

CROESUS NUMBER #1

SITE #24

MINFILE#105M001ab

1. LOCATION AND ACCESS

Croesus No. 1 occurs midway up the western slope of Keno Hill, extending roughly 350m along an azimuth of roughly 005° up the north side of Erikson Gulch from the creek at 1160m a.s.l. to 1280m a.s.l. The site is centred around UTM co-ordinates 7 089 425m N and 486 655m E. Two-wheel drive access is possible via Blackcap Road which branches off of Wernecke Road, 1.3km to the northwest. The site is off the road roughly 160m southeast of a Blackcap road switchback along an azimuth of 120°.

2. SITE PHYSIOGRAPHY (Photo 24-1)

Croesus No. 1 is located on a moderately steep, 26° slope within Erickson Gulch on the west side of Keno Hill. The site has a southern aspect and is thickly vegetated with spruce, fir, alder and willow. Below 1230m, the site occurs within the talus debris fan of a prominent outcrop of greenstone that extends up the slope of the hill. Soils are poorly developed, derived from colluvial materials and ranging in thickness up to 1.5m. Above 1230m, bedrock is covered with a blanket of glacial gravels. Permafrost is likely, especially in the shadow of the gulch on the lower portions of the slope. Minor earth flows are evident on the slope immediately west of the site.

No surface water was observed associated with the Croesus No.1 mine workings. Shallow seeps are likely based on the presence of coarse talus below 1230m. All runoff from the mine site flows southward to Erikson Gulch, a tributary of Christal Creek. Shallow ditches, probably cut by the early miners to channel spring runoff to the mine workings, were found above the site. Runoff from the upper section of the Blackcap Road is channeled off the end of the switchback and down the slope adjacent to the Croesus No.1 workings. There are no culverts or waterbars along the Blackcap Road to dissipate the runoff on to the shallow west facing slope above. The excess runoff has cut a gully into the unstable slope adjacent to the Croesus No.1 site.

3. GEOLOGY AND MINERALIZATION

The Croesus No.1 occurs along the roughly north-south running contact of Earn Group schist and phyllite and a large greenstone lens. A vein of massive siderite with minor galena (PbS) and freibergite ((Cu, Fe)₁₂Sb₄S₁₃) was outlined along a strike length of 300m.

4. SITE HISTORY

The history of the Croesus No.1 is not well documented. Most of the underground development work is considered to date from the 1930s. The larger cat trenches possibly date from the 1940s. The Minfile report lists all work as pre-1965. Work completed on the site includes 4 adits, 3 shallow shafts into overburden, 2 bulldozer trenches, and a small hand trench. A total of 9 tonnes of ore grading 7,431 g/t silver were shipped offsite, probably in the 1930s.

5. MINE DEVELOPMENT

There are four collapsed adits, three shafts and three trenches located on the property. There are five waste rock piles associated with these excavations. All the workings occur along a trend of azimuth 005° at the western edge of a prominent greenstone outcrop located roughly 160m east of the Blackcap Road switchback.

5.1 Mine Openings and Excavations

The adits are numbered in sequence, Adit #1 being the uppermost at an elevation of 1225m. Dimensions for the adits are estimated from the portal timbers and the sizes of the associated waste rock piles. The portals were constructed with log timbers but have collapsed and are no longer accessible. None of the adits produced any water and no samples were collected.

	<u>Elevation</u>	<u>Dimensions (H x W x L)</u>	<u>Photo</u>
<u>Adit #1</u>	1225m	1.5 x 1.2m x <5m	24-4
<u>Adit #2</u>	1220m	1.5 x 1.2m x <50m	24-5
<u>Adit #3</u>	1205m	1.5 x 1.2m x <5m	24-7
<u>Adit #4</u>	1185m	1.5 x 1.2m x <7m	24-8

Shafts #1-3

There are three shafts indicated on a map prepared in the 1960's by Boyle. A windless and a shaft bucket found in the base of the Trench #1 likely indicate the location of Shaft #1 (Photo 24-3). The shaft appears to have been filled by later trenching. A shallow boxhole dug into the overburden just above Adit #1 correlates to the site of Shaft #2 as indicated on Boyle's map. It is located at an elevation of roughly 1250m. The sides of the shaft have collapsed in and it is now less than a metre deep. There are no structures or equipment associated with it and it poses no risks. Shaft #3 is indicated by Boyle to be on the eastern side of Erickson Gulch just above the creek. This shaft was not investigated.

Trench #1 (Photo 24-2)

Trench #1 occurs at roughly 150m northeast of the Blackcap Road switchback. The trench was cut by bulldozer into glacial gravel and broken phyllite bedrock to a depth of 5m. The trench arcs in a 30m long semi-circle with steep sides that slope up to 40° into a narrow v-shape. The slopes are loose, but not a hazard. The site is partially revegetated with willows.

Trench #2

Trench #2 is a 50m long bulldozer trench running east-west across the slope 40m below Trench #1. It is up to 1.5 m deep and 3m wide cut into overburden and broken phyllite. The trench is heavily revegetated with fir, alder and willow.

Trench #3

Trench #3 is located beside Shaft #2 at an elevation of 1250m. This trench just a shallow hand dug excavation measuring 24m long by 2m wide by 0.5m deep that has since revegetated.

5.2 Waste Rock Disposal Areas

There are four waste rock piles associated with the adits and one waste rock pile associated with the Trench #1. None of the waste rock piles have surface water flowing over them or water seeping from them.

Waste Rock Pile WR-01

This waste rock pile was formed by end dumping from Adit #1. Up to 95% of the surface rock is composed of blocky, unoxidized greenstone.

Dimensions: 10m x 8m x 1.5m

Sampling: No samples were collected.

Waste Rock Pile WR-02 (photo 24-5, 24-624-7)

This waste rock pile was formed by end dumping from Adit #2. The majority (~67%) of the surface rock is coarse crystalline siderite, roughly 30% is blocky greenstone, 3% is quartz and there is trace calcite. The slope of the pile is about 30°. There is abundant manganese staining in the siderite vein material. Strong oxidation occurs to a depth of at least 50cm.

Dimensions: 40m x 17m x 3m

Sampling: Sample 24WR-01 was collected from the north end of the pile (see attachments for analytical results). Field test results included a paste pH of 6.7 and conductivity of 1090µS/cm.

Waste Rock Pile WR-03

This waste rock pile was formed by end dumping from Adit #3. It has the same surface composition as waste rock pile #2.

Dimension: 25m x 8m x 1.5m

Sampling: No samples were collected.

Waste Rock Pile WR-04 (Photo 24-9)

This waste rock pile formed by end dumping out of Adit #4. It is composed of 60% blocky greenstone and 40% medium grained, crystalline siderite. Moderate oxidation was observed.

Dimensions: 10m x 8m x 1.5m

Sampling: No samples were collected.

Waste Rock Pile WR-05

This waste rock pile is associated with the Trench #1. It is composed of 80% overburden. No oxidation was observed.

Location: The waste rock pile has formed at the western end of the upper trench.

Dimensions: 30m x 6m x 1m

Sampling: No samples were collected.

5.3 Tailings Impoundments

No ore was processed at this site; no tailings were encountered.

5.4 Minesite Water Treatment

There are no water treatment facilities at this site.

6. MINE SITE INFRASTRUCTURE

No mine site infrastructure was encountered at this site.

7. SOLID WASTE DUMPS

No solid waste dumps were encountered at this site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous waste was encountered on the property. Potential contaminants of concern are any metals washing from the waste rock piles.

9. **WATER QUALITY**

No surface water was encountered at the site. Erickson Gulch is located roughly 90m downslope of Adit #4. A water sample (24WQ-S01-01/02) was collected from the Gulch roughly 40m down stream (see attachments for results). At the time of sampling, Erickson Creek had a flow of approximately 40L/sec.

10. **RECLAMATION**

Natural revegetation is occurring in the trenches, the waste rock piles have very little vegetation growing on them.

11. **REFERENCES**

Minfile #105M001ab

Boyle, R.W., 1965. *Lead-Zinc-Silver Deposits, Keno Hill-Galena Hill Area*. Geological Survey of Canada, Bulletin 111.

ATTACHMENT 2: 1999 CROESUS WATER SAMPLES

LABORATORY RESULTS

Sample Number	Detection Limit	Units	24WQS01-01/02 Sept. 21/99
Site Description			Erikson Gulch, downslope of the site
pH (field)	N/A	pH	N/A
Conductivity (field)	N/A	µS/cm	N/A
pH (Lab)	0.01	pH	7.53
Conductivity (Lab)	0.01	µS/cm	195
Total Alkalinity	5	mg CaCO3/L	43
Chloride	0.25	mg/L	<0.25
Hardness (CaCO3 equiv)	5	mg/L	94.6
Nitrate-N	0.05	mg/L	0.06
Nitrite-N	0.003	mg/L	0.005
Sulphate	1	mg/L	44
Total Dissolved Solids	5	mg/L	129
Analysis by ICP-USN			
Aluminum	0.0008	mg/L	0.0119
Antimony	0.005	mg/L	<0.005
Arsenic	0.01	mg/L	<0.01
Barium	0.00004	mg/L	0.0579
Beryllium	0.00001	mg/L	<0.00001
Bismuth	0.0004	mg/L	<0.0004
Boron	0.002	mg/L	<0.002
Cadmium	0.00006	mg/L	0.00007
Calcium	0.002	mg/L	27.7
Chromium	0.00006	mg/L	<0.00006
Cobalt	0.00003	mg/L	<0.00003
Copper	0.00003	mg/L	0.00023
Iron	0.00001	mg/L	0.015
Lead	0.0003	mg/L	0.0024
Lithium	0.001	mg/L	0.001
Magnesium	0.0005	mg/L	4.98
Manganese	0.00002	mg/L	0.00099
Mercury	0.0001	mg/L	<0.0001
Molybdenum	0.00007	mg/L	0.00023
Nickel	0.00001	mg/L	0.0002
Phosphorus	0.03	mg/L	<0.03
Potassium	0.4	mg/L	<0.4
Selenium	0.004	mg/L	<0.004
Silicon	0.004	mg/L	2.41
Silver	0.00005	mg/L	<0.00005
Sodium	0.004	mg/L	0.6
Strontium	0.00002	mg/L	0.0939
Sulphur	0.008	mg/L	14.6
Thallium	0.001	mg/L	<0.001
Titanium	0.00002	mg/L	0.00016
Vanadium	0.00003	mg/L	<0.00003
Zinc	0.0002	mg/L	0.0008
Analysis by Hydride AA			
Arsenic	0.0002	mg/L	0.001
Selenium	0.0001	mg/L	<0.0001

**ATTACHMENT 2: 1999 CROESUS WASTE ROCK SAMPLES
LABORATORY RESULTS**

Site Number	Detection Limit	Units	24WR01-01 - Sept. 12/99
Sample Description			North side of Waste Rock Pile #2
Paste pH (field)	N/A	pH	6.7
Conductivity (field)	N/A	µS/cm	1090
pH in Saturated Paste			
pH	0.1	pH	6.6
pH in Soil (1:2 water)			
pH	0.01	pH	7.1
ICP Semi-Trace Scan			
Aluminum	5	µg/g	11000
Antimony	2	µg/g	1780
Arsenic	2	µg/g	73
Barium	0.05	µg/g	66.2
Beryllium	0.1	µg/g	<0.1
Bismuth	5	µg/g	21
Cadmium	0.1	µg/g	1300
Calcium	5	µg/g	12600
Chromium	0.5	µg/g	7.6
Cobalt	0.1	µg/g	18
Copper	0.5	µg/g	3270
Iron	1	µg/g	230000
Lead	1	µg/g	3820
Lithium	0.5	µg/g	7
Magnesium	1	µg/g	1690
Manganese	0.5	µg/g	69200
Mercury	0.01	µg/g	11
Molybdenum	1	µg/g	6
Nickel	1	µg/g	20.7
Phosphorus	5	µg/g	<5
Potassium	20	µg/g	2780
Selenium	2	µg/g	<2
Silicon	5	µg/g	357
Silver	0.5	µg/g	1980
Sodium	5	µg/g	61
Strontium	1	µg/g	41
Sulphur	10	µg/g	11300
Thorium	1	µg/g	<1
Tin	1	µg/g	23
Titanium	0.2	µg/g	34
Uranium	5	µg/g	<5
Vanadium	1	µg/g	28
Zinc	0.5	µg/g	92200
Zirconium	0.1	µg/g	5.4

**ATTACHMENT 2: 1999 CROESUS WASTE ROCK LABORATORY RESULTS
MODIFIED SOBEK METHOD ACID-BASE ACCOUNTING TEST**

SAMPLE	SITE DESCRIPTION	PASTE pH	S(T) %	S(SO4) %	AP	NP	NET NP	NP/AP
24WR01-01 - Sept./99 - Soil	North side of Waste Rock Pile #2	7.4	0.45	0.33	3.8	30.0	26.3	8.0

AP = ACID POTENTIAL IN TONNES CaCO₃ EQUIVALENT PER 1000 TONNES OF MATERIAL.

NP = NEUTRALIZATION POTENTIAL IN TONNES CaCO₃ EQUIVALENT PER 1000 TONNES OF MATERIAL.

NET NP = NET NEUTRALIZATION POTENTIAL = TONNES CaCO₃ EQUIVALENT PER 1000 TONNES OF MATERIAL.

NOTE: WHEN S(T) AND/OR S(SO₄) IS REPORTED AS <0.01, IT IS ASSUMED TO BE ZERO FOR THE AP CALCULATION.

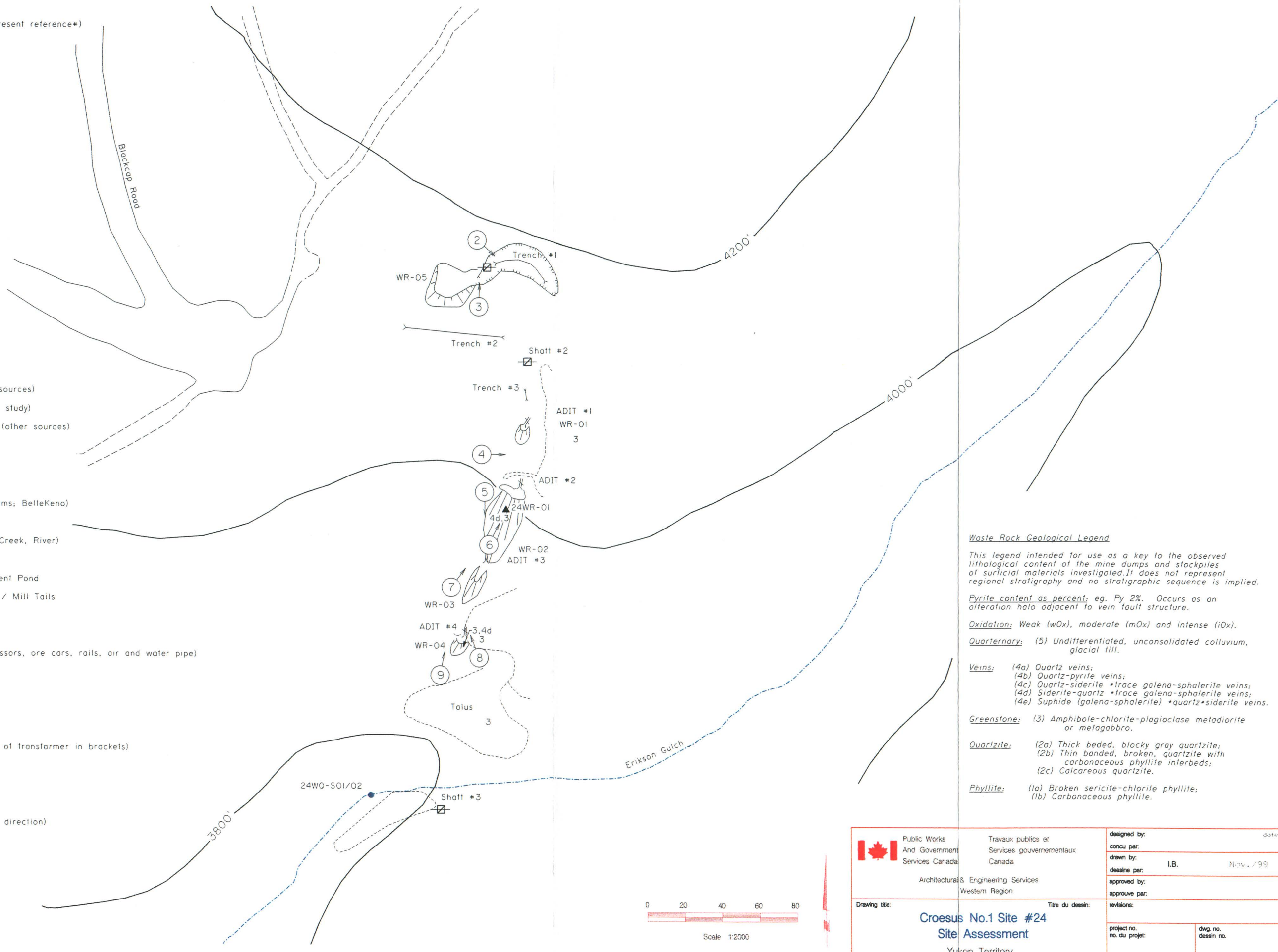
N/D = NO DUPLICATE ASSAY. CALCULATIONS ARE BASED ON ASSAY RESULTS OF THE INITIAL SAMPLE.

RE = REPLICATE.

NOTE - A HIGH LEVEL OF SOLUBLE METALS (ESPECIALLY IRON) WERE OBSERVED IN MANY SAMPLES DURING THE ABA TITRATIONS.

SAMPLES WITH A NEGATIVE NET NP SHOULD BE TESTED FOR MOBILE METALS USING STANDARD SHAKE FLASK EXTRACTION TESTS.

- 22A Building (22A: building site present reference*)
Indicates Asbestos Material
- 22A Collapsed Building
- Adit
- Collapsed Adit
- Shaft
- Collapsed/Backfilled Shaft
- Mine Rock Dump
- Bedrock Open Pit
- Trench
- Stripped Overburden Stockpile
- Stripped / Disturbed Area
- Outcrop Boundary
- Highway
- Road (gravel, 2 wheel drive)
- Road (gravel, 4X4 accessible)
- Road (inaccessible)
- Trail
- Culvert
- 24501-01 1999 Soil Sample (this study)
- Pre 1999 Soil Sample (other sources)
- 25WR04-01 1999 Waste Rock Sample (this study)
- Pre 1999 Waste Rock Sample (other sources)
- w0-12-06 1999 Water Sample
- Pre 1999 Water Sample
- Tension Cracks
- Mass Movement (note: for Forms; Bellekeno)
- Groundwater Seep
- Surface Water Flow (Stream, Creek, River)
- Lake
- Settling Pond / Water Treatment Pond
- Tailings Dam / Tailings Pond / Mill Tails
- Ponded Water / Trench
- Barrels
- Abandoned Equipment (compressors, ore cars, rails, air and water pipe)
- Mine Rails / Trestle
- Collapsed Trestle
- Solid Waste Disposal Site
- Area of Soil Contamination
- *(6) Transformer Location (number of transformer in brackets)
- Power Line
- Power Line Collapsed
- Aerial Transmission Towers
- 5 Photo Site (arrow shows view direction)
- GPS Survey Location
- Former Building Site (Elsa)



Waste Rock Geological Legend

This legend intended for use as a key to the observed lithological content of the mine dumps and stockpiles of surficial materials investigated. It does not represent regional stratigraphy and no stratigraphic sequence is implied.

Pyrite content as percent: eg. Py 2%. Occurs as an alteration halo adjacent to vein fault structure.

Oxidation: Weak (wOx), moderate (mOx) and intense (iOx).

Quaternary: (5) Undifferentiated, unconsolidated colluvium, glacial till.

Veins: (4a) Quartz veins;
(4b) Quartz-pyrite veins;
(4c) Quartz-siderite + trace galena-sphalerite veins;
(4d) Siderite-quartz + trace galena-sphalerite veins;
(4e) Sphide (galena-sphalerite) + quartz-siderite veins.

Greenstone: (3) Amphibole-chlorite-plagioclase metadiorite or metagabbro.

Quartzite: (2a) Thick bedded, blocky gray quartzite;
(2b) Thin banded, broken, quartzite with carbonaceous phyllite interbeds;
(2c) Calcareous quartzite.

Phyllite: (1a) Broken sericite-chlorite phyllite;
(1b) Carbonaceous phyllite.

Public Works And Government Services Canada Architectural & Engineering Services Western Region	Travaux publics et Services gouvernementaux Canada	designed by:	03101
		conçu par:	
		drawn by:	I.B. Nov. / 99
		designé par:	
		approved by:	
		approuvé par:	
Drawing title: Croesus No.1 Site #24 Site Assessment Yukon Territory		Titre du dessin: révisions:	
		project no. no. du projet:	125-12.01
		dwg. no. dessin no.:	1 of 1

0 20 40 60 80
Scale 1:2000
CAD FILE: site24.DGN



Photo 24-1: Overview of Croesus site. Note waste rock dump WR-02 from Adit #2 at phot centre; also Blackcap (Site #25) waste rock dumps at top right corner. (Azimuth 350°)



Photo 24-2: Upper Trench #1 into thick colluvial soils.(Azimuth 130°)



Photo 24-3: Windless and shaft bucket from backfilled shaft in area of upper trench (Shaft#1).



Photo 24-4: Adit #1 portal area. (Azimuth 030°)



Photo 24-5: Top of waste rock dump WR-02. Note abundant manganese stained siderite vein material. (Azimuth 010°)



Photo 24-6: Waste rock dump WR-02 test pit (sample 24WR01-01) at Adit#2. Note strong oxidation at depth in pit and abundant siderite vein cobbles.



Photo 24-7: Adit #3 at base of rock dump WR-02. Note portal timbers to left of hammer. (Azimuth 000°)



Photo 24-8: Collapsed portal at Adit #4. Note natural revegetation. (Azimuth 020°)



Photo 24-9: Rock dump WR-04. Note blocky greenstone and siderite vein material. (Azimuth 040°)