Notes by: Tom Schroeter

MEG TALK

-1-

Snip
887760

SNIP — Ron Nicols

Mar. 23/88

-intro- Stan Pedley / Thanx - Ron Netolisky

1966: 4 ft of >6 opt Au
- Discovery trench

GEOLOGY
'Simple' → Fsp. wackes + ss + sst. 045-100/10-40° NE
est. L. Jurassic (Unuk R. Fmn.)
- orthoclase porphyry + extensive alt'n halos (qtz-ser-py)
- main structures @ 120°

OWNERS: 60 Cominco / 40 Delaware
- original (1980's) drilling @ 100m step outs from Discovery Tr.

Geochem: soils > 100 ppb (>200 ppb linearity - NE)
↓
25m spacing down face of hill

1986 Work (ddh): incl. 2.8 m @ 36 g/t Au
>1000 ppb - largest soils
500 to 1000 - good

AIRSTRIP - ultimately 4800 ft. long
- following with 50m ddh spacing / to 250 m down-dip

TWIN ZONE STRUCTURE 1000m x 500 m vertical
- open to east + down-dip 110-120°/40-60° SW
- 48 ddh along this zone (33 used for 'ore' calculations)
⟹ considerable potential into hill + downdip

1988 - 325m level plus 'up' + 'down' drill.
- 150m level - haulage level.

Mineralogy: tellurobismuthite, hessite, volynskite, ~~Ni~~, po, arseno., ZnS, PbS, cpy, tetra, MoS_2, cosalite, ~~po~~, mag + native gold (10-15%)

Gangue: calcite, ankerite, qtz, bio, chl, kspar, sericite.

⟹ MESOTHERMAL (i.e. no vertical zoning)
- interbands of low grade gold in kspar alt'd fsp wackes
- bio-chl-rich sections locally ab. (rare 'ore' values in HW/FW)

Reserves (conservative)
1.1 m tonnes @ 24 g Au/tonne

SNIP (cont'd)

~~Av. Metal Content in Ore~~

- common assoc. with arsenopy — as free Au.
- also with tellurides

Fe	9.84
Zn	2100 ppm
As	662 ppm
Cu	504
Pb	360
Au	45 ppm
Bi	33
Cd	16
Ag	14
Sb	1
Hg	9 ppb

Recoveries 75% Au
80% Ag

Q: 'Cut' factor 150 g/t - why?
- 'common sense' (only 144 pts.)

Net $15 K/y: ~$3.5 m spent
∴ Good cost/oz exp'n.!!

- u/g portal to be collared this week. (Mar. 23/88)

Q: Min. assoc. with intrusions?
- Could be but no direct evidence yet

Q: Av. width of vein system?
1-10m Av. 3-3.5m Au dist'd evenly

Q: Silts at base of hill anomalous?
- very little drainage — cks. go u/g ∴ went to soils!

Q: Twin structure related to regional structure?
- not topographically but close to Branson Ck. structure

Q: F/y job vs rd → F/y (to start)

Sanatorum
est. $20m cap. cost
1989

SNIP

Feb. 4/88

- Bill Wolfe

Twin Zon dips 58° SW

1000 m strike (elev. 150m to 650m)

Native gold – 1965 – Cominco – prop. abandoned in 1970's
restaked in 1980

- good soil geochm 200 to >1000 ppb Au

1986 – Delaware/Cominco
'86-'87 15000 m in 85 ddh
- several parallel high grade vein structures – best = Twin

banded vein
1–10m wide vein in massive bedded gwke, sst unit
(U Tri – L Jur age) – Unuk R. Fm.?

- massive to dissem py, cal, bio, chl + minor qtz.
- Tellurides – telluro bismuthinite, Hessite, Volynskite + kspar, sericite, ankerite

py, po, mag,
ilm, arsp, ZnS,
PbS, cpy, tetra, MoS2, cosalite
native Au

Au:Ag ~ 2:1

300m vertical tested

Reserves: 1.1m tonnes @ 24g/t Au or 1.2m tons @ .7opt

Adit at 325m level Proposed 180 m haulage level

Notes by VAP.

MDSC SNIP UPDATE - JUNE 21/88

Bill W. Wolfe, Walter W. Kewit, Dana D. Peterson → Cominco Ltd.

Pre Exploration Development Program (W. Wolfe)

LOG NO: JUN 24 1988 VAN
ACTION:
FILE NO: SNIP

- Fuel from Wrangell via DC3 - use 1000/1200 gals/day at this time
- Exploration
- Level was actually collared @ 300 m elev not 325 as shown in prospectus - Lower level to start in a few days - portal @ 180 m, not 150 m.
- Expl level has 300 m in ore. Crosscut is going in @ Sect 500.
- Some structural problems - will need much drilling
- In general V. good success - particularly below sect 400 & 500 - Zone up to 8 m thick grade > than avg .7 oz. - Undiluted grade over the 100 m is @ 60 ozs -
- In general very happy w/ results - Now they are going to start @ lower level
- Much drilling needs to be done to upgrade reserves to proven - Need a min of 200,000 t, looking @ 500 tpd -
- Current objective is to complete raise, drill above + below 300 level to upgrade reserves
- ~~Level~~ 180 level will be haulage level -
- Working on mine plan at this time

(+) Zones // to Twin Zones do exist, level been

hit by some drill holes — could be fault offsets of Twin Zone — have not been investigated much to date — These are in the Footwall of Twin Zone.

- Airstrip is being upgraded to Hawalle Hercules — 4500' x 250' wide — Now only used by DC3 —
- Trace elements in undiluted ore: Average

As.	662 ppm		
Cu	504	Fe	9.84%
Pb	360	Zn	2100 ppm
Au	45		
Ag	14	S	6-7%
~~Bi~~	33		
Cd	16	≈ 15%	py + pyrrhotite
Sb	1		
Hg	9 ppb	Sphal, galena, aspy, cpy total < 1%	

- Vein has Tellurides, molybdenite, Tet, cpy, gal sphal, cobaltite, aspy, Ilmenite, mite, py, pyrrh, Calcite, ankerite, chlorite, bio, Sericite, not Au

Met test gives 97-98% rec. most Au is free Au, 50-60% will be recoverable by gravity, rest will be by cyanide.

- Choice 1 for tailings is monsoon Ck valley.

- Power & Roads —

- Howe studied feasibility of hydro line from Alaska.
- Feasible physically from Bradfield Canal — Alaska is very keen to see this done — Economics are out of line — Cost recovery is no better than flying diesel into property.

	Capital $	operating ¢/Kwh	Financing + operating ¢/Kwh
Diesel	3.535 M	14.8	19.9
Alaska (includes only B.C. side of line)	10.501 M	(include backup diesel) 10.9	23.6
Local Small Hydro	6.735 M	8.3	18.5

(3) SNIP.

- Diesel back up would be required for both Hydro solutions - So most likely will go for diesel - However decision is not made yet - Price of oil could jump -

- Bottom line: project is on a FAST TRACK Powerline will not be ready on time, ∴ Diesel is only way to go - Plan is to go to production with fly-in diesel fuel.

MINE/MILL PLANNING

- One body x 3m wide, 43% is less than 2m wide.
- Trackless eqpt impractical if < 3m.
- Dip 45-55%, much faulting

∴ Will combine Trackless & conventional mining Use cut & Fill, conventional setup, no problems anticipated Levels @ 50m intervals w/ramps in between.

- Use sand from Johnny flats & mine tailings for back fill! Tailings look to be dry for the best, cost wise & access wise & environmental wise.

- ~~Uranium~~

SITE SELECTION (MILL & TAILINGS)

- Bronson Ck has been dyked off to protect A/Strip

- Monsoon Ck diverted to its former course before capture by Bronson Ck

(4) SNIP

Tailing Sites

choice 1 (choice camp is NOW)

Bronson flats, Swamp S.W of Monsoon Lk, Triangle Lake, Small Lk to W of Monsoon Ck.

Choice 2.

MINE SITES

- Bronson flats - Too far from main portal
- At N.E. end of choice 1 Tailings pond - prob. bedrock 10. deep.
- Best option right @ portal & mid point of choice 1 tailings site - By far the best site - any possible leakage would be contained within Tailings pond.

ENVIRONMENTAL ISSUES

Acid generation - Have tested 8 ore samples, 12 waste samples and 5 Tailings samples. Will report shortly -

All waste samples have +ve self neutralization potential - ∴ Waste is not anticipated to be an acid generation problem

One + Tailings could be a problem - but results were effected by one oddball sample ~~—~~ not representative of any one.

Overall Acid generation is not expected to be a problem.

Water management → close pond system with no decant.

Mine drainage now under ~~—~~ investigation

(5) SNIP

Exploration Portal now discharges 3-500 gals/min.

SCHEDULE (Aggressive!)

	June 10/88	Start Stg II geotech
	23/88	Confirm prelim ore reserves
	30/88	Finalize cap cost estimates
	July 4/88	Finalize op plans
	8/88	Complete Ec. eval
	15	Owners approval in principle
	18	Commence detailed design
	29	Complete Stg II geotech
	Aug 2	Submit Stg I report
*	Sept 16	MDSC Approval in principle
	19	Start tailings dyke constn
*	Jan 8/89	Start mine development
*	May 1/89	Start Site Construction
*	July 14/89	Start mine ~~construction~~ production
*	Sept 29/89	Start Mill production

+ - SNIP

SLIDES Good std. ~200
geol. slide June '88
(comms)
+ reg. geol. slide
+ polished secs.

Ron Nicholls
Intrai Bill Wolfe

Res. (Twin Zone) } 430,000 tonnes @ 21.9 g/t Au (ind. + inf.)
Mining Rate ~ 300 tonnes/day -diluted 25%
Prod. Target: late '89 Av. thickness 4.5m
SNIP - L. Unuk R. Fmn. (204-208 Ma) - also Reg.
Note: Sulphurets, Premier, Goldwedge etc. 188-193 Ma
i.e. Upper Unuk R to Betty Ck. Fmn.
- all Lower Jurassic Note: Galore Ck. intr. = 189-195 Ma

- Orthoclase porphyries! - when altered = qtz-ser-py.
- Red Bluff porphyry - linear WNW
- "Felsic Rhyolite" - along strike of Twin Zone to east
- Au in soils - anomalous >100 ppb
- Best min. - Twin 'west' zone: ① cal, bio, chl., qtz, py 'streaky'
- "SHEAR VEIN" type
- ② Bio-py stkwk zone; ③ Py-bio (lensy, discontinuous)
- Also grody intsecs. 80 m below Twin Zone
(no tonnage calcs.) eg. 37 g/t Au over 7m

- Vein mineralogy - see previous notes
- No defineable alt'n near vein

- 'Streaky' calcite (inc. cannite) units (+py+chl+bio+arsenopy)
- Crackle qtz - usually fairly clean
- No preference of Au values to 3 types of ore or any part of zone (i.e. HW, FW, centre)
- Au - mostly free form ∴ met. recovery ~ 95% (80% + tailing)

DEVELOPMENT → cut + fill method

QUESTIONS: ① Total capital cost? (to end '88 ~ $10m)

② Mag. target? - No

③ Cutting of high assays? >150 g cut back; min. 2m mining width
S.G. = 3.0

④ Cross structures along drift? - 'not major'

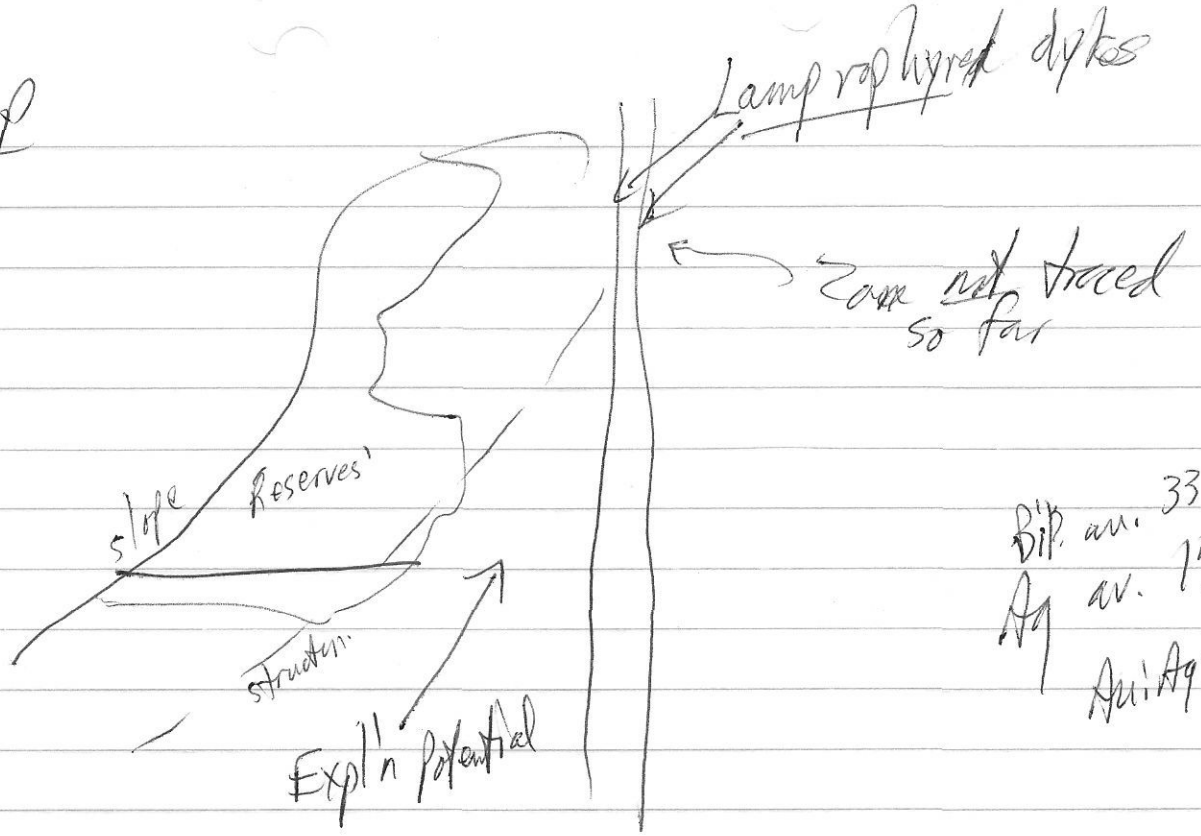
⑤ Parallel zone(s)? - 'Yes', probably

⑥ Genetic rel. between alt'n / Red Bluff or. por + min.? - could be!

Thanx: Dave Barr

NWMA
Dec '88

SNIP



Bi? av. 33 ppm
Ag av. 14 ppm
Au:Ag ~ 3:1

1.6 m tons @ .65 – diluted 25% cut back - 150 g/t

S.G. = 3.0 used

Styles 1) Qtz-Cal-Massive Py 'Streaky'
300 Level west Diff 83 m of 43.1 g/t Au over 5.0 m w/ HW

2) Bio-Py Flooded Zone
55m of 11.1 g/t Au over 10m

3) Py Zone
75m of 26.3 g/t Au over 2m

- major shear system ("shear vein") – no change in 500m vertical
- mesothermal

300 Level: ~800 m into hill

Mining Plan: Series of ramps / 'Cut + Fill'

Tom Schroeter
NWMA
Dec. 88

COMINCO-DELAWARE SNIP GOLD PROJECT
ISKUT RIVER, NORTHWESTERN B.C.

The Snip property, located on the lower slopes of Johnny Mountain, adjoins the north boundary of the Skyline Explorations Ltd. Stonehouse property where gold production commenced in 1988.

The first claims on the northeast flank of Johnny Mountain date from 1910 and Cominco prospectors staked and prospected claims in the area in 1929. Native gold was first observed in outcrop by a Cominco exploration crew prospecting the ground around Johnny Mountain for base metals in 1965. The showing was hand trenched in 1966 and this work revealed a strong calcite-quartz-pyrite-sphalerite-galena-native gold-chlorite-sericite shear vein hosted by intensely carbonate-altered siltstone. Assays of 1.36 ounces per ton gold over 11 feet, 0.44 ounce per ton gold over 18 feet and 6.54 ounces per ton gold over 4 feet were obtained over a 60-foot strike length. The property was abandoned in the early 1970's but restaked by Cominco in late 1980. Cominco carried out geological mapping, soil geochemistry and trenching in the 1981 to 1983 period. This work confirmed the existence of high gold grades and outlined strong gold geochemical anomalies in soil - including extensive areas of 200 to 1000 ppb gold.

In early 1986, Cominco Ltd. signed an option agreement with Delaware Resources Corp. During 1986-1987, programs financed by Delaware led to the completion of 85 diamond-drill holes (50,350 feet) which intersected several high-grade vein structures. The best of these is the Twin Zone, a 3 to 25 foot-thick, discordant, shear vein cutting a thickly bedded sequence of feldspathic greywacke and siltstone.

The Twin Zone structure strikes 120 degrees, dips 50 degrees southwest and has been traced over a strike length of 3500 feet and through a vertical range of 1500 feet. During 1988, underground drifting on the Twin Zone System on the 300 Level has demonstrated the existence of two distinctly different ore types. Type A ore occurs in a complex banded shear vein composed of alternating bands of

massive calcite; heavily disseminated to massive pyrite; thin bands of biotite-chlorite and crackle quartz. Pyrite averages 15 percent in Type A Twin Zone mineralization. Other sulphide minerals include pyrrhotite, chalcopyrite, sphalerite, galena and arsenopyrite. Molybdenite is also common locally. Minor to trace amounts of bismuth and lead tellurides, including tellurobismuthite, cosalite, hessite and volynskite have been observed in polished thin sections.

Type B mineralization is dominated by pyrite-pyrrhotite mineralogy (quartz and calcite are absent) and tends to be more attenuated and discontinuous than the Type A ore. Both types lie within the Twin Zone structural plane with Type B ore located eastward and down-dip from the more mineralogically complex Type A ore.

Polished sections reveal that native gold is in free form. It occurs with gangue minerals (biotite, sericite, quartz, carbonate) and commonly at the margins of pyrite, arsenopyrite and Pb-Bi tellurides. It also fills late-stage fractures in pyrite and arsenopyrite.

The current ore reserve estimate comprises 1.57 million short tons of 0.64 ounce gold per ton in indicated and inferred categories. The reserve includes 25 per cent mining dilution at zero grade, based on a minimum mining width of 6 feet. Individual assays greater than 5 ounces per ton have been cut to 5 ounces per ton. Metallurgical tests on underground bulk samples and drill core composites spaced throughout the ore reserve produced combined recoveries (gravity + cyanidation) of 91 to 98 per cent gold.

Underground exploration and development of the deposit is now in progress and preliminary engineering for construction of mill, tailings disposal sites and surface facilities is underway in preparation for late 1989 start-up of a 330 ton per day operation.

SNIP - David Johnson. 'MINING WEEK' Feb. 28/91

14'x32' deck on hovercraft - good photos. → SNIP

10 tpd fuel in / 10 tpd conc. out to Wrangell.

4 wk in / 2 wk out Direct ship → Van or elsewhere

- Direct cyanidization would have given 96-98% Au recoveries (in bullion) but environment reg'd gravity sep. followed by flotation ⟹ 89% recovery.
(ultimately lowered the capital cost)

- lack of "natural buffer" to hold a spill i.e. lack of impervious materials (mainly use gravel)

bullion → Cdn. mint

Cu conc. → Japan smelter

Amd potential → underwater in perpetuity

Mill start-up - Jan. 25/91

TO DATE: { 2 bullion bars, ~600 tons conc. containing ~7500 oz Au

plant oper. ~90% of time. Normally - 95% oper.

Currently ~115 people on site, "more productive than expected"
i.e. room for guests

Future? - structure continues below valley bottom

- want to drill below from U/G

Mine Life: 8 to 9 yrs. — Long Term commitment!

est. ~90,000 oz Au/yr

- "Need for success in mining in NWBC coastal area"! - lots of -ve examples

cap. cost = $73 million (expl. + devel.)

Q. 1. Seasonal limits on oper. of hovercraft — need to winterize (i.e. shut down after construction). Working last 2 wks. - breaking ice

Cost of round-trip est. @ 1/3 of aircraft!!

Q. 2. Johnny Mtn. project status

Q. 3. Staff rotation? - experience in Arctic

est. oper costs = $200/oz Au

→ SNIP

Wed. Mar. 6/91

Cloudy -5°C

SNIP MINE VISIT

- Smithers Exploration Group - Rock Talk ✓
- Al Samis - (Chief) Mine Geologist
- Earl M - Mine Geologist (ex-Blackdome)
- Ray ? - Mill Superintendent

- Hovercraft - #2m outs
- 10 tonnes concentrate outs
- 10 tonnes fuel in.

U/G TOUR

- 380 Level - oreshoot ~ 300,000 tonnes @ 1 opt Au (~ 1/3 of mines' reserves)
- vein ranges from 4-15 m in width

Age Dates: Lamprophyre dyke ~ 31 Ma
Twin Zone Diorite ~ 52 Ma
Dyke ~ 49.2 Ma
} Reset?

- Poured 3 gold bars to date - each ~ 500 oz Au (83% recovery for Au)

- Currently getting ~ 25% of Au by jig (gravity) - shaker table + ~75% by flotation (original plan was 60% by flotation & 40% by jig).

- Au. Lead grade for Feb. = 28.9 g/t Au
- 300 tpd - operating
- Ag ~ 1 opt or Au: Ag ~ 1:1
- Concentrate bag (~3000 lbs) av. ~ 300 g/t Au (8.6 opt)
- 4 stopes currently in use; hope to run 8-10
- combination of various mining methods
- HW gnkes → alt'd (kspar) + 'ore'

340 Level

- Backfill into mine goes thru a jig-filter system to get rid of potential acid rk. drainage problem (sulphide material → tailings underwater)
- Mill built for ~ #6/m

→ SNIP

MDRU – UBC
Iskut Project.

SNIP – Geochemistry Oct. 11/91

- Al Sinclair (missed to call Proto)
- David Rhys – thesis
- Qtz.-mag. rk. cut by py stringers
- several shear (vein) zones thru haulage way
"Annite" (dk. green chlorite)
- Classic shear-vein zone textures
  eg. – down-dip verging folds
  - sheath folds
  - C-S Fabrics (undulating)
  - sythetic shears (Riddel-type)
  - Sturton lineation
  - curvature of cleavage into the zone
  - subhorizontal cleavage
  - assymetric augen
- "open space" filling (bladed qtz – annite) within ductile bio-rich metaseds [TGS – also Premier (dyke)]
- ab. gash veins (± Au) – sygmoidal
- boudinaging (⊥ to striation motion direction)

Red Bluff Por. – kspar phenox – 'augenized' (Z-shaped folded)
i.e. – Twin Zone post dates Xll'n of Red Bluff por. (qtz-mag alt'n)

Late faults: – offset orebodies
– have hydrothermal system (no Au) – charac. bleached, gouge-filled + vuggy qtz (rare cpy)

SNIP - Mark Brown (continued)

- vein type
- in 5th yr of operation
- $61m - total cap. cost - CIM Vista 6
- open @ 470 tons/day
- > 500,000 oz milestone Oct. 13/94
- 4yr life left
- active (15-20,000 m/yr) u/g
- large surface drilling
- confident to extend life

Twin zone + FW → (150 koz) prov. addition to reserves (since prod.)

- currently 180 up to 470 mels up to 580-600 m elev. over next 2yrs.
- establish crown pillar - small open pit
- Expln → to east above/below 180 level
  - → 300 Expln Drift

811,000 t @ 26g/t Au   135 persons

Jun. '94   expl'n + u/g drilling = 3/4 of total
"indicated" reserve.
- overall dilution ~16% (i.e. 1/2 of orig. est. of 20%)

- working up the mine; rather than down

Recoveries — approx. 91% - flotation
200 tpd flotation concentrator (i.e. sacrificing
$40m to alleviate potential
cyanide prob.

Flotation vs bullion (doré)

Gravity = 40% Au
Flotation = 52%   } 91-93% total

300 g/t conc - 3500 lb bags

Max 5-7 days without aircraft (weather)
Mar-Nov - hovercraft
(2 trips/day)   Oct-Apr - charter DC-4

Rock Talk IV (Smithers) Mar. 5/96

SWIP — Ken Donner – Mine Geologist

Prod. = 669,000 oz to end '95
from 800,000 T @ 8.6 g/T Au

Reserves: 480,000 T @ 25.8 g/T Au
Gold: 35% gravity; 65% concentrate

U/G Expln = 344,000 t 24.5 g/T Au
added to original res.
150 + 130 Vein FW

'95: T-West vein – west of Moscon Lake Fault 130°-150°/vert 30cm wide
63 ddh = 11,000 m ⇒ 12 g/T Au over 1.5m (cut-off) (cut-off)
-3 blocks I.D. in same structure
East Block – up to 160 g/T Au
Middle Block – fault offset of East Block
Res. on East Zone ⇒ 29,600 tonnes Au @ 21.7 g/T Au

Oct. '95 – start u/g – portal – west side of tailings pond
-ddh @ 25m 30 m drift (planned) + incline – complete late Nov
pattern

SNIP

Cap Cost = $61M

May 12/03

470 TPD

"Inferred" ore res = 940,000 tonnes @ 2.85 g/t Au

(20% mining dilution)

→ ~~feasibility~~ feasibility study in late '89

→ very clean cut graded 320 g/t Au + 150 g/t Ag

Twin zone 0.5 - 15 m wide g/z - carb vein

+ 1000 m strike + 500 m vertical

(12.5 m ddh spacing)

63,700 m ddh in 750 holes (1986-1990)

- overall mill recovery = 91% Au

(for Rick Bailes re - Kiniskan) TGS