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**PROSPECTUS**  
**REGARDING THE DEVELOPMENT**  
**OF AN**  
**UNDERGROUND MINING**  
**MILLING AND CYANIDE LEACHING PROJECT**  
**AT**  
**PROSPER MINE, BEDWELL RIVER**  
**VANCOUVER ISLAND, B.C.**

**FOR**  
**TAMARA RESOURCES INC.**  
**809 - 837 West Hastings Street**  
**Vancouver, B.C.**

**BY**  
**GEORGE P. KRUECKL, P.ENG.**  
**KRUECKL CONSULTING SERVICES LIMITED**  
**308 - 543 Granville Street**  
**Vancouver, B.C.**  
**V6C 1X8**

**April 10, 1986**

## TABLE OF CONTENTS

	Page
Summary	1
Introduction	1
Location and Access	2
Property	3
Physiography, Climate and Vegetation	3
History	4
Mineral Reserves	6
Process Description	6
Specific Process Description	8
Mining	8
Crushing and Grinding	8
Leach Ponds	9
Gold Recovery Plant	9
Reagents	9
Pollution Control	10
Production	10
Power Supply	10
Right of Way	10
Truck Haul Route	10
Workforce	11
Time Table	11
About the Author	12
 <b>Figures</b>	
Figure 1	Prosper Mine Location
Figure 2	Prosper Mine Location
Figure 3	Claims Location Map
Figure 4	Existing Underground Workings
Figure 5	Longitudinal Section
Figure 6	Flow Sheet

## SUMMARY

Tamara Resources Inc. is interested in mining some 2,000 tons of ore material at the Prosper Mine near Tofino, Vancouver Island and further to mill and cyanide leach 2,500 tons of mill feed (500 tons are added from an existing ore stockpile) at the mine site. A jig concentrate and (gold) pregnant carbon would be produced at the site for transfer to other facilities on mainland B.C. for further processing to recover precious metal values (mainly gold).

The company expects to commence operations in June 1986 having a project life of approximately 3 months from June 1986 to mid-September 1986. Mining operations will be at 25 tons per day and between 8 and 14 men will be employed.

## INTRODUCTION

Tamara Resources Inc., a Vancouver based junior resource company, intends to proceed during 1986 with placing into production an underground gold mine, a crushing and grinding plant and a closed circuit cyanide leaching pond and gold recovery plant at Bedwell River on Vancouver Island, B.C. The material to be leached consists of at approximately 2,500 tons of mill feed mainly from the Prosper underground mine. If no additional reserves are found during the mining and processing of the 2500 tons already outlined then the site will be dismantled and reclaimed. The complete project has been costed and set up in such a way that the processing of 2500 tons will bring adequate financial return to the investors.

The cyanide leaching pond with agitation and the gold recovery plant are not new technology. This technology has been in existence for some 80 to 90 years. The following prospectus which describes the project, is written for the Mining Development Steering Committee, with the intent of receiving permission for Tamara to proceed toward production.

## LOCATION AND ACCESS

The "Prosper Mine" is located 29.5 kms north-northeast of Tofino, on Vancouver Island, B.C., in the Alberni Mining Division on Mineral Claim Maps M92F/5E&W. Specific location is 49°24' north latitude, 125°45' west longitude. The elevation of the lower adit for the Prosper mine is approximately 600 metres (200 ft.) a.s.l. or 55 metres (180 ft.) above the Bedwell River level located 500 metres to the west (see Figures 1, 2 and 3).

The property has several means of access involving overland, sea and air transportation.

The first involves air transport consisting of three helicopter landing sites on the property, one at the old camp located across the Bedwell River about 500 metres west of the mine, one within 50 metres of the lower portal at the mine site which is able to handle a Hughes 500 helicopter, and the third along the east bank of the Bedwell River, in low water and which is limited to a Ranger 206 helicopter.

The second access is by road and water. Access to the head of Bedwell Sound from Tofino may be gained by boat or float plane. An old logging road along the west side of the Bedwell River, partially overgrown, and with bridges in general state of disrepair, connects the head of Bedwell Sound to the old campsite. A boat or rubber dinghy is required to cross the Bedwell River at the old campsite (see Figures 2 and 3) to gain access to an 800 meter (1/2 mile) logging road to the mine site.

This last leg for the overland access begins across the river from the old campsite, and connects with the Prosper mine lower adit portal. This road, although only capable of handling bikes and trail bikes presently due to an over growth of trees, can be easily upgraded to handle large equipment.

TAMARA RESOURCES INC.

PROSPER MINE

PROSPER MINE LOCATION

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N.T.S. 92F/5 W

SCALE: As Shown

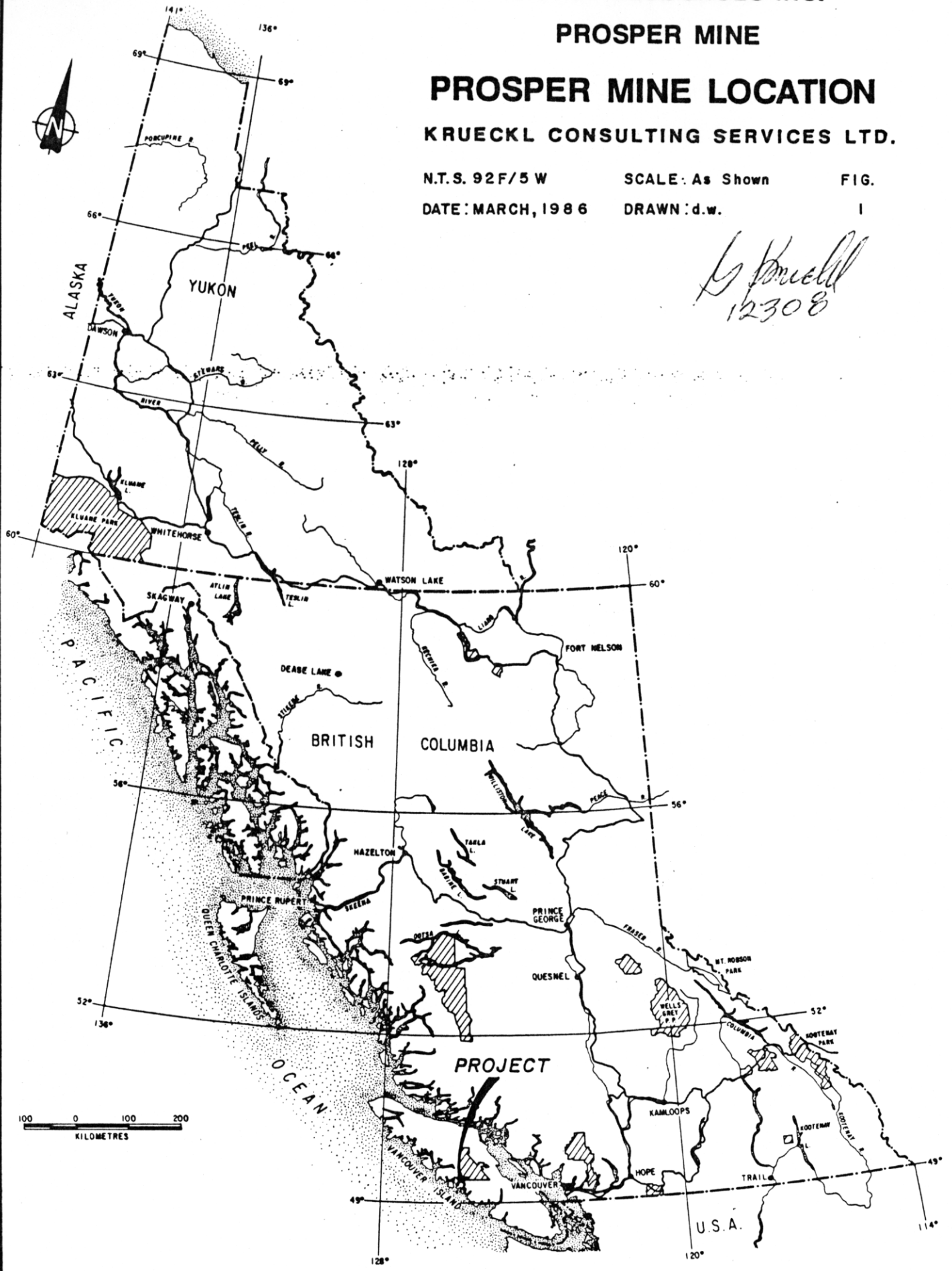
FIG.

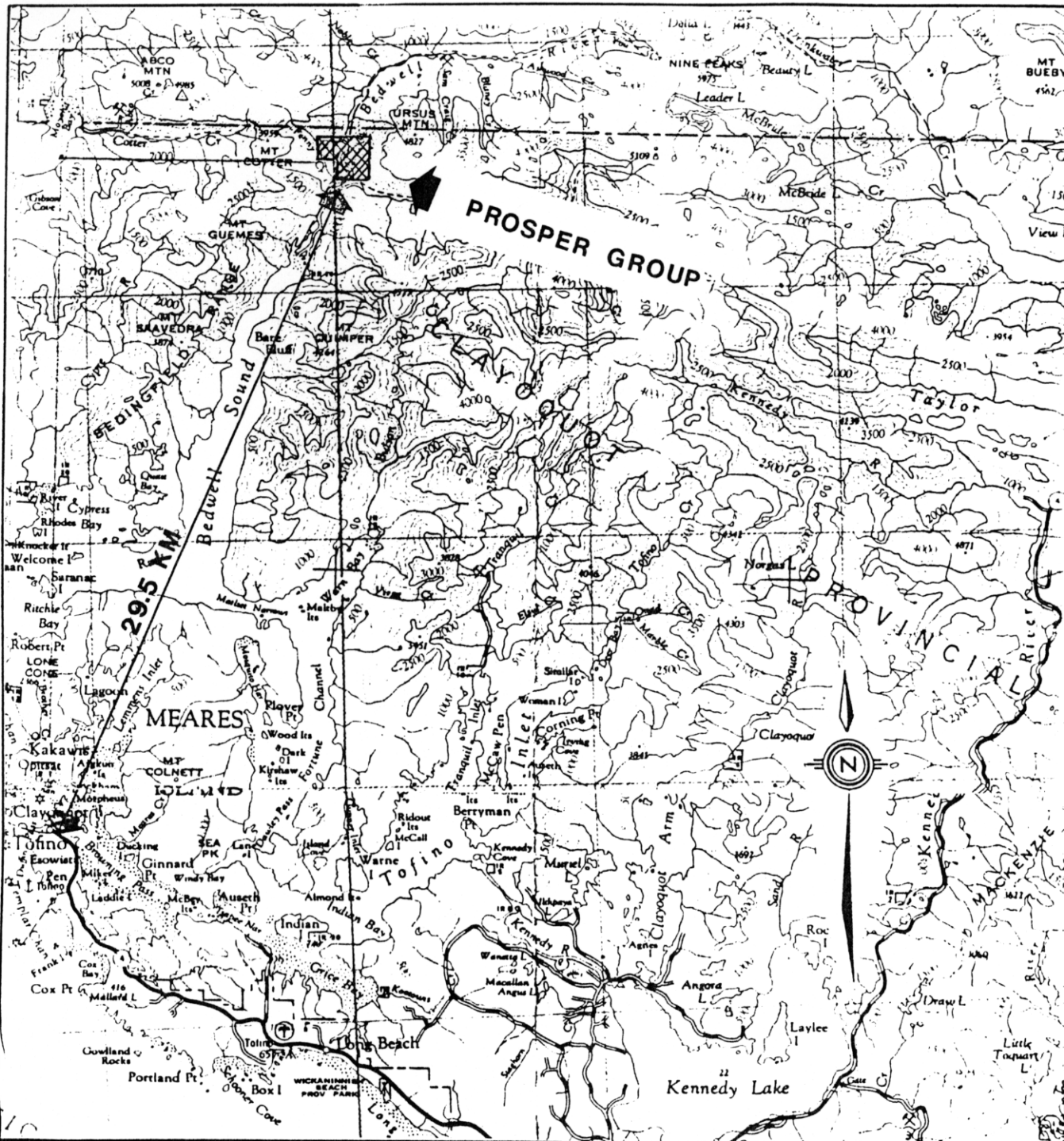
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**TAMARA RESOURCES INC.  
PROSPER MINE**

**PROSPER MINE LOCATION**

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N.T.S. 92 F / 5 W

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FIG.

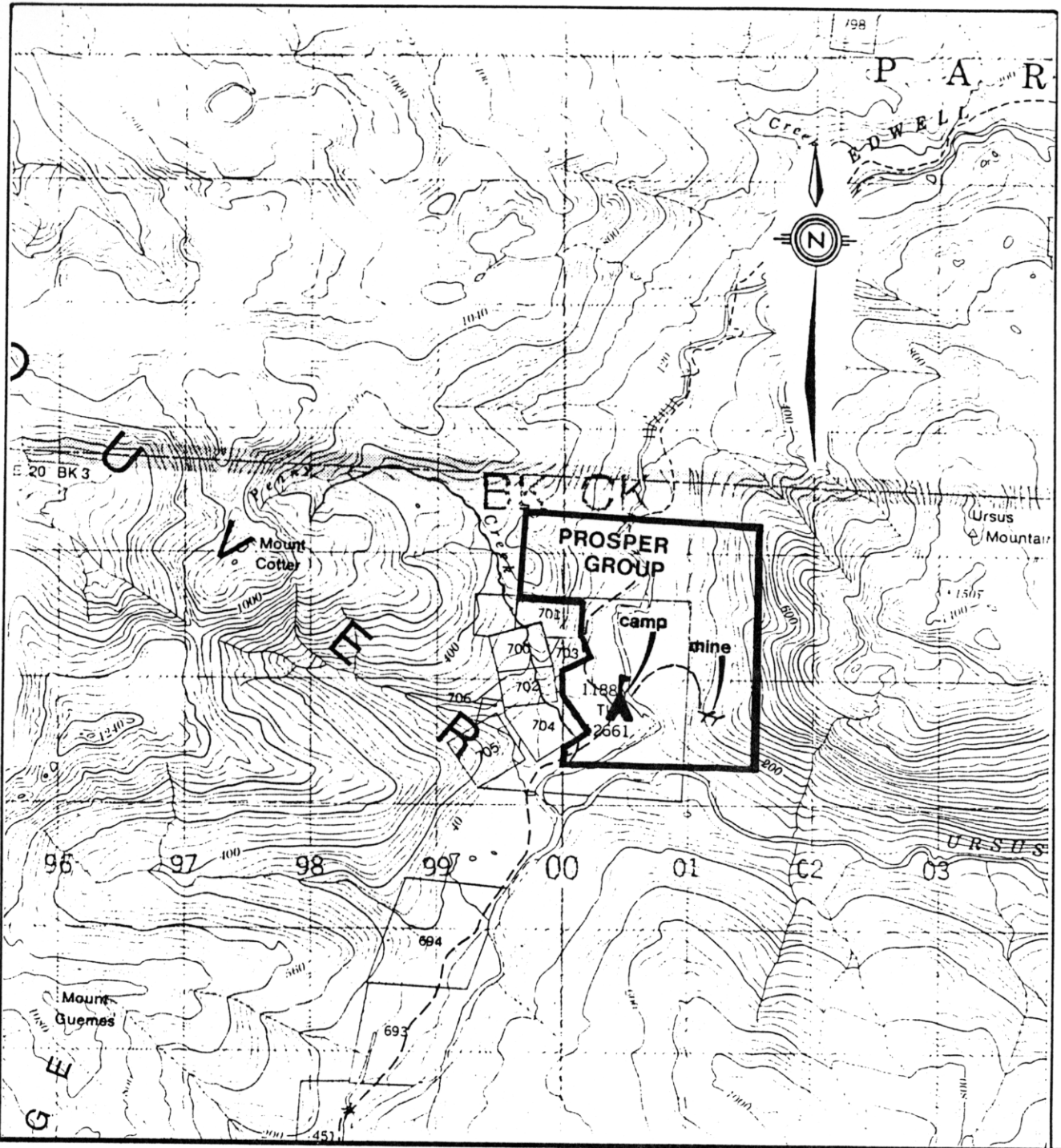
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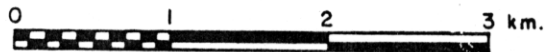
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**TAMARA RESOURCES INC.  
PROSPER MINE  
CLAIMS LOCATION**

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N.T.S. 92 F/5 W	SCALE: 1:50,000	FIG.
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## PROPERTY

The property consists of five mineral claims located on the Bedwell River immediately north of its confluence with Ursus Creek situated east of Bedwell Sound near Tofino in the Alberni Mining Division of Vancouver Island. Information on file with the British Columbia Ministry of Energy, Mines and Petroleum Resources on March 26th was as follows:

<u>Claim Name</u>	<u>Record No.</u>	<u>Units</u>	<u>Expiry Date</u>
Bec	24 (6)	3	June 4, 1989
Bes	43 (9)	3	Sept 30, 1988
Bat	215-218 (6)	4	July 12, 1989
Ben	233-236 (7)	4	July 6, 1989
	Total	14 units	

The current legal status of these claims is beyond the scope of this report and may be verified by an independent legal opinion. These claims are, however, believed to be located on Crown land and private land holdings in the area are not known to the writer.

The workings on this property consist of several known veins with adits and shafts. One of these, the "Prosper Vein", has two adits and several trenches (Figure 4). Another, the "Isob Vein" has one adit and several trenches. Two other veins to the south of the Prosper and Isob veins on the property have several trenches and the old "Avon" (or Castle) workings on which fairly extensive shaft sinking, tunneling and trenching was carried out in several locations are also situated on this property.

## PHYSIOGRAPHY, CLIMATE AND VEGETATION

As is characteristic of the western coast of Vancouver Island, the Bedwell Sound and Bedwell River area is rugged and mountainous. The valley-bottom of the Bedwell River is on the average one-quarter mile wide and excepting for about 1½ miles at its mouth has an average gradient of about 80 feet per mile. Most of the tributary streams are in deep narrow canyons. The forest cover of conifers is abundant in spite of extensive logging in the last 20 years and mining timber is plentiful.



Rainfall for Tofino, the nearest weather recording station, is abundant at 3288 mm (120 inches) annually, the major portion of this falling from October through to April. The temperature is mild, the monthly average varying from +3.8°C to +14.4°C, freezing conditions being very infrequent during December through to February.

Table I has a complete breakdown of temperature and precipitation giving yearly averages by month and annually over the last 30 years.

**TABLE I**

**BRITISH COLUMBIA/COLOMBIE-BRITANNIQUE**

	JAN JAN	FEB FÉV	MAR MAR	APR AVR	MAY MAI	JUN JUIN	JUL JUIL	AUG AOÛT	SEP SEPT	OCT OCT	NOV NOV	DEC DÉC	YEAR ANNÉE
<b>TOFINO A</b>													
49° 5'N 125° 46'W 20 m													
Daily Maximum Temperature	6.7	8.5	9.0	10.9	13.7	16.1	18.3	18.1	17.2	13.4	9.8	7.7	12.5
Daily Minimum Temperature	0.8	2.0	1.9	3.5	5.9	8.5	10.2	10.7	9.0	6.4	3.4	2.1	5.4
Daily Temperature	3.8	5.3	5.5	7.2	9.9	12.4	14.2	14.4	13.1	9.9	6.6	4.9	8.9
Standard Deviation, Daily Temperature	1.5	1.3	0.9	0.8	0.8	1.0	0.7	0.9	1.1	0.9	1.1	1.7	0.5
Extreme Maximum Temperature	14.4	18.9	18.3	21.7	25.8	32.2	32.8	31.3	29.4	23.9	21.1	15.6	32.8
Years of Record	25	24	25	24	25	25	26	26	26	25	25	26	26
Extreme Minimum Temperature	-15.0	-7.2	-5.0	-1.7	0.0	2.2	3.9	4.4	-0.6	-2.2	-7.0	-12.2	-15.0
Years of Record	25	25	25	24	24	25	26	26	25	25	25	26	26
Rainfall	382.7	357.3	361.2	231.4	143.0	101.7	86.1	114.1	163.2	391.8	429.3	464.2	3226.0
Snowfall	20.5	6.0	6.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	13.2	53.0
Total Precipitation	404.3	366.4	372.4	233.8	143.0	101.7	86.1	114.1	163.2	391.8	432.3	479.2	3286.3
Standard Deviation, Total Precipitation	159.2	170.0	148.0	94.0	73.0	49.4	71.2	89.2	77.4	204.3	143.9	145.7	412.5
Greatest Rainfall in 24 hours	174.2	128.5	169.7	106.2	95.5	51.3	98.3	131.3	105.9	154.2	155.4	166.4	174.2
Years of Record	26	26	26	26	26	26	26	26	26	25	26	27	27
Greatest Snowfall in 24 hours	31.2	10.7	20.3	14.2	T	0.0	0.0	0.0	0.0	0.0	22.6	15.5	31.2
Years of Record	26	26	26	26	26	26	26	26	26	26	25	27	27
Greatest Precipitation in 24 hours	174.2	128.5	169.7	106.2	95.5	51.3	98.3	131.3	105.9	154.2	155.4	166.4	174.2
Years of Record	26	26	26	26	26	26	26	26	26	25	26	27	27
Days with Rain	20	18	19	18	13	11	9	11	13	19	22	22	195
Days with Snow	4	2	2	1	0	0	0	0	0	0	1	3	13
Days with Precipitation	21	19	20	18	13	11	9	11	13	19	22	23	199

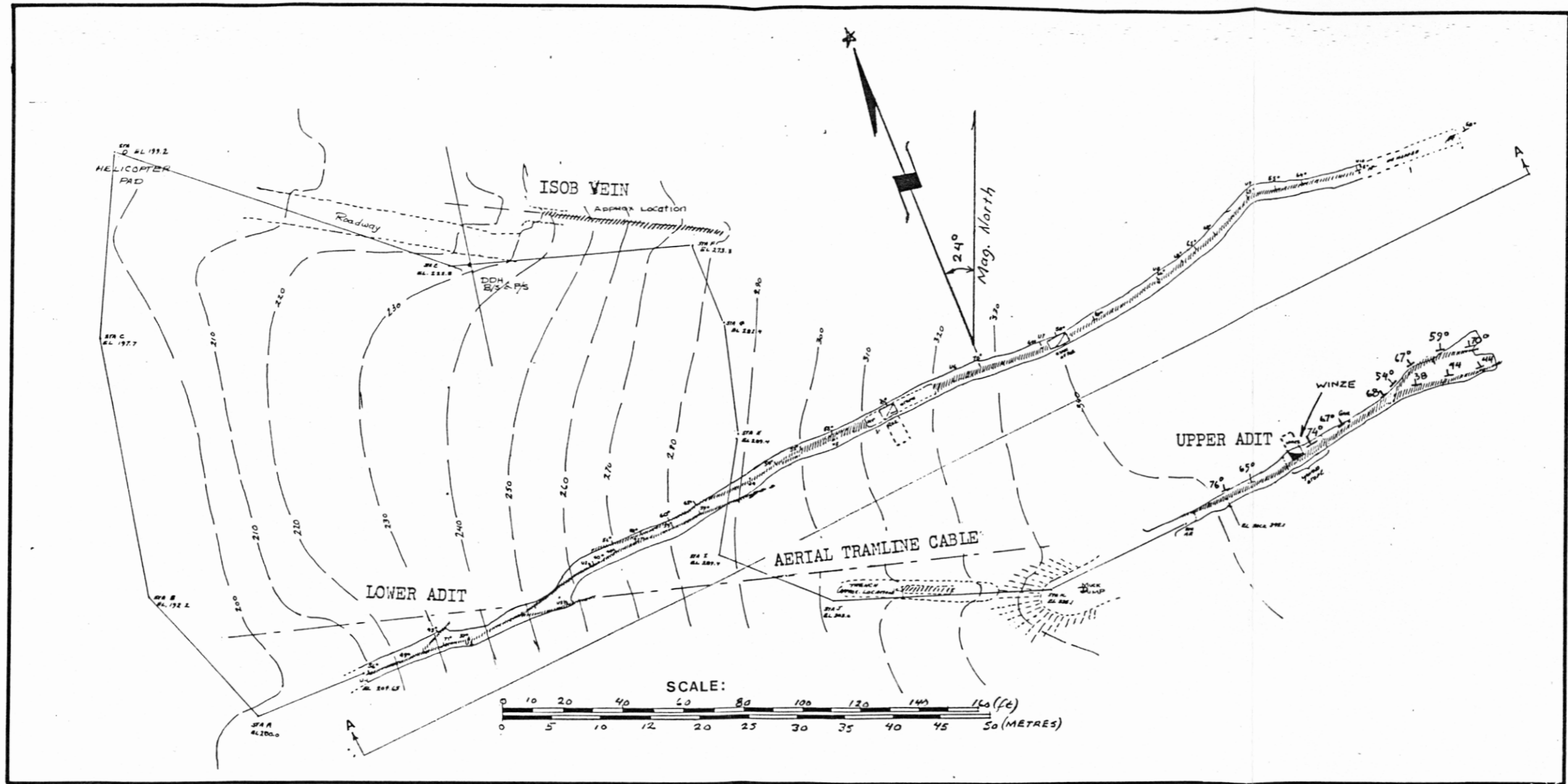
**HISTORY**

The history of the present property dates back to before the turn of the century when the contact metasomatic copper-magnetite deposits on the "Castle" claim (now the Ben claims) were developed between 1898 and 1900 by shafts and drifts. In addition, at least two quartz veins were found and trenched, showing values in gold. This claim was restaked in 1938 under the number "Avon" and more recently as the "Ben" claim.

The subject of this report, however, revolves more around the Prosper vein. The "Prosper" was originally developed about 1903 under the name Pakeha. At that time, a short (10 m) adit (currently called the lower adit) was driven on the "Prosper" vein.

In 1938 the old Pakeha was restaked under the name "Prosper" by a prospecting group. Between 1938 and 1941, the group developed the claim by trenching along strike on each vein at intervals for approximately 150 meters. Two other veins, located several hundred feet south of the Prosper vein were also discovered and trenched. In 1942 an adit was begun on the Prosper vein, some 40 meters in elevation above the old Pakeha adit (lower adit) and samples were taken to Bralorne Mines Ltd.'s Buccaneer Mine located several miles up-river. Bralorne advanced the upper adit to a distance of 120 feet (36.6 m) from the portal. On completion of the drift, Bralorne began sinking a winze (internal shaft) and stoping the ceiling (back). However, restrictions on boat travel due to the Japanese attack near Tofino, and the scarcity of supplies, and labour shortages led to the decision to close all mining ventures in the area. Only 100 tons of ore from the Prosper having an average grade of 2.18 oz. gold per ton, could be shipped to the Buccaneer before the close-down order was received. The Buccaneer mill was then dismantled and shipped to the interior of British Columbia, thereby closing the door on this nearby location for milling the Prosper ore.

Right after the war, action on the property was revived. In early 1947, the Prosper Gold Mining Syndicate was formed who optioned the property. They immediately began underground development in the lower (Pakeha) tunnel, which was located about 41 meters (135 feet) vertically feet below the upper tunnel. By the end of July, the crew had advanced the face a distance of 128 meters (420 feet) from the portal, and estimated they would encounter the down-rake of the high-grade ore found on the upper level in 30 to 100 feet. They had also encountered a 40-foot long section of the vein containing near ore grade material halfway into the lower tunnel and had driven a raise up for a distance of 32 feet. A total of 5 tons of hand-cobbed ore from this raise, that assaying a spectacular 2.68 oz. gold per ton, was later shipped to a smelter. The Syndicate, however, was unable to raise any additional financing and all development was curtailed on July 31, 1947. In his closing report, the manager conceded, "At this stage of development the property has good prospects of making a small mine so further exploration and development is fully justified." A plan of all of these old underground workings which are accessible to this day are shown in Figure 4.



Some years later, logging operations carried a road to the lower portal but at that time (1968) the price of gold, at \$35.00 per ounce, did not bring forward the investor's interest to finance the development of this mine.

Minimal assessment work was carried out for many years but finally in 1981, Canamco (later Bermuda) Resources Ltd. optioned the property and by mid-1985 had conducted limited exploration work on the property and then elected to option their interest in the Prosper Mine to Tamara Resources Inc., which agreement was concluded in mid-February, 1986.

### MINERAL RESERVES

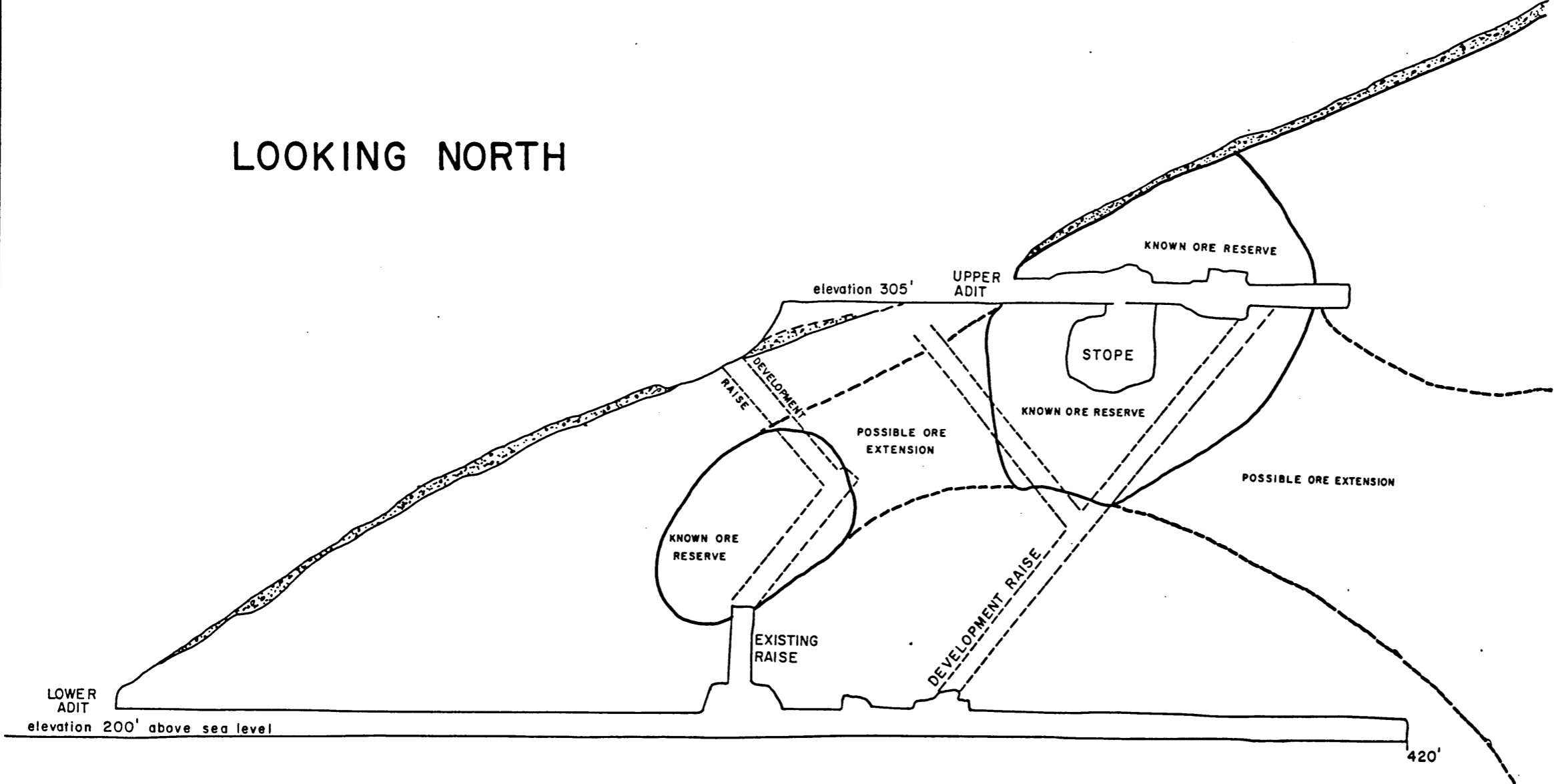
Ore reserves defined to date consist of three parts: a) the stope ore from the underground reserves associated with the Prosper vein; b) the stockpile (or dump) material at the portal of the Prosper vein upper adit, and c) fifty percent of the 1986 development muck diluted 150% with barren gangue material from Tamara's proposed work in preparing the mine for the first phase of production. The location of these reserves are shown on Figure 5 and are itemized as follows:

	<u>Tonnage</u>	<u>Gold Content Grade</u>
<u>Ore Reserve Summary</u>		
a) Stope Ore	1,500 tons	1.33 oz/t
b) Dump Ore	500 tons	0.50 oz/t
c) Development Muck Ore	<u>500 tons</u>	<u>0.80 oz/t</u>
Total	2,500 tons	1.06 oz/t

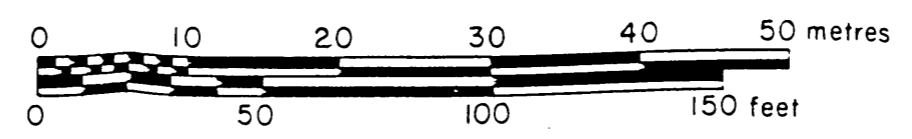
### PROCESS DESCRIPTION

The precious metals, gold and silver must be extracted from the mine ore using crushing, grinding, slurring the ground ore, cyanide leaching of slurried ore in large agitation ponds, and recovery of gold from pregnant cyanide solution. All of these steps in the process have been used extensively in the industry and the flow sheet involves the following components:

LOOKING NORTH



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TAMARA RESOURCES INC.		
PROSPER MINE		
PROSPER MINE		
LONGITUDINAL SECTION		
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1. Underground - contract mining involving drilling and blasting of ore veins, the ore and muck being transported out to dumps near the portal of the mine. Figure 5 shows the proposed underground development.
  
2. Crushing and Grinding Mill
  - Small Front End Loader
  - Primary Crusher; 10 x 16 Tel Smith Crusher with 20 HP electric motor
  - Screening; 10 mesh Pioneer 4 x 8 vibrating screen
  - Conveyor
  - Secondary Grinding - several types of grinders are possible, a selection will be made when detailed engineering is carried out
  - Pulping Hopper - make up water pipeline from Bedwell River
  - 12 x 18 Duplex Jig
  - Surge tank - make up water pipeline from Bedwell River
  - Slurry Pump
  - P.V.C. pipe to carry finely ground slurry to the process plant.
  
3. Process Plant
  - 2 large leach ponds lined with P.V.C. plastic liner - each pond holds 55,000 cubic feet of slurry; these ponds are 135' by 70' and 10' deep and are covered with a plastic liner to keep rainfall out
  - Cyanide barren solution circulating system involving 6 x 6 Galigar slurry pump will discharge the solution into each pond in a manner that will agitate the slurry while circulation is under way.
  - Small air compressor with large receiver tank to supply periodic bursts of air into the circulating system pipe line to help keep lines free of slurry fines build up
  - Pregnant cyanide solution holding pond lined with P.V.C. plastic liner having 25,000 cubic feet capacity; this pond is 70' by 70' and 10' deep and is covered with a plastic liner to keep rainfall out
  - Pregnant cyanide solution circulating pump, to circulate the pregnant solution through filters and carbon columns to recover gold

- 200' by 8" diameter double flannel lined filters
- Two carbon columns to hold one ton of carbon
- Assaying facilities

Figure 6 shows a flowsheet of the operation.

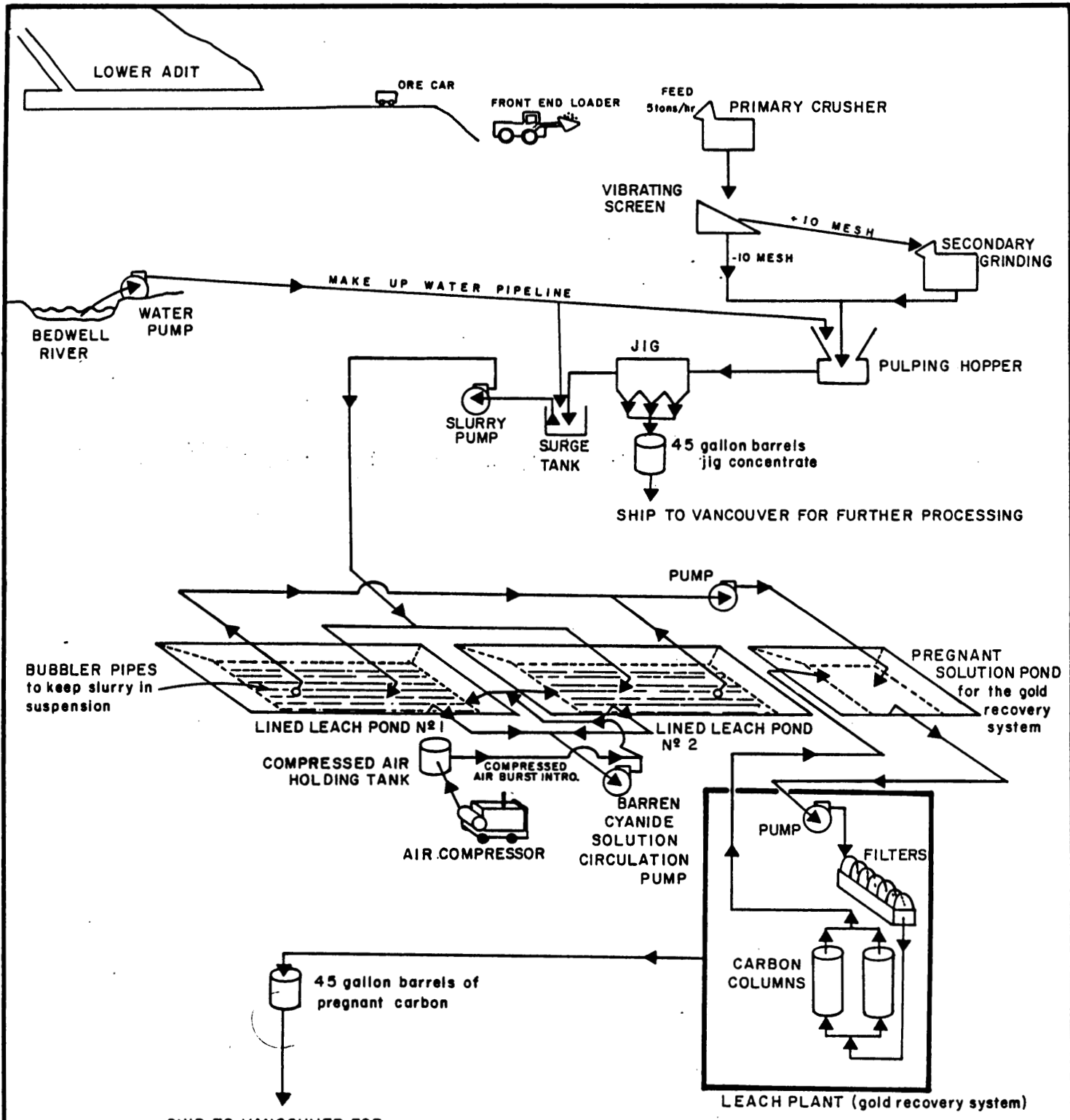
## **SPECIFIC PROCESS DESCRIPTION**

### **Mining**

In this process ore grade material contained in near vertical veins 90 cm wide in the underground workings (stopes) of the Prosper Mine is drilled and blasted and transported via ore car underground to the mine portal and stockpiled near the crushing and grinding mill.

### **Crushing and Grinding**

This process consists of taking the ore from the stockpile with a small front end loader and feeding the ore at the rate of 5 tons per hour into a primary crusher hopper. The ore is crushed to a maximum of  $1\frac{1}{4}$  inch particles size and all of the material is then screened on a vibrating screen. The screen oversize is further broken down in a secondary grinding mill. All of the screen undersize and ground material is feed into a slurring hopper where these fine-grained products are slurried with water and feed to a duplex jig for removing coarse gold. The concentrate from the jig which contains the coarse gold is stored in barrels and shipped to the Lower Mainland for further processing to extract the free coarse gold.



**TAMARA RESOURCES INC.**

**PROSPER MINE**

**PROSPER MINE**

**FLWSHEET**

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N.T.S. 92 F/5 W	SCALE: AS SHOWN	FIG.
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### **Leach Pond**

The slurry that is remaining from the jig is pumped to one of two (55,000 cubic feet capacity) cyanide leaching ponds which are agitated to keep the fine rock particles in suspension. These ponds are constructed of earth and lined with a P.V.C plastic liner having dimensions 135 feet by 70 feet at their crest and are 10 feet deep.

These ponds will be covered so no rainfall can enter the system. The pumping system circulates barren cyanide solution through the leaching pond, and specifically through slurried ore, to extract and take into solution any gold that is exposed on (or within) the fine rock particles suspended in the slurry.

### **Gold Recovery Plant**

Once the barren solution is pregnant (gold laden) then this solution is drawn off the leach pond for storage in a 25,000 cubic feet pregnant solution storage pond. This pond is also lined with a P.V.C. plastic liner and covered to keep rainfall out. Here the solution is circulated via a separate pumping system through filters and carbon columns to extract the gold from the pregnant cyanide solution. When the carbon in the carbon columns are pregnant (gold laden) then the carbon is removed and shipped to the Lower Mainland for further processing to extract the gold. This process has rendered the pregnant cyanide solution barren and this barren cyanide solution is then returned to the leach pond for additional circulation to extract more gold from the ore particles. The leaching plant would operate for about 60 continuous days during.

### **Reagents**

Metallurgical testwork to date suggests the various chemical additions that will be required to process the ore involve coconut carbon, sodium cyanide, sodium hydroxide and sodium sulphide. The actual gold extraction from the jig concentrate and carbon will be carried out off site.

### **Pollution Control**

Due to the high rainfall in the area all areas that have exposed chemicals will be covered. As a second line of defense, alkaline-chlorination and/or the sulphur dioxide - air process will be utilized for the destruction of cyanide on completion of the project.

### **PRODUCTION**

Mine production is scheduled to commence second week in June 1986, and leaching will begin about mid-July 1986. The project will operate for three months to process 2,500 tons and will shut down about mid-September 1986.

### **POWER SUPPLY**

Power will be supplied to the equipment from diesel electric generator set, and additional diesel and gas driven motors on compressors, pumps etc. are also required. The necessary fuels, lubricating oil etc. will be barged into the site via Tofino.

### **RIGHT OF WAY**

The operation is remote from any private land or rights-of-way. An old logging road currently not being used will be upgraded for the use of the project participants.

### **TRUCK HAUL ROUTE**

Most reagents will be shipped to the site from Vancouver via Highway 99 to Horseshoe Bay, then via ferry to Nanaimo and then on Highway 4 to Tofino. Supplies will then be off-loaded at Tofino and reloaded on a barge for shipment up Bedwell Sound to the point where Bedwell River enters the Sound. From there, these supplies will be transported by truck 3½ miles to the site. It is expected that the total project would use about 20 tons of reagent materials.

**WORKFORCE**

	<u>No.</u>	<u>Category</u>	<u>Days/W</u>	<u>Mandays/W</u>
Miners	4	(S)	6	24
Mill Operators	2	(1-L, 1-S)	6	12
Leach Plant Operator	2	(1-L, 1-S)	7	14
Labourers	2	(L)	6	12
Cook	1	(L)	7	7
Helper	1	(L)	7	7
Geologist	<u>1</u>	(S)	<u>6</u>	<u>6</u>
	13		82	

82 ÷ 7 = 12 man weeks per week

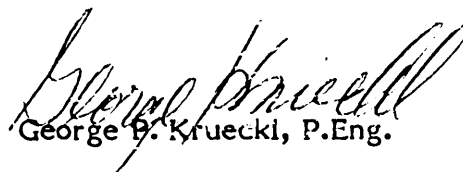
In the above list 'L' stands for 'Local' and 'S' stands for 'Specialist'. The local people require some specialized training which may be gained by taking short courses or by learning on the job. The specialty positions will be hired from other locations in the province.

The company will have a camp that can hold 12 men. Twice weekly trips will be made to Tofino for supplies 30 kilometers to the east. Tofino also has a hospital equipped with more than 20 beds. Local float plane service is also available to and from the property. Tofino would be connected by radio with the mine site at all times.

**TIMETABLE**

Test work is currently underway and should be completed during April or May following which the first crew will be travelling to the site to upgrade access road and install a camp. The major onsite construction is expected to begin June 1, 1986 and underground development would begin about mid-June 1986. The mill would start-up the last week in June and the leach plant would begin to circulate cyanide about mid-July 1986.

Submitted by,  
Krueckl Consulting Services Limited

  
George G. Krueckl, P.Eng.

## ABOUT THE AUTHOR

Krueckl Consulting Services Limited has been retained by Tamara Resources inc. as the engineering consultants on the Prosper Mining Project.

George Krueckl, P.Eng., President of the company, has been directly involved in the mining industry for over 25 years and has been a member of the Association of Professional Engineers of the Province of British Columbia since 1977.

He is a graduate of the University of Saskatchewan with a Bachelors degree in Geological Engineering.

The author has had his main experience in mine engineering for surface and underground mines (base metals and coal) with major mining companies including milling of ores and the various extractive processes such as flotation, cyanide leaching, gravity separation, magnetic separation, etc., all commonly used in the mining industry.

Since 1982 his work experience has concentrated on placing into production precious metal mining ventures involving mainly cyanide heap leaching of old mine tailings and dumps and small conventional underground vein type gold mines.