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GEOLOGY OF THE
CINOLA GOLD DEPOSIT
Queen Charlotte Islands, B.C.
Canada

by

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ABSTRACT

The Cinola deposit represents the exposed mid-upper levels of an epithermal hot-springs-type precious metal system.

The deposit can be separated into three distinct lithologic groups:

1) a sedimentary sequence (predating the following two);
2) an intrusive igneous sequence; and
3) an epithermal hot-spring suite.

The sedimentary sequence is comprised of two formations; black-dark grey variably calcareous mudstones and argillites of the Late Cretaceous Haida Formation, and coarse to fine clastic sediments of the Tertiary Mio-Pliocene Skonun Formation. These two formations are separated by a normal right-lateral fault, the Specogna Fault, with the downdropped block consisting of Skonun Formation sediments (east of the fault).

The intrusive igneous sequence is comprised of at least two separate rhyolite intrusions localized along the Specogna Fault. The rhyolite intrusions have been dated as Middle Miocene, predating or contemporaneous with the hot-spring suite. These intrusions of rhyolite initiated the movement of meteoric water and the development of a hot-spring system.

The epithermal hot-spring suite is comprised of a hydrothermal breccia unit which has been traced along the Specogna Fault (on strike) for at least 800 m, stockwork silica veining, and silica veining developed along extensional faults. Associated with the hot-spring development and extending laterally away from the hydrothermal breccia unit is a region of intense pervasively silicified Skonun Formation sediments. This zone parallels the

Specogna Fault and forms a rough "mushroom" shaped area normal to the Specogna Fault. Beyond the area of the pervasive silicification is a region of argillically altered Skonun Formation sediments dominated by the presence of kaolinite-illite with minor alunite and sericite.

The Cinola orebody is essentially wedge shaped extending 800 m in a northwest - southeast direction. Near surface the upper portion of the "wedge" is approximately 200 m wide. It thins at depth to 50 m wide at sea level.

Precious metals are localized by hydrothermal brecciation, stockwork veining, vein development along extensional faults and pervasive silicification events. Minor pyrite and marcasite occur throughout the deposit but do not appear to correlate directly with the gold mineralization. Trace levels of mercury, arsenic and antimony are found in varying amounts in the deposit. Their exact relationship to the precious metals is uncertain, however relationships between higher levels of these metals and localized lithologic units have been identified. Argillic alteration is peripheral to the zone of pervasive silicification and contains minor gold occurring in veins.

INTRODUCTION

The Cinola deposit is located 770 kms north of Vancouver, British Columbia on Graham Island, the northern and largest of the Queen Charlotte archipelago. It is easily accessible by logging roads from the towns of Masset and Queen Charlotte City.

The deposit was discovered in 1970 by a prospector Efrem Specogna and his brother Johnny Trico. Subsequently, the deposit was examined by a number of companies including Kennco, Canex Aerial Exploration, UMEX, Silver Standard Mines Ltd., Quintana Minerals Corporation, Consolidated Cinola Mines Ltd. and Energy Reserves Group.

City Resources (Canada) Limited obtained the deposit through purchase of Consolidated Cinola Mines Limited in November, 1986.

The first major report on the deposit was written by Richards et al (1976) who described the deposit as a Carlin-type gold deposit. Champigny et al (1980, 1981) also classed the deposit as Carlin-type with sediments being deposited in a braided stream environment and gold mineralization being formed under normal hydrostatic pressure at 1100 metres below surface.

Brooks et al (1980) was the first to separate out lithologically distinct sedimentary units and a breccia unit which occurs on the footwall of the deposit. These sedimentary units were recognized by City Resources geologists (1986) as occurring in an alluvial fan environment and the breccia was recognized as a hydrothermal breccia, typical of epithermal hot-spring gold deposits which have recently been recognized elsewhere as a distinct deposit type, particularly in the Pacific Rim area (Berger et al 1985).

The understanding of this deposit has been helped by the utilization of the epithermal hot-springs model which characteristically has gold depositing in a near surface environment, under elevated water pressures due to silica sealing of pore spaces, etc. Boiling of solution at shallow depths is typical of an epithermal hot-springs deposit. Recognition of textures present in this deposit which are typical of boiling at shallow depths include quartz after calcite, colloform banding of quartz crustification, multiple brecciatian and fluidised breccias.

The work by City Resources has outlined geological reserves of 43.5 million tonnes grading 1.65 g/t Au, at a 0.69 g/t Au cut-off.

Proven and probable minable reserves at a 1.1 g/t cut-off are 40.7 million tonnes grading 1.65 g/t Au.

REGIONAL GEOLOGY

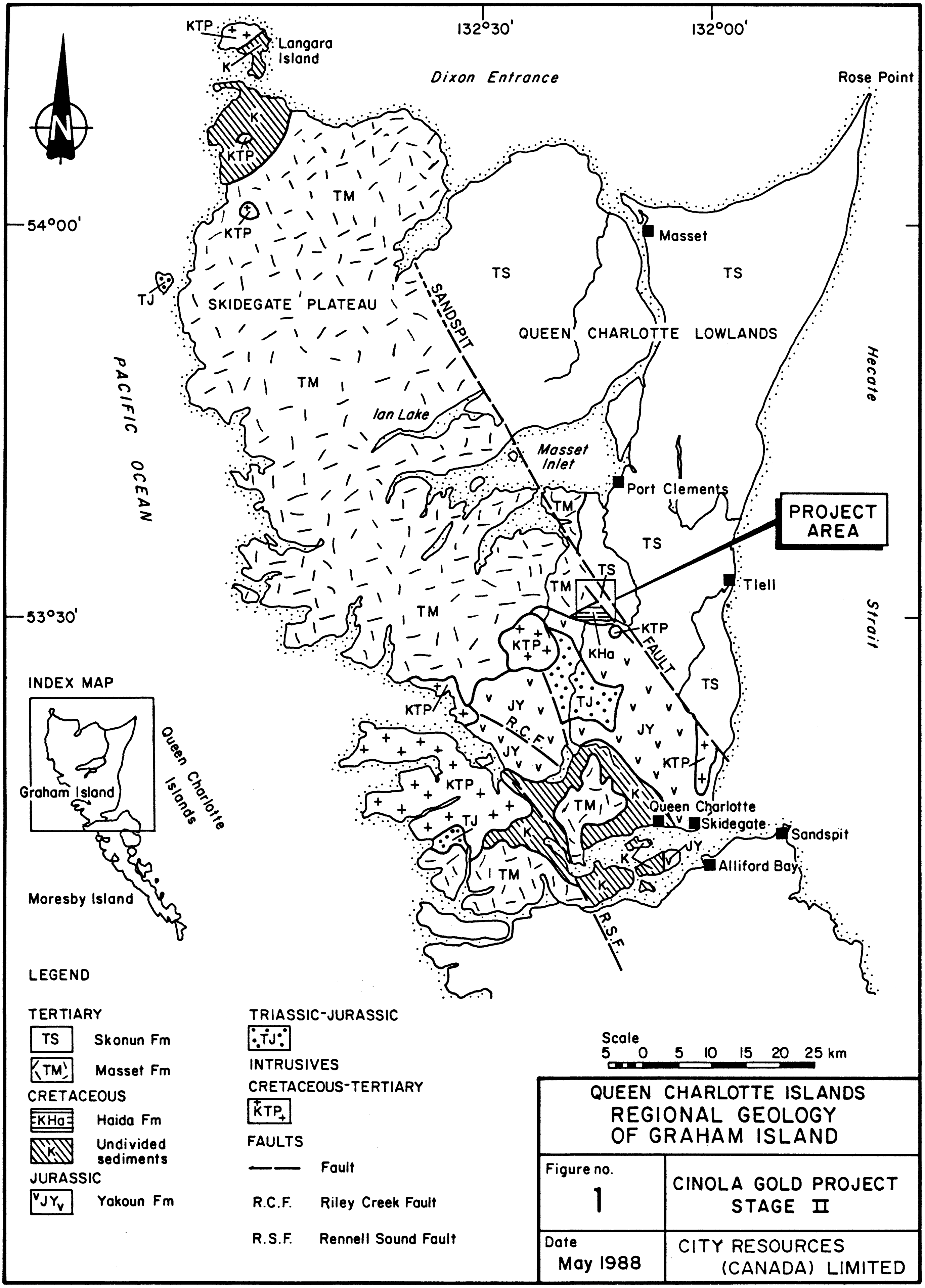
The Cinola gold deposit on Graham Island is situated on the physiographic boundary between the Queen Charlotte lowlands to the east and the Skidegate plateau to the west (Figure 1). The boundary is marked by the northwest-southeast trending Sandspit Fault system, evidence of which can be observed on surface as a series of weakly developed fault scarps and as abrupt changes in stream drainage patterns.

Regionally, the Sandspit Fault system forms the western boundary of the Queen Charlotte basin. The basin appears as a graben structure into which sediments were shed, predominantly during the Tertiary Mio-Pliocene period. These sediments range from fine to coarse grained and comprise the Skonun Formation. West of the Sandspit Fault system are Mesozoic and Lower Tertiary rocks, including mafic to rhyolitic volcanics and volcanociastics, carbonates, epiclastics, and intermediate to granitic intrusive rocks.

The dominant lithologic unit west of the Sandspit Fault system, south of the Cinola deposit and the Yakoun River, is the Yakoun Formation of middle to upper Jurassic age. This is primarily a volcanic unit dominated by pyroclastic rocks of porphyritic andesite composition.

Further west and south of the Cinola deposit this formation includes volcanic sandstone, conglomerate, shale, siltstone and minor coal. The Yakoun Formation originated in an eugeosynclinal environment and is equivalent to the Bonanza Formation on Vancouver Island.

The area immediately west of the deposit is underlain by grey to black argillites and siltstones of the Early to Late Cretaceous



QUEEN CHARLOTTE ISLANDS
REGIONAL GEOLOGY
OF GRAHAM ISLAND

Figure no. 1

CINOLA GOLD PROJECT
STAGE II

Date May 1988

CITY RESOURCES
(CANADA) LIMITED

Haida Formation, which also originated in a marine eugosynclinal environment. The area northwest of the Cinola deposit, extending to the west coast of Graham Island, is underlain by basaltic to rhyolitic extrusive volcanic and pyroclastic rocks of the Tertiary Mio-Pliocene Masset Formation.

Porphyritic rhyolitic sills and dykes similar to the Masset Formation rhyolites intrude the deposit and the Haida Formation argillites adjacent and west of the deposit. Intrusive rocks of diorite to quartz diorite composition occur as plugs and stocks in the region south of the Yakoun River and southwest of Sheila Lake.

PROPERTY GEOLOGY

Data Acquisition

The Graham Island (Cinola) gold deposit represents the exposed middle-upper levels of an epithermal, hot-springs-type, precious metal system. This interpretation is based on the results of the work conducted by City Resources (Canada) Limited from November, 1986 through March, 1987. City Resources geologists logged approximately 3450 m of new core from 29 NQ(47 mm diameter) and HQ(63 mm diameter) sized diamond drill holes, plus 6220 m of cuttings from 63 air reverse circulation (146 mm diameter) holes. Both the diamond and air reverse circulation drill holes were drilled at an inclination of -50°. Other work in 1986-1987 included relogging of 27 900 m of core stored on-site from 227 diamond drill holes completed prior to 1984, most of these holes were drilled vertically.

City Resources also conducted an underground exploration program in March 1987. Two new cross-cuts totalling 117 m in length were driven from the existing undergroound drift. The new cross-cuts were sampled and mapped in detail, and previously drifted underground workings were also mapped in detail. The ribs and backs of the new cross-cuts and of 340 m of previous underground workings were geologically mapped, as was the face of each new cross-cut advance.

All drill hole logging information was transferred to a computer data-base on-site and at the Vancouver office utilizing Gemcom Services Inc's. PC-XPLOR data-base system. Information stored in the data-base included lithologic, survey, and assay data, which were checked, verified, and edited for transcript errors.

The information in the data-base was used to create 23 lithologic/alteration and assay/vein cross-sections that completely encompassed the Cinola deposit. Oriented at N 65°30'E and spaced approximately 30 m apart, these cross-sections were used to interpret lithologic, grade, and alteration (silicification and argillic) boundaries for the deposit. Continuity from cross-section to cross-section was maintained by used of a "hanging acetate" model at a scale of 1:500.

Bench plan geology was derived from the completed cross-sections utilizing a computer program designed for City Resources (Canada) by Interactive Computer Applications Systems Ltd. of North Vancouver. The geologically interpreted cross-sections, which were digitized and stored on disk, were "sliced" horizontally at 6 m intervals and plotted on bench plans. These bench plans were then integrated into a consistent, three-dimensional interpretation.

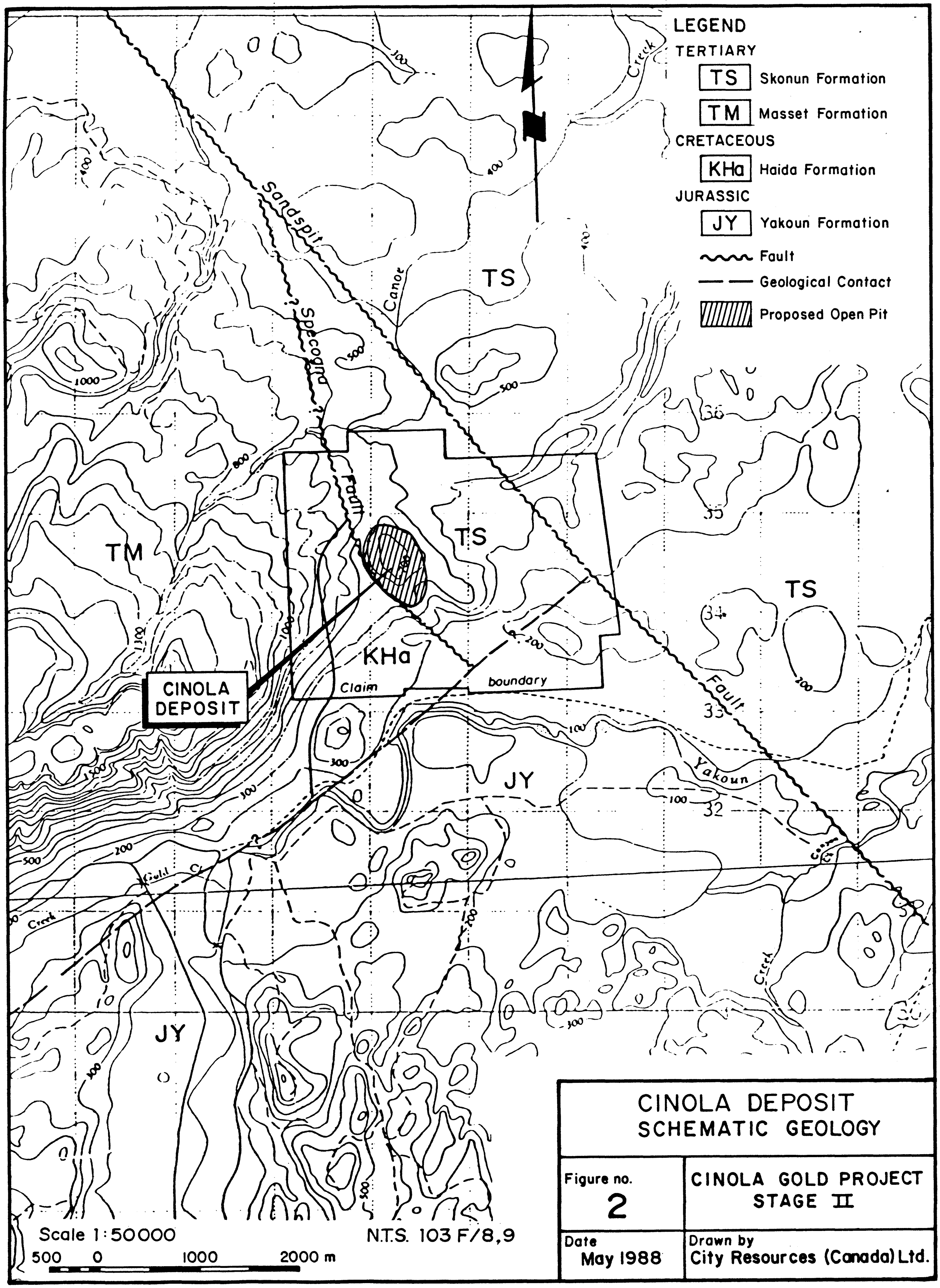
The geological cross-sections and bench plans formed the basis for assay sections and assay bench plans (on 6 m intervals), and subsequently for the hand-calculated geological and mineable reserves; they also provided the geologic basis for the separately derived geostatistical reserve models.

Structure

The Cinola deposit is localized between the Sandspit Fault to the east and the footwall Specogna Fault 1500 m to the west (Figure 2). Both faults strike at 143° in the area of the deposit. While subsidiary, parallel faults may exist between the Sandspit fault and the area of past detailed drilling, which extends 400 m east of the Specogna Fault, no other major faults at this trend have been observed (Figures 2 and 3).

Locally, the Specogna Fault is the true western margin of the Queen Charlotte basin. Movement on the fault was syngenetic to deposition of the Skonun Formation and was dominantly normal, dipping 45 to 50° to the east. The zone of major faulting appears to be up to at least 70 m in width and to have been active during and beyond the period of mineralization. During mineralization, right lateral movement on both the Specogna and Sandspit faults created a conjugate set of fractures trending at 30°. These fractures filled with silica, forming a series of 'seismic', high grade gold veins.

Post-mineralization movement is evident at the "Marino Showing" in the northwest corner of the deposit. Detailed drilling in this area has revealed a large block of rhyolite surrounded by sheared argillite of the Haida Formation, the rhyolite was displaced vertically at least 200 m along the Specogna Fault after being "cut" by numerous silica veins containing visible gold.



LEGEND
TERTIARY
TS Skonun Formation
TM Masset Formation
CRETACEOUS
KHa Haida Formation
JURASSIC
JY Yakoun Formation
Fault
Geological Contact
Proposed Open Pit
TS
TM
KHa
JY
Sandspit Fault
Specogna Fault
Canoe
Yakoun
Gold Cr.
Creek
Claim boundary
CINOLA DEPOSIT
Scale 1:50000
500 0 1000 2000 m
N.T.S. 103 F/8,9
CINOLA DEPOSIT
SCHEMATIC GEOLOGY
Figure no.
2
CINOLA GOLD PROJECT
STAGE II
Date
May 1988
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Lithologies

The lithologic units comprising the Cinola deposit can be separated into three packages: the sedimentary sequence (predating the following two), the intrusive igneous sequence, and the epithermal hot-spring suite.

Table 1 provides a summary description of Cinola Gold Project deposit lithologies.

Sedimentary Sequence

The sedimentary sequence includes two formations, the Late Cretaceous Haida and the Teritary Mio-Pliocene Skonun (Figures 3 and 4).

Late Cretaceous Haida Formation

(Units 1a, 1b, 1c)
This formation outcrops west of the Specogna Fault on the western side of the deposit and is dominated by black-dark grey variably calcareous indurated mudstone. Minor sandstone and siltstone layers are also present. Drilling indicates it extends to a depth of at least 220 m below surface.

The major mine units within the Haida Formation are as follows:

a) Unit 1a is a competent grey-black mudstone with minor siltstone or sandstone;
b) Unit 1b is sheared, soft grey-black mudstone that occurs predominantly within the Specogna Fault zone; and
c) Unit 1c consists of the Haida Formation mudstone/ siltstone, which has undergone silicification, subsequent brittle fracturing, resilicification, and veining.

TABLE 1
DESCRIPTION OF CINOLA DEPOSIT LITHOLOGIES

A. Sedimentary Units

AGE	FORMATION	UNIT	DESCRIPTION
Tertiary (Mio-Pliocene)	Skonun	2a	Mudstone/Siltstone
		2b	Sandstone
		2c	Conglomerate, cast-supported
		2d	Conglomerate, matrix-supported
		2e?	Boulder Conglomerate (see intrusive unit description)
		4c	Mudflow Breccia with mudsupported angular clasts predominantly rhyolitic
		4cu	
Cretaceous	Haida	1a	Mudstone/Siltstone, competant, grey-black
		1b	Mudstone, sheared soft, grey-black
		1c	Mudstone,silicified, veined fractured, grey-black

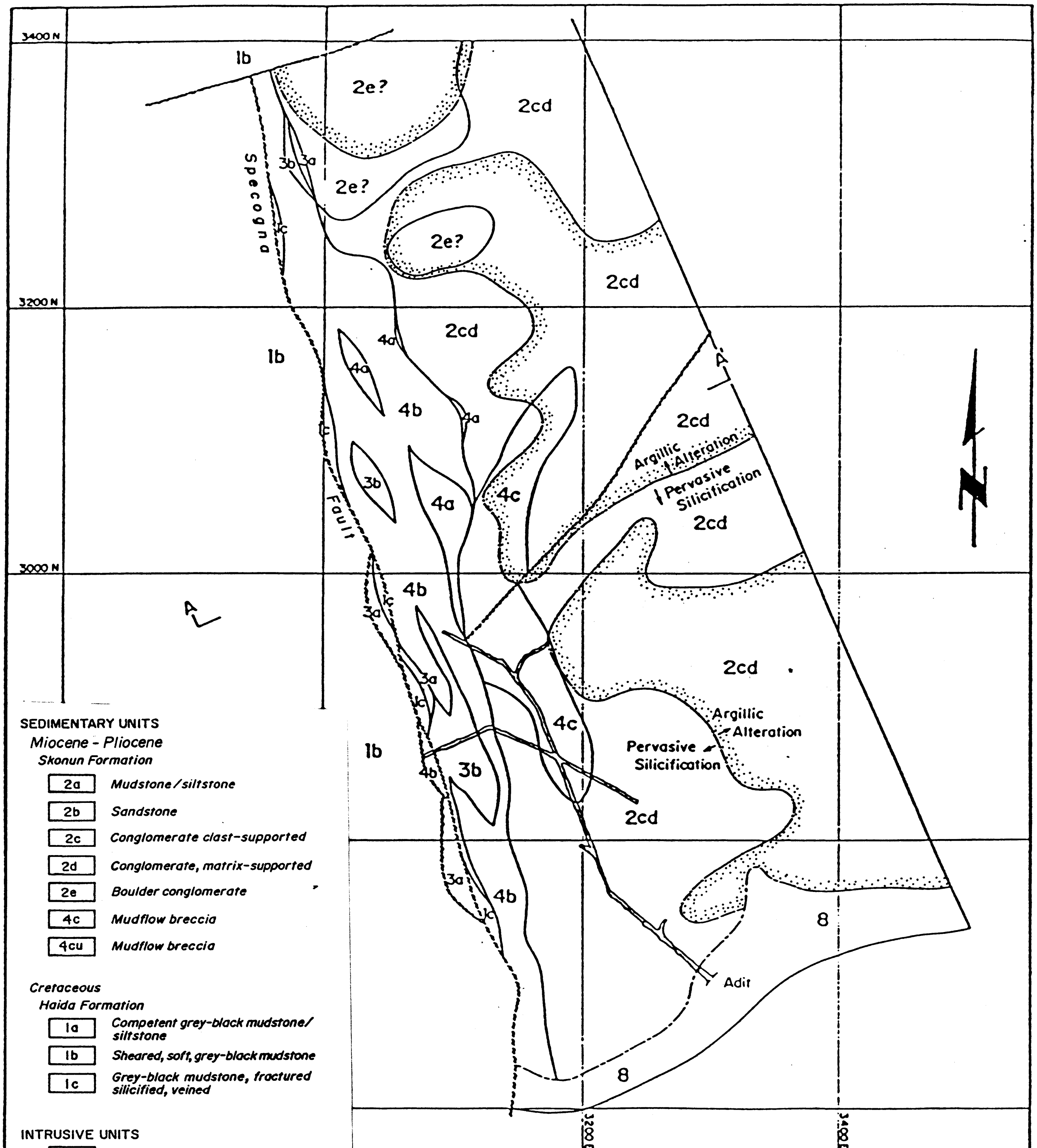
*NB-Argillic alteration and silicification overprint the sedimentary units and are not defined separately as units.

B. Intrusive Igneous Units

AGE	FORMATION	UNIT	DESCRIPTION
Tertiary (Miocene-14 Ma.)		3a	Rhyolite Porphyry
		3b	Hydrofracted Rhyolite Crackle Breccia
		3c	Rhyolite Breccia within 4b
		4a	Vuggy, rhyolite, acid-leached(?), silicified +- marcasite and clay minerals
		2e?	Mixed Boulder Conglomerate and Rhyolite

C. Epithermal Hot-spring Units

AGE	FORMATION	UNIT	DESCRIPTION
Tertiary (Miocene-Younger than 14 Ma.)		4b	Polymictic Hydrothermal Breccia
		5a	Vein, calcite
		5b	Vein, silica after calcite
		5c	Vein, drusy quartz
		5d	Vein, white silica
		5e	Vein, silicified breccia
		5f	Vein, brown hematitic silica
		5g	Vein, grey chalcedonic silica



SEDIMENTARY UNITS

Miocene - Pliocene

Skonun Formation

2a	*Mudstone/siltstone*
2b	*Sandstone*
2c	*Conglomerate clast-supported*
2d	*Conglomerate, matrix-supported*
2e	*Boulder conglomerate*
4c	*Mudflow breccia*
4cu	*Mudflow breccia*

Cretaceous

Haida Formation

1a	*Competent grey-black mudstone/ siltstone*
1b	*Sheared, soft, grey-black mudstone*
1c	*Grey-black mudstone, fractured silicified, veined*

INTRUSIVE UNITS

3a	*Rhyolite porphyry*
3b	*Hydrofractured rhyolite crackle breccia*
3c	*Rhyolite breccia within 4b*
4a	*Vuggy acid-leached (?) silicified rhyolite ± marcasite and clay minerals*
4b	*Polymictic hydrothermal breccia*

OTHER

8	*Overburden*

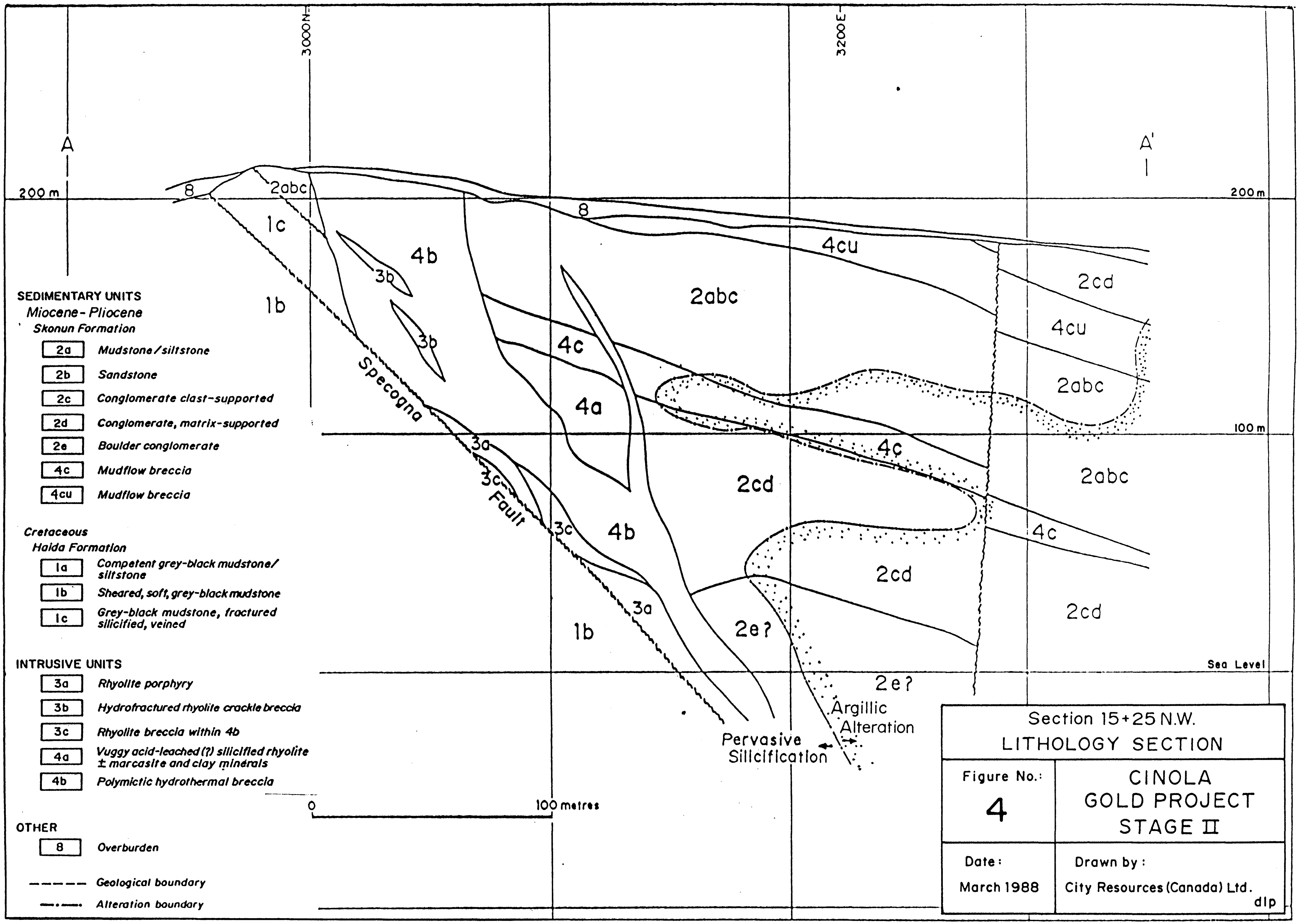
----- *Geological boundary*

-·-·- *Alteration boundary*

Section 114m

HORIZONTAL LITHOLOGY SECTION

Figure No.: 3	CINOLA GOLD PROJECT STAGE II
Date: March 1988	Drawn by: City Resources (Canada) Ltd. dlp



3000N
3200E
A
A'
200 m
200 m
100 m
Sea Level
8
2abc
1c
4b
3b
3b
1b
4cu
2cd
4cu
2abc
4c
4a
2abc
4c
2cd
3a
3c
3c
4b
4c
2cd
2cd
3a
1b
2e?
2e?
Specogna Fault
Argillic Alteration
Pervasive Silicification
SEDIMENTARY UNITS
Miocene-Pliocene
Skonun Formation
2a Mudstone/siltstone
2b Sandstone
2c Conglomerate clast-supported
2d Conglomerate, matrix-supported
2e Boulder conglomerate
4c Mudflow breccia
4cu Mudflow breccia
Cretaceous
Haida Formation
1a Competent grey-black mudstone/siltstone
1b Sheared, soft, grey-black mudstone
1c Grey-black mudstone, fractured silicified, veined
INTRUSIVE UNITS
3a Rhyolite porphyry
3b Hydrofractured rhyolite crackle breccia
3c Rhyolite breccia within 4b
4a Vuggy acid-leached (?) silicified rhyolite ± marcasite and clay minerals
4b Polymictic hydrothermal breccia
OTHER
8 Overburden
Geological boundary
Alteration boundary
0
100 metres
Section 15+25 N.W.
LITHOLOGY SECTION
Figure No.:
4
CINOLA GOLD PROJECT STAGE II
Date:
March 1988
Drawn by:
City Resources (Canada) Ltd.
dlp

Tertiary Mio-Pliocene Skonun Formation
(Units 2a, 2b, 2c, 2d, 2e?, 4c, 4cu)

In general, the base of the Skonun Formation within the present limit of the Cinola deposit consists of coarse conglomerate. Subsequent deposition, although dominantly conglomerate, reveals increasing proportions of siltstone and sandstone northward and eastward from the south end of the deposit area. The finer-grained sediments also increase in proportion up-section, culminating into a sandy debris flow unit containing pelecypods indicative of a marine environment.

Wood fragments, particularly in the finer-grained sediments, account for 3 to 5% of the total rock volume. Locally, the wood fragments can be present as rare large logs, such as have been observed in the underground workings; these logs are apparently oriented northeast-southwest.

The major mine units within the Skonun Formation are as follows:

a) Unit 2a consists of grey to brown mudstone/ siltstone with minor carbon in the form of plant and tree fragments;
b) Unit 2b is a light grey to brown, medium to coarse grained sandstone with bedding and graded bedding commonly apparent;
c) Unit 2c is a clast-supported, medium grey to pale brown, polymictic conglomerate with rounded to subrounded pebble to cobble size clasts;
d) Unit 2d is a matrix-supported, medium grey to pale brown, polymictic conglomerate with rounded to subrounded pebble to cobble size clasts;
e) Unit 2e is a medium grey to pale brown polymictic, conglomerate containing pebble, cobble, and boulder sized andesite to rhyolite clasts, as well as an interstitial

matrix of rhyolite and/or sand sized particles of quartz and rock fragments. This unit is also found in the intrusive igneous sequence;

f) Unit 4c is a greyish-brown to maroon coloured, mud matrix-supported sedimentary breccia, containing grey to pale brown, angular to subangular clasts of predominantly rhyolite and wispy to fragmental pyrite and marcasite; and

g) Unit 4cu consists of a grey to brown, sandy/mud matrix-supported sedimentary breccia containing grey to pale brown, angular to subangular clasts, occasionally including pelecypods.

The combined unit designation was applied at the geologic cross-section interpretation stage of model development when it became difficult to separate out individual units from an intermixed package of sediments. In notating the combined unit, the major units were listed in order of decreasing volume. For example, an intermixed sandstone/mudstone sequence consisting of 60% sandstone would be noted as 2ba.

Intrusive Igneous Sequence

The intrusive igneous sequence includes at least two separate rhyolite intrusions localized along the Specogna Fault (Figures 3 and 4). The rhyolite intrusions in Unit 3 have been dated as middle Miocene (about 14 Ma), predating or contemporaneous with the hot-spring suite.

a) Unit 2e? is described within the Skonun Formation above. The cross-section interpretation of Unit 2e? indicates a distinct arched contact with the overlying sediments and the apparent predominance of rhyolite in localized areas within the Cinola deposit.

Overall this "boulder conglomerate" gives the impression of an unconsolidated coarse sediment intruded by a highly fluidized rhyolite, which ascended through these sediments and incorporated them into what appears as a porridge-like mixture of conglomerate and rhyolite;

b) Unit 3a is a grey to blue, tan to flesh coloured, quartz-feldspar rhyolite porphyry that contains quartz and plagioclase feldspar phenocrysts 2 to 5 mm in size;

c) Unit 3b consists of a tan to grey, silicified, hydrofractured rhyolite with a stockwork of pyrite/silica veinlets containing local minor hematite;

d) Unit 3c consists of a tan to grey, silicified, brecciated rhyolite with minor Haida mudstone fragments; and

e) Unit 4a is typically a tan to grey, highly silicified, vuggy rhyolite with honeycomb-like texture containing up to 10% ubiquitous pyrite.

Epithermal hot-spring suite

Both the sedimentary and the intrusive igneous rock sequences have been subjected to overprinting by argillic alteration and silicification. Associated with these alteration features is extensive silica-vein development peripheral to a hydrothermal breccia. The hydrothermal breccia is spacially related to the Specogna Fault (Figures 3 and 4).

The lithologic features of the epithermal hot-spring suite are summarized below.

a) Hydrothermal Breccia Unit 4b is commonly a bluegrey to black, coarse to finely-commuted polymictic breccia with a siliceous matrix. This unit has been traced along the Specogna Fault (on strike) for at least 800 m. It is up to 100 m wide near ground level, narrows at depth (~200 m) to a width of 10 m, and is generally tabular in structure with dyke-like offshoots extending into the wall rocks. The breccia unit itself consists of numerous generations of breccia, visible in both drill core and the underground workings, with gold grades consistently greater than 1.71 g Au/t.

The margins of the breccia are characterized by silica and by "floating" fragmental and rounded clasts of wall rock units, indicating violent pressure release and sudden precipitation of silica;

b) <u>Stockwork Veining</u> extends into the wall rock for several metres as a hydrofractured zone. Gold values consistently greater than 1.71 g Au/t occur in this stockwork, particularly on the hanging wall of the hydrothermal breccia. Stockwork veining is also found peripheral to the larger, vertical "seismic" veins described in e) below;

c) <u>Pervasive Silicification</u> characterizes an extensive region of Skonun sediments east of the hydrothermal breccia and stockwork veining. The evidence of silicification includes cryptocrystalline silica cement binding pebbles and smaller clasts of the original sediment, silica after calcite, chalcedonic silica veins, and drusy quartz crystals occurring as void fillings, vugs, and veins. The zone of silicification extends laterally, parallel to the Specogna Fault, and is roughly mushroom-shaped (Figure 3).

d) <u>Argillic Alteration</u> is found beyond the area of pervasive silicification in a region of Skonun sediments dominated by kaolinite-illite with minor alunite and sericite. Generally, the contact between argillic alteration and silicification marks the 0.69 g Au/t gold grade boundary, as there is an abrupt drop to gold value grades of less than 0.69 g Au/t within the argillically altered sediments; and

e) "Seismic" Veining within the pervasively silicified bedrock is an important localizer of high grade gold values. The veins are vertical to subvertical bands of chalcedonic quartz, striking 25 to 30°, and are related to conjugate sets of fractures created by differential movement on the Specogna and Sandspit faults while the hot-spring system was active.

Several types of veins have been recognized and recorded on drill logs. The vein unit divisions are based on visual characteristics and consist of the following:

a) Unit 5a is crystalline white calcite;
b) Unit 5b is clear, white to grey silica containing remnant calcite crystal outlines;
c) Unit 5c is clear, euhedral, drusy quartz often occurring as void filling or vugs (crystals from 1 to 5 mm);
d) Unit 5d is milky-white silica;
e) Unit 5e is white to light grey silica containing numerous breccia fragments;
f) Unit 5f is brownish-pink hematitic (?) silica (colour may be related to hydrocarbons); and
g) Unit 5g is grey-black cryptocrystalline to chalcedonic silica.

Ore types and distribution of mineralization

The orebody is essentially wedge-shaped and extends 800 m northwest-southeast. The wedge is approximately 200 m wide at surface, thinning with depth to 50 m wide at sea level (Figures 3 and 4).

The ore (>1.1 g Au/t) is distributed in four silicified lithologies: Skonun sediments, comprising 55% of the total ore tonnage; hydrothermal breccia, 30%; rhyolite, 13%; and Haida mudstone, 2%. Higher grade stockwork and "seismic" veining are distributed through all the ore types.

Genesis

Champigny et al. (1981) have hypothesized, based on evidence from borehole drilling at Tow Hill at the northern end of Graham Island, that the Cinola gold deposit was formed 1000 to 1500 m below the ground surface in an old braided stream, alluvial plain environment. (Tow Hill is a geographic feature 80 km northwest of Cinola on the eastern margin of the Queen Charlotte basin). The boreholes indicated the presence of conglomerates at a depth of 1000 to 1500 m, and it was assumed that the conglomerates at Cinola were buried to at least that depth when gold was deposited. More recent data obtained from relogging of Cinola exploration drill core and mapping of underground workings, however, strongly suggest that the gold was deposited in a hot-spring system near the surface in an alluvial fan environment.

Although most evidence of the hot-spring has eroded away, some material thought to be sinter was observed in DDH 80-88. If this material is indeed sinter, then only 100 to 200 m of bedrock may have been removed from the original ground surface (during the time of gold deposition), exposing the deposit at its present level. This would confirm the deposition of gold at Cinola in a near surface alluvial fan environment.

Rapid tectonic uplift along the western margin of the Queen Charlotte basin is believed to have created a fault scarp, accompanied by rapid erosion and the development of alluvial fans. One of these, the "Cinola Fan", originated along the

Specogna Fault and was intruded by a highly fluidized rhyolite (Unit 2e?); this intrusion initiated the movement of groundwater and the development of a hot-spring system.

The magma chamber, or source of this intrusion, was positioned near the surface and able to sustain high heat flow long enough to allow the intrusion of a later rhyolite (Unit 3a) along the Specogna Fault and the generation of the hot-spring system.

The unconsolidated, porous nature of the alluvial fan sediments allowed extensive migration of hydrothermal fluids, both vertically and laterally, away from the Specogna Fault during the early stages of hot-spring development. With the migration of hydrothermal fluids came the deposition of silica and various elements, including gold. Silica deposition slowly sealed the sediment pores, restricting the movement of hydrothermal fluids to the vicinity of the Specogna Fault. The silica sealing process eventually created significant overpressuring within the hot-springs system, and hydrothermal fluids erupted explosively. These eruptions caused the supersaturated silica solutions to boil suddenly and gold to precipitate.

Numerous overpressuring and explosive hydrothermal eruption events are thought to have taken place at the Cinola deposit, each event resulting in the increase in the quantity and grade of gold in the deposit. These eruptions were localized along the Specogna Fault and are evident as hydrothermal breccia units within the present deposit.

This understanding of the hot-spring genesis of the Cinola deposit has proven very useful in successfully outlining gold grades throughout the various lithologic units. Further geological study is required and is in progress to obtain a more complete interpretation of the detailed nature of the hot-spring system.

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