Diamonds PLC (later renamed Vatukoula Gold Mines “VGM”), which by April 2008 controlled 100% of the mine. Red Lion and Westech retained the Tuvatu Property for nominal consideration and had the licenses to the Tuvatu Property re-issued by the Republic of Fiji in the name of Lion One.

On September 18, 2008, American Eagle entered into a share purchase agreement with Laimes Global Inc., Brian Wesson and Amelia Wesson (the “**Vendors**”) whereby the Vendors agreed to sell to American Eagle all of the shares of LII in exchange for 7,300,000 American Eagle Shares at a deemed price of \$4.43 per American Eagle Share and the assumption of the debt of LII of \$769,605.50 owed to Viso Gero. This share purchase was a non-arm’s length transaction.

The flow chart below shows the corporate ownership structure as of the effective of this report..



### 3.3 X-TAL - AER AGREEMENT

**X-Tal Minerals Corp.**, (the “**Company**” or “**X-Tal**”) and AER entered into a definitive Merger Agreement (the “**Agreement**”) dated November 1, 2010 to complete a business combination (the “**Transaction**”) in which the Company will acquire all of the outstanding shares of AER. The combined entity will focus on generating shareholder value through the exploration and development of its mineral projects in Fiji. (X-Tal News Release Nov 2, 2010)

Pursuant to the terms of the Agreement, all of the common shares of AER shall become exchangeable for common shares of the Company on a basis of one (1) common share of AER for one (1) common share of X-Tal. AER and X-Tal currently have 21,108,543 and 6,300,001 common shares outstanding, respectively. The Company will also complete a name change to Lion One Metals Limited and plans to graduate from the NEX to the TSX Venture Exchange (“**TSXV**”).

In conjunction with the Transaction, the Company will carry out a concurrent private placement (the “**Financing**”) of up to \$10,000,000. The Company has agreed to pay cash commissions of up to 6% of the gross proceeds raised, and issue agent’s warrants of up to 6% of the number of shares sold. In addition, the Agent has the option (the “Agents’ Option”) to sell up to that number of additional Units which is equal to 15% of the number of Units sold pursuant to the Offering at a price equal to the Issue Price. The Agents’ Option may be exercised at any time within 30 days after the closing date of the Offering.

The Transaction is subject to shareholder approval, and will be voted upon at the Annual Meeting of the Company on December 21, 2010. The Agreement will result in a reverse takeover of the Company subject to shareholder and regulatory approval, including approval of the TSXV. The Transaction is also subject to the approval of the AME shareholders.

### **3.4 ROYALTIES, PERMITS AND OBLIGATIONS**

In the Republic of Fiji, a royalty is payable to the state government when a mineral is sold, disposed of or used. The Fiji *Mineral Resources Act 1989* requires that the holder of a mining lease or mining claim lodge a royalty return and any royalty is payable at least annually for all leases and claims held, even if no production took place but saleable metal was won. The Minister allows samples with small quantities of gold to be sent for analysis, however, under the law in Fiji, trail mining and bulk sampling can be carried out and any significant gold won as determined by the Minister will be subject to royalties. Royalties for the Tuvatu Property will be 5% of the value of precious metal exported. This royalty is then split with parts compensating the community and other stakeholders. There are no other royalties applicable to the Tuvatu Property.

#### **Security of Title**

The Government acknowledges that security of land tenure is a critical issue for mineral sector investors. Hence Government is totally committed to enforcing investors land rights which are enshrined in both the 1990 Constitution and the Land Transfer Act (Cap. 131). The Land Lease itself is a legally binding document that guarantees security of land tenure.

#### **Reporting Requirments**

All Prospecting Licences, Permits to Mine, and Mining Leases are subject to established reporting requirements. Information and data regarding areas currently under licence are confidential to the MRD, although once prospecting or mining rights have been abandoned or relinquished; these data become the property of Government and become publicly available through MRD. The reporting procedure is straight and not considered onerous.

#### **Native Title, Land Rights and Compensation Agreements**

In terms of native land rights, four Vanua’s cover the area of Tuvatu. There are also native Fijian leaseholders in the project area who must be consulted regarding any acquisition plans. Compensation agreements must be finalized with these leaseholders to gain access to both surface and underground areas of their leases.

Compensation agreements which have been drawn up and signed by local landowners by Lion One under the previous company ownership need to be replaced with new agreements. Since the

time of the earlier agreements were completed, the Mineral Resources Department and the Ministry of Lands have drafted a new Compensation Policy. The agreements are yet to be signed by the local landowners.

In mid-1997, TGM established the Landowners Affairs Working Group (“LAWG”) to liaise and coordinate all work necessary to acquire land required for the project. The role of LAWG was to advise TGM on land matters, land acquisition and all the related issues. The LAWG is still active in these matters. Since the current agreement procedure involves the re-signing of existing agreements to bring them into conformity with the new regulations no significant issues are expected.

### **3.5 PERMITS AND ENVIRONMENTAL ISSUES.**

#### **General Exploration**

At present the Tuvatu property is held under an SPL that allows for continuing exploration of the area. In October, 2010 a three year extension was granted by the Director of Mines for Fiji. As far as is known to P&E the license is in good standing and general exploration activities (drilling, trenching, prospecting, technical surveys etc.) require no further permitting.

#### **Underground Dewatering**

Dewatering of the underground mine decline, as planned for in the recommended Phase I work programs will require:

- Completing Initial Baseline Studies
- Submission of an Environmental Management Plan (EMP) to the Department of the Environment
- Submission of a Dewatering plan to the Mines Department.

X-Tal reports that they are in the process of conducting baseline studies and obtaining the required permits to de-water the decline. The Company does not anticipate any problems or delays in obtaining these documents. It is estimated that acquisition of the required permit will take less than a month including acquiring the base line data.

#### **Mining Stage Permits**

The next stage in the progression from advanced exploration to the conductance of mining activities requires the issuance of a (Special) Mining Lease (“SML”) as prescribed under the Mining Act, and in conformance with the various special terms and conditions agreed upon between the Director of Mines and the Licence holder. The issuance of the Lease is subject to two conditions.

1. The submission of a comprehensive Feasibility Study which demonstrates the commercial viability of the project. The Feasibility Study will be accompanied by a detailed Financing Plan for the development and by an approved Environmental Impact Assessment document, detailing an acceptable environmental impact assessment process.
2. The submission of a Development Agreement outlining the broad principles, responsibilities, and obligations of all parties to the development. This Agreement would normally be prepared through consultation with the Licence holder, the Fiji Government, and representatives of the people of the development region. In general, new mining

projects are handled as Executive Agreements between Government and the Licence holder.

The Company, in anticipation of the eventual progression to mining activity, anticipates an early start to the planning process in order to allow for the orderly acquisition of a SML

### 3.6 2009-10 EXPLORATION EXPENDITURES ON TUVATU PROJECT.

The following Table 3-2 summarizes the exploration expenditures incurred by Lion One in Fiscal years 2009-2010. These expenditures cover the time period from July 1, 2008 to June 30, 2010. American Eagle entered into the agreement to acquire the Tuvatu property on September 18, 2008 from Laimes International, a related party and incurred costs from the point forward.

**Table 3-2: Direct Exploration Expenditures on Tuvatu Project Fiscal Years 2009-2010**

TABLE 3-2: TUVATU - DIRECT EXPLORATION EXPENDITURES FOR FISCAL 2009 & 2010:

	Fiscal 2010	Fiscal 2009	Total
Drilling	\$ 37,001	\$ 77,558	\$ 114,559
Exploration consulting and engineering	149,617	173,987	323,604
Salaries and benefits	200,240	234,653	434,893
Sample preparation, assaying, analysis	15,325	34,391	49,716
Site development	55,399	65,469	120,868
Site general expenses	31,388	77,087	108,475
Travel	70,284	167,204	237,488
<b>Total</b>	<b>\$ 559,254</b>	<b>\$ 830,349</b>	<b>\$ 1,389,603</b>

Source: Lion One fiscal year-end Financial Statements 2009-2010

## 4.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

### 4.1 ACCESS

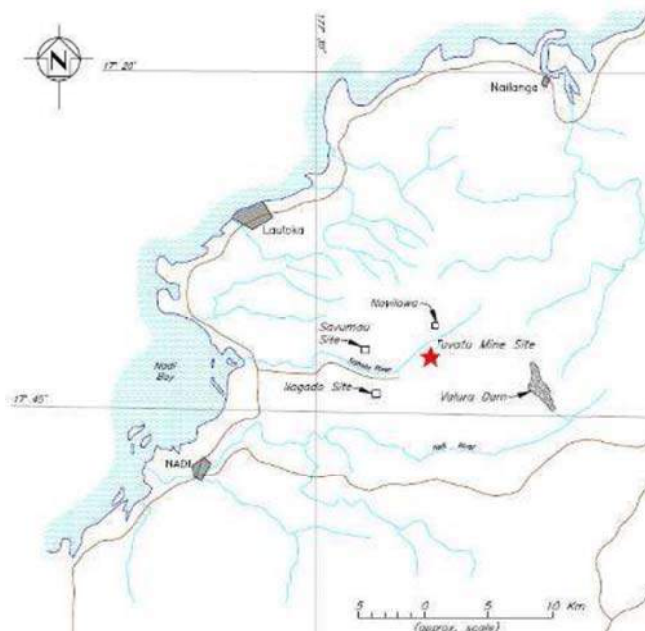
Tuvatu lies on the west coast of Viti Levu, 24 km northeast of the town of Nadi and approximately 15 km by road from the Nadi International Airport. Nadi, the closest city, is serviced by several Australian airlines who offer direct daily jet flights from Brisbane. Tuvatu is readily accessed from Nadi International Airport using the Sabeto Road. A network of local formed roads and pastoral tracks provides good access to most of the Property. During the wet season (November to March) both the major and minor creeks may be impassable for some days. The terrain ranges in elevation from 120 m to 660 m.

The Sabeto Road turnoff is found approximately 5-8 minutes north of the Nadi International Airport. The Sabeto Road winds along with the Sabeto River on its eastern side. Further along the Sabeto Road, the road forks, with the left fork going to Korobebe village, and on to Navilawa village. The Tuvatu deposit is located between Murua Creek and Qalibua Creek approximately 400 m southeast of the main road to Navilawa (Figure 4-1).

SPL1283 and SPL1296 cover land areas in the upper catchment of the Sabeto River immediately south of Navilawa village. The tenements are bounded to the southeast by the Namotomoto ridge. Nagado village is located on this ridgeline. The village of Korobebe is located on the banks of the Sabeto River about 4 km southwest of the Tuvatu deposit and further downstream are the villages of Naboutini, Koroyaca and Sabeto. On the opposite side of the river from Sabeto village is Natalau village. Indian cane farmers lease the land around and between all the local Fijian villages.

An in-house preliminary feasibility study by Emperor Gold Mines (2000) identified a potential tailings dam site at Nagado situated 5 km from the potential plant site which would be located on the Tuvatu property.

**Figure 4-1: Local Location Map Showing Access to Tuvatu**



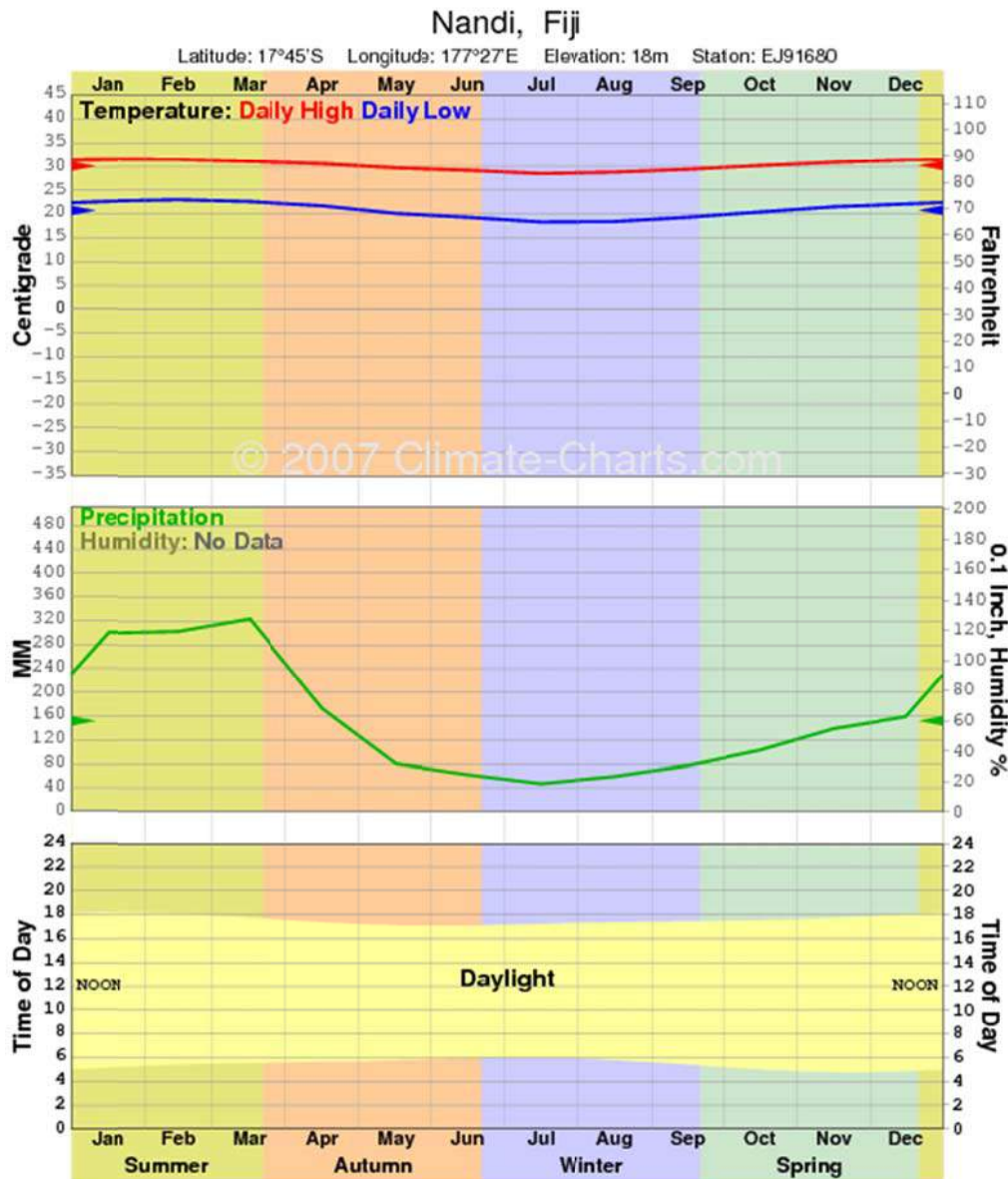


## 4.2 CLIMATE

Viti Levu's climate is dominantly controlled by oceanic temperatures and winds, restricting the diurnal temperature range heavily with an average daily range of 8.5 °C to 10.3 °C. Average minimum temperatures for Nadi range from 18 °C to 23 °C while average maximums range from 28 °C to 32 °C. It can be expected that these are a good guideline for the Tuvatu area, given it's close proximity to Nadi. Mean rainfall in the area varies from 50 mm in July to a high of 300-325 mm during the December to March wet season. These trends are shown below in Figure 4-2.

The islands lie in an area which is occasionally traversed by tropical cyclones, and mostly confined to the period November to April, with greatest frequency around January and February. On average, some ten to twelve cyclones per decade affect some part of Fiji, and two or three causing severe damage. Specific locations may not be directly affected for several years but the dominant north-west tracks give some increased risk of damage in the outlying northwest island groups.

**Figure 4-2: Climate trend Data Nandi, Fiji 2010 (Source: www.climate-charts.com)**



### 4.3 LOCAL RESOURCES

Tuvatu is located within the upper reaches of the Sabeto Valley. The area hosts a number of small villages that are dependent on the local waterways (e.g. Sabeto River) to supply water for local sustainable agricultural practices such as sugar cane, coconut oil and fruits and vegetables.

The major towns in close proximity to the Tuvatu area are Lautoka, Nadi and Ba. Lautoka, Fiji's second-largest city, is located 30 km from Tuvatu. The local economy still relies heavily on the sugar industry and the Lautoka Sugar Mill has been operating there since 1903. Nadi is Fiji's third-largest city and is a tourist and business hub due to the presence of the Nadi International Airport (Table 4.1).

English is the official language, however, Fijian and Hindi are also taught in schools as part of the school curriculum

The major land use in the Tuvatu region is pastoral, with most income generated from sugar cane, copra and rice production. The fishing, manufacturing and tourist industries are also employers in the region. Any skilled workforce for a mining development in the region would be expected to be drawn from the coastal Nadi-Lautoka-Ba region. There are also experienced former mine workers from the Vatukoula Gold Mine.

**Table 4.1: Population Centres (2007)**

Town	Population	Principal Activity
Lautoka	52,220	Agriculture, tourism, fishing
Nadi	42,284	Tourism, manufacturing
Ba	18,526	Agriculture, fishing, mining

### 4.4 INFRASTRUCTURE

Fiji is one of the most developed of the Pacific island economies, though still with a large subsistence sector. Sugar exports, remittances from Fijians working abroad, and a growing tourist industry (with 400,000 to 500,000 tourists annually) are the major sources of foreign exchange. Sugar processing makes up one-third of industrial activity.

Little infrastructure exists within the local area proximal to the Tuvatu Property other than a small exploration facility. Local villages utilise a combination of traditional and modern practices but do not contain any significant infrastructure. The majority of regional infrastructure, such as transport, telecommunication and energy revolve around the nearby cities of Nadi and Lautoka.

Nadi is equipped with modern technology for both its internal and international telecommunications. All major towns have digital telephone exchanges and the islands are linked by cable and satellite to worldwide networks. The Property is covered by GSM mobile-phone reception.

### 4.5 POWER

The Fiji Electricity Authority (“FEA”) holds the monopoly in all facets of the energy sector; generation, transmission and distribution. Hydro and diesel are the two sources of power for the FEA. Its supply capacity currently stands at 50 MW, however rising use of electricity have prompted government to call for submissions from independent power producers.

Electricity is accessible to all areas within the declared boundaries of cities, towns and townships. This accounts for more than 70 % of the population who have electricity supplied to them. Electricity is available to all main centres at 240 V, 50 cycles AC.

The FEA have an 11 kV line at Korobebe village, which could supply 2 MW of power. This line could be upgraded by the Fiji Electricity Authority (Scheme No G79/99) to 33 kV from the Sabeto turnoff to the mine site. The villages around Tuvatu utilise chiefly fuel wood and small diesel generators.

#### **4.6 WATER**

An estimated 70 % of Fiji's population have access to clean piped water looked after by the Government's Public Works Department. There are 32 major regional water supply schemes. Compared to international rates, Fiji's water rates are relatively cheap.

Government funds the development of regional and urban water supplies, and also carries out the construction, operation and maintenance of these schemes through the Water and Sewerage Section of the Public Works Department. In 2005, F\$42.3 million has been set aside for Regional Water Supply projects and Sewerage Schemes including Nadi-Lautoka. In 2001, Government announced measures to provide basic water (plus power and sanitation) to rural areas in the attempt to help eradicate poverty. In 2002, the Government announced major provisions for water related infrastructure such as F\$35.1 million for urban and regional water supplies including F\$17.9 million for Nadi / Lautoka. Another F\$2.5 million was provided in the 2003 budget for other rural water supplies, and F\$16 million for the maintenance and operations of existing water supplies.

#### **4.7 AIR SERVICES**

Nadi International Airport is the main international gateway to Fiji and accommodates almost 1.3 million international passengers annually. It is located about 8 km west of the township of Nadi. The airport hosts modern services and facilities, and services regular air routes to Australia, New Zealand, USA, Canada, Europe, Japan and South Korea. The focus of international air services is Air Pacific with a capacity up to B747. There are several domestic air service in Fiji. Sun Air and Air Fiji are two operators that provide regular scheduled air services while others also provide chartered flights on request.

#### **4.8 SHIPPING**

Since Fiji comprises 300 islands, shipping is a vital means of transport for people living in the outlying areas. Shipping services are provided by the Department of Government Shipping Services and the Fiji islands Maritime and Safety Administration. The Government has implemented many financial schemes to continue to upgrade and expand its regular passenger and freight shipping services to the majority of the islands.

#### **4.9 LAND TRANSPORT**

Fiji has 4780 km of proclaimed roads. The main sections of which are tar sealed link Suva, Nadi and Lautoka, the major cities and town of the main island of Viti Levu. The Suva-Nadi highway is 185 km long. Nadi, can be reached from Suva at the highway speed of 80 km/h in less than 3 hours.

There are regular bus, taxi and motor vehicle rental services available.

The Public Works Department is responsible for administration of roads in Fiji. Since 2002, the Fijian government has invested F\$110 million for the construction and improvement of its road network. The two main islands of Viti Levu and Vanua Levu account for 90 % of the nation's road network, while Viti Levu alone hosts 77 % of the nations paved road length chiefly pivoted around Nadi. The road network is utilised by a range of bus, taxi, motor vehicles, motor cycles and inter-island freight industries.

#### **4.10 PHYSIOGRAPHY**

The upland areas of the Tuvatu property are grassland. Stream valleys and their perimeters are heavily vegetated. Several intermittent and perennial streams are located within the prospecting licenses. Elevation of the Tuvatu property ranges from 50 meters to a maximum of 700 meters. The area is hilly with slopes of 15 % - 30 % being common.

## 5.0 HISTORY AND PREVIOUS EXPLORATION

### 5.1 EXPLORATION HISTORY

Prospecting in the Tuvatu region, in the upper reaches of the Sabeto Valley, was active during the early part of the 20<sup>th</sup> century. Limited pitting and underground work was carried out by PL 689, operated by Baylet and Bryant from 1945 to 1952. Later geological work was undertaken by the Nadele Syndicate which pitted two lodes, drove an adit and conducted trenching work. No records of the syndicate's work have been located. From 1977 to 1979, the area was explored by Aquitane Fiji. In 1987, Geopacific Ltd. ("Geopacific") staked out SPL1283 and SPL1296 in the area and investigated the soil anomaly and discovered the outcrop of what is now called the Tuvatu deposit in the vicinity of the anomaly.

**Table 5.1: Summary of Historical Exploration in the Tuvatu Area<sup>1</sup>**

YEAR	COMPANY	EXPLORATION
1987	Geopacific	Geopacific staked out SPL1238 and SPL1296, discovering the Tuvatu deposit. Geopacific spends approximately A \$1.5 million in exploration through 1997. Geopacific was in association with Noranda Pty. Ltd. for three years.
1992	Geopacific	John Tankard & Associates Pty. Limited Consulting Mining Engineers prepared a two-step mining plan for the steep dipping Tuvatu deposit and draft plans of a slot-cut mine and waste dumps.
1995	Geopacific	Geopacific entered into an option agreement with Emperor.
1996-February 1998	Emperor	Emperor conducted Phase I of an exploration program which included a regional geological mapping program, stream sediment sampling, induced polarization ("IP") and airborne magnetic / radiometrics geophysical surveys and drilling. 193 diamond drill holes ("DDH") totalling 42,782.57 m. 44 reverse circulation ("RC") drill holes totalling 5,225 m. Drilling delineated a mineralized area that extended over 800 m. Emperor completed 572.4 m of underground development. 17 underground DDH totalling 1,107.75 m. Metallurgical test work was conducted at the Vatakoula mine (refer to Section 15).  In 1997 Emperor exercised its option to acquire 100 % of the Tuvatu tenements.
March 1998 – March 1999	Emperor	Emperor carried out Phase II of its exploration program which focused on developing the decline to access the Upper Ridges lodes identified during the Phase 1. 768.5 m of development completed. 26 underground DDH totalling 1,374.2 m. A bulk sample of Upper Ridges mineralization was tested at Vatakoula (Refer to Section 15).  In January of 1999, resource consultants Geoval completed a non NI 43-101 compliant historical resource calculation which outlined 19,000 t of Indicated Resources <sup>1</sup> with a grade of 9.7 g/t Au and 1,161,000 t of Inferred Resources <sup>1</sup> with a grade of 5.5 g/t Au.
April 1999-September 1999		Phase 3 of the project included underground and surface drilling and an upgrade of the historical resource. Detailed re-mapping of the underground work was undertaken to further understand the structural controls on mineralization. 37 RC bore holes were advanced totalling 4,040 m. 69 underground DDH totalling 10,925.8 m. A new mineralized zone was located 500 m west of the Property.  The new historical resource was updated in July, 1999. While still non NI43-101 compliant, the historical resource outlined 19,300 t of Indicated Resources <sup>1</sup> with a grade of 9.7 g/t Au and 964,000 t of Inferred Resource <sup>1</sup> with a grade of 7.8 g/t Au.  In September 1999, a 20 t bulk sample of mineralization taken from the UR1 strike and rise development was sent to Vatakoula for column leach testing (refer to Section 5.2).
2000	Metcon	Work was suspended in late 2000 as a cost-cutting measure due to low gold prices. Metcon Laboratories enlisted to carry out additional metallurgical test work on composite samples from UR1, UR2 and UR5 lodes.
2001-2009	TGM / Lion One (AER)	Regional exploration was carried out by TGM. Work performed included mapping, costeaning, stream sediment and soil sampling. Work identified 10 new prospects areas outside the Tuvatu mine/deposit area: 1) Nubunidike, 2) Ura Creek, 3) Kubu, 4) Jomaki, 5) Qalibua, 6) Malawai 7) Sawasawa East, 8) Tuvatu South, 9) Lukes and 10) Korobebe  Detailed exploration by Emperor conducted on Nubunidike, Ura Creek, Jomaki, Malawai and Kubu. Rock chip sampling was followed up by trenching and channel sampling.  Drilling was done by AER, through its Fijian subsidiary, Lion One.

<sup>1</sup>Note: The Mineral Resource Estimates present in Table 5.1 above are considered historical in nature and as such are based on prior data and reports prepared by previous operators. The work necessary to verify the classification of the mineral resource estimates has not been completed and the resource estimates therefore, cannot be treated as NI 43-101 defined resources verified by a qualified person. The historical estimates should not be relied upon and there can be no assurance that any of the resources, in whole or in part, will ever become economically viable.

## **5.2 HISTORIC GEOPHYSICS**

A number of geophysical surveys were completed by Emperor during their Phase 1 exploration period from 1996-1998. Results from these surveys were used to help guide Emperors exploration efforts geophysical surveys were usually used in combination with stream sediment and follow-up geochemical soil survey anomalies.

### **5.2.1 MAGNETIC AND RADIOMETRIC SURVEYS**

In September 1997, an aeromagnetic survey was flown over the Tuvatu, Vuda and Kingston tenement areas by Emperor. It is reported that preliminary results for this survey delineated several structural and lithological features of interest.

Interpretation of the magnetic imagery provided some useful information regarding lithologies and structure in the regional context. The imagery has mapped out the Sabeto Volcanics (shoshonites) and monzonite intrusives as magnetic highs in the Navilawa and Vuda areas. In contrast the Nadi Sedimentary Group appears as an intense magnetic low in the centre of the image. Contacts between the sediments and younger volcanics / intrusives appear to be commonly faulted.

The Vuda alteration zone occurs as a large, roughly circular magnetic low surrounding a magnetic high. This magnetic high probably represents another monzonite stock at shallow depths. It was noted that the Teitei prospect and abandoned Natalau Mine both occur on the edge of this magnetic high.

Several structural lineaments were also been well delineated by the survey. A series of north-northeast and north-south trending structures were identified passing through the Tuvatu and Kingston prospect areas. Emperor geologists considered that these structures probably correspond to the structures which host the Upper Ridges and Nasivi lodes. In addition a series of east-west, northeast and northwest trending structures were identified. One of these northeast structures appears to separate members of the Nadi Sedimentary Group from members of the Sabeto Volcanics south of the Vuda prospect.

Both the Tuvatu and Kingston prospects occur as magnetic lows within a magnetically high domain related to the Navilawa stock. These areas probably represent zones of alteration where magnetite destruction has taken place. It is also apparent that both prospects occur at the intersection of several magnetic lineaments.

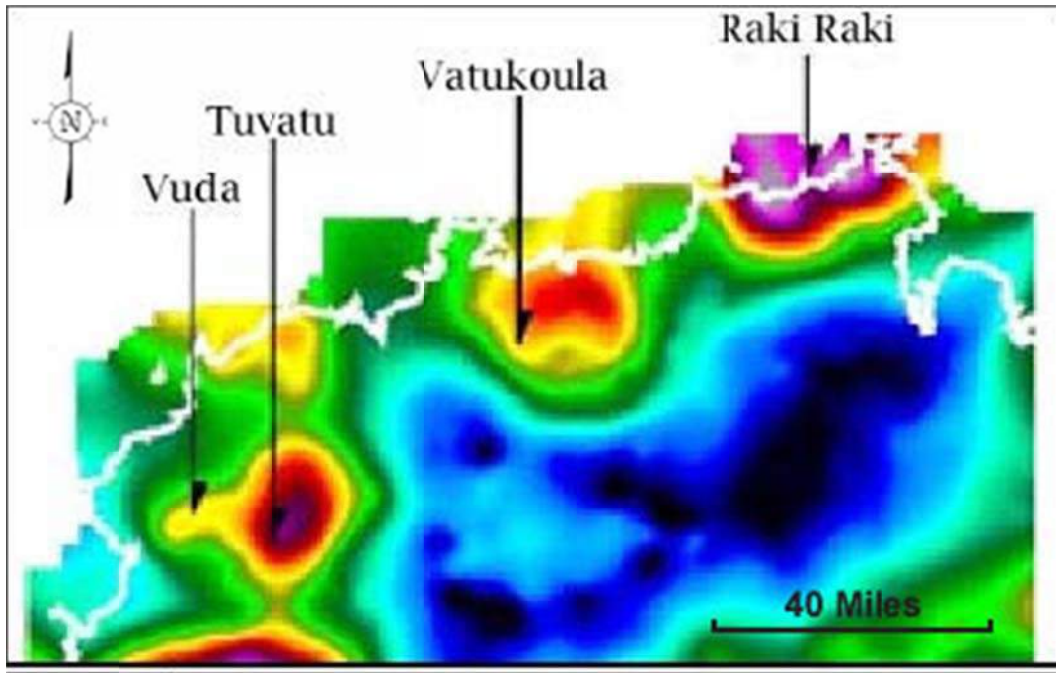
The total count radiometrics imagery reflects the magnetics with a high radiometric response corresponding with members of the Sabeto Volcanics as well as the monzonite intrusives. The strongest response appears to be related to the Navilawa monzonite stock.

A time domain IP / resistivity survey was conducted over the Tuvatu prospect in April, 1996. The IP survey highlighted several strong chargeability and resistivity anomalies within the prospect area which required further drill testing.

## 5.2.2 GRAVITY

This gravity map for Fiji was provided by Metal Mining Agency of Japan and is available from the Fiji MDR website as part of the Australian Agency for International Development (AusAID) Fiji Airborne Geophysical Survey Project. Figure 5-1 represents terrain-corrected Bouguer gravity data processed to suppress long wavelength and shallow sources over Viti Levu. The image illustrates that the isolated gravity highs appear to be indicating the gravity effects of deep, dense, intrusions beneath the epithermal gold deposits.

**Figure 5-1: Intermediate Wavelength Gravity Field**



(Source: MRD 1998)

## 5.3 HISTORICAL IN-HOUSE FEASIBILITY STAGE STUDIES

In 1997 a Preliminary Feasibility report was completed by Australian engineering firm Bateman Kinhill. The Preliminary Feasibility report resulted in a preliminary design, of a treatment facility capable of milling 600,000 to 1,200,000 tonnes per annum of ore.

An In-house Feasibility Study was completed in August of 2000.. A potential tailings dam site was identified in Nagado with a capacity of 10 Mt. An environmental impact assessment was also conducted.

Bateman Engineers Pty. Limited of Queensland, Australia conducted a feasibility study in July of 2000 which examined two options for a Carbon-In-Leach plant instead of a flotation plant incorporating a CIL circuit for the flotation concentrate.

## 5.4 HISTORIC MINERAL RESERVES

P&E have not established a reserve for the Tuvatu mineral resource. Previous work by Emperor (Emperor, 2000) established a historic Probable Reserve of 269,000 ounces Au from 1,262,000 t of ore grading 6.63 g/t Au, based on an Indicated resource of 211,000 ounces Au. A preliminary mine plan was developed by Emperor based upon this resource that would yield some 80,000 ounces of gold per annum at a production rate of 400,000 tpa.

The mineral reserve estimate used by Emperor for their in-house 2000 preliminary feasibility study is historical in nature and *as such are based on prior data and reports prepared by previous operators. The work necessary to verify the classification of the mineral reserve estimate has not been completed and the reserve estimate therefore, cannot be treated as NI 43-101 defined reserve verified by a qualified person. The historical resource/reserve estimate should not be relied upon.*

It should be further noted that the historical resource estimate used by Emperor as the basis of the preliminary feasibility study has been superseded by the NI 43-101 compliant Resource Estimate (P&E, 2010) that is the subject of this report.

## **5.5 HISTORICAL PRODUCTION**

Despite the underground development work conducted by Emperor there has not been any official production from the Tuvatu deposit.



## 6.0 GEOLOGICAL SETTING

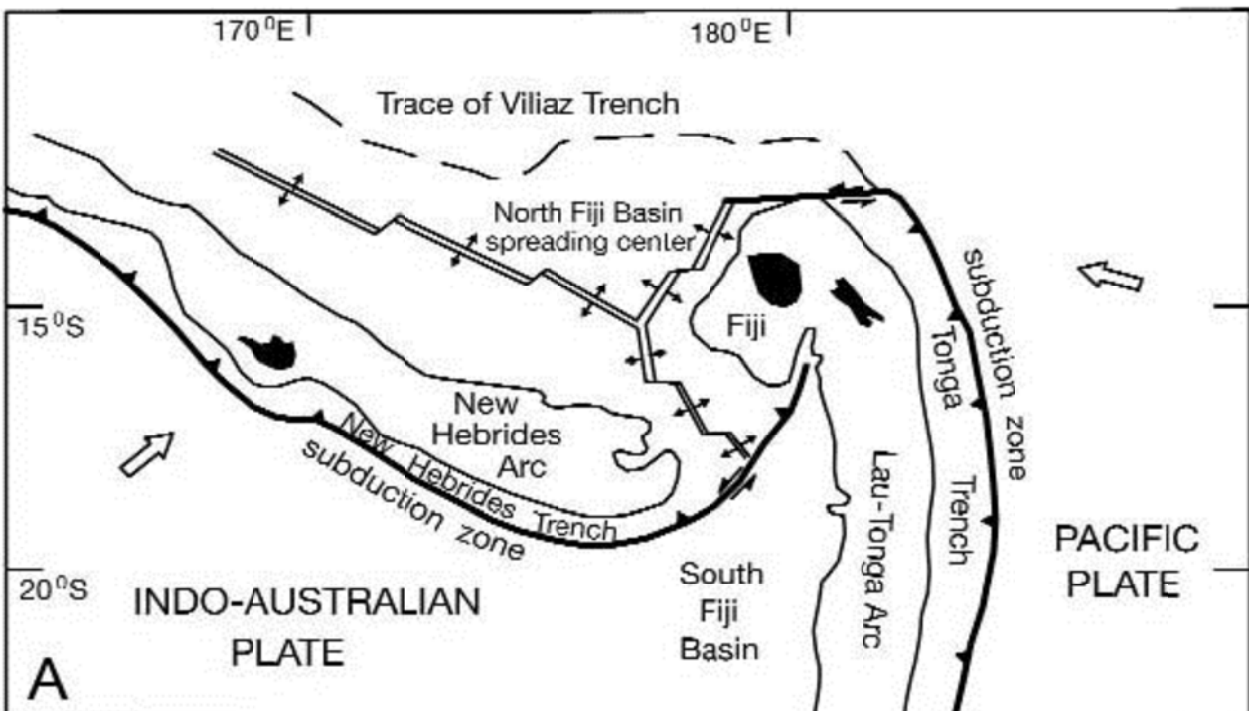
### 6.1 REGIONAL GEOLOGY

#### 6.1.1 TECTONIC SETTING

Fiji is comprised of two large islands, Viti Levu and Vanua Levu, and approximately 300 smaller islands. As described in Scherbarth and Spry (2006), the islands are positioned on a prominent offset of the convergent boundary between the Pacific and Indo-Australian tectonic plates (Figure 6.1). Fiji is presently a remnant oceanic arc that developed during the Tertiary.

During the middle Mesozoic to late Miocene, active subduction of the Pacific plate beneath the Indo-Australian plate occurred along the Viliatrench (Fig. 6-1). Collisions of the Ontong-Java Plateau into the Solomon Islands and the Melanesian Border Plateau into the eastern portion of the Viliatrench stopped subduction along the Viliatrench and led to a reversal of arc polarity north of Fiji along the Vanuatu segment of the arc possibly as early as 8 Ma (Hamburger and Isacks, 1988; Gill and Whelan, 1989; Begg and Gray, 2002). A new trench, the Vanuatu trench, was established on the western side of the Vanuatu arc, making the Viliatrench an inactive, relict trench. Between 5.5 and 8 Ma, an arc north of Fiji fragmented to form a transverse rift. Sometime later, the Fiji platform, comprising the present-day Fiji Islands, underwent counter-clockwise rotation. (Scherbarth and Spry, 2006).

**Figure 6-1: Tectonic Setting of the Southwest Pacific Region at 5.5 Ma**



(Modified after Scherbarth and Spry 2006, Hathaway, 1993)

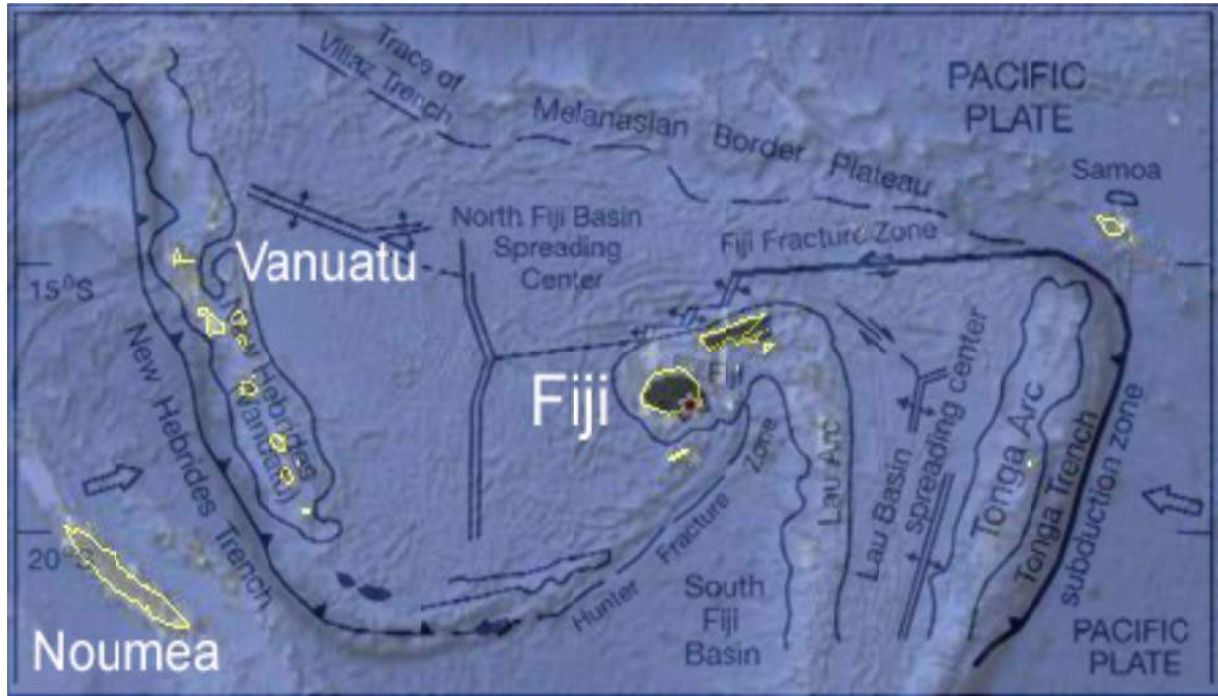
The east-northeast-trending Fiji fracture zone and the northeast-trending Hunter fracture zone are active, major left-lateral transform zones (Figure 6.2). The Fiji fracture zone defines the northern boundary of the Fiji platform and the southern boundary of the Pacific plate. The Hunter fracture zone is a fossil subduction zone where the South Fiji basin crust was formerly subducted beneath Fiji. Fracture zones, sub parallel to the Fiji fracture zone, are the Viti Levu

lineament, which runs along the northernmost portion of Viti Levu, and the Vatulele-Beqa lineament, which occurs along the edge of the Fiji platform just south of Viti Levu. These fracture zones have controlled the distribution of late Miocene to early Pliocene volcanic centers on the Fiji platform.

Fracture zones sub parallel to the Fiji fracture zone include the Viti Levu lineament, which runs along the northernmost portion of Viti Levu, and the Vatulele-Beqa lineament, which occurs along the edge of the Fiji platform just south of Viti Levu. These fracture zones have controlled the distribution of late Miocene to early Pliocene volcanic centers and related intrusions (Gill and Whelan, 1989). Gold mineralization on Fiji is commonly associated with this period of magmatism (Setterfield *et al.*, 1991).

Tuvatu is one of several epithermal gold systems along the > 250 km northeast trending Viti Levu lineament, which are genetically associated with alkalic magmatism. A number of gold deposits have been discovered along this trend including Tuvatu, Vatukoula and Raki Raki. Vatukoula has produced some 7 million ounces since 1937.

**Figure 6-2: Present Tectonic Setting of the Southwest Pacific Region**



(modified after Scherbarth and Spry, 2006)

### 6.1.2 REGIONAL STRATIGRAPHY

The regional stratigraphy of the Fiji is shown in Figure 6-3 and briefly discussed below.

The oldest rocks in Fiji belong to the Upper Eocene to Lower Oligocene (35–40 Ma) Yavanu Group, which are composed of extrusive and intrusive tholeiitic rocks, a trondjhemitic stock, a tonalite (Yavuna) stock, and minor volcanoclastic rocks and limestone.

Tholeiitic rocks of the younger Upper Oligocene to Middle Miocene (32-13 Ma) Wainimala Group overlie units of the Yavanu Group. During the middle to late Miocene (7–12.5 Ma), the Colo Orogeny created large-scale faulting and folding of the Wainimala Group along with the

emplacement of a plutonic suite of gabbro and minor tonalite intrusions (Begg, 1996; Begg and Gray, 2002).

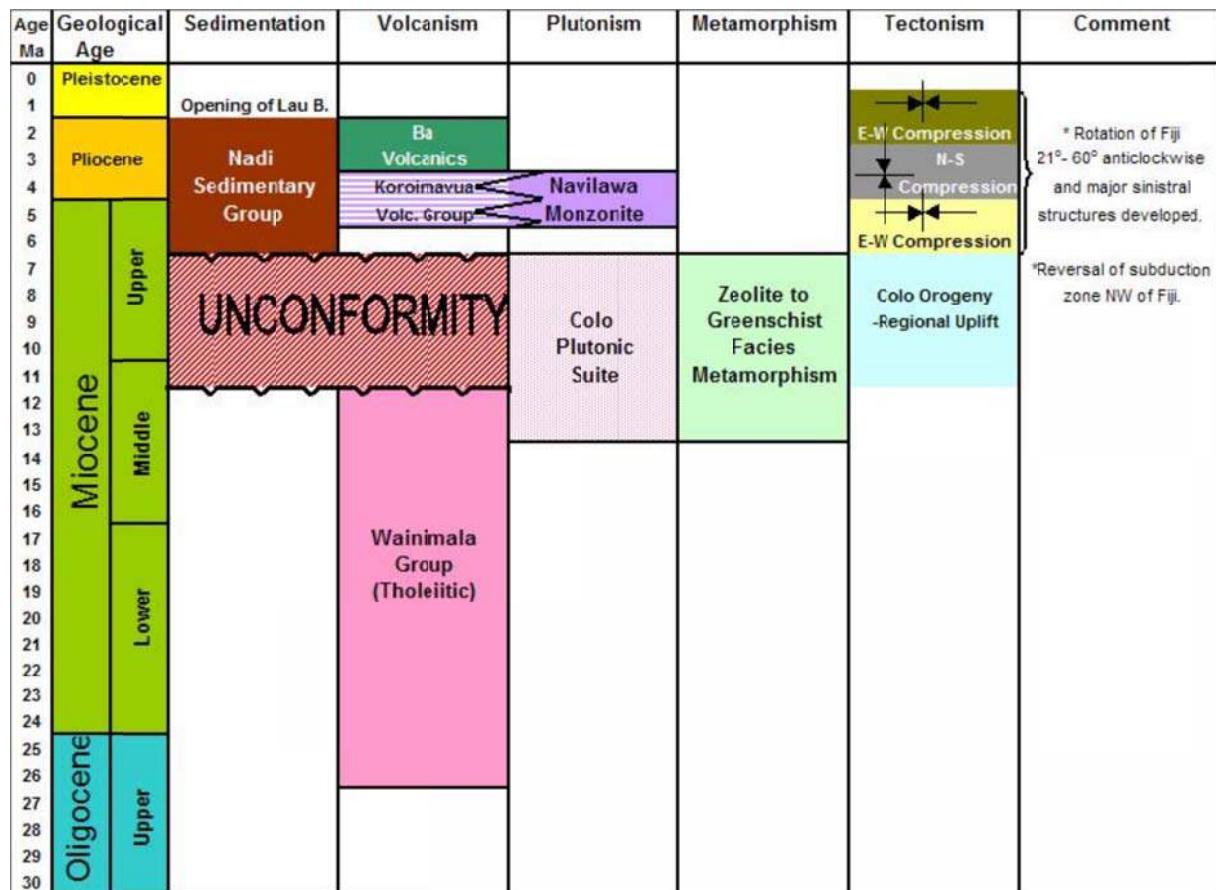
At the end of the Colo Orogeny, Viti Levu experienced a period of widespread and voluminous volcanism from 6.5 to 2.5 Ma (Colley and Flint, 1995). Magmatic compositions changed from island-arc tholeiite and calc-alkaline andesite to shoshonite at approximately 5.5 Ma (Gill and Whelan, 1989).

During the early Pliocene, the prominent Tavua and Rakiraki volcanoes, composed of shoshonite and high-K calc-alkaline volcanic rocks, were erupted (Colley and Flint, 1995). The Koroimavua Group occurs to the northeast of Nadi and consists of basal shoshonitic volcanoclastic sandstone and mudstone overlain by the Sabeto Volcanics, which include shoshonitic lava, breccia, rudite, and sandstone (Begg, 1996).

The Ba Volcanic Group dominates the northern half of Viti Levu and is composed of shoshonites and, to a lesser extent, calc-alkaline volcanic rocks. The Tavua volcano, the largest in Fiji, is a main feature of the Ba Volcanic Group and hosts the Emperor gold deposit. Both the Koroimavua and Ba Groups occur along the east-northeast trending axis defining the Viti Levu lineament and appear to be contemporaneous shoshonitic lava, breccia, rudite, and sandstone (Begg, 1996).

The Ba Volcanic Group dominates the northern half of Viti Levu and is composed of shoshonites and, to a lesser extent, calc-alkaline volcanic rocks. The Tavua volcano, the largest in Fiji, is a main feature of the Ba Volcanic Group and hosts the Emperor gold deposit.

**Figure 6-3: Geological Units and Time Scale of Viti Levu, Fiji**



(Source: A-Izzeddin, 1999)

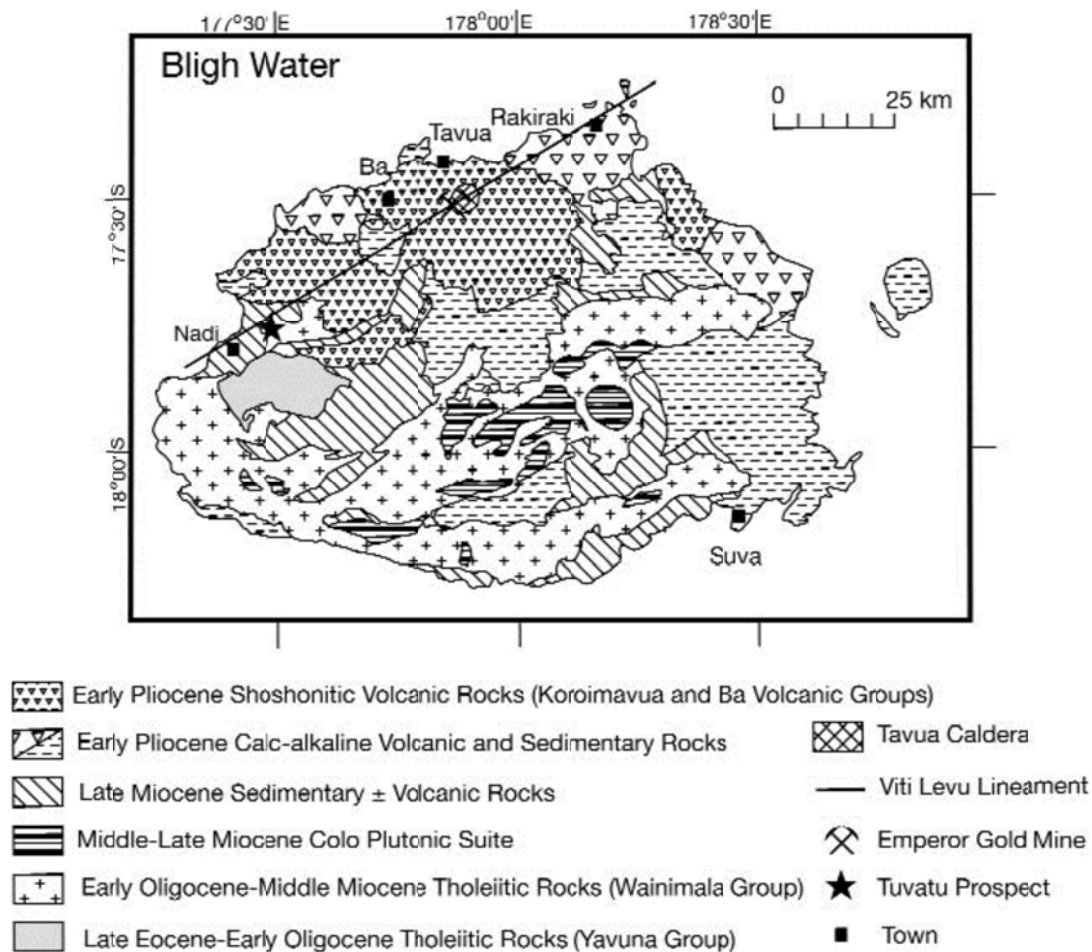
## 6.2 GEOLOGY OF THE TUVATU AREA

The Tuvatu deposit is one of several gold prospects known from the Sabeto area of north-western Viti Levu. Other gold and gold copper prospects in the local region are at Vuda, Navilawa (Kingston Mine and Banana Creek) and Nawainiu Creek, all associated with known or presumed centres of volcanic activity and / or volcanic core complexes within the shoshonitic Koroimavua Volcanic Group of earliest Pliocene to latest Miocene age.

Scherbarth and Spry (2006) and Vigar (2007) provide an excellent overview of the geology of the Tuvatu area and much of the following material is derived, at least in part, from these sources. The geology of the Tuvatu area is depicted in Figure 6-4.

The oldest (12 to 26 Ma) geologic unit in the Tuvatu area is the Nadele Breccia, which is a member of the Wainimala Group (see Figure 6-3). It constitutes approximately 60 percent of the 1-km<sup>2</sup> deposit area (Hatcher, 1998) and consists of andesitic to basaltic reworked, polymict volcanic breccias, pillow lavas, and sedimentary rocks. Hatcher (1998) noted that the groundmass of the Nadele Breccia contained zeolite, chlorite, and epidote, which formed in response to the low-grade metamorphism during the Colo Orogeny. The Nadele Breccia was intruded by the 4.9 ± 0.1 Ma Navilawa Monzonite, which McDougall (1963) interpreted to be the intrusive equivalent of the Sabeto Volcanics. Porphyry copper-style mineralization occurs at the center of the Navilawa Monzonite near the transition zone between micro-monzonite and monzonite.

**Figure 6-4: Geology of Viti Levu, Fiji**



(Source: modified after Begg, 1996; Rodda, 1967)

The Sabeto Volcanics (Early Pliocene to Late Miocene, 4.8 to 5.5 Ma) unconformably overlie the Nadele Breccia in the Tuvatu area and represent the basal unit of the Korroimavua Volcanic Group which is the oldest shoshonite volcanism in Fiji. The volcanics occur in a northeast-trending band across the north-western side of Viti Levu and host a number of gold mines and prospects including Tuvatu, Vatukoula and Raki Raki (see Figure 6-4). The units of this Group consist of a series of interbedded andesitic volcanoclastics and flows. Hatcher (1998) subdivided this group into three units comprising a basal volcanoclastic breccia (30 to 45 m), andesite porphyry flow (30 to 40 m) and volcanoclastic conglomerate (40 m).

The Navilawa Monzonite (Early Pliocene to Late Miocene, 4.85 Ma) intrudes the Nadele Breccia in the northeast portion of the project area and hosts the majority of the gold-telluride mineralization. The intrusive has been divided into two phases, a central coarse to medium grain monzonite and peripheral micro monzonite.

The overall intrusive complex is elongate in a northeast orientation. Numerous small intrusive stocks, dominantly composed of micro monzonite also occur but tend to be elongated in a north-northwest direction.

### **6.3 TUVATU DEPOSIT GEOLOGY**

The geology of the Tuvatu deposit is dominated by a sequence of volcanic units that have been intruded by a monzonite intrusive (Figure 6-5). The monzonite stock is interpreted to represent the root of a caldera and is elongate in a northeast-southwest orientation.

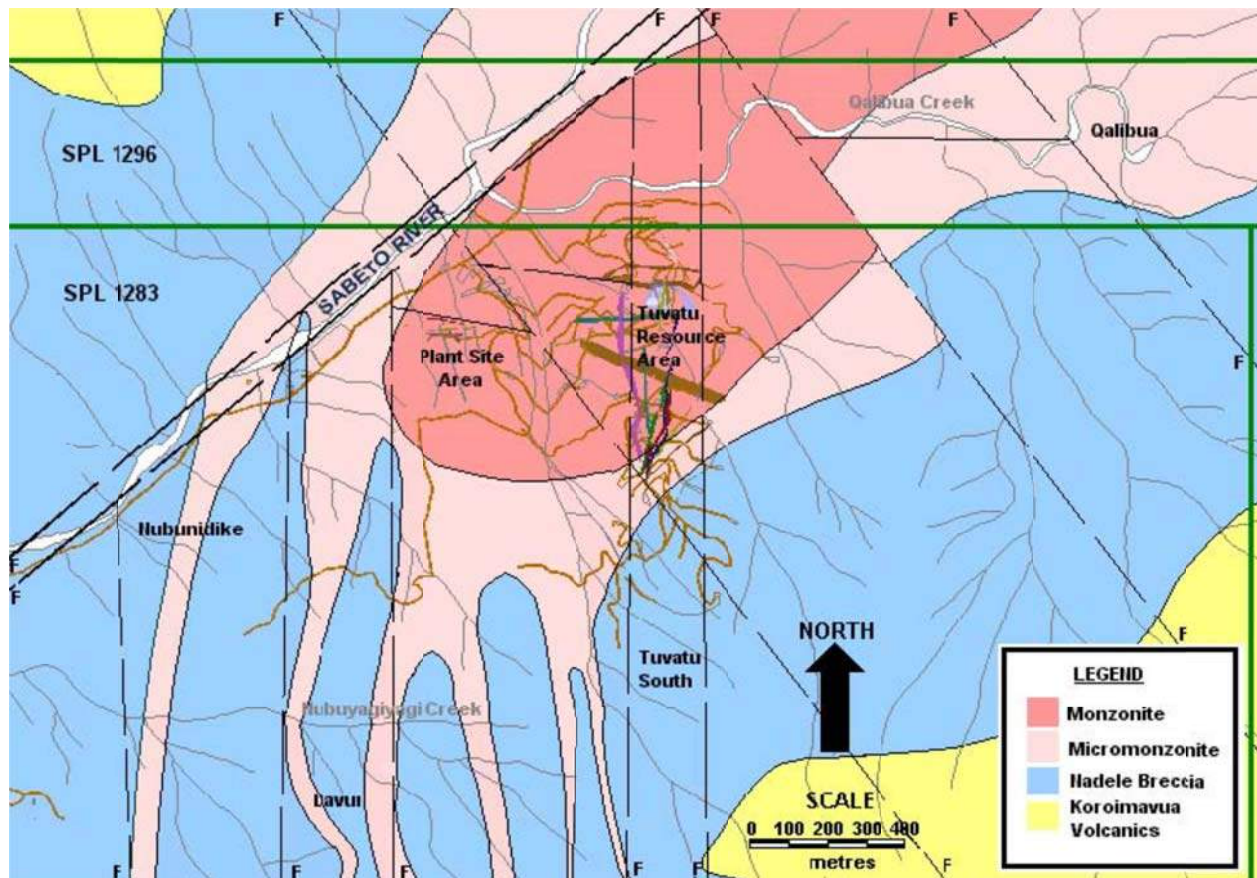
The basal unit in the region is the Nadele Breccia which is exposed in the Sabeto Valley and is a member of the Late Oligocene-Middle Miocene Wainimala Group. The Nadele Breccia is volcanic in origin and consists of a sequence of massive, coarse, polymict breccia units interbedded with minor flows and sediments.

Basal units of the Sabeto Volcanics (part of the Late Miocene-Early Pliocene Koroimavua Volcanic Group) unconformably overlie the Nadele Breccia in the Sabeto Valley. Members of the Sabeto Volcanics found outcropping in the area have shoshonitic affinities and include andesitic and biotite bearing dacitic lithic and crystal tuffs, grits, agglomerates and minor flows. Shoshonites belonging to the Koroimavua Volcanics found outcropping in the area have shoshonitic affinities and include andesitic and biotite-bearing dacitic lithic and crystal tuffs, grits, agglomerates and minor flows. Shoshonites belonging to the Koroimavua Volcanic Group have been age dated at 5.88 Ma.

The volcanoclastic units have subsequently been intruded by a monzonite stock that has been dated at 4.85 Ma, and is interpreted to be co-magmatic with the volcanic units of the Koroimavua Volcanic Group.

Locally, the geology is structurally complex with the area cut by an east-west trending fault zone referred to as the Core Shed Fault. Additional structures include northwest trending structures that locally offset veins, as exemplified by the CABX structure.

**Figure 6-5: Tuvatu Area Geology**



(Source: internal TGM summary report dated September 2005)

The Tuvatu gold-silver telluride deposit is the second largest gold deposit in Fiji after the large Emperor gold telluride deposit (production, and Proven and Probable reserves of 280 t Au). The deposits are 50 km apart and occur along the >250 km east-northeast trending Viti Levu lineament. They are spatially associated with alkaline rocks of almost identical age (~5.4–4.6 Ma) and having a shoshonitic affinity.

The gold mineralization in both deposits is spatially and genetically related to monzonite intrusions and to a low-grade porphyry copper-style system. The Emperor deposit occurs along the margins of the Tavua volcano whereas the Tuvatu deposit may occur adjacent to an eroded shoshonite volcano. At both locations, low-sulphidation, epithermal gold telluride mineralization occurs in flat-lying veins, steep faults, shatter zones, stock-works, and hydrothermal breccias. Mineralization in both deposits formed in multiple stages and is characterized by the presence of quartz-roscoelite telluride veins in which gold-rich tellurides were deposited prior to silver-rich tellurides. Gold tellurides and vanadium minerals were deposited at approximately 250°C from moderately saline fluids. Oxygen and hydrogen isotope compositions of ore fluids at Emperor and Tuvatu are similar to the composition of waters exsolved from arc magmas. Previously published values of  $\delta^{34}\text{S}$  of sulphides (-20.3 to +3.9 ‰) from Emperor are like those obtained from the Tuvatu deposit (-15.3 to -3.2 ‰) and indicate, along with mineral assemblages, that the ore fluids were oxidizing and near the hematite-pyrite buffer.

The similar igneous lithological units of almost identical age, transition from porphyry- to epithermal-style mineralization, paragenetic relationships, and comparable fluid inclusion and stable isotope data suggest a common origin for sulfide and gold telluride mineralization at the Tuvatu and Emperor deposits. Potential exists for additional epithermal gold telluride

mineralization near volcanic centers in shoshonitic rocks (Ba and Koroimavua Volcanic Groups) spatially related to the Viti Levu lineament in northern Viti Levu.

#### 6.4 TUVATU MINE (SUB-SURFACE)

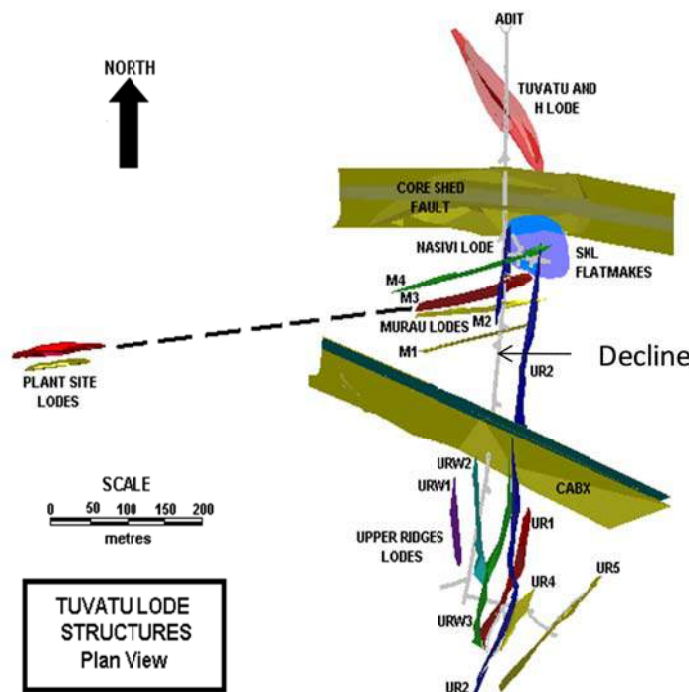
The Tuvatu Deposit was the subject of an underground exploration program that consisted of a 600 m decline that was developed to a depth of 240 m below surface. The decline gained access to underground mineralized gold structures that had been identified by TGM exploration drilling. These structures are noted below and shown in Figure 6-6.

- 11 lodes in the Upper Ridges area (the subject of resource modelling).
- 2 lodes in the Murau area (no information made available).
- 3 lodes in the West area (no information made available).
- 2 lodes in the Tuvatu area (no information made available).
- Flatmakes in the SKL area (no information made available).

In addition a number of other lodes have been identified in the local area but remain untested.

An exploration decline was developed with minor crosscut and strike drive development during Phase 1. Underground development started in November 1997 and continued in phases through 1998. A number of the lodes were intersected, geologically mapped and sampled resulting in several phases of underground drilling. Surface and underground drilling and exploration defined the Tuvatu resources within a number of sub-parallel structures. Several of the lodes remain open at depth and along strike. A trial mining exercise was also carried out to evaluate the continuity of structure and grade.

**Figure 6-6: Mine Development Showing Mineralization**



(source: Emperor 2000 Draft Feasibility Study)

The initial development program was extended to deepen the working in order to investigate the Upper Ridges lodes in the southern part of the resource area. These lodes had previously been identified by surface drilling at a broad spacing. A bulk sample of Upper Ridges' mineralization (Nasivi / SKL stockwork) was dispatched to Vatukoula for metallurgical test work.

This programme greatly increased the geological knowledge of the deposit and successfully extended the Upper Ridges lodes (particularly UR2) and expanded upgraded the overall resource area.



## **7.0 DEPOSIT TYPES**

### **7.1 INTRODUCTION**

The Tuvatu mineralization system is one of the three largest gold systems in Fiji, the other two being the Emperor (Ahmad et al., 1987; Begg, 1996) and Mt. Kasi (Turner, 1986) deposits. All three are Early Pliocene to Late Miocene alkaline igneous rock related gold systems spatially associated with the >250 km northeast-trending Viti Levu lineament.

A clear genetic relationship among porphyry copper-style mineralization, epithermal low-sulphidation gold telluride mineralization and alkaline igneous rocks of the Tavua volcano at the Emperor deposit was demonstrated by Ahmad et al. (1987), Setterfield et al. (1991), Eaton and Setterfield (1993), Begg (1996), and Begg et al. (1997). In this regard, Scherbarth and Spry (2006) in their study comparing the Emperor and Tuvatu deposits propose a genetic model for the Tuvatu deposit that is related to that for the Emperor and incorporates the formation of both porphyry- and epithermal-style mineralization spatially and genetically associated with alkaline magmatism. Similarly, Naden and Henney (1995) consider Tuvatu to be a telescoped porphyry system that displays characteristics, such as a low silver content, and a simple mineralogy dominated by sulphides rather than sulphosalts or tellurides, that are indicative of both porphyry and epithermal systems

### **7.2 METALLOGENIC MODELS**

#### **7.2.1 GENERAL CONCEPTS**

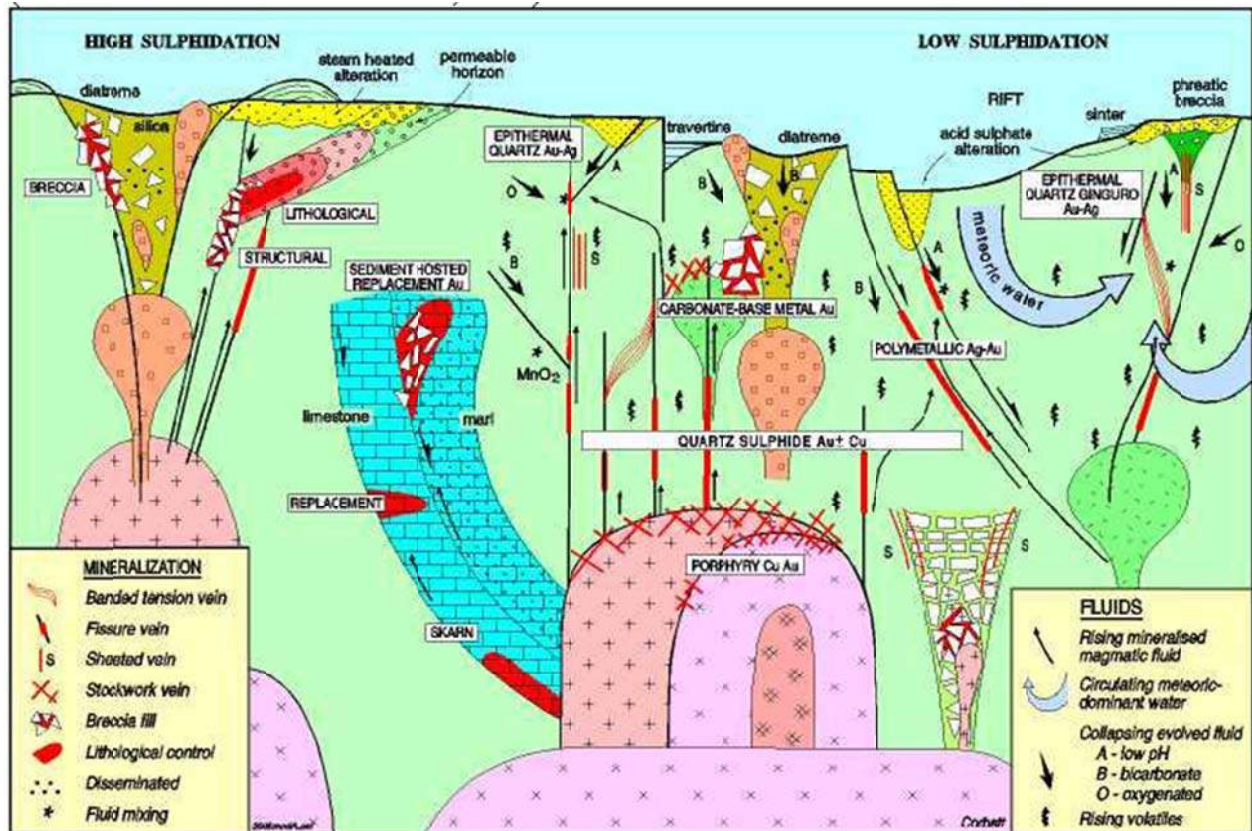
Epithermal deposits are formed from hydrothermal systems related to volcanic activity, which is derived from volcanic-plutonic arcs associated with subduction zones. As the line of calderas extending south south-westerly across the Fijian island of Viti Levu hosted and / or resulted in the Vatukoula, Tuvatu and Raki Raki gold mineralization it is likely that similar epithermal processes were at work in the formation of each deposit though with variations. Accordingly, a model must consider characteristics of each despite the majority of research data coming from the long-lived, productive Vatukoula mine.

Work by various researchers, such as Corbett and Leach (1998), during the last fifteen years has refined and re-defined the epithermal gold concept. This research has resulted in epithermal deposits being assigned to one of two major categories: high sulphidation (acid-sulphate) and low sulphidation (adularia-sericite).

High-sulphidation deposits are hosted by leached silicic rock associated with acidic fluids generated in the volcanic-hydrothermal environment. These volatile-rich magmatic fluids rise to higher levels without significant interaction from host rock or ground water. Disseminated and replacement ores are common. Their link to the magmatic source is more proximal than low-sulphide mineralization which is more distal.

By contrast low-sulphidation systems are formed by geothermal fluids – reduced, diluted, with neutral pH's - mixed with ground water. They originate in dilational, rift-style structural settings. Gold-bearing structures are generally veins and/or stockworking. Cavity-fillings, drusy and colliform structures are common. Figure 7-1 displays a general cross section through a volcanic/intrusive system and shows local environments for both low and high sulphidation epithermal deposits.

**Figure 7-1: Conceptual Model Illustrating the Styles of Pacific Rim Porphyry to Epithermal Cu-Au Mineralization**



(modified from Corbett, 2002a)

In a sense epithermal gold deposits may be thought of as a ‘continuum’ in that they evolve transitionally according to distance and pressure/temperature change away from a magmatic source – through porphyry copper-gold, through high-sulphidation, through to low-sulphidation types. Along the way variations in wall rock and structure may produce additional deposit types such as skarns, carbonate-base metal gold and others. To add to the general complexity, Corbett and Leach (1998) have further subdivided the low-sulphidation epithermal systems into Arc Low and Rift Low categories. The Arc Low spectrum includes quartz sulphide Au + Cu, polymetallic Au-Ag, carbonate-base metal Au and epithermal Au-Ag sub-categories. The Rift Low may include proximal skarn, replacement and adularia-sericite sub-categories.

Corbett (2004) notes that as the group of sulphide-bearing low-sulphidation intrusion-related Au deposits display a fluid evolution from quartz-sulphide Au+/- Cu, to carbonate-base metal Au, and later epithermal Au-Ag. Many deposits are characterised by all three deposit styles either grading temporally in overprinting events (Porgera), laterally (Kelian, Indonesia), or vertically (Kerimenge), while others display telescoping into single lodes (Tuvatu, Fiji),

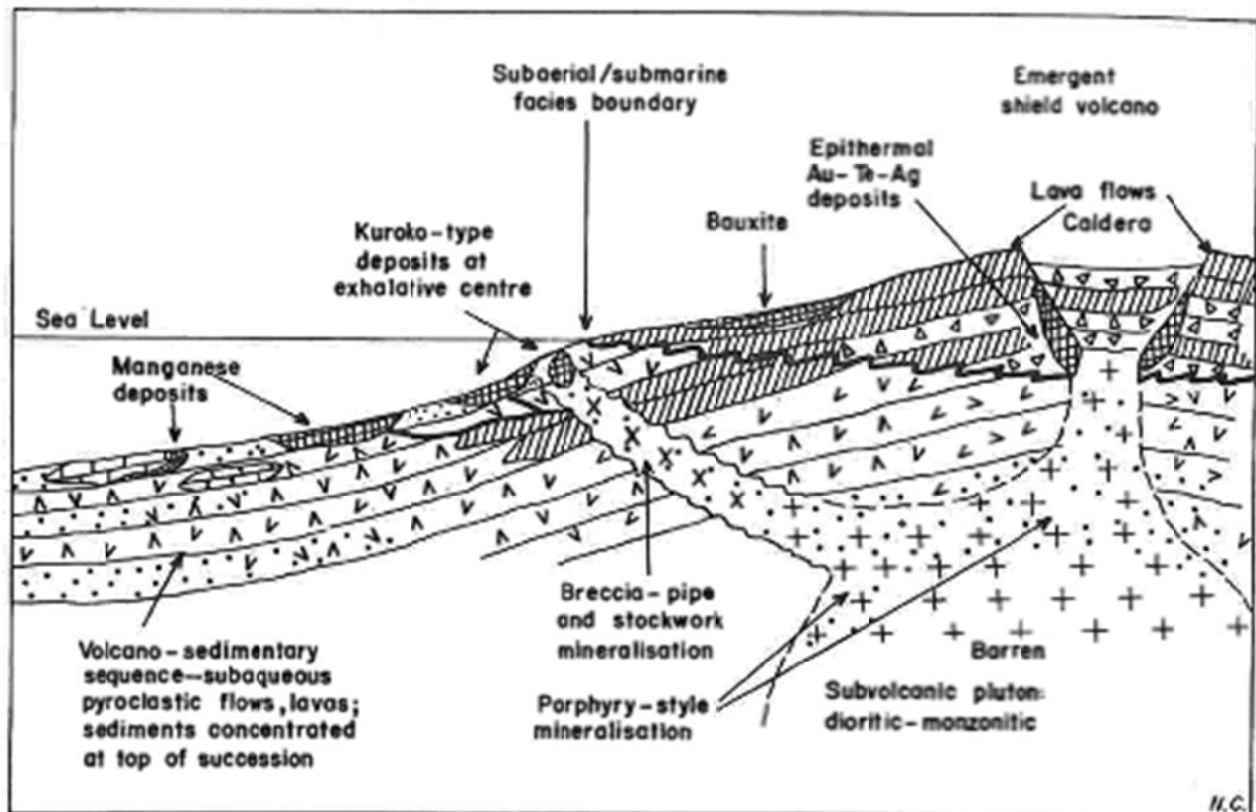
### 7.3 PROPOSED TUVATU MODEL

The Tuvatu deposit and related perimeter area ore-deposit model incorporates a mineralizing system that is situated along the margin of a caldera structure, which has domed or collapsed producing a radial fracture pattern exterior to its margin. The host intrusive at Tuvatu was likely original magma chamber rock subsequently cooled, fractured, faulted and mineralized by a later epithermal pulse.

The Tuvatu deposit and perimeter area display many of the features common to low sulphidation epithermal deposits and has, accordingly, been placed into that category. Recent researchers (Naden and Henney (1995), Corbett (2004), and Scherbarth and Spry, (2006)) have concluded that the host monzonite at Tuvatu possibly represents the core portion of the original magma chamber near the centre of the caldera and was the site of an early developing porphyry system. The Tuvatu vein system likely originated as a later pulse of mineralization from a deeper, or lateral magmatic source, which was then deposited within faults and fractures of this consolidated, pre-existing, earlier intrusive. Mineralized veins and structures are similar in form to those at Vatukoula including the ‘flatmakes’ though grades may be slightly higher at Tuvatu. Perimeter mineralization seems to occur in radial patterns trending towards the Tuvatu resource and is likely synchronous with the Tuvatu low sulphidation epithermal mineralization. The radial fracture patterns are a possible response to doming or even collapse with the caldera chamber. Surrounding volcanic rocks should be equally prospective. Colley and Flint suggest a volcanogenic system of mineralization. The principal features of this type of system are illustrated in figure 7-2 and shows differing locations of potential porphyry coppers, epithermal precious-metal lodes, Kuroko-type massive sulphides, manganese deposits and bauxite.

From an exploration viewpoint, strong south-westerly and southerly structural features are present trending away from the Tuvatu deposit. Both would be regarded as prospective – particularly in those areas of interception with dykes, cross faults or shears. Similarly the entire perimeter of the caldera should be regarded as prospective: again within areas of shear / fault intercepts. It is possible that most of the major massive sulphide occurrences in Fiji are from the proximal, vent area (e.g. Nukudamu, Wainikoro, Wainivesi, Colo-i-Suva).

**Figure 7-2: Conceptual Model Illustrating the Location of Mineral Occurrences within a Volcanogenic System of mineralization in Fiji.**



(modified from Colley and Flint, 1995)

## **8.0 MINERALIZATION**

### **8.1 INTRODUCTION**

The mineralization at Tuvatu is typical of epithermal deposits in being confined to narrow structures with little wall rock alteration. The gold grades are distributed irregularly along these narrow structures and range from very rich high-grade areas to adjacent areas of near background levels. The irregular distribution of gold has implications for exploration, resource modelling and mine development. A high density of in-fill drilling and sampling will be required to establish a meaningful medium term mining plan.

Gold mineralization is primarily hosted in monzonite but there are rare elevated gold grades in the volcanic units. The mineralization is considered to have a magmatic source. It occurs as networks of narrow veins and cracks, with individual veins generally ranging from 1 to 200 mm wide within enclosing zones that can be up to 5 m in true width. It is these bundles of veins that are defined as the mineralized lodes. The individual lode structures can be traced for distances of 100 m to 600 m with continuity within the structure of mineralized zones for over 100 m. The lodes vary in width from 0.5 to 5.0 m with an average true width of 1.6 m. Very high grades may be encountered within individual structures within the lodes e.g. 0.5 m at 1620 g Au/t and 0.3 m at 1130 g Au/t historically reported by Emperor.

The mineralized zone at Tuvatu is thought to have originally developed as a porphyry copper system which has subsequently been overprinted by epithermal gold mineralization. The style of mineralization is thought to have evolved as the local monzonite intrusion cooled and meteoric waters mixed with the magmatic fluids, resulting in the gradational changing of the mineralization and alteration styles.

Mineralization associated with the porphyry copper system is characterised by apatite, potassium feldspar, magnetite, biotite veins with intense potassic alteration selvages. These veins are considered to have developed as the monzonite intrusive was in the final stages of crystallisation and early stages of cooling. As the system cooled it was overprinted by a phase of phyllic alteration which was characterised by a quartz-muscovite-pyrite assemblage. The system was then overprinted by a set of quartz-adularia veins accompanied by lesser amounts of calcite, chalcopyrite, pyrite, galena, tellurides and native gold.

These veins generally have narrow chlorite-smectite selvages and commonly exhibit banded textures. Minor roscoelite (vanadium potassium-mica) has also been observed in association with the quartz-adularia veins. Roscoelite is commonly observed at Vatukoula and many major deposits around the world (e.g. Porgera, Hishikari) and invariably has a close association with gold mineralization. The precipitation of roscoelite generally requires the reduction of a vanadium-bearing mineralizing fluid. Reduction of the mineralizing fluid may also lead to the precipitation of gold, tellurides and pyrite. Also rare occurrences of fluorite have been observed associated with veining. The presence of fluorite further demonstrates the strong magmatic volatile content of the mineralizing fluids.

### **8.2 PRECIOUS METAL MINERALIZATION OF THE TUVATU DEPOSIT**

The structure, alteration, and mineralogy of the Tuvatu lodes are described in Hatcher (1998) and Scherbarth (2002). A brief summary after Spry and Scherbarth (2006) is provided below:

“There is an intimate link at Tuvatu between local and regional structures, the emplacement of the Navilawa Monzonite, the development of the veins, and the deposition of mineralization during two deformational events (D1 and D2; A-Izzedin, 1998). The development of vein structures within the Navilawa Monzonite and the reactivation of pre-existing structures during the upper Miocene and Pliocene were related to the reversal of the subduction zone northwest of Fiji, in concert with movement along the Viti Levu lineament.

The earliest structure at Tuvatu is the 50 m wide, east-west trending (D1) brecciated Core Shed fault zone, which dips steeply to the south. The development of north-trending Nasivi lodes, north- to northeast-trending Upper Ridges lodes, northwest-trending sub-vertical fault structures (e.g., Carbonate Breccia CABX reverse fault), and sub-horizontal Murau and SKL flatmakes formed during an episode of north-south compressions (D2). A-Izzedin (1998) suggested that D2 structures subsequently acted as pathways for mineralizing fluids and were the main sites of deposition. Brecciation of the veins indicates that these structures were active while mineral deposition occurred or were reactivated intermittently.

Porphyry-style copper mineralization occurs in the northern part of the deposit in the northwest-to southeast-trending H and Tuvatu lodes, which are 5 to 40 m wide and dip moderately to the northeast. The Tuvatu lode is characterized by potassic alteration of the wall rock consisting of coarse grained apatite, orthoclase, magnetite, pyrite, chalcopyrite, and optically and compositionally zoned biotite. In the H lode, epithermal gold veins locally crosscut porphyry copper-style mineralization. In contrast to the Tuvatu lode, where magnetite is very common, magnetite occurs in trace quantities in the H lode. Other differences between the Tuvatu and H lodes include a marked decrease in grain size of the ore minerals in the H lode and the presence of trace amounts of native gold, calaverite, petzite, and tennantite. Although these two lodes are overprinted by gold-bearing epithermal-style veins and associated propylitic and phyllic alteration, most gold occurs in epithermal-style veins unrelated to porphyry-style mineralization in the Navilawa Monzonite, basaltic-andesite dikes and, to a lesser extent, the Nadele Breccia.

Epithermal gold mineralization was deposited in three lode types, “steep-dipping veins” striking northeast (e.g., Nasivi and Upper Ridges lodes), shallowly dipping veins ( $< 45^\circ$ ) or flatmakes representing reactivated oblique thrust faults (e.g., Murau lode), and irregular brecciated bodies or shatter zones (e.g., SKL lode) that occur at the intersection of the other two lode types (see Figure 6-6). Each lode consists of up to nine individual flatmakes (e.g., SKL) or vertical veins (e.g., Upper Ridges) that are generally no more than 1 m wide. In most places, alteration zones are narrow and do not extend more than 1 m into the wall rocks. Most veins are silicified and include base metal sulphides (pyrite, chalcopyrite, sphalerite, and galena), native gold and/or electrum tellurides, and gangue minerals (quartz, chalcedony, sericite, adularia, and roscoelite). Medium-grained cockade and fine-grained banded quartz in the veins is intergrown with or replaced by chalcedony. Adularia and white mica occur within the medium- to fine-grained quartz. Roscoelite, contains up to 32.71 wt %  $V_2O_3$ , among the highest reported vanadium values in roscoelite from an epithermal Au-Ag-Te deposit.” (Spry and Scherbarth, 2002).

### **8.3 MINERALIZATION IN THE EXPLORATION DECLINE**

***It is important to note that the work as outlined in this section has not been verified by P&E as part of the present report. Access to the now water filled decline was restricted.***

Vigar (2009) reports that the various lode structures exposed in the exploration decline were examined and compared to the geological maps and assay plans presented by Vigar in 1999. The channel samples collected underground were taken from development faces, backs and walls depending on the situation at the time. The samples are collected as rock chips in a continuous

pattern, generally across the backs immediately behind the development face. A program of comparison between these chip/channel samples and channel samples cut with a diamond saw was carried out in 1999 in the UR2 strike drive and results were very close in both mean and standard deviation.

The first structures encountered in the decline are two feldspar-biotite rich pegmatite dykes known as the H and Tuvatu lodes. These dykes are sub-vertical and trend northwest. Considerable hydrothermal activity was associated with the emplacement of these dykes and abundant vugs occur within these structures, often in-filled with biotite-apatite-magnetite. The Tuvatu lode was the first lode discovered at Tuvatu and tends to be richer in biotite than H Lode. These dykes have been sporadically overprinted by later epithermal quartz-adularia mineralization.

A major fault, the Core Shed Fault, crosses the decline shortly after the Tuvatu Lode. The Core Shed Fault is a strong structure approximately 50 m wide (down the Decline). It consists of strong brecciated and sheared monzonite in a clay matrix. The footwall is quite sharp and appears to indicate relatively recent movement (post- mineralization) although this may have been a long lived structure both pre-dating and post-dating mineralization (Vigar, 2009)

A strong vertical fault containing mineralization occurs immediately south of the Core Shed Fault. This structure was not anticipated prior to development although mineralization was known to occur in the general area. Good grades were locally encountered. This structure is now known as the GRF lode. In addition, a series of narrow flat-makes known as the SKL Flatmakes occur immediately south of the Core Shed Fault. These structures are surprisingly continuous considering their narrow width of a few centimetres only. The grades are also high and the mineralization style similar to that seen in the other structures.

The Murau Lodes are a series of narrow steep and flat structures. These are poorly known beyond the decline and resource estimates have not been done.

The UR West 2 structure is typical of the steeper lode structures. Strong shearing and alteration occurs within sharp vein boundaries although these anastomose over short distances creating rapid changes in width and intensity. An alteration halo exists around the individual veins and the structure as a whole.

The main UR2 Structure is strongly developed in the cross cut and drives to the north and south. A development rise has also been put up 25 metres above the level to the south of the cross cut. The lode is strongly developed and was easily followed in the strike drives although splays and cross cutting lodes caused confusion for short distances, these minor structures died out quickly (within 10 m) of leaving the main structure. A strong system of inter linked fractures with alteration is developed within the main lode.

The UR2 Structure is cut by small east west sub-vertical shears. The lode is diffracted by these structures but passes through them. Strong dilation often occurs at these sites with mineralization occurring for short distances laterally along the east west structure.

The following is an overview of the mineralization, modified after A-Izzeddin (2000):

- Mineralization is hosted in structurally controlled sets of narrow quartz veins (generally less than 0.5 m) which may form mineralized lodes up to 5 m wide.
- Early porphyry-related mineralization overprinted by late epithermal episode.

- Bleaching and alteration halo of sericite and clay minerals, becomes more pronounced with weathering.
- Gold is free-milling and generally associated with silica / quartz, adularia and minor base metals (galena and sphalerite) and tellurides.
- High grades may be encountered in lodes, e.g. 0.5 m at 1620 g Au/t and 0.3 m at 1130 g Au/t.

The reported style of the UR2 lode has implications for interpretation and resource modelling. In many cases where a drill hole intersection has been labelled UR2 there are other mineralized intercepts only a few metres away that have been labelled as Lode Undifferentiated. These intercepts are most likely splays off the UR2 Lode. This is consistent with the underground geological mapping. In these cases the whole lode should be modelled including the intervening barren material as it would better reflect the in-situ resource material.

#### **8.4 OTHER MINERALIZED PROSPECTS**

In addition to the main Tuvatu deposit, the Tuvatu property contains numerous mineralized showings and prospects scattered throughout the remaining portions of the tenement. A brief summary of the mineralization that defines these targets is given below. The reader is also referred to Section 9.0 of this report which details the more recent exploration work conducted by Lion One on select prospects on the Property. P&E notes that recent and historical exploration has demonstrated the region is prospective for the discovery of additional gold mineralization of a style similar to that of the Tuvatu deposit to which such mineralization might be geologically related. *The reader is cautioned that there can be no assurance that further exploration on any of the peripheral prospects will necessarily be successful or that any mineralization uncovered will be comparable in tenor to that found at the nearby Tuvatu deposit.*

P&E has not conducted a site visit to any of the 10 mineralized areas noted below. Only the main Tuvatu deposit was visited by Mr. F.H. Brown

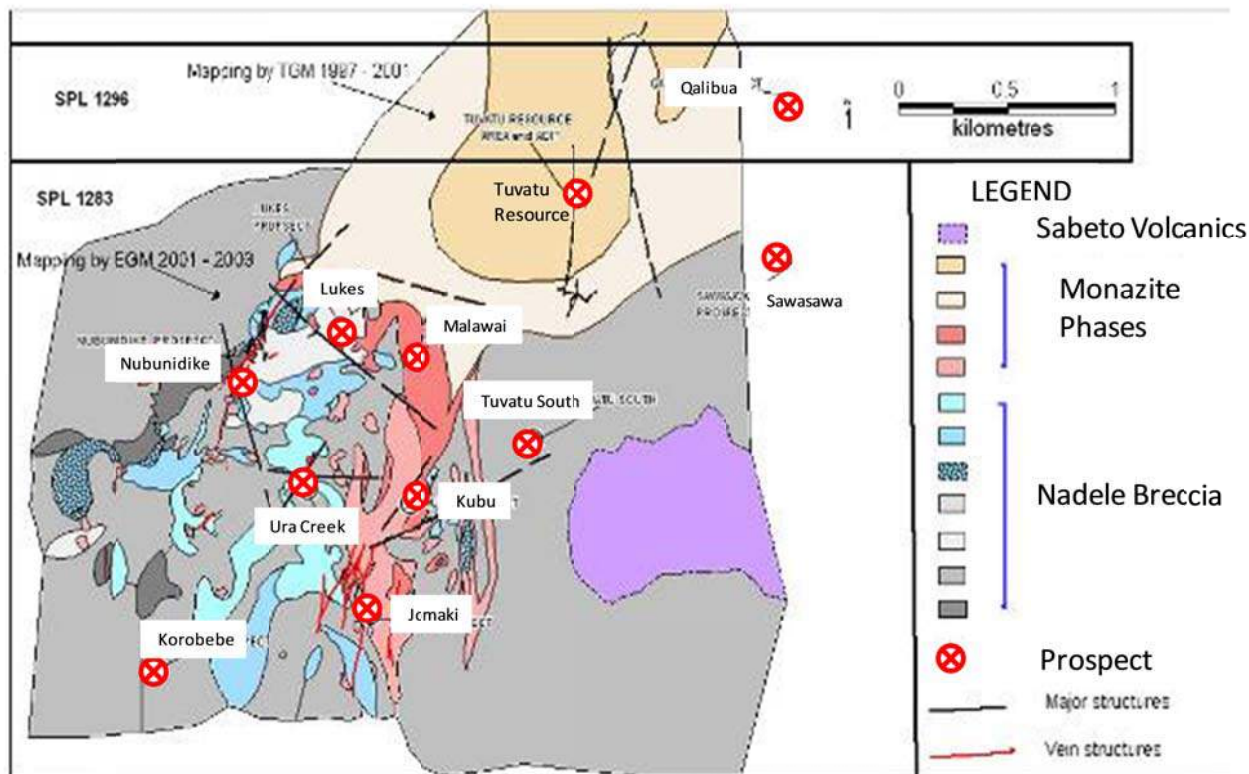
The following section is sourced from an unpublished draft version of an internal NI 43-101 compliant report by Vigar (2009).

Only limited exploration had been carried out in the area surrounding the Tuvatu deposit before TGM's work beginning in the 2001-2003 period. An initial, regional exploration program was carried out starting in 2001 and involved regional mapping, costeaning, stream sediment and soil sampling. This work identified more than 10 new prospect areas outside the Tuvatu Mine area as noted below and depicted in Figure 8-1.

1. Nubunidike Prospect
2. Ura Creek Prospect
3. Jomaki Prospect
4. Malawai Prospect
5. Qualibua Prospect
6. Kubu Prospect
7. Korobebe Prospect
8. Tuvatu South Prospect
9. Sawasawa East Prospect

Detailed exploration was carried out by TGM at Nubunidike, Ura Creek, Jomaki, Malawai, and Kubu with Nubunidike and Ura Creek the most advanced. Exploration work commenced on Qualibua in June 2002, but was not extended to cover Sawasawa East or the Tuvatu South prospects. Subsequent ridge and spur soil geochemistry located high tenure gold-in-soil anomalies at the Korobebe Prospect. The reader is referred to Exploration Section 9 of this report for exploration on the Property by AER.

**Figure 8-1: Location of Mineralized Prospects on the Tuvatu Property**



### 8.4.1 NUBUNIDIKE PROSPECT

One of the most promising prospects is Nubunidike, located 1 km south west of the Tuvatu deposit area. The structure trends NNW and has been traced for about 900 m, from where three main vein structures were discovered by Emperor in 2002-2003. The veins themselves have a maximum true width at surface of approximately 1.5 m and extend for at least 500 m along strike.

The original three main vein structures recognized at the Nubunidike Prospect include the Nubunidike, Hornet Creek, and 290 veins. Initial work on the Nubunidike Prospect during the 2002-2003 exploration campaign involved mapping, detailed soil sampling, and excavating 16 trenches and 6 small pits. The discovery outcrop of the Nubunidike Vein was recently “re-discovered” at the mouth of Nubunidike Creek, where mineralization occurs over a true width of 1.5 m in a sulphide bearing quartz vein, trending NNE-SSW and dipping around 55° east.

Further mapping on the Nubunidike Prospect located strike extensions both north and south of the discovery outcrop. Mineralization occurs as quartz-sphalerite-pyrite veins with trace chalcopyrite, covellite and galena. Alteration is dominantly sericite-pyrite, and reportedly carries



less than 0.5 g Au/t. Veins are hosted in micro-monzonite dykes as well as in fragmental and basaltic units of the Nadele Sequence.

For the most gold mineralization is restricted to the area north of Davui Creek, where the main Nubunidike Vein has been traced for over 300 m. Davui Creek is thought to follow a major regional lineament, with the southern block up-faulted relative to the northern block. Veins south of Davui Creek are characteristically fine-grained and chalcedonic, with a notable absence of sulphides and very low gold tenors.

### ***Nubunidike Vein***

The Nubunidike Vein located at the mouth of Nubunidike Creek occurs as an irregular sulphide-bearing quartz veined zone with a true width averaging between 0.15 m and 1.50 m, trending 030°-038°TN and dipping from 50°-60°E. Mineralization is dominantly quartz-sphalerite (10 %), pyrite (5 %), chalcopyrite (1-3 %), with trace covellite, galena, marcasite and electrum. Alteration assemblages include sericite-pyrite plus clays. Irregular 1-2 cm quartz-chalcocite veins also occur. The main vein is hosted in fragmentals and basalts of the Nadele Sequence. Mineralization along the Nubunidike vein was been mapped over a strike length of 370 m.

### ***Hornet Creek Vein***

The Hornet Creek Vein lies approximately 40 m east of Nubunidike Vein. The vein occurs as an irregular siliceous “hydraulic” breccia vein, with minor base-metal sulphides and ranges from 5-30 cm wide, trends 014°-016°TN and dips 45°-50°E. Alteration is dominantly sericite-pyrite-clay. The veins are hosted in monzonite dykes, fragmental rocks and basalts of the Nadele Sequence.

The Hornet Creek Structure is offset by a crosscutting NNW-SSE low angle fault dipping 42°S. At the intersection with the 290 structure, the dip along the Hornet Creek Vein increases to 75°S. The Hornet Creek Vein was been traced over a strike length of 290 m.

### ***290 Structure***

The 290 structure lies between the Nubunidike and the Hornet Creek Veins. It is an irregular quartz-sulphide vein 2-8 cm in width that trends 030°-035°TN and dips 65°-75°E.

The structure is a siliceous breccia with mineralization occurring as quartz-pyrite veins with trace free gold and base metal sulphides. Alteration is dominantly sericite-pyrite. The presence of white clays could indicate a potassic or argillic overprint.

The 290 vein is considered a late stage structure as it is apparently unaffected by low-angle faults which offset other veins. It is hosted in a monzonite dyke, as well as within fragmental and basaltic rocks of the Nadele Sequence. Visible wire gold was reportedly found in some surface samples. The 290 Structure was been traced over a strike length of 90 m.

## **8.4.2 URA CREEK PROSPECT**

The Ura Creek Prospect lies approximately 1 km south-southwest of the Tuvatu resource area and covers the area from Ura Creek in the north, to the lower part of Veto Creek in the south. The initial discovery was made in Ura Creek, a tributary of Davui Creek, where white clay alteration was observed.

Mineralization occurs as a 1-2 m wide (true width) gossanous iron-oxide stained shear zone hosted within micro-monzonite. Lode forming minerals include quartz, pyrite, and sphalerite. The host rocks are dominantly phyllic (pyrite-sericite) altered but higher-grade intersections often display propylitic-argillic assemblages where kaolinite and other whitish clays occur. Free gold was observed in panned samples taken in Ura Creek next to the discovery outcrop.

In Veto Creek, similar alteration and silicification occurs over a true width of 1-2 m within a monzonite dyke with a similar orientation. If this is interpreted as a strike extension, the Ura Creek structure may extend for approximately 195 m.

The main Ura Creek structure is offset by a low-angle, cross-cutting shear. The vein direction is reasonably consistent across the shear, but dips change from 45°-50°E north of the shear to 70°-80°E on the southern side. On the north side of the crosscut shear, the Ura Creek Structure is a gossanous zone up to 3 m wide, characterized by a variable alteration halo in the footwall with little distinction between the vein proper and the selvage. Hanging wall alteration extends to less than 0.5 m into host rock. Only very minor alteration is associated with the structure south of the crosscut shear.

### **8.4.3 JOMAKI PROSPECT**

This prospect is located on Jomaki Ridge, about 1.7 km south of the Tuvatu deposit. Near the main gold anomalies, two separate NNE-trending, steeply dipping, iron-oxide stained quartz-pyrite veins hosted in hornblende monzonite were located.

Extensions of the veins trending NNE have been traced to Savusika Creek in the south. This may indicate a strike extent of around 140 m. Lodes characteristically occur as 2-10 cm wide quartz-pyrite veins with 5-10 cm wide sericite-pyrite alteration selvages.

Stockwork zones were located in the lower and mid-regions of Veto Creek with several pods of stockwork veining with true widths of up to 1.5 m occurring between variably dipping bounding faults trending NNE. This type of mineralization is associated with limonite-hematite stained quartz-pyrite-sphalerite veins with trace carbonate, galena ± covellite and chalcopyrite. Alteration is pervasive across stockwork zones as sericite-pyrite, with some undetermined white clay minerals also evident.

Veins discovered in lower Veto Creek and tributaries are characteristically 1-3 cm wide quartz-sphalerite-covellite-pyrite veins with trace galena and chalcopyrite. Alteration selvages up to 5 cm wide are dominantly sericite + pyrite.

### **8.4.4 MALAWAI PROSPECT**

The Malawai prospect is characterized by two conspicuous zones of alteration. One zone is of patchy but pervasive phyllic alteration about 120 m wide, and extends along Malawai Ridge near the upper reaches of Vunimadora Creek. Reportedly no veining was associated with this alteration zone.

The second zone of alteration occurs in Malawai Creek, below the Davui Access Road. It is characterized by closely spaced sericite-pyrite ± kaolinite altered fractures extending over a strike length of 150 m. This Malawai Creek zone is coincident with a tributary stream sediment anomaly of 8.8 ppb. A soil gold anomaly of 0.2 g Au/t to the east may also be associated. Although rock chip and channel results were low along the main channel of Malawai Creek,

stream Emperor considered that the sediment geochemistry and alteration suggests other tributaries could be prospective for gold mineralization.

#### **8.4.5 QUALIBUA PROSPECT**

The Qualibua Prospect lies approximately 1 km east of the resource area. It is bounded to the north by the northern boundary of SPL1296, and by the western edge of SPL1283. Mineralization occurs in micro-monzonite at the periphery of the main intrusion. Mineralization is believed to be associated with E-W trending quartz-base metal veins associated with the Core Shed Fault structure. N-S trending dyke swarms are common in the area.

Work on this prospect re-commenced in June 2002 but was been limited to only fact mapping and river bed sampling along part of Qualibua Creek and the lower portion of Wailoloa Creek. Qualibua South and Sawasawa East prospects were located by later soil geochemistry. No follow-up work was done on these areas by Emperor.

#### **8.4.6 KUBU PROSPECT**

Located about 1.8 km SW of the Tuvatu deposit, the prospect consists of numerous quartz-sulphide veins and silicified shear zones along Kubu Creek and the adjacent ridge.

The Kubu prospect is characterized by a number of gold anomalous results obtained from veins and altered shear zones along Kubu Creek and Kubu Ridge. Mineralization typically consists of quartz-pyrite with trace sphalerite-galena-covellite and chalcopyrite. This structure could represent a strike extension of the Jomaki vein system.

#### **8.4.7 KOROBEBE PROSPECT**

This Prospect consists of three untested soil anomalies , the largest of which is defined by gold values ranging from nil up to 0.5 g Au/t over a long axis length exceeding 520 m. The two smaller anomalies extend over 240 and 130 metres respectively and are defined by central peak in the range of 0.3 g Au/t. Fine-grained silica veins have been located south of the anomalies which are SE of Korobebe Village and 3 km SW of the resource area.

Ridge and spur soil sampling towards Korobebe Village located three gold anomalies. The most significant of these anomalies extends over 520 m, with range of values from nil to a maximum gold value of 0.5 ppm. Another anomaly defined by values ranging from nil up to 0.3 ppm extended over a strike length of 240 m and lies open to the south. The occurrence of chalcidonic silica near Korobebe Village was initially considered to be indicative of a low-temperature outflow zone for hydrothermal fluids. Significant soil anomalies in this area were unexpected. Emperor considered this locality a high priority for follow-up work.

#### **8.4.8 TUVATU SOUTH PROSPECT**

The Tuvatu South Prospect is located just south of the Tuvatu Resource area. Two distinct mineralized structures occur in the area. A series of altered structures are associated with dykes thought to represent Upper Ridges type structures, striking SSE and dipping steeply towards the east. Another set of shear structures (non-mineralized) strike 310° - 335°TN and dips 64° - 78° W. The first zone contains 2 m to 3 m wide (approx. true width) limonite-hematite stained quartz-pyrite-sphalerite veins with trace carbonate, galena ± covellite and chalcopyrite in a basaltic host rock.

The strike extends 100 m to the south. The second zone contains 1.0-2.5 m wide (approx..true width), brecciated veins containing quartz-pyrite with moderate chlorite alteration. The strike length is traced for approx. 200 m.

#### **8.4.9 SAWASAWA EAST AND LUKES PROSPECTS**

There is little information currently available on the Sawasawa East and Lukes Prospects for which additional follow-up exploration is planned.

Other epithermal gold veins in the Tuvatu area include the Plant Site lode, otherwise referred to as the West lode, located west of the other vein systems. This area includes three east-west-trending lodes (WEST1, WEST2, and WEST3), one northwest-southeast lode (WEST4) that cuts across the other three lodes.

## 9.0 EXPLORATION

### 9.1 RECENT EXPLORATION (2008)

The issuer reports that no recent exploration was conducted within the Tuvatu Resource Area. Recent exploration was, however, conducted on the Perimeter Area of the Property as outlined below. Historical exploration is summarized in Section 5 of this report

### 9.2 EXPLORATION ON OTHER PROSPECTS ON THE PROPERTY

A recent paper prepared for Lion One by Jenks (2008) contains a comprehensive overview of the geology and exploration work completed on the prospects on the Tuvatu Property.

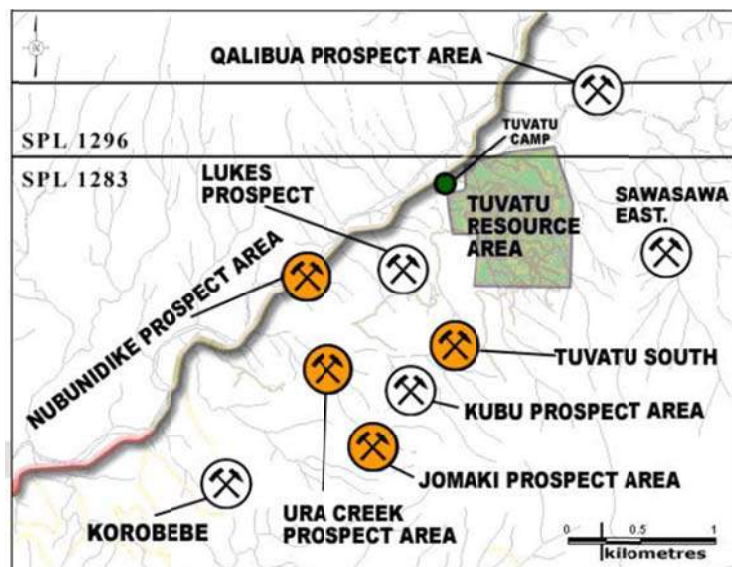
During 2008, Lion One reports having conducted mapping and geochemical sampling programs. Two surface drill holes were also completed. Select zones of prospective mineralisation which were previously located were followed up. Of the ten prospects identified on the Property the following prospects were explored by Lion One (Figure 9-1):

- Nubunidike Prospect;
- Ura Creek Prospect;
- Jomaki Prospect;
- Tuvatu South Prospect; and
- Qalibua Prospect

Work undertaken concentrated on detailed geological mapping, rock chip and channel sampling in the region south of the Tuvatu deposit and the Qualibua Creek area.

The field work was carried out by Lion One staff, W. Kuruisaravi, R. Sulua, and S. Bulu under the direction of Brian Wesson. The mapping and rock chip / channel sampling program involved the hiring of a trained team of temporary workers from Korobebe Village. Temporary security staff at the Tuvatu Camp and core shed facility was also hired from Korobebe / Nagado / Natawa Villages. The prospects are summarized below.

**Figure 9-1: Prospect Locations, 2008 Program**



## 9.2.1 SAMPLING RESULTS

Lion One submitted a total of 1,309 grab chip and channel samples between November 2008 and May 2010 to ALS Chemex laboratories in Brisbane for analysis. Samples values presented in this section have been extracted directly from assay certificates by P&E, and have no other associated information such as geology or sample widths (Table 9.1). P&E has not verified the information and cautions that the information is not necessarily indicative of the mineralization on the property.

Table 9.1: Recent 2008 Exploration Sampling Results.

	Float Samples										
	Ag ppm	Co ppm	Cr ppm	Cu ppm	Fe ppm	Mg ppm	Mn ppm	Mo ppm	Pb ppm	Zn ppm	Au ppm
Count	706	706	706	706	706	706	706	706	706	706	706
Minimum	0.2	1	1	2	0.76	0.01	13	1	2	4	0.01
Maximum	221	145	378	24300	30.1	9.29	46500	497	24900	44700	31.70
Average	1.63	17.61	18.75	199.94	5.86	1.09	1260.10	5.17	176.41	434.45	0.38

	Channel Samples										
	Ag ppm	Co ppm	Cr ppm	Cu ppm	Fe ppm	Mg ppm	Mn ppm	Mo ppm	Pb ppm	Zn ppm	Au ppm
Count	603	603	603	603	603	603	603	603	603	603	603
Minimum	0.2	1	1	2	0.12	0.01	26	1	2	2	0.01
Maximum	159	513	277	18500	27.6	3.76	36400	733	6830	4500	15.30
Average	1.87	19.80	15.36	192.05	6.24	0.92	1384.13	6.93	100.94	176.18	0.25

	Total										
	Ag ppm	Co ppm	Cr ppm	Cu ppm	Fe ppm	Mg ppm	Mn ppm	Mo ppm	Pb ppm	Zn ppm	Au ppm
Count	1309	1309	1309	1309	1309	1309	1309	1309	1309	1309	1309
Minimum	0.2	1	1	2	0.12	0.01	13	1	2	2	0.01
Maximum	221	513	378	24300	30.1	9.29	46500	733	24900	44700	31.70
Average	1.74	18.62	17.19	196.30	6.04	1.01	1317.24	5.98	141.65	315.48	0.32

## 9.2.2 THE NUBUNIDIKE PROSPECT

The Nubunidike Prospect includes the Nubunidike, Hornet and 290 veins. A total of 25 samples are reported from this general area, with grades ranging from 0.01 g/t Au to 9.08 g/t Au.

## 9.2.3 THE URA CREEK STRUCTURE

The Ura Creek structure occurs within the Nadele Breccia, strikes north-westerly and has been traced for 195 metres. The Ura Creek showings occur 1.0 km south-southwest of the resource area and trend north-easterly toward the resource.

The issuer reports that four trenches were dug at Ura Creek, with three testing the strike extent to the and one testing the strike extent to the south. Trenching proved the strike extend of the structure to be over 90 m.

A total of 15 samples are reported from this general area, with grades ranging from 0.01 g/t Au to 31.70 g/t Au.

## 9.2.4 JOMAKI PROSPECT

Approximately 1.7 km south of the resource area the Jomaki Ridge prospect, the Lomaki Prospect vein structures trend northerly and north-westerly towards the resource area and are apparently open towards the south. Vein density is encouraging in this area.

Follow up mapping identified several mineralised structures in the Veto Creek / Jomaki Ridge areas.

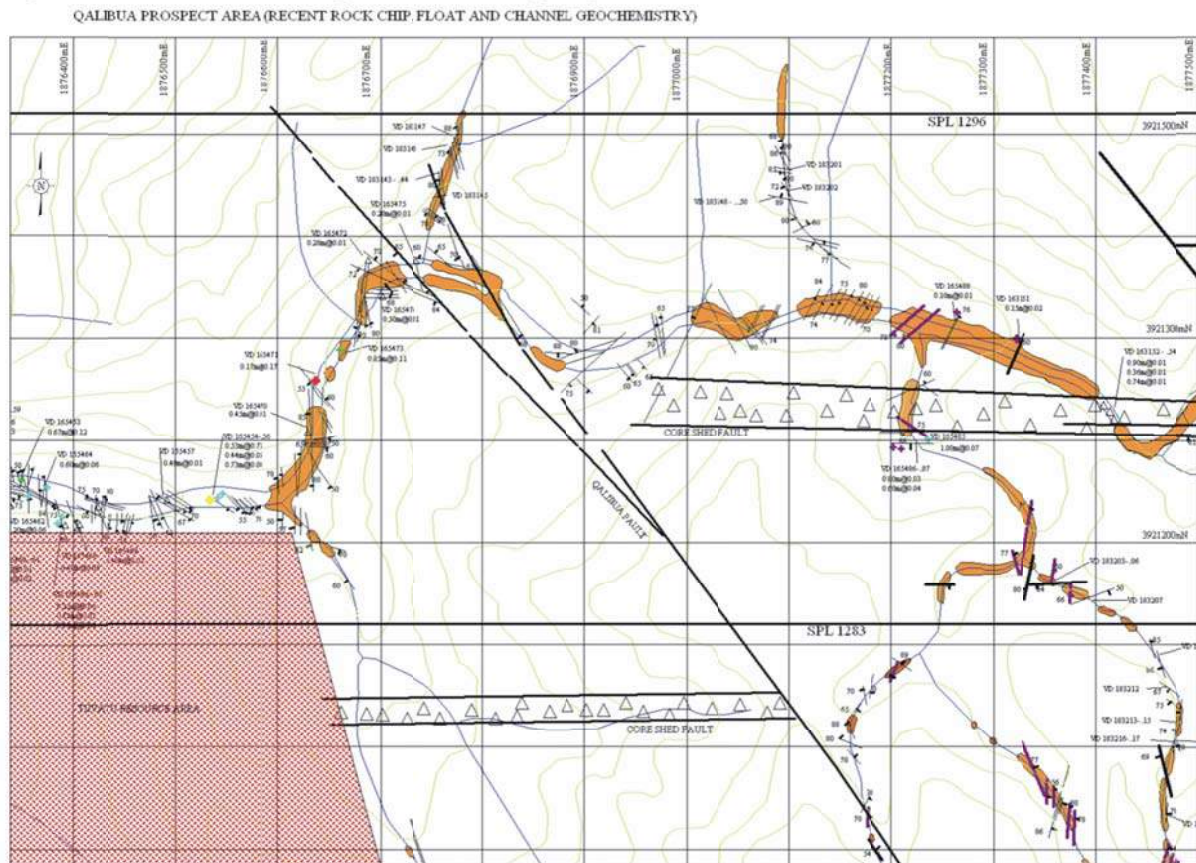
A total of 43 samples are reported from this general area, with grades ranging from 0.01 g/t Au to 16.15 g/t Au.

### 9.2.5 QALIBUA PROSPECT

Situated one kilometre northeast of the resource area this prospect is associated with anomalous stream sediment geochemistry and an intersection of N-S and E-W trending magnetic lows. Mapping and sampling was carried out along Qalibua Creek and the lower portion of Murau, SawaSawa and Wailoaloa Creek (Figure 9-??).

A total of 170 samples are reported from this general area, with grades ranging from 0.01 g/t Au to 9.95 g/t Au.

**Figure 9-2: Qalibua Prospect 2008 Sampling**

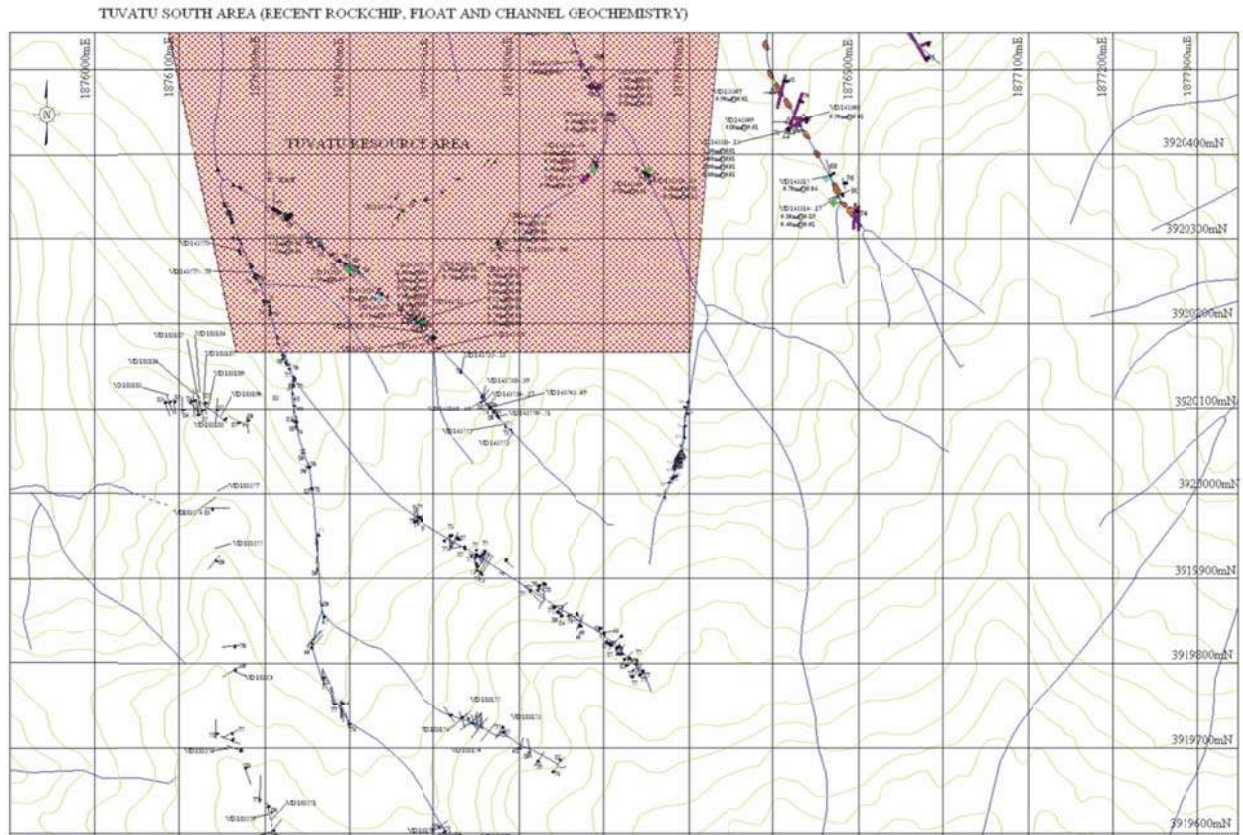


### 9.2.6 TUVATU SOUTH PROSPECT

This area is the southern extension of the Tuvatu resource area 500 m to the south. Two distinct mineralized structures occur in the area. The first zone contains two to three meter wide quartz-pyrite-sphalerite veins. The strike extends 100 m to the south. The second zone contains 1.0 m to 2.5 m wide veins and can be traced over 200 m.

A total of 81 samples are reported from this general area, with grades ranging from 0.01 g/t Au to 26.9 g/t Au.

**Figure 9-3: Tuvatu South Prospect 2008 Sampling**





## 10.0 DRILLING

Drilling programs carried out on the Property prior to 2007 are described in Section 5.1 of this report.

### 10.1 2008-2010 LION ONE

A diamond drill exploration program was carried out on the Nubunidike Prospect in 2008. The program targeted the combined Nubunidike, 290, and Hornet veins approximately 50 m below surface over a strike length of 500 m. The aim of the program was to acquire information on the dip and strike continuity of the vein system as well as grade distribution within the structures.

Although eleven holes totalling approximately 2,200 m were proposed for the drilling program, circumstances were such that only 2 boreholes, TUDDH-338 and TUDDH-340, were completed this being done during October 2008..

Both boreholes intersected structures and went through shear zones characterized by slickensided contacts.. The host rock is coarse to medium grained Nadele Breccia with 1 mm wide calcite veins and 0.2 m to 1.46 m wide layers of intercalated fine grained sediments,

Fifty-nine samples were taken from the two holes. Both the host rock and mineralized veins were sampled. The sample length ranged from 0.23 m to a maximum of 1.00 m.

A LY44 drill rig was used for the program. The drill sites were along the Navilawa access road to minimise cost and land disturbance.

**Table 10.1: Summary of Mineralized Intercepts from the 2009/2010 Drill Program**

Hole No.	From (m)	To (m)	Length (m)	Dip(o)	Au average (g/t)	Structure
TUDDH-338	81.21	81.62	0.41	45	1.06	Nubunidike Vein
TUDDH-340	No significant intersections					

Note that the intervals assayed for the 2008 diamond drilling are labelled as true widths in the field data sheets.

Andrew Vigar of MA visited the property in 2009 and during the field inspection he noticed that the drilling was not oriented properly relative to the vein being tested. It is possible that the two drill holes may have missed their intended target.

## **11.0 SAMPLING METHOD AND APPROACH**

There are no detailed sampling quality assurance / quality control (“QA/QC”) reports available on the sampling done by TGM for the pre-2000 drilling. According to TGM’s in-house mine report, selected portions of drill core were analyzed for gold and waste intervals were not assayed.

According to Emperor’s in-house feasibility report, all drill collars were picked up by mine surveyors on a regular basis using a Leica TPS 300 theodolite. Data was downloaded digitally and entered into a database. Where possible the collar azimuth and dip were also calculated by the surveyor to compare with the planned orientation and down hole survey data. The majority of diamond drill holes were also surveyed by down hole camera at 50 m intervals using an Eastman down hole survey camera. Percussion drill holes generally were not surveyed down hole due to the difficulties in surveying inside RC drill rods.

Drill core sections were cut in half using a core saw. Half-core samples were numbered, bagged and dispatched to the internal Emperor laboratory at Vatukoula for analysis.

### **2008 Drilling Program**

It should be noted that the 2008 drilling was completed on prospects peripheral to the main Tuvatu resource area and as such is not directly relevant to the P&E 2010 Resource Estimate. Accordingly P&E has not visited this site and has not conducted an independent verification sampling program or further checked the quality of the drill hole data.

During the 2008 exploration drill program, only visually identifiable mineralized intervals were assayed for gold with a total of 59 samples ranging in length from 0.23 to 1.0 m being collected from 376 m of drilling.

The field data sheets for this drilling state that all widths reported are true widths. The significant drill assay results are given in Table 10.1

There was no independent review of the drillhole sampling, geological logging or geological interpretations. It is expected that the work was done to an industry acceptable standard, however, there is risk involved with structural interpretations, grade and geological continuity.

## 12.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

During the pre-2000 drilling by Emperor, all samples were dispatched to the Emperor laboratory at Vatukoula for preparation and analysis. The whole sample was pulverised in a 5 kg ring mill prior to splitting. A 50 g sub-sample was subsequently analysed via fire assay with an atomic absorption spectrometry (“AAS”) finish. All samples above 1 g/t Au were re-assayed. According to Vigar (2009), monthly re-assays and checks on standards, mill products, mine and exploration samples were conducted with external commercial laboratories as part of the Emperor standard operating procedure. Laboratory certificates for these assays and checks were not provided to P&E. There was no evidence of the implementation of a QA/QC program utilizing field duplicates, blanks and standards.

The laboratory at Vatukoula is a private laboratory, as opposed to a commercial one, and it is not expected that they conducted an internal QC program for the samples submitted. However, the Vatukoula mine has relied on the results of its laboratory in order to run its operations since the 1930s and it can be reasonably assumed that the laboratory provides accurate assaying work.

### 2008 drill program analytical Procedures

All analysis in the 2008 drill program by Lion One was carried out by ALX Chemex Laboratories, Brisbane, Australia. In this program, the following procedure was followed:

- the sample was finely crushed (>75% passing through a -2mm) and a 1,000 gram split pulverized (>85% passing through a -75microns/2-200 mesh);
- assay for gold by fire assay for a 30 gram charge and AAS finish;
- assay silver by aqua regia digestion and AAS; and
- Exploration samples will likely undergo multi-element analysis (to 35 elements) via aqua regia or multi-acid digestion and ICP.

### Security of Samples

P&E is of the opinion that that no particular security measures have been used during the life of the Tuvatu project as visible free gold is rare and off-site laboratories have been used throughout. Half-core splits of most drill core have been retained on-site. This core is well catalogued and is available for on-site inspection.

### 2008 QA/QC Program

No information was provided regarding the QA/QC program for the 2008 drilling. Despite this it is mandatory that any new drilling, implement an appropriate QA/QC program.. This should include field blanks, field duplicates, and certified reference material (“CRM”) samples inserted in the field, as well as a request to the laboratory for them to insert laboratory blanks, and CRM and laboratory duplicates. The CRM should preferably be purchased from an independent manufacturer, such as Rocklabs in New Zealand, ([www.rocklabs.com](http://www.rocklabs.com)) or CANMET in Canada, ([www.nrcan.gc.ca](http://www.nrcan.gc.ca)). Quality control monitoring should be an on-going process by a member of the X-Tal team.

Given that the 2008 drilling is not considered relevant to the Project Database as it relates to the current Resource Estimate P&E the apparent lack of a QA/QC program for the 2008 is not deemed critical. Any future drilling however will require implementation of a proper real time monitored QA/QC program if the data are to be used in future Resource Estimate updates.

P&E does not have sufficient historical knowledge regarding the adequacy of past sample preparation, security and analytical procedures from the existing work at Tuvatu to form an opinion as to the adequacy of such work. However, P&E has somewhat relied on the results of its own sample verification program as outlined in the data verification in Section 13 to deem the existing sample database suitable for a resource estimation.

### 13.0 DATA VERIFICATION

#### 13.1 P&E SITE VISIT AND INDEPENDENT SAMPLING

The Tuvatu deposit was visited by Mr. Fred Brown, CPG, Pr.Sci.Nat. of P&E, during the period July 9-14, 2010. For this report, Mr. Brown retrieved 23 representative core samples from 23 drill holes. An attempt was made to sample intervals from a variety of low and high-grade material.

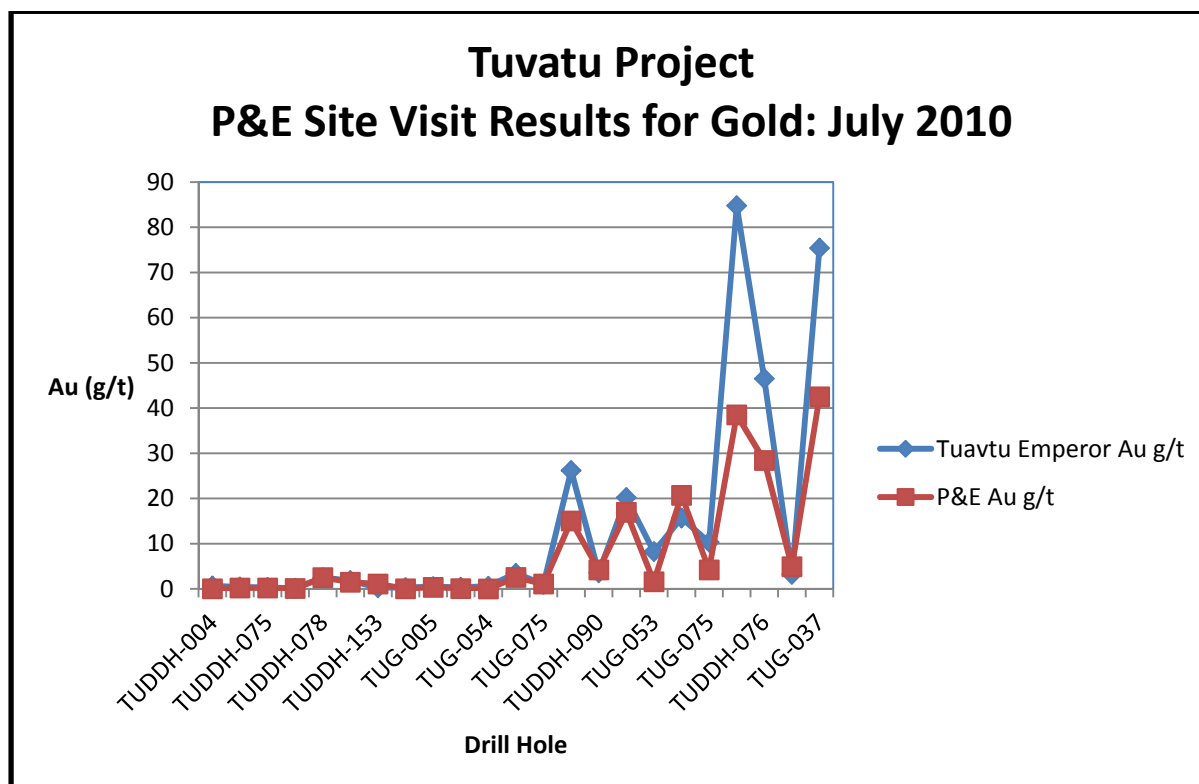
The selected sample intervals were then sampled by taking quarter splits of the remaining half-split core. The samples were then documented, bagged, and sealed with packing tape and were shipped by Fred Brown to ALS Chemex Laboratories in Brisbane, Australia for analysis.

At no time, prior to the time of sampling, were any employees or other associates of Lion One or AER advised as to the location or identification of any of the samples to be collected by P&E.

A comparison of the P&E independent sample verification results versus the original assay results for gold can be seen in Figure 13-1. The P&E results demonstrate that the results reported by Vigar and Kerr were reproducible with the major differences being with the samples above 10.0 g Au/t. This variation is probably due to the “nugget effect.”

Based on the result of the verification sampling, P&E deems the sample database suitable for use in a resource calculation. It is recommended that future work include twinning drill holes or re-sampling of selected portions of the drill core.

**Figure 13-1: Independent Sample Verification Results for Gold, July 2010**



## 13.2 HISTORICAL DATA VERIFICATION

The client provided P&E with a database of all the samples assayed from the Tuvatu Property as well as a PDF copy of all the original assay certificates. In creating the block model for the resource calculation, a subsection of constrained data was created from the original database. The constrained database consisted of 5865 assays. This constrained database was then manually checked against the original assay certificates.

A total of 454 corrections were made. The majority of corrections were either adjusting the minimum detection level or adjusting the assay value to the first assay value obtained in the case where secondary and tertiary assays were taken from the same sample. In the first case, the minimum detection level for the assays was 0.01 ppm. Samples that were below the detection limit ( $< 0.01$  ppm) were entered into the database as 0.01 ppm, which gives a high bias to these samples. These were adjusted to be half the minimum detection limit, 0.005 ppm.

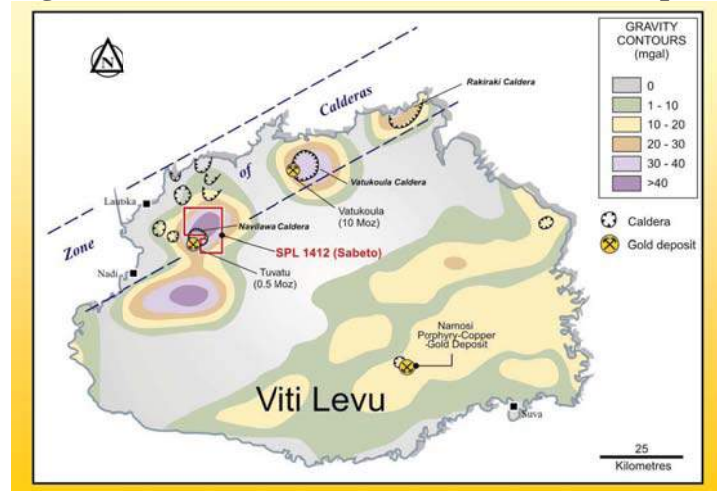
In the case where there were secondary or tertiary assay values, there was no discernable method or reason why one value was entered into the database over another. The database was adjusted to take the original assay value across the entire database for the sake of consistency.

## 14.0 ADJACENT PROPERTIES

This section of the report describes significant properties immediately adjacent to the Tuvatu property. The aim of this section is to convey to the reader some idea of the nature of epithermal gold deposits that occur in Fiji. *It should be noted however, that the QP has been unable to verify the public information presented in this section and the information presented on these adjacent deposits is not necessarily indicative of the mineralization on the Property that is the subject of this technical report*

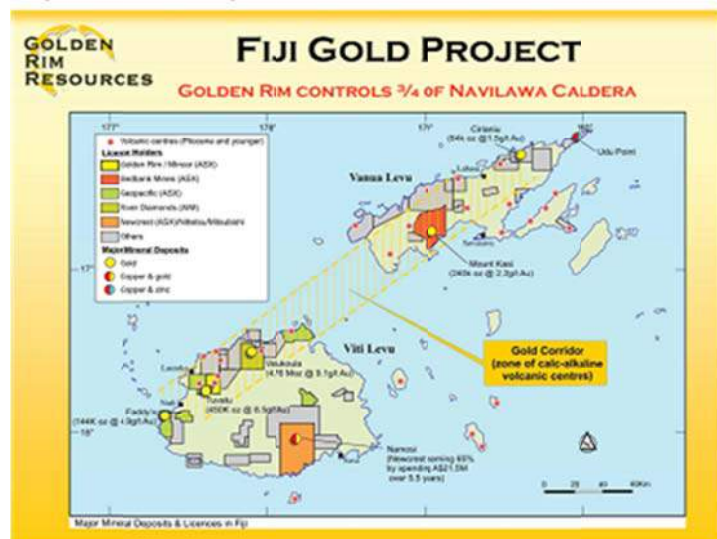
Tuvatu lies within the northeast trending Viti Levu lineament of calc-alkaline magmatism. A number of epithermal gold systems have been discovered along this trend including Tuvatu and Vatukoula (Figure 14-1). Active exploration in the vicinity of Tuvatu is being conducted on SPL1412 held by Golden Rim Resources Ltd. (“Golden Rim”) and located immediately north of the Tuvatu property. The following descriptions are taken from public documents available from the webpages or other publically referenced documents of Golden Rim ([www.goldenrim.com](http://www.goldenrim.com)) the current owner.

**Figure 14-1: Viti Levu Lineament with Gold Deposits**



(Source: Golden Rim 2008 Annual Report)

**Figure 14-2: Regional Tenement in Tuvatu Area**

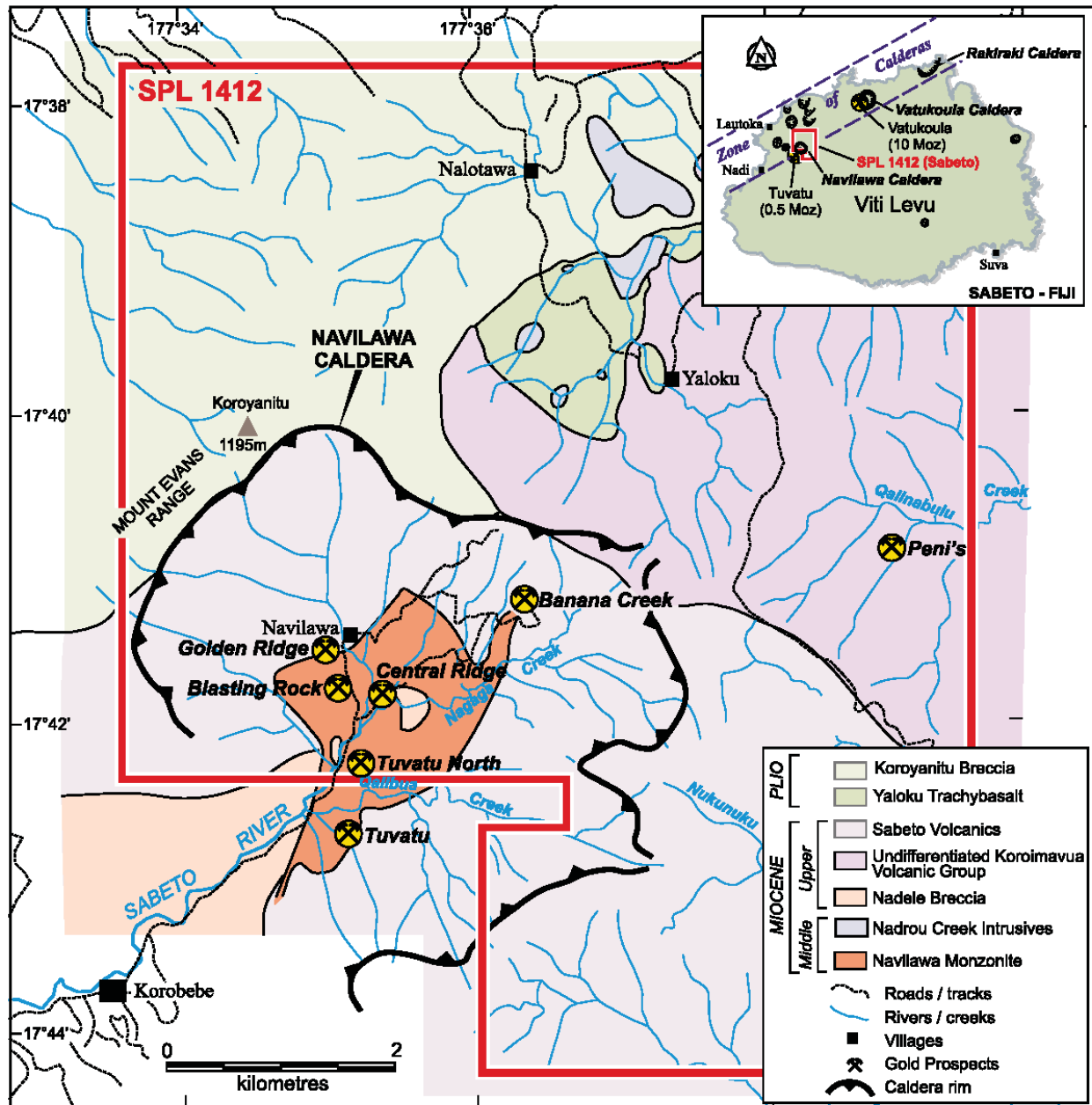


(Source: Golden Rim, 2008 annual report)

## 14.1 GOLDEN RIM - SABETO (GOLD) PROJECT

Golden Rim's Sabeto license SPL1412, covering an area of about 110 km<sup>2</sup>, is located directly north of the Tuvatu tenement block (Figure 14-4). Golden Rim has not completed any exploration on the Sabeto project since 2008.

**Figure 14-4: Location and Geology of the Sabeto Gold Project**

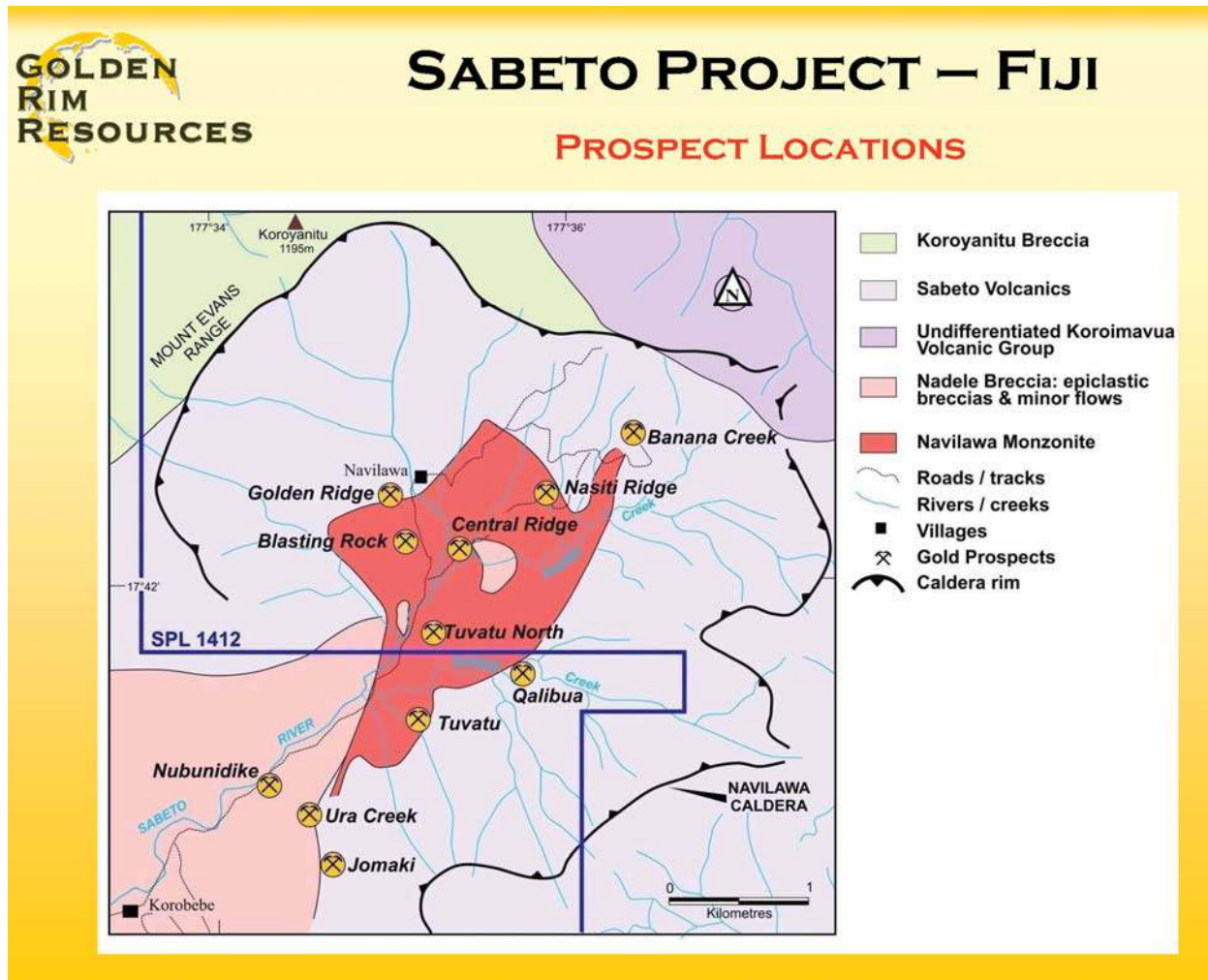


(Source: Golden Rim 2007 PowerPoint Presentation)

Previous exploration on this property by Mincor had established significant potential for bonanza grade epithermal deposits similar to the mineralization at the Banana Creek, Tuvatu North, Kingston and Vatume Hill prospects. These prospects are shown on Figures 14-5 with the Tuvatu North, Banana Creek and Central Ridge prospects briefly discussed below.



Figure 14-5: Location Map of Sabeto Prospects



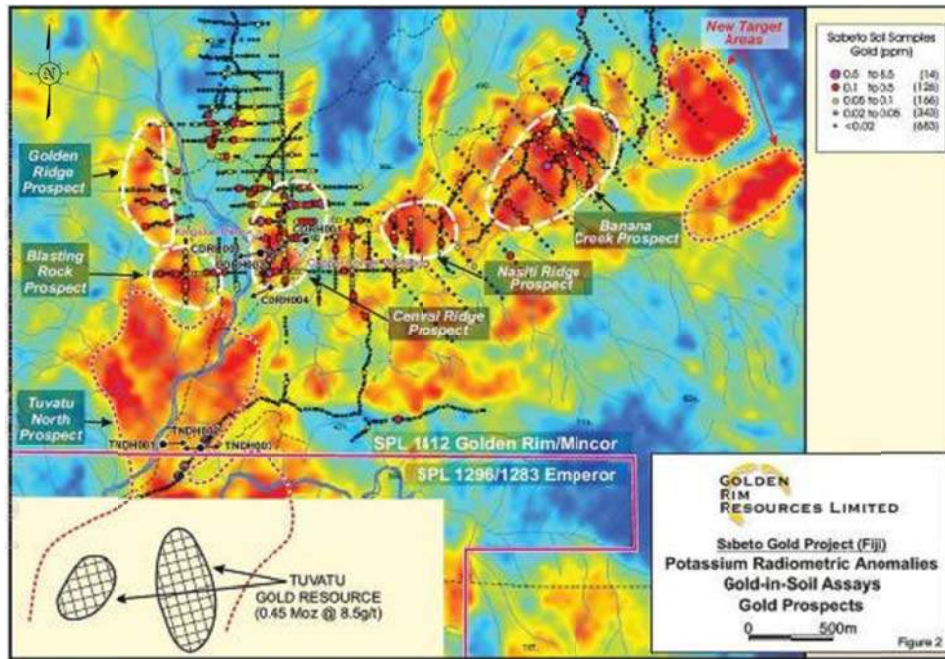
(Source: Golden Rim 2007 Annual Report)

### 14.1.1 TUVATU NORTH PROSPECT

At the Tuvatu North prospect in the southern portion of the tenement, previous explorer Pan Continental discovered a series of NE trending gold-bearing veins in 1988 which are now recognised as an extension of the epithermal gold veins of the adjacent Tuvatu gold deposit. The veining lies approximately 80 m north of the tenement boundary and sits in a distinctive alteration zone around 160 m wide, which trends northward from the Tuvatu deposit. Golden Rim describe the alteration zone as characterized by orange brown soil (argillic alteration) and a deeper soil profile compared with the greenish grey, shallow soil cover over the fresh monzonite to the East and West

Major potassium radiometric anomalies were identified within the licensed ground from a survey conducted by Golden Rim (Figure 14-6). In addition, a number of IP geophysical anomalies were identified, but not tested until the mid-1980's. The radiometric potassium anomaly at Tuvatu North has dimensions of 1.2 km x 0.9 km and is coincident with a magnetic low anomaly.

**Figure 14-6: Soil sample and Radiometric Anomalies SPL1412**

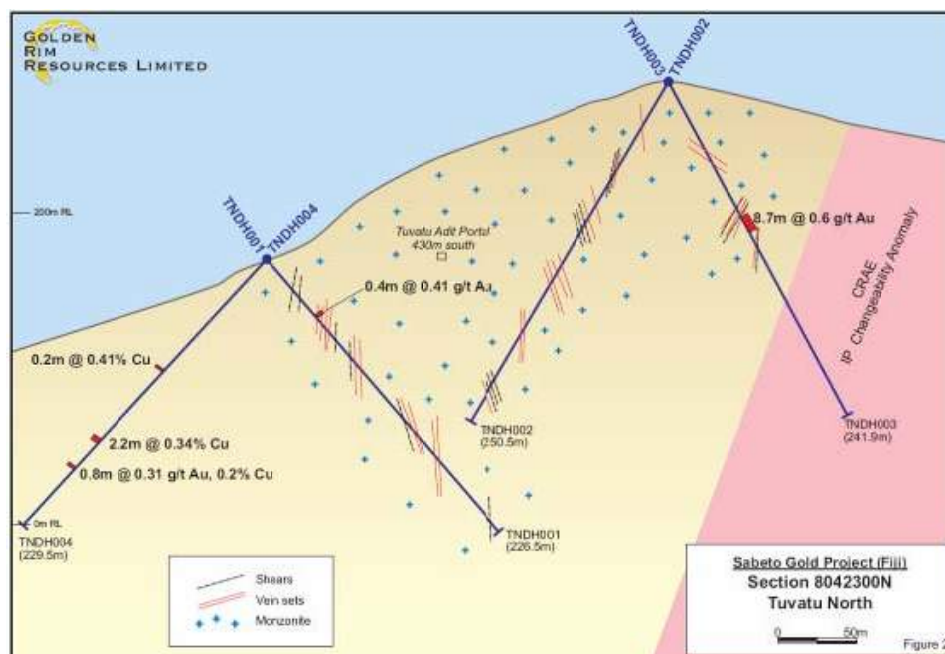


(Source: Golden Rim 2007 PowerPoint Presentation)

Very little previous exploration has been conducted on the anomalies. Mapping of tracks and creeks in the area have identified abundant silica / limonite veining but gold tenor was low.

Golden Rim initiated drilling on the Tuvatu North prospect in 2007 and drilled two holes (TNDH001 and TNDH002) to investigate radiometric anomalies at the Tuvatu North Prospect and a further two holes to test CRAE IP chargeability anomalies previously outlined. The significant assay results are depicted in Figure 14-7.

**Figure 14-7: Tuvatu North Drill Results**



(Source: Golden Rim Sep 2007 Quarterly Report)

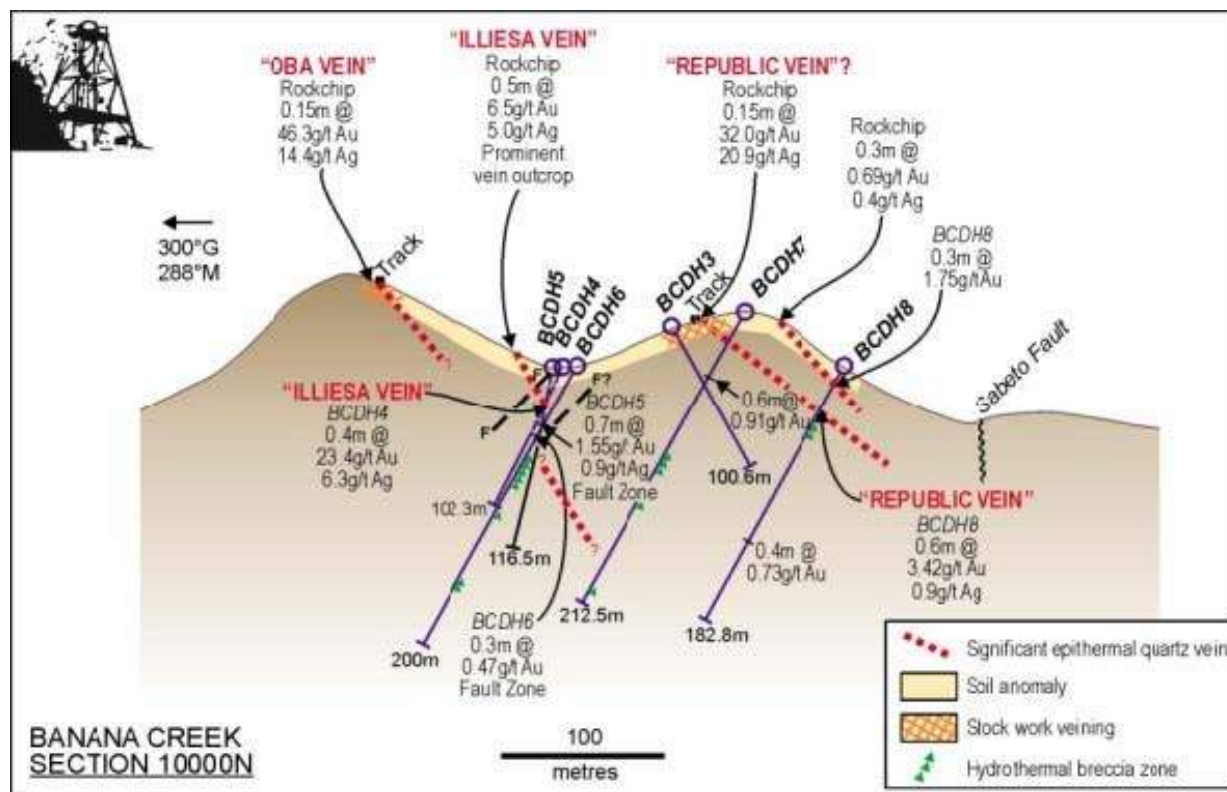
### 14.1.2 BANANA CREEK PROSPECT

At the Banana Creek prospect further north within the same tenement, geological mapping delineated at least five significant zones of stock work and quartz-sulphide veining. Golden Rim has reported that these zones trend NNW, strike for at least 200 m, and range in width from 10 to 20 m. All zones are open along strike and down dip. The largest of these zones, the Republic Zone, is at least 300 m long and 20 m wide.

A diamond drilling program of three holes for a total of 595.3 m was completed at Banana Creek from September to November 2002 to test the mineralized zones. Results are shown on Figure 14-8.

Golden Rim concluded that the drilling confirmed that the significant sulphide stockwork vein zones delineated in the mapping do not host any significant gold, and that significant gold is related to epithermal quartz veins only.

**Figure 14-8: Banana Creek Drillhole Results**



Mearns, (1990) described Banana Creek as a fairly extensive (1400 x 400 x 260 m) epithermal vein system that is zoned both vertically and horizontally. The lowest part of the system is characterised by low-sulphide veins with a Au-Pb-Zn association, while the higher levels are characterised by a low quartz high-sulphide system with a Au-As-Hg-Te association.

### 14.1.3 CENTRAL RIDGE PROJECT

As reported in Golden Rim's June 2007 quarterly, 4 holes were drilling in the Central Ridge Project (Figure 14-9). Significant carbonate / pyrite veining with patchy silicification was intersected in most holes hosted in biotite monzonite. Despite obtaining numerous anomalous

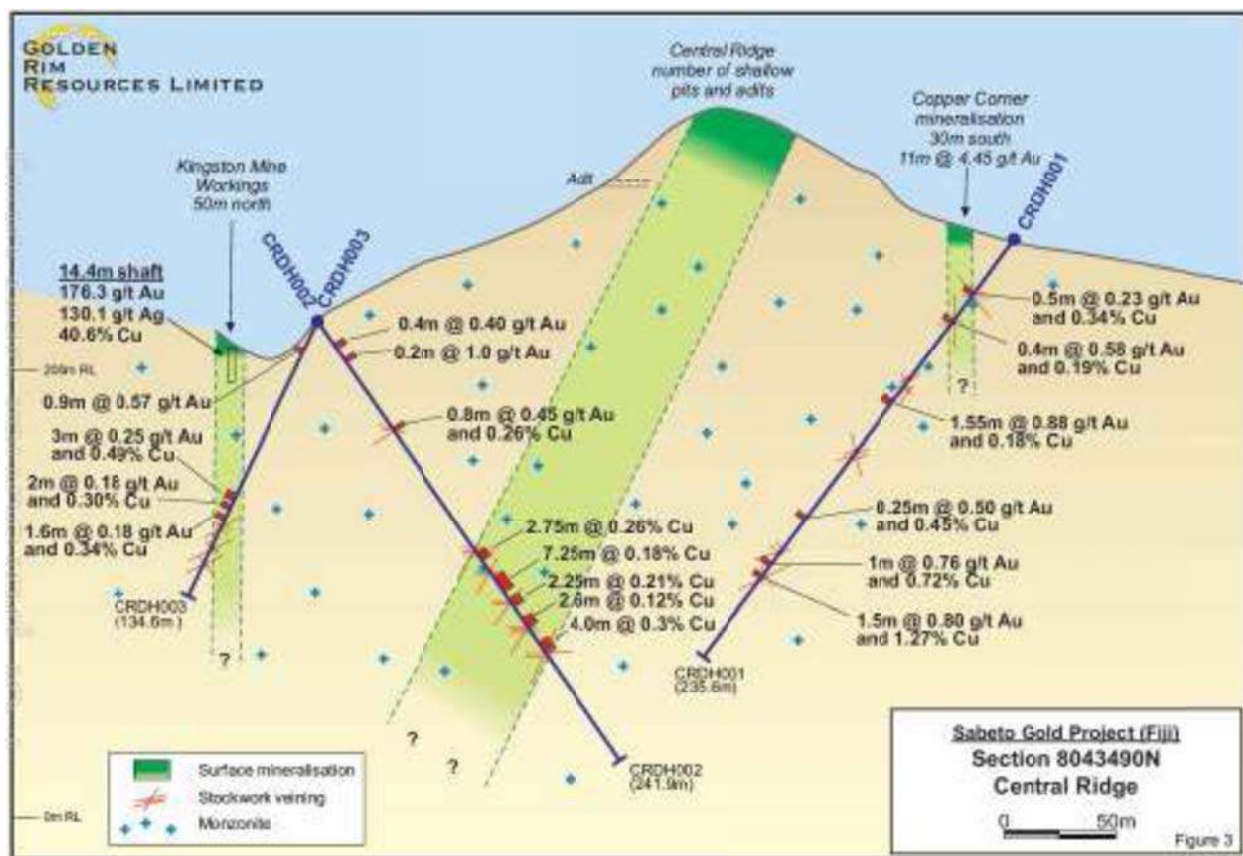
gold and copper assays the intercepts are all sub-economic. Much of the veining and silicification was associated with highly fractured zones within the main monzonite body.

The most significant copper and gold mineralization was intersected in CRDH 001 which was collared near historical workings and drilled towards the old Kingston Mine. Better intercepts from CRDH001 include 1.55 m at 0.88 g/t Au, 0.18 % Cu, 1.09 % Zn; 1 m at 0.76 g/t Au, 0.72 % Cu; and 1.5 m at 0.8 g/t Au, 1.27 % Cu.

CRDH 002 was collared around 50 m south of the Kingston Mine. This hole intersected broader zones of copper mineralization than CRDH 001, but gold tenors were generally lower. Most of the zones of copper mineralization were associated with highly fractured zones that were strongly chlorite altered. The most significant gold result from CRDH 002 was 0.2 m at 1.00 g/t Au from a brecciated fault zone at 20.9 m depth.

According to Golden Rim's June 2007 quarterly report, no additional drilling was planned for the Central Ridge area.

**Figure 14-9: Central Ridge drilling**



(Source: Golden Rim September 2006 Quarterly Report)

## 15.0 MINERAL PROCESSING AND METALLURGICAL TESTING

No current mineral processing or metallurgical test work has recently been completed by AER.

### 15.1 PREVIOUS METALLURGICAL TESTING

Metallurgical test work was conducted at the Vatukoula mine during their underground exploration program which found that 87 % of the gold was recoverable via direct cyanidation and 30 % of the gold recoverable via a gravity circuit.

In 1996, during the Phase 1 program, a parcel of Nasivi-SKL mineralization (968 t) was dispatched to the Vatukoula mine for batch processing and metallurgical test work. The mineralization treated averaged 3.63 g Au/t with a gold recovery of 82.74 %. The mineralization was only slightly refractory with 87 % of the gold being recoverable via direct cyanidation. Test work also suggested that 30 % of the gold could be extracted via a gravity circuit.

The second Phase of underground work began in March 1998 when 1,095 t of mineralization from the UR1 South strike drive was sent to Vatukoula and treated by the same procedure as the initial Phase 1 bulk sample. Metallurgical results were comparable to those for the first mineralization parcel. The mineralization was found to have a head grade of 4.79 g Au/t over the strike drive width. This compared with a grade of 4.83 g/t Au calculated from channel sample data. It was found that 84 % of the gold could be recovered via direct cyanidation. In flotation tests, 87 % of the gold went to the concentrate and 86.7 % recovery could be achieved via flotation followed by cyanidation. 146 oz of gold were produced from the parcel.

Additional metallurgical testing was conducted in September of 1999. The aim of this work was to test the amenability of the mineralization to extraction via heap leach. A 20 t bulk sample of mineralization from the UR1 strike and rise development was dispatched to the Vatukoula mine for column leach test work. The grade of the mineralization was determined to be 4.33 g/t Au but a high degree of variability was noted in grab samples.

A representative sample of 565 kg was leached in a purpose built column for a period of 31 days in order to simulate dump leach conditions. Reconciled recovery for the mineralization was found to be 56.4 %. A second sample of 457 kg was crushed to -20 mm prior to leaching for 37 days. The reconciled recovery for the crushed mineralization was 57.1 %.

The crushed sample exhibited a significant difference between reconciled and assayed recoveries, most likely due to the grade variability. Reagent consumption for both trials was low to moderate for lime and cyanide respectively.

In March 2000, Metcon Laboratories was enlisted to carry out additional metallurgical testwork on composite samples of mineralization from the UR1, UR2 and UR5 lodes. Samples were collected at regular intervals along the backs of the strike drives from the various lodes and combined to form composite samples for each lode.

Test work included gravity concentration, cyanidation, grinding and flotation test work. Initial work was carried out on mineralization samples ground to 7 µm. Recovery from gravity concentration ranged from 18.5 % to 52.8 %. Results for gravity concentration followed by cyanidation ranged from 81.7 % to 91.7 % recovery. Tests were carried out at coarser and finer

grinding sizes with some reductions in recovery at the coarser 150 µm grind size and only a small improvement at the finer 50 µm grind size. Flotation tests were also carried out on each composite at 150 and 75 µm grind sizes with between 90.6 and 93.6 % gold recovery to a rougher flotation concentrate of around 15 % by weight.

The related consultants' reports covering the above metallurgical studies by AMMTEC Ltd, Metcon Laboratories, Orway Mineral Consultants and Amdel Limited are appended to the In-House Feasibility Study (August 2000). According to the In-house Feasibility Study, approximately 9 % of the geologically modelled mineralization intercepts had undergone metallurgical test work.

## **16.0 MINERAL RESOURCES AND RESERVES**

### **16.1 INTRODUCTION**

The mineral resource estimate presented herein is reported in accordance with the Canadian Securities Administrators' NI 43-101 and has been estimated in conformity with generally accepted CIM "Estimation of Mineral Resource and Mineral Reserves Best Practices" (2005) guidelines. Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve. It cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate of Inferred Mineral Resources is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure.

P&E has relied upon and believes it has a reasonable basis to rely upon the opinion of Lion One that the estimate of mineral resources is not at this time materially affected by any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political mining, metallurgical, infrastructure or other relevant factors

All mineral resource estimation work reported herein was carried out by Mr. Fred Brown MSc. (Eng), CPG Pr.Sci.Nat. of P&E, and an independent Qualified Persons in terms of NI 43-101. This mineral resource estimate relies on information and data supplied by Lion One. A draft copy of this report was reviewed by Lion One for factual errors.

The effective date of this estimate is August 1, 2010.

Mineral resource modeling and estimation were carried out using the commercially available GEMS Gemcom v5.23 and Snowden Supervisor v7.10.11 software programs.

The site was visited by Mr. Brown from July 9-14, 2010. Access to the underground workings was not possible because the portal was closed and the mine was not dewatered and reconditioned.

### **16.2 PREVIOUS RESOURCE ESTIMATES**

A historic preliminary feasibility study prepared by Emperor (Emperor, 2000) was based on an unpublished mineral resource prepared by Andrew Vigar. The historical mineral resource as reported was based on eleven mineralized lodes, using a global bulk density of 2.7 t/m<sup>3</sup> and a cut-off grade of 3.00 g/t Au. No oxidized material was reported, and a capping value of 75 m.g/t was applied to all assays. The historical mineral resource reported a total of 211,000 ounces of gold in the Indicated category, and 283,000 ounces of gold in the Inferred category (Table 16.1).

A historic revised mineral resource estimate for the Tuvatu deposit was subsequently prepared by Andrew Vigar for the Tuvatu Gold Mining Company Limited (Vigar 2000). The historical mineral resource was reported based on eleven mineralized lodes, using a global bulk density of 2.7 t/m<sup>3</sup> and a cut-off grade of 3.00 g/t Au. An additional 21,000 t of unclassified oxidized material was reported, and a capping value of 75 g/t was applied to all assays. The historical

mineral resource reported a total of 289,000 ounces of gold in the Indicated category, and 251,000 ounces of gold in the Inferred category (Table 16.1).

The Vigar 2000 historical mineral resource was subsequently revised for unknown reasons (Vigar, 2007). The revised historical mineral resource as reported was based on eleven mineralized lodes, using a global bulk density of 2.7 t/m<sup>3</sup> and a cut-off grade of 3.00 g/t Au. No oxidized material was reported. This historical mineral resource was publicly reported in 2005 for the Emperor annual report to the ASX in compliance with JORC requirements (quoted in Vigar, 2007). No oxidized material was reported and a capping value of 75 g/t was applied to assays. The historic mineral resource reported a total of 210,000 ounces of gold in the Indicated category, and 238,000 ounces of gold in the Inferred category (Table 16.1).

Using the same data set as that used for the previous estimates, C.H. Lutherborrow (Dip TSc BSc MGeoSc MAusIMM) prepared a historical mineral resource estimate for the X-Tal Minerals Corporation (Lutherborrow, 2010). The historical mineral resource was reported based on seventeen mineralized lodes and three stockwork domains, using a global bulk density of 2.7 t/m<sup>3</sup> and a cutoff grade of 3.00 g/t Au. No oxidized material was reported, and a capping values ranging between 8.7 g/t and 121.7 g/t were applied on an individual lode basis. The mineral resource reported a total of 157,000 ounces of gold in the Indicated category, and 436,000 ounces of gold in the Inferred category (Table 16.1).

**Table 16.1: Historical Mineral Resource Estimates<sup>1,2</sup>**

Resource	Indicated			Inferred		
	Tonnes 1000	x Grade	Ozs x 1000	Tonnes 1000	x Grade	Ozs x 1000
Emperor 2000	852	7.71	211	608	14.47	283
Vigar 2000 <sup>2</sup>	1,065	8.45	289	757	10.31	251
Emperor 2005	828	7.9	210	812	9.1	238
Lutherborrow 2010	615	7.9	157	1598	8.2	436

(1) P&E has not independently verified the above mineral resource estimates, and makes no assurances as to the validity or economic viability of any of the stated mineral resources, in whole or in part. These historical estimates have not been shown to be in accordance with the mineral resources or mineral reserves classifications contained in the CIM Definition Standards on Mineral Resources and Mineral Reserves, as required by NI 43-101 and should not be relied upon. It should be further noted that these historical resource estimates have been superseded by the P&E 2010 NI 43-101 compliant resource estimate that is the subject of this report. The P&E 2010 resource estimate, as of the date of this report, is considered to be the only current and valid estimate for the Tuvatu deposit that is verified by a Qualified Person.

(2) Oxidized material not included.

### 16.3 SAMPLE DATABASE

Sample data were provided by Lion One in the form of an Access database. The majority of the data were originally compiled by Emperor between 1995 and 2001. The data were subsequently audited and validated by Vigar (Vigar 2007).

Data included historical surface drilling records, historical underground drilling records, and historical trenching and underground chip sampling data. The supplied database contains 607 records (Table 16.2), and includes collar, survey, lithology and assay data. Assay data fields consist of the drillhole ID, downhole interval distance, sample number and gold grade. The database contains a total of 38,557 Au assays. All data are in metric units and all collar coordinates are in a UTM grid system. All elevation data are relative to an assumed artificial sea level horizon of 10,000 m



**Table 16.2: Drilling Records**

<b>Data Type</b>	<b>Record Count</b>
Trench	35
Pit	5
Costean	6
Misc Drilling	24
Surface Diamond Drilling	232
RC Drilling	192
UG Drilling	113
<b>TOTAL</b>	<b>607</b>

## **16.4 DATABASE VALIDATION**

Industry standard validation checks were completed on the supplied database, and minor corrections made. P&E typically validates a mineral resource database by checking for inconsistencies in naming conventions or analytical units, duplicate entries, interval, length or distance values less than or equal to zero, blank or zero-value assay results, out-of-sequence intervals, intervals or distances greater than the reported drill hole length, inappropriate collar locations, and missing interval and coordinate fields. Minor naming discrepancies were noted and corrected during import of the data, as were a small number of interval sequence errors.

Of the 994 downhole survey measurements reported for diamond drilling and underground drilling, only six measurements reported a downhole survey deviation from the previous measurement of greater than 10°, with a maximum reported difference of 22.5°.

Three drillhole records contained incomplete collar coordinates and were not used for mineral resource modeling.

As a check on the validity of the assay database, P&E reviewed original Emperor assay records against a constrained subset of the supplied database. The constrained database consisted of 5,865 assays representing samples intercepted by the lodes defined in Lutherborrow (2010). These values were manually checked against the original assay records, and a number of discrepancies were noted in adjustments for the minimum detection level or in adjusting the assay value to the first assay taken in the case of secondary and tertiary assays. In the first case, the minimum detection level for the assays was 0.01 ppm. Samples that were below the detection limit (< 0.01 ppm) were entered into the supplied database as 0.01 ppm which gives a high bias to these samples. In the case of secondary or tertiary assay values, there was no discernable method or reason provided as to why one value was entered over another. The supplied database was therefore adjusted to take the original assay value across the database for consistency, a total of 454 corrections (8 %). All assay values of 0.01 g/t or less were then converted to 0.005 g/t, half of the assumed lower-detection limit.

## **16.5 SURVEY CONTROL**

A topographic surface of unknown origin was also supplied by Lion One. Emperor (2000) reports that all drillhole collar locations were established by mine surveyors and downloaded in digital format to a central database. Diamond drillholes were reported by Emperor as surveyed by an Eastman downhole camera at 50 m intervals.

Project tenement boundaries as supplied by Lion One were used to ensure that all reported mineral resources lie within the licensed areas.

## 16.6 BULK DENSITY

A total of 171 bulk density measurements were reported from drillhole core at Tuvatu (A-Izzeddin 1998), with an average reported bulk density of 2.83 t/m<sup>3</sup> (Table 16.3). The statistical mode of the bulk density measurements was assigned to all lithologies for this mineral resource estimate.

**Table 16.3: Bulk Density Statistics**

Count	171
Minimum	2.40 t/m <sup>3</sup>
Maximum	3.09 t/m <sup>3</sup>
Average	2.83 t/m <sup>3</sup>
Mode	2.85 t/m <sup>3</sup>
Standard Deviation	0.13

## 16.7 DOMAIN MODELING

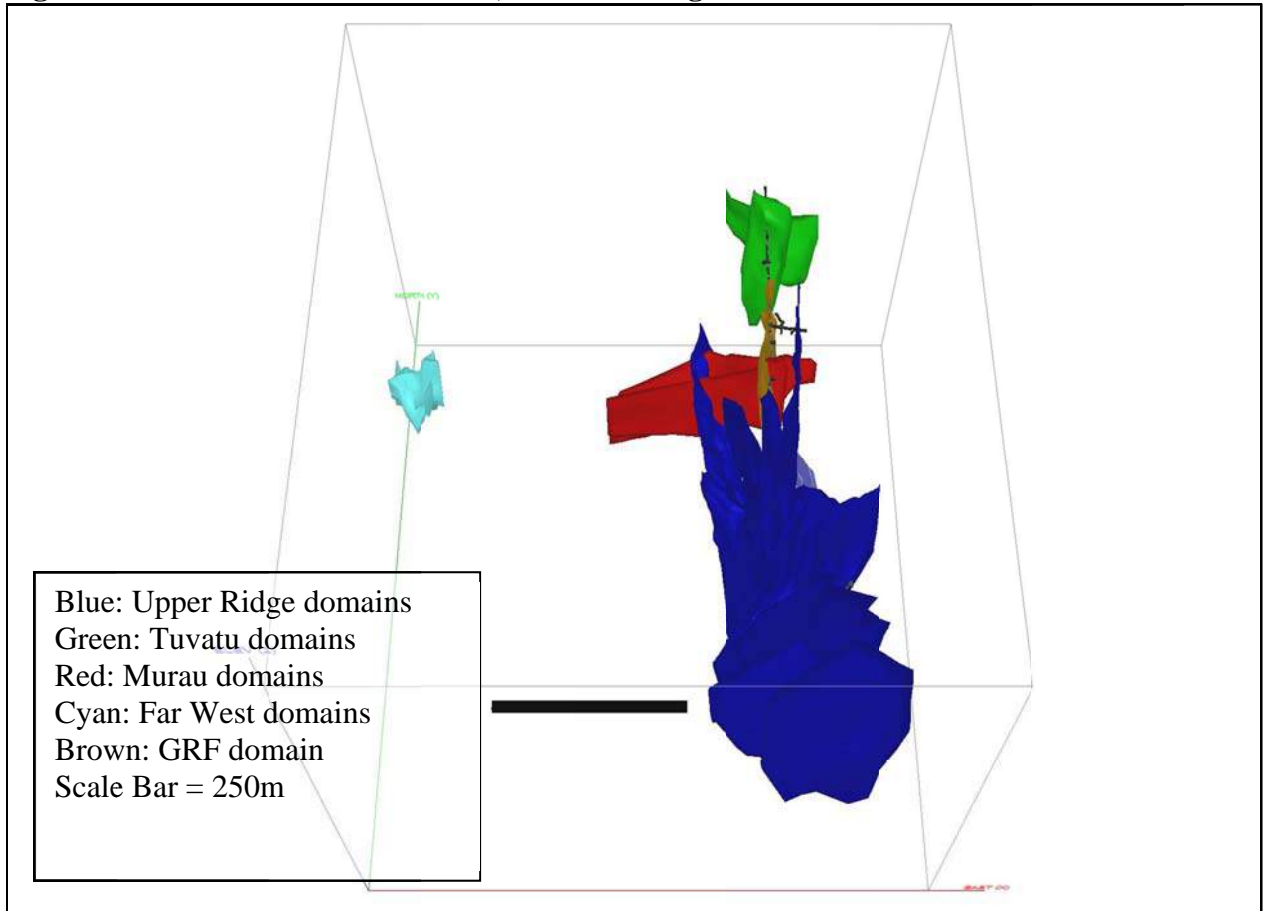
Previous mineral resource estimates have been based on a series of lodes identified by project geologists from drillhole core and underground mapping. The seventeen lodes identified by Lutherborrow (2010) have been categorized into ten Upper Ridge lodes (UR1, UR2, UR4, UR5, UR6, UR7, UR8, WR1, WR2 and WR3), two Tuvatu lodes (V1 and H1), two Murau lodes (M1 and M2), one lode identified during the development of the adit (GRF), and two Far West lodes (FW1 and FW2).

Based on the lodes identified by Lutherborrow (2010), seventeen distinct mineralization structures were generated by computer screen digitizing of successive polylines along parallel sections spaced ten meters apart. The polylines were defined by the selection of higher grade assays within the lode outlines modeled by Lutherborrow (2010), with assumed continuity along strike and down dip. In some cases low-grade mineralization was also included within the polyline boundaries for the purpose of maintaining continuity. All polyline vertices were snapped directly to drillhole assay intervals in three-dimensions, in order to generate true volumes. A three-dimensional representation of the mineralization structure was then created by combining successive polylines into a validated wireframe (Figure 16-1).

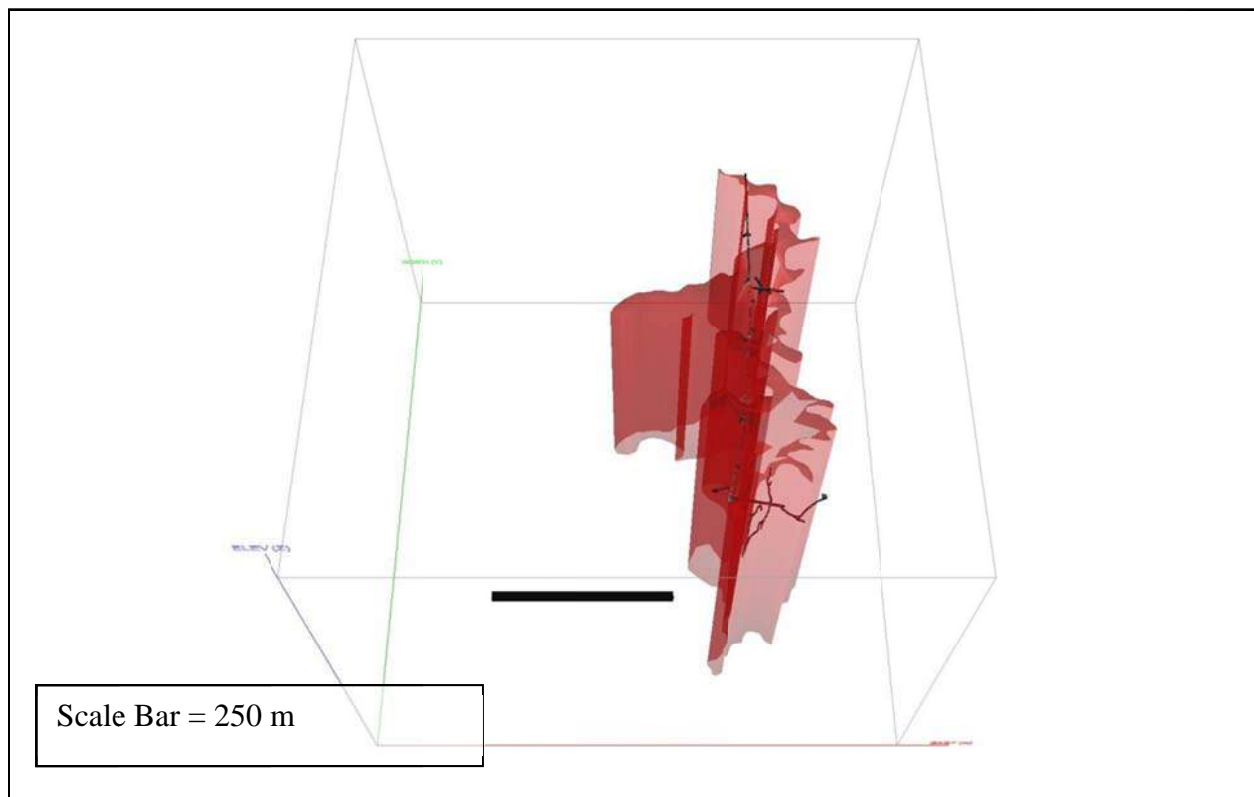
In order to ensure that all potential economic mineralization was captured for mineral resource estimation, a secondary stockwork iso-shell (X2) based on a 3.00 g Au/t threshold was then modeled around the defined mineralization structures. All mineral resources defined by the iso-shell were classified as Inferred. (Figure 16-2).

Tankard (1993) reports an eighteen metre weathered zone and an additional twelve meters of oxidized material associated with trenching and surface RC drillholes at Tuvatu. Vigar (2000) also initially reported an oxide surface of fifteen meters. In order to account for near-surface oxide material, a lower oxide limit was assumed at 30 m below the topographic surface. All mineral resources above this limit were classified as Inferred.

**Figure 16-1: Mineralized Structures, View Looking North**



**Figure 16-2: Iso-shell, View Looking North**



## 16.8 COMPOSITING

Assay sample lengths for the database range from 0.01 to 6.00 m, with an average sample length of 0.81 m. A compositing length of 1.00 m was therefore selected for use for estimation. Length-weighted down hole composites were calculated within the defined mineralization structures. Missing sample intervals in the data were assigned a nominal grade of 0.001 g Au/t.

The compositing process started at the first point of intersection between the drillhole and the structure intersected, and halted upon exit from the domain wireframe. Composites that were less than 0.50 m in length were discarded so as to not introduce a short sample bias into the estimation process. The wireframes that represented the interpreted mineralization structures were also used to back-code a rock code field into the drillhole workspace. Each assay and composite was assigned a rock code value based on the domain wireframe that the interval fell within. The composite data were then exported to Gemcom extraction files for grade estimation.

## 16.9 EXPLORATORY DATA ANALYSIS

Summary assay statistics for each domain (Table 16.4) and summary composite statistics (Table 16.5) were calculated by individual domain, for the total data set, and for the combined non-stockwork structures. Comparison of the data sets suggests that additional drilling will be required moving forward in order to better delineate individual higher grade zones within the defined mineralization structures. A comparison of the data sets also demonstrates the difference in grade distributions within the mineralization structures.

**Table 16.4: Summary Assay Statistics**

Assays	Samples	Minimum	Maximum	Mean	St Dev	CV	99 %
--------	---------	---------	---------	------	--------	----	------

UR1	353	0.005	160.00	4.21	13.52	3.21	61.00
UR2	572	0.005	1185.00	7.00	51.88	7.41	116.00
UR4	199	0.005	209.00	3.50	17.41	4.97	114.00
UR5	158	0.005	150.00	3.21	14.41	4.49	69.20
UR6	98	0.005	6.70	0.59	1.31	2.21	6.70
UR7	18	0.005	21.80	1.73	5.16	2.98	21.80
UR8	18	0.005	18.27	2.51	5.24	2.09	18.27
WR1	375	0.005	1614.00	9.82	86.66	8.82	167.00
WR2	286	0.005	79.00	2.12	6.92	3.26	29.50
WR3	265	0.005	270.00	4.61	18.97	4.11	66.90
V1	227	0.005	271.00	3.22	19.42	6.03	16.60
H1	88	0.005	24.00	2.21	4.91	2.22	24.00
M1	94	0.005	66.00	3.39	8.75	2.58	66.00
M2	148	0.005	110.00	2.63	10.24	3.89	38.00
GRF	93	0.005	75.40	4.07	11.52	2.83	75.40
FW1	193	0.005	155.00	5.37	17.44	3.25	152.00
FW2	129	0.005	100.00	2.72	10.06	3.70	39.00
X2	13016	0.005	1051.00	0.92	12.47	13.56	14.94
STRUCTURES	3314	0.005	1614.00	4.75	38.17	8.04	27.50
TOTAL	16331	0.005	1614.00	1.64	21.98	13.44	67.50

**Table 16.5: Summary Composite Statistics**

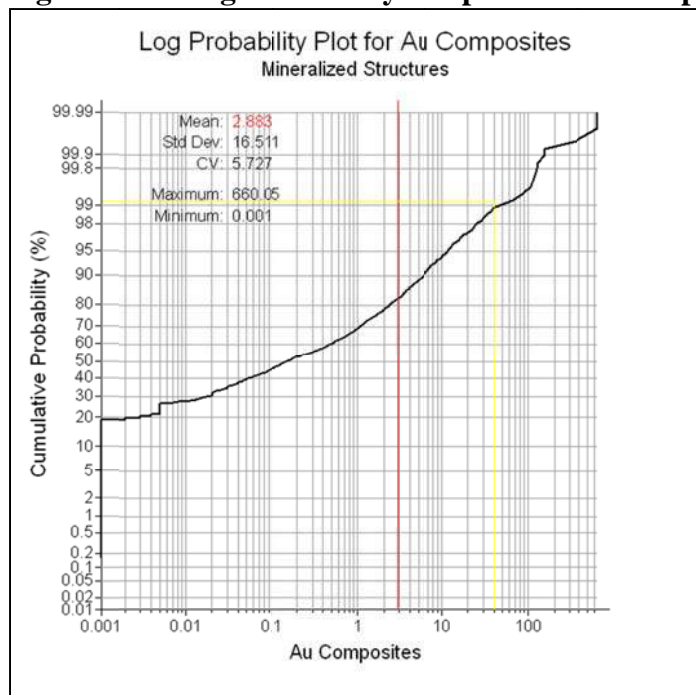
Composites	Samples	Minimum	Maximum	Mean	St Dev	CV	99%
UR1	275	0.001	104.15	3.14	8.64	2.76	36.99
UR2	439	0.001	125.36	3.87	11.72	3.02	67.38
UR4	172	0.001	63.06	1.75	6.39	3.65	47.05
UR5	127	0.001	85.22	2.07	8.73	4.21	39.66
UR6	132	0.001	13.40	0.57	1.77	3.10	9.43
UR7	21	0.001	5.13	0.35	1.12	3.23	5.13
UR8	19	0.001	13.40	1.71	4.03	2.35	13.40
WR1	383	0.001	660.05	5.36	39.84	7.44	119.48
WR2	313	0.001	34.56	1.16	4.13	3.57	25.45
WR3	203	0.001	127.96	3.63	11.22	3.09	28.78
V1	258	0.001	54.57	1.62	4.23	2.61	14.95
H1	69	0.001	24.00	2.49	5.11	2.05	24.00
M1	95	0.001	28.51	1.99	4.63	2.33	28.51
M2	114	0.001	24.98	1.39	3.53	2.55	16.84
GRF	65	0.001	19.66	2.15	3.89	1.81	19.66
FW1	159	0.001	153.99	5.30	16.52	3.12	104.96
FW2	157	0.001	99.98	1.67	8.58	5.14	33.54
X2	23972	0.001	373.00	0.26	3.82	14.46	4.69
STRUCTURES	2961	0.001	660.05	2.88	16.51	5.73	37.58
TOTAL	26934	0.001	660.05	0.52	8.99	17.44	10.42

## 16.10 TREATMENT OF EXTREME VALUES

The distribution of high-grade gold outliers was evaluated by examining composite capping graphs, histograms and log-probability graphs for the combined composite data set (Figure 16-3).

In addition, analysis of check samples collected by P&E from drillhole core suggests a potential bias in higher grade assay values exceeding approximately 40 g Au/t.

**Figure 16-3: Log Probability Graph of Gold Composites**



A global value of 40 g/t, corresponding to the 99.16 percentile, was therefore selected to minimize rapid variation in the composite sample distribution, and reduce the influence of high-value Au outliers during linear estimation. The capping threshold was implemented on composites during estimation, and all composite values exceeding the threshold were reduced to this value.

### 16.11 BLOCK MODELS

A series of orthogonal block models were established across the project area for each modeled mineralization structure (Table 16.6). Each block model consists of separate folders for estimated grade, block percent, block density and block classification attributes. A percent block model was used to accurately represent the volumes and tonnages that were contained within the respective mineralization structures. As a result, domain boundaries were properly represented by the percent model's capacity to measure infinitely variable inclusion percentages within a specific structure. The volume of the adit was considered to be inconsequential, and was not adjusted for in the volumetrics calculations.

**Table 16.6: Block Model Setup**

Axis	Origin	Blocks	Size
X	1,875,800	90	10m
Y	3,920,200	90	10m
Z	10,600	90	10m
Rotation	0		

### 16.12 ESTIMATION & CLASSIFICATION

The mineral resource estimate was constrained by wireframes representing individual domains that form hard boundaries between their respective composite grade data sets.

Due to the complex nature of the mineralized structures, variography was inconclusive. Block grades were therefore estimated using Inverse Distance Cubed (“ID3”) linear weighting of capped composite values. A two-pass series of expanding search ellipses with minimum sample requirements was used for sample selection and classification:

- During the first pass, three to twelve composite values from two or more drillholes within the defined search ellipsoid were required for estimation. The search ellipsoid axes were aligned along the general orientation of the mineralized structure (Table 16.7), and measured 35 m x 35 m x 10 m. All block grades estimated during the first pass were classified as Indicated.
- During the second pass, blocks not populated during the first pass were estimated. Three to twelve composite values from two or more drillholes within the defined search ellipsoid were required for estimation. The search ellipsoid axes were aligned along the general orientation of the mineralized structure (Table 16.7), and measured 300 m x 300 m x 30 m. All block grades estimated during the second pass were classified as Inferred.

**Table 16.7: Search Ellipse Orientations Along Mineralized Structures<sup>1</sup>**

<b>Structure</b>	<b>Orientation</b>
FW1	isotropic
FW2	isotropic
GRF	085° -75° 355°
H1	210° -85° 300°
M1	175° -85° 265°
M2	175° -85° 265°
UR1	110° -80° 200°
UR2	110° -80° 190°
UR4	120° -85° 210°
UR5	135° -85° 225°
UR6	155° -85° 245°
UR7	155° -85° 245°
UR8	155° -85° 245°
V1	210° -85° 300°
WR1	080° -75° 350°
WR2	085° -75° 355°
WR3	105° -75° 195°
X2	090° -85° 180°

(1). Orientations are defined by the Gemcom Azimuth-Dip-Azimuth convention.

### **16.13 MINERAL RESOURCE ESTIMATE**

Mineral resources were classified in accordance with guidelines established by the CIM (2005):

- Inferred Mineral Resource: “An ‘Inferred Mineral Resource’ is that part of a mineral resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified,

geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes.”

- Indicated Mineral Resource: “An ‘Indicated Mineral Resource’ is that part of a mineral resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough for geological and grade continuity to be reasonably assumed.”
- Measured Mineral Resource: “A ‘Measured Mineral Resource’ is that part of a mineral resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough to confirm both geological and grade continuity.”
- 

In order to ensure that the reported mineral resources meet the CIM requirement of “reasonable prospects for economic extraction”, all mineral resources are tabulated against a cut-off grade of 2.0 g/t Au. The cut-off grade was calculated using the assumed economic parameters listed in Table 16.8, which were derived by P&E from general knowledge of similar projects and local costs. The gold price represents the 24 month trailing average as of July 31, 2010.

**Table 16.8: Cut-off Parameters**

Mining Cost	US\$30.00/t
Processing Cost (800 t/d)	US\$15.00/t
General & Administrative	US\$13.00/t
Gold Price	US\$993.00/oz
Process Recovery	90%
Cut-off	2.0 g/t Au

The mineral resource reported a total of 172,000 ounces of gold in the Indicated category, and 480,000 ounces of gold in the Inferred category at a cut-off grade of 2.00 g/t (Table 16.9 and Table 16.10).

**Table 16.9: Mineral Resource Estimate at a 2.0g/t Au Cutoff<sup>1,2</sup>**

	Indicated			Inferred		
	Tonnes x 1000	Grade g/t	Au ozs x 1000	Tonnes x 1000	Grade g/t	Au ozs x 1000
Sulphides	760	7.05	172	2,502	5.78	465
Oxides	0	0	0	116	4.15	15
<b>TOTAL</b>	<b>760</b>	<b>7.05</b>	<b>172</b>	<b>2,618</b>	<b>5.71</b>	<b>480</b>



- (1) Mineral resources which are not mineral reserves do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues. There is no guarantee that all or any part of the mineral resource will be converted into mineral reserve.
- (2) It cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate of Inferred Mineral resources is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure

**Table 16.10: Sulphide Mineral Resource Estimates by Domain at a 2.0 g/t Au Cut-off<sup>1,2</sup>**

Structure	Indicated			Inferred		
	Tonnes x 1000	Grade g/t	Au ozs x 1000	Tonnes x 1000	Grade g/t	Au ozs x 1000
FW1	0	0.00	0	97	6.84	21
FW2	0	0.00	0	49	3.86	6
GRF	21	5.32	4	13	4.59	2
H1	18	7.97	5	18	6.26	4
M1	26	5.61	5	140	6.02	27
M2	8	3.35	1	7	3.24	1
UR1	134	6.83	29	132	6.60	28
UR2	205	6.84	45	457	5.74	84
UR4	52	5.96	10	98	4.17	13
UR5	29	8.15	8	89	4.56	13
UR6	1	2.16	0	1	2.22	0
UR7	0	2.01	0	10	3.00	1
UR8	1	3.97	0	32	3.89	4
V1	7	3.66	1	17	3.42	2
WR1	91	9.73	29	226	9.48	69
WR2	57	7.68	14	124	7.26	29
WR3	111	6.50	23	82	4.07	11
X2	0	0.00	0	912	5.12	150
<b>TOTAL</b>	<b>760</b>	<b>7.05</b>	<b>172</b>	<b>2,502</b>	<b>5.78</b>	<b>465</b>

- (1) Mineral resources which are not mineral reserves do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues. There is no guarantee that all or any part of the mineral resource will be converted into mineral reserve.
- (2) It cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate of Inferred Mineral resources is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure

To demonstrate the economic sensitivity of the deposit the total estimated sulphide mineral resource was also tabulated relative to cut-off grades of 1.0 g/t Au and 3.0 g/t Au. Total estimated mineral resources at a 1.0 g/t cut-off are comprised of an Indicated Au mineral resource of 189,000 ounces and an Inferred Au mineral resource of 551,000 ounces. Total estimated mineral resources at a 3.0 g/t cut-off are comprised of an Indicated Au mineral resource of 158,000 ounces and an Inferred Au mineral resource of 400,000 ounces (Table 16.11).

**Table 16.11: Sulphide Mineral Resource Sensitivity<sup>1,2</sup>**

Sulphides	Indicated			Inferred		
	Tonnes x 1000	Grade g/t	Au oz x 1000	Tonnes x 1000	Grade g/t	Au oz x 1000
3.0 g/t Au cut-off	572	8.57	158	1,682	7.39	400
2.0 g/t Au cut-off	760	7.05	172	2,502	5.78	465
1.0 g/t Au cut-off	1,118	5.26	189	4,382	3.91	551

- (1) Mineral resources which are not mineral reserves do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political,

marketing, or other relevant issues. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

(2) It cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate of Inferred Mineral Resources is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure.

## 16.14 VALIDATION

The block model was validated visually by the inspection of successive section lines in order to confirm that the block model correctly reflects the distribution of high-grade and low-grade samples. Visual validation of the block estimates combined with observed differences in the summary statistics suggests that the impact of high-grade samples on the mineral resource estimate will need to be further evaluated moving forward.

A validation check for global bias was completed by comparing the modeled block estimates to a Nearest Neighbour (“NN”) block estimate generated using the same search criteria and tabulated at a nominal zero grade cut-off within the constraining domain. Results demonstrate a minimal global bias and are deemed suitable for mineral resource estimation (Table 16.12).

**Table 16.12: Nearest Neighbour Results at a Nominal Zero Grade Cut-off.**

Structure	ID3 g/t	NN g/t
FW1	4.85	6.14
FW2	1.58	2.23
GRF	2.25	2.05
H1	3.27	3.34
M1	3.50	4.34
M2	0.98	1.17
UR1	3.48	3.61
UR2	3.84	4.26
UR4	2.10	2.40
UR5	2.20	1.66
UR6	0.39	0.41
UR7	0.32	0.31
UR8	0.78	0.46
V1	0.96	1.03
WR1	3.25	3.03
WR2	1.96	1.87
WR3	2.36	2.28
X2	0.13	0.13
<b>TOTAL</b>	<b>0.33</b>	<b>0.33</b>

## **17.0 OTHER RELEVANT DATA AND INFORMATION**

P&E is not aware of any other relevant data or information at this time.

## 18.0 INTERPRETATION AND CONCLUSIONS

No further resource drilling has been conducted after 2000. P&E feels that the current drillhole database is reasonable and suitable for use in the preparation of the independent NI 43-101 compliant P&E 2010 Mineral Resource Estimate that is the subject of the current report

- P&E has reached the following interpretations and conclusions, based on its review and synthesis of the project data. Historically, the mine area geology has been interpreted as a sequence of volcanoclastic units intruded by a monzonite stock with the narrow vein style of epithermal gold mineralization occurring as structurally-controlled sets and networks of narrow veins and cracks within the monzonite host, with individual structures generally ranging from 1 to 200 mm wide. This style of mineralization is best developed as a narrow vein underground mining operation. There are, however, areas of either wide veins (> 5 m) or dense arrays of narrow veins over considerable widths. Consideration could be given to open pit mining scenarios in such circumstances (i.e. Upper Ridges or Murau areas).
- The main lode structures identified to date are:
  - 11 lodes in the Upper Ridges area;
  - 2 lodes in the Murau area;
  - 3 lodes in the West area;
  - 2 lodes in the Tuvatu area;
  - the flatmikes in the SKL area; and
  - an additional number of other lodes have been identified in the local area but remain untested.
- Although the local geology is purportedly quite well understood P&E believes that structural complexities can be locally important and that there is more work required on the structural model to allow for higher confidence when more advanced scoping or feasibility level studies are undertaken, for example:

There appears to be a general consensus (Vigar, 2009) that the structural model is reliable only in the Upper Ridges area that forms the bulk of the resource estimate. Future exploration and mining in the other areas identified will require better structural models for modelling and planning purposes. In addition any mining method employed will likely utilize highly selective ore control methods to recover high-grade material. Therefore a more reliable understanding of local geometry / structural changes is required.

- The historical approach of not assaying areas of more subtle mineralized material when combined with the re-evaluation of geology based on wireframes suggests that some upside potential may exist for small scale mineralized structures within the Tuvatu resource area. P&E concurs with the MA recommendation that the complete database be re-evaluated, more core sampled and assayed and resource models suitable for both open pit and underground mining studies be generated.
- The Tuvatu deposit remains open at depth and down plunge with further drilling, guided by current 3-D modelling, required to expand the current resource.

- In addition, the mineralization at Tuvatu still contains mineralized lodes that remain relatively untested. For example of the 20 known lodes, only 11 were used in the resource model. There is considerable scope to increase the resource with attention to these areas.
- P&E has noted that the current database is not based on standardized sectional drilling. This makes it difficult to define individual lodes using traditional methods of interpreting geology on section.
- Block modelling and estimation methods should be reviewed prior to more detailed studies being undertaken. The long sections demonstrate that many models show high grade plunging shoots within the lodes. These shoots are often open at depth and it is suggested that that first phase of drilling be targeted at confirming these shoots and better defining their limits.
- P&E notes that detailed grade control will be required to ensure reliable location of the high-grade lenses that selective mining requires. These types of structures tend to pinch and swell over relatively short distances and the exact nature of mineralization must be known on a predictable basis.
- The Tuvatu region is highly prospective as evidenced by the number of prospects described in this report. P&E believes that recent and historical exploration has demonstrated the mineralized system within the Perimeter areas (i.e. SPL1283 and SPL1296) as outlined in Section 14 “Adjacent Properties” of this report, is prospective for the discovery of additional gold mineralization of a similar nature to that at the current Tuvatu Mine.

The following interpretations and conclusions are noted from the 2000 work by Emperor:

- The lode structures defined on the geological maps and assay plans were exposed in an exploration decline. Data obtained from the decline appears to generally agree with the drilling information at the exploration stage. This provides a reasonable level of confidence that the lodes have been modelled in a reasonable way. Without the actual numbers and sample locations, it is difficult to make an informed opinion on the drilling versus decline correlations regarding grade, width and location.
- An area of potential upside is that the exploration decline encountered smaller, local mineralized structures that were not thought to exist. This is evidenced by the GRF lode which now forms part of the Tuvatu resource inventory, but was not identified in drilling. Additionally, other mineralized structures in the exploration decline were identified that were considered too poorly understood to use in mineral resource estimation but their significance should perhaps be re-visited .
- Grade control drilling will be critical for mine planning. It has been noted in the decline that local splays and cross cutting lodes in the Upper ridges area caused ‘confusion’ regarding the location of UR2. Additionally, local offsetting and dilation of the lode due to shearing was noted. If selective mining methods are planned, these splays, cross

cutting lodes and local offsets will need to be well understood and modelled in order to plan the maximum extraction of economic mineralization.

## 19.0 RECOMMENDATIONS

Recommendations are made to conduct dual phased, results driven advanced exploration designed to move the project through a scoping study. The recommended program is designed to increase the confidence levels of current resource categories by conducting both a program of in-fill drilling and to expand current resources through step out drilling and the targeting of highly prospective areas beyond the current resources. A results driven, multi-phased recommended exploration plan is presented below:

- The resource models suggest that gold mineralization occurs as plunging structures in the plane of the lodes; therefore these structures are likely relatively continuous and should support selective mining. P&E recommends that a program of confirmation drilling be conducted to verify the location and extent (especially at depth) of these structures.
- Additional underground drilling should be initiated once the existing decline is re-commissioned, in order to upgrade large sections of Inferred resources to the Indicated level of confidence.
- P&E noted high levels of silver in core sections selected as confirmatory check samples, and recommends that a larger number of core samples be assayed to confirm the silver content.
- The geometry of mineralization will require grade control spacing of at least 10 m intercepts within the plane of the lodes in order to facilitate selective mining. There is little current evidence that significant mineralization occurs outside of the quartz veins, though this should be demonstrated conclusively by confirmatory drilling.

The Nubunidike, Ura Creek, Korobebe, and Sawasawa East Prospects have been investigated by recent exploration activity but remain underexplored. Systematic follow-up exploration activity is recommended.

- P&E is of the opinion that recent and historical exploration has demonstrated that the mineralized systems within SPL1283 and SPL1296 are an extension of the main Tuvatu epithermal system and as such the SPL areas are significantly prospective.. It is recommended that an aggressive exploration program be undertaken.

### 19.1 RECOMMENDED PHASE I WORK PLAN:

The Phase 1 work program will commence in early 2011 and together with the Phase II program will possibly extend over three calendar years and involve the following work items.

Initiation of de-watering activities for the Tuvatu decline in advance of a detailed Scoping Study. The Scoping Study will consist of a resource drilling program, environmental and social baseline studies, initial mine design and mine development studies, a trial stoping program, a geotechnical engineering program, preliminary mine facility and infrastructure layout designs, initial metallurgical and processing test work, tailings storage facility engineering, materials handling

assessment, power and utilities study, equipment selection and approvals and license procurement activities.

If results of the scoping study warrant underground pre-development work, of the Tuvatu resource area, will be initiated: Work will consist of underground rehabilitation activities including scaling and rock bolting, mapping of underground workings, resource drilling, additional underground development, trial stoping, and geotechnical assessments.

## 19.2 RECOMMENDED PHASE II WORK PLAN

The recommended Phase II exploration work program will depend in part on the success of the rehabilitation and development work undertaken in Phase I although it is possible that Phase II could overlap with Phase I underground Tuvatu activities. It is recommended that Phase II be initiated as soon as Phase I technical results and budgetary measures allow.

Phase II will consist of surface exploration activities covering the entire concession area. In detail this will include reconnaissance mapping, prospecting, sampling, heavy mineral geochemical surveying, high energy stream sediment survey and geophysical surveying and modelling. As results warrant the exploration work will be extended to the remaining Tuvatu concessions where reconnaissance mapping, prospecting, sampling, heavy mineral geochemical surveying, high energy stream sediment survey and geophysical surveying and modelling. This will be followed by a continuing program of advanced surface exploration work covering the entire concession area. Surface diamond drilling, trenching and sampling, reconnaissance mapping, prospecting, heavy mineral geochemical surveying, high energy stream sediment survey and geophysical surveying and modelling will be conducted

## 19.3 PROPOSED PHASE I AND II BUDGETS

The following proposed Phase I and II Budgets are designed to carry out the results driven, multi-phased exploration programs recommend in the section above. The budget is presented in US\$ which as of the effective date of this report had an exchange rate of 1 Fijian dollar = 1 US\$ 0.50.

### 19.3.1 PROPOSED PHASE I: BUDGET

<b>TUVATU MINE RE-ACTIVATION AND ADVANCED EXPLORATION</b>	<b>US\$</b>
<b>Total Re-Opening Installation &amp; Operating Expenses.....</b>	<b>1,510,000</b>
<b>Tuvatu Mine Area: Resource Definition &amp; Adjacent Exploration</b>	
Resource Definition - Underground Development .....	\$ 500,000
Resource Definition - Drilling, Geology & Modeling .....	\$ 1,930,000
Scoping Study - Initial .....	\$ 135,000
<b>TOTAL: TUVATU MINE, RESOURCE DEFINITION &amp; EXPLORATION: .....</b>	<b>\$ 2,565,000</b>
<b>Tuvatu General: Entire Concession Area</b>	
<b>Exploration</b>	
Reconnaissance Mapping, Prospecting, Rock Sampling .....	\$ 150,000
Heavy Mineral Geochemical Survey (5 per km <sup>2</sup> ), spl costs .....	\$ 25,000
High Energy Stream Sediment Geochemical Survey (15 per km <sup>2</sup> ), spl costs .....	\$ 10,000
Stream Sampling Crew .....	\$ 55,000



Litho-geochemistry, Spectral Reflectance, Petrography.....	\$ 30,000
Geophysical Interpretation and Modeling .....	\$ 70,000
Interpretation and Reporting .....	\$ 60,000
<b>TOTALS: TUVATU GENERAL EXPLORATION:.....</b>	<b>\$ 400,000</b>

**Programme Supervision and Support, Nadi Base**

Salaries/Supervision.....	\$ 355,000
Local Accommodation/Housing .....	\$80,000
Wages.....	\$ 170,000
Office Expenses .....	\$ 50,000
Insurance .....	\$ 15,000
<b>TOTAL: PROGRAMME SUPERVISION AND SUPPORT, NADI BASE: .....</b>	<b>\$ 670,000</b>

**TOTAL PHASE I PROPOSED BUDGET:.....\$ 5,145,000**

**19.3.2 PROPOSED PHASE II BUDGET**

**Nagado General: Entire Concession Area** **US \$**

**Exploration**

Reconnaissance Mapping, Prospecting, Rock Sampling.....	\$ 120,000
Heavy Mineral Geochemical Survey (5 per km <sup>2</sup> ), spl costs .....	\$ 90,000
High Energy Stream Sediment Geochemical Survey (15 per km <sup>2</sup> ), spl costs .....	\$ 45,000
Stream Sampling Crew .....	\$ 80,000
Litho-geochemistry, Spectral Reflectance, Petrography .....	\$ 30,000
Geophysical Surveys and Modelling .....	\$ 60,000
Interpretation and Reporting .....	\$ 75,000
<b>TOTALS: NAGADO GENERAL: ENTIRE CONCESSION AREA: .....</b>	<b>\$ 500,000</b>

**Follow-Up of Exploration Targets**

Geological Mapping, Studies, Re-logging.....	\$ 90,000
Surface Diamond Drilling, \$325/m all in .....	\$ 125,000
Trenching and Sampling .....	\$ 60,000
Compensation & Environment .....	\$ 30,000
Interpretation and Reporting .....	\$ 25,000
<b>TOTAL FOLLOW-UP OF EXPLORATION TARGETS: .....</b>	<b>\$ 330,000</b>

**Programme Supervision and Support, Nadi Base Office**

Salaries/Supervision .....	\$ 178,000
Local Accommodation/Housing .....	\$ 40,000
Wages .....	\$ 85,000
Office Expenses .....	\$ 24,000
Insurance .....	\$ 8,000
<b>TOTAL PROGRAMME SUPERVISION AND SUPPORT, NADI BASE: .....</b>	<b>\$ 335,000</b>

**TOTAL PHASE II BUDGET .....\$1,165,000**

**TOTAL PHASE I & PHASE II BUDGET ..... US \$6,310,000**

Respectfully Submitted,

**P&E Mining Consultants Inc.**

*{SIGNED AND SEALED}*

*[Eugene Puritch]*

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Eugene Puritch, P. Eng. President

{SIGNED AND SEALED}

*[Wayne D Ewert]*

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Wayne D. Ewert P.Geo

{SIGNED AND SEALED}

*[David Burga]*

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David Burga P.Geo

{SIGNED AND SEALED}

*[F.H. Brown]*

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Fred H. Brown , CPG, Pr.Sci.Nat

Effective Date: October 1, 2010

Dated this 19th day of October, 2010

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## 21.0 CERTIFICATES

### CERTIFICATE of AUTHOR

#### Dr. Wayne D. Ewert, P.Geo.

I, Wayne D. Ewert, P.Geo., residing at 10 Langford Court, Brampton, Ontario, L6W 4K4 do hereby certify that:

1. I am a principal of P&E Mining Consultants Inc. and currently contracted as a consultant by X-Tal Minerals Corp., and have worked as a geologist continuously since obtaining my B.Sc. degree in 1969.
2. This certificate applies to the technical report titled “Technical Report and Resource Estimate on the Tuvatu Gold Property, Viti Levu, Fiji” (the “Technical Report”) with an effective date of October 1, 2010
3. I graduated with an Honours Bachelor of Science degree in Geology from the University of Waterloo in 1970 and with a PhD degree in Geology from Carleton University in 1977. I am a member of the Geological Association of Canada, of the Canadian Institute of Mining and Metallurgy and a P. Geo., Registered in the Province of British Columbia (APEGBC No. 18965), the Province of Ontario (APGO No. 0866) and the Province of Saskatchewan (APEGs No.16217).

I have read the definition of “qualified person” as set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101. My relevant experience for the purpose of the Technical Report is:

- Supervising Project Geologist III, Cominco Ltd., ..... 1976 – 1982
- Supervising Project Geologist, Getty Mines Ltd., ..... 1982 – 1986
- Canadian Manager, New Projects, Gold Fields Canadian Mining Limited, ..... 1986 – 1992
- Vice-President, A.C.A. Howe International Limited, ..... 1992 – 2004
- Principal, P&E Mining Consultants Inc., ..... 2004 – Present

During the past 25 years I have had direct and indirect experience with low and high sulphidation epithermal and related Porphyry mineralizing systems similar to that at the Tuvatu project. My first experience was as Canadian Manager New Projects for Gold Fields in 1987 when I was involved in several B.C. located epithermal deposits. Since then I have been involved in evaluating, analyzing and reporting upon epithermal systems in at least 4 continents and more than a dozen countries, the most recent (2009-2010 ) of which was involvement in co-authoring NI 43-101 Technical Reports on the Snowfield/Brucejack project in northern B.C.

4. I have not visited the Tuvatu Property.
5. I am responsible for sections 1 through 3, 6, 7, 8, 14 and co-authored sections 18 and 19 and am also responsible for the overall structuring of this Technical Report.
6. I am independent of the issuer applying the test in Section 1.4 of NI 43-101.
7. I have had no prior involvement with the Tuvatu Property that is the subject of this Technical Report.
8. I have read NI 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance therewith.
9. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Effective Date: October 1, 2010

Signing Date: October 19, 2010

[SIGNED and SEALED]

{Wayne D. Ewert}

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Dr. Wayne D. Ewert P. Geo.

## CERTIFICATE of AUTHOR

### EUGENE J. PURITCH, P.ENG.

I, Eugene J. Puritch, P. Eng., residing at 44 Turtlecreek Blvd., Brampton, Ontario, L6W 3X7, do hereby certify that:

1. I am President of P&E Mining Consultants Inc. under contract by American Eagle Resources Inc. (the "Issuer").
2. This certificate applies to the technical report titled "Technical Report and Resource Estimate on the Tuvatu Gold Property, Viti Levu, Fiji" (the "Technical Report") with an effective date of October 1, 2010.
3. I am a graduate of The Haileybury School of Mines, with a Technologist Diploma in Mining, as well as obtaining an additional year of undergraduate education in Mine Engineering at Queen's University. In addition, I have met the Professional Engineers of Ontario Academic Requirement Committee's Examination requirement for Bachelor's Degree in Engineering Equivalency. I am currently licensed by the Professional Engineers of Ontario (License No. 100014010) and the Association of Professional Engineers and Geoscientists of Saskatchewan (License No. 16216) and registered with the Ontario Association of Certified Engineering Technicians and Technologists as a Senior Engineering Technologist. I am also a member of the National and Toronto CIM. I have practiced my profession continuously since 1978.

I have read the definition of "qualified person" as set out in National Instrument 43-101 ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101. My summarized career experience is as follows:

- Mining Technologist - H.B.M.&S. and Inco Ltd.	1978-1980
- Open Pit Mine Engineer – Cassiar Asbestos/Brinco Ltd	1981-1983
- Pit Engineer/Drill & Blast Supervisor – Detour Lake Mine	1984-1986
- Self-Employed Mining Consultant – Timmins Area	1987-1988
- Mine Designer/Resource Estimator – Dynatec/CMD/Bharti	1989-1995
- Self-Employed Mining Consultant/Resource-Reserve Estimator	1995-2004
- President – P & E Mining Consultants Inc.	2004-Present

During the past 21 years, I have undertaken numerous resource estimates and mine designs for epithermal gold deposits similar to Tuvatu. These projects have ranged from large open pit to small underground potential and existing mining operations. My involvement was specifically with the actual database management, geologic interpretation, geostatistics and grade estimation involved in resource estimation. In the mine design aspects, I was directly involved with cut-off grade determination, cost modeling, pit and stope design and development of mineable reserves via dilutin and extraction calculations. Some specific epithermal gold projects I was involved with are as follows:

Kinross Gold - Fruta del Norte  
Barrick Gold – Veladero  
Aquiline Resources - Calcatreu  
Geomaque Exploration - Vueltas el Rio  
Intrepid Mineral - Casposo  
Pershimco Resources - Cerro Quema  
St. Andrew Goldfields - Hislop  
Gold Canyon Resources Springpole  
William Resources - Rustler's Roost  
European Goldfields – Certej

4. I have not visited the Tuvatu Property.
5. I am responsible for co-authoring Sections 16, 18 and 19 of the Technical Report.
6. I am independent of the Issuer applying the test in Section 1.4 of NI 43-101.
7. I have had no prior involvement with the Tuvatu Property that is the subject of this Technical Report.
8. I have read NI 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance therewith.
9. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

Effective Date: October 1, 2010

Signing Date: October 19, 2010

**[SIGNED and SEALED]**

**{Eugene Puritch}**

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Eugene J. Puritch, P.Eng

## **CERTIFICATE of AUTHOR**

### **Fred H Brown, MSc. (Eng), CPG, Pr. Sci. Nat.**

I, Fred H Brown, of Suite B-10, 1610 Grover St., Lynden Washington, do hereby certify that:

1. I am an independent geological consultant;
2. I graduated with a Bachelor of Science degree in Geology from New Mexico State University, USA in 1987. I obtained a Graduate Diploma in Engineering (Mining) in 1997 from the University of the Witwatersrand and a Master of Science in Engineering (Civil) from the University of the Witwatersrand in 2005;
3. I am registered with the South African Council for Natural Scientific Professions as a Professional Geological Scientist (registration number 400008/04), the American Institute of Professional Geologists as a Certified Professional Geologist (certificate number 11015) and the Society for Mining, Metallurgy and Engineering as a Registered Member (#4152172);
4. I have worked as a geologist continuously since my graduation from university in 1987;
5. I am responsible for the preparation of section 16 and 9.0 of this report titled “Technical Report and Resource Estimate on the Tuvatu Gold Property, Viti Levu, Fiji” (the “Technical Report”) with an effective date of October 1, 2010.
6. I visited the project site over the period 9 July 2010 to 14 July 2010;
7. I have not had prior involvement with the Tuvatu project that is the subject of this Technical Report;
8. As of the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading;
9. I have read the definition of “qualified person” as set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101. I have practised my profession continuously for over twenty years, and during this time I have been involved in the estimation of numerous mineral resources for structurally controlled precious mineral deposits worldwide, including Canada, Peru, Mexico, South Africa and the USA. This report is based on my personal review of information provided by the Issuer and on discussions with the Issuer’s representatives.
10. I am independent of the issuer applying the test in Section 1.4 of NI 43-101;
11. I have read NI 43-101 and Form 43-101F1 and the Report has been prepared in compliance therewith;

Effective Date: October 1, 2010

Signing Date: October 19, 2010

**[SIGNED and SEALED]**

*{Fred H. Brown}*

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Fred H Brown CPG, PrSciNat



## CERTIFICATE of AUTHOR

### DAVID BURGA, P.GEO.

I, David Burga, P.Geo., residing at 3884 Freeman Terrace, Mississauga, Ontario, L5M 6P6, do hereby certify that:

1. I am an independent geological consultant contracted by P&E Mining Consultants Inc. and have worked as a geologist for a total of 12 years since obtaining my B.Sc. degree in 1997.
2. This certificate applies to the technical report titled “Technical Report and Resource Estimate on the Tuvatu Gold Deposit, Viti Levu, Fiji”, (the “Technical Report”) with an effective date of October 1, 2010.
3. I graduated with a Bachelor of Science degree in Geology from The University of Toronto, Ontario in 1997. I am currently licensed by the Association of Professional Geologists of Ontario, (License No. 1836)

I have read the definition of “qualified person” as set out in National Instrument 43-101 (“NI 43-101”) and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.

- Exploration Geologist, Cameco Gold ..... 1997-1998;
- Field Geophysicist, Quantec Geoscience ..... 1998-1999;
- Geological Consultant, Andeburg Consulting Ltd. .... 1999-2003;
- Geologist, Aeon Egmond Ltd. .... 2003-2005;
- Project Manager, Jacques Whitford ..... 2005-2008;
- Exploration Manager – Chile, Red Metal Resources ..... 2008-2009
- Consulting Geologist.....2009-Present

During the past 12 years I have been involved with numerous epithermal gold projects in an exploration capacity. I have evaluated approximately 10 epithermal projects for potential purchase in northern Chile and southern Peru. Properties were evaluated based on size, alteration, mineralization, structure, location and economic potential. I was the project geologist for the Chaparra epithermal gold property in the Arequipa area of Peru and responsible for field mapping and surface sampling programs.

4. I have not visited the Tuvatu property.
5. I am responsible for the preparation and authoring of Sections 4, 5, 9 through 13, 15 and 17.
6. I am independent of the Issuer applying the test in Section 1.4 of NI 43-101.
7. I have not had prior involvement with the Tuvatu Property that is the subject of this Technical Report.
8. I have read NI 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance therewith.
9. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

Effective Date: October 1, 2010

Signing Date: October 19, 2010

**{SIGNED AND SEALED}**

[David Burga]

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David Burga, P.Geo.