

**KENO VALLEY/DUBLIN GULCH
ENVIRONMENTAL BASELINE ASSESSMENT**

VOLUME IV: Keno Valley Sites #41 to #66, #68 to #70

Prepared for
Waste Management Program
Indian and Northern Affairs Canada

By
Environmental Services
Public Works and Government Services Canada

March, 2000

At the request of the client, there has been no interpretation of data compiled and gathered for this assessment. Therefore, this report does not draw comparisons or make references to environmental quality criteria, guidelines, or codes of practice, and makes no recommendations for future action.

TABLE OF CONTENTS

VOLUME I -

INTRODUCTION..... I3

I1 PROJECT OBJECTIVE	I3
I2 STUDY AREA	I3
I3 BASELINE ASSESSMENT REPORT FORMAT	I3

PART A - ENVIRONMENTAL SETTING..... A13

A1 STUDY AREA PHYSIOGRAPHY	A13
A2 BEDROCK GEOLOGY	A14
A3 SOILS	A17
A4 VEGETATION.....	A19
A5 HYDROLOGY AND WATER QUALITY DATA	A21
A5.1. Data Sources.....	A21
A5.2. Study Area Hydrology.....	A21
A6 STUDY AREA WATER QUALITY.....	A33
A6.1. Dublin Gulch Water Quality.....	A33
A6.2. Keno Valley Area Water Quality.....	A33
A7 TERRESTRIAL WILDLIFE.....	A40
A8 FISH RESOURCES.....	A41
A9 DATA GAPS.....	A41

PART B - LAND USES OTHER THAN MINING B47

B1 DATA SOURCES	B47
B2 LAND TENURE.....	B47
B3 TOURISM, RECREATIONAL, AND RESIDENTIAL USES	B50
B4 TRAPPING, HUNTING, AND SPORT FISHERY USES.....	B52

PART C - KENO VALLEY/DUBLIN GULCH MINE SITE ASSESSMENT REPORTS..... C55

C1 MINE SITE ASSESSMENT COMPONENTS.....	C55
C2 COMPILATION OF HISTORICAL MINE DATA	C55
C3 FIELD INVESTIGATION ACTIVITIES	C59
C4 KENO HILL/DUBLIN GULCH WATERSHED WATER QUALITY	C60

APPENDIX A - WATER QUALITY MONITORING DATA DUBLIN GULCH AND KENO VALLEY AREA

APPENDIX B - WHITE MOUNTAIN ENVIRONMENTAL CONSULTING 1995 "Fish and Fish Habitat Assessment Conducted Near Elsa, Yukon for United Keno Hill Mines August 1994 - September 1995"

VOLUME I (cont.)

LIST OF FIGURES –

I1	General Location Map	I5
I2	Study Area Overview	I6
I3	Study Area: Dublin Gulch	I7
I4	Study Area: Keno Valley East	I8
I5	Study Area: Keno Valley West	I9
A1	Study Area Catchment Basins & Hydrological Characteristics: Dublin Gulch	A26
A2	Study Area Catchment Basins & Hydrological Characteristics: Keno Valley West	A27
A3	Study Area Catchment Basins & Hydrological Characteristics: Keno Valley East	A28
A4	Mean Annual Runoff as a Function of Elevation, Keno Valley Area	A30
A5	Average Monthly Discharges of Seven Regional Stations	A32
A6	Water Quality Monitoring Sites, Dublin Gulch	A35
A7	Water Quality Monitoring Sites, Keno Valley West	A38
A8	Water Quality Monitoring Sites, Keno Valley East	A39
B1	Current Land Use/Land Tenure Dublin Gulch	B54a
B2	Current Land Use/Land Tenure Keno Valley West	B54b
B3	Current Land Use/Land Tenure Keno Valley East	B54c
B4	Registered Trapping Concessions	B54d
B5	Game Management Zones and Outfitting Concessions	B54e
C1	Mine Site Locations Dublin Gulch	C56
C2	Mine Site Locations Keno Valley East	C57
C3	Mine Site Locations Keno Valley West	C58
C4	Regional Watershed Sampling Points, Dublin Gulch	C62
C5	Regional Watershed Sampling Points, Keno Valley East	C63
C6	Regional Watershed Sampling Points, Keno Valley West	C64

LIST OF TABLES –

I1	Keno Valley/Dublin Gulch Mine Site List	I10
A1	Catchment Area Quarterly Flows	A24
A2	Water Quality Monitoring Stations, Dublin Gulch	A34
A3	Water Quality Monitoring Stations, Keno Valley Area	A37
B1	Current Land Tenure in Keno valley Study Area	B48
B2	Tourism/Recreational Land Use Activities, Keno Valley Study Area	B50

VOLUME II – Keno Valley Sites #1 to #20

Figures, photos and analytical results attached to individual site reports.

VOLUME III – Keno Valley Sites #21 to #40

Figures, photos and analytical results attached to individual site reports.

VOLUME IV – Keno Valley Sites #41 to #66, #68 to #70

Figures, photos and analytical results attached to individual site reports.

VOLUME V – Keno Valley Sites #71 to #73, #75 to #81

Dublin Gulch Sites #85 to #86, #88 to #94, and #96

Figures, photos and analytical results attached to individual site reports.

Site #78 (Elsa Village): figure in pocket.

DEVON
SITE #41
MINFILE# 105M 001az

1. LOCATION AND ACCESS

The site is located on the south side of Keno Hill, approximately 1km north-northwest of the junction of Lightning Creek and McNeill Gulch. There are no trails to the property, but Hope Gulch and Beauvette Hill Trails are nearby. The approximate UTM co-ordinates for the adit are 7 088 855m N and 493 100m E and for the trenching are 7 089 100m N and 493 500m E (Latitude: 63° 55' 42" N and Longitude: 135° 09' 34" W).

2. SITE PHYSIOGRAPHY

The Devon site area is located on a moderate to steep south-facing slope of Keno Hill at an elevation of 5000ft (1520m), at the base of a talus slope. The site is above treeline and is well vegetated with small shrubs, grasses and moss. The surface run-off from the mine site flows southward to Lightning Creek, located roughly 1km downslope.

3. GEOLOGY AND MINERALIZATION

At the showing, on a moderate to steep slope, the only evidence of exploration work is a collapsed adit, or shallow shaft, at the base of a talus slope. A nearby small sorted dump of vein material contains oxidized siderite with galena in 5 - 10mm veinlets. Keno Hill Quartzite underlies the area around the showing.

The bulldozer trenching, approximately 600m to the east of the showing, exposed Earn Group rusty carbonaceous and quartz carbonaceous phyllite. A very weak, poorly exposed vein containing oxidized siderite cuts the phyllite.

4. SITE HISTORY

The site is comprised of two small areas, there is an adit to the west, and there are three bulldozer trenches roughly 600m east of the adit. Both were excavated prior to 1962.

5. MINE DEVELOPMENT

There is one collapsed adit with a small dump of waste rock nearby. Three bulldozer trenches are located roughly 600m to the east of the adit. No ore was processed at this site and no tailings were encountered. There is no water treatment facility at this site. Site details are located on Figure 1; site photos are located in Attachment 1.

5.1 Mine Openings and Excavations

Devon Adit

The adit is located at the base of a talus slope. Broken timbers indicate where the entrance was, however, the adit has collapsed and can no longer be accessed. The small waste rock pile a few meters south of the adit suggests that the adit was not developed very far. The ground around the adit appeared stable at the time of the site visit.

Trenches (photo 41-1)

There are three trenches to the east of the adit. The walls of the trenches are comprised of stripped overburden and bedrock and appeared stable at the time of the site visit. All three trenches are roughly 5m wide by a maximum of 4m high. The first two trenches (T1 and T2) measure about 30m in length and the third trench (T3) about 65m in length. All three trenches were accessible by foot.

5.2 Waste Rock Disposal Areas

There is a small waste rock pile outside of the adit. Waste rock associated with the trenching is comprised of predominantly overburden and is located along the sides of the trenches.

Waste rock pile #1

A small, sorted, dump of vein material was noted near the collapsed adit. The material contained oxidized siderite with galena in 5 - 10mm veinlets.

Location: The pile is located 10m south of the adit, immediately to the east of a wood frame building.

Dimensions: The volume of the pile is roughly 0.5m³.

Sampling: No samples were collected.

6. MINE SITE INFRASTRUCTURE

There is one wood frame building located near the adit. No other mine site infrastructure, including rail and trestle, electrical equipment or fuel storage, was encountered.

6.1 Building 41A (photo 41-2)

There is an old frame (heavy timber structure) cabin located about 10m to the south of the adit.

Dimensions (L x W x H): 4m x 3m x 4m

Paint: none

Asbestos: There was some asbestos tar paper cladding on the building and on the ground.

Foundation: none

Non-Hazardous Contents: none

Hazardous Contents: none

7. SOLID WASTE DUMPS

There were no solid waste dumps observed at this site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous materials were encountered at this site. Potential contaminants of concern may include any metals washing from the waste rock pile or the trench walls.

9. WATER QUALITY

There was no surface water encountered at this site.

10. RECLAMATION

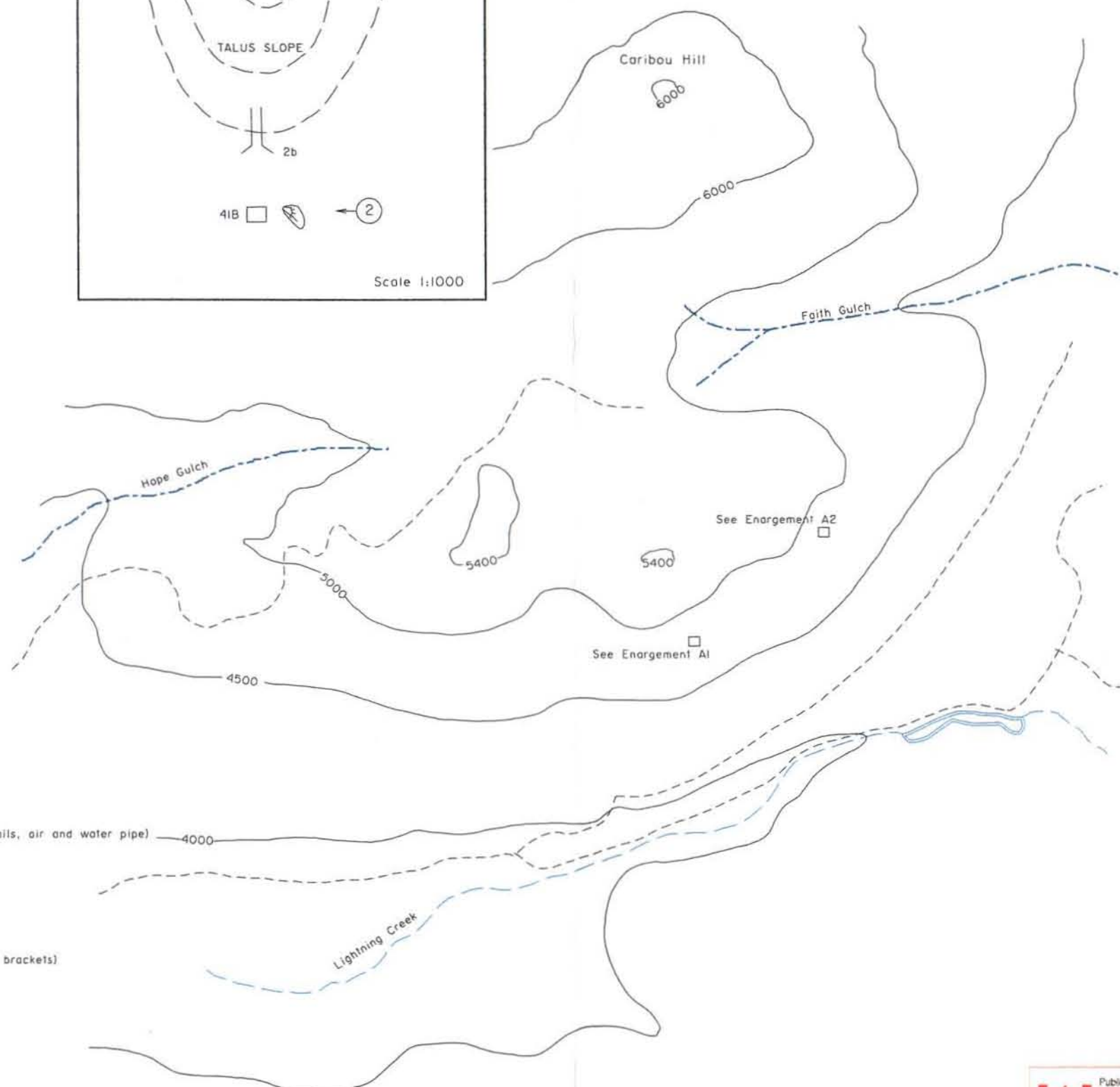
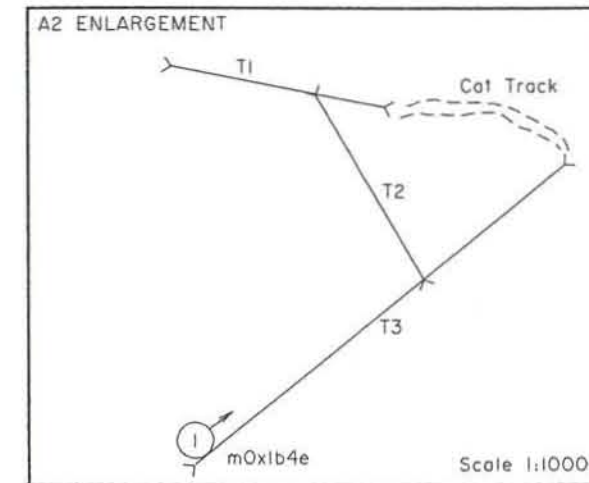
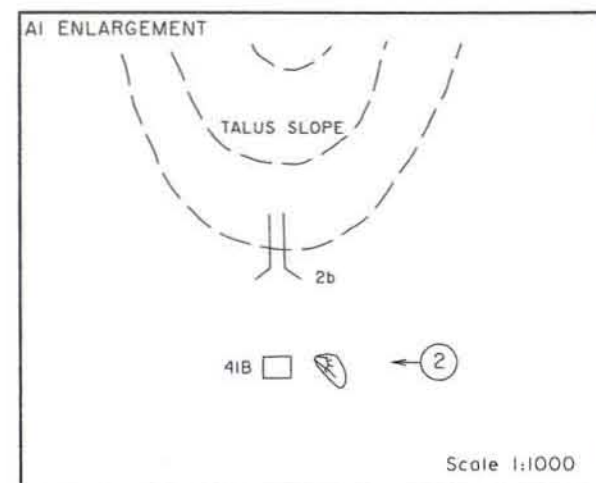
Natural revegetation has been slow in this area due to the higher elevation. Some grasses are starting to grow in the collapsed adit area.

11. REFERENCES AND PERSONAL COMMUNICATIONS

United Keno Hill Mines Limited. 1996. *United Keno Hill Mines Limited – Site Characterization*. Report No. UKH/96/01, prepared by Access Mining Consultants Limited.

United Keno Hill Mines Limited. 1996. *United Keno Hill Mines Limited – Site Characterization, Technical Appendices I-VI*. Report No. UKH/96/01, prepared by Access Mining Consultants Limited.

- 22A+ Building (22A: building site present reference*)
- 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)
- 251004-01 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: BelleKenol)
- 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 (Else)



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).

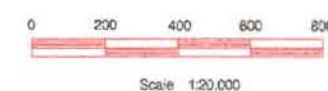
Quaternary: (5) Undifferentiated, unconsolidated colluvium, glacial till.

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 bedded, broken, quartzite with carbonaceous phyllite interbeds;
(2c) Calcareous quartzite.

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



CAD FILE: KEY.DGN

Public Works And Government Services Canada Travaux publics et Services gouvernementaux Canada Architectural & Engineering Services Western Region	designed by: conçu par: drawn by: dessiné par: approved by: approuvé par: revision:	C.S. NOV./99
	Drawing title: Devon Site #41 Site Assessment Yukon Territory	Titre du dessin: Devon Site #41 Site Assessment Yukon Territory

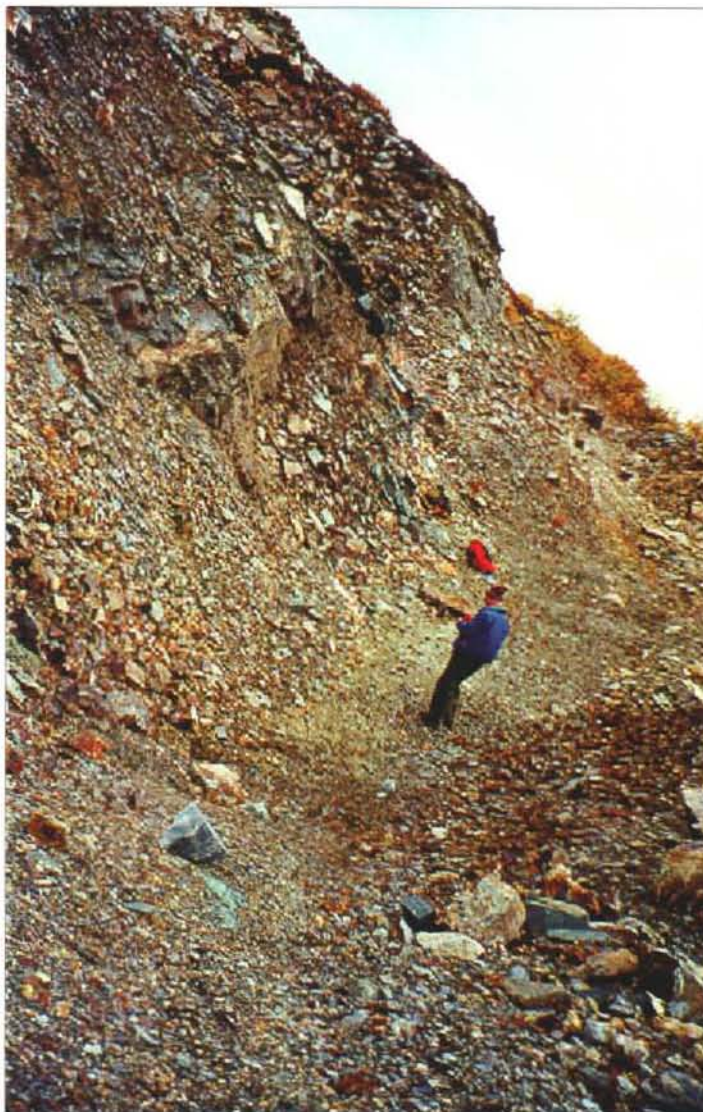


Photo 41-1 : Devon. View of Trench #3. (Azimuth 052°)



Photo 41-2 : Devon. Building 41A, located 10m south of the Adit.. (Azimuth 280°)

FAITH (DUNCAN)

SITE #42

MINFILE# 105M 002

1. LOCATION AND ACCESS

The site is located on the southeast side of Keno Hill approximately 1km southeast of Caribou Hill summit. The site occurs between 4650ft (1420m) and 4800ft (1460m) above sea level within the Faith Gulch headwaters. There are no roads that lead to the site, however the Beauvette Hill Trail following Lightning Creek to passes below the site roughly 400m to the east. A partially overgrown cat trail extends through the site along the ridgeline between the Beauvette Hill Trail and the Hope Gulch Trail roughly 1.7km to the west. The approximate UTM co-ordinates are 7 089 900m N and 493 700m E.

2. SITE PHYSIOGRAPHY

Faith is located along a ridge paralleling Faith Gulch near the southeastern toe of Keno Hill. The site occurs at a break in slope that varies from roughly 10° above to over 20° below and faces north into Faith Gulch. The mine site is situated at treeline and is vegetated with stunted lodge pole pine, fir and black spruce trees, willows, grass lichen and moss. Surface runoff from the mine site drains to the north, into Faith Gulch, a tributary of the Keno Ladue River. No surface water was observed draining the site.

3. GEOLOGY AND MINERALIZATION

The trenches and road cuts expose Keno Hill carbonaceous phyllite and Triassic. A 0.5m quartz vein cuts the greenstone. A bulldozer road cut near the old collapsed shaft exposed a thin interbedded and banded quartzite and moderate to strong carbonaceous phyllite of the Keno Hill Quartzite.

Mineralization at the Faith site is recorded as including shear hosted quartz-siderite veins with sporadic galena, tetrahedrite and pyrite.

4. SITE HISTORY

Initially staked in 1919, the site had limited underground development totaling 25.6m, including an 80° inclined shaft. In 1923, 11.8 tonnes of hand cobbled ore was shipped from the site. A total of 3 bulldozer trenches and various road cuts were completed on the site in 1989.

Public Works and Government Services Canada (PWGSC) conducted a phase II assessment of the Faith site in 1996.

5. MINE DEVELOPMENT

There is one shaft, three trenches and associated waste rock piles. No ore was processed at the site and no tailings were encountered. There is no waste water treatment facility at this site. Site details are located on Figure 1; site photos are in Attachment 1 and laboratory results for sampling are in Attachment 2.

5.1 Mine Openings and Excavations

Faith Shaft (Figure 1; Photo 42-1)

The shaft is located at the eastern end of the site, roughly 100m south of Faith Gulch. The shaft is inclined at 80° to the south.

Dimensions: 2m x 2m, extending 1m above ground.

Supports: The collar is supported by timber cribbing and clad with vertical wooden poles.

Condition: The ground around the shaft appears stable.

Accessibility: The shaft is blocked 3m below the collar by collapsed rock and cannot be accessed beyond that point.

Trench #1 (Photo 42-2)

The trench is located roughly 160m southeast of the shaft, running azimuth 055° along the crest of the ridge. A small bull white quartz vein with minor limonite crosscuts the trench near the southwestern end.

Dimensions: 25m x 3m x 0.5m

Condition: There are no stability problems as the trench walls are shallow.

Accessibility: The trench can be easily accessed.

Trench #2 and Trench #3

Trenches #2 and #3 parallel each other 15m apart, roughly 60m west of Trench #1. The trenches are shallow cuts into the overburden.

Dimensions: (20m long) x (1.5m wide) x (<0.5m deep)

Condition: There are no stability problems as the trench walls are shallow.

Accessibility: The trench can be easily accessed.

5.2 Waste Rock Disposal Areas (Figure 1)

A small waste rock pile was found associated with the shaft.

Description: Roughly 5000 tonnes of coarse (to 20cm), angular carbonaceous phyllite and chlorite schist waste rock from development of the shaft is present on the site. Minor quartz-siderite vein material was observed. The waste rock is rusty orange in colour, indicating weak to moderate

oxidation. The waste rock pile has been reworked by a bulldozer. Limited natural revegetation includes scattered pine seedlings, willows, moss, lichen, and grasses.

Location: Located immediately down slope from the shaft.

Dimensions: (45m long) x (25m wide) x (<3m high)

Sampling: No samples were collected in 1999.

A single sample was collected for acid base accounting (ABA) and metals analysis from the front edge of the pile (PWGSC, 1996).

Sample: DU/WR/P301

6. MINE SITE INFRASTRUCTURE (Figure 1)

There is one tent frame building and at the site. No mine site infrastructure such as electrical equipment, fuel storage or rail and trestle was encountered.

6.1 Building 42A

A wooden tent frame structure is located to the west of the trench.

Dimensions: (3m long) x (3m wide) x (2m high)

Paint: No paint was observed.

Asbestos: No asbestos was observed.

Foundation: Rocks prop up the wooden platform.

Contents: There is wood debris inside the building and scattered glass, wood and metal debris and an empty 45-gallon drum outside of the building. No hazardous materials were observed at the site.

7. SOLID WASTE DUMPS

There were no solid waste dumps observed at this site. An empty 45 gallon drum was found in Trench #1.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous products were encountered.

9. WATER QUALITY (Figure 1)

Two water samples were collected from Faith Gulch for analysis. The first sample (Faith upstream-09/18/99) was collected 100m upstream of the site as a background sample. The second sample (Faith downstream-09/18/99) was collected 100m downstream of the site.

These samples were collected to repeat previous sampling (DU/WQ/Str-301 and -302 respectively; PWGSC, 1996).

10. RECLAMATION

Natural revegetation is occurring at the site. Pine seedlings, willows, mosses, lichen and grasses were noted in disturbed areas.

11. REFERENCES AND PERSONAL COMMUNICATIONS

Minfile # 105M 002

Public Works and Government Services Canada. 1996. *Faith (Duncan) Mine Site – Site II Assessment*.

**ATTACHMENT 2: 1999 FAITH WATER SAMPLES
LABORATORY RESULTS**

Sample Number	Detection Limit	Units	Faith Upstream - 09/18/99	Faith Downstream - 09/18/99
Site Description			From Faith Gulch, 100m upstream of mine site	From Faith Gulch, 100m downstream of mine site
pH (field)	N/A	pH	6.2	6.1
Conductivity (field)	N/A	µS/cm	40	80
pH (Lab)	0.01	pH	7.11	6.94
Conductivity (Lab)	0.01	µS/cm	49	49
Total Alkalinity	5	mg CaCO3/L	16	12
Chloride	0.25	mg/L	<0.25	<0.25
Hardness (CaCO3 equiv)	5	mg/L	19.4	21.2
Nitrate-N	0.05	mg/L	0.1	0.1
Nitrite-N	0.003	mg/L	0.006	0.003
Sulphate	1	mg/L	10.1	9.5
Total Dissolved Solids	5	mg/L	32	41
Analysis by ICP-USN				
Aluminum	0.0008	mg/L	0.0015	0.002
Antimony	0.005	mg/L	<0.005	<0.005
Arsenic	0.01	mg/L	<0.01	<0.01
Barium	0.00004	mg/L	0.0725	0.0725
Beryllium	0.00001	mg/L	<0.00001	<0.00001
Bismuth	0.0004	mg/L	<0.0004	<0.0004
Boron	0.002	mg/L	<0.002	<0.002
Cadmium	0.00006	mg/L	0.00009	0.0001
Calcium	0.002	mg/L	5.1	5.15
Chromium	0.00006	mg/L	<0.00006	0.00011
Cobalt	0.00003	mg/L	<0.00003	<0.00003
Copper	0.00003	mg/L	0.0023	<0.00003
Iron	0.00001	mg/L	0.003	0.058
Lead	0.0003	mg/L	0.0011	0.0021
Lithium	0.001	mg/L	<0.001	0.001
Magnesium	0.0005	mg/L	1.56	1.59
Manganese	0.00002	mg/L	0.00084	0.0037
Mercury	0.0001	mg/L	<0.0001	<0.0001
Molybdenum	0.00007	mg/L	<0.00007	<0.00007
Nickel	0.00001	mg/L	0.0003	0.0004
Phosphorus	0.03	mg/L	<0.03	<0.03
Potassium	0.4	mg/L	<0.4	<0.4
Selenium	0.004	mg/L	<0.004	<0.004
Silicon	0.004	mg/L	2.07	2.08
Silver	0.00005	mg/L	<0.00005	<0.00005
Sodium	0.004	mg/L	<0.4	<0.4
Strontium	0.00002	mg/L	0.0342	0.0325
Sulphur	0.008	mg/L	3.36	3.41
Thallium	0.001	mg/L	<0.001	<0.001
Titanium	0.00002	mg/L	<0.00002	<0.00002
Vanadium	0.00003	mg/L	<0.00003	<0.00003
Zinc	0.0002	mg/L	0.0065	0.0045
Analysis by Hydride AA				
Arsenic	0.0002	mg/L	0.0012	0.0011
Selenium	0.0001	mg/L	0.0009	0.0007



Faith (Duncan) Water Quality Results (ug/L)

Parameter	DU/WQ/STR/301	DU/WQ/STR/302	Guidelines for Freshwater Aquatic Life
Field Conductivity	40.8	60.2	---
Hardness	16.6	25.8	---
pH	7.27	7.26	6.5-9
Acidity	3100	3800	---
Alkalinity - Total	7900	11700	---
Sulphate	10700	15500	---
Aluminum	10	10	5-100
Arsenic	1.4	1.2	50
Barium	70	70	---
Beryllium	< 5	< 5	---
Boron	< 100	< 100	---
Cadmium	< 0.2	< 0.2	0.2-1.8
Calcium	4450	7530	---
Chromium	< 1	< 1	2-20
Cobalt	< 20	< 20	---
Copper	< 1	< 1	2-4
Iron	< 30	< 30	300
Lead	< 1	< 1	1-7
Lithium	< 20	< 20	---
Magnesium	1330	1700	---
Manganese	< 5	< 5	---
Mercury	< 0.05	< 0.05	0.1
Molybdenum	< 30	< 30	---
Nickel	< 20	< 20	25-150
Selenium	0.5	0.7	1
Silver	< 0.1	< 0.1	0.1
Sodium	< 2000	< 2000	---
Vanadium	< 30	< 30	---
Zinc	6	< 5	30

--- = Value not established; < = Less than the detection limit indicated

Faith (Duncan) Waste Rock Sample ABA and ICP Results

Parameter	Units	Sample No. DU/WR/P301
Field Conductivity	uS/cm	40
Field Paste pH		6.02
Lab Paste pH		7.2
Total Sulfur	%	0.07
Sulfate	%	n/a
AP	*	2.19
NP	**	-1.50
Net NP	***	-3.69
NP/AP		< 0.1
Ag	ppm	5.2
Al	%	0.34
As	ppm	141
Ba	ppm	93
Be	ppm	< 0.1
Bi	ppm	< 1
Ca	%	0.09
Cd	ppm	< 0.1
Co	ppm	6
Cr	ppm	114
-	ppm	34
Fe	%	2.05
Ga	ppm	< 1
K	%	0.06
Li	ppm	5
Mg	%	0.10
Mn	ppm	1042
Mo	ppm	7
Na	%	< 0.01
Ni	ppm	27
P	ppm	610
Pb	ppm	503
Sb	ppm	12
Sn	ppm	< 1
Sr	ppm	14
Th	ppm	< 1
Ti	%	< 0.01
U	ppm	< 1
V	ppm	7.0
W	ppm	6
Zn	ppm	230

*AP = Acid Potential in tonnes CaCO₃ equivalent per 100 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

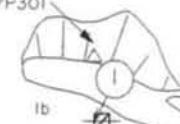
n/a = no assay / analysis; < = lower detection limit; > = upper detection limit

- 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 Farms, BelleKenol)
- 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)

Faith upstream -09/18/99
96DU-WQ-Str301

96DUWR/P301

Faith down stream -09/18/99
96DU-WQ-Str302



1b

Trench 3

Trench 2

Trench 1

42A

Cat Trail

4800'

0 20 40 60 80

Scale 1:2000

CAD FILE: KEY.DGN

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 bedded, broken, quartzite with carbonaceous phyllite interbeds;
(2c) Calcareous quartzite.

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

 Public Works and Government Services Canada Travaux publics et Services gouvernementaux Canada Architecture & Engineering Services Western Region	designed by: conçu par: drawn by: dessiné par: C.S. Mgr. J. O'D.
	approved by: approuvé par:
Drawing title: Faith Site #42 Site Assessment Yukon Territory	Titre du dessin: revisions: project no. no. du projet: 125-12.01 dwg. no. dessin no.: 1 of 1



Photo 42-1 : Faith. Faith timber shaft cover building (Building 42-B). (Azimuth 200°)



Photo 42-2 : Faith. View along trench (Trench #3) at tent brame (Building 42-A). (Azimuth 230°)

DUNCAN
SITE #43
MINFILE# 105M 003

1. LOCATION AND ACCESS

The Duncan site is located near the top of Keno Hill, approximately 1 km west, southwest of Caribou Hill summit and 1km east of Monument Hill summit. Access by foot to Caribou Hill is possible via the Hope Gulch Trail, however, no foot trail exists from the cirque rim to the shaft. The site is located at the approximate UTM co-ordinates 7 090 770m N and 492 200m E (Latitude: 63° 56' 36"N, Longitude: 135° 08' 32"W).

2. SITE PHYSIOGRAPHY

The site area is straddles the north and south sides of the Silver Basin Gulch cirque at an elevation of 5600ft (1700m). The trenches are on the moderately steep south side of the cirque, just below the rim. The Duncan showing and shaft are on the very steep north facing cirque wall approximately 90m below the rim of the cirque. Surface runoff from the trenches likely drain into Hope Gulch, a tributary of Lightening Creek. Surface runoff from the shaft area drains into Silver Basin Gulch, a tributary of the Keno Ladue River.

3. GEOLOGY AND MINERALIZATION

The Minfile reports that the host rock is the Keno Hill Quartzite and that the veining contains galena and tetrahedrite in a siderite gangue. Some quartz, in a rusty coloured quartz-muscovite-sericite-phyllite, was observed around the shaft, but it could have come from above the shaft. In all five trenches, Earn Group rocks, mainly quartz, sericite chlorite, phyllite and lessor carbonaceous phyllite were observed. One trench had a section of siliceous carbonaceous metasiltstone.

4. SITE HISTORY

Between 1919 and 1923 a 14m shaft and 12m of drifting was excavated in the shaft. Roughly 11.8 tonnes of ore grading 23,147 g/t silver and 22% lead was shipped from the cirque workings. Between 1946 and 1962 and in 1989 the bulldozer trenches were excavated south of the cirque rim.

5. MINE DEVELOPMENT

Mine development consists of one shaft, five trenches and associated waste rock piles. No ore was processed at this site and no tailings were encountered. Site details can be found on Figure 1 and site photos are in Appendix 1.

5.1 Mine Openings and Excavations

Shaft (photo 43-1)

The shaft is located roughly 90m vertically below the rim of the cirque. It has collapsed approximately 1m below the collar. There is a windless and broken log cribbing at the entrance to the shaft.

Dimensions (L x W x H): 1.5m x 1.5 m x 14m

Supports: The log cribbing has collapsed and blocks the entrance to the shaft.

Condition: The shaft is collapsed approximately 1m below the surface.

Accessibility: The shaft could not be accessed.

Trenches

Four trenches cut bedrock immediately south of the cirque rim and a fifth trench is located approximately 350m south of the cirque rim.

Trench #1

Trench #1 is the westernmost trench immediately to the south of the cirque rim.

Dimensions (L x W x H): 55m x 2m x 1m

Condition: The trench appeared stable at the time of the site visit.

Accessibility: The trench is accessible.

Trench #2

Trench #2 is 10m to the east and parallel to trench #1, immediately south of the cirque rim

Dimensions (L x W x H): 35m x 2m x 1m

Condition: The trench appeared stable at the time of the site visit.

Accessibility: The trench is accessible.

Trench #3 (photo 43-2)

Trench #3 is 5m to the east of trench #2, immediately south of the cirque rim.

Dimensions (L x W x H): 40m x 2-4m x 1m

Condition: The trench appeared stable at the time of the site visit.

Accessibility: The trench is accessible.

Trench #4

Trench #4 is 10m to the east and parallel to trench #3, immediately south of the cirque rim.

Dimensions (L x W x H): 40m x 1-4m x 1m

Condition: The trench appeared stable at the time of the site visit.

Accessibility: The trench is accessible.

Trench #5

Trench #5 is located approximately 350m south of the cirque rim, to the south-southwest of trench #1.

Dimensions (L x W x H): 20m x 2-4m x 0.5-2.5m

Condition: The trench appeared stable at the time of the site visit.

Accessibility: The trench is accessible.

5.2 Waste Rock Disposal Areas

There are six small waste rock piles associated with the Duncan workings. At the time of the site visit, there was no surface water encountered on top of any of the piles.

A pile of waste rock roughly 5m deep was observed near the shaft. The surface of the waste rock pile is composed of rusty coloured chlorite sericite schist with minor quartz veining. Given the size of the shaft the waste rock pile was expected to be larger, however, the shaft site is on a steep slope and consequently dump material likely moved down slope.

There are small waste rock piles located at the ends of the five trenches. The surface of the waste rock is mostly overburden with a small volume of sericite phyllite (Earn Group rocks).

6. MINE SITE INFRASTRUCTURE

There is one collapsed building at this site. No mine site infrastructure such as rail and trestle, electrical equipment or fuel storage areas was encountered.

6.1 Building 43A (photo 43-3)

One collapsed wood frame building was noted on site located 25m northwest of the shaft.

Dimensions (L x W x H): 10m x 10m x ?

Paint: No paint was observed.

Asbestos: No asbestos was observed.

Foundation: none

Non-Hazardous Contents: No non-hazardous contents were observed.

Hazardous Contents: No hazardous contents were observed.

7. SOLID WASTE DUMPS

There were no solid waste dumps encountered at this site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous materials were encountered at the site. Potential contaminants of concern include any metals washing from the waste rock piles and the trench walls.

9. WATER QUALITY

There was no surface water encountered at the site.

10. RECLAMATION

The five trenches are naturally revegetating.

11. REFERENCES AND PERSONAL COMMUNICATIONS

Minfile #105M 003

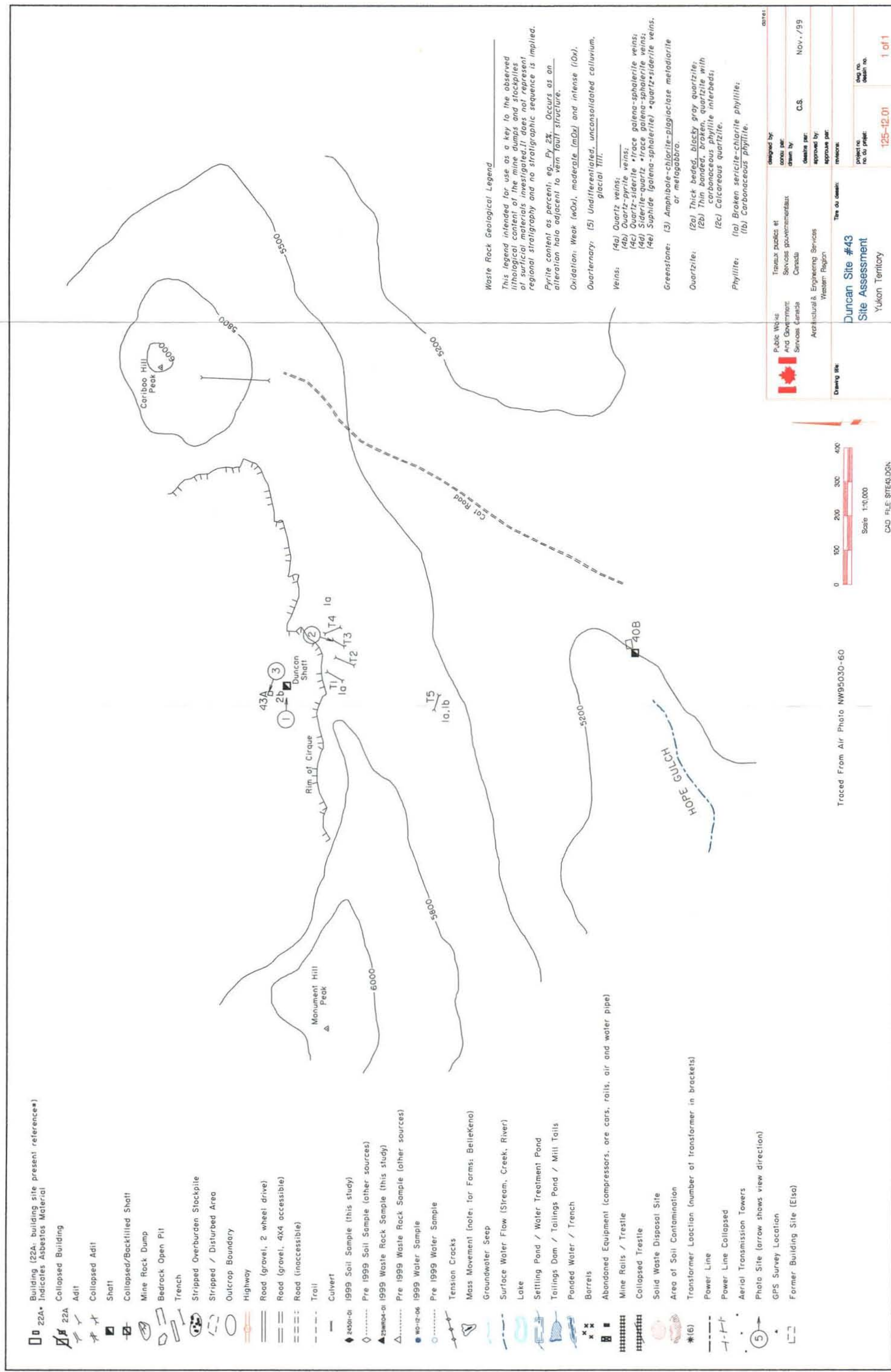




Photo 43-1 : Duncan. Collapsed shaft with windlass still in place across the top. (Azimuth $\sim 090^\circ$)



Photo 43-2 : Duncan. Trench #3 with waste rock pile at the end. (Azimuth 215°)

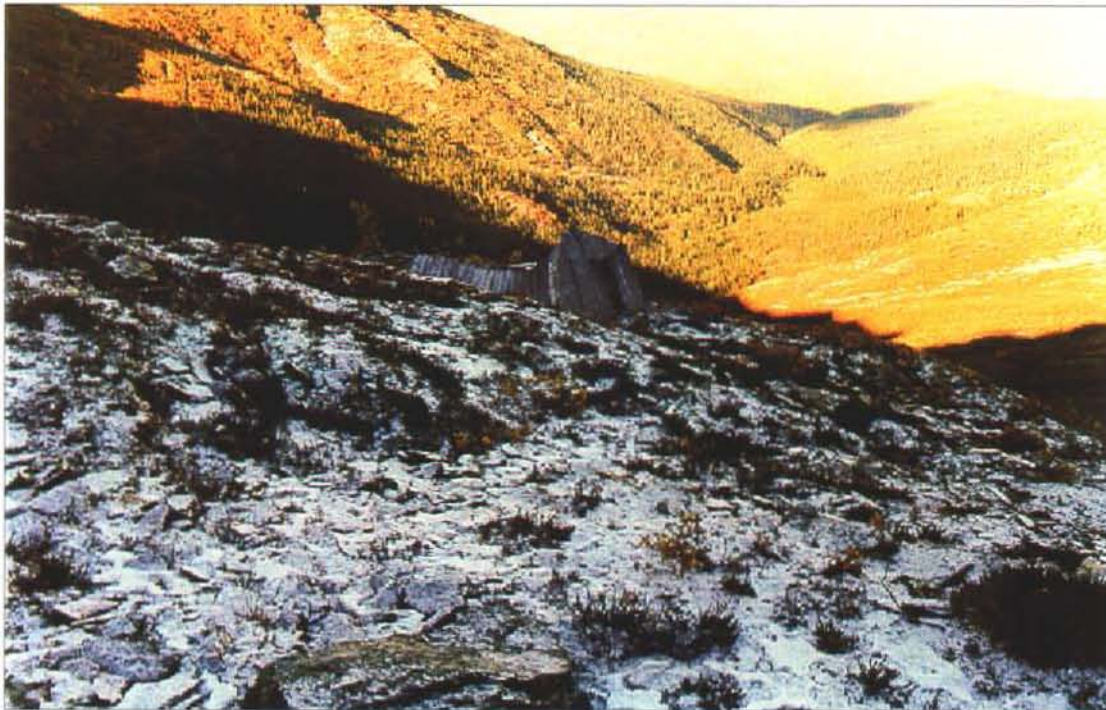


Photo 43-3 : Duncan. View of Building 43A. (Azimuth $\sim 300^{\circ}$)

GOLD QUEEN

SITE #44

MINFILE# 105M 004

1. LOCATION AND ACCESS

The Gold Queen site is located on the north side of Keno Hill, approximately 700m northwest of Monument Hill summit and at the headwaters of Silver Basin Gulch. Access is possible via the Silver Basin Gulch Trail approximately 4km from the signpost at the Keno Hill summit. At the time of the visit, travel by vehicle was stopped by a washout at the start of the descent into the Gulch. The site is located at the approximate UTM co-ordinates of 7 091 700m N and 491 350m E (Latitude: 63° 56' 41" N and Longitude 135° 09' 16" W).

2. SITE PHYSIOGRAPHY

Gold Queen is on a moderate to steep north-facing slope of Keno Hill, just below Monument Hill summit, at an elevation of roughly 4900ft (1490m). Given the aspect and the elevation, the area is presumably underlain by permafrost. The site is just at treeline, with the vegetation dominated by small shrubs and grasses with the occasional spruce tree. Surface runoff from the site drains to the north into Silver Basin Gulch, a tributary of the Keno Ladue River.

3. GEOLOGY AND MINERALIZATION

The trench, up to 2m deep, cut Keno Hill quartzite talus. A 5cm piece of limonite and oxidized siderite float was also found. The vein is partly exposed in a bulldozer cut a short distance above the collar of the adit. The vein fault is up to 0.3m wide and has fresh and oxidized siderite containing trace amounts of fine grained galena and pyrite. A sample of the siderite containing disseminated tetrahedrite assayed 1138 g/t silver and 0.2% lead. Wallrock to the vein fault is Keno Hill Quartzite.

4. SITE HISTORY

The site was explored by prospecting pits, an adit and bulldozer trenching between the years of 1960 and 1986.

5. MINE DEVELOPMENT

One adit and one trench were visited. No ore was processed at the site and no tailings were encountered. There is no waste water treatment facility at this site. Site photos are located in Attachment 1.

5.1 Mine Openings and Excavations

Gold Queen Adit (photo 44-1)

The adit was collared at the base of a 15m high cliff, immediately east of a strong flowing tributary of Silver Basin Gulch. Below the adit the tributary disappears into the talus. The adit itself was dry at the time of the site visit.

Dimensions (L x W x D): 1.5m x 1.5m x ?

Supports: The adit is supported by log cribbing at the portal.

Condition: The adit is in fair condition.

Accessibility: unknown

Trench #1

The trench is located at the end of the Silver Basin Gulch Trail. There is no outcrop along the trench walls. At the bottom, it has all float material, mostly blocky Keno Hill Quartzite and some carbonaceous phyllite and one 5cm limonite-manganese stained vein. There is a small amount of ponded water in the bottom of the trench.

Dimensions (L x W x H): 35m x 4-8m x 2m

Condition: The trench walls are shallow, there are no stability concerns.

Accessibility: The trench can be accessed.

5.2 Waste Rock Disposal Areas

There is only a small waste dump outside of the adit. Most of the waste material is likely in the creek or has been washed down. The trench was excavated into overburden and does not have any waste rock associated with it.

6. MINE SITE INFRASTRUCTURE

No mine site infrastructure was encountered at the site.

7. SOLID WASTE DUMPS

No solid waste dumps were encountered at the site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazard waste products were encountered at the site. Potential contaminants of concern include any metals washing from the adit or trench.

9. WATER QUALITY

One water sample was collected for analysis. The sample (Silver Basin-WS-1-Silver Basin) was collected from the Silver Basin Gulch, 30m above the adit, as a background sample. The field pH was 6.4 and the conductivity was 1280 μ S/cm.

10. RECLAMATION

Natural revegetation is slowly occurring in the disturbed areas.

11. REFERENCES AND PERSONAL COMMUNICATIONS

Minfile #105M 004

ATTACHMENT 2: 1999 GOLD QUEEN WATER SAMPLES

LABORATORY RESULTS

Sample Number	Detection Limit	Units	Silver Basin-WS-1 - Silver Basin - 14/09/99
Site Description			Collected from Silver Basin Gulch, 30m above the adit.
pH (field)	N/A	pH	6.4
Conductivity (field)	N/A	µS/cm	1460
pH (Lab)	0.01	pH	7.88
Conductivity (Lab)	0.01	µS/cm	645
Total Alkalinity	5	mg CaCO3/L	103
Chloride	0.25	mg/L	<0.25
Hardness (CaCO3 equiv)	5	mg/L	325
Nitrate-N	0.05	mg/L	0.19
Nitrite-N	0.003	mg/L	<0.003
Sulphate	1	mg/L	222
Total Dissolved Solids	5	mg/L	450
Analysis by ICP-USN			
Aluminum	0.0008	mg/L	0.0078
Antimony	0.005	mg/L	<0.005
Arsenic	0.01	mg/L	<0.01
Barium	0.00004	mg/L	0.0466
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	0.000058
Calcium	0.002	mg/L	87.2
Chromium	0.00006	mg/L	0.00023
Cobalt	0.00003	mg/L	<0.00003
Copper	0.00003	mg/L	0.00184
Iron	0.00001	mg/L	0.171
Lead	0.0003	mg/L	<0.0003
Lithium	0.001	mg/L	0.003
Magnesium	0.0005	mg/L	24.5
Manganese	0.00002	mg/L	0.0494
Mercury	0.0001	mg/L	<0.0001
Molybdenum	0.00007	mg/L	0.00038
Nickel	0.00001	mg/L	<0.00001
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	2.05
Silver	0.00005	mg/L	<0.00005
Sodium	0.004	mg/L	0.8
Strontium	0.00002	mg/L	0.258
Sulphur	0.008	mg/L	71.8
Thallium	0.001	mg/L	<0.001
Titanium	0.00002	mg/L	<0.00002
Vanadium	0.00003	mg/L	<0.00003
Zinc	0.0002	mg/L	0.0034
Analysis by Hydride AA			
Arsenic	0.0002	mg/L	0.0007
Selenium	0.0001	mg/L	<0.0001



Photo 44-1 : Gold Queen. Entrance to the Gold Queen Adit. (Azimuth 190 °)

SILVER BASIN
SITE #45
MINFILE# 105M 005

1. LOCATION AND ACCESS

The site is on the north side of Keno Hill, approximately 1km north of the Monument Hill summit. Four-wheel drive access is possible by the Silver Basin Gulch Trail, some 2.5km from Keno Hill Signpost. The approximate UTM co-ordinates are 7 091 450m N and 491 000m E (Latitude: 63° 57' 08" N and Longitude: 135° 09' 30" W).

2. SITE PHYSIOGRAPHY

The area slopes gently to moderately to the north and east. The site is located at an elevation of 5400ft (1640m) and is above the treeline. The vegetation is mostly grass, moss and some small shrubs. Surface runoff from the site drains 500m to the west into Silver Basin Gulch, a tributary of the Keno Ladue River. Given the elevation and aspect, the area is presumably underlain by continuous permafrost.

3. GEOLOGY AND MINERALIZATION

Trench #1 located in the relatively flat area above the break in slope of the Gulch cut Earn Group quartz, sericite chlorite phyllite and carbonaceous phyllite.

Trench #2 is located on a moderate dipping east facing slope of Silver Basin Gulch and sub-parallel to the strike of the vein. The vein is poorly exposed in two locations, approximately 30m apart. The vein in the upper section of the trench is approximately 0.5m wide and has quartz and weak oxidized siderite. The lower vein zone is approximately 1m wide. The footwall 0.5m, section is vein quartz, and the hanging wall section has fractured quartz in a strong rusty mud gouge with occasional small pods of gneissic galena. The rusty gouge may be crushed and oxidized arsenopyrite. The wallrock for the vein is Keno Hill Quartzite. The vein is reported in the Yukon Minfile as 2.4m wide, traced for 30m, with minor galena, tetrahedrite and arsenopyrite in a quartz-siderite gangue.

In the road cut, just above the head of Trench #2, the vein is a 1.5m wide fracture zone with weak quartz and oxidized siderite veining.

Abundant vein quartz, with minor oxidized siderite is present in the shaft waste rock pile. No mineralization was seen in the quartz or siderite. Host rock for the hand shaft is Keno Hill quartzite.

4. SITE HISTORY

Between 1919 and 1927 a short shaft, open cuts and trenches were excavated. Some bulldozer trenching was undertaken in 1986.

5. MINE DEVELOPMENT

Three trenches and one collapsed shallow shaft were visited. There is a small waste rock pile outside of the shaft. No ore was processed at the site and no tailings were encountered. There is no wastewater treatment facility at the site. Site photos are in Attachment 1 and laboratory sampling results are in Attachment 2.

5.1 Mine Openings and Excavations

Shaft #1 (photo 45-1)

The hand shaft is collared in Keno Hill Quartzite. It has collapsed approximately 1m below the surface. From the amount of material in the waste rock pile, the shaft was originally approximately 3m deep. The shaft is located roughly 200m east of Silver Basin Gulch Trail.

Dimensions (L x W x D): 1m x 1m x 3m

Supports: The shaft is supported by log cribbing.

Accessibility: The shaft cannot be accessed.

Trench #1 (photo 45-2)

Trench #1 is a bulldozer trench excavated shallowly into overburden. There is a small volume of ponded water at the northern end. The trench is oriented at 005°.

Dimensions (L x W x H): 48m x 2-4m x 1.5m

Condition: The trench walls are gently sloped and shallow. There are no stability concerns.

Trench #2 (photo 45-3)

The trench is located on a moderately dipping (30°) east facing slope on the southeast side of the Silver Basin Gulch Trail, 300m northeast of the shaft. A quartz vein is exposed in the upper and lower sections of the trench. There is a small trickle of water crossing the lower vein.

Dimensions (L x W x H): 50m x 2-4m x 2-4m

Condition: The trench walls are moderately steep and are composed of rock rubble and exposed bedrock. There is possibility of the walls slumping.

Trench #3

Trench #3 is a small hand trench located 5m to the west of the shaft.

Dimensions (L x W x H): 1m x 3m x 0.5m

Condition: Given the size of the trench there are no stability concerns.

5.2 Waste Rock Disposal Areas

There are three waste rock piles associated with the workings.

Waste rock from the excavation of Trench #1 is piled at the north end of the trench, just past the ponded water. The pile measures roughly 4m wide, 6m long and 1.5m high. The surface rock on top of the pile is primarily overburden. There is no surface water flowing over the pile at the time of the site visit.

There is a small waste rock pile located outside of the shaft. Abundant vein quartz, with minor oxidized siderite is present in the shaft waste rock pile. No mineralization was seen in the quartz or siderite. No acid rock drainage conditions were seen in the vein or vein wallrock.

6. MINE SITE INFRASTRUCTURE

There is one collapsed building at the site. No fuel caches, electrical equipment, rail and trestle or any other mine site infrastructure was encountered.

6.1 Building 45A (photo 45-4)

There is an old collapsed log and timber cabin located on the west side of Silver Gulch Trail.

Dimensions (L x W x H): not measured

Asbestos: No asbestos was encountered.

Non-Hazardous Contents: A small volume of metal debris, mostly tin cans, was observed inside the cabin.

Hazardous Contents: No hazardous contents were encountered.

7. SOLID WASTE DUMPS

No solid waste dumps were encountered.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous products were encountered. Potential contaminants of concern include any metals washing from the trench walls or from the waste rock pile.

9. WATER QUALITY

There is a small trickle of water flowing over the lower quartz vein in Trench #2. A water sample (Silver Basin F3 – Silver Basin – 99/09/17) was collected for analysis. The field pH was 5 and the conductivity 930µS/cm.

10. RECLAMATION

Due to the high elevation, there is very little natural revegetation of the disturbed areas. There is some grass growing back in the trenches.

11. REFERENCES AND PERSONAL COMMUNICATIONS

Minfile #105M 005

ATTACHMENT 2: 1999 SILVER BASIN WATER SAMPLES

LABORATORY RESULTS

Sample Number	Detection Limit	Units	Silver Basin F3 - Silver Basin - 99/09/17
Site Description			Small trickle of water flowing over the lower vein in Trench #2
pH (field)	N/A	pH	5
Conductivity (field)	N/A	µS/cm	930
pH (Lab)	0.01	pH	5.84
Conductivity (Lab)	0.01	µS/cm	770
Total Alkalinity	5	mg CaCO ₃ /L	8
Chloride	0.5	mg/L	<0.5
Hardness (CaCO ₃ equiv)	5	mg/L	422
Nitrate-N	0.1	mg/L	<0.1
Nitrite-N	0.003	mg/L	0.003
Sulphate	1	mg/L	420
Total Dissolved Solids	5	mg/L	627

Analysis by ICP-USN

Aluminum	0.0008	mg/L	16.9
Antimony	0.005	mg/L	0.013
Arsenic	0.01	mg/L	0.48
Barium	0.00004	mg/L	0.237
Beryllium	0.00001	mg/L	0.00061
Bismuth	0.0004	mg/L	0.0014
Boron	0.002	mg/L	0.027
Cadmium	0.00006	mg/L	0.0227
Calcium	0.002	mg/L	133
Chromium	0.00006	mg/L	0.0177
Cobalt	0.00003	mg/L	0.0321
Copper	0.00003	mg/L	0.368
Iron	0.00001	mg/L	44.6
Lead	0.0003	mg/L	0.443
Lithium	0.001	mg/L	0.035
Magnesium	0.0005	mg/L	27.1
Manganese	0.00002	mg/L	3.51
Mercury	0.0001	mg/L	0.0002
Molybdenum	0.00007	mg/L	0.00984
Nickel	0.00001	mg/L	0.169
Phosphorus	0.03	mg/L	1.65
Potassium	0.4	mg/L	1.5
Selenium	0.004	mg/L	<0.004
Silicon	0.004	mg/L	16.8
Silver	0.00005	mg/L	0.0117
Sodium	0.004	mg/L	0.8
Strontium	0.00002	mg/L	0.565
Sulphur	0.008	mg/L	139
Thallium	0.001	mg/L	<0.001
Titanium	0.00002	mg/L	0.115
Vanadium	0.00003	mg/L	0.0181
Zinc	0.0002	mg/L	1.29

Analysis by Hydride AA

Arsenic	0.0002	mg/L	0.452
Selenium	0.0001	mg/L	0.0032

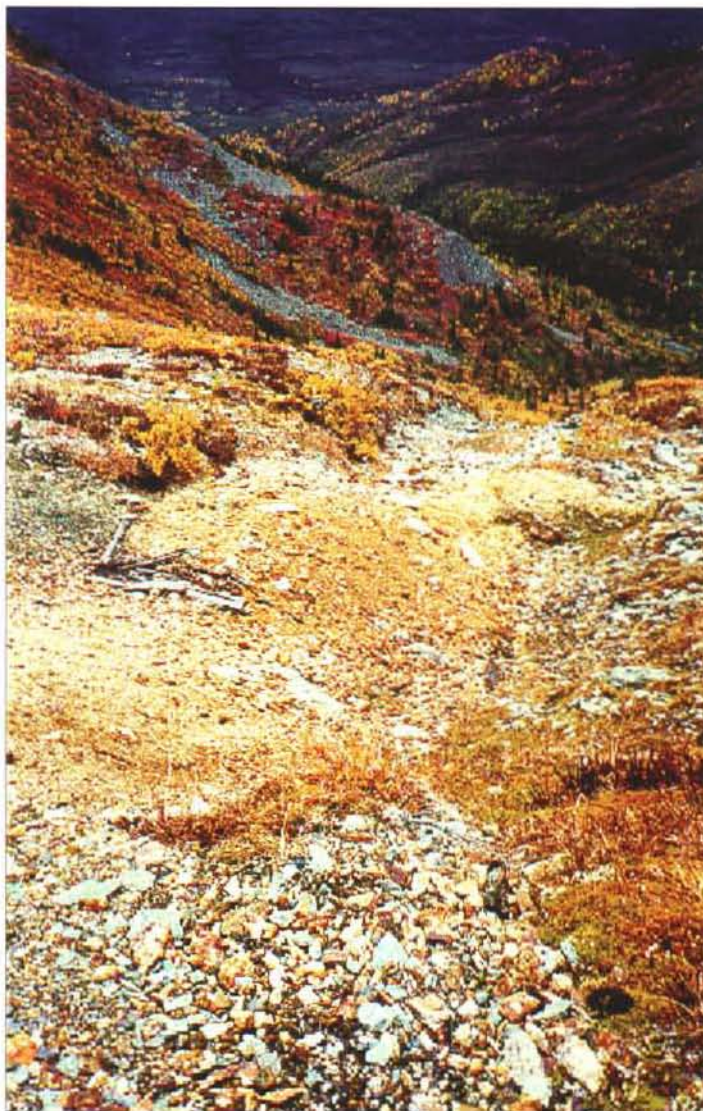


Photo 45-1 : Silver Basin. The pile of logs is the remains of a shallow shaft, Silver Basin Gulch is in the background. (Azimuth $\sim 090^{\circ}$)



Photo 45-2 : Silver Basin. View of Trench #1 with ponded water at the north end. (Azimuth 005^o)

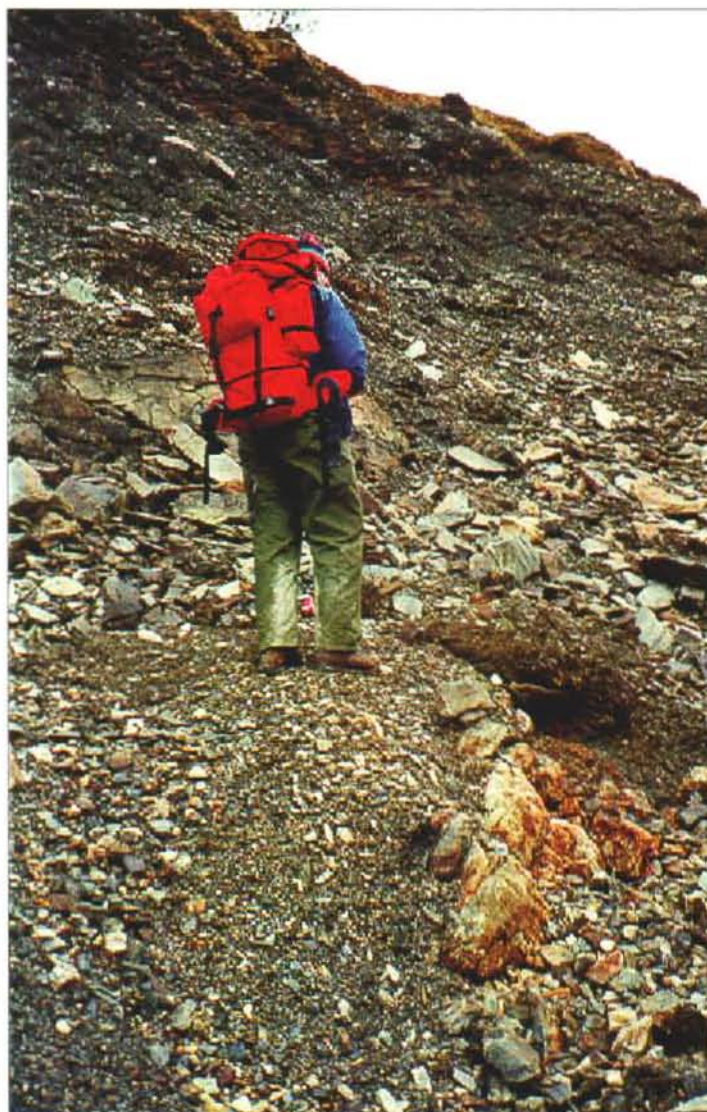


Photo 45-3 : Silver Basin. View of Trench #2. (Azimuth 316°)



Photo 45-4 : Silver Basin. Collapsed log and timber cabin beside Silver Basin Gulch Trail.
(Azimuth $\sim 180^{\circ}$)

NABOB
SITE #46
MINFILE# 105M 006

1. LOCATION AND ACCESS

The Nabob site is located on the north side of Keno Hill, approximately 1.6km north-northwest of Monument Hill summit. Access is by an unnamed trail that branches off the Silver Basin Gulch Trail, almost 3km from the Signpost. It is located at the approximate UTM co-ordinates 7 092 350m N and 491 000m E (Latitude: 63° 57' 36" N and Longitude 135° 11' 42" W).

2. SITE PHYSIOGRAPHY

Nabob is located above treeline at an elevation of roughly 5400ft (1650m). The site is on a gentle slope near the edge of a steep precipice that slopes to the north. Vegetation in the area is mainly grasses and moss with some small shrubs. Surface runoff of the site drains into McKay Gulch, 400m to the north. Given the elevation, the site is likely underlain by continuous permafrost conditions.

3. GEOLOGY AND MINERALIZATION

Two trenches are exposed. The first was Earn Group quartz, sericite, chlorite, phyllite; the second was in Keno Hill Quartzite with a very weak quartz oxidized siderite vein. Lenticular metadiorite (greenstone) and veins of galena and tetrahedrite in a siderite gangue are also reported to occur in the Earn group phyllite (Minfile #105M 006).

4. SITE HISTORY

Hand trenching at the site began in the 1920's and continues to the present day. In 1975 bulldozer trenches were excavated.

5. MINE DEVELOPMENT

Two shallow bulldozer and one hand trench were examined. No ore was processed at the site and no tailings were encountered. There is no wastewater treatment facility at the site. Site photos are located in Attachment 1.

5.1 Mine Openings and Excavations

Trench #1

This bulldozer trench is only shallowly excavated. The base is covered with pieces of carbonaceous phyllite. The trench is oriented at 338°.

Dimensions (L x W x H): 15m x 6-3m x 1m

Condition: The trench is very shallow and poses no stability concerns.

Trench #2 (photo 46-1)

This hand trench is dug into overburden. The trench is oriented at 010°.

Dimensions (L x W x H): 3m x 1m x 0.5m

Condition: The trench is very small and shallow and does not pose any stability concerns.

Trench #3

This bulldozer trench is deeper than the other two trenches. It is oriented at 020°.

Dimensions (L x W x H): 17m x 3m x 2.5m

Condition: The moderately sloped walls do not pose any stability concerns.

5.2 Waste Rock Disposal Areas

Trenches #1 and #2 are in overburden and there is very little waste rock associated with them. Waste rock from Trench #3 lines the trench walls. It is mostly composed of overburden and blocky quartzite with some quartz-siderite veining.

6. MINE SITE INFRASTRUCTURE

No mine site infrastructure was encountered at the site.

7. SOLID WASTE DUMPS

There are no solid waste dumps at the site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous waste was encountered at the site. Potential contaminants of concern include any metals washing from the trenches.

9. WATER QUALITY

No surface water was observed at the site.

10. RECLAMATION

All the trenches are naturally revegetating and have grasses and small bushes established on them. Trench #3 provides enough protection for a few small spruce trees to grow.

11. REFERENCES AND PERSONAL COMMUNICATIONS

Minfile #105M 006



Photo 46-1 : Nabob. Small hand trench dug into overburden. (Azimuth 010 °)

MONUMENT (& LADUE FRACTION)

SITE #47

MINFILE# 105M 007

1. LOCATION AND ACCESS

The site is located on Keno Hill, on the northwest-facing slope of Monument Hill summit, at an elevation of 5600ft. Access is by the Silver Basin Gulch trail suitable for 4X4 vehicle traffic and the site is located roughly 1.5km past the Signpost. The approximate UTM co-ordinates are 7 090 900m N and 490 900m E (Latitude: 63° 56' 47" N and Longitude: 135° 10' 35" W).

2. SITE PHYSIOGRAPHY

The site is located in a broad and gently sloped northwest face of Monument Hill. Given the elevation and aspect, the site is presumably underlain by continuous permafrost conditions. The area is well above treeline and is well vegetated with sub-alpine species, predominantly grasses. A variety of moss and lichens grow on the talus and there are some small shrubs growing in protected pockets. Surface runoff from the site drains 500m to the north into Faro Gulch, a tributary of Keno Ladue.

3. GEOLOGY AND MINERALIZATION

All trenches on the gentle to moderate north facing slope cut medium - thickly banded Keno Hill Quartzite bedrock or near bedrock float. A 5m wide section of mud in the floor near the east end of Trench #2 is interpreted as a fault because of its northwesterly strike. A 1m wide band of bull quartz was cut near the northwest end of Trench #4 but it was not seen in either Trench #5 or #6, located approximately 30m to the southwest.

The Yukon Minfile reports galena, sphalerite, tetrahedrite, arsenopyrite, as well as oxidized minerals were found at both occurrences. However, none were seen during our visit.

4. SITE HISTORY

Exploration work consists of shallow prospect shafts and hand trenching dating back to 1919. In 1958 and 1959 bulldozer trenches were excavated on the Venus 1F claim. An old adit of unknown age was developed on the Ladue Fraction claim. In 1999, six bulldozer trenches, in the area of the showing, were examined. No old shallow shafts, hand trenches or adits were found. It is possible that these were destroyed by later bulldozer trenching.

5. MINE DEVELOPMENT

There are six bulldozer trenches. No ore was processed at the site and no tailings were encountered. There is no wastewater treatment facility at this site. Site photos are located in Attachment 1.

5.1 Mine Openings and Excavations

Trench #1

Trench #1 is located upslope of the other trenches, roughly 500m southwest of Silver Basin Gulch Trail. The trench is wide and shallow with a talus slope along the northern side.

Dimensions (L x W x H): 100m x 5m x 3m

Condition: The gently sloped sides pose no stability concerns.

Accessibility: The trench is easily accessed.

Trench #2 (photo 47-1)

Trench #2 is located between Trench #1 and the road, at the eastern end of the site. The southern side of the trench is a moderately steep talus slope. At the time of the site visit there was a small pool of water in the bottom of the trench. A section of mud at the east end of the trench is interpreted as a fault.

Dimensions (L x W x H): 30m x 3m x 1m

Condition: The talus slope on the south side is moderately steep, but appeared stable. The wall on the north side is very low and does not pose any stability concerns.

Accessibility: The trench can be easily accessed.

Trench #3

Trench #3 is 100m to the west of Trench #2. It is excavated into overburden.

Dimensions (L x W x H): 30m x 2-8m x 25m

Condition: The low trench walls pose no stability concerns.

Accessibility: The trench can be easily accessed.

Trench #4 (photo 47-2)

Trench #4 is 400m to the west of Trench #3, 150m from Silver Basin Gulch Trail. There is a 1m wide band of quartzite at the northwest end. The trench is oriented from 318° at the northwest end and doglegs to 342° at the south end.

Dimensions (L x W x H): 115m x 3m x 2m

Condition: The low trench walls pose no stability concerns.

Accessibility: The trench is easily accessed.

Trench #5

Trench #5 is roughly 90m west of Trench #4. At the time of the site visit, there was a small volume of water at the bottom of the trench. The trench is oriented at 340°.

Dimensions (L x W x H): 50m x 8-3m x 1m

Condition: The low trench walls pose no stability concerns.

Accessibility: The trench can be easily accessed.

Trench #6

Trench #6 is located immediately to the west of Trench #5, 100m south of Silver Basin Gulch Trail and at the western edge of the site. A claim post (tag #2YA39940) is located 20m to the west of the northern end of the trench. The trench is oriented at 338°.

Dimensions (L x W x H): 64m x 4-8m x 2m

Condition: The trench walls are comprised primarily of blocky quartzite float and pose no stability concerns.

Accessibility: The trench can easily be accessed.

5.2 Waste Rock Disposal Areas

Waste rock from the trenching is composed primarily of overburden and some Keno Hill Quartzite and forms many of the trench walls.

6. MINE SITE INFRASTRUCTURE

No buildings, electrical equipment, fuel storage areas or any other mine site infrastructure were encountered at this site.

7. SOLID WASTE DUMPS

There were no solid waste dumps observed at this site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous waste was encountered at the site. Potential contaminants of concern include any metals washing from the trench walls.

9. WATER QUALITY

Two small puddles of water were observed at the base of Trench #2 and Trench #5. No water samples were collected.

10. RECLAMATION

No active measures of reclamation have been done on this site. Grasses and mosses are naturally revegetating the trenches.

11. REFERENCES AND PERSONAL COMMUNICATIONS

Minfile # 105M 007

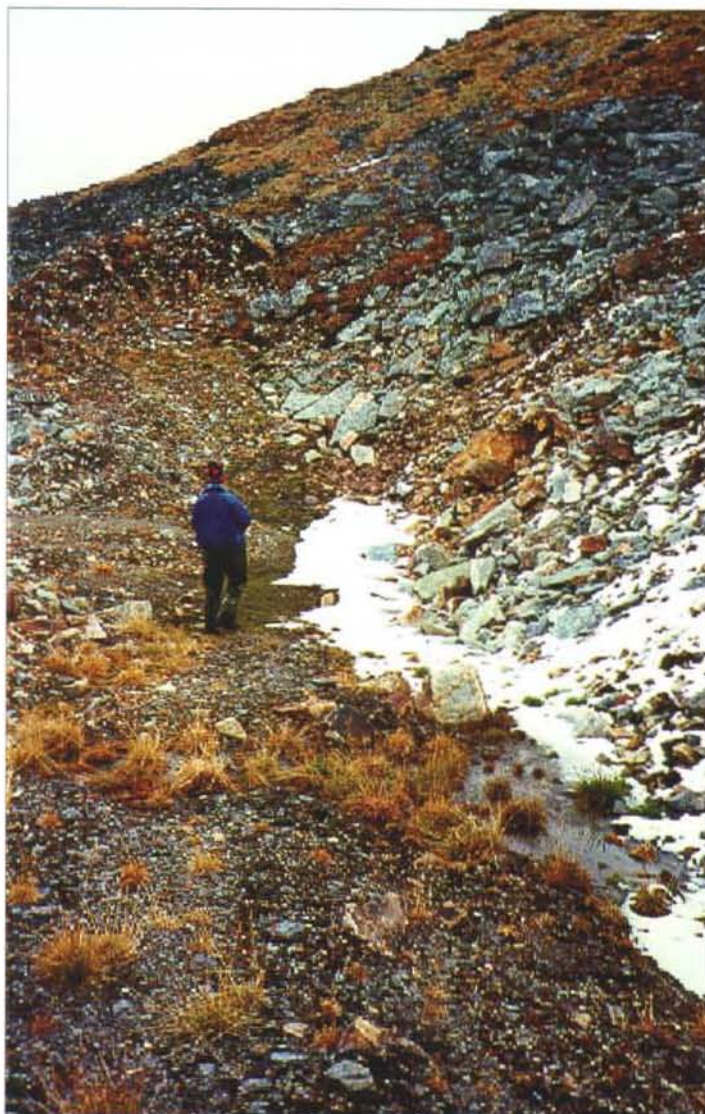


Photo 47-1 : Monument and Ladue Fraction. View of Trench #2, note small pool of water at bottom of the trench. (Azimuth 076°)



Photo 47-2 : Monument and Ladue Fraction. View of Trench #4, Gambler Lake is in the background. (Azimuth 318°)

APEX (#48)
MINFILE# 105M 009

1. LOCATION AND ACCESS

Access to the Apex site is from Signpost Road. A small cabin (Building 48A) is located approximately 250 m south of the 4th switchback past the intersection of Signpost Road and Keno 700 Road. The coordinates of the cabin are approximately 60° 55' 18" N by 135° 18' 22" W. Six trenches are located to the west of the cabin. The UTM coordinates of the site are approximately 7088920 m N 488640 m E. The elevation of the site is approximately 1465 m.

2. SITE PHYSIOGRAPHY

The Apex site is located on a flattened ridge on the south slope of Keno Hill, west of Charity Gulch. The site lies above the tree line in an area dominated by typical alpine vegetation. The surface water in the area drains toward Lightening Creek.

3. GEOLOGY AND MINERALIZATION

The major rock type observed at Apex was thin to medium bedded quartzite. Minor occurrences of carbonaceous phyllite were also observed. Weak narrow (<10 cm) quartzite breccia was observed with quartz and minor black manganiferous siderite. There was very little quartz noted in the quartzite. The minfile reports that the vein at the site is composed mostly of manganese oxide and siderite with localized calcite and sphalerite.

4. SITE HISTORY

Only 1 shaft was observed at the site. The minfile reports that 2 shafts, a 10.6 m adit and a 5.5 m winze were developed at the Apex site between 1925 and 1936, however, the second shaft could not be located.

5. MINE DEVELOPMENT

5.1 Mine Openings And Excavations

There were 6 trenches observed at the Apex site running parallel to each other. They are located to the west of Building 48A. A shaft was observed in Trench 3. Trenches 1 to 6 and Shaft 1 are described below in order from the east to west.

Trench 1 (photo 48-1)

Location: easternmost trench at the Apex site lying about 40 m west of Building 48A

Dimensions (L x W x H): 67 m x 4 m x 2 m - longitudinal bearing AZ 320

Condition: stable

Trench 2

Location: about 83 m west of Building 48A and 43 m west of Trench 1

Dimensions (L x W x H): 67 m x 5 m x 2.5 m – longitudinal bearing AZ 304

Condition: stable

Trench 3

Long trench with shaft (Shaft 1) in the bottom

Location: about 30 m from Trench 2

Dimensions (L x W x H): 113 m x 4-8 m x 1-3 m – longitudinal bearing AZ 320

Condition: stable

Shaft 1 (photo 48-2)

Old shaft filled in to within 5 m of surface

Location: in the bottom of Trench 3 (see description of Trench 3 below), 58 m from the waste rock dump at the south end of the trench

Dimensions (L x W): 2 m x 1.5 m

Condition: poor - caved in 5 m below surface

Accessibility: open

Trench 4

Location: approximately 80 m west of Trench 3

Dimensions (L x W x H): 37 m x 3 m x 1-3 m – longitudinal bearing AZ 356

Condition: stable

Trench 5

Location: approximately 10 m west of Trench 4

Dimensions (L x W x H): 35 m x 5 m x 2 m – longitudinal bearing AZ 288

Condition: stable

Trench 6

Trench (photo 69-6)

Location: about 20 m west of Trench 5

Dimensions (L x W x H): 50 m x 4 m x 2 m - longitudinal bearing AZ 314

Condition: stable

5.2 Waste Rock Disposal Areas

Each trench at the Apex site has a small waste rock disposal pile at the south end of it. These piles consist mostly of overburden. No waste rock samples were taken at this site.

5.3 Tailings Impoundments

No tailings were observed at the Apex site.

5.4 Minesite Water Treatment

No water treatment occurs at the Apex site.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

Building 48A (photo 48-3)

One level, single room freestanding wood cabin

Location: 250 m south of Signpost Road – approximately 60° 55' 18" N by 135° 18' 22" W

Dimensions (L x W x H): 3.5 m x 2.5 m x 2.5 m

Construction: wood

Paint: none observed

Asbestos: none observed

Foundation: none

Non-Hazardous Contents: 2 beds, utensils, firewood, and blankets are located inside. A fire pit, gas range (no fuel tank observed) and scattered debris (steel piping, cans) are located outside.

Hazardous Contents: none observed

6.2 Fuel Storage

There was no storage of fuel observed at the Apex site.

6.3 Rail and Trestle

There was no evidence of rail and trestle at the Apex site.

6.4 Milling and Processing Infrastructure

There was no evidence or record of milling or processing activities occurring at the Apex site.

6.5 Electrical Equipment

There was no electrical equipment observed at the Apex site.

7. SOLID WASTE DUMPS

No solid waste dumps were observed at the Apex site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were observed at the Apex site.

9. WATER QUALITY

No surface water was observed at the Apex site. Surface water drainage from the area is received by Lightning Creek. No water quality samples were taken at this site.

10. RECLAMATION

The disturbed areas of the Apex site have largely been reclaimed by natural vegetation. There have been no known reclamation measures carried out by past or present operators of the site.



Photo 48-1: View of Trench 1 at Apex site. (AZ 142)



Photo 48-2: View of Shaft 1 in Trench 3 at Apex site. (AZ 132)



Photo48-3: View of abandoned wood cabin located at Apex site. (AZ 200)

VANGUARD
SITE #49
MINFILE# 105M 010

1. LOCATION AND ACCESS

The site is located on the south slope of Keno Hill on the west side of Charity Gulch. Access is by an old 500m trail, connecting with the Keno 700 road at Charity Gulch that needs to be upgraded at Charity Gulch for four-wheel drive vehicle travel. The approximate UTM co-ordinates are 7 088 250m N and 489 300m E (Latitude: 63° 55' 22" N and Longitude: 135° 13' 05" W).

2. SITE PHYSIOGRAPHY

Vanguard is located right at treeline at an elevation of 4100ft (1250m). The vegetation is mostly large shrubs and moss with patchy spruce trees, alders and grassy areas. The soil layer is thin and there are a number of talus slopes at and near the site. Surface runoff drains into Charity Gulch which flows south into Lightning Creek, located 1km downslope.

3. GEOLOGY AND MINERALIZATION

The area is mainly underlain by near bedrock float of medium to thin bedded quartzite with porting of carbonaceous phyllite (Unit 2b). The bulldozer trench exposed a section of interbanded thinly bedded quartzite and 30 - 40% carbonaceous phyllite.

The best vein fault exposure is in the floor of the bulldozer trench where weak sheeted vein faults, up to 5cm wide with oxidized and fresh siderite occur over a 4m width. Along strike the siderite pinches out and the vein fault becomes a knife like break. This was seen in Shaft #2. At Shaft #3, abundant, generally fresh, siderite fragments from the shaft occurs on a wide bench. Minor very fine galena is associated with the siderite. This bench was used to sort galena from the vein for shipment in 45-gallon drums.

The adit is now collapsed and the portal area covered with broken thinly bedded quartzite with abundant carbonaceous phyllite. It is reported by local old timers, that the adit failed to intersect a mineralized vein fault, which is confirmed by the absence of siderite on the adit dump.

Based on field observations, it is likely that that the oreshoots occur in sheeted vein faults that have no strong lateral continuity.

4. SITE HISTORY

Between 1920 and 1949, a number of shafts were excavated and 11.6 tonnes of ore (8160 g/t silver, 65% lead) was shipped in 1934. In 1948 and 1949 another 31.8 tonnes of ore (10285 g/t silver, 51% lead) was shipped from the site. In 1962 and 1963 another 91.4m of underground crosscutting was completed.

5. MINE DEVELOPMENT

The main showing with the adit, four shafts and a bulldozer trench were examined. All prospecting shafts were caved 1 - 2m below the surface. No ore was processed at the site and no tailings were encountered. There is no wastewater treatment facility at the site. Site details can be found on Figure 1; site photos are in Attachment 1 and laboratory results for samples are in Attachment 2.

5.1 Mine Openings and Excavations

Shaft #1

Shaft #1 is located in the southwestern corner of the site, past the cabin. It has largely been removed by bulldozer trenching and the original dimensions are unknown. Some timbers partially covered by quartzite float are all that remain of the shaft.

Shaft #2 (photo 49-1)

Shaft #2 is located 12m northwest of the wood framed cabin. It is likely a shallow prospecting shaft. The shaft has collapsed roughly 1m below the surface. The area of collapse is about 2m². A single log post is all that is visible of the original support structure.

Shaft #3 (photo 49-2)

Shaft #3 is located 75m northwest of Shaft #2, 30m south of the tent frame. The collar is supported with log cribbing that measures 1.5m². The shaft has collapsed 2m below surface.

Shaft #4 (photo 49-3)

Shaft #4 is located 80m northwest of Shaft #3, 70m northeast of the adit. The shaft measures 1.5m² and is still open to about 3m down. The walls are supported with log cribbing. Three sides of the walls are still in good repair, the fourth wall is beginning to rot at the top and has partially collapsed.

Vanguard Adit (photo 49-4)

The adit is located at the eastern edge of the site on the northern side of the road. The log cribbing that supported the portal have collapsed and the adit can no longer be accessed. Between the adit entrance and Shaft

#4, in the near bedrock talus, is an up to 3m deep depression. The collapse of the adit is the most probable explanation for the depression. According to local workers, the adit failed to intersect the mineralized vein fault.

Trench #1 (photos 49-5, 49-6)

There is an 'L-shaped' bulldozer trench at the southwestern end of the site. The entire trench is 100m long, averages 7m wide and is up to 12m in height. The trench walls are composed of bedrock outcropping and quartzite float. The walls have slumped in some areas but overall seem fairly stable. The trench is easily accessible.

5.2 Waste Rock Disposal Areas

There are three waste rock disposal areas associated with the Vanguard workings.

Waste rock pile #1

Waste rock excavated from the trench is piled along the trench walls. It is composed of thin to medium beds of quartzite and carbonaceous phyllite layers. There is a smaller volume of manganiferous siderite vein material. Very little oxidation was observed at the surface of the waste rock. There was no surface water on the waste rock at the time of the site visit.

Dimensions (L x W x H): 80m x 4m x 3m

Sampling: No samples were collected.

Waste rock pile #2

This waste rock pile, located near Shaft #3, appears to be the ore sorting area. The waste rock is composed of mostly thumb to fist sized pieces of manganiferous siderite and blocky quartzite. There was no surface water on the waste rock at the time of the site visit.

Dimensions (L x W x H): 40m x 20m x 2m

Sampling: A sample (Vanguard-Waste Rock-Sept.20/99) was collected for analysis. The field paste pH was 6.2 and the conductivity was 20µS/cm.

Waste rock pile #3

This waste rock pile is located outside of the adit. The waste rock is primarily carbonaceous phyllite. No oxidized areas were observed.

Dimensions (L x W x H): 60m x 20m x 2m

Sampling: No samples were collected.

6. MINE SITE INFRASTRUCTURE

There are two building remains, some rail and ties and a fuel storage area. Electricity was not provided to the site.

6.1 Building 49A (photo 49-7)

A log cabin was encountered on the north side of the road, to the west of the adit. The roof has lost most of its corrugated tin roofing and is collapsing and covered in moss. The fir is rotting and smelly. There is a two-person outhouse located nearby measuring 1m by 1m by 1.5m.

Dimensions (L x W x H): 5m x 4m x 2m

Asbestos: No asbestos was encountered.

Foundation: There is no foundation.

Non-Hazardous Contents: There is roughly 1m³ of metallic debris in and around the cabin.

Hazardous Contents: No hazardous contents were encountered.

Building 49B

There is a collapsed tent frame between Shaft #3 and Shaft #4. No hazardous contents were encountered.

6.2 Fuel Storage

There are twenty 45-gallon drums outside of the adit. Fourteen of the drums are empty and six of the drums are filled with rock.

6.3 Rail and Trestle (photo 49-8)

There is over 120m of steel gauge rail on the cleared area outside of the adit. Some of the rail is still in place but most of it is piled off to the side. No trestle was observed.

7. SOLID WASTE DUMPS (photo 49-9)

There is a fair amount of solid waste around the adit portal. There are scattered 45-gallon drums, steel rail, and various wood and metal debris. A 10cm-deep, 2.5m² hydrocarbon stain was observed.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous waste was encountered at the site. Potential contaminants of concern include any metals washing from the waste rock piles or trench walls.

9. WATER QUALITY

No surface water was encountered at the site and no water samples were collected.

10. RECLAMATION

Vegetation is growing back very slowly. No active reclamation measures have been taken at the site.

11. REFERENCES AND PERSONAL COMMUNICATIONS

Minfile #105M 010

**ATTACHMENT 2: 1999 VANGUARD WASTE ROCK
LABORATORY RESULTS**

Site Number	Detection Limit	Units	Vanguard - Waste Rock - Sept 20/99
Sample Description			Waste rock from waste rock pile #2, a sorting area near Shaft #3.
Paste pH (field)	N/A	pH	6.2
Conductivity (field)	N/A	µS/cm	20
pH in Saturated Paste			
pH	0.1	pH	5.9
pH in Soil (1:2 water)			
pH	0.01	pH	6.2
ICP Semi-Trace Scan			
Aluminum	5	µg/g	17400
Antimony	2	µg/g	990
Arsenic	2	µg/g	101
Barium	0.05	µg/g	210
Beryllium	0.1	µg/g	<0.1
Bismuth	5	µg/g	<5
Cadmium	0.1	µg/g	35.2
Calcium	5	µg/g	612
Chromium	0.5	µg/g	14.6
Cobalt	0.1	µg/g	9.3
Copper	0.5	µg/g	663
Iron	1	µg/g	140000
Lead	1	µg/g	96000
Lithium	0.5	µg/g	6.8
Magnesium	1	µg/g	883
Manganese	0.5	µg/g	15300
Mercury	0.01	µg/g	2.5
Molybdenum	1	µg/g	4
Nickel	1	µg/g	20.8
Phosphorus	5	µg/g	1390
Potassium	20	µg/g	1880
Selenium	2	µg/g	<2
Silicon	5	µg/g	264
Silver	0.5	µg/g	2020
Sodium	5	µg/g	604
Strontium	1	µg/g	13
Sulphur	10	µg/g	10500
Thorium	1	µg/g	<1
Tin	1	µg/g	12
Titanium	0.2	µg/g	118
Uranium	5	µg/g	<5
Vanadium	1	µg/g	18
Zinc	0.5	µg/g	3240
Zirconium	0.1	µg/g	13.7

**ATTACHMENT 2: 1999 VANGUARD 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
Vanguard - Waste Rock - Sept.20/99	Waste rock from waste rock pile #2, a sorting area near Shaft #3.	6.1	0.16	0.15	0.3	0.6	0.3	2.0

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*)

22A* Indicates Asbestos Material

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

1999 Soil Sample (this study)

Pre 1999 Soil Sample (other sources)

1999 Waste Rock Sample (this study)

Pre 1999 Waste Rock Sample (other sources)

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

Transformer Location (number of transformer in brackets)

Power Line

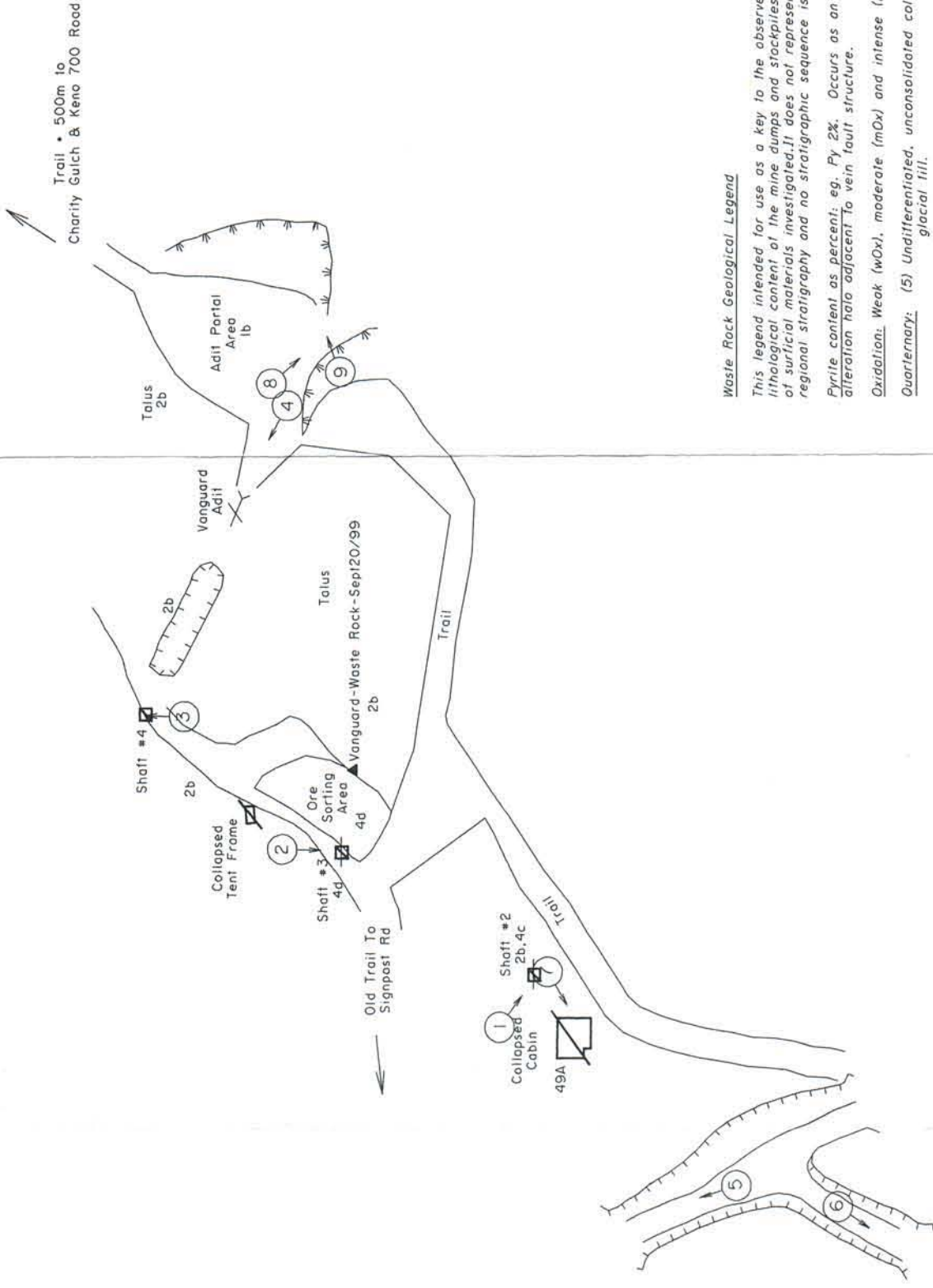
Power Line Collapsed

Aerial Transmission Towers

Photo Site (arrow shows view direction)

GPS Survey Location

Former Building Site (Eiso)



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 bedded, broken, quartzite with carbonaceous phyllite interbeds;

(2c) Calcareous quartzite.

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

(1b) Carbonaceous phyllite.

	Public Works and Services Canada	Travaux publics et Services gouvernementaux Canada	designed by: C.S.	date: NOV./99
	Architecture & Engineering Services Western Region		drawn by: C.S.	
			checked by: C.S.	
			approved by: C.S.	
			revisions:	
			project no. 125-12.01	1 of 1
			date of print:	



Scale 1:2000

CAD FILE: SITE49.DGN



Photo 49-1 : Vanguard. Shaft #2 has collapsed 1m below surface, the timber post in the bottom right hand corner is all that marks the location. (Azimuth 110°)

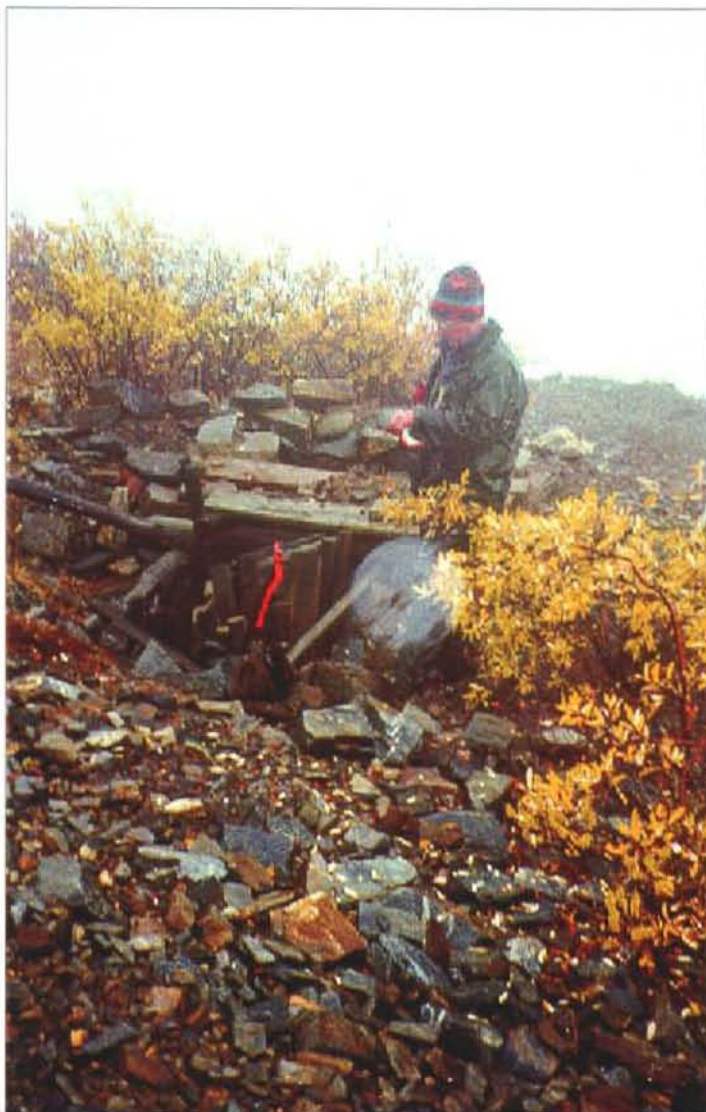


Photo 49-2 : Vanguard. The log cribbing supporting the collar of Shaft #3 is still in place but the shaft has caved 2m below surface. (Azimuth 180°)



Photo 49-3 : Vanguard. Shaft #4 is still open and in fairly good condition.



Photo 49-4 : Vanguard. The pile of broken logs and sheet metal marks the entrance to the Vanguard Adit. The first 30m of the adit have collapsed. (Azimuth 290°)



Photo 49-5 : Vanguard. View of Trench #1, looking to the northwest. (Azimuth 040^o)

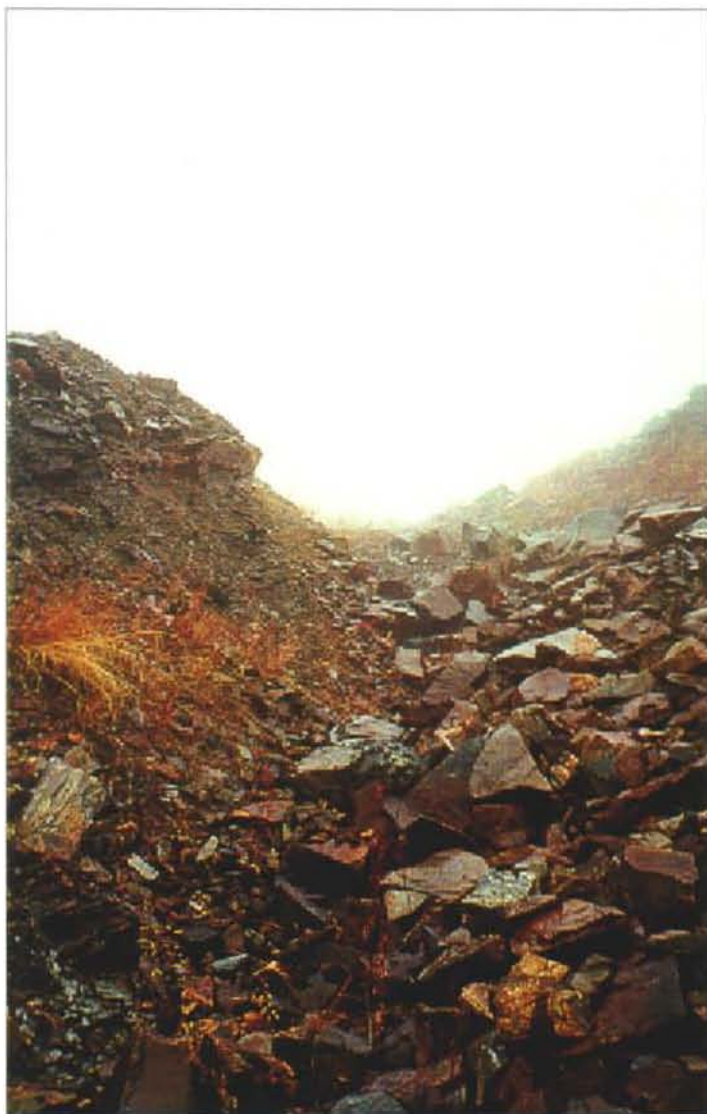


Photo 49-6 : Vanguard. View of Trench #1, looking to the southwest. (Azimuth 320°)



Photo 49-7 : Vanguard. View of Building 49A. (Azimuth 250°)



Photo 49-8 : Vanguard. Some rail is still in place but most of it is piled off to the sided.
(Azimuth 135°)



Photo 49-9 : Vanguard. Solid waste dumped near the adit. (Azimuth 090 °)

HOMESTAKE
SITE #50
MINFILE# 105M011

A thick blanket of snow covered the site at the time of the site visit.

1. LOCATION AND ACCESS

Homestake is on the north side of Bunker Hill at an elevation of roughly 1300m. Approximate UTM coordinates are 7086 600m N and 489 750m E. Access to the site is possible by foot via an unnamed overgrown road. This road is 2.5km in length and branches off Lightning Creek Road near the junction of Thunder Gulch and Lightning Creek. The site is located at the end of this road.

2. SITE PHYSIOGRAPHY

Homestake was developed on the steeper north side of Bunker Hill. The elevation difference between the top of the site and the bottom is roughly 150m. Since the site is north facing, it is presumed to be underlain by permafrost. Site drainage flows about 900m northward into Lightning Creek located at roughly 1070m elevation. The area around the lower section of the site is well vegetated with bushes and spruce trees, the higher region of the site is near the treeline and is vegetated by predominately grasses, and some dwarfed trees and bushes.

3. GEOLOGY AND MINERALIZATION

The host rock is the Keno Hill Quartzite. Two types of vein have been explored. One has erratic lenses of arsenopyrite (FeAsS) and galena (PbS) in a quartz-carbonate gangue and is exposed for more than 90m along strike. The other vein hosts tetrahedrite ($\text{Cu}_{12}\text{Sb}_4\text{S}_{13}$) and galena in a carbonate gangue and is exposed for 30m, with widths of 3 to 7.6m.

4. SITE HISTORY

Homestake was first worked between 1928 and 1931 during which time a 26.8m shaft was built and 38.4m of underground was explored. Extensive bulldozer trenching was completed from 1962 to 1964 and again in 1966 and 1974. Between 1967 and 1979, 107m of drifting was conducted on a single adit level.

5. MINE DEVELOPMENT

Workings at the Homestake site consist of four trenches, one adit and two waste rock piles. The shaft could not be located and is believed to have been destroyed by later trenching. Site details can be found on Figure 1: see Attachment 1 for site photos.

5.1 Mine Openings and Excavations

Homestake Adit (photo 50-1)

There is a level, cleared area outside of the portal. A 10m long wooden structure protects the entrance to the adit. Railway tracks are still in place within the wooden structure and along the level ground to the east. There was a small amount of fiberglass insulation and metal piping found within the wooden structure.

Location: The adit is at the bottom of the site, located downslope of the trenches, to the north.

Dimensions (L x W x H): The main adit is 107m x 2.0m x 2.0m (roughly), and there is another 143m of drifting off the main adit.

Supports: Timber and concrete support the portal.

Condition: The portal entrance and the wooden structure appear stable. The condition of the adit is unknown, however there is no evidence of subsidence of the adit from the surface.

Accessibility: The portal entrance is boarded up and cannot be accessed.

Trench 1 (photo 50-2)

This trench is oriented downslope northeast-southwest and is largest of the four trenches. Outcrop is exposed on both sides of the trench walls, however the southeastern wall is much higher. The walls are composed primarily of quartzite and small zones of quartz-carbonate veining. A pile of chlorite schist boulders is exposed near the top of the trench, on the west side.

Location: The trench begins near the top of Bunker Hill.

Dimensions (L x W x H): 330m x 75m (at the widest point) x 4.5m (at the highest point)

Condition: Some fragments have broken off the trench walls and been deposited on the trench floor, however the walls appear stable.

Accessibility: The trench is accessible.

Trench 2

Trench 2 is oriented northwest-southeast along the top of Bunker Hill. Grass and small bushes grow within the trench. Outcrop of quartzite is exposed along the trench walls.

Location: At the top of Bunker Hill, to the west of the top of trench 1.

Dimensions (L x W x H): 158m x 34m x 2.5m

Condition: The trench walls appear stable.

Accessibility: The trench is accessible.

Trench 3

Trench 3 is oriented downslope north-south, to the west of trench 1. Grass and small bushes grow within the trench. There are small outcroppings of quartzite along the trench walls.

Location: Trench 3 is roughly parallel to trench 1, to the west.

Dimensions (L x W x H): 140m x 30m x 2.0m

Condition: The trench walls appear stable.

Accessibility: The trench is accessible.

Trench 4 (photo 50-3)

Trench 4 is excavated across slope, downslope of the other 3 trenches. Quartzite outcrop is exposed on the southern side of the trench and a waste rock pile is on the northern side. Long grass grows in the bottom of the trench; no other vegetation grows within the trench.

Location: North of the other 3 trenches, upslope and south of the adit entrance.

Dimensions (L x W x H): 142m x 25m (at the rim) x 4.0m

Condition: Big blocks of rock have broken off the southern trench wall.

Accessibility: The trench is accessible.

5.2 Waste Rock Disposal Areas

There were two waste rock piles identified. One is associated with the excavation of Trench 1; the second is associated with the excavation of Trench 4. The large level clearing outside of the portal is likely waste rock from the adit. However, the snow cover at the time of the site visit made it difficult to characterize that area. Waste rock piles associated with Trenches 2 and 3 were likely deposited as low level piles at the side of the trenches, but were not observed due to the snow cover.

Waste rock pile #1

The source of the waste rock in this pile is from the excavation of Trench 1. Due to weather constraints, the overall geology of the waste rock could not be determined. The rock fragments found in the test pit were mostly quartzite and minor amounts of unmineralized quartz vein and schist fragments with roughly 20% overburden. There was minor iron (Fe) staining on the surface of the waste rock pile; there is no evidence of oxidation below the surface. The pile is bimodal ranging in grain size from silt to cobble sized.

Location: At the northern end of Trench 1.

Dimensions (L x W x H): 67m x 22m x 2.5m

Sampling: A 30cm test pit was dug and sample #Home-WR-01 was collected (photo 50-4).

Waste rock pile #2

The waste rock has been excavated from Trench 4 and is similar in characteristics as waste rock pile #1.

Location: Forms the northern side of Trench 4.

Dimensions (L x W x H): 75m x 15m x 3.0m

Sampling: A 30cm test pit was dug and sample #Home-WR-02 was collected (photo 50-5)

5.3 Tailings Impoundments

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

5.4 Minesite Water Treatment

There is no water treatment facility at this site.

6. MINE SITE INFRASTRUCTURE

There are two buildings and a small length of rails at this site. Roads were built to trenches 1 and 4, the two buildings and to the adit. Site details can be found on Figure 1; see Attachment 1 for site photos.

6.1 Buildings

There are two wooden buildings at this site.

Building 50A (photo 50-6)

Dimensions (L x W x H): 17m x 4m x 3m

Location: 40m west of trench 4

Construction: wood sheeting

Paint: none observed

Asbestos: none observed

Foundation: none

Non-Hazardous Contents: sink, toilet, table, metal bedframe, shelves, diesel stove

Hazardous Contents: none observed

Building 50B (photo 50-7)

Dimensions (L x W x H): 3.5m x 3.5m x 3.0m

Location: 10m west of building 50A

Construction: wood sheeting

Paint: none observed

Asbestos: none observed

Foundation: none

Non-Hazardous Contents: table, benches, and clothes

Hazardous Contents: none observed

6.2 Fuel Storage

No fuel storage tanks or drums were encountered.

6.3 Rail and Trestle (photo 50-8)

There were two small lengths of rail encountered. The first comes goes from the portal to the end of the wooden structure. The second section is to the east of the adit, in the level clearing. No trestle was encountered.

Fabrication: steel rail and wooden ties

Amount of materials: The total length of rail is approximately 35m.

Condition: The ties are in good condition, the rail has begun to rust.

6.4 Milling and Processing Infrastructure

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

6.5 Electrical Equipment

No electrical equipment 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 materials were encountered on this site. The only contaminants of concern would be the possibility of dissolved metals seeping or washing from the waste rock piles, the trench walls or out of the adit.

9. WATER QUALITY

There were two small streams encountered at this site. The beginning of one stream seeps out of the top of Trench 1, following the base of the trench before seeping back into the ground 30m later (photo 50-9). A water sample (Home-WQ-US-01) was collected at the top of the stream. The water had no visible particulates and did not appear to be depositing any sediment. The flow rate was less than 1 L/s (visual estimation). The second stream exits the Homestake portal flowing at a rate of less than 1 L/s (visual estimation). A sample was collected (Home-WQ-02) from just outside the portal. The water has no visible particulates and does not appear to be depositing sediment. The stream continued downhill.

10. RECLAMATION

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

11. REFERENCES

Minfile #105M001

**ATTACHMENT 2: 1999 HOMESTAKE WATER SAMPLES
LABORATORY RESULTS**

Sample Number	Detection Limit	Units	Home-WQ-A01-02 - Homestake - Sept. 22/99	Home-WQ-US-2 - Homestake - Sept. 22/99
Site Description			Adit drainage	Seep at the top of Trench #1
pH (field)	na	pH	N/A	N/A
Conductivity (field)	na	µS/cm	N/A	N/A
pH (Lab)	0.01	pH	7.81	7.2
Conductivity (Lab)	0.01	µS/cm	640	56
Total Alkalinity	5	mg CaCO3/L	178	59
Chloride	0.25	mg/L	<0.25	<0.25
Hardness (CaCO3 equiv)	5	mg/L	327	27.2
Nitrate-N	0.05	mg/L	0.08	<0.05
Nitrite-N	0.003	mg/L	<0.003	<0.003
Sulphate	1	mg/L	164	1.3
Total Dissolved Solids	5	mg/L	430	37
Analysis by ICP-USN				
Aluminum	0.0008	mg/L	0.0074	0.0269
Antimony	0.005	mg/L	<0.005	<0.005
Arsenic	0.01	mg/L	<0.01	<0.01
Barium	0.00004	mg/L	0.00232	0.00419
Beryllium	0.00001	mg/L	<0.00001	<0.00001
Bismuth	0.0004	mg/L	<0.0004	<0.0004
Boron	0.002	mg/L	<0.002	<0.002
Cadmium	0.00006	mg/L	0.00018	0.00002
Calcium	0.002	mg/L	103	9.48
Chromium	0.00006	mg/L	0.00014	<0.00006
Cobalt	0.00003	mg/L	<0.00003	<0.00003
Copper	0.00003	mg/L	0.00056	0.00052
Iron	0.00001	mg/L	0.038	0.063
Lead	0.0003	mg/L	<0.0003	<0.0003
Lithium	0.001	mg/L	0.006	0.002
Magnesium	0.0005	mg/L	24.2	0.405
Manganese	0.00002	mg/L	0.0059	0.00402
Mercury	0.0001	mg/L	<0.0001	<0.0001
Molybdenum	0.00007	mg/L	0.00029	<0.00007
Nickel	0.00001	mg/L	0.0043	0.0001
Phosphorus	0.03	mg/L	<0.03	<0.03
Potassium	0.4	mg/L	<0.4	<0.4
Selenium	0.004	mg/L	0.007	<0.004
Silicon	0.004	mg/L	2.29	1.78
Silver	0.00005	mg/L	<0.00005	<0.00005
Sodium	0.004	mg/L	0.6	<0.4
Strontium	0.00002	mg/L	0.203	0.0197
Sulphur	0.008	mg/L	52.6	0.482
Thallium	0.001	mg/L	<0.001	<0.001
Titanium	0.00002	mg/L	0.0001	0.00066
Vanadium	0.00003	mg/L	<0.00003	<0.00003
Zinc	0.0002	mg/L	0.0465	<0.0002
Analysis by Hydride AA				
Arsenic	0.0002	mg/L	0.0103	0.0002
Selenium	0.0001	mg/L	<0.0001	<0.0001

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

Site Number	Detection Limit	Units	Home-Wr-01 - Homestake - 5- 20cm - Sept. 22/99	Home-Wr-02 - Homestake - 5- 20cm - Sept. 22/99
Sample Description			East side of Waste Rock Pile #1	North side of Waste Rock Pile #2
Paste pH (field)	N/A	pH	N/A	N/A
Conductivity (field)	N/A	µS/cm	N/A	N/A
pH in Saturated Paste				
pH	0.1	pH	6.9	7.3
pH in Soil (1:2 water)				
pH	0.01	pH	7.4	7.6
ICP Semi-Trace Scan				
Aluminum	5	µg/g	30300	29600
Antimony	2	µg/g	61	54
Arsenic	2	µg/g	1540	470
Barium	0.05	µg/g	591	385
Beryllium	0.1	µg/g	0.6	0.7
Bismuth	5	µg/g	<5	<5
Cadmium	0.1	µg/g	4.4	34
Calcium	5	µg/g	1040	2120
Chromium	0.5	µg/g	51.9	48.1
Cobalt	0.1	µg/g	1.9	9.9
Copper	0.5	µg/g	30.5	97.4
Iron	1	µg/g	20000	38000
Lead	1	µg/g	365	1780
Lithium	0.5	µg/g	6.6	14.9
Magnesium	1	µg/g	535	749
Manganese	0.5	µg/g	172	6610
Mercury	0.01	µg/g	<0.01	0.12
Molybdenum	1	µg/g	4	3
Nickel	1	µg/g	4.4	30.2
Phosphorus	5	µg/g	492	709
Potassium	20	µg/g	10900	9000
Selenium	2	µg/g	<2	<2
Silicon	5	µg/g	849	426
Silver	0.5	µg/g	8	74.5
Sodium	5	µg/g	894	1600
Strontium	1	µg/g	109	68
Sulphur	10	µg/g	2740	3760
Thorium	1	µg/g	7	4
Tin	1	µg/g	2	5
Titanium	0.2	µg/g	71.6	104
Uranium	5	µg/g	<5	<5
Vanadium	1	µg/g	61	52
Zinc	0.5	µg/g	287	2510
Zirconium	0.1	µg/g	51.3	19.5

**ATTACHMENT 2: 1999 HOMESTAKE WASTE ROCK SAMPLES LABORATORY RESULTS
MODIFIED SOBEEK METHOD ACID-BASE ACCOUNTING TEST**

SAMPLE	SITE DESCRIPTION	PASTE pH	S(T) %	S(SO ₄) %	AP	NP	NET NP	NP/AP
Home-Wr-01 - Homestake -5- 20cm - 22/9/99 - Waste	East side of Waste Rock Pile #1	7.3	0.14	0.14	0.0	0.4	0.4	---
Home-Wr-02 - Homestake -5- 20cm - 22/9/99 - Waste	North side of Waste Rock Pile #2	7.7	0.15	0.03	3.8	6.8	3.0	1.8

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

Shoal

Collapsed/Backfilled Shaft

Mine Rock Dump

Bedrock Open Pit

Trench

Stripped Overburden Stockpile

Stripped / Disturbed Area

Oulcrop Boundary

Highway

Road (gravel, 2 wheel drive)

Road (gravel, 4X4 accessible)

Road (inaccessible)

Trail

Culvert

2450-01 1999 Soil Sample (this study)

Pre 1999 Soil Sample (other sources)

258604-01 1999 Waste Rock Sample (this study)

Pre 1999 Waste Rock Sample (other sources)

WP-12-06 1999 Water Sample

Pre 1999 Water Sample

Tension Cracks

Mass Movement (note: for Farms; BelleKen)

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, rolls, air and water pipe)

Mine Rails / Trestle

Collapsed Trestle

Solid Waste Disposal Site

Area of Soil Contamination

Transformer Location (number of transformer in brackets)

Power Line

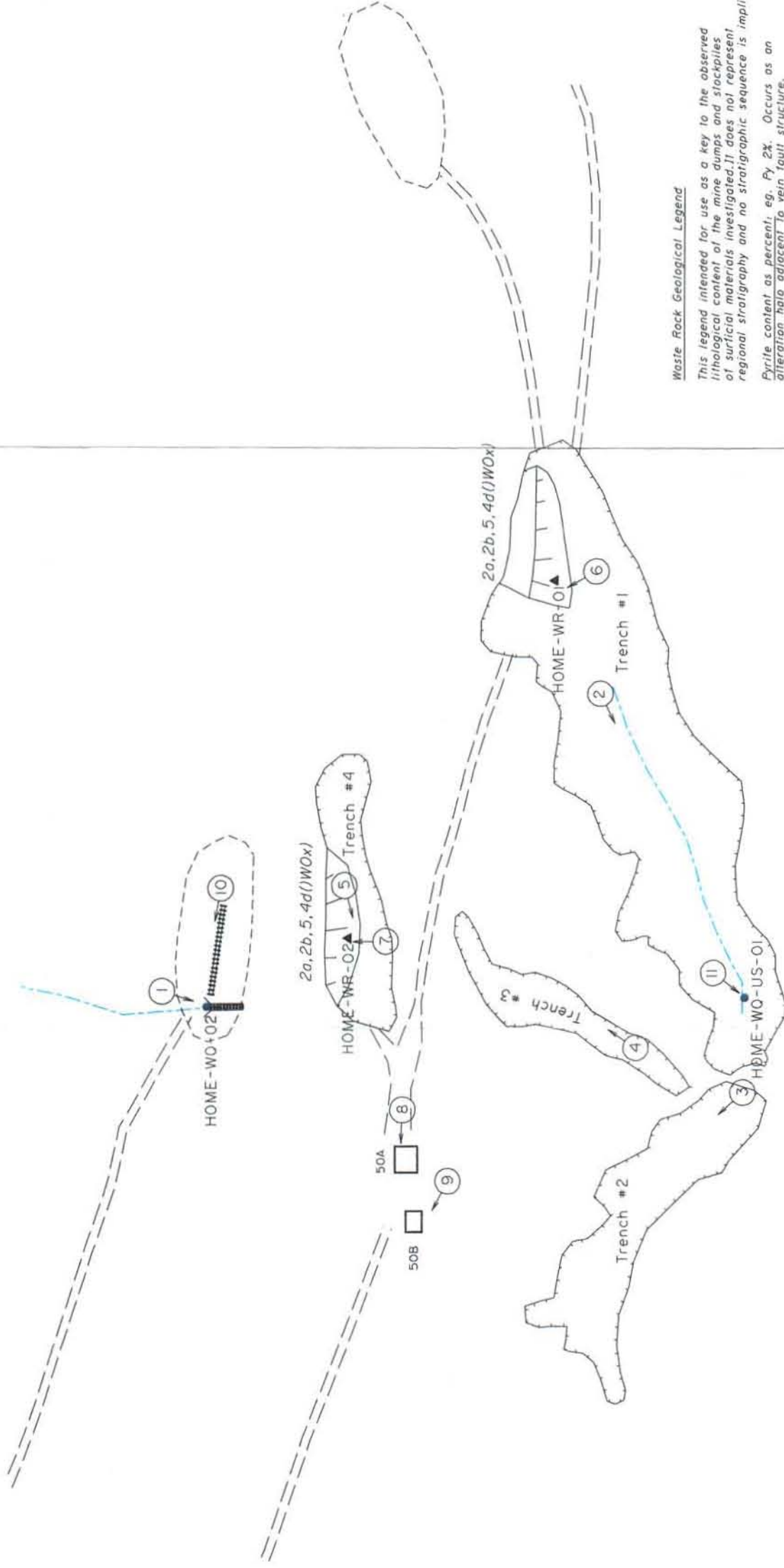
Power Line Collapsed

Aerial Transmission Towers

Photo Site (arrow shows view direction)

GPS Survey Location

Former Building Site (Eisa)



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;

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

Quartzite: (2a) Thick bedded, blocky gray quartzite;

(2b) Thin bedded, broken, quartzite with carbonaceous phyllite interbeds;

(2c) Calcareous quartzite.

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

(1b) Carbonaceous phyllite.

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	Architecture & Engineering Services Western Region			C.S.				NOV./99
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Homestake Site #50 Site Assessment		Yukon Territory		125-12 01		1 of 1		

CAD FILE SITE50.DGN



Photo 50-1: The large wooden structure is the portal to the Homestake adit. (Azimuth 225°)



Photo 50-2: Trench 1, the largest trench at the site. (Azimuth 235°)



Photo 50-3: Trench 4. Note the high trench walls on the left and waste rock pile #2 on the right. (Azimuth 260°)



Photo 50-4: Test pit 1, waste rock pile #1. Note there is no oxidized horizon, only minor Fe-staining at the surface. (Azimuth 350°)



Photo 50-5: Test pit 2, waste rock pile #2, minor Fe-staining at the surface. (Azimuth 000°)



Photo 50-6: Building 50A with a small pile of wood debris out front (Azimuth 270°)



Photo 50-7: Building 50B, the table is visible through the doorway. (Azimuth 270°)



Photo 50-8: Rail and ties, old poles on right and portal to adit in the background. (Azimuth 270°)



Photo 50-9: Water sample site for HOME-WQ-US-01 (Azimuth 240°)

CHRISTINE (#51)
(MINFILE# 105M 012)

1. LOCATION AND ACCESS

The Christine site is located at the peak of Bunker Hill. It is about 7 km east of Keno and accessible by helicopter. The UTM coordinates for the Christine site are 7085200 m N 492300 m E. Its elevation is about 1825 m.

2. SITE PHYSIOGRAPHY

The Christine site consists of a single trench dug on the southwest flank of Bunker Hill near the summit. The overburden at the site consists of large boulders about 30 cm in diameter. Surface water runoff drains towards Thunder Gulch.

3. GEOLOGY AND MINERALIZATION

The major rock type observed at the Christine site was grey quartzite. Greenstone was a minor rock type observed at the site. The minfile reports a vein up to 3 m wide exposed over 100 m. This veining is reported to contain erratic lenses of galena up to 30 cm wide.

4. SITE HISTORY

The minfile reports that trenching was done by hand at the Christine site during 1920. It also reports that bulldozer trenching was conducted in the late 1960s.

5. MINE DEVELOPMENT

5.1 Mine Openings and Excavations

Trench 1 (photo 51-1)

Trench 1 was the only development observed at the Christine site.

Dimensions: 24 m x 2 m x 1.5 m – longitudinal bearing AZ 130

Condition: stable

5.2 Waste Rock Disposal Areas

A small pile of overburden is located at the northwest end of the trench. There were no waste rock piles containing mineralization observed at the site.

5.3 Tailings Impoundments

No tailings were observed at the Christine site.

5.4 Minesite Water Treatment

No water treatment occurs at the Christine site.

6. MINE SITE INFRASTRUCTURE

No infrastructure was observed at the Christine site

7. SOLID WASTE DUMPS

No solid waste dumps were observed at the Christine site.

8. POTENTIAL CONTAMINANTS OF CONCERN

An empty 45 gallon jet fuel drum was observed at the site about 20 m west of Trench 1. No potential contaminants of concern were observed at the Christine site.

9. WATER QUALITY

No surface water was observed at the Christine site. Surface water runoff from the area drains towards Thunder Gulch. No water quality samples were taken at this site.

10. RECLAMATION

There is no vegetation occurring at the Christine site due to its elevation and soil conditions. The development at this site has not disturbed the area significantly.



Photo 51-1: View along length of Trench 1 at Christine site. (Azimuth 130°)

MO (#52)
(MINFILE# 105M 013)

1. LOCATION AND ACCESS

The Mo site includes three areas. The first area of interest is on the Windy and Casy claims which are located on the east slope of Sourdough Hill. The other two areas, located on the south slope of Sourdough Hill are on the Bob and Boogla claims. All three areas can be accessed with a four-wheel drive vehicle along the Sourdough Hill Trail. The Windy and Casy claims are about 1 km south of the Sourdough Hill Road. The Bob claim can be found another 1 km further south just southeast of a three-way intersection in the trail. Turning southwest at the intersection leads to the Boogla claim about 0.5 km down the trail. The UTM coordinates for the Windy and Casy claims are 7085440 m N 487140 m E. The large trench on the Bob claim is at UTM coordinates 7084080 m N 486640 m E. The pit on the Boogla claim is at UTM coordinates 7085440 m N 487140 m E.

2. SITE PHYSIOGRAPHY

The Windy and Casy claims, one part of the Mo site, lie on the east slope of Sourdough Hill. Water runoff from this area drains into Thunder Gulch. The Bob and Boogla claims lie on the south slope of Sourdough Hill. Water runoff from these areas drains into Duncan Creek.

3. GEOLOGY AND MINERALIZATION

The major rock type observed at the Windy and Casy claims was grey phyllite. The rock was mostly unoxidized. The mineralization observed at Windy and Casy included sideritic veining with sphalerite and white quartz. Traces of galena were observed. Material was weakly to strongly limonitic. The sulphides observed were sphalerite and galena. Weak calcite was found in the vein. Other carbonates included dolomite and siderite. The major rock type observed at the Bob claim was green and grey phyllite. The rock was mostly unoxidized with traces of limonite. No mineralization was observed in this area. The major rock type observed at the Boogla claim was pale green phyllite. Black phyllite with minor amount of limonite coating was also found. The mineralization observed at the Boogla claim was white quartz.

4. SITE HISTORY

The minfile reports that the Mo site was under development from 1968 to 1991. Most of the work occurred at the Windy and Casy claims from 1968 to 1989. The work primarily consisted of bulldozer trenching. The minfile refers to a 2.4 m adit developed in 1980. No adit was found in the area. At least two shafts were developed at the Windy and Casy claims in 1981 and in 1989.

according to the minfile. According to the minfile bulldozer trenching at the Bob claim occurred in 1978. Bulldozer work at the Boogla claim occurred in 1991.

5. MINE DEVELOPMENT

5.1 Mine Openings and Excavations

Windy and Casy Trenches

The Windy and Casy Trenches are located just off of the Sourdough Hill Trail on the Windy and Casy claims. This is a large area of trenching with small pits and two small shafts. The trenches can be accessed on foot from the Sourdough Hill Trail. One trench of particular interest shows an example of the bedrock in the area (Photo 52-6).

Pit 1 (photo 52-2)

Location: at south end of Windy and Casy trenching at side of road running through area (see figure 1)

Dimensions: 4 m x 3 m x 2 m

Condition: stable

Comment: potential site of former adit

Shaft 1 (photo 52-3)

Two compartment shaft

Location: in a trench at south end of Windy and Casy trenching about 22 m east of Pit 1 (see map).

Dimensions: 2.5 m x 2.5 m – filled to within 2 metres of trench floor

Condition: the shaft has either been filled or it has collapsed

Shaft 2 (photo 52-4)

Small shaft

Location: in a trench at site of Windy and Casy trenching about 15 m south of a small shack (Building 52A)(see map).

Dimensions: 1.3 m x 1.5 m – filled to within 3 metres of trench floor

Condition: the shaft has either been filled or it has collapsed

Trench 1 (photo 52-7)

Large shallow trench

Location: on the Bob claim

Dimensions: 83 m x 12 m x 1.5 m – longitudinal bearing AZ 138

Condition: stable – no revegetation

Pit 2 (photo 52-9)

Pit 2 is a deep pit with vehicle access from either side. Bedrock and overburden is dumped on the downhill side in two large piles. Bedrock is showing on the north slope of the pit.

Location: on Boogla claim

Dimensions: 30 m x 20 m x 7 m

Condition: stable

5.2 Waste Rock Disposal Areas

Windy and Casy Trenching

The major displacement of material from the trenching in this area has made it difficult to distinguish waste rock from overburden. Material has been piled and graded in several places to make level areas and roads (photo 52-1). Significant revegetation has occurred in the area. The extent of natural reclamation ranges from 20 to 60 percent depending on the quality of the soils.

Trench 1 waste rock piles

The waste rock from Trench 1 is mostly contained in the walls of the trench. They contain a mixture of green and grey phyllite and overburden. A small waste rock pile lies at the end of a long depression at the north end of the trench. It also contains phyllite and overburden. A waste pile in the middle of the trench is composed of green phyllite from an area of digging in the trench floor. These waste rock piles show no signs of revegetation because the rock is not a suitable substrate.

Pit 2 waste rock piles (photo 52-10)

There are two large waste rock piles located at Pit 2. They are composed of pale green and black phyllite that originated from the pit. The dimensions of the piles are 35 m x 4 m x 4 m and 10 m x 4 m x 7 m. Both waste rock piles are stable. No significant revegetation of these waste piles has occurred.

5.3 Tailings Impoundments

No tailings were observed at the Mo site.

5.4 Minesite Water Treatment

No water treatment occurs at the Mo site.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

Building 52A (photo 52-5)

Wooden shack

Location: at Windy and Casy trenches (see Figure 1)

Dimensions (L x W x H): 5 m x 3 m x 2.5 m

Construction: wood

Paint: none observed

Asbestos: none observed

Foundation: none

Non-Hazardous Contents: woodstove, bed, cookware, clothing, magazines

Hazardous Contents: none observed

6.2 Fuel Storage

There was no fuel storage observed at the Mo site.

6.3 Rail and Trestle

There was no evidence of rail and trestle at the Mo site.

6.4 Milling and Processing Infrastructure

There was no evidence or record of milling or processing activities occurring at the Mo site.

6.5 Electrical Equipment

There was no electrical equipment observed at the Mo site.

7. SOLID WASTE DUMPS

No solid waste dumps were observed at the Mo site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were observed at the Mo site.

9. WATER QUALITY

Two small pools of standing water were observed at the Windy and Casy trenches. Water quality sample 99-53-2-2 was taken from a surface water pool (SWPA) at the south end of the trenches. Sample 99-53-2-4 was taken from a surface water pool (SWPB) at the north end of the trenches. A map of the Windy and Casy trenches shows the sample locations (see Figure 1). The field pH of SWPA was 7.6. The field pH of SWPB was 7.5. Field conductivity was not measured at either sample point. Laboratory sample analysis data is provided in Attachment B. Water runoff from the Windy and Casy trenches drains towards Thunder Gulch. No surface water was observed at the Bob and Boogla claims. Water runoff from these areas drains towards Duncan Creek.

10. RECLAMATION

The Windy and Casy claims area has mostly been revegetated except for some of the roads and trenches. The trench at the Bob claim is unsuitable for vegetation growth. Natural reclamation has not occurred in the pit at the Boogla claim. There have been no known reclamation measures carried out by past or present operators of the site.

Sample Number	Detection Limit	Units	99-MO-1-2 15/09/99	99-MO-1-4 15/09/99
Site Description			Sample from surface water pool A	Sample from surface water pool B
pH (field)	N/A	pH	7.6	7.5
Conductivity (field)	N/A	µS/cm	not measured	not measured
pH (Lab)	0.01	pH	7.68	7.57
Conductivity (Lab)	0.01	µS/cm	420	340
Total Alkalinity	5	mg CaCO ₃ /L	181	158
Chloride	0.25	mg/L	<0.25	<0.25
Hardness (CaCO ₃ equiv)	5	mg/L	228	176
Nitrate-N	0.05	mg/L	0.74	0.18
Nitrite-N	0.003	mg/L	0.003	<0.003
Sulphate	1	mg/L	36.8	20.2
Total Dissolved Solids	5	mg/L	251	214
Analysis by ICP-USN				
Aluminum	0.0008	mg/L	0.0386	0.0388
Antimony	0.005	mg/L	<0.005	<0.005
Arsenic	0.01	mg/L	<0.01	<0.01
Barium	0.00004	mg/L	0.0206	0.0186
Beryllium	0.00001	mg/L	<0.00001	<0.00001
Bismuth	0.0004	mg/L	<0.0004	<0.0004
Boron	0.002	mg/L	<0.002	<0.002
Cadmium	0.00006	mg/L	0.0001	0.00017
Calcium	0.002	mg/L	70.3	54
Chromium	0.00006	mg/L	0.00036	0.00038
Cobalt	0.00003	mg/L	<0.00003	0.00021
Copper	0.00003	mg/L	0.0021	0.00203
Iron	0.00001	mg/L	0.024	0.136
Lead	0.0003	mg/L	0.0005	0.0014
Lithium	0.001	mg/L	0.004	0.006
Magnesium	0.0005	mg/L	10	10.1
Manganese	0.00002	mg/L	0.00289	0.0283
Mercury	0.0001	mg/L	<0.0001	<0.0001
Molybdenum	0.00007	mg/L	<0.00007	0.00028
Nickel	0.00001	mg/L	0.0003	0.0008
Phosphorus	0.03	mg/L	<0.03	<0.03
Potassium	0.4	mg/L	<0.4	<0.4
Selenium	0.004	mg/L	0.01	<0.004
Silicon	0.004	mg/L	3.03	2.36
Silver	0.00005	mg/L	<0.00005	<0.00005
Sodium	0.004	mg/L	0.8	0.4
Strontium	0.00002	mg/L	0.375	0.248
Sulphur	0.008	mg/L	12.2	6.71
Thallium	0.001	mg/L	<0.001	<0.001
Titanium	0.00002	mg/L	0.00032	0.00087
Vanadium	0.00003	mg/L	<0.00003	<0.00003
Zinc	0.0002	mg/L	0.0158	0.0111
Analysis by Hydride AA				
Arsenic	0.0002	mg/L	0.0006	0.0007
Selenium	0.0001	mg/L	<0.0001	<0.0001

22A Building (22A: building site present reference*)

22A* 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)

25W104-01 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: BelleKen)

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

Transformer Location (number of transformer in brackets)

Power Line

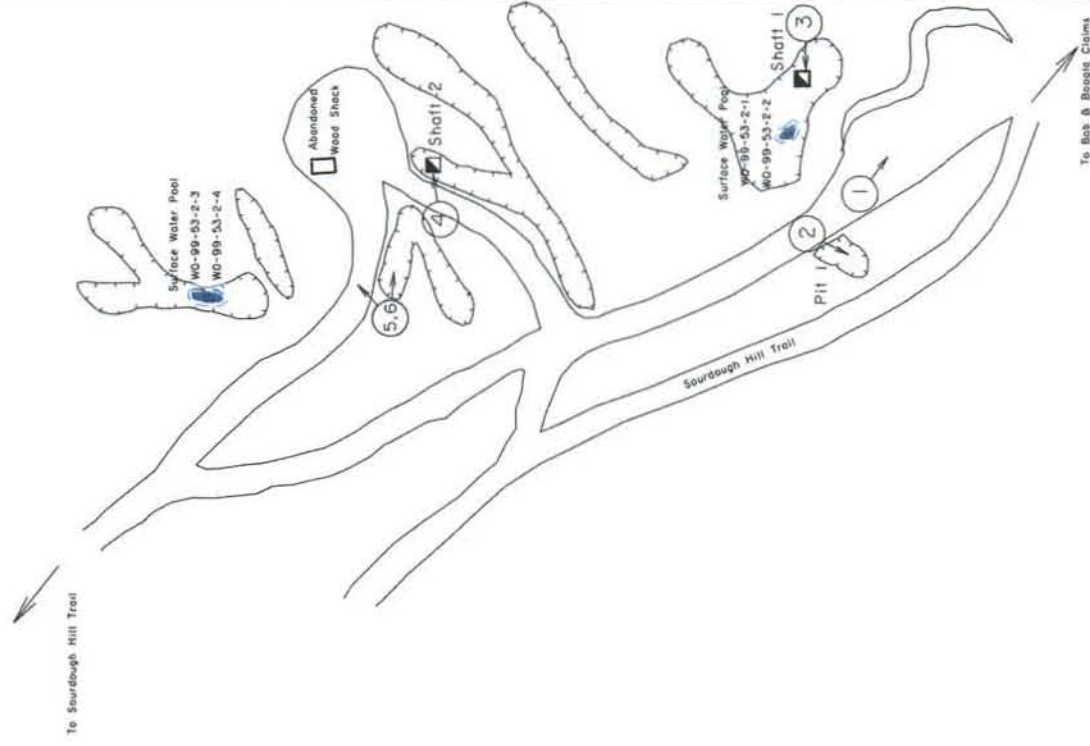
Power Line Collapsed

Aerial Transmission Towers

Photo Site (arrow shows view direction)

GPS Survey Location

Former Building Site (Elsa)



	Public Works Aval Government Services Canada	Travaux publics et Services gouvernementaux Canada	Designed by: conçu par: C.S.	date: NOV. / 99
Architectural & Engineering Services Western Region		Drawn by: dessiné par:	approved by: approuvé par:	
Title du dessin: Mo Site #52 Site Assessment Yukon Territory		relations:		
Drawing title:		project no. no. du projet:	125-12.01	diag. no. dessin no.
		1 of 1		



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Photo 52-1: Large area of displaced material at south end of Windy and Casy workings.



Photo 52-2: View of Pit1 at Windy and Casy workings.



Photo 52-3: View of Shaft 1 at Windy and Casy workings.

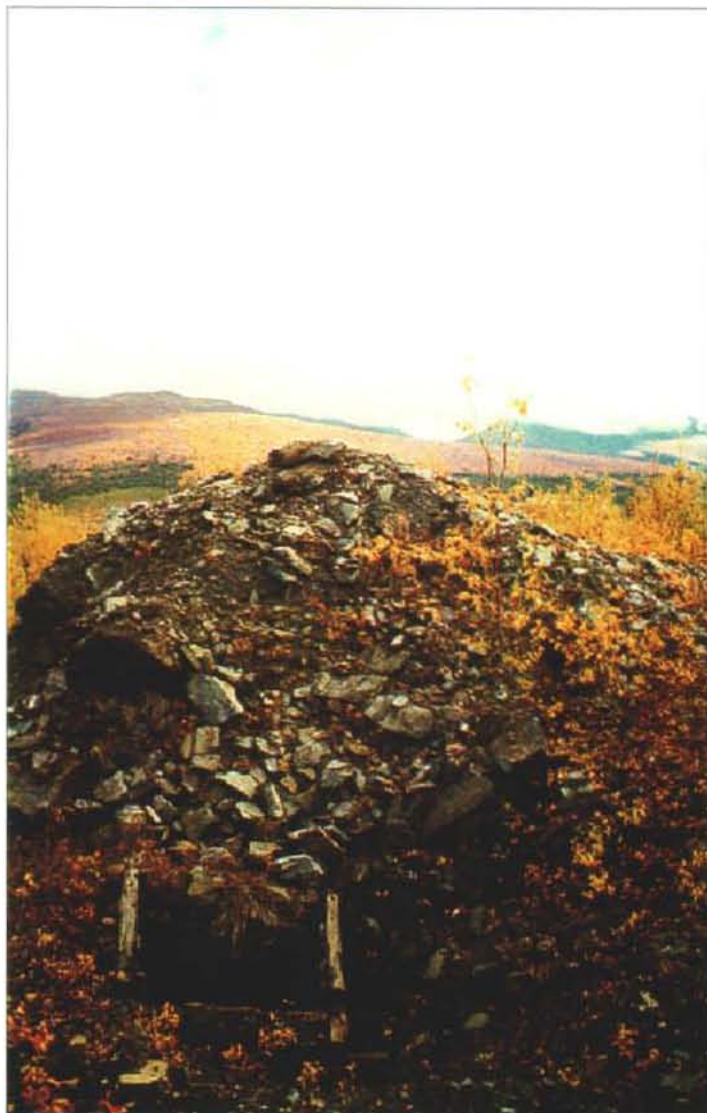


Photo 52-4: View of Shaft 2 at Windy and Casy workings.

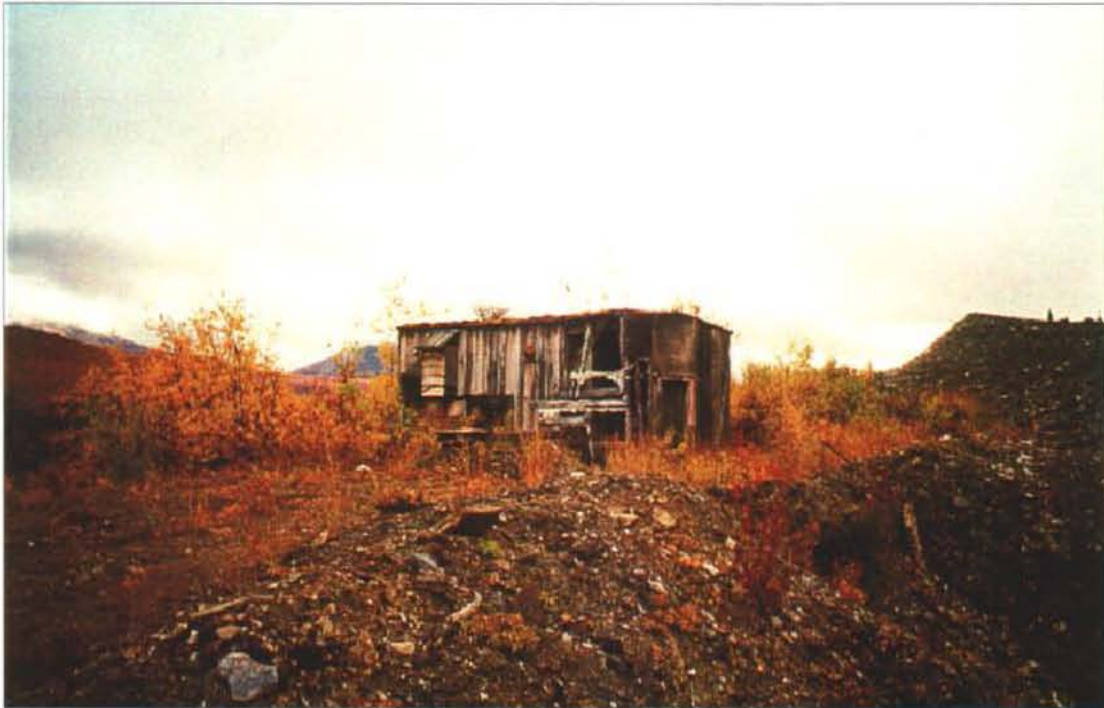


Photo 52-5: Abandoned wood shack near north end of Windy and Casy workings.

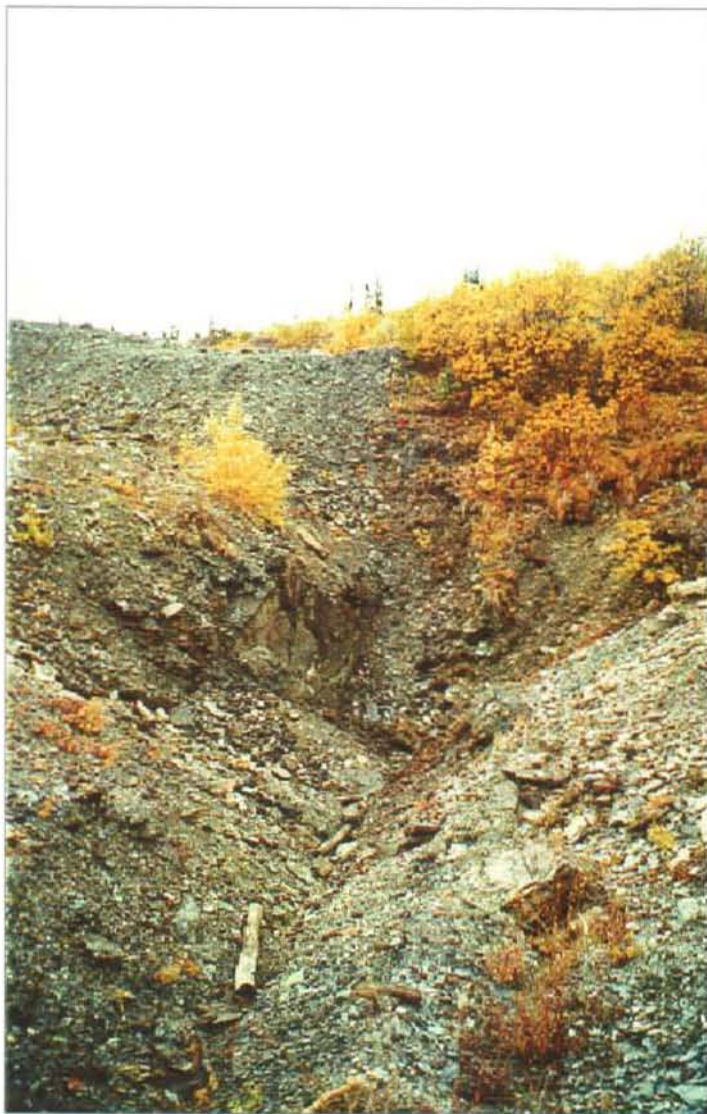


Photo 52-6: Deep trench showing bedrock just west of shack at Windy and Casy workings.



Photo 52-7: View along length of large trench (Trench 1) located 2 km south of Windy and Casy workings on Bob claim. (AZ 138°)



Photo 52-8: Area of digging at the bottom of Trench 1.



Photo 52-9: View of Pit 2 at Boogla claim located 2.4km south of Windy and Casy workings showing exposed bedrock. (AZ 070°)



Photo 52-10: Example of waste rock piles surrounding Pit2

MAYBRUN(#53)
(MINFILE#105M 014)

1. LOCATION AND ACCESS

The Maybrun site is located on the south side of Thunder Gulch at the confluence of two creeks about 1.5 km south of Lightning Creek. The site can be accessed by driving to the end of Thunder Gulch Trail and scrambling across the placer mining developments in Thunder Gulch. The approximate UTM co-ordinates of the site are 7085540 m N 488040 m E. The elevation of the site is approximately 1175 m.

2. SITE PHYSIOGRAPHY

The Maybrun site lies on the south side of Thunder Gulch. A cabin and an adit discovered at the site are near to the creek. They are surrounded by large piles of boulders and gravel displaced by a placer mining operation in Thunder Gulch. A collapsed shaft is located uphill from the adit. Surface water drainage in this area flows towards Thunder Gulch.

3. GEOLOGY AND MINERALIZATION

The major rock type observed at the Maybrun site was fine to coarse bedded quartzite which had minor rusting. Pale green phyllite was a minor rock type observed. The mineralization observed at the site included quartz vein material and minor limonite.

4. SITE HISTORY

The minfile reports that the Maybrun site was host to up to 6 shafts and 4 adits. Work conducted at these development took place consistently from 1920 to 1994. It is estimated that at least 400 tonnes of ore were shipped from this site. Only one adit and one shaft were found at the Maybrun site.

5. MINE DEVELOPMENT

5.1 Mine Openings And Excavations

Adit 1 (photo 53-1)

Location: on the south side of Thunder Gulch behind large piles of placer tailings

Dimensions (H x W x L): 2.3 m x 2.8 m x 10 m plus drifting (about 10 m)

Supports: wood portal; underground developments appear to be unsupported

Condition: appears stable

Accessibility: open

Shaft 1 (photo 53-2)

Description: collapsed shaft

Location: 50 m south of adit up a steep slope

Dimensions (L x W x H): unknown

Supports: unknown

Condition: collapsed and filled in to surface level

Accessibility: shaft site is accessible from a trail leading up the hill from Building 53A

5.2 Waste Rock Disposal Areas

A waste rock pile is located west of Adit 1 and below Shaft 1. It is composed of overburden and quartzite waste rock. The waste rock has minor rusting. The waste rock pile is 50% revegetated.

5.3 Tailings Impoundments

No tailings were observed at the Maybrun site.

5.4 Minesite Water Treatment

No water treatment occurs at the Maybrun site.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

Building 53A (photo 53-3)

Location: on the south side of Thunder Gulch behind large piles of placer tailings

Dimensions (L x W x H): 2.5 m x 2 m x 2.5 m

Construction: wood and corrugated steel

Paint: none observed

Asbestos: none observed

Foundation: none

Non-Hazardous Contents: bed, utensils, plateware

Hazardous Contents: none observed

6.2 Fuel Storage

About a dozen empty 45 gallon drums were found at the Maybrun site.

6.3 Rail and Trestle

There was no evidence of rail and trestle at the Maybrun site.

6.4 Milling and Processing Infrastructure

There was no evidence or record of milling or processing activities occurring at the Maybrun site.

6.5 Electrical Equipment

There was no electrical equipment observed at the Maybrun site.

7. SOLID WASTE DUMPS

No solid waste dumps were observed at the Maybrun site

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were observed at the Maybrun site.

9. WATER QUALITY

No surface water samples were taken at the Maybrun site. Surface water drainage in this area flows towards Thunder Gulch.

10. RECLAMATION

The disturbed areas of the Maybrun site have largely been reclaimed by natural vegetation. There have been no known reclamation measures carried out by past or present operators of the site.

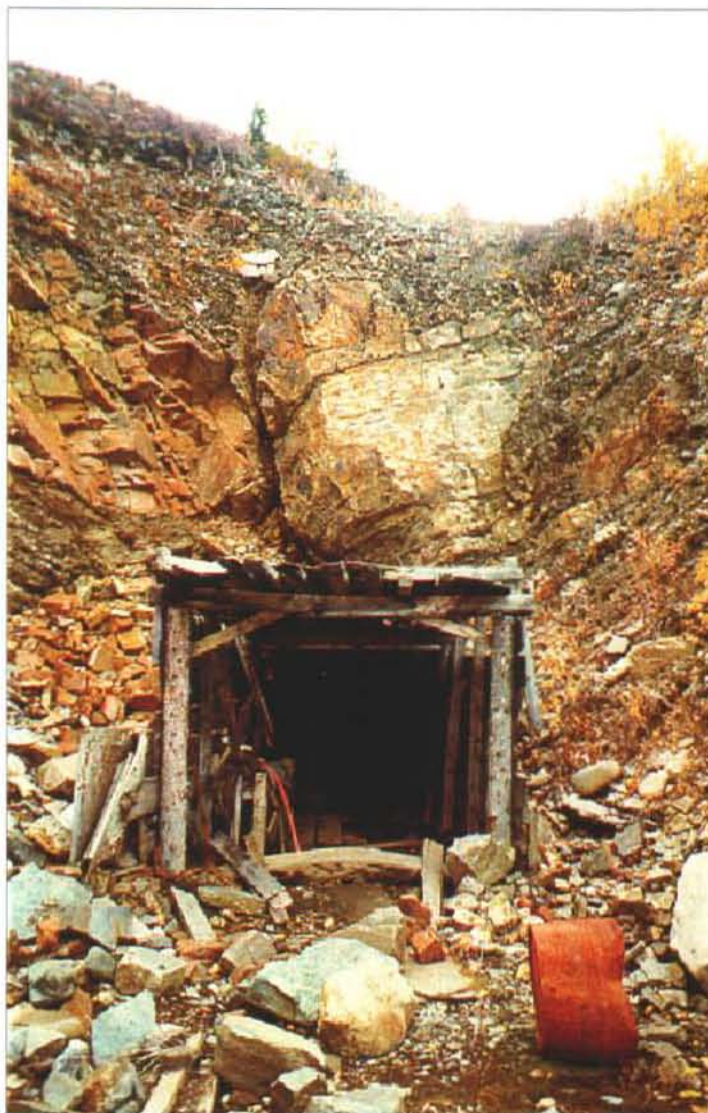


Photo 53-1: View of Adit 1 at Maybrun site. (AZ 234)



Photo 53-2: View of Adit 1 at Maybrun site. AZ 234
 Photo 53-2: View of collapsed shaft (Shaft 1) at Maybrun located above Adit 1. (AZ 300)



Photo 53-3: Abandoned shack, empty barrels and scattered debris located at Maybrun.

HOGAN (#54)
(MINFILE#105M 015)

1. LOCATION AND ACCESS

The Hogan site lies right on Lightening Creek Road about 2 km out of Keno City. The approximate UTM coordinates for the site are 7085440 m N 487140 m E. The elevation of the site is approximately 1000 m.

2. SITE PHYSIOGRAPHY

The Hogan site lies on the south slope of Keno Hill. It is on the north side of Lightening Creek. Lightening Creek Road runs along the base of the waste rock pile. Another road runs along the top of the waste rock pile between the pile and the Hogan adit. The adit is concealed by dense secondary forest. Surface water drainage from the site runs into Lightening Creek.

3. GEOLOGY AND MINERALIZATION

The major rock type observed at the Hogan site was grey quartzite with some disseminated fine grained pyrite. Minor rock types observed included black phyllite, greenstone and brecciated quartzite. The mineralization observed included siderite veining with some massive sphalerite, galena and pyrite. The sulphides found include sphalerite, galena and pyrite. The only carbonate found was siderite. The minfile reports that a narrow vein at the Hogan site has erratic lenses of galena and tetrahedrite mineralization. Much of the coarse siderite is now partly oxidized to limonite and manganese oxides. Massive pyrite lenses and a little sphalerite also occur at the site. Other minor veins and faults are reported to be present nearby.

4. SITE HISTORY

The minfile reports that the work conducted at the Hogan site took place in 1952 and 1953. The developments consisted of a 213.4 m adit with crosscuts and drifts on the Fox claim.

5. MINE DEVELOPMENT

5.1 Mine Openings And Excavations

Adit 1 (photo 54-2)

Collapsed and overgrown adit

Location: in the hillside above and near the center of the waste rock dump

Dimensions (L x W x H): unknown – reported to be 213.4 m deep

Supports: unknown

Condition: adit is collapsed

Accessibility: adit site can be accessed from Lightening Creek Road

Shaft 1 (photo 54-3)

Timbered raise filled to surface

Location: on top of the dump at the east end

Dimensions (L x W): 0.8 m x 0.6 m

Condition: filled in

Accessibility: raise location can be accessed from Lightening Creek Road

5.2 Waste Rock Disposal Areas

A large waste rock pile about 75 m long, 9 m wide and 7 m high is located at the side of Lightening Creek Road (photo 54-1). It lies directly below Adit 1. The rock in the pile consists mainly of grey quartzite with minor disseminated pyrite. Some sections of the dump are moderately limonitic. The pile can be divided into 4 zones based on the colouration.

Zone 1 (photo 54-4)

The most western section of the pile was grey in colour with moderate rust occurring on the surface. Waste rock sample 99-HO-1-1 was taken from this section. The field paste pH of this sample was 3.1. The field conductivity of this sample 1.19 mS/cm.

Zone 2

The section just west of center was medium grey on the surface with a pale orange subsurface. Waste rock sample 99-HO-1-5 was taken from this section. The field paste pH of this sample was 2.1. The field conductivity was not measured.

Zone 3 (photo 54-6)

Field samples from a 12 m wide zone of dark grey quartzite just east of the center of the waste rock pile had paste pH measurements that were highly acidic. The field paste pH measurement for waste rock sample 99-HO-1-2, taken from the center of the dark grey zone, was 1.2. The field conductivity of this sample was 18.38 mS/cm. Paste pH measurements taken from 4 other field samples in this section ranged from 1.4 to 2.6. Acidic field samples were obtained from the surface of this section and at a depth of 0.5 m. The origin of the acid is unknown. Evidence of water seeping from this section of the waste rock pile was observed (photo 54-7).

Zone 4 (photo 54-5)

The most eastern section of the waste rock pile had characteristics similar to the westernmost section. It was grey in colour with moderate rusting on the surface. Waste rock sample 99-HO-1-3 was taken from this section. The field paste pH of this sample was 3.6. The field conductivity of this sample was 2.68 mS/cm.

Laboratory and Field analysis data is provided in Attachment B.

5.3 Tailings Impoundments

No tailings were observed at the Hogan site.

5.4 Minesite Water Treatment

No water treatment occurs at the Hogan site.

6. MINE SITE INFRASTRUCTURE

Evidence of a rail system running along the top of the waste rock pile was found at the Hogan site. Discarded rails and wooden ties were found at various locations along the top of the waste rock pile and a rusted 1 ton side dump car was found in the bushes above the dump.

7. SOLID WASTE DUMPS

No solid waste dumps were observed at the Hogan site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No evidence of potential contamination was found at the Hogan site.

9. WATER QUALITY

The Hogan site lies right next to Lightning Creek. Water quality sample 99-HO-ST-2 was taken from Lightning Creek upstream from the Hogan site. Sample 99-HO-ST-4 was taken downstream. Laboratory and Field analysis data is provided in Attachment B.

Significant runoff was observed running down Lightning Creek Road during a heavy period of rain. The runoff traveled from east to west past the Hogan site. The flow and volume of the runoff was

not sufficient to obtain samples for laboratory analysis, however the pH of the water was measured using a handheld pH meter. The runoff water east (upstream) of the Hogan site was found to have a pH of 6.5. The runoff water west (downstream) of the Hogan site was found to have a pH of 3.4. Water seeping from Zone 3 of the Hogan waste rock pile was found to have a pH of 2.6.

10. RECLAMATION

The Hogan site has been mostly overgrown with trees and bushes. The waste rock pile, however, remains largely unvegetated. Vegetation that does occur on other zones of the waste rock pile does not occur on zone 3. There have been no known reclamation measures carried out by past or present operators of the site.

Sample Number	Detection Limit	Units	99-HO-ST-2 - Hogan 16/09/99	99-HO-ST-4 - Hogan 16/09/99
Site Description			Upstream water quality sample from Lightening Creek	Downstream water quality sample from Lightening Creek
pH (field)	N/A	pH	not measured	not measured
Conductivity (field)	N/A	µS/cm	not measured	not measured
pH (Lab)	0.01	pH	7.51	7.49
Conductivity (Lab)	0.01	µS/cm	180	180
Total Alkalinity	5	mg CaCO ₃ /L	37	43
Chloride	0.25	mg/L	<0.25	<0.25
Hardness (CaCO ₃ equiv)	5	mg/L	82.3	84.3
Nitrate-N	0.05	mg/L	<0.05	0.05
Nitrite-N	0.003	mg/L	<0.003	<0.003
Sulphate	1	mg/L	39.8	40.3
Total Dissolved Solids	5	mg/L	112	112
Analysis by ICP-USN				
Aluminum	0.0008	mg/L	0.0354	0.05
Antimony	0.005	mg/L	<0.005	<0.005
Arsenic	0.01	mg/L	<0.01	<0.01
Barium	0.00004	mg/L	0.0509	0.052
Beryllium	0.00001	mg/L	<0.00001	<0.00001
Bismuth	0.0004	mg/L	<0.0004	<0.0004
Boron	0.002	mg/L	<0.002	<0.002
Cadmium	0.00006	mg/L	0.00017	0.00021
Calcium	0.002	mg/L	24.7	25
Chromium	0.00006	mg/L	0.00013	0.00014
Cobalt	0.00003	mg/L	<0.00003	<0.00003
Copper	0.00003	mg/L	0.0008	0.00078
Iron	0.00001	mg/L	0.091	0.12
Lead	0.0003	mg/L	0.0005	0.0012
Lithium	0.001	mg/L	0.002	0.002
Magnesium	0.0005	mg/L	4.6	4.61
Manganese	0.00002	mg/L	0.0117	0.0192
Mercury	0.0001	mg/L	<0.0001	<0.0001
Molybdenum	0.00007	mg/L	0.00016	0.00011
Nickel	0.00001	mg/L	0.0004	0.0005
Phosphorus	0.03	mg/L	<0.03	<0.03
Potassium	0.4	mg/L	<0.4	<0.4
Selenium	0.004	mg/L	<0.004	<0.004
Silicon	0.004	mg/L	2.42	2.41
Silver	0.00005	mg/L	<0.00005	<0.00005
Sodium	0.004	mg/L	0.7	0.9
Strontium	0.00002	mg/L	0.0746	0.0746
Sulphur	0.008	mg/L	13.3	13.3
Thallium	0.001	mg/L	<0.001	<0.001
Titanium	0.00002	mg/L	0.00092	0.00154
Vanadium	0.00003	mg/L	<0.00003	<0.00003
Zinc	0.0002	mg/L	0.0159	0.0186
Analysis by Hydride AA				
Arsenic	0.0002	mg/L	0.0003	0.0004
Selenium	0.0001	mg/L	<0.0001	0.0002

ATTACHMENT B: HOGAN WASTE ROCK SAMPLES

LABORATORY RESULTS

Site Number	Detection Limit	Units	99-HO-1-1 - Hogan - 18/9 - Rock	99-HO-1-2 - Hogan - 18/9 - Rock	99-HO-1-3 - Hogan - 18/9 - Rock	99-HO-1-5 - Hogan - 18/9 - Rock
Sample Description			Waste rock sample from Zone 1	Waste rock sample from Zone 3	Waste rock sample from Zone 4	Waste rock sample from Zone 2
Paste pH (field)	N/A	pH	3.1	1.2	3.6	2.1
Conductivity (field)	N/A	µS/cm	1190	18380	2680	not measured
pH in Saturated Paste						
pH	0.1	pH	4.1	0.7	3.5	2
pH in Soil (1:2 water)						
pH	0.01	pH	3.79	1.6	3.6	2
ICP Semi-Trace Scan						
Aluminum	5	µg/g	13900	9970	17200	8230
Antimony	2	µg/g	<2	130	<2	4
Arsenic	2	µg/g	128	31	37	26
Barium	0.05	µg/g	195	138	167	96.8
Beryllium	0.1	µg/g	0.4	<0.1	0.6	0.2
Bismuth	5	µg/g	<5	<5	<5	<5
Cadmium	0.1	µg/g	4.2	1	2.3	0.7
Calcium	5	µg/g	303	24	318	79
Chromium	0.5	µg/g	20.5	14.1	24.6	21.1
Cobalt	0.1	µg/g	3.1	0.4	1.6	0.3
Copper	0.5	µg/g	39.2	2.9	109	8.6
Iron	1	µg/g	28000	85000	31000	19000
Lead	1	µg/g	173	62	126	120
Lithium	0.5	µg/g	9.4	3.5	5.4	8.9
Magnesium	1	µg/g	719	222	596	391
Manganese	0.5	µg/g	1450	12	2900	74
Mercury	0.01	µg/g	<0.01	<0.01	<0.01	<0.01
Molybdenum	1	µg/g	1	2	1	<1
Nickel	1	µg/g	16.1	4	13.8	3.1
Phosphorus	5	µg/g	452	<5	429	224
Potassium	20	µg/g	3810	3950	5010	2720
Selenium	2	µg/g	<2	<2	<2	<2
Silicon	5	µg/g	8350	560	5630	11
Silver	0.5	µg/g	2.7	1.9	1.2	1.6
Sodium	5	µg/g	404	208	242	197
Strontium	1	µg/g	16	10	21	8
Sulphur	10	µg/g	1370	101000	3620	3400
Thorium	1	µg/g	5	<1	6	2
Tin	1	µg/g	11	18	11	2
Titanium	0.2	µg/g	27.2	22.4	31.9	25.6
Uranium	5	µg/g	<5	<5	<5	<5
Vanadium	1	µg/g	23	15	24	21
Zinc	0.5	µg/g	363	58.9	384	71.7
Zirconium	0.1	µg/g	8.3	5.7	12.2	5.8

ATTACHMENT B: 1999 HOGAN WASTE ROCK SAMPLES LABORATORY RESULTS MODIFIED SOBEK METHOD ACID-BASE ACCOUNTING TEST								
SAMPLE	SITE DESCRIPTION	PASTE pH	S(T) %	S(SO4) %	AP	NP	NET NP	NP/AP
99-HO-1-1 - Hogan - 18/9 - Rock	Waste rock sample from Zone 1	4.6	0.11	0.09	0.6	12.0	11.4	19.2
99-HO-1-2 - Hogan - 18/9 - Rock	Waste rock sample from Zone 3	2.0	6.10	0.37	179.1	-11.8	-190.8	<0.1
99-HO-1-3 - Hogan - 18/9 - Rock	Waste rock sample from Zone 4	4.2	0.27	0.23	1.3	0.6	-0.6	0.5
99-HO-1-3 - Hogan - 18/9 - Rock RE	Waste rock sample from Zone 4	-	0.27	0.23	1.3	-	-	-
99-HO-1-5 - Hogan - 18/9 - Rock	Waste rock sample from Zone 2	2.5	0.28	0.24	1.3	-7.4	-8.6	<0.1

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.

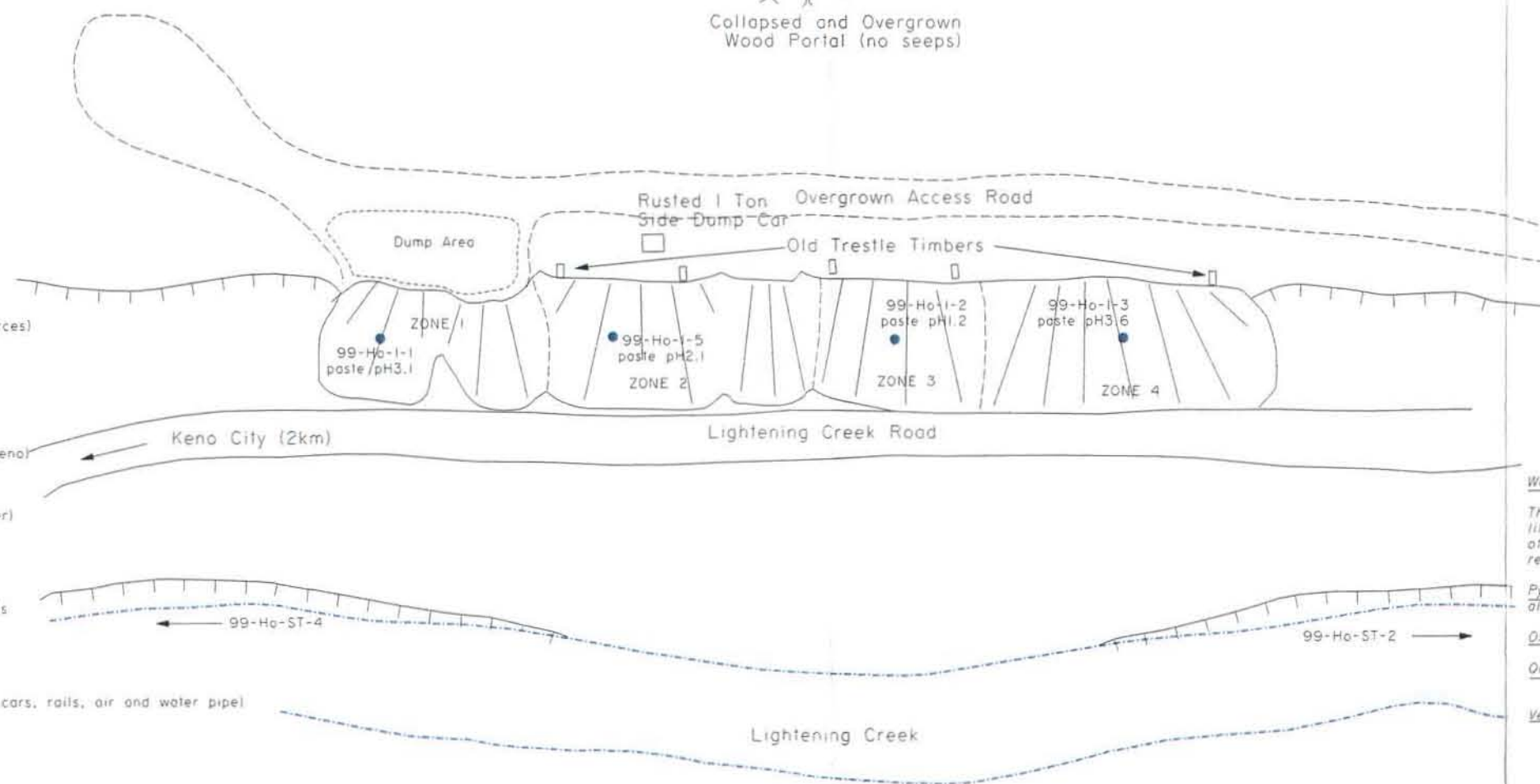
RE = REPLICATE.

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)
- ▲ 25W04-01 1999 Waste Rock Sample (this study)
- △ Pre 1999 Waste Rock Sample (other sources)
- 99-12-06 1999 Water Sample
- Pre 1999 Water Sample
- Tension Cracks
- Mass Movement (note: for Forms; BelleKenol)
- 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
- Photo Site (arrow shows view direction)
- GPS Survey Location
- Former Building Site (Elsa)

Collapsed and Overgrown
Wood Portal (no seeps)



Waste Rock Geological Legend

This legend intended for use as a key to the observed lithological content at 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 melagabbro.

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

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

Public Works And Government Services Canada Travaux publics et Services gouvernementaux Canada Architecture & Engineering Services Western Region	Drawing title: Hogan Site #54 Site Assessment Yukon Territory	Titre du dessin: Hogan Site #54 Site Assessment Yukon Territory	Designed by: Drawn by: I.B.	Date: NOV. 99
	Project no. no. du projet: 125-12.01	Drawn no. dessin no.: 1 of 1		



Photo 54-1: View along the top of waste rock piles at Hogan site. (AZ 275)



Photo 54-2: Obscured view of collapsed adit (Adit 1) at Hogan site.



Photo54-3: View of Shaft 1 at Hogan site. 6 inch ruler appears for scale.

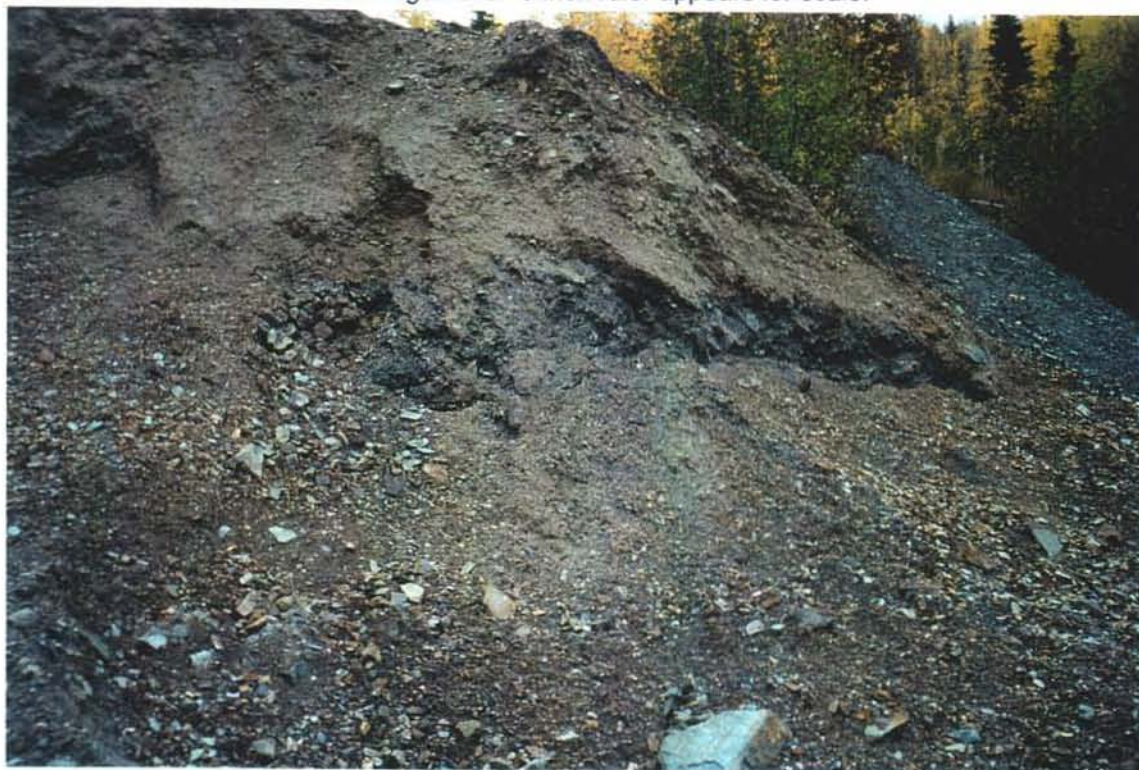


Photo54-4: Weathering of west side of waste rock dump at Hogan site.



Photo 54-5: View of east side of Hogan waste rock dump. Highly acidic material appears in a zone that is light grey in color.

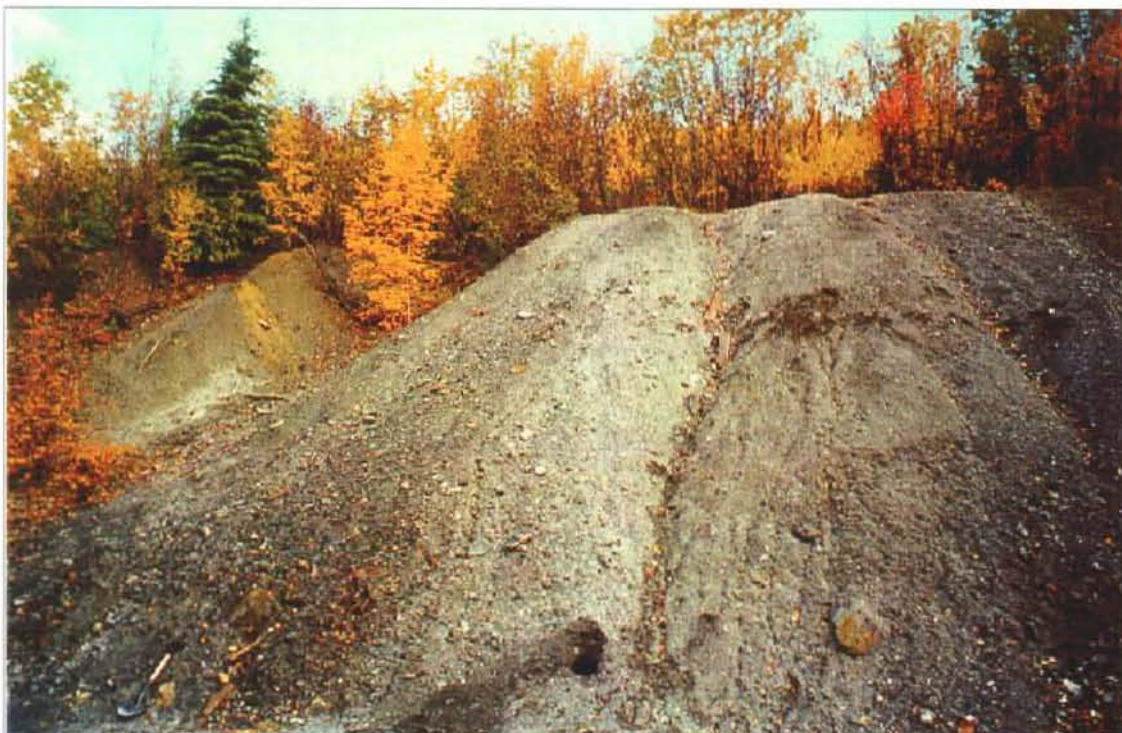


Photo54-6: View of light grey zone of waste rock at Hogan waste rock pile.

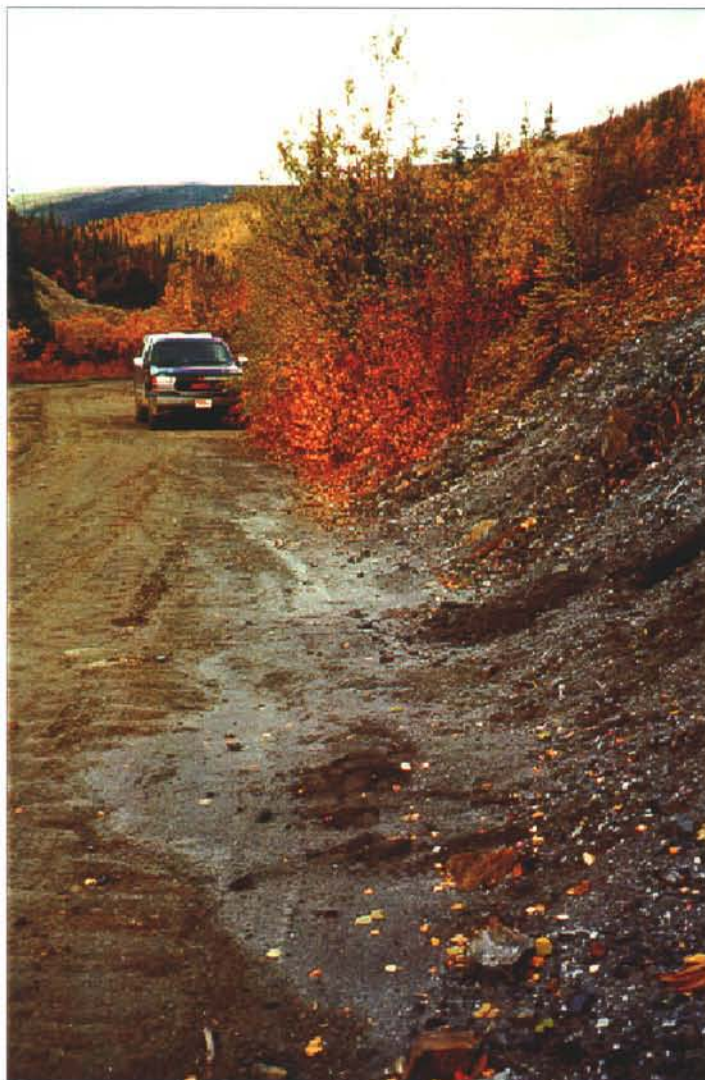


Photo54-7: Seep from light grey zone of waste rock at Hogan site.

RUNER
SITE #55
MINFILE #105M016

Runer was the focus of a 1996 Phase II Environmental Assessment undertaken by Environmental Services, Public Works and Government Services Canada. The site was revisited in 1999, and no major changes at the site were noted. The text of this report is largely based on the PWGSC 1996 report.

1. LOCATION AND ACCESS

Runer is located on the southwestern toe of Keno Hill at an elevation of 3800ft (1160m), 3km east of Keno town site. It is accessible by 4-wheel drive or all-terrain vehicles along a gravel road branching off from the dirt road between the Signpost Road and Lightening Creek Road. The UTM co-ordinates for the site are 7 087 550m N and 488 150m E.

2. SITE PHYSIOGRAPHY

Runer is situated on a 35° south-facing slope. Exposed side hill excavations indicate the underlying soil to be peaty silts and sands to a depth of 20-40cm, underlain by well-mixed, compacted boulders, cobbles, sand and silt to depth varying between 3 and 8m. The toe of the bottom-most waste rock pile is situated approximately 600m north of Lightening Creek. Charity Gulch, a stream originating near Keno Summit and draining southward to Lightning Creek is located approximately 1.1km to the east of the mine site. Black spruce, willows and birch, with lesser amounts of shrubs and moss dominate the vegetation.

3. GEOLOGY AND MINERALIZATION

The commodities of interest at the Runer site are silver, lead and zinc. The Keno Hill-Galena Hill silver-lead ores occur in erratic shoots and lenses lying in vein-faults that cut fine-bedded to massive quartzite, intercalated greenstone sills and lenses, and various schistose rocks. These rocks are intruded by gabbro and diabase sills. Mineralization consists of pyrite, galena, sphalerite and tetrahedrite in quartzite and siderite gangue.

4. SITE HISTORY

An adit was apparently driven approximately 30m in the 1920's, following the discovery of the rich No. 9 Vein on Keno Hill. Two short shafts (7.6m and 12.1m) were sunk in 1946. Between 1952 and 1953, the 3900-level adit was driven 305m and the 3800-level adit was driven 91m. A 45.7m adit was driven above the 3900-level (upper) adit prior to 1959. 55.2 tonnes of ore were produced during this early period.

Between 1975 and 1979 bulldozer trenching exposed a new vein 15m to 30m east of the 3800-level adit. 41.2 tonnes of ore were shipped from this occurrence between 1979 and 1981. 19.1 tonnes of ore were obtained from a 6.7m shaft. Between 1979 and 1982 the upper adit was rehabilitated and bulldozer trenching was completed. In 1983 a new 35.4m adit was driven near the 3820 level. In 1986 a new exploration adit was collared, although its depth is unknown. 534 tonnes of ore was shipped during this period. In 1987, roughly 500m of lateral underground development and 25m of shaft sinking occurred.

The current claim holder has undertaken further mining of an open cut in the lowest part of Runer. At the time of the site visit, a bulldozer was scraping the bedrock to expose a silver-rich galena vein (photo 55-1). The ore was hand sorted into 2L pails.

5. MINE DEVELOPMENT (Photo 55-2)

5.1 Mine Openings and Excavations

The remains of an adit (possibly the 3800-level adit) were observed high in the wall of the lower trench; a timber retaining wall above the adit and the adit entrance have been crushed by slumping overburden and bedrock.

The adit is inaccessible because of the instability of the surrounding rock. Tracks and an ore car indicate the presence of a buried adit approximately 150m west of the lower trench. No accessible underground workings were encountered during the site assessment.

It appears that the extensive trenching program conducted in the vicinity of the 3800-level and 3900-level adits have buried, caved, or removed the historical workings. The trenching in the vicinity of these adits has disturbed an area approximately 70,000m². The trenches themselves are approximately 10 m wide, cover a strike length of 300 m, and are over 30 m deep in places. The remaining area of disturbance is created by the deposition of waste rock and overburden in piles that average 5 m in height.

Additional trenching has occurred in the vicinity of the buried adit 150 m west of the lower trench. The disturbed area is approximately 11,000 m². Two trenches, 10 m wide by 50 m long and approximately 5 m deep, exist at this location. Trenching has also taken place on the east side of the upper/lower trench area. The area disturbed is approximately 100 m by 150 m. The trenches in this area were generally less than 5 m deep. Undercuts and rotational slumps evident and at the top edge of the upper workings (Photo 18) are indicative of ongoing slope wasting.

Because both trenches have been cut into rock, the trench wall slopes range from 40° to near-vertical. Loose waste rock or overburden piles are "perched" atop the trench walls at the trench edges. The margins of both trenches are not fenced, and no warning signs have been posted to alert site visitors of danger areas.

5.2 Waste Rock Disposal Areas

The disturbed rock on site is predominately a result of the surface trenching programs. Records indicate a limited extent of waste rock would have been generated from underground development, in the order of 10,000 tonnes. The assumptions made to derive this estimate are:

- a specific gravity of 2.65;
- a total of 550m of development; and,
- mine openings 2.5m by 2.7m.

There are four areas disturbed by trenching and underground development at the Runer mine site, as shown in Drawing 2. Waste rock from the underground workings has been mixed with overlaying weathered bedrock and overburden at each of the disturbed areas. The slopes of the trench walls are steep and unstable. The slopes of the bulldozer-worked piles of overburden and rock appeared to be at the angle of repose and are considered relatively stable, with one critical exception. A near-vertical fracture in the weathered bedrock below the machine shop has caused the ground to cave within 10m of Buildings 55A and 55B. Extension cracks are present within 2m of the buildings.

In 1996, samples of the overburden/weathered bedrock material were collected at each of the disturbed areas (RUWR/P303, P304, P307, P308, and P310). Samples were also collected from chert-rich material in a waste rock pile beside the western adit (RUWR/P306) and beside the lower trench (RUWR/P301). Samples RUWR/P305 and RUWR/P309 were collected from chlorite-altered waste rock beside the lower trench. Sample RUWR/P302 was collected from a pile of sphalerite-rich, carbonized waste rock near the garage. Samples are described and ABA/ICP results are presented in Attachment A, Tables 1 and 2 respectively

5.3 Tailings Impoundments

No ore was processed at the site and no tailings were encountered.

5.4 Mine site Water Treatment

There is no mine site water treatment facility at the site.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

Building 55A: Garage

Dimensions (L x W x H): 11m x 4.3m x 4m

Location: On a level waste rock pad.

Construction: The building is of wood-frame construction with plywood interior cladding.

Paint: No paint was observed.

Asbestos: No asbestos was observed.

Foundation: There is a 25 x 25cm-beam foundation to a height of 1m.

Non-Hazardous Contents: galvanized sheeting, rubber hosing, various hand tools, 2 pneumatic rock drills and associated drill steel

Hazardous Contents: 15 empty 20L motor oil pails, 3 205L drums (one drum is one-third filled) containing salt, and 2 Caterpillar tractor batteries (one with a cracked casing)

Building 55B: Storage Shed

Dimensions (L x W x H): 4.9m x 2.4m x 3m

Location: On a level waste rock pad.

Construction: The building is of wood-frame construction with plywood interior cladding, wood plank flooring and anodized sheet metal exterior cladding and roof covering.

Paint: No paint was observed.

Asbestos: No asbestos was observed.

Foundation: There is a 25 x 25cm-beam foundation to a height of 1m.

Non-Hazardous Contents: Coil of aluminum spiral electrical cable, 3 empty 20L motor oil pails, steel rods, plastic tarps, fiberglass insulation, miscellaneous steel couplings and pipe fittings

Hazardous Contents: 3 full 20L motor oil pails

Building 55C: This log and beam structure was likely a water tower.

Dimensions (L x W x H): 5m x 5m x 5m

Location: The possible water tower is situated about 200m east of the garage.

Construction: A wood plank deck is attached to the top of the base support, the deck is surmounted by a 3m x 3m x 3m wood beam box with attached steel wire cabling.

Asbestos: No asbestos was observed.

Foundation: The structure is supported by log and beam cross bracing to a height of 5m.

Non-Hazardous Contents: none

Hazardous Contents: none

6.2 Fuel Storage

There are two 22,750 welded steel above-ground storage tanks (ASTs) located on an embankment behind the garage and storage shed buildings. A wooden support for a refueling line joins the easternmost tank with a wood beam loading dock, which at one time supported a smaller-volume refueling tank. A visual inspection of the tanks' interiors found the easternmost AST to be empty with a minimal sludge residue; the westernmost tank was tilted slightly downward at its western end, and approximately 1.5cm of oily water was measured at the lowest point. Also in the garage and storage shed area are eight 205L drums, one empty and three are filled with wood stakes.

Approximately 125m west of the garage are twenty empty 205L fuel drums. On top of the slope above these drums approximately 315 empty 205L drums are stacked in four contiguous rows. Another 6 empty 205L drums were observed at various locations in the immediate vicinity.

6.3 Rail and Trestle

Area 1

Location: The rails are located on an embankment 10m north of the material laydown area.

Fabrication: steel rails

Amount of materials: There are 16 6m rails.

Condition: The rail pile does not pose any safety risks.

Area 2

Location: The rails are located in the material storage area.

Fabrication: The rails and steel car are composed of steel.

Amount of materials: There is one steel ore car and 8 6m steel rails.

Condition: The rails and car do not pose any safety risks.

6.4 Milling and Processing Infrastructure

There is no milling and processing infrastructure located at this site.

6.5 Electrical Equipment

Electricity is not provided to the site and no electrical equipment was encountered.

7. SOLID WASTE DUMPS

Three areas of material storage were encountered:

Solid Waste Area #1: Material Laydown Area

Location: Immediately west of the storage shed.

Dimensions (L x W x H): 20m x 20m x 1.5m

Drainage: Lightening Creek

General composition: Various steel heavy equipment parts and Caterpillar tread placed on two wooden pallets, roughly 80 timber poles, 75-100mm diameter and averaging 8m in length, 2 pieces of 400mm diameter galvanized metal ducting, each 4m in length, approximately 40 pieces of "2x4" and "4x4" lumber, 1 empty 205L drum and 2 empty 20L pails, 1 wooden outhouse

Impacted vegetation: The vegetation does not appear to be impacted.

Solid Waste Area #2: Material Storage Area

Location: Approximately 125m west of the garage.

Dimensions (L x W x H): 20m x 20m x 2m

Drainage: Lightening Creek

General composition: Various steel heavy equipment parts, 20 empty 205L drums, 10 pieces of steel casing 150-200mm in diameter and varying in length between 2m and 6m, approximately 2m³ of stacked shoring timber

Impacted vegetation: The vegetation does not appear to be impacted.

Solid Waste Area #3: Materials Stored near Garage

Location: The material is stored near the garage and storage shed.

Dimensions (L x W x H): 10m x 10m x 1.5m

Drainage: Lightening Creek

General composition: wood frame plywood work bench, 2 wooden ladders, 4 empty 20L plastic pails, wood timber frame formerly supporting vehicle fuel dispensing tank, wood support fuel line, miscellaneous drill steel and steel piping.

Impacted vegetation: The vegetation does not appear to be impacted.

8. POTENTIAL CONTAMINANTS OF CONCERN

8.1 Out-of-Service Transformers

No out-of-service transformers were encountered.

8.2 Metals and Hydrocarbons in Soil

Almost all of the untimbered portion and about one-quarter of the timbered section of the garage floor exhibited moderate to heavy hydrocarbon staining. The waste rock/soil portion was most heavily stained, and appeared to have been used as a disposal area for waste motor and transmission oil.

Stained soil was also noted adjacent to the southwest corner of the timber frame refueling structure west of the garage and south of the two ASTs.

Soil staining was evident outside the doorway to the small storage shed located west of the garage. In 1996, the stained area was excavated to 30cm depth; stained wood fibre was found to 5cm depth beneath which was waste rock and sandy silt to 30 cm. No obvious signs of soil discoloration were noted below the layer of wood fibre.

A small area of staining was noted immediately south of the drum stack. Soil composition was sandy and exhibited a slight hydrocarbon odour.

8.3 Liquid Hazardous Materials

In 1996, four samples were obtained from 20L pails of motor oil located within the storage shed. None of the samples were found to contain PCBs.

8.4 Solid Hazardous Materials

Two locked 1.5 x 1m red painted steel magazines were found approximately 30m west of the material storage area, and another steel locked magazine (2 x 3 x 3m) was located approximately 80m southwest of the materials storage area. Contents of the three magazines are unknown. All magazines were at the side of a roadway leading to the garage and storage shed.

9. WATER QUALITY

No seepage from waste rock was observed at the toe of the piles, and no seepage was observed in the trenches.

In 1996, three surface water samples (RU-WQ-STR-001, -002, and -003) were obtained from Lightning Creek at points upstream and downstream from the Runer site. Results are presented Attachment A, Table 3.

10. RECLAMATION

No active reclamation measures are known to have been undertaken by present or past operators. Due to the recentness of the mining, very little vegetation was observed in the disturbed areas.

11. OTHER INFORMATION AND DATA

Detailed information and interpretation of results can be found in the *Phase II Environmental Assessment of the Runer Mine Site*, prepared by Environmental Services Public Works and Government Services Canada, March 1997.

12. REFERENCES

Public Works and Government Services Canada, Environmental Services. *Phase II Environmental Assessment of the Runer Mine Site*. March 1997



Photo 55-1: Bulldozer working at Runer site.



Photo 55-2: View of Runer site from Bunker Hill.

ATTACHMENT A

**RUNER
ACID ROCK DRAINAGE
ASSESSMENT REPORT**

(From PWGSC 1997
"Phase II Environmental Assessment of the Runer Mine Site")

RUNER ACID ROCK DRAINAGE ASSESSMENT REPORT

1.0 INTRODUCTION

This site specific report has been prepared in conjunction with a *Phase II Environmental Assessment of the Runer Abandoned Mine Site*, prepared by Environmental Services, Public Works and Government Services Canada (PWGSC). As part of the Phase H assessment prepared by PWGSC, Steffen Robertson and Kirsten (SRK) was requested to assess the potential for acid rock drainage associated with the site, which is the subject of this report. The reader is directed to the PWGSC report for a comprehensive environmental assessment of the Runer site.

This report assesses existing, and potential acid rock drainage (ARD) conditions at the Runer site and provides recommendations for remediation. This site specific report is part of the *Acid Rock Drainage Review Report, Yukon Abandoned Mine Site Assessments*, prepared by SRK, which includes similar assessments for a number of sites. The reader is directed to that report for detail regarding the scope of work, site assessment methodology, ARD remediation options, and the evaluation of potential remediation options.

The Runer exploration site is located on the southern slope of Keno Hill, three kilometres east of the village of Keno Hill, Yukon Territory. The site is accessible by vehicle. An operating mine, the Bellekeno Mine, is located one kilometre to the southwest, on Sourdough Hill. Lightning Creek flows between the two sites.

Mining related disturbances observed during the site assessment consist of four areas of trenching with remnants of older underground workings. The waste rock consists of mine rock, weathered bedrock and overburden and is the result of two periods of development: 1952 to 1959; and 1975 to 1985 (Yukon Minfile 105M 016). All ore was shipped off site for processing.

The site is located in a transition zone between western boreal forest and subalpine forest. Sparse vegetation, in the form of fireweed, grasses (foxtail barley) and sedges, is growing along the crests of rock piles. The slopes and tops of the piles are generally barren of vegetation, except for the eastern workings where shrubs and small trees are growing. The toe of the waste rock is approximately 250 metres north of Lightning Creek, a third-order stream.

2.0 GEOLOGY AND MINERALIZATION

The Keno Hill silver-lead ores occur in erratic shoots and lenses lying in vein-faults that cut fine-bedded to massive quartzite, intercalated greenstone sills and lenses, and various schistose rocks (GSC Paper 68-68, p.21). These rocks are intruded by gabbro and diabase sills. The vein-faults at the Runer site consist of brecciated quartzite, graphite schist, phyllite and some greenstone. The mineralization consists of oxidized forms of pyrite (FeS_2), galena (PbS), sphalerite ($(\text{Zn,Fe})\text{S}$) and tetrahedrite ($(\text{Cu,Fe})_{12}\text{Sb}_4\text{S}_{13}$) in quartzite and siderite (FeCO_3) gangue (GSC Bulletin I 11, p. 46-47).

3.0 WASTE ROCK DISPOSAL AREAS

3.1 Description

There are four areas of workings, each disturbed by trenching and underground development, at the Runer site as shown on the site maps (four sections). The trenches, which were excavated by a bulldozer mounted ripper (pers. comm. J.B. O'Neill), appear to have buried or caved the underground workings. The cut slopes of the trenches and roads are relatively steep. The faces of the push dumped rock piles are gentler, at 30° to 35°, and the underlying hillside generally slopes at 25°.

Portions of the rock piles, as shown on the site maps, are rich in quartzite and chert, phyllite altered to sericite, and chlorite schist. The piles at the lower workings are predominately overburden and consist of rounded cobbles and boulders. No ponding water or surface runoff was observed, nor were any seeps encountered below the rock piles.

Records indicate that only a limited amount of the waste rock in the piles was generated from underground development, in the order of 10,000 tonnes (Yukon Minfile 105M 016). The assumptions made to derive this estimate are:

- a specific gravity of 2.65;
- a total of 550 metres of development; and
- mine openings 2.5 metres by 2.7 metres.

An area approximately 70,000 m² was disturbed by trenching in the central area of the workings (upper and lower trench area). The trenches are approximately 10 metres wide, and cover a strike length of 330 metres, and are over 30 metres deep in places. The remaining area of disturbance at the upper and lower trench area was created by the pushing and dumping waste rock and overburden in piles that average 5 metres in height. The upper trench area extends from the road at the north end of the site southward to a level area just above the timbers from the old underground workings. The west and north wall of the trench is cut into weathered bedrock. The excavated material has been piled on the east side of the trench. The lower trench area consists of one deep trench, that extends 130 metre south from the old underground workings. The west, north and east walls of the trench have been cut into overburden and weathered bedrock. The excavated material has been piled on the east side of the trench and push dumped to the south. Between this trench and the southern road piles of excavated material indicate the location of buried trenches.

Additional trenching occurred in the vicinity of a buried adit, 150 metres west of the lower trench. The disturbed area is approximately 11,000 m². Two trenches, 10 metres wide by 50 metres long and approximately 5 metres deep are located in the western half of the workings, below the bedrock face. Rail lines mark the location of the adit.

Trenching has also taken place on the east side of the upper trench area. The area disturbed is approximately 100 metres by 150 metres. The trenches in this area were generally less than 5 metres deep.

Steep and unstable slopes were encountered along the walls of the trenches in the central area. A near vertical fracture in the weathered bedrock below a garage, as shown on the site map of the central workings, has caused the ground to cave within 10 metres of the building. Extension cracks were observed within 2 metres of the garage. The slopes of the remaining cut faces and rock piles appeared to be at the angle of repose and relatively stable.

3.2 Sampling

Samples RUWR/P303, RUWR/P304, RUWR/P307, RUWR/P308 and RUWR/P310 were collected of the overburden/weathered bedrock material as shown on the site maps. Samples RUWR/P306 and RUWR/P301 were also collected from chert-rich quartzite material in a waste rock pile beside the western adit and beside the lower trench. Samples RUWR/P305 and RUWR/P309 were collected from chlorite altered waste rock beside the lower trench. Sample RUWR/P302 was collected from a stockpile which contained approximately 100 m³ of ore grade material. Descriptions of the samples are summarized in Table 1.

Three water samples were collected from Lightning Creek. Sample RUWQ/Str-001 was collected approximately 500 metres upstream of the site, below the confluence of Charity Gulch with Lightning Creek. Sample RUWQ/Str-002 was collected approximately 500 metres downstream of the site and 100 metres downstream of the Bellekeno discharge point. Sample RUWQ/Str-003 was collected approximately 350 metres below the Runer workings, 50 metres above the confluence of Thunder Gulch with Lightning Creek, and above the Bellekeno Mine site.

3.3 Analytical Results

Results of geochemical analyses of waste rock samples are provided in Table 2 and the analytical results for the water samples are provided in Table 3.

Paste Parameters

The laboratory paste pH values for the ten rock samples ranged from 7.2 to 8.2, indicating that the material is not currently generating acid. Conductivity values of the waste rock were measured at four locations in the field and ranged between 10 µS/cm to 30 µS/cm.

Acid Base Accounting

The rock samples had Neutralization Potential to Acid Potential (NP:AP) ratios of less than 1.5, suggesting that the material is potentially acid generating. Total sulphur concentrations ranged from 0.02% to 0.13%. Four of the samples had negative NP values and neutral to alkaline paste pH values, which indicating that this material has undergone acid generation in the past but that its acid generation potential has been nearly exhausted.

Metals Concentrations

The sample from the ore grade stockpile contains elevated concentrations of antimony, copper, lead, manganese and silver. Two samples of waste rock/overburden also contain elevated concentrations of lead and manganese. The metal concentrations of the remaining samples are comparatively low.

Water Quality

All the water samples had field pH values between 7.5 and 7.8 and laboratory conductivity readings between 155 $\mu\text{S}/\text{cm}$ and 170 $\mu\text{S}/\text{cm}$. The upstream and downstream samples obtained from Lightning Creek above the Bellekeno workings contained <0.0001 ppm silver, <0.03 ppm iron and 0.006 ppm zinc.

Zinc concentrations were elevated to 0.02 ppm and iron concentrations to 0.13 ppm below the Bellekeno workings. Concentrations of silver (0.0002 ppm) in the sample collected below the Bellekeno workings exceed CCTNE freshwater aquatic life criteria.

4.0 EXISTING OR POTENTIAL ACID ROCK DRAINAGE CONDITIONS

The rock piles at the Runer site are composed of predominately oxidized rock and overburden. The material has either undergone acid generation in the past or is potentially acid generating. Testing indicates that the material is not currently generating acid.

Comparison of the upstream and downstream water quality from Lightning Creek suggests that the downstream environment is unaffected by waste rock drainage. There is no evidence of surface run off and no seeps or relic staining was observed below the dumps at the time of the assessment.

5.0 REMEDIATION OPTIONS

Typical reclamation and control options for acid generating mine waste and mine openings include:

- source control which includes limiting further oxidation, for instance, by placing the waste under water thus preventing oxygen entry;
- migration control which limits the mobility of oxidation products, for example, by reducing infiltration to the waste by placing a low permeability cover; and,
- release control by collecting and treating contaminated flows prior to discharge.

Collection and treatment of the runoff from the Runer site was not considered a feasible control option due to the lack of contaminated surface water discharging from the site. Remediation requirements are generally limited to providing public safety and improving the aesthetic appearance of the site, since the receiving environment does not appear to be significantly impacted.

Relocation of part of the excavated rock to infill the deepest trenches and buttress the cut slopes will address physical stability concerns. It is unlikely that all of the waste rock at the site will fit back in the trenches because of bulking. Relocating the dump material to the trenches will also help control migration of oxidation products by reducing the catchment area for surface run-on and by compacting the pile to minimize the surface area available for infiltration.

Covering the rehandled dump material with a simple soil cover (such as silt-glacial till) and encouraging vegetation to grow will improve the physical stability and the aesthetic appearance of the site. Migration of oxidation products from the rock would also be reduced.

6.0 CONCLUSIONS AND RECOMMENDATIONS

While the site does have the potential to be acid generating and metal leaching the risk to the environment is low. Considering the near neutral paste pH of the material; the volume of weather bedrock and overburden mixed in with the mine rock; and the lack of surface runoff at the site it is unlikely that acidic drainage or metal leachate from the waste rock is or will significantly impact the downstream environment.

Based on the limited samples collected to date, no remediation action is required with respect to acid rock drainage at the Runer site. Remediation requirements are therefore limited to providing public safety and improving the aesthetic appearance of the site. The excavated material is suitable for backfilling the trenches.

7.0 REFERENCES

- Boyle, R.W., 1961. Geology, Geochemistry, and Origin of the Lead-Zinc-Silver Deposits of the Keno Hill-Galena Hill Area, Yukon Territory. Geological Survey of Canada Bulletin 111.
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TABLE 1 Runer Waste Rock Sample Descriptions

Sample ID	Sample Location and Description
RUWR/P301	Sample of chert/quartzite rich material collected on the east side of the lower trenches. The sample was collected over a thickness of 40 cm and consisted of carbonitized schist and 20% quartzite fragments up to 8 cm in diameter. Surface was a buff/orange colour.
RUWR/P302	Sample collected over a thickness of 20 cm from 100 M3 stockpile of mineralized rock behind the garage. The surface of the pile was weathered black by manganese oxides. Field paste pH was 7.4 and conductivity 20 μ S/cm.
RUWR/P303	Grab sample of typical weathered bedrock and overburden collected on the east side of the upper trenches. Fragments included quartzite, schist and greenstone.
RUWR/P304	Grab sample of a pile of typical weathered bedrock collected beside the eastern trenches. This material did not appear to be significantly reworked by a bulldozer and contained less overburden as compared to the piles beside the central trenches.
RUWR/P305	Sample collected from a pile of schist and quartzite vein material on the west side of the lower trenches. The sample was collected over a thickness of 30 cm. The upper 5 cm consisted of sand and silt sized chlorite schist and quartzite and organic material. Cobbles up to 25 cm in diameter of chlorite altered greenstone were dominate below the sand and silt layer.
RUWR/P306	Sample of chert/quartzite rich dump material collected beside the buried adit at the western trenches. Surfaces of the quartzite have oxidized to a red/brown colour. Sample collected over a thickness of 26 cm and contained >50% sand sized material with minor clay. The field paste pH was 7.5 and the paste conductivity was 10 μ S/cm.
RUWR/P307	Sample of overburden and weathered bedrock collected at the crest of the rock pile below the western trenches. Sample collected over a thickness of 22 cm from subrounded fragments of chloritized greenstone and quartzite. Field paste pH was 5.6.
RUWR/P308	Sample of overburden and weathered bedrock, similar to P307, collected below the western trenches at the crest of the rock pile. The sample was collected over a thickness of 20 cm and contained more silt sized material than P307. The field paste pH was 7.4.
RUWR/P309	Sample of chlorite waste rock piled on the western side of the lower trenching, collected over a thickness of 25 cm in quartzite and chlorite schist, with fragments up to 15 cm in diameter. The sand and silt fraction was moist to the touch. The field paste pH was 7.3 and the field conductivity was 30 μ S/cm.
RUWR/P310	Sample of typical waste rock material collected on the east side of the lower trenches, collected over a thickness of 30 cm in chlorite schist and minor quartzite fragments.

**TABLE 2 Runer Waste Rock ABA and ICP
Results**

Parameter	Unit	Sample Number RUWR/									
		P301	P302	P303	P304	P305	P306	P307	P308	P309	P310
Lab Paste pH		7.50	7.25	7.61	7.50	7.43	7.71	7.49	7.98	7.54	8.23
Total Sulfur	%	0.13	0.17	0.06	0.09	0.05	0.03	0.02	0.03	0.06	0.10
AP		4.06	5.31	1.88	2.81	1.56	0.94	0.63	0.94	1.88	3.13
NP		2.63	3.44	2.63	2.88	2.13	-0.06	0.69	-0.50	-1.31	-22.19
Net NP		-1.44	-1.88	0.75	0.06	0.56	-1.00	0.06	-1.44	-3.19	-25.31
NP/AP		0.65	0.65	1.40	1.02	1.36	<0.1	1.10	<0.1	<0.1	<0.1
Aluminum	%	0.26	0.48	1.12	2.16	1.11	0.40	0.45	0.65	1.28	1.15
Antimony	ppm	94	999	32	21	10	4	3	3	18	35
Arsenic	ppm	1060	<1	<1	<1	28	37	40	24	<1	87
Barium	ppm	36	90	139	70	77	1	1.11	64	72	66
Beryllium	ppm	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	ppm	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	%	0.12	0.13	0.17	0.31	0.14	0.11	0.09	0.18	0.2	0.92
Chromium	ppm	154	93	94	65	104	117	136	144	115	97
Cobalt	ppm	9	22	11	35	9	5	6	7	11	1
Copper	ppm	169	1262	81	146	47	29	17	22	60	108
Iron	%	3.65	12.52	4.01	7.57	3.10	1.63	1.67	1.75	3.98	4.00
Lead	ppm	3192	>10000	969	1173	206	100	10	2	382	1756
Lithium	ppm	2	4	12	27	16	4	6	8	17	15
Magnesium	%	0.07	0.23	0.53	1.31	0.51	0.15	0.12	0.28	0.56	0.67
Manganese	ppm	7419	>10000	965	9789	570	285	262	219	1059	2684
Molybdenum	ppm	13	35	13	23	11	6	7	7	13	13
Nickel	ppm	40	183	34	91	32	18	21	19	32	41
Potassium	%	0.04	0.05	0.06	0.10	0.06	0.06	0.04	0.04	0.04	0.05
Phosphate	ppm	460	530	700	860	540	350	400	350	610	520
Silver	ppm	114.0	>200	34.0	13.8	7.0	3.2	0.3	0.3	14.3	58.1
Sodium	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium	ppm	24	30	23	41	20	13	23	14	19	14
Tin	ppm	3	11	2	6	2	<1	<1	<1	2	3
Titanium	%	<0.01	<0.01	0.04	0.03	<0.01	<0.01	<0.01	0.03	<0.01	0.02
Tungsten	ppm	21	4	3	<1	4	6	7	7	3	4
Uranium	ppm	<1	<1	<1	<1	1	<1	<1	<1	<1	<1
Vanadium	ppm	4.4	20.9	27.5	72.4	28.4	9.8	7.8	33.1	29.0	36.0
Zinc	ppm	441	1645	185	1006	170	99	83	54	217	865

AP = Acid Potential in tonnes; CaCO₃equivalent per 100 tonnes of material

NP = Neutralization Potential in tonnes CaCO₃ equivalent per 1000 tonnes of material

Net NP = Net Neutralization Potential = tonnes CaCO₃equivalent per 1000 tonnes of material

na = no assay analysis

< = lower detection limit

> = upper detection limit

TABLE 3 Runer Water Quality Results

Parameter	Units	Sample Number		
		RUWQ/STR-001	RUWQ/STR-002	RUWQ/STR-003
Field Conductivity		120	140	120
Field pH		7.5	7.8	7.6
Conductivity	µmhos/cm	155	169	159
Hardness (CaCO ₃)	mg/L	72.4	78.3	75.2
PH		7.66	7.81	7.7
Acidity (to pH 8.3) CaCO ₃	mg/L	2.7	3.3	2.5
Alkalinity-Total CaCO ₃	mg/L	30.3	37.1	31.8
Sulphate SO ₄	mg/L	45.3	42.7	45.5
Aluminum T-Al	mg/L	0.013	0.074	0.011
Arsenic T-As	mg/L	0.0023	0.0031	0.0022
Barium T-Ba	mg/L	0.06	0.06	0.06
Beryllium T-Be	mg/L	<0.005	<0.005	<0.005
Boron T-B	mg/L	<0.1	<0.1	<0.1
Cadmium T-Cd	mg/L	<0.0002	0.0004	<0.0002
Calcium T-Ca	mg/L	22.2	24.3	23.1
Chromium T-Cr	mg/L	<0.001	<0.001	<0.001
Cobalt T-Co	mg/L	<0.02	<0.02	<0.02
Copper T-Cu	mg/L	<0.001	0.001	<0.001
Iron T-Fe	mg/L	<0.03	0.13	<0.03
Lead T-Pb	mg/L	<0.001	0.012	<0.001
Lithium T-Li	mg/L	<0.02	<0.02	<0.02
Magnesium T-Mg	mg/L	4.14	4.27	4.26
Manganese T-Mn	mg/L	0.006	0.017	0.005
Mercury T-Hg	mg/L	<0.00005	<0.000051	<0.00005
Molybdenum T-Mo	mg/L	<0.03	<0.03	<0.03
Nickel T-Ni	mg/L	<0.02	<0.02	<0.02
Selenium T-Se	mg/L	0.0009	0.0009	0.0006
Silver T-Ag	mg/L	<0.0001	0.0002	0.0001
Sodium T-Na	mg/L	<2	<2	<2
Vanadium T-V	mg/L	<0.03	<0.03	<0.03
Zinc T-Zn	mg/L	0.006	0.02	0.006

< = lower detection limit

Wernecke Railroad (# 56)
(MINFILE# 105M 017)

1. LOCATION AND ACCESS

Wernecke Railroad is located on the northwest slope of Keno Hill, approximately 0.5 km west of the Wernecke town site. Approximate UTM coordinates are 7091700 m N 484700 m E. The elevation of the site is approximately 3900 m. The site is down slope from the Sadie Ladue workings at the Wernecke town site. The site is easily accessible by foot or four-wheel drive down an old road. Air photo identification NW 95030-77.

2. SITE PHYSIOGRAPHY

Wernecke Railroad is located on the northwest slope of Keno Hill. The elevation difference between the top of the site and the bottom is roughly 100 m. Site drainage flows west into the Christal Creek drainage area. The area is well vegetated with grasses, small bushes, and Alders. The site consists of bulldozer trenches and covers an area of approximately 30 acres. Some pooling was observed in the trenches.

3. GEOLOGY AND MINERALIZATION

The minfile indicates that the host rock for Wernecke Railroad is Earn Group schist and phyllite with greenstone lenses. Two or more veins are exposed which are up to 45 cm wide and weakly mineralized with galena and tetrahedrite. Another vein has arsenopyrite in quartz gangue. Some gold is present.

4. SITE HISTORY

This site has been worked since the 1920's. Work conducted included shallow shafts in the 20's, bulldozing and diamond drilling in the 60's, and heavy bulldozing and drill holes in the 70's.

5. MINE DEVELOPMENT

Workings at the Wernecke Railroad consisted of shafts, drilling and bulldozing. Intensive bulldozing is predominant and covers the entire area. No shafts or other workings were visible.

5.1 Mine Openings and Excavations

Up to twenty eight trenches were identified from the air photo. No other workings were found.

5.2 Waste Rock Disposal Areas

No large waste rock piles were observed.

5.3 Tailings Impoundments

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

5.4 Minesite Water Treatment

There was no water treatment observed at this site.

6. MINE SITE INFRASTRUCTURE

No mining infrastructure was observed at this site. A shack was observed at the beginning of the trail from Sadie Ladue. This may have been included with the Sadie Ladue site.

6.1 Buildings

Small 7m X 5m shack with wooden frame and metal exterior was observed approximately 15m along the trail from the Sadie-Ladue site.

6.2 Fuel Storage

No fuel storage was observed at this site.

6.3 Rail and Trestle

No rail and trestle remnants were observed at this site.

6.4 Milling and Processing Infrastructure

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

6.5 Electrical Equipment

No electrical equipment was encountered at this site.

7. SOLID WASTE DUMPS

No large solid waste dumps were encountered at this site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous materials were encountered on this site.

9. WATER QUALITY

Two pools were identified in the center of the site. The larger pool measured approx. 25m X 7m, and had extensive plant growth. A sample was taken from this pool (56-WS-1). Field pH and conductivity were 8.6 and 1510 μ S respectively. A smaller pool was observed approximately 40 m north of the larger pool.

10. RECLAMATION

Natural revegetation is occurring in the trenches and on the roads. The area is well vegetated with alders, small bushes, and grasses.

11. OTHER SOURCES OF INFORMATION AND DATA

No other sources of information and data were identified.

12. REFERENCES

Minfile #105M 017

United Keno Hill Mines Limited. 1996. *United Keno Hill Mines Limited – Site Characterization*. Report No. UKH/96/01, prepared by Access Mining Consultants Limited.

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Attachment A: 1999 Wernecke Railroad Water Samples

Analytical Results

Sample Number	Detection Limit	Units	S6-WS-1
Site Description			standing pond
pH (field)	N/A	pH	8.6
Conductivity (field)	N/A	µS/cm	1510
pH (Lab)	0.01	pH	7.83
Conductivity (Lab)	0.01	µS/cm	200
Total Alkalinity	5	mg CaCO3/L	78
Chloride	0.25	mg/L	<0.25
Hardness (CaCO3 equiv)	5	mg/L	120
Nitrate-N	0.05	mg/L	<0.05
Nitrite-N	0.003	mg/L	0.004
Sulphate	1	mg/L	20.4
Total Dissolved Solids	5	mg/L	153
Analysis by ICP-USN			
Aluminum	0.0008	mg/L	0.0149
Antimony	0.005	mg/L	<0.005
Arsenic	0.01	mg/L	<0.01
Barium	0.00004	mg/L	0.0194
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	0.00002
Calcium	0.002	mg/L	32
Chromium	0.00006	mg/L	0.00028
Cobalt	0.00003	mg/L	<0.00003
Copper	0.00003	mg/L	0.00183
Iron	0.00001	mg/L	0.102
Lead	0.0003	mg/L	0.0004
Lithium	0.001	mg/L	0.003
Magnesium	0.0005	mg/L	6.03
Manganese	0.00002	mg/L	0.00373
Mercury	0.0001	mg/L	<0.0001
Molybdenum	0.00007	mg/L	0.00043
Nickel	0.00001	mg/L	0.0009
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	0.122
Silver	0.00005	mg/L	<0.00005
Sodium	0.004	mg/L	0.4
Strontium	0.00002	mg/L	0.0775
Sulphur	0.008	mg/L	6.91
Thallium	0.001	mg/L	<0.001
Titanium	0.00002	mg/L	0.00036
Vanadium	0.00003	mg/L	<0.00003
Zinc	0.0002	mg/L	0.0032
Analysis by Hydride AA			
Arsenic	0.0002	mg/L	0.0005
Selenium	0.0001	mg/L	0.0002

- 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)
- 90-12-06 1999 Water Sample
- Pre 1999 Water Sample
- Tension Cracks
- Mass Movement (note: for Forms; BelleKenol)
- 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 / Tressle
- Collapsed Tressle
- 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 (Elsol)



Note: Trench outlines from aerial photographs



CAD FILE: SADIE.DGN

Public Works And Government Services Canada Travaux publics et Services gouvernementaux Canada	Architectural & Engineering Services Western Region	designed by:	12/12/99
		drawn by:	C.S. 12/12/99
Drawing title: Wernecke (Railroad) Site #56 Site Assessment Yukon Territory	Titre du dessin: 125-12.01	design par:	12/12/99
		approved by:	12/12/99
project no. no. du projet:	125-12.01	design no. dessin no.:	1 of 1

FORMO (# 57)
(MINFILE# 105M 018)

1. LOCATION AND ACCESS

The mine site straddles the Highway approximately 7 km east of Elsa. The upper mine site workings are immediately above the highway. The lower site workings are accessible via an extremely overgrown road down to the middle and lower adits approximately 250 m below the Highway. Only foot traffic may access the lower workings. The upper workings are at an elevation of 880 m, middle workings at 850 m and the lower workings are at 820 m. The location is given as 63°56'26"N and 135°22'09"W. UTM co ordinates are 7090442.500m N 481904.984m E.

2. SITE PHYSIOGRAPHY

The site is spread out down the steep lower slope of Galena Hill, above and below the Highway, with waste rock extending to Christal Creek at the bottom of the slope, a vertical drop of approximately 110 m. Site drainage extends directly down this slope into Christal Creek. Waste rock from the middle and lower workings has slumped down the steep slope.

White spruce forest dominates the undisturbed areas immediately surrounding the lower and middle Formo workings. The area below the lower workings is unvegetated and much of the area is slumping. The area below the middle workings is also unvegetated. Much of the access area between the Highway and the workings downslope are choked with heavy alder growth. The upper workings site is unvegetated. Surrounding forest is mature spruce and poplar forest.

3. GEOLOGY AND MINERALIZATION

The Keno Hill-Galena Hill silver-lead ores occur in erratic shoots and lenses lying in vein faults that cut fine-bedded to massive quartzite, intercalated with greenstone sills and lenses, and various schistose rocks.

The Formo vein are composed of siderite with variable, but small, amounts of quartz, sphalerite, galena and freiberigite. The cubiform galena occurs as clots and clusters rarely more than a few centimeters in size. The vein has been affected by post-mineralization fault movement, as well as intense weathering. Siderite and galena are commonly weathered to limonite and anglesite. The footwall is greenstone and the hangingwall is graphite schist that is highly brecciated within a few meters of the vein.

4. SITE HISTORY

The original workings consisted of short shafts and drifts driven in 1929 to 1931 when 36.3 tonnes of ore were shipped for milling. 54.4 tonnes of ore were later taken from the site in 1947. A further 1219.2 m of drifting and crosscutting, as well as minor raising and shaft sinking were completed in 1952-53 on three levels.

The workings were expanded in 1961, when 13.4 tonnes of ore were produced. Thirteen x-ray holes, at a depth of 205.1 m, were shot into the hill in 1962 and bulldoze trenching was done at the site in 1964. In 1974-75, more trenching and exploration was done at the site. The 2700 level adit was rehabilitated in 1980-81 and the southerly extension of it was explored. 71.7 tonnes of ore was produced from this in 1983.

(Source: Yukon Minfile)

5. MINE DEVELOPMENT

5.1 Mine Openings And Excavations

Former shafts at the upper workings have been destroyed by trenching. Two adits remain at the middle and lower workings. No samples were collected, as Phase III testing (samples FOWR/P301, FOWR/P302, FOWR/P303, FOWR/P304, FOWR/P305, FOWR/P306, FOWR/P307/1, FOWR/P307/2, FOWR/P308) was considered to be adequate.

Middle adit

Adit is covered in a board enclosure.

Location: See map. Adit is 50 m below (north east of) highway.

Dimensions (L x W x H): Approximately 2.5 x 2.5 m.

Supports: The timbered portal is boarded up.

Condition: Good condition.

Accessibility: Adit is partially sealed but entry is possible; site is only accessible from highway via overgrown access road.

Lower adit

Timbered adit is covered in a board enclosure.

Location: See map. Adit is 80 m below (north east of) highway.

Dimensions (L x W x H): Approximately 2.5 x 2.5 m.

Supports: The timbered portal is open but logs are loose and deteriorated.

Condition: Timbers are rotting.

Accessibility: Adit is open but is only accessible from highway via overgrown site access road.

Upper shaft (photo 57-1)

Demolished during upper workings trenching. Only timbers remain at surface of site.

Open Pits

The upper workings are large trenches that resemble pits. Information on this site has been placed in the "Trenches" section. No pits were identified at the Formo site.

Trenches (photos 57-2 & 57-3)

A series of trenches with one trench running north-south and approximately three trenches running perpendicular off of the main trench from the upper workings.

Location: Upper workings immediately south of the highway.

Dimensions (L x W x H): North-south trench approx. 80 m x 15 m x 5 m (max.); perpendicular trenches approx. 70 m x 10 m x 10 m (max.).

Condition: Minor revegetation of the trenches, particularly at the bottom; staining at bottom of main trench appears to be result of seasonal ponding water (none at time of site visit); material sloughing off trench walls at a number of locations.

Accessibility: Immediately adjacent to highway.

5.2 Waste Rock Disposal Areas

Waste rock piles were adequately described in the Phase III report as indicated in the following table.

Table 1

Sample No.	Field pH	Field Conductivity	Summary of ABA test Results
FOWR/P301	7.0	260 μ S/cm	NP:AP=6.4 Low potential for acid generation
FOWR/P302	7.6	180 μ S/cm	NP:AP=0.5 Potentially acid generating
FOWR/303	6.4	-	NP:AP=1.2 Potentially acid generating
FOWR/P304	-	210 μ S/cm	NP:AP=0.2 Potentially acid generating
FOWR/P305	-	-	NP:AP=2.3 Potentially acid generating
FOWR/P306	-	-	NP:AP=<0.1 Acid generating
FOWR/307/1	-	-	NP:AP=<0.1 Acid generating
FOWR/307/2	-	-	NP:AP=<0.1 Potentially acid generating
FOWR/P308	-	-	NP:AP=0.75 Acid generating

Waste rock pile – Upper workings (photos 57-2 & 57-3)

Over 6900 m³ of rock was removed from upper workings site and the waste rock was deposited on either side of the adjacent to the trenches.

Location: See map. Upper workings directly adjacent to highway.

Dimensions (L x W x H): Two piles; approximately 30 m and 60 m x 12 m (max.) x 7 m (max.).

Samples: Waste rock pile was adequately sampled in Phase II/III reports. The waste rock samples were submitted for ABA tests as part of the Phase III assessment (results in Table 1).

Waste rock pile – Middle workings

Approximately 1000 m³ of rock was removed from the middle workings site and the waste rock was mostly deposited below the adit.

Location: See map.

Dimensions (L x W x H): 100 m x 30 x approximately 1 to 2 m deep.

Samples: Waste rock pile was adequately sampled in Phase II report. The waste rock samples were submitted to lab for analysis (results Table 1).

Waste rock piles (2) – Lower workings (photos 57-4 & 57-5)

An area of disturbance of approximately 6000 m² was noted at the lower workings site and the waste rock was deposited below the adit.

Location: See map.

Dimensions (L x W x H): 50 m x 250 m x approximately 1 to 3 m deep.

Samples: Waste rock pile was adequately sampled in Phase II report. The waste rock samples were submitted to lab for analysis (Table 1).

5.3 Tailings Impoundments

None observed.

5.4 Minesite Water Treatment

None observed.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

Five buildings were identified at the site. A large core shack was identified at the upper workings, a shack and adit enclosure were noted at the lower workings and a wood cabin was identified near the middle workings. A multi-bay outhouse was also noted immediately downhill from the upper workings.

Building 57A – Core Shack (photo 57-6)

Large open wood plank building used for storage of cores. Raised wood platform for core storage.

Location: South of the upper workings accessible via a waste rock constructed access road to the top of the site.

Dimensions (L x W x H): 11 m x 6 m x 5 m.

Construction: Wood frame with wood plank siding; some fibreglass insulation; tarpaper interior mostly removed.

Paint: None.

Asbestos: Asbestos tar paper cladding.

Non-Hazardous contents: Core samples; wood debris including pallets; empty barrels.

Foundation: None.

Hazardous contents: None.

Surrounding area: Minor debris including metal siding and wood pallets in forested area surrounding building.

Building 57B – Wood Shack

Small wood shed possibly formerly used for storage.

Location: Immediately adjacent to lower workings.

Dimensions (L x W x H): 5 m x 4 m x 4 m.

Construction: Wood frame with wood plank exterior.

Paint: None.

Asbestos: None.

Non-Hazardous contents: Small quantity of steel tubing.

Foundation: None.

Hazardous contents: None.

Surrounding area: Waste rock and small amount of debris including three empty barrels.

Building 57C – Adit Enclosure

Small wood shed enclosing lower adit.

Location: At lower adit.

Dimensions (L x W x H): 5 m x 3 m x 3 m.

Construction: Wood plank and frame.

Paint: None.

Asbestos: None.

Non-Hazardous contents: None.

Foundation: None.

Hazardous contents: None.

Surrounding area: Wood and metal debris including empty barrels strewn around the site and down the slope; also large waste rock pile below the adit.

Building 57D – Wood Cabin

Accommodation quarters for personnel at site with associated porch. Building was formerly electrified.

Dimensions (L x W x H): 7 m x 5.5 m x 8 m.

Location: East of middle workings area in location overgrown with second growth forest.

Construction: Wood frame with plywood interior, wood plank exterior, plywood roof and asphalt shingles.

Paint: None.

Asbestos: None identified.

Non-Hazardous contents: Metal water tank.

Foundation: None.

Hazardous contents: None.

Surrounding area: Wood debris.

Building 57E – Multi-bay Outhouse

Six seat single room outhouse.

Location: Immediately below (north of) highway on access road to middle and lower workings.

Dimensions (L x W x H): 4 m x 3 m x 4 m.

Construction: Wood frame with wood plank floor over dirt crawlspace.

Paint: None.

Asbestos: None.

Non-Hazardous contents: None.

Foundation: None.

Hazardous contents: None.

Surrounding area: Three empty pails and one empty barrel; second growth alder forest

6.2 Fuel Storage

There is currently no fuel in storage at the site. All barrels at the site were empty.

6.3 Rail and Trestle

Middle workings

Location: Extending from middle adit.

Fabrication: Metal rails.

Amount of materials: Two 16 m lengths.

Condition: Rails are in satisfactory condition and remain in place.

Lower workings

Location: Extending from lower adit.

Fabrication: Metal rails.

Amount of material: Two 7 m lengths.

Condition: Rails are in poor condition but remain in place.

6.4 Milling and Processing Infrastructure

There is no milling or processing infrastructure present at this site.

6.5 Electrical Equipment

No electrical equipment was identified at the site.

7. SOLID WASTE DUMPS

No solid waste dumps were identified at the site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were observed at the site.

9. WATER QUALITY

Water quality samples were collected during the previous Phase II and III assessments. Water samples were also collected during this (1999) assessment. The Phase II water sampling program included four surface water samples (Christal Cr. upgradient, downgradient of lower workings and downgradient of middle workings and creek trib. downstream of waste rock dump). The Phase III water sampling program included three sampling events (19 August, 1997; 18 October, 1997; 23 April 1998) at each of the locations identified during the Phase II program with the exception of the sample collected from the Christal Creek tributary. Two seep samples were also collected during the August sampling episode at the lower tailings waste rock dump, one near the bottom and the other approximately 35 m upslope.

The water sample downgradient of the lower workings waste rock dump, as well as the seep sample collected from near the bottom of the rock toe were repeated during the 1999 assessment. Results of these previous episodes are detailed in Attachment C.

Three water quality samples were collected:

1. 57-WQ-StrCD-01 (Christal Creek, approximately 10 m downstream of lower workings waste rock pile toe);
2. 57-WQ-SCD-01 (approximately 7 m above toe of lower workings waste rock pile).

10. RECLAMATION

Reclamation at the site has included removal of all rail and trestle and stockpiling at the base of the site as well as storage of two ore cars. High-grade ore barrels have also been stacked at the barrel storage site. The site itself does not appear to have been reclaimed and the portal is open.

11. OTHER SOURCES OF INFORMATION AND DATA

This site was previously assessed under contract to PWGSC and both Phase II and III reports were produced as part of the previous assessment. No major changes were identified since that time.

12. REFERENCES AND PERSONAL COMMUNICATIONS

Public Works and Government Services Canada. February 1997. Phase II Environmental Site Assessment of the Formo Abandoned Mine Site.

Public Works and Government Services Canada. June 1998. Phase III Site Assessment, Formo Mine Site.

United Keno Hill Mines Limited. 1996. *United Keno Hill Mines Limited – Site Characterization*. Report No. UKH/96/01, prepared by Access Mining Consultants Limited.

United Keno Hill Mines Limited. 1996. *United Keno Hill Mines Limited – Site Characterization, Technical Appendices I-VI*. Report No. UKH/96/01, prepared by Access Mining Consultants Limited.

Table B1. 1999 Water Quality Results, Formo Site

Sample Number		Detection Limit	Units	57 - WQ - StrCD-01	57 - WQ - SCD-01	Formo Seep 1	Formo Seep 2	Formo Seep 3
Site Description								
pH (field)		0.01	pH	7.8	7			
Conductivity (field)		0.01	µS/cm	680	2630			
Total Alkalinity		5	mg CaCO3/L	129	39	26	12	10
Chloride		0.1	mg/L	0.41	na	0.6	1.1	1.1
Chloride		1	mg/L	na	<1	na	na	na
Chloride		2.5	mg/L	na	na	na	na	na
Electrical Conductivity		0.01	µS/cm	670	2900	2800	72	71
Hardness (CaCO3 equiv)		5	mg/L	365	1880	1380	40.7	40.6
Nitrate-N		0.05	mg/L	<0.05	2.6	3.52	1.06	0.61
Nitrate-N		0.2	mg/L	na	na	na	na	na
Nitrate-N		0.5	mg/L	na	na	na	na	na
Nitrite-N		0.003	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003
Nitrite-N		0.02	mg/L	na	na	na	na	na
pH		0.01	pH	7.92	6.29	6.86	6.47	6.64
Sulphate		1	mg/L	220	2030	1890	10.8	11.3
Total Dissolved Solids		5	mg/L	470	3200	2910	105	101
ICP-USN Total Metals Scan in Water								
	Aluminum	0.0008	mg/L	0.12	0.034	1.16	0.157	0.132
	Antimony	0.005	mg/L	<0.005	<0.005	0.009	<0.005	<0.005
	Arsenic	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
	Barium	0.00004	mg/L	0.0575	0.00821	0.0378	0.0181	0.0173
	Beryllium	0.00001	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
	Bismuth	0.0004	mg/L	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
	Boron	0.002	mg/L	<0.002	<0.002	0.006	<0.002	<0.002
	Cadmium	0.00001	mg/L	0.00408	1.25	1.25	0.00019	0.00016
	Calcium	0.002	mg/L	103	418	411	10.6	10.7
	Chromium	0.00006	mg/L	0.00014	<0.00006	0.00141	<0.00006	<0.00006
	Cobalt	0.00003	mg/L	0.00029	0.00728	0.00847	<0.00003	<0.00003
	Copper	0.00003	mg/L	0.00086	0.0024	0.00841	0.00424	0.00382
	Iron	0.00001	mg/L	0.479	0.055	3.03	0.29	0.27
	Lead	0.0003	mg/L	0.0024	<0.0003	0.0909	<0.0003	<0.0003
	Lithium	0.001	mg/L	0.006	0.051	0.056	<0.001	<0.001
	Magnesium	0.0005	mg/L	18.9	167	166	2.83	2.84
	Manganese	0.00002	mg/L	0.202	3.41	3.16	0.00416	0.0029
	Mercury	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Molybdenum	0.00007	mg/L	0.00039	<0.00007	<0.00007	<0.00007	<0.00007
	Nickel	0.00001	mg/L	<0.00001	0.1	0.103	0.0024	0.002
	Phosphorus	0.03	mg/L	<0.03	<0.03	0.09	<0.03	<0.03
	Potassium	0.4	mg/L	<0.4	2.3	2.9	<0.4	<0.4
	Selenium	0.004	mg/L	<0.004	0.019	0.015	<0.004	<0.004
	Silicon	0.004	mg/L	2.62	3.47	4.51	1.61	1.58
	Silver	0.00005	mg/L	<0.00005	0.00024	0.00112	<0.00005	<0.00005
	Sodium	0.004	mg/L	1.2	2.5	2.5	<0.4	<0.4
	Strontium	0.00002	mg/L	0.207	0.61	0.596	0.0187	0.0181
	Sulphur	0.008	mg/L	71.2	665	620	4.06	3.99
	Thallium	0.001	mg/L	<0.001	0.004	0.002	<0.001	<0.001
	Titanium	0.00002	mg/L	0.00319	<0.00002	0.0313	0.00087	0.00041
	Vanadium	0.00003	mg/L	0.00014	<0.00003	0.00244	<0.00003	<0.00003
	Zinc	0.0002	mg/L	0.445	25.6	26.3	0.011	0.0114
Total Arsenic by Hydride AA								
	Arsenic	0.0002	mg/L	<0.0002	<0.0002	0.0066	0.0014	0.0017
Total Selenium by Hydride AA								
	Selenium	0.0001	mg/L	0.0001	<0.0001	0.0011	0.0004	0.0004

Table 2 Formo Waste Rock Sample ABA and ICP Results

Parameter	Unit	Sample No. FOWR-								
		P301	P302	P303	P304	P305	P306	P307/1	P307/2	P308
Field Cond	uS/cm	260	180	na	210	na	na	na	na	na
Field Paste pH		7.00	7.60	6.40	na	na	na	na	na	na
Lab Paste pH		7.82	7.79	7.49	7.36	7.52	3.87	3.12	5.46	4.02
Total Sulfur	%	1.04	8.44	2.25	4.79	1.79	4.18	6.55	4.61	4.02
Sulfate	%	0.24	0.20	0.38	0.54	0.85	2.59	1.74	1.67	2.36
AP		25.00	257.50	58.44	132.81	29.38	49.69	150.31	91.88	51.88
NP		161.00	127.00	68.75	29.00	68.25	-24.78	-14.25	4.28	38.94
NET NP		136.00	-130.50	10.31	-103.81	38.88	-74.47	-164.56	-87.59	-12.94
NP/AP		6.44	0.49	1.18	0.22	2.32	<0.1	<0.1	<0.1	0.75
Aluminum	%	1.02	0.35	0.56	0.73	0.68	0.38	0.47	1.34	0.63
Antimony	ppm	3	155	71	169	6	36	77	85	140
Arsenic	ppm	125	5165	180	3148	253	651	833	582	603
Barium	ppm	34	22	54	38	29	38	23	39	35
Beryllium	ppm	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth	ppm	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	ppm	<0.1	>100	>100	>100	<0.1	<0.1	55.3	>100	<0.1
Calcium	%	6.00	4.95	2.50	2.93	3.27	2.64	1.26	1.98	1.97
Chromium	ppm	86	83	76	81	88	90	71	111	79
Cobalt	ppm	11	15	15	17	12	5	10	15	8
Copper	ppm	25	130	150	129	25	29	166	123	107
Gallium	ppm	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iron	%	3.37	7.99	3.79	5.82	3.46	4.55	9.46	6.24	6.35
Lead	ppm	1426	>10000	>10000	>10000	1039	>10000	9900	>10000	>10000
Lithium	ppm	17	4	6	10	11	5	7	23	9
Magnesium	%	1.48	0.68	0.79	1.04	0.96	0.21	0.30	1.24	0.50
Manganese	ppm	2432	2064	3277	3487	1321	122	206	536	310
Molybdenum	ppm	13	20	21	21	16	15	23	22	18
Nickel	ppm	42	42	45	61	38	16	29	54	29
Potassium	%	0.10	0.10	0.11	0.11	0.10	0.12	0.09	0.10	0.11
Phosphate	ppm	1080	1090	1510	1180	1330	590	790	630	530
Silver	ppm	12.7	>200	154.6	>200	11.3	103.8	133.7	151.3	>200
Sodium	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium	ppm	113	26	42	43	43	11	6	28	19
Tin	ppm	3	6	4	5	2	3	6	6	5
Titanium	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tungsten	ppm	2	19	56	27	3	2	20	51	4
Vanadium	ppm	27.8	3.4	8.2	20.8	9.8	10.3	10.3	38.4	18.8
Zinc	ppm	1435	>10000	>10000	>10000	1144	505	>10000	>10000	3448

AP = Acid Potential in tonnes CaCO₃ equivalent per 100 tonnes of material

NP = Neutralization Potential in tonnes CaCO₃ equivalent per 1000 tonnes of material

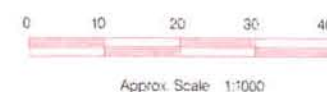
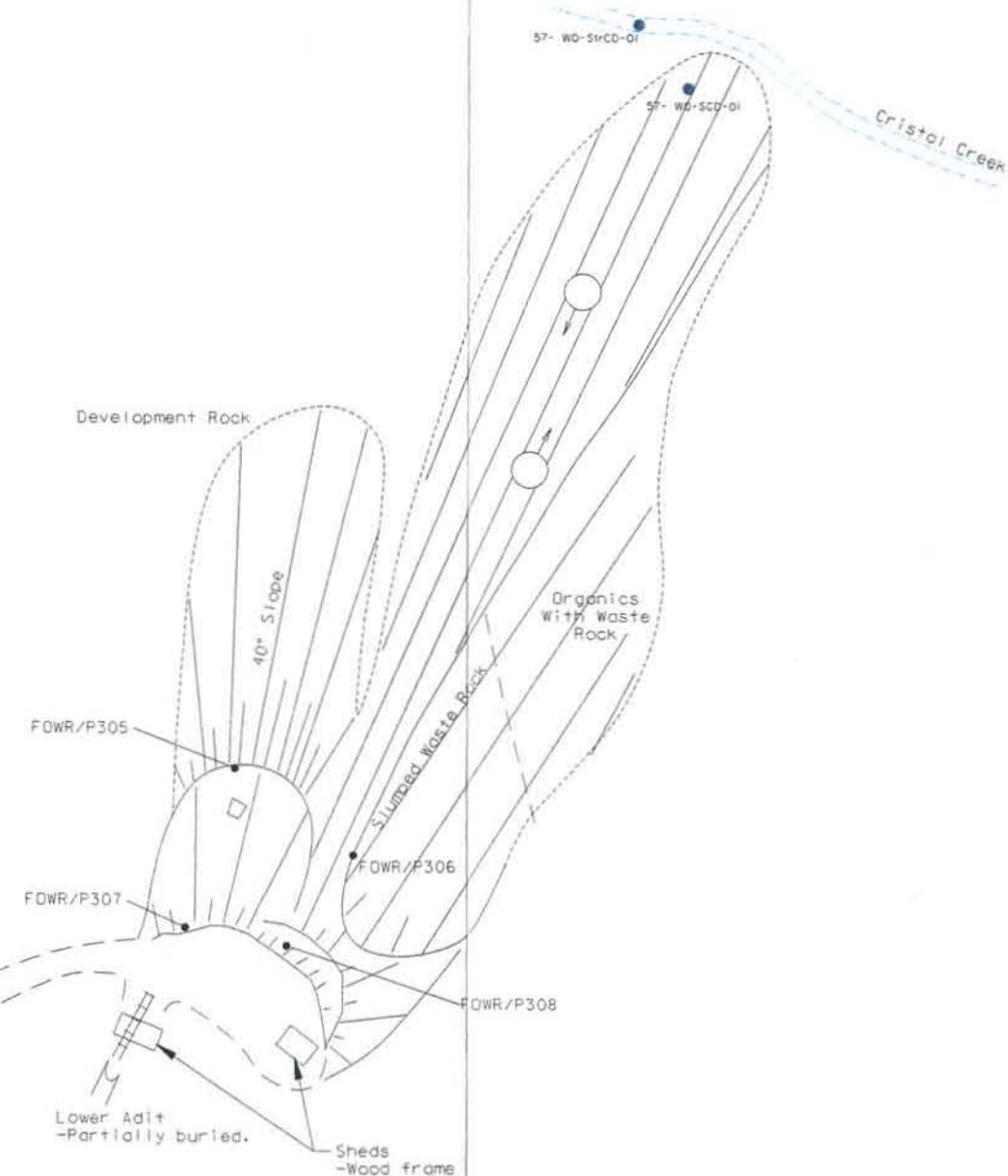
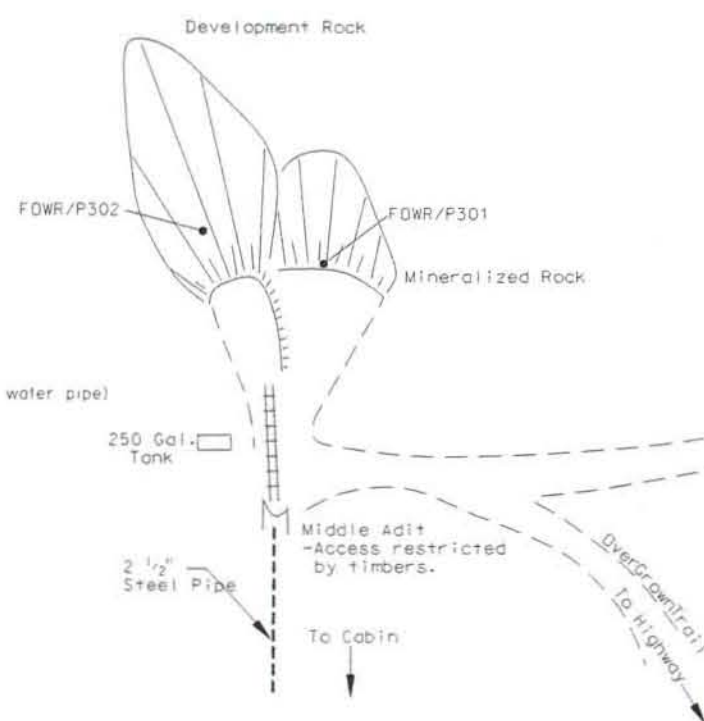
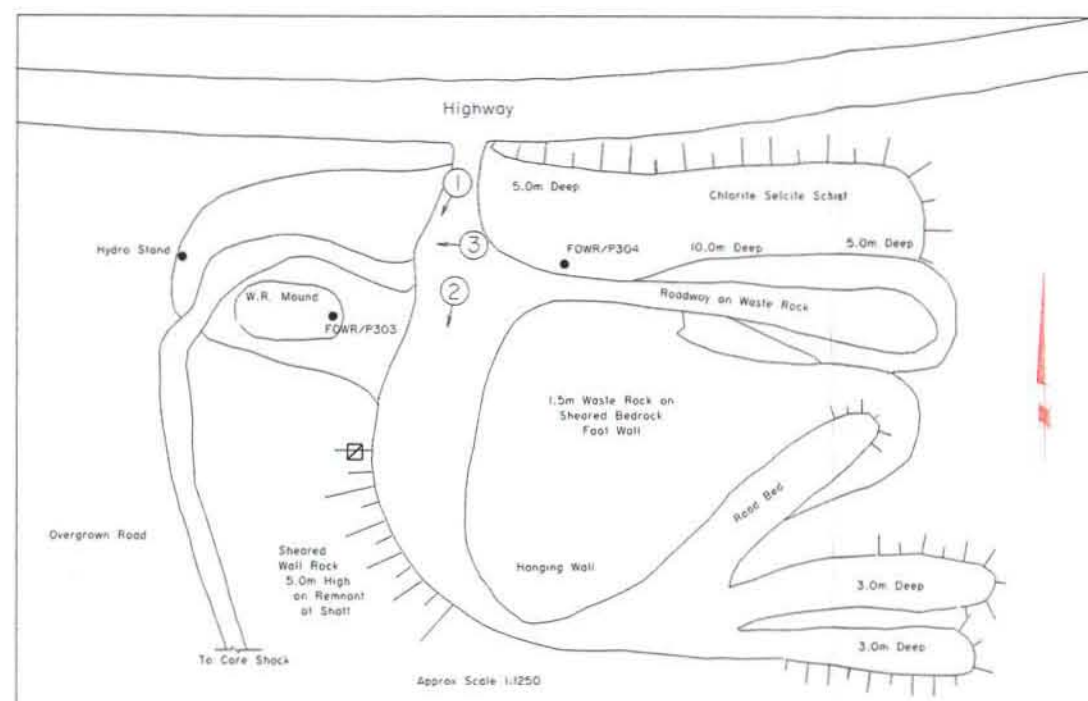
Net NP = Net Neutralization Potential = tonnes CaCO₃ equivalent per 1000 tonnes of material

na = no assay / analysis

< = lower detection limit

> = upper detection limit

- 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-D1 1999 Soil Sample (this study)
- ◇ Pre 1999 Soil Sample (other sources)
- ▲ 25W04-01 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: BelleKenol)
- 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
- *16 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)



CAD FILE: Site57.DGN

	Public Works And Government Services Canada	Travaux publics et Services gouvernementaux Canada	designed by: conçu par:	
			drawn by:	C.S. Nov 1999
Architectural & Engineering Services Western Region			approved by:	
Drawing title:			approved per:	
Fromo Mine Site #57 Site Assessment Yukon Territory			revisions:	
			project no. no. du projet:	125-12.01
			dwg. no. dessin no.:	1 of 1



Photo 57-1: Remains of shaft on slope at upper workings.



Photo 57-2: Bottom of slope at upper workings where water has ponded in past.



Photo 57-3: Site road formed in waste rock at upper workings.



Photo 57-4: Waste rock below lower workings. Note extensive vegetation kill zone.



Photo 57-5: Waste rock below lower workings. Note Christal Creek at bottom.



Photo 57-6: Interior of core shack at upper workings.

PADDY (# 58)
(MINFILE# 105M 020)

1. LOCATION AND ACCESS

The site is located off of the Hansen-McQuesten Road, which joins Highway 11 approximately 5 km east of the village of Elsa and the main site is not accessible by vehicle. The primary means of accessing this site is along a gravel access road stemming from the Highway to the south west. The road loops around and enters the barrel storage area (photo 58-1), with one road continuing on and splitting to the south. The barrel storage area is situated at 63°56'55.0"N and 135°22'42.8"W at an approximate elevation of 700 m. The east road crosses Christal Creek at a demolished bridge and parallels the creek to the west, finally entering the main (adit) site through the Christal Creek canyon. The second (west) fork travels uphill and runs along the hill/canyon top to the north before ending above the adit immediately west of the east fork.

A second road exits the barrel storage area to the east, turning north and running along the top of the canyon before rejoining the west fork of the main road north of the adit site and north of the new trenching area. The adit is at 63°56'55.0"N and 135°22'42.8"W at an approximate elevation of 730 m. UTM co ordinates are 7091342.832m N and 481450.112m E.

2. SITE PHYSIOGRAPHY

The site is spread out along Christal Creek to the north of the Highway. The creek itself enters a canyon to the north of the main adit site. The adit and waste rock slope are spread down a steep hillside immediately west of the creek with some trenching and waste rock piles present on at the top of the slope above the adit. A gravel road runs north-south parallel to the creek and a steep sparsely forested hill is present immediately east of the road. Another gravel access road runs north along the top of the hill to the west of the adit. Second growth forest is present in this area, with mature spruce forest further to the east. The road accesses a second area of trenching to the north, which is located immediately west of the canyon. Drainage from each of these areas is directly into Christal Creek.

The barrel storage area to the north is located in a relatively flat area of second growth willow forest. While surface drainage from this site is not along established runoff pathways, it is clear that Christal Creek is the local surface water receptor.

3. GEOLOGY AND MINERALIZATION

The Paddy veins are composed of siderite with variable, but small, amounts of quartz, sphalerite, galena and freiberigite (silver-bearing tetrahedrite). The cubiform galena occurs as clots and clusters rarely more than a few centimeters in size. The vein has been affected by post-mineralization fault movement, as well as intense weathering. Siderite and galena are commonly weathered to limonite and anglesite. The footwall is greenstone and the hangingwall is graphite schist which highly brecciated within a few meters of the vein. Note also that mineralized waste piles at the sorting area contained significant calcite and pyrite, and trace chalcopyrite.

4. SITE HISTORY

Two short adits were driven after staking in 1918, the longest adit was 10 m. Bulldozer trenching was performed in the 1950 to 1963 era, ground sluicing in 1964-65, a short adit in 1965, and two drill holes in 1966. Underground exploration was conducted in 1968, 1969 and 1971. Additional bulldozing was conducted in 1975, and 25 holes were drilled in 1976. 224 tonnes of ore were mined in 1978. Trenching was conducted in 1982. 20 tonnes of hand-sorted ore were mined in 1984. Further trenching was conducted in 1986, 1990 and 1993.

(Source: Yukon Minfile)

5. MINE DEVELOPMENT

5.1 Mine Openings And Excavations

Note: Only one adit was noted in recent field investigations. The open cut above the adit may have destroyed the early adits. It is thought that almost all of the underground mining was conducted from the known adit.

Adit (photo 58-2)

A timbered adit is present just above Christal Creek to the west.

Location: See map.

Dimensions (L x W x H): About 2.5 x 2.5 m size, total length is at least 241m of drifting and crosscutting, more than 61m of raising, and some stoping.

Supports: The timbered portal is partially collapsed.

Condition: Poor condition, could collapse at any time.

Accessibility: Fair access by foot, or by ATV on road above.

No samples were collected, as Phase III testing was considered adequate (samples PAD-WR 1-1 and PAD-WR 2-1).

Open Pits

A small open cut is present above the adit on the upper road. It is located at a contact between graphitic phyllite and greenstone.

Location: Approximately 20 vertical meters above the adit.

Dimensions (L x W x H): Approximately 20 m x 10 m x 10 m.

Condition: Pit walls appear to be stable, but are locally very steep. The road going past the pit has slumped considerably, and may be unstable, but has changed little since the Phase III report.

Accessibility: Good access by foot or fair access by ATV.

No samples were collected, as Phase III testing was considered to be adequate (samples PAD-WR 1-1 and PAD-WR 2-1).

Trenches (photo 58-3 to 58-5)

Three trenches basically parallel to each other, not previously discussed, were noted at a separate site to the south of the main (adit) site. Trenches run approximately east-west on top of knoll ending at or near cliff face. Trenches appear to be relatively recent and have had no revegetation over surface. Only a small amount of bedrock is exposed.

Location: Approximately 400 m south west of main (adit) site.

Dimensions (L x W x H): Approx. 75 m x 25 m x 3 m; approx. 35 m x 10 m x 2 m; and approx. 25 m x 8 m x 2 m.

Condition: Two largest trenches recent and no revegetation; older trench partially reveged; material sloughing off two newer trenches into adjacent Christal Creek canyon at east end; remainder of trenches are stable.

Accessibility: along high road south to barrel storage area.

5.2 Waste Rock Disposal Areas

Waste rock piles were adequately described in the Phase III report. The following table summarizes the results of the Phase III waste rock samples.

Table 1 – Phase III Report

Sample ID	Sample Location and Discription	Summary of ABA Test Results
PAD-WR 1-1	Collected from main waste rock pile below the adit	Low potential for acid generation (NP:AP=5.0)
PAD-WR 2-1	Collected from the smaller waste rock pile to the south and west of the adit.	Low potential for acid generation (NP:AP=5.3)

Waste rock pile – Adit

The waste rock from the adit and the excavation located above the adit was dumped down the hillside (photo 58-6). The waste rock dump below the adit extends down to Christal Creek. The rock in the upper waste rock dump has started to slump down the hillside.

Location: See map.

Dimensions (L x W x H): Approximately 35 m x 30 m (measure from map). Estimated average depth of mine waste 1 m.

Samples: Waste rock pile was adequately sampled in Phase II/III reports (samples PAD-WR 1-1 and PAD-WR 2-1). The waste rock samples were submitted for ABA tests as part of the Phase III assessment (results in Table 1).

Waste rock piles (2) – South of adit

Some waste rock from the adit and the excavation above the adit was placed into two small waste rock piles on a level area to the north of the adit.

Location: See map.

Dimensions (L x W x H): Both approximately 8 m x 8 m (measure from map). Average depth of mine waste rock approximately 2 m.

Samples: Waste rock pile was adequately sampled in Phase II report (samples PAD-WR 1-1 and PAD-WR 1-2). The waste rock samples were submitted to lab for analysis (results in Table 1)

5.3 Tailings Impoundments

None present.

5.4 Minesite Water Treatment

None present.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

A single small building was noted along the road, north of the adit. Access was not gained to the building interior.

Building 58A – Storage Building

The building appeared to have been used for storage purposes.

Location: Along the roadway north of the adit, immediately adjacent to the west bank of Christal Creek.

Dimensions (L x W x H): 4 m x 2.5 m x 2.5 m.

Construction: Wood frame with wood floor; asphalt shingle roofing.

Paint: White painted exterior. Unknown interior.

Asbestos: None on exterior.

Non-Hazardous contents: Unknown.

Foundation: None.

Hazardous contents: Unknown.

Surrounding area: No materials noted in immediately area.

6.2 Fuel Storage

There is currently no fuel in storage at the site. Barrels at the barrel storage area were probably formerly used for high grading and are currently empty.

6.3 Rail and Trestle (photo 58-7)

Location: Rails piled on road below adit.

Fabrication: Metal rail.

Amount of materials: 25, 5 m lengths.

Condition: Rails are in satisfactory condition, however, they have been removed and there is no evidence of their former location.

6.4 Milling and Processing Infrastructure

There is no milling or processing infrastructure present at this site.

6.5 Electrical Equipment

No electrical equipment was identified at the site.

7. SOLID WASTE DUMPS

No solid waste dumps were identified at the site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were observed at the site.

9. WATER QUALITY

Water quality samples were collected during the previous Phase II and III assessments. Water samples were also collected during this assessment. The Phase II water sampling program included three surface water samples (upgradient, downgradient and at adit) and a seep sample (below adit). The Phase III water sampling program included three sampling events (19 August, 1997; 18 October, 1997; 23 April 1998) at each of the locations identified during Phase II, however, the seep was only active during the August sampling episode. With the exception of the sample collected in Christal Creek at the adit, these sampling locations were repeated as part of the 1999 site assessment. Results of these previous episodes are detailed in Attachment C.

Christal Creek was sampled upstream of the site immediately upstream of a beaver dam (photo 58-8) constructed at the collapsed bridge (58-WQ-StrCD-02). The beaver dam was not identified in previous assessments and is probably of recent construction. Christal Creek was also sampled downstream of the site, immediately upstream of the north collapsed bridge (58-WQ-StrCD-01) at a location similar to previous sampling programs (photo 58-9).

A small seep was noted immediately downhill below the adit. The seep was sampled (58-WQ-SCD-01). The volume of water noted in the seep was noted at less than 1 L/sec, similar to the two previous episodes where water was noted at this location.

Laboratory sample analysis and field data from the 1999 site assessment is provided in Attachment B.

10. RECLAMATION

Reclamation at the site has included removal of all rail and trestle and stockpiling at the base of the site as well as storage of two ore cars. High-grade ore barrels have also been stacked at the barrel storage site. The site itself does not appear to have been reclaimed and the portal is open.

11. OTHER SOURCES OF INFORMATION AND DATA

This site was previously assessed under contract to PWGSC and both Phase II and III reports were produced as part of the previous assessment. Changes to the site since that time are limited to erosion of the slope such that the second adit is no longer visible. As well, a beaver dam has been constructed immediately upstream of the site and the adjacent road has begun to erode into the creek.

12. REFERENCES AND PERSONAL COMMUNICATIONS

Public Works and Government Services Canada. March 1997. Site Assessment Report, Paddy Camp, Elsa, Yukon, prepared by Norecol, Dames & Moore.

Public Works and Government Services Canada. June 1998. Phase III Site Assessment, Paddy Mine Site.

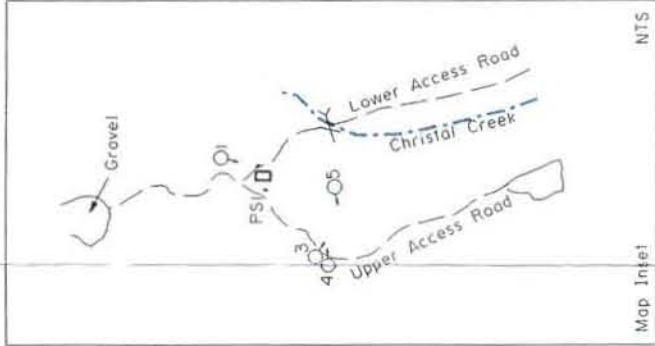
United Keno Hill Mines Limited. 1996. *United Keno Hill Mines Limited – Site Characterization*. Report No. UKH/96/01, prepared by Access Mining Consultants Limited.

United Keno Hill Mines Limited. 1996. *United Keno Hill Mines Limited – Site Characterization, Technical Appendices I-VI*. Report No. UKH/96/01, prepared by Access Mining Consultants Limited.

Table B1. 1999 Water Quality Results, Paddy Site

Sample Number		Detection Limit	Units	58 - WQ - StrCD-01	58 - WQ - StrCD-02	58 - WQ - SCD-01
Site Description						
pH (field)		0.01	pH	7.9	8	7.8
Conductivity (field)		0.01	µS/cm	830	610	6120
Total Alkalinity		5	mg CaCO3/L	125	125	205
Chloride		0.1	mg/L	0.45	0.46	4.2
Electrical Conductivity		0.01	µS/cm	665	660	1750
Hardness (CaCO3 equiv)		5	mg/L	356	362	1090
Nitrate-N		0.05	mg/L	0.06	0.1	0.25
Nitrite-N		0.003	mg/L	<0.003	<0.003	<0.003
pH		0.01	pH	7.92	7.9	7.77
Sulphate		1	mg/L	221	218	831
Total Dissolved Solids		5	mg/L	472	477	1490
ICP-USN Total Metals Scan in Water						
	Aluminum	0.0008	mg/L	0.0585	0.0802	0.0217
	Antimony	0.005	mg/L	<0.005	<0.005	<0.005
	Arsenic	0.01	mg/L	<0.01	<0.01	<0.01
	Barium	0.00004	mg/L	0.053	0.0548	0.0211
	Beryllium	0.00001	mg/L	<0.00001	<0.00001	<0.00001
	Bismuth	0.0004	mg/L	<0.0004	<0.0004	<0.0004
	Boron	0.002	mg/L	<0.002	<0.002	<0.002
	Cadmium	0.00001	mg/L	0.00153	0.00163	0.00879
	Calcium	0.002	mg/L	104	104	276
	Chromium	0.00006	mg/L	0.00012	0.00011	0.00043
	Cobalt	0.00003	mg/L	0.00023	0.00028	0.0002
	Copper	0.00003	mg/L	0.00051	0.00076	0.00226
	Iron	0.00001	mg/L	0.339	0.354	0.096
	Lead	0.0003	mg/L	0.0008	0.0018	0.01
	Lithium	0.001	mg/L	0.005	0.005	0.01
	Magnesium	0.0005	mg/L	19.3	19	85.7
	Manganese	0.00002	mg/L	0.184	0.203	0.0165
	Mercury	0.0001	mg/L	<0.0001	<0.0001	<0.0001
	Molybdenum	0.00007	mg/L	0.00044	0.00033	0.00124
	Nickel	0.00001	mg/L	<0.00001	<0.00001	0.0014
	Phosphorus	0.03	mg/L	<0.03	<0.03	<0.03
	Potassium	0.4	mg/L	<0.4	<0.4	1.5
	Selenium	0.004	mg/L	0.005	<0.004	<0.004
	Silicon	0.004	mg/L	2.48	2.54	2.56
	Silver	0.00005	mg/L	<0.00005	<0.00005	<0.00005
	Sodium	0.004	mg/L	1.3	1.3	4.1
	Strontium	0.00002	mg/L	0.209	0.206	0.475
	Sulphur	0.008	mg/L	71.6	71.6	285
	Thallium	0.001	mg/L	<0.001	<0.001	<0.001
	Titanium	0.00002	mg/L	0.00149	0.00204	<0.00002
	Vanadium	0.00003	mg/L	<0.00003	<0.00003	<0.00003
	Zinc	0.0002	mg/L	0.213	0.229	0.656
Total Arsenic by Hydride AA						
	Arsenic	0.0002	mg/L	<0.0002	<0.0002	<0.0002
Total Selenium by Hydride AA						
	Selenium	0.0001	mg/L	0.0002	0.0005	0.0012

- 0 22A Building (22A, building site present reference*)
- 22A Indicates Asbestos Material
- Collapsed Building
- Adit
- Collapsed Adit
- Shall
- Collapsed/Backfilled Shaft
- Mine Rock Dump
- Bedrock Open Pit
- Trench
- Striped Overburden Stockpile
- Striped / Disturbed Area
- Outcrop Boundary
- Highway
- Road (gravel, 2 wheel drive)
- Road (gravel, 4x4 accessible)
- Road (inaccessible)
- Trail
- Culvert
- 450-01 1999 Soil Sample (this study)
- Pre 1999 Soil Sample (other sources)
- 2300-01 1999 Waste Rock Sample (this study)
- Pre 1999 Waste Rock Sample (other sources)
- 40-02-06 1999 Water Sample
- Pre 1999 Water Sample
- Tension Cracks
- Mass Movement (note: for Forms, Bellekeno)
- Groundwater Seep
- Surface Water Flow (Stream, Creek, River)
- Lake
- Selling 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
- Transformer Location (number of transformer in brackets)
- Power Line
- Power Line Collapsed
- Aerial Transmission Towers
- Photo Site (arrow shows view direction)
- GPS Survey Location
- Former Building Site (Eiso)



Map Inset

NTS

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).

Quartzite: (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 melagabbro.

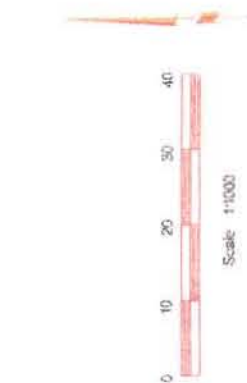
Quartzite: (2a) Thick bedded, blocky gray quartzite;

(2b) Thin bedded, blocky, quartzite with carbonaceous phyllite interbeds;

(2c) Calcareous quartzite.

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

(1b) Carbonaceous phyllite.



CAD FILE SITESS.DGN

 Public Works And Government Services Canada	Travaux publics et Services gouvernementaux Canada	designed by: conçu par: drawn by:	C.S. Nov. / 99
Architectural & Engineering Services Western Region		checked by: approved by: revision:	
Drawing title: Paddy Site #58 Site Assessment Yukon Territory		project no. no. du projet:	dep. no. dessin no. 125-12.01 1 of 1



Photo 58-1: Barrel storage area to north of main sites.



Photo 58-2: Open adit.



Photo 58-3: Trenched area to north west of main site.



Photo 58-4: Top of knoll at newly trenched area.



Photo 58-5: Trenched area visible from Christal Creek canyon below.



Photo 58-6: Waste rock on slope adjacent to adit.



Photo 58-7: Stockpiled rail below adit.



Photo 58-8: Beaver dam immediately downstream of site.

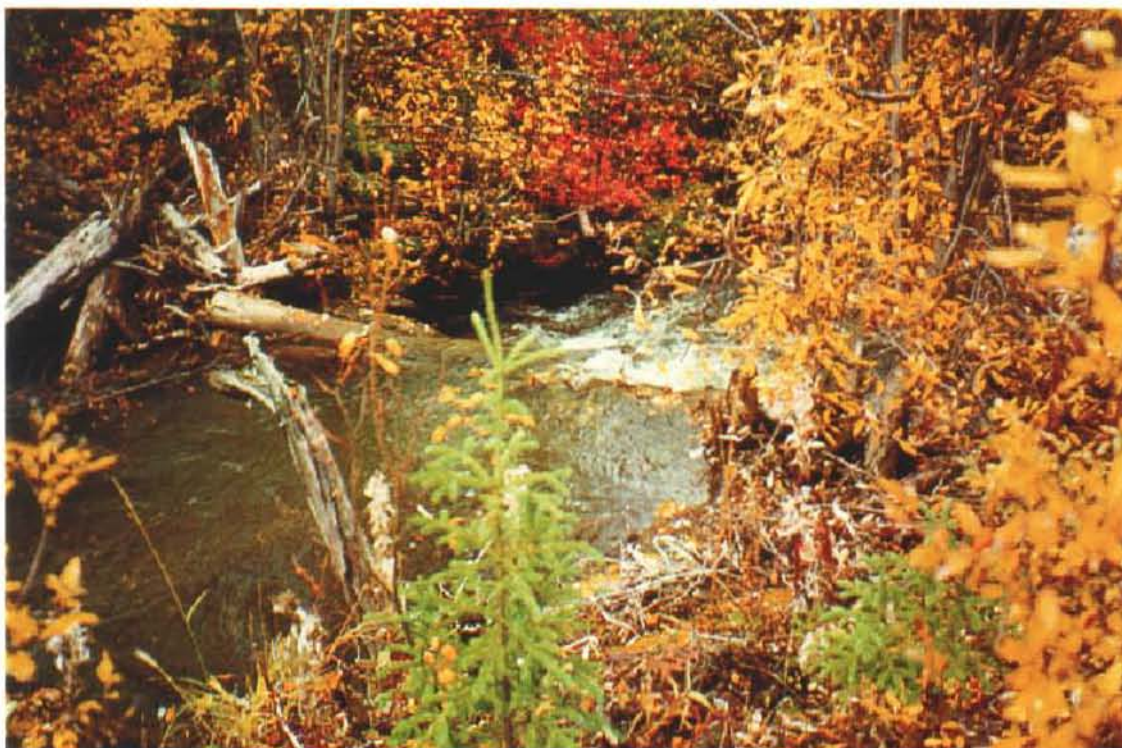


Photo 58-9: Second collapsed bridge downstream of site.

EAGLE
Site No. 59
MINEFILE: 105M 021

1. LOCATION AND ACCESS

The Eagle site is on the east side of Galena Hill, near the top, at an elevation of 4300 feet (1300m) (Site #59, Figure 1). Access is through the Hector-Calumet Mine along the road that leads to the microwave towers. A partially overgrown cat track, the Eagle Trail, leads south at the Jock shaft. Approximately 85 m from the shaft, the Eagle Trail forks, and the eastern fork crosses the shoulder of Galena Hill to the Eagle site. All roads are passable by 4WD vehicle. The NTS co-ordinates for this site are 7 086 900m N and 481 900m E.

2. SITE PHYSIOGRAPHY

The site is located just below the top of Galena Hill on a gentle southeast-facing slope. The site drains into Lightning Creek, which is located more than a kilometer down slope. The area around the mine is well vegetated with spruce trees and shrubs and the soils are thin.

3. GEOLOGY AND MINERALIZATION

Wall rock and a small section of the vein is exposed at the upper (western) end of the trench. The wall rocks bounding the vein are composed of quartzite and schist. The vein is composed mainly of massive quartz, pyrite, siderite, galena $\pm$ sphalerite. There is abundant manganese oxide on the wall rock adjacent to the vein and on the vein material itself.

Most of the remainder of the pit is composed of subcrop (loose rock likely close to its original location) and is composed of fresh quartzite and schist with little mineralization or alteration.

4. SITE HISTORY

According to the Minfile report, work commenced on the site in the 1920's, when 3 shafts and several pits were excavated. Additional work included bulldozer trenching through the 1950's and 1960's. The most recent work on the site was drilling in 1978-79.

5. MINE DEVELOPMENT

Workings at the Eagle site consist of a single, large trench, a collapsed shaft, and several shallow, older trenches. These are shown on Figure 2.

5.1 Mine Openings and Excavations

According to the Minfile report, three shafts were developed at the site. However, the remnants of only one was found. This shaft was located in the pit and was partially covered by overburden and waste. It is likely that the other two shafts were destroyed during trenching.

Large Trench (Photo 59-1)

Location: Main feature of property; oriented east-northeast.

Dimensions (L x W x H): 215 m x 8 m x 0-6 m

Condition: The trench walls are stable.

Accessibility: The road to the property ends at the pit and the pit is accessible by foot throughout its length.

Shaft (Photo 59-2)

Location: Located in the pit about 95 m from the eastern end of the pit.

Dimensions (L x W x H): 1.5 m x 1.5 m x 2 m

Condition: The shaft has completely collapsed. The trench was excavated around the shaft.

Accessibility: The shaft is inaccessible.

5.2 Waste Rock Disposal Areas

The waste rock dumps at the site were formed by pushing rock up the sides of the trench during excavation. The largest dump, located near the upper (western) end of the trench, comprises approximately 3,000 m³ of rock (Photo 59-3). Quartzite, schist, and quartz vein material make up most of the surface of the dump. All waste rock dumps appear stable.

Few sulfides and little iron staining was seen on the surface of the waste dumps. There was no evidence of seeps from the dump, and no apparent impact on the vegetation growing around it. No waste rock samples were collected from the dump.

5.3 Tailings Impoundments

No ore processing was conducted at this site. Therefore, no tailings, tailings ponds, or dams were encountered.

5.4 Minesite Water Treatment

There are no wastewater treatment facilities at this site.

6. MINE SITE INFRASTRUCTURE

The only mine infrastructure encountered at the site is the remnant of a small cabin.

Building 59A - Cabin

Location: The cabin is approximately 150 m to the north-northeast of the shaft.

Dimensions (L x W x H): 2 m x 1.5 m x 1.5 m

Construction material: Wooden logs

Paint: None

Asbestos: None

Contents: None

Foundation: Dirt

Hazardous products: None observed

Surrounding area: Two empty barrels, one tire and some pieces of metal were seen.

7. LANDFILLS AND DUMPS

No landfills or dumps were encountered at this site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous materials were encountered on this site. The only contaminants of concern would be the possibility of dissolved metals from the waste rock piles.

9. WATER QUALITY

One water sample (59-01-seep) was collected near the upper (western) end of the main trench, from a seep in the footwall of the vein. The flow was < 0.5 L/s. The pH was 7.0 and the conductivity was $80 \mu\text{S}$. Abundant green moss was growing in the seepage. The seep water flows down the trench and then exits it before reaching the shaft. The fall water quality analysis of this sample is provided in Table 1.

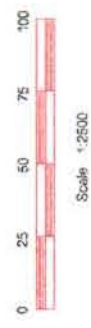
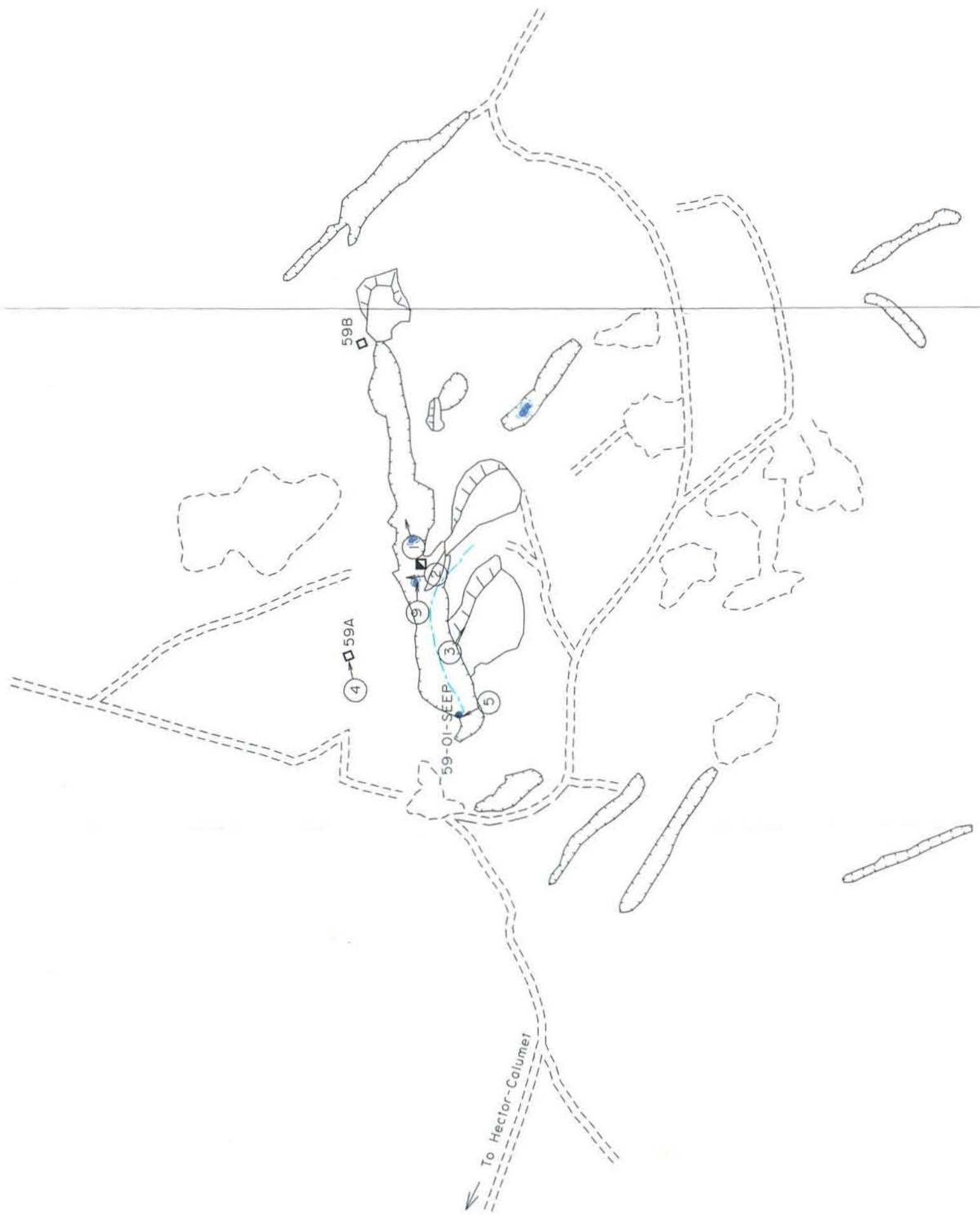
10. RECLAMATION

All the trenches and waste rock piles are naturally revegetating and have grasses and small bushes established on them.

Table 1. Seep water quality

Parameter	Detection Limit	Units	59-01 - Seep (47694-6)
Aluminum	0.0008	mg/L	0.116
Antimony	0.005	mg/L	<0.005
Arsenic	0.01	mg/L	0.02
Barium	0.00004	mg/L	0.056
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	0.00148
Calcium	0.002	mg/L	12.6
Chromium	0.00006	mg/L	0.00029
Cobalt	0.00003	mg/L	0.00049
Copper	0.00003	mg/L	0.00184
Iron	0.00001	mg/L	0.958
Lead	0.0003	mg/L	0.089
Lithium	0.001	mg/L	0.006
Magnesium	0.0005	mg/L	2.09
Manganese	0.00002	mg/L	0.106
Molybdenum	0.00007	mg/L	0.00058
Nickel	0.00001	mg/L	0.0021
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	4.46
Silver	0.00005	mg/L	0.00036
Sodium	0.004	mg/L	0.8
Strontium	0.00002	mg/L	0.0331
Sulphur	0.008	mg/L	2.96
Thallium	0.001	mg/L	<0.001
Titanium	0.00002	mg/L	0.00234
Vanadium	0.00003	mg/L	0.00019
Zinc	0.0002	mg/L	0.18
Zirconium	0.00004	mg/L	
Mercury	0.0001	mg/L	<0.0001
Arsenic (hydride AA)	0.0002	mg/L	0.0202
Selenium (hydride AA)	0.0001	mg/L	0.0001
Total Alkalinity	5	mg CaCO3/L	31
Chloride	0.25	mg/L	<0.25
Electrical Conductivity	0.01	µS/cm	96
Hardness (CaCO3 equiv)	5	mg/L	41.9
Nitrate-N	0.05	mg/L	0.07
Nitrite-N	0.003	mg/L	<0.003
pH	0.01		7.06
Sulphate	1	mg/L	7.9
Total Dissolved Solids	5	mg/L	60

- 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)
- 1999 Waste Rock Sample (this study)
- Pre 1999 Waste Rock Sample (other sources)
- 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
- Transformer Location (number of transformer in brackets)
- Power Line
- Power Line Collapsed
- Aerial Transmission Towers
- Photo Site (arrow shows view direction)
- GPS Survey Location
- Former Building Site (Elsa)



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Project no. [blank]			The design: [blank]				
Design no. [blank]			The design: [blank]				
125-12.01			1 of 1				



Photo 59-1. Trench, looking eastward from below the shaft.



Photo 59-2. Collapsed shaft in center of trench.



Photo 59-3. Main waste rock pile, looking east. Note water from seep and revegetation of waste rock.



Photo 59-4. Wooden cabin.



Photo 59-5. Seep from the rock around the vein. Note green moss growing in water.

FISHER
SITE #60
MINFILE# 105M022

1. LOCATION AND ACCESS

The Fisher site is located on the southeast slope of Galena Hill at an elevation of 1040m. The UTM coordinates are 7 084 700m N and 481 300m E. The site has poor access; it is a 1.5-2km walk along an overgrown road. The overgrown road starts on the west side of the Duncan Creek to Galkeno 300 Road, 40m north of Duncan Creek Road. The site was difficult to locate, as it has become overgrown with alders.

2. SITE PHYSIOGRAPHY

Second-growth vegetation of willows, alders and shrubs as well as sparse patches of spruce grow at and around the Fisher site. The site gently slopes to the southeast. The surface runoff from the mine site flows southward into Fisher Creek, a tributary of Duncan Creek, located 1km downslope. Fisher Creek was dry at the time of the site visit. No surface water was encountered at the site.

3. GEOLOGY AND MINERALIZATION

According to the Minfile report, mineralization is hosted in the Hyland Group. The Hyland Group is a meta-sedimentary sequence consisting of quartz-graphite schist, phyllite, minor quartzite and limestone. No outcrop was found at this site. Some rocks found in the overburden were comprised of quartz vein material often containing galena (PbS) and tetrahedrite ($\text{Cu}_{12}\text{Sb}_4\text{S}_{13}$); several barren quartz veins were found.

4. SITE HISTORY

A 12m shaft was excavated in 1950 and was reopened in 1963. Between 1970 and 1983 several phases of bulldozer trenching were completed. Two roads were built to the site in 1981.

5. MINE DEVELOPMENT

Several trenches and one shaft were excavated at Fisher.

5.1 Mine Openings and Excavations

Only one trench could be located. Most likely vegetation has reclaimed the other trenches. The shaft could not be located. However, it is possible that it was destroyed by later trenching.

Trench (photo 60-1)

The trench was excavated in overburden creating a shallow cleared area comprised of sand, gravel and boulders. The trench is oriented at 320°. There is no visible outcropping of rock.

Location: 100m northwest of the end of the road, through thick alder growth.

Dimensions (L x W x H): 60m x 20m (at rim) x 8m

Condition: There is no danger of stability problems as the trench is so shallow and the sides are gently sloped. The bottom of the trench has sparse vegetation of grasses and small bushes.

Accessibility: The trench can be easily accessed.

5.2 Waste Rock Disposal Areas

No waste rock piles were encountered. It is likely that the overburden was pushed to the sides of the trench.

5.3 Tailings Impoundments

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

5.4 Minesite Water Treatment

There is no water treatment facility at this site.

6. MINE SITE INFRASTRUCTURE

No minesite infrastructure was encountered.

7. SOLID WASTE DUMPS

No solid waste dumps were encountered.

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were encountered.

9. WATER QUALITY

No surface water was encountered at this site; no water samples were collected.

10. RECLAMATION

The trench is revegetating slowly with bushes and grasses. The vegetation in the area appears healthy.

11. REFERENCES

Minfile Report #105M022

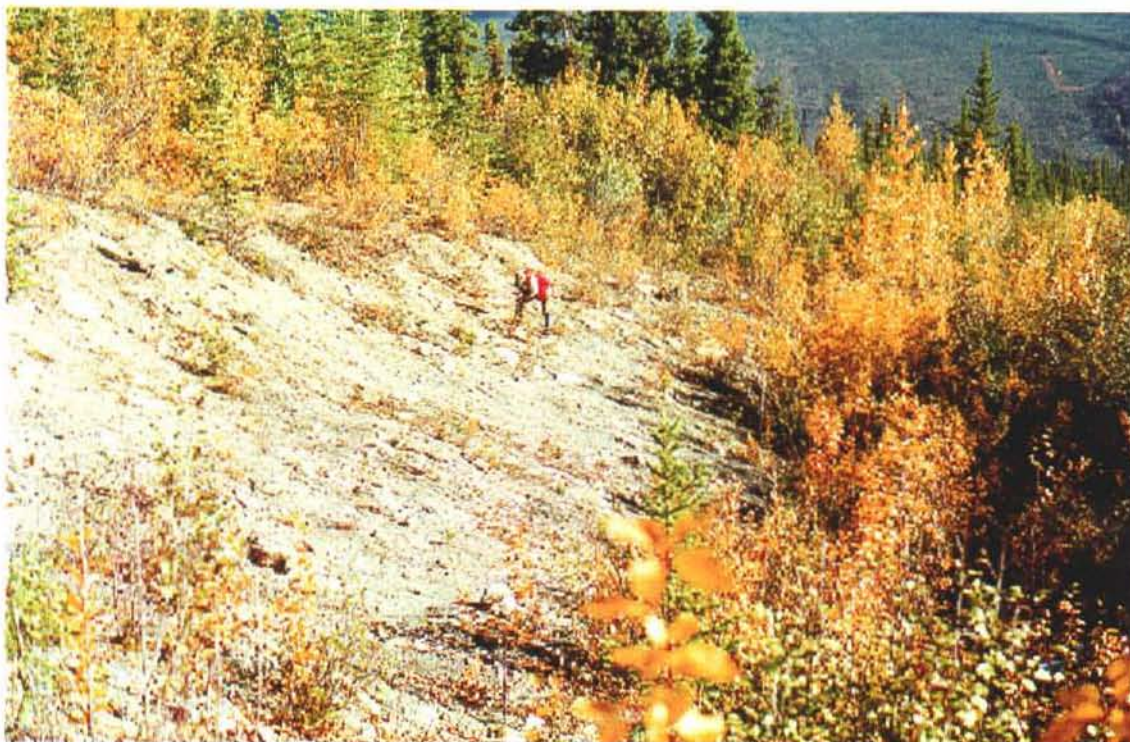


Photo 60-1: View of trench 1. (Azimuth 140°)

CREAM & JEAN (#61)
(MINFILE# 105M 024)

1. LOCATION AND ACCESS

Access to the adit is from the highway, approximately 400 m to the north either cross country through mature forest or along an overgrown road adjacent to Sandy Creek. The location is given as 63°55'54.4"N and 135°25'52.6"W. Access to the headframe from the adit crosses through dense second growth willow and alder. The headframe may also be reached by heading north from the highway through open spruce forest. The location is given as 63°55'58.4"N and 135°25'44.5"W. The adit is at an approximate elevation of 950 m and the headframe is on an adjacent hillside at an approximate elevation of 960 m. UTM co ordinates are 7089483.498m N 478853.974m E for the adit, and 7089606.565m N 478965.126m E for the headframe.

2. SITE PHYSIOGRAPHY

The site is located uphill (south) of the highway in an area of dense secondary and primary forest. The adit and loadout chute is located on a steep ridge that drains west-northwest into Sandy Creek. Some of the waste rock has fallen into the creek. The headframe and bunkhouse are located approximately 160 m east of the adit on a separate ridge that faces north towards the highway. The immediate area is choked with willow saplings. The local topography at the bunkhouse is quite flat. A creek was noted to the west of this site. A short steep slope is located immediately north of the headframe and drainage from headframe and waste rock pile is down this slope.

3. GEOLOGY AND MINERALIZATION

The site is underlain by Earn Group thin-bedded quartzites, phyllites and graphitic schist, with thin lenses of greenstone and a few thick beds of quartzite. Outcrop in the area is very poor. The Jean Adit dump is composed of two rock types; boulders and cobbles of dark grey-green greenstone with calcite-quartz-siderite veins and disseminated pyrite, and smaller material that is dark grey phyllite. No mineralization was observed at the Jean adit, and the high carbonate content appears to dominate the low pyrite content.

At the Cream Shaft there is considerable mineralized material that occurs at the contact between quartzite and grey-brown phyllite. Quartz-siderite-calcite-limonite-pyrite-sphalerite-galena vein material is common in the dump. Minor tetrahedrite, pyrargyrite and chalcopyrite are also reported here.

The shallow shaft and open cuts 60 m southeast of the Cream Shaft contain quartz-pyrite-arsenopyrite-scorodite mineralization.

4. SITE HISTORY

The Cream inclined shaft was sunk 32.3 m in the 1925 to 1949 period. Three sublevels totaling 29.3 m were driven from the shaft. In 1951 this shaft produced 54.4 tonnes of hand-sorted ore. At least 12 shallow test pits were dug to the northeast of the Cream shaft, testing the quartzite contact. A cluster of at least 6 shallow shafts and test pits were dug about 60m southeast of the Cream headframe.

The Jean adit was driven for 78.9 m in 1955. It did not connect with the Cream workings. No production is noted for the Jean, and no mineralized material is evident on the dump.

A residence was constructed approximately 80 m downstream from the Jean adit circa 1980. It is currently abandoned.

5. MINE DEVELOPMENT

5.1 Mine Openings And Excavations

Jean Adit (photo 61-1)

The portal has completely collapsed, and the site is overgrown with dense alders except for the steep slope of the waste dump (photo 61-2).

Location: See map. Adjacent to Sandy Creek, about 400 m upstream (southeast) of the highway.

Dimensions (L x W x H): About 1.5 m x 1.5 m, reported to be 78.9 m deep.

Supports: Wooden timbered; collapsed.

Condition: Completely collapsed; stable.

Accessibility: Inaccessible.

Cream Shaft (photo 61-4)

A wood headframe about 8 m high stands over the inclined shaft.

Location: See map. In dense scrub forest.

Dimensions (L x W x H): The headframe is approximately 4 m x 6 m x 8 m. The shaft is about 1.5 m x 1.5 m, and is reported to be 32.3 m deep.

Supports: The shaft is timbered, appears to be in fair to good condition.

Condition: Shaft appears to be in good condition; stable.

Accessibility: Wooden doors cover the inclined shaft, and can be opened. Water and ice are present at a depth of approximately 2 m which prevents access to underground, and limits the hazard.

Note: The headframe is photogenic, and is relatively close to the highway. It might be possible to develop this site as a tourist attraction. The mine is a good example of an underground hand-mining operation. The hand-cranked windlass is still in place, and a hoist bucket in good condition is present.

Test Pits

Large number of very small (< 3 m x 2 m x 3 m) test pits that are overgrown.

Location: Strung out in line east of shaft. See map.

Dimensions (L x W x H): All very small

Condition: Overgrown.

Accessibility: Same as shaft.

5.2 Waste Rock Disposal Areas

Waste rock pile - Cream Shaft

The waste rock is from the shaft development and production (photo 61-3). The bottom of the dump is likely weakly mineralized development rock, and the top is highly mineralized vein material discarded during ore production. The surface material is stained due to oxidation. No water was noted to flow over the dump. There is considerable mineralized material that occurs at the contact between quartzite and grey-brown phyllite. Quartz-siderite-calcite-limonite-pyrite-sphalerite-galena vein material is common in the dump. Minor tetrahedrite, pyrrargyrite and chalcopyrite are also reported here. The material sampled is very high in sulphide sulphur (over 12%), and has a NP/AP of 0.2. There is high metal content in this dump.

Location: See map. Site is approximately 30 m east of Sandy Creek.

Dimensions (L x W x H): 15 m x 5 m x 2m (estimated at 300 tonnes).

Sampling: One mineralized waste rock sample was collected. See Attachment B for laboratory and field test results.

Waste rock pile – Jean Adit

The Jean Adit dump is composed of two rock types; boulders and cobbles of dark grey-green greenstone with calcite-quartz-siderite veins and disseminated pyrite, and smaller material that is dark grey phyllite. No mineralization was observed at the Jean adit, and the high carbonate content appears to dominate the low pyrite content as no rusting was observed. No drainage was noted through the dump, although the creek does contact the toe of the dump. The dump is derived from underground development.

Location: See map. Site is immediately east of Sandy Creek. The toe of the waste dump is in the creek.

Dimensions (L x W x H): 25 m x 20 m x 4 m (estimated at 400 tonnes).

Sampling: None collected.

5.3 Tailings Impoundments

There were no tailings impoundments at the site.

5.4 Minesite Water Treatment

There is no minesite water treatment at the site.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

Building 61A – Headframe (photo 61-4)

This is a small headframe with much of the original equipment remaining inside the building.

Location: See map. The building is located approximately 400 m from the highway but is inaccessible by and not visible from the road. The headframe is in dense scrub forest.

Dimensions (L x W x H): 4 m x 6 m x 8 m.

Construction: Wood frame with no floor; uninsulated.

Paint: None.

Asbestos: None.

Non-Hazardous contents: None.

Foundation: No foundation appeared to be present.

Hazardous contents: None.

Surrounding area: One empty barrel; some domestic debris; wood debris; waste rock pile down the slope to the north and northeast.

Building 61B – Bunk/Cookhouse (photo 61-5)

This building appears to have served as a combination bunkhouse and cookhouse. The building has collapsed and much of the building material debris is spread throughout the immediate area.

Location: See map. The building is located approximately 400 m from the highway but is inaccessible by and not visible from the road. The building is in dense scrub forest and is only visible in immediate close range but may be located due to its close proximity to the headframe, approximate 30 m to the northeast.

Dimensions (L x W x H): 11 m x 4 m (collapsed).

Construction: The structure is of wood frame construction.

Paint: None.

Asbestos: None.

Non-hazardous contents: Stove; domestic debris; bed; asphalt sheeting; large amount of debris from collapsed building.

Foundation: No foundation appeared to be present.

Hazardous contents: None.

Surrounding area: Debris from the building; three empty barrels; adjacent waste rock pile (photo 61-3).

6.2 Fuel Storage

All barrels present at the site were empty. No fuel is currently stored at the site.

6.3 Rail and Trestle (photo 61-2)

Location: There is a short rail and loadout chute immediately west of the adit leading down to a former (overgrown) road near Sandy Creek. Rails have been removed and stockpiled adjacent to the adit (photo 61-6).

Fabrication: Horizontal metal rail leading to wooden chute down the slope.

Amount of materials: Approximately 20 m of rail and 30 m wood chute.

Condition: Rail has been removed and stockpiled. Wood chute has deteriorated.

6.4 Milling and Processing Infrastructure

No milling or processing infrastructure is present at the site.

6.5 Electrical Equipment

No electrical equipment was identified at the site.

7. SOLID WASTE DUMPS

No solid waste dumps were noted at the site, however, a large amount of debris was noted at or surrounding the former bunkhouse/cookhouse structure.

8. POTENTIAL CONTAMINANTS OF CONCERN

8.1 Out-of-Service Transformers

No transformers were noted at the site.

8.2 Metals and Hydrocarbons in Soil

No metal or hydrocarbon impacted soil was identified at the site.

8.3 Liquid Hazardous Materials

All barrels present at the site were empty. No liquid hazardous materials were noted at the site.

8.4 Solid Hazardous Materials

No solid hazardous materials were noted at the site.

9. WATER QUALITY

Two upstream water samples were collected for this site, one on Sandy Creek and one on the unnamed creek adjacent to the headframe. The Sandy Creek sample (61-WQ-Str-CD-01) was taken approximately 40 m upstream of the adit, however, it should not be considered background since Betty (#19) is located upstream of Cream&Jean on Sandy Creek. The unnamed creek sample (61-WQ-Str-CD-02) was collected approximately 30 m upstream of the bunkhouse at a distance of 50 m from the building. Field pH and conductivity were not measured at either sample point.

Two samples were collected downstream of the site. Sample 61-WQ-Str-CD-03 was collected approximately 75 m downstream of the bunkhouse on the unnamed creek. A second sample (Sandy Cr-01) and duplicate, were collected by other personnel on Sandy Creek at the upstream side of the culvert crossing the highway, approximately 400 m downstream of the adit.

Laboratory sample analysis and field data is provided in Attachment B.

10. RECLAMATION

There has been no reclamation attempted at either area of the site with the exception of the rails removed from the loadout at the adit. Both areas have extensively overgrown. The headframe remains standing and the bunkhouse/cookhouse has collapsed and debris has spread throughout the immediate area. Waste rock piles present at the two areas remain unvegetated.

11. OTHER INFORMATION AND DATA

Note comments above regarding the tourism potential of the Cream shaft headframe.

12. REFERENCES AND PERSONAL COMMUNICATIONS

United Keno Hill Mines Limited. 1996. *United Keno Hill Mines Limited – Site Characterization*. Report No. UKH/96/01, prepared by Access Mining Consultants Limited.

United Keno Hill Mines Limited. 1996. *United Keno Hill Mines Limited – Site Characterization, Technical Appendices I-VI*. Report No. UKH/96/01, prepared by Access Mining Consultants Limited.

ATTACHMENT B: 1999 CREAM & JEAN WATER SAMPLES

LABORATORY RESULTS

Sample Number	Detection Limit	Units	61-StrCD-01 - Cream & Jean	61-StrCD-02 - Cream & Jean	61-StrCD-03
Site Description			40m upstream of adit	30m upstream of bunkhouse	75m downstream of bunkhouse
pH (field)	N/A	pH	-	-	-
Conductivity (field)	N/A	µS/cm	-	-	-
pH (Lab)	0.01	pH	7.58	7.14	7.54
Conductivity (Lab)	0.01	µS/cm	410	480	365
Total Alkalinity	5	mg CaCO ₃ /L	72	21	62
Chloride	0.25	mg/L	<0.25	0.36	<0.25
Hardness (CaCO ₃ equiv)	5	mg/L	218	249	193
Nitrate-N	0.05	mg/L	<0.05	0.71	<0.05
Nitrite-N	0.003	mg/L	<0.003	<0.003	<0.003
Sulphate	0.5	mg/L	140	220	122
Total Dissolved Solids	5	mg/L	301	377	265

Analysis by ICP-USN

Aluminum	0.0008	mg/L	0.0216	0.031	0.0229
Antimony	0.005	mg/L	<0.005	<0.005	<0.005
Arsenic	0.01	mg/L	<0.01	<0.01	<0.01
Barium	0.00004	mg/L	0.0282	0.0149	0.0264
Beryllium	0.00001	mg/L	<0.00001	<0.00001	<0.00001
Bismuth	0.0004	mg/L	<0.0004	0.0021	<0.0004
Boron	0.002	mg/L	<0.002	0.008	<0.002
Cadmium	0.00006	mg/L	0.00012	0.00812	0.00018
Calcium	0.002	mg/L	60.9	63.1	54.1
Chromium	0.00006	mg/L	0.00027	0.0004	<0.00006
Cobalt	0.00003	mg/L	<0.00003	<0.00003	<0.00003
Copper	0.00003	mg/L	0.00206	0.00289	0.00114
Iron	0.00001	mg/L	0.02	0.024	0.027
Lead	0.0003	mg/L	<0.0003	0.0003	<0.0003
Lithium	0.001	mg/L	0.001	0.003	0.003
Magnesium	0.0005	mg/L	13	17.8	12
Manganese	0.00002	mg/L	0.0045	0.0271	0.00316
Mercury	0.0001	mg/L	<0.0001	<0.0001	<0.0001
Molybdenum	0.00007	mg/L	0.00018	<0.00007	0.00012
Nickel	0.00001	mg/L	<0.00001	0.0114	<0.0001
Phosphorus	0.03	mg/L	<0.03	<0.03	<0.03
Potassium	0.4	mg/L	<0.4	<0.4	<0.4
Selenium	0.004	mg/L	<0.004	<0.004	<0.004
Silicon	0.004	mg/L	3.07	3.12	3.12
Silver	0.00005	mg/L	<0.00005	<0.00005	<0.00005
Sodium	0.004	mg/L	1.3	3.1	1.4
Strontium	0.00002	mg/L	0.108	0.082	0.0963
Sulphur	0.008	mg/L	45.4	71.7	39
Thallium	0.001	mg/L	<0.001	<0.001	<0.001
Titanium	0.00002	mg/L	0.00037	0.00039	0.00019
Vanadium	0.00003	mg/L	<0.00003	<0.00003	<0.00003
Zinc	0.0002	mg/L	0.0447	2.92	0.0556
Zirconium	0.00004	mg/L			

Analysis by Hydride AA

Arsenic	0.0002	mg/L	0.0007	0.0007	0.0004
Selenium	0.0001	mg/L	<0.0001	<0.0001	0.0003

ATTACHMENT B: 1999 CREAM & JEAN WATER SAMPLES

LABORATORY RESULTS

Sample Number	Detection Limit	Units	Sandy CR-01-Water	Sandy CR-02-Water Sept 20
Site Description			In Sandy Creek, 400m downstream of adit	Duplicate
pH (field)	N/A	pH	-	-
Conductivity (field)	N/A	µS/cm	-	-
pH (Lab)	0.01	pH	7.56	7.49
Conductivity (Lab)	0.01	µS/cm	370	370
Total Alkalinity	5	mg CaCO3/L	53	48
Chloride	0.25	mg/L	0.26	0.34
Hardness (CaCO3 equiv)	5	mg/L	189	192
Nitrate-N	0.05	mg/L	0.1	0.09
Nitrite-N	0.003	mg/L	<0.003	<0.003
Sulphate	1	mg/L	115	116
Total Dissolved Solids	5	mg/L	260	261
Analysis by ICP-USN				
Aluminum	0.0008	mg/L	0.0373	0.0327
Antimony	0.005	mg/L	<0.005	<0.005
Arsenic	0.01	mg/L	<0.01	<0.01
Barium	0.00004	mg/L	0.0252	0.0253
Beryllium	0.00001	mg/L	<0.00001	<0.00001
Bismuth	0.0004	mg/L	<0.0004	<0.0004
Boron	0.002	mg/L	<0.002	<0.002
Cadmium	0.00006	mg/L	0.00102	0.00099
Calcium	0.002	mg/L	49.4	49.2
Chromium	0.00006	mg/L	0.00027	0.00026
Cobalt	0.00003	mg/L	<0.00003	<0.00003
Copper	0.00003	mg/L	0.00247	0.00287
Iron	0.00001	mg/L	0.052	0.054
Lead	0.0003	mg/L	<0.0003	<0.0003
Lithium	0.001	mg/L	0.004	0.003
Magnesium	0.0005	mg/L	12.2	12.1
Manganese	0.00002	mg/L	0.0106	0.0103
Mercury	0.0001	mg/L	<0.0001	<0.0001
Molybdenum	0.00007	mg/L	<0.00007	0.00011
Nickel	0.00001	mg/L	0.0023	0.0022
Phosphorus	0.03	mg/L	<0.03	<0.03
Potassium	0.4	mg/L	<0.4	<0.4
Selenium	0.004	mg/L	<0.004	<0.004
Silicon	0.004	mg/L	2.98	2.98
Silver	0.00005	mg/L	<0.00005	<0.00005
Sodium	0.004	mg/L	1.3	1.4
Strontium	0.00002	mg/L	0.0865	0.0873
Sulphur	0.008	mg/L	37.4	37.5
Thallium	0.001	mg/L	<0.001	<0.001
Titanium	0.00002	mg/L	0.00066	0.00061
Vanadium	0.00003	mg/L	<0.00003	<0.00003
Zinc	0.0002	mg/L	0.394	0.396
Zirconium	0.00004	mg/L		
Analysis by Hydride AA				
Arsenic	0.0002	mg/L	0.0004	0.0003
Selenium	0.0001	mg/L	<0.0001	<0.0001

**ATTACHMENT B: 1999 CREAM & JEAN WASTE ROCK
LABORATORY RESULTS**

Site Number	Detection Limit	Units	61_WR_TPBM_01
Sample Description			Cream shaft waste rock pile
Paste pH (field)	N/A	pH	-
Conductivity (field)	N/A	µS/cm	-
pH in Saturated Paste			
pH	0.1	pH	6.4
pH in Soil (1:2 water)			
pH	0.01	pH	6
ICP Semi-Trace Scan			
Aluminum	5	µg/g	8830
Antimony	2	µg/g	410
Arsenic	2	µg/g	51
Barium	0.05	µg/g	24.5
Beryllium	0.1	µg/g	<0.1
Bismuth	5	µg/g	9
Cadmium	0.1	µg/g	3300
Calcium	5	µg/g	7620
Chromium	0.5	µg/g	13.1
Cobalt	0.1	µg/g	32.9
Copper	0.5	µg/g	4900
Iron	1	µg/g	64000
Lead	1	µg/g	23000
Lithium	0.5	µg/g	9.2
Magnesium	1	µg/g	4060
Manganese	0.5	µg/g	2940
Mercury	0.01	µg/g	1.2
Molybdenum	1	µg/g	1
Nickel	1	µg/g	30.7
Phosphorus	5	µg/g	228
Potassium	20	µg/g	1890
Selenium	2	µg/g	<2
Silicon	5	µg/g	396
Silver	0.5	µg/g	817
Sodium	5	µg/g	62
Strontium	1	µg/g	4
Sulphur	10	µg/g	110000
Thorium	1	µg/g	<1
Tin	1	µg/g	1
Titanium	0.2	µg/g	25.2
Uranium	5	µg/g	<5
Vanadium	1	µg/g	22
Zinc	0.5	µg/g	257000
Zirconium	0.1	µg/g	6.6

**ATTACHMENT 2: 1999 CREAM & JEAN 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
61_WR_TPBM_01	Cream shaft waste rock pile	6.7	12.30	0.04	383.1	86.5	-296.6	0.2
61_WR_TPBM_01 RE	Duplicate	-	12.60	0.04	392.5	-	-	-

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*)

22A 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

2400-01 1999 Soil Sample (this study)

Pre 1999 Soil Sample (other sources)

2500-01 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: BelleKen)

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, rolls, air and water pipe)

Mine Rails / Trestle

Collapsed Trestle

Solid Waste Disposal Site

Area of Soil Contamination

Transformer Location (number of transformer in brackets)

Power Line

Power Line Collapsed

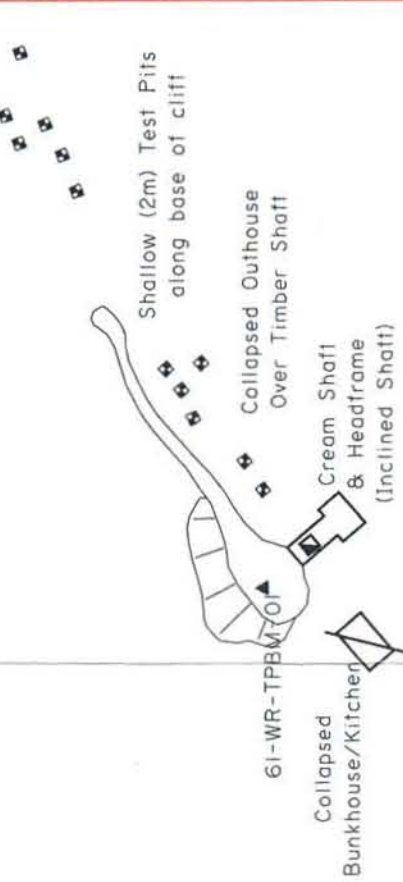
Aerial Transmission Towers

Photo Site (arrow shows view direction)

GPS Survey Location

Former Building Site (Elsa)

Test Pit



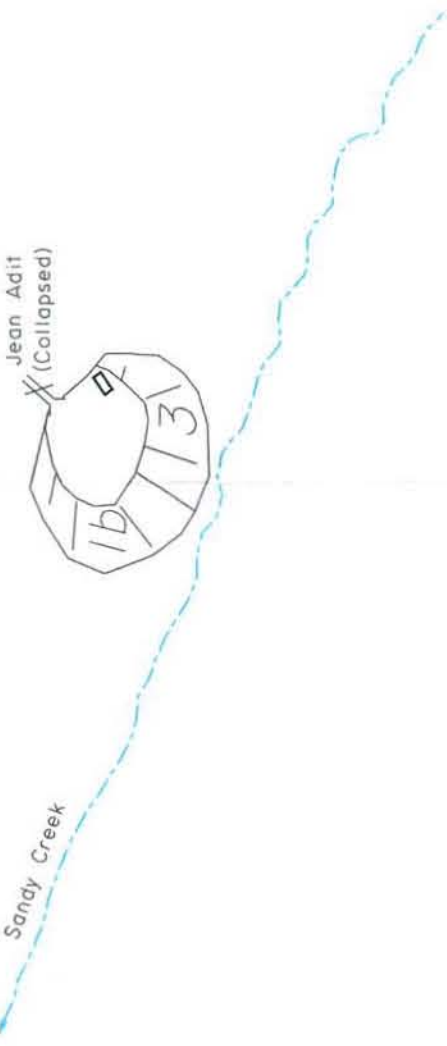
Old House
1980s

To Highway 300m

Shallow Trenches

Jean Adit
(Collapsed)

Sandy Creek



Waste Rock Geological Legend

This legend is 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 melagabbro.

Quartzite: (2a) Thick bedded, blocky gray quartzite; (2b) Thin bedded, 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	Treasury Publics et Services gouvernementaux Canada Architectural & Engineering Services Western Region	designed by: conce par: drawn by: dessiné par: approved by: approuvé par: revised: révisé:	date: date:
Drawing title: Cream & Jean Site #61 Site Assessment Yukon Territory		project no. no. du projet: 125-12.01	drawn no. dessiné no. 1 of 1



CAD FILE: STER.DGN



Photo 61-1: Timbers partially obscuring entrance to collapsed adit.



Photo 61-2: Waste rock and loadout structure below adit.



Photo 61-3: Waste rock on slope adjacent to headframe.



Photo 61-4: Wood framed headframe (61A).



Photo 61-5: Wood debris at former bunkhouse/cookhouse building 61B.



Photo 61-6: Wood and metal debris near entrance to adit.

NORD (#62)
(MINFILE# 105M 025)

1. LOCATION AND ACCESS

The site is located at the lower northwest slope of Galena Hill near junction of Silver Trail Highway and Hanson-McQuesten Lakes Road directly adjacent to road. Nord is at 63°56'32"N and 135°25'00"W and an approximate elevation of 790 m. UTM co ordinates are 7090692.561m N 479577.968m E.

2. SITE PHYSIOGRAPHY

The site is located below the highway on the northwest side of Galena Hill, with gentle to moderate slope to the north-northwest. The site is drained by an unnamed creeks which flow into the South McQuesten River valley; however the creeks terminate at boggy ponds in the valley that do not flow directly into the river. Overburden is commonly very thick in this area, except near resistant greenstone lenses. Permafrost is thought to be present. Areas disturbed by bulldozing are completely revegetated by very thick bush, except where stripping has completely removed all organic material.

3. GEOLOGY AND MINERALIZATION

The area is underlain by Earn Group schist and phyllite, with greenstone lenses that form resistant hills. A narrow (max. 30 cm) quartz-calcite vein is exposed in a deep bulldozer trench immediately adjacent to the Hanson-McQuesten Lakes Road. The vein is at a schist - greenstone contact, and contains galena, sphalerite, arsenopyrite, pyrite and tetrahedrite mineralization. A second vein is exposed (in subcrop) at a large stripped area just north of the Highway junction. This rusty quartz vein cuts muscovite-chlorite-biotite schist, and contains trace galena.

4. SITE HISTORY

Bulldozer trenching was conducted in 1953 and 1955, and a six metre deep shaft was sunk in 1956. Eight holes were drilled in conjunction with bulldozer trenching in 1969. Further bulldozer trenching was conducted in 1984 and 1986. The Hanson-McQuesten Lakes Road was built in approximately the 1980's, and may be an upgrade of some of the exploration roads.

5. MINE DEVELOPMENT

5.1 Mine Openings And Excavations

The site reportedly consists of a shaft bulldozed trenches and drill sites. The shaft was not located due to thick bush. It may have been demolished by subsequent bulldozing. No drill sites were identified. A single trench and adjacent bulldozed path were located directly adjacent to the road.

Trenches (photo 62-1)

The main vein is exposed in a bedrock sidehill trench beside the road, with a steep rock wall on the road side and material pushed downslope.

Location: Immediately adjacent to the Hanson-McQuesten Lakes Road, approximately 1 km from the Highway junction.

Dimensions (L x W x H): 30 m x 10 m x 5 m.

Condition: The trench is stable, with solid rock on its wall. The loose material is at a stable angle of repose, with some natural revegetation. The trench does not appear to be a hazard, except possibly to vehicles driving off the road over the steep bank.

Accessibility: The trench is immediately adjacent to the road, and is easily accessible.

5.2 Waste Rock Disposal Areas

Waste rock from the trench consists mainly of overburden, with some weathered bedrock. Mineralized material would comprise about 1% of the pile. The pile was pushed downslope, is at a stable angle and is partly revegetated. No water was observed at the trench site, which appears to be free draining.

Location: See map. The pile is immediately adjacent to the trench that is directly adjacent to Hanson-McQuesten Lakes Road.

Dimensions (L x W x H): Approximately 20 m x 5 m x 2 m.

Sampling: No samples were collected.

5.3 Tailings Impoundments

There are no tailings impoundments at this site.

5.4 Minesite Water Treatment

No minesite water treatment facility is present at this site.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

No buildings are present at the site.

6.2 Fuel Storage

No fuel storage was observed at the site.

6.3 Rail and Trestle

No rails or trestles were observed at the site.

6.4 Milling and Processing Infrastructure

No mill or processing facilities are present at the site.

6.5 Electrical Equipment

No electrical equipment was observed at the site.

7. SOLID WASTE DUMPS

No solid waste dumps were observed at the site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were observed at the site.

9. WATER QUALITY

No water was observed at the site or surrounding area and, therefore, no water samples were collected.

10. RECLAMATION

Dense natural revegetation has reclaimed the old roads/ trenches. Vegetation is so dense that the roads are difficult to walk. No reclamation measures are known to have been undertaken at this site. Drill sites and the shaft were not located.

11. OTHER INFORMATION AND DATA

No other information was identified.

12. REFERENCES AND PERSONAL COMMUNICATIONS

Yukon Minfile.



Photo 62-1: Partially overgrown trench adjacent to road.

GERLITSKI

SITE #63

MINFILE# 105M026

1. LOCATION AND ACCESS

Gerlitski is located just north of a prominent knob on the south side of the McQuesten River valley between Galena Creek and Thompson Creek. The site is 0.5km north of Hwy #2, 1.2km west of the turnoff to the Silver King site. Approximate UTM co-ordinates are 7 085 550m N and 470 800m E. There are no roads to the site; foot access is possible by hiking through thick bush.

2. SITE PHYSIOGRAPHY

Gerlitski is on level ground vegetated with second-growth alders; willows and small bushes grow at and around the site. Site drainage reports to Flat Creek, located 1.25km to the north. There was no surface water encountered at the site.

3. GEOLOGY AND MINERALIZATION

According to the Minfile report, the host rock is the Keno Hill Quartzite, a medium to thick-bedded quartzite with carbonaceous phyllite. Numerous veins in this area have good length and width, moderate lead and zinc, but are low in silver. The Gerlitski vein is 150m long, up to 9.1m wide and is weakly mineralized with galena (PbS), sphalerite ((Zn,Fe)S), and tetrahedrite (Cu₁₂Sb₄S₁₃). Outcropping of the Keno Hill Quartzite with minor quartz veining is exposed along the trench walls.

4. SITE HISTORY

During five periods of exploration, extensive drilling and some bulldozer trenching were completed at this site. The first phase of drilling and bulldozer trenching were undertaken between 1956-58. Over 750 more drill holes were drilled in the years 1962, 1966, 1972-76 and 1980.

5. MINE DEVELOPMENT

Two trenches were located during the site visit. The main trench (trench 1) runs north-south with a small trench (Trench 2) starting at its northern end. There is evidence of drilling on the northern section of trench 1. Waste rock has been deposited on the western side of trench 1. Site photos are located in Attachment 1.

5.1 Mine Openings and Excavations

Trench 1 (photo 63-1)

Trench 1 has exposed bedrock along its eastern side; the western side is much lower and has been covered with waste rock piles. The southern end is narrow and overgrown with alders and bushes. There is a clearing at the northern end; core boxes and small pieces of core scattered in this open area indicate that the trench was drilled (photo 63-2).

Location: The southern tip of the trench begins approximately 15m west of the northwest toe of the prominent knob.

Dimensions (L x W x H): 242m x 2.5m x 2m (maximum width and height)

Condition: The trench walls are nearly vertical but not very high. At the time of inspection the walls appeared stable, however there is a small volume of rock debris on the trench floor that has broken off.

Accessibility: The southern end has become overgrown with alders, otherwise the trench is easily accessible.

Trench 2

There is a small volume of exposed bedrock along the northern side of the trench; the southern side has been covered with a low waste rock pile.

Location: The south end of Trench 2 is turned 70° to the west from Trench 1.

Dimensions (L x W x H): 70m x 8m x 1.5m

Condition: The low walls of the trench appeared stable at the time of the inspection.

Accessibility: The trench is easily accessed.

5.2 Waste Rock Disposal Areas

The majority of the waste rock was deposited in the northern half of Trench 1, on the western side of the trench. Smaller volumes of waste rock were deposited on the west side of the southern half of Trench 1, and on the southern side of Trench 2. Individual waste rock piles were difficult to distinguish. For the purposes of this report the waste rock has been grouped into 4 different piles based on small changes in geologic composition and on the shape and volume of the pile. There was no evidence of surface or subsurface drainage flowing over or through any the waste rock piles.

Waste rock pile #1

The waste rock in this pile was excavated from the southern half of Trench 1. This section of the trench is much narrower and shallower than the northern half and subsequently the waste rock pile associated with it is long but not very high or wide. A thick carpet of green moss covers much of the surface of the rock pile and small bushes have begun to grow. The waste rock is composed of predominantly of quartzite and weakly mineralized

(0.5 – 1 % sulphides) quartz vein material; approximately 25% of the waste rock is overburden. There is minor iron (Fe) staining on the surface of the rocks.

Location: The pile forms the western side of the trench for the southern half of trench 1.

Dimensions (L x W x H): 127m x 1m x 1m

Sampling: No samples were collected.

Waste rock pile #2

This is the highest of the waste rock piles and it is sparsely vegetated with small spruce trees and bushes. The waste rock is from Trench 1 and is composed of predominantly quartzite and some mineralized (3-5% disseminated pyrite and trace amounts of other sulphides) quartz veining; roughly 20% of the waste rock is overburden. It also contains minor amount of sandstone and schist.

Location: The pile is approximately mid-way along the western side of Trench 1.

Dimensions (L x W x H): 35m x 5m x 3m

Sampling: A 30cm deep test pit was dug and sample #63-02-waste was collected (photo 63-3). The surface 2-4mm of the waste rock pile is oxidized but there is no oxidation observed occurring below this surface layer. The waste rock is bimodal; grain size is from sand to cobble sized. The field pH of the sample was 6.8 and the conductivity was 26 uS/cm.

Waste rock pile #3 (photo 63-4)

This waste rock pile has been leveled to an average width of roughly 1m to form a large cleared area. The waste rock in this pile was excavated from the northern half of Trench 1. It is composed of predominantly of unmineralized quartzite and overburden. The pile has small areas of quartzite and quartz veining with higher mineralization and with stronger iron (Fe) staining. Besides a few clumps of grasses, very little vegetation is growing on this pile.

Location: The pile forms the western side of the trench along the northern half of Trench 1.

Dimensions (L x W x H): 65m x 45m x 1m

Sampling: A 30cm test pit was dug in an area of stronger Fe-staining and sample #63-01-waste was collected (photo 63-5). The waste rock was oxidized at surface but there is no oxidation occurring below surface. The waste rock is bimodal; grain size is from sand to cobble sized. The field pH of the sample was 5.5 and the conductivity was 510 uS/cm.

Waste rock pile #4

This small waste rock pile is very overgrown with moss, shrubs and young alders. The source of the pile is from the excavation of Trench 2. The major rock type is quartzite and minor quartz vein material with 25% of the pile composed of overburden. No oxidation was observed on the surface of the waste rock pile.

Location: The pile is on the south side of Trench 2.

Dimensions (L x W x H): 70m x 1m 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 is no water treatment facility 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 products were encountered. Potential contaminants of concern include any metals washing from the waste rock piles or off the trench walls.

9. WATER QUALITY

There was no surface water encountered at the time of the site visit. No water samples were collected.

10. RECLAMATION

Natural revegetation has occurred in Trench 2 and in the southern half of Trench 1. The northern section of Trench 1 has naturally revegetated within the trench however the waste rock associated with the excavation of this trench has patchy areas of natural revegetation.

11. REFERENCES

Minfile #105M026

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

Site Number	Detection Limit	Units	63-01-Waste - Gerlitzki - 15cm - Sept. 21/99	63-02-Waste - Gerlitzki - 15cm - Sept. 21/99
Sample Description			East side of Waste Rock Pile #3	North Side of Waste Rock Pile #2
Paste pH (field)		pH	5.5	6.8
Conductivity (field)		µS/cm	510	26
pH in Saturated Paste				
pH	0.1	pH	5.8	7.6
pH in Soil (1:2 water)				
pH	0.01	pH	6.2	7.4
ICP Semi-Trace Scan				
Aluminum	5	µg/g	27700	21400
Antimony	2	µg/g	12	<2
Arsenic	2	µg/g	560	293
Barium	0.05	µg/g	516	448
Beryllium	0.1	µg/g	0.2	0.4
Bismuth	5	µg/g	16	<5
Cadmium	0.1	µg/g	513	34.8
Calcium	5	µg/g	2200	7060
Chromium	0.5	µg/g	38.8	37.9
Cobalt	0.1	µg/g	12	10.8
Copper	0.5	µg/g	696	231
Iron	1	µg/g	86000	46000
Lead	1	µg/g	1730	247
Lithium	0.5	µg/g	9.9	8.8
Magnesium	1	µg/g	1760	1870
Manganese	0.5	µg/g	2920	2690
Mercury	0.01	µg/g	0.33	<0.01
Molybdenum	1	µg/g	6	2
Nickel	1	µg/g	25.4	24.3
Phosphorus	5	µg/g	650	811
Potassium	20	µg/g	9100	6800
Selenium	2	µg/g	<2	<2
Silicon	5	µg/g	403	212
Silver	0.5	µg/g	188	49.8
Sodium	5	µg/g	643	955
Strontium	1	µg/g	46	41
Sulphur	10	µg/g	55000	1310
Thorium	1	µg/g	<1	<1
Tin	1	µg/g	41	15
Titanium	0.2	µg/g	108	230
Uranium	5	µg/g	<5	<5
Vanadium	1	µg/g	44	43
Zinc	0.5	µg/g	37000	3690
Zirconium	0.1	µg/g	15.5	16.7

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

SAMPLE	SITE DESCRIPTION	PASTE pH	S(T) %	S(SO ₄) %	AP	NP	NET NP	NP/AP
63-01-Waste - Gerlitzki - 15cm - 21/09/99 - Waste Rock	East side of Waste Rock Pile #3	6.3	3.68	0.16	110.0	13.0	-97.0	0.1
63-02-Waste - Gerlitzki - 15cm - 21/09/99 - Waste Rock	North side of Waste Rock Pile #2	7.9	0.07	0.07	0.0	2.3	2.3	~~~

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.



Photo 63-1: Trench 1 with waste rock pile #2 on left side. (Azimuth 070°)



Photo 63-2: Core boxes and other debris lying in trench 1. (Azimuth 170°)



Photo 63-3: Test pit from waste rock pile #2. Note the shallow oxidation horizon. (Azimuth 170°)

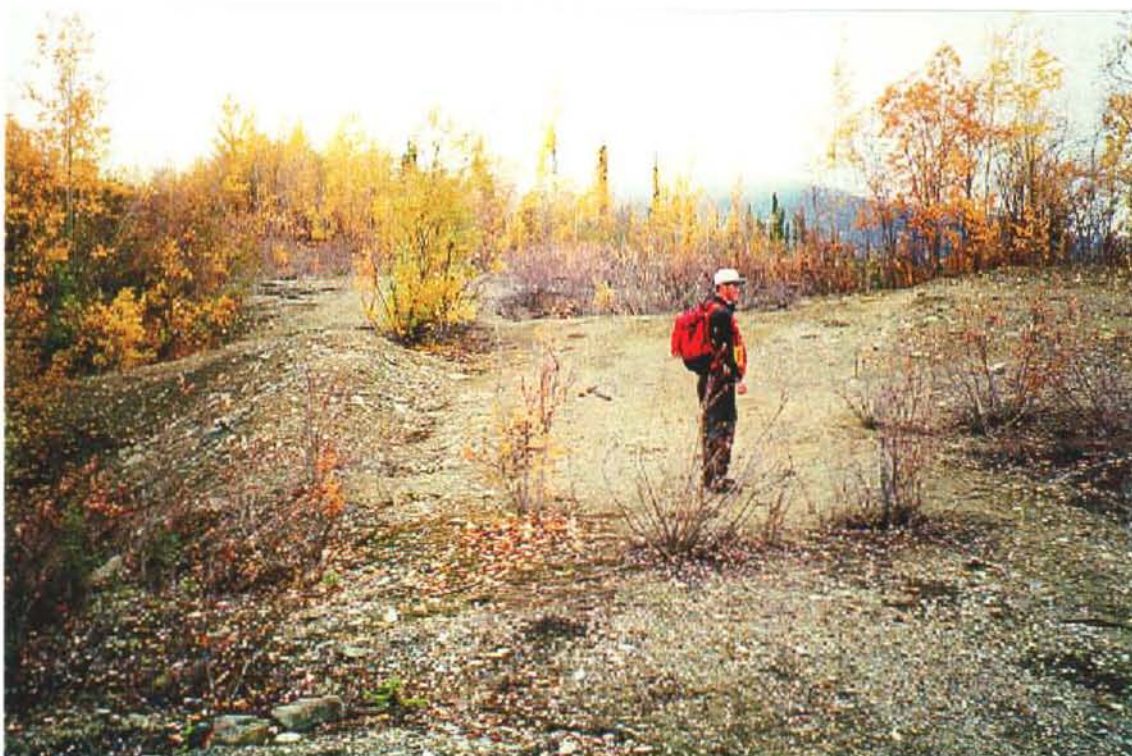


Photo 63-4: The large, leveled area is Waste rock pile #3, trench # is to the right just off the photo. (Azimuth 080°)



Photo 63-5: Test pit from waste rock pile #3. Note the oxidation at the surface of the pit.
(Azimuth 240°)

TITAN
SITE #64
MINFILE# 105M 027

1. LOCATION AND ACCESS

The site is located on an unnamed creek (named Titan for the purposes of this report) that merges with the South McQuesten River 1km to the southwest. The junction of Titan Creek with the South McQuesten River is just 1km upstream of where Christal Creek and the South McQuesten River merge. The site is located on old winter trail that goes from the McQuesten Lake Road to the Shanghai showing. However, vehicle access is no longer possible by this trail as it has become too overgrown and a helicopter was used to access the site. The approximate UTM co-ordinates are 7 093 150m N and 473 300m E (Latitude: 63° 57' 27" N and Longitude: 135° 33' 18" W).

2. SITE PHYSIOGRAPHY

The site is in on the northwest side of the broad valley that the South McQuesten River flows down. Surface runoff from the site drains to the southeast via Titan Creek and into the South McQuesten River. The area is well populated with spruce trees, poplar, alders, small shrubs and moss.

3. GEOLOGY AND MINERALIZATION

According to the Minfile on the site the host rock is the Keno Hill Quartzite, near the Keno Hill Quartzite and Hyland Group schist and phyllite contact. There is at least one strong vein. Vein breccia and siderite gangue is present in float and one outcrop with a 1.8m wide vein exposure. Galena panned from overburden here is high in silver.

4. SITE HISTORY

Bulldozer trenches were excavated between 1963 and 1974. Between 1977 and 1979, 105 percussion drill holes were drilled.

5. MINE DEVELOPMENT

None of the bulldozer trenches were visited because of limited time. Eleven trenches can be counted from the airphoto.

6. MINE SITE INFRASTRUCTURE

There is reportedly a cabin with a fireguard, on the east side of Titan Creek, just south of the winter road. No other mine site infrastructure was reported or observed.

7. SOLID WASTE DUMPS

There were no solid waste dumps observed at the site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous materials were encountered at this site. Potential contaminants of concern include any metals that wash from the trenches.

9. WATER QUALITY

Three water samples were collected for analysis. The first sample (sample Titan Creek 09/18/99) is from Titan Creek, just downstream of the site. The second and third samples (sample S1 – South McQuesten upstream of Titan Creek – 09/18/99, and S2, a duplicate) is a background sample and was collected from the South McQuesten River, just upstream of where it merges with Titan Creek. Sampling results can be found on Attachment 1.

10. RECLAMATION

Those trenches viewed from the helicopter had a cover of alders and poplar.

11. REFERENCES AND PERSONAL COMMUNICATIONS

Minfile #105M 027

ATTACHMENT 1: 1999 TITAN WATER SAMPLES

LABORATORY RESULTS

Sample Number	Detection Limit	Units	(S1) South McQuestion Upstream of Titan Creek - 09/18/99	(S2) South McQuestion Upstream of Titan Creek - 09/18/99	Titan Creek - 09/18/99
Site Description			A background sample, collected just upstream of where Titan and the South McQuesten River merge.	Duplicate of S1	Collected just downstream of the Titan site.
pH (field)	N/A	pH	-	-	-
Conductivity (field)	N/A	µS/cm	-	-	-
pH (Lab)	0.01	pH	7.88	7.82	7.97
Conductivity (Lab)	0.01	µS/cm	310	315	430
Total Alkalinity	5	mg CaCO3/L	92	92	135
Chloride	0.25	mg/L	<0.25	0.32	0.39
Hardness (CaCO3 equiv)	5	mg/L	153	153	229
Nitrate-N	0.05	mg/L	<0.05	<0.05	0.07
Nitrite-N	0.003	mg/L	0.004	0.003	0.006
Sulphate	1	mg/L	60.7	61.3	69.7
Total Dissolved Solids	5	mg/L	246	262	287
Analysis by ICP-USN					
Aluminum	0.0008	mg/L	0.179	0.175	0.0059
Antimony	0.005	mg/L	<0.005	<0.005	<0.005
Arsenic	0.01	mg/L	<0.01	<0.01	<0.01
Barium	0.00004	mg/L	0.0441	0.0441	0.0556
Beryllium	0.00001	mg/L	<0.00001	<0.00001	<0.00001
Bismuth	0.0004	mg/L	<0.0004	<0.0004	<0.0004
Boron	0.002	mg/L	<0.002	<0.002	<0.002
Cadmium	0.00006	mg/L	0.00022	0.00021	0.00004
Calcium	0.002	mg/L	39	39.1	66.9
Chromium	0.00006	mg/L	<0.00006	<0.00006	<0.00006
Cobalt	0.00003	mg/L	0.00131	0.00128	<0.00003
Copper	0.00003	mg/L	0.00226	0.00217	0.00126
Iron	0.00001	mg/L	0.137	0.141	0.028
Lead	0.0003	mg/L	<0.0003	<0.0003	0.0042
Lithium	0.001	mg/L	0.005	0.006	0.005
Magnesium	0.0005	mg/L	13.7	13.7	12.7
Manganese	0.00002	mg/L	0.0619	0.0612	0.00219
Mercury	0.0001	mg/L	<0.0001	<0.0001	<0.0001
Molybdenum	0.00007	mg/L	0.00044	0.00044	0.00054
Nickel	0.00001	mg/L	0.0145	0.0145	0.0006
Phosphorus	0.03	mg/L	<0.03	<0.03	<0.03
Potassium	0.4	mg/L	<0.4	0.4	0.8
Selenium	0.004	mg/L	<0.004	<0.004	<0.004
Silicon	0.004	mg/L	1.62	1.62	2.55
Silver	0.00005	mg/L	<0.00005	<0.00005	<0.00005
Sodium	0.004	mg/L	1.2	1.2	1.2
Strontium	0.00002	mg/L	0.169	0.169	0.151
Sulphur	0.008	mg/L	19.8	19.9	22.6
Thallium	0.001	mg/L	<0.001	<0.001	<0.001
Titanium	0.00002	mg/L	0.00034	0.0003	<0.00002
Vanadium	0.00003	mg/L	<0.00003	<0.00003	<0.00003
Zinc	0.0002	mg/L	0.0358	0.0357	<0.0002
Analysis by Hydride AA					
Arsenic	0.0002	mg/L	0.001	0.0008	0.0011
Selenium	0.0001	mg/L	0.0006	0.0005	0.0004

SHANGHAI

SITE #65

MINFILE# 105M 028

1. LOCATION AND ACCESS

Shanghai is located approximately 4.5km east of the junction of Shanghai Creek and the McQuesten River, on the north side of the river. A 6km road connects the property with the South McQuesten Road, at the airport. Vehicle access to the site is not possible since there is no longer a bridge across the McQuesten River. The approximate UTM co-ordinates are 7 088 950m N and 467 650m E (Latitude: 63° 55' 46" N and Longitude: 135° 41' 08" W).

2. SITE PHYSIOGRAPHY

The site is situated at an elevation of 2100ft (640m) on a flat area, at the toe of a steeper unnamed hill to the north. The site is well vegetated with spruce trees, shrubs, grass, alders, willows and moss. A small, unnamed creek flows to the east and joins the South McQuesten River, 150m to the south. No evidence of permafrost was observed.

3. GEOLOGY AND MINERALIZATION

The face of the main adit dump is composed of highly broken dark gray carbonaceous Keno Hill quartzite with approximately 30% of the area having patches of brown to rusty highly oxidized vein material. On the road near the ore-loading chute, approximately five football size pieces of vein material with up to 50% pyrite were seen.

Government geologist report that the underground working explored two sub-parallel vein faults, 2.0 - 6.0m wide, that converge to the southwest and are mineralized by sphalerite, pyrite and galena occurring in irregular quartz-calcite pods in sheared and brecciated Keno Hill Quartzite. Zinc assays in one oreshoot 51.8m in length graded 13.6% Zn over an average width of 2.m and in another oreshoot 9.1m in length, graded 7.2% Zn across an average width of 1.5m.

The zinc content in these oreshoots is considerable higher than in most of the veins of Galena Hill - Keno Hill. Pyrite content may also be significantly higher as was seen in the few vein specimens seen on the road. The presence of these two minerals could result in an acid rock drainage condition. Siderite is absent, but calcite is reported in reported in the vein fault. The amount of calcite is unknown.

4. SITE HISTORY

From 1927 to 1963, exploration work at the site included shallow shafts, adits and drifts, and bulldozer trenching. In the mid 1960's 786.4m of underground lateral development and 48.8m of raising was carried out. In 1972 an attempt was made to mine high-grade ore. Since then, bulldozer trenching and stripping and drilling was carried out until 1993.

5. MINE DEVELOPMENT

The main adit and rock dump and old campsite were visited. None of the workings centered about 500m northeast of the main adit were visited because of limited time available. No ore was processed at Shanghai and no tailings were encountered. There is no wastewater treatment facility at the site. Site details can be found on Figure 1; site photos are located in Attachment 1 and laboratory results for sampling are in Attachment 2.

5.1 Mine Openings and Excavations

Main Adit (photo 65-1)

The main adit is located roughly 30m north of the clearing where the old camp was and where the waste rock was deposited. A 10m long log portal structure built outside of the adit has collapsed. A stream of water flows from the adit.

Dimensions (L x W x H): 835m (total length of all underground development) x 3m x 2m

Accessibility: The adit can no longer be accessed.

5.2 Waste Rock Disposal Areas (photo 65-2)

Waste rock from the adit is spread over a 48m by 34m area in front of the adit. The water flowing from the adit flows around the waste rock pile on the eastern side. No water was observed on the pile.

The face of the waste rock pile is composed of highly broken dark gray carbonaceous Keno Hill quartzite with approximately 30% of the area having patches of brown to rusty highly oxidized vein material. A sample (Shanghai-Waste Rock-Sept.18/99) of the later material gave a paste pH of 4.7 and conductivity of >1000 μ S/cm.

Most exploration adits generally have a section of the pile where low grade to high grade oreshoot vein material is stored. None was seen at any location along the dump face. It is assumed that no sorting took place.

6. MINE SITE INFRASTRUCTURE

The remains of a building, a fuel cache, core boxes, metal lined storage bin and some rail and ties were encountered. The site was no provided with electricity.

6.1 Building 65A

There is a collapsed rotted wood frame building at the north end of the waste rock pile. There is an old hot water tank in the rubble. No hazardous products were observed.

6.2 Fuel Storage

To the west of the waste rock pile there is a fuel storage area with twenty-four empty 45-gallon drums.

6.3 Rail and Trestle

There are two mine cars and approximately 150m of narrow gauge rail track on top of the waste rock pile.

6.4 Milling and Processing Infrastructure

Between the adit and the waste rock pile there is a 10m by 20m area with are roughly 30 core boxes, some containing core and some empty. To the east of the fuel storage area is a wooden structure with a metal ramp that was used to hand sort the ore.

7. SOLID WASTE DUMPS (photo 65-3)

There is a fair amount of waste near the collapsed building. Material observed include 10m³ of wood waste, 5m³ of asbestos tar paper, metal debris, 20m of water and air pipes, and a receiving air tank 0.7m in diameter and 2.4m high.

8. POTENTIAL CONTAMINANTS OF CONCERN

No hazardous products were encountered. Potential contaminants of concern include metals washing from the waste rock pile, the adit or from the high grade vein pieces.

9. WATER QUALITY

There is a stream of water flowing from the adit at a rate of approximately 4L/sec (visual estimation). The stream flows around the waste rock on the eastern side and presumably joins the South McQuesten River. A sample (Shanghai – 09/18/99) was collected for analysis. The field pH was 6.2 and the conductivity was 480µS/cm. Laboratory results are in Attachment 2.

10. RECLAMATION

The areas around the main adit, the sorting bin and the fuel cache have mature second growth vegetation of primarily willows and alders. There are some small trees and bushes growing in the cleared area where the campsite and waste rock pile are, however most of it does not have any vegetation growing on it

11. **REFERENCES AND PERSONAL COMMUNICATIONS**

Minfile #105M 028

ATTACHMENT 2: 1999 SHANGHAI WATER SAMPLES

LABORATORY RESULTS

Sample Number	Detection Limit	Units	Shanghai - 09/18/99
Site Description			Sample collected from the water coming out of the adit
pH (field)	N/A	pH	6.2
Conductivity (field)	N/A	µS/cm	480
pH (Lab)	0.01	pH	7.6
Conductivity (Lab)	0.01	µS/cm	1350
Total Alkalinity	5	mg CaCO ₃ /L	297
Chloride	0.25	mg/L	<0.25
Hardness (CaCO ₃ equiv)	5	mg/L	814
Nitrate-N	0.05	mg/L	<0.05
Nitrite-N	0.003	mg/L	<0.003
Sulphate	1	mg/L	466
Total Dissolved Solids	5	mg/L	1010
Analysis by ICP-USN			
Aluminum	0.0008	mg/L	0.0456
Antimony	0.005	mg/L	0.005
Arsenic	0.01	mg/L	0.01
Barium	0.00004	mg/L	0.007
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	0.0151
Calcium	0.002	mg/L	208
Chromium	0.00006	mg/L	<0.00006
Cobalt	0.00003	mg/L	0.0005
Copper	0.00003	mg/L	0.00641
Iron	0.00001	mg/L	0.42
Lead	0.0003	mg/L	0.0139
Lithium	0.001	mg/L	0.019
Magnesium	0.0005	mg/L	73.3
Manganese	0.00002	mg/L	0.108
Mercury	0.0001	mg/L	<0.0001
Molybdenum	0.00007	mg/L	0.0005
Nickel	0.00001	mg/L	0.0062
Phosphorus	0.03	mg/L	<0.03
Potassium	0.4	mg/L	1
Selenium	0.004	mg/L	0.006
Silicon	0.004	mg/L	4.29
Silver	0.00005	mg/L	<0.00005
Sodium	0.004	mg/L	1.8
Strontium	0.00002	mg/L	0.615
Sulphur	0.008	mg/L	153
Thallium	0.001	mg/L	<0.001
Titanium	0.00002	mg/L	<0.00002
Vanadium	0.00003	mg/L	<0.00003
Zinc	0.0002	mg/L	1.79
Analysis by Hydride AA			
Arsenic	0.0002	mg/L	0.0073
Selenium	0.0001	mg/L	0.0008

**ATTACHMENT 2: 1999 SHANGHAI WASTE ROCK
LABORATORY RESULTS**

Site Number	Detection Limit	Units	Shanghai - Waste Rock - Sept 18/99
Sample Description			Sample collected from the waste rock pile outside of the adit.
Paste pH (field)	N/A	pH	4.7
Conductivity (field)	N/A	µS/cm	>1000
pH in Saturated Paste			
pH	0.1	pH	3.9
pH in Soil (1:2 water)			
pH	0.01	pH	4.4
ICP Semi-Trace Scan			
Aluminum	5	µg/g	19000
Antimony	2	µg/g	180
Arsenic	2	µg/g	1350
Barium	0.05	µg/g	1.47
Beryllium	0.1	µg/g	<0.1
Bismuth	5	µg/g	<5
Cadmium	0.1	µg/g	2220
Calcium	5	µg/g	864
Chromium	0.5	µg/g	21.6
Cobalt	0.1	µg/g	17.5
Copper	0.5	µg/g	1690
Iron	1	µg/g	140000
Lead	1	µg/g	3450
Lithium	0.5	µg/g	10.8
Magnesium	1	µg/g	2930
Manganese	0.5	µg/g	2980
Mercury	0.01	µg/g	4.2
Molybdenum	1	µg/g	4
Nickel	1	µg/g	61.9
Phosphorus	5	µg/g	152
Potassium	20	µg/g	5800
Selenium	2	µg/g	<2
Silicon	5	µg/g	70
Silver	0.5	µg/g	431
Sodium	5	µg/g	205
Strontium	1	µg/g	1
Sulphur	10	µg/g	183000
Thorium	1	µg/g	<1
Tin	1	µg/g	9
Titanium	0.2	µg/g	56.1
Uranium	5	µg/g	<5
Vanadium	1	µg/g	32
Zinc	0.5	µg/g	160000
Zirconium	0.1	µg/g	12.4

**ATTACHMENT 2: 1999 SHANGHAI 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
Shanghai - Waste Rock - Sept.18/99	Sample collected from the waste rock pile outside of the adit.	5.1	15.40	0.36	470.0	1.4	-468.6	<0.1

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.

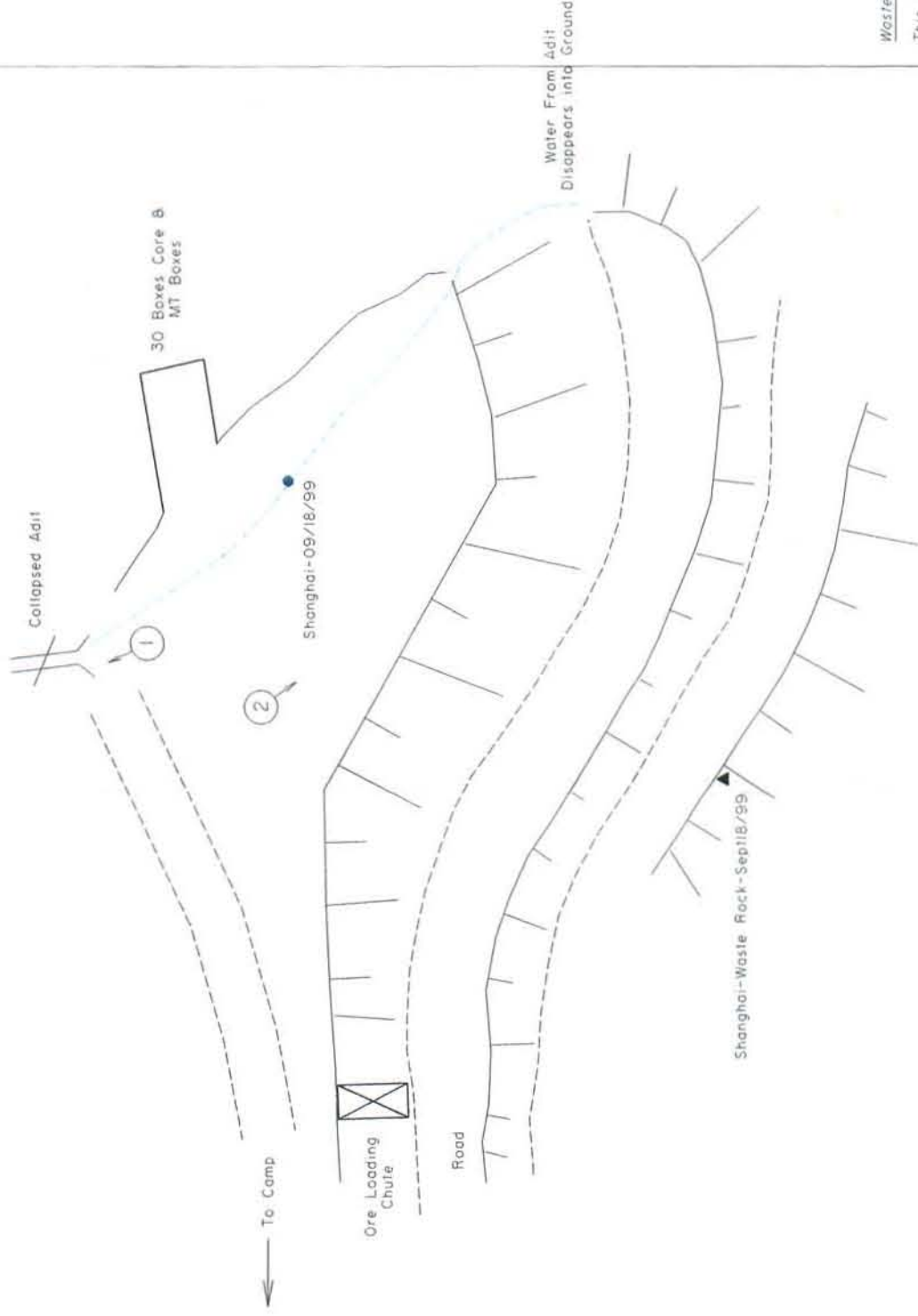
N/D = NO DUPLICATE ASSAY. CALCULATIONS ARE BASED ON ASSAY RESULTS OF THE INITIAL SAMPLE.

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.

- 224 Building (224a, building site present reference*)
- 224a Indicates Asbestos Material
- 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
- 2450-01 1999 Soil Sample (this study)
- Pre 1999 Soil Sample (other sources)
- 2390-01 1999 Waste Rock Sample (this study)
- Pre 1999 Waste Rock Sample (other sources)
- 40-12-06 1999 Water Sample
- Pre 1999 Water Sample
- Tension Cracks
- Mass Movement (note for Forms, BelleKen)
- 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
- Transformer Location (number of transformer in brackets)
- Power Line
- Power Line Collapsed
- Aerial Transmission Towers
- Photo Site (arrow shows view direction)
- GPS Survey Location
- Former Building Site (Eiso)



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) Sphalerite (galena-sphalerite) + quartz-siderite veins.

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

Quartzite:

(2a) Thick bedded, blocky gray quartzite;

(2b) Thin bedded, broken, quartzite with carbonaceous phyllite interbeds;

(2c) Carbonaceous quartzite.

Phyllite:

(1a) Broken sericite-chlorite phyllite;

(1b) Carbonaceous phyllite.



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Canada

Designed by:
C.S.

Drawn by:
J.N. 09

Checked by:

Approved by:

Drawing title:

Titre du dessin:

Shanghai Site #65
Site Assessment
Yukon Territory



Scale: 1:500

CAD FILE: SITE66.DGN

125-12.01

400 no.
drawn no.

1 of 1



Photo 65-1 : Shanghai. Collapsed Main Adit with water flowing. (Azimuth 340°)



Photo 65-2 : Shanghai. Aerial view of waste rock pile and mine site debris. (Azimuth 120°)



Photo 65-3 : Shanghai. Close-up of the scattered debris at the site. (Azimuth 120°)

MOON
SITE #66
MINFILE# 105M 046

1. LOCATION AND ACCESS

The site is located at the base of the north side of Keno Hill, between Faro and McKay Gulch, at an elevation of 2700ft (820m). Access is by an overgrown trail that branches off from the lower Faro Gulch Trail. The approximate UTM co-ordinates are 7 094 050m N and 489 200m E.

2. SITE PHYSIOGRAPHY

The area gently slopes to the north. The site is well vegetated with spruce trees, shrubs, grass and moss. Second growth vegetation of alders and willows grow up to 5m in height in the disturbed areas. Surface runoff flows into Keno Ladue River, located 1km to the north.

3. GEOLOGY AND MINERALIZATION

At the adit site, an approximately 20m wide Tombstone porphyritic sill-like intrusion, gently dipping to the south, within Earn Group carbonaceous phyllite occurs. The light brown colored porphyritic intrusion has fine quartz phenocrysts in a very fine-grained altered matrix with prominent muscovite.

The adit, now collapsed, was driven on a near vertical southwest striking vein which cross-cut the porphyritic intrusion. Mineralized vein material on the dump has quartz and minor siderite gangue, often containing abundant pyrite and lesser amounts of chalcopyrite, sphalerite, arsenopyrite and galena.

4. SITE HISTORY

In 1921, a 30m adit was driven and some hand trenches were excavated. Further trenching was undertaken between 1963 to 1993. In 1963, three drill holes were drilled.

5. MINE DEVELOPMENT

The adit and associated waste rock pile were investigated. No ore was processed at the site and no tailings were encountered. There is no wastewater treatment at this site. Site photos are located in Attachment 1 and laboratory results for sampling are in Attachment 2.

5.1 Mine Openings and Excavations

Moon Adit (photo 66-1)

The adit is located at the north end of the site area, 120m north of the campsite area. The portal and the first 10m of the adit have collapsed.

Dimensions (L x W x H): 1.5m x 1.5m x 30m

Supports: Log cribbing supported the portal.

Condition: The log cribbing is broken up and has collapsed. The first 10m of the adit has caved-in. The ground above the remainder of the adit appears stable.

Accessibility: The adit can still be accessed by an opening exposed by the cave-in.

5.2 Waste Rock Disposal Areas (photo 66-2)

There is a waste rock pile located near the entrance to the adit. Mineralized vein material on the dump has quartz and minor siderite gangue, often containing abundant pyrite and lesser amounts of chalcopyrite, sphalerite, arsenopyrite and galena. Oxidization is absent to very weak. On the waste rock pile are metal drums and a truck box containing sorted highly oxidized vein material are likely ore stockpiles. A waste rock sample (Moon-waste rock-Sept 18/99) was collected for analysis. The field paste pH was 3.6 and the conductivity was >1000 μ S/cm.

6. MINE SITE INFRASTRUCTURE

Three buildings and two fuel caches were encountered at this site. There is no electricity to the site. No rail or trestle was encountered.

6.1 Buildings

Building 66A (photo 66-3)

There is a flat roofed wooden shack located on the west side of the site. The building was likely used as sleeping quarters.

Dimensions (L x W x H): 6.1m x 3.0m x 2.4m

Paint: The building was not painted.

Asbestos: The roof is covered in asphalt asbestos roofing.

Foundation: none

Non-Hazardous Contents: The shack was filled with non-hazardous debris such as glass and metal.

Hazardous Contents: No hazardous contents were observed.

Building 66B (photo 66-4)

This peaked plywood and stud frame building is located 29m east of building 66A. It appears to have been a workshop.

Dimensions (L x W x H): 4.3m x 4.3m x 3.7m

Paint: The building is not painted.

Asbestos: No asbestos containing materials were observed.

Foundation: none

Non-Hazardous Contents: Inside the building there is assorted non-hazardous debris such as glass and metal and an empty 45-gallon drum.

Hazardous Contents: Inside and scattered outside there are three truck batteries and other car parts.

Building 66C (photo 66-5)

This building is a portable wooden structure on an iron skid that houses a kitchen inside.

Dimensions (L x W x H): 6.1m x 3.0m x 2.4m

Paint: Besides a painted 'Wide Load' sign above the door, the building is not painted.

Asbestos: No asbestos containing materials were encountered.

Foundation: The building rests on iron skids.

Non-Hazardous Contents: No non-hazardous contents were encountered.

Hazardous Contents: No hazardous contents were encountered.

6.2 Fuel Storage

Fuel Cache #1

Twenty-three empty fuel drums were encountered 13m east of Building 66A.

Fuel Cache #2

Ten empty fuel drums were encountered 20m south of Building 66C.

7. SOLID WASTE DUMPS

A small solid waste dump is located above the adit. It contained batteries for vehicles, empty 45-gallon drums, a potbelly stove, and asbestos covered hoses.

8. POTENTIAL CONTAMINANTS OF CONCERN

Potential contaminants of concern include acid leaching from the batteries and any metals leaching from the waste rock pile or ore stockpiles.

9. WATER QUALITY

No surface water was encountered.

10. RECLAMATION

Thick second growth vegetation of willows and alders has revegetated the disturbed ground in most areas.

Small bushes are growing on the adit cave-in and the waste rock pile. The ore stockpile is in the bed of a truck and therefore has no vegetation growing on it.

11. REFERENCES AND PERSONAL COMMUNICATIONS

Minfile #105M 046

ATTACHMENT 2: 1999 MOON WASTE ROCK

LABORATORY RESULTS

Site Number	Detection Limit	Units	Moon - Waste Rock - Sept 18/99
Sample Description			Sample collected from the waste rock pile outside of the Moon Adit.
Paste pH (field)	N/A	pH	3.6
Conductivity (field)	N/A	µS/cm	>1000
pH in Saturated Paste			
pH	0.1	pH	1.8
pH in Soil (1:2 water)			
pH	0.01	pH	3
ICP Semi-Trace Scan			
Aluminum	5	µg/g	3020
Antimony	2	µg/g	1070
Arsenic	2	µg/g	475
Barium	0.05	µg/g	19.6
Beryllium	0.1	µg/g	<0.1
Bismuth	5	µg/g	121
Cadmium	0.1	µg/g	77.3
Calcium	5	µg/g	92
Chromium	0.5	µg/g	2.7
Cobalt	0.1	µg/g	7.4
Copper	0.5	µg/g	212
Iron	1	µg/g	170000
Lead	1	µg/g	60500
Lithium	0.5	µg/g	4.5
Magnesium	1	µg/g	270
Manganese	0.5	µg/g	101
Mercury	0.01	µg/g	0.03
Molybdenum	1	µg/g	10
Nickel	1	µg/g	12.9
Phosphorus	5	µg/g	24
Potassium	20	µg/g	730
Selenium	2	µg/g	<2
Silicon	5	µg/g	325
Silver	0.5	µg/g	815
Sodium	5	µg/g	261
Strontium	1	µg/g	2
Sulphur	10	µg/g	82000
Thorium	1	µg/g	20
Tin	1	µg/g	4
Titanium	0.2	µg/g	25.3
Uranium	5	µg/g	<5
Vanadium	1	µg/g	5
Zinc	0.5	µg/g	6890
Zirconium	0.1	µg/g	9.9

**ATTACHMENT 2: 1999 MOON 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
Moon - Waste Rock - Sept.18/99	Sample collected from the waste rock pile outside of the Moon Adit.	3.3	11.20	2.30	278.1	-23.5	-301.6	<0.1

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*)

□ 22A* Indicates Asbestos Material

□ 22A Collapsed Building

□ 22A Collapsed Adit

□ 22A Collapsed Adit

□ 22A Collapsed Adit

□ 22A Collapsed/Backfilled Shaft

□ 22A Mine Rock Dump

□ 22A Bedrock Open Pit

□ 22A Trench

□ 22A Stripped Overburden Stockpile

□ 22A Stripped / Disturbed Area

□ 22A Outcrop Boundary

□ 22A Highway

□ 22A Road (gravel, 2 wheel drive)

□ 22A Road (gravel, 4X4 accessible)

□ 22A Road (inaccessible)

□ 22A Trail

□ 22A Culvert

□ 24501-01 1999 Soil Sample (this study)

□ 24501-01 Pre 1999 Soil Sample (other sources)

□ 24501-01 1999 Waste Rock Sample (this study)

□ 24501-01 Pre 1999 Waste Rock Sample (other sources)

□ 24501-01 1999 Water Sample

□ 24501-01 Pre 1999 Water Sample

□ 24501-01 Tension Cracks

□ 24501-01 Mass Movement (note: for Forms; BelleKen)

□ 24501-01 Groundwater Seep

□ 24501-01 Surface Water Flow (Stream, Creek, River)

□ 24501-01 Lake

□ 24501-01 Settling Pond / Water Treatment Pond

□ 24501-01 Tailings Dam / Tailings Pond / Mill Tails

□ 24501-01 Ponded Water / Trench

□ 24501-01 Barrels

□ 24501-01 Abandoned Equipment (compressors, ore cars, rails, air and water pipe)

□ 24501-01 Mine Rails / Trestle

□ 24501-01 Collapsed Trestle

□ 24501-01 Solid Waste Disposal Site

□ 24501-01 Area of Soil Contamination

□ 24501-01 Transformer Location (number of transformer in brackets)

□ 24501-01 Power Line

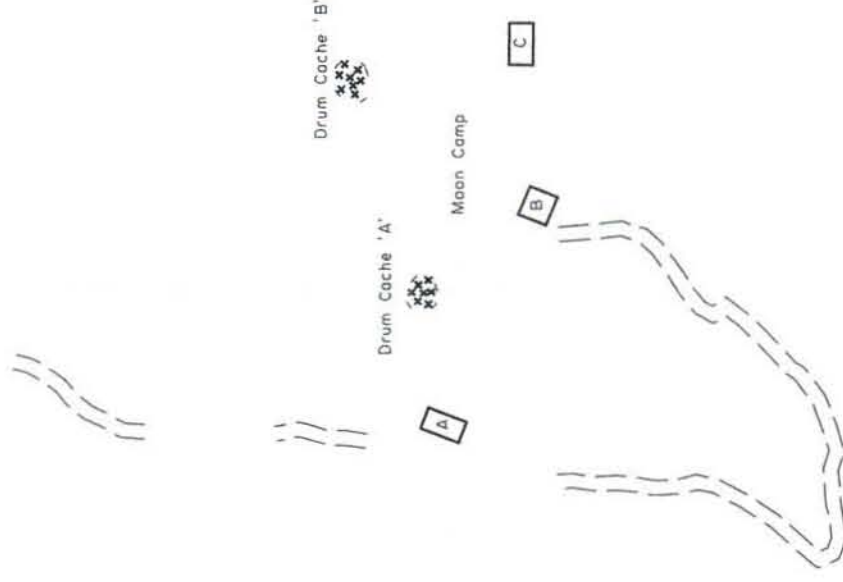
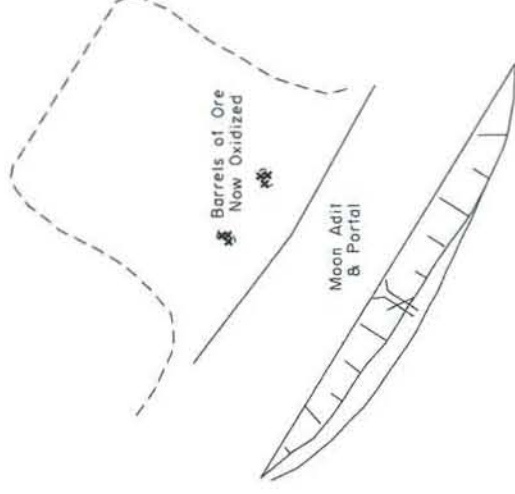
□ 24501-01 Power Line Collapsed

□ 24501-01 Aerial Transmission Towers

□ 24501-01 Photo Site (arrow shows view direction)

□ 24501-01 GPS Survey Location

□ 24501-01 Former Building Site (Eiso)



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).

Quartzite: (5) Undifferentiated, unconsolidated calluvium, 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.

Greensstone: (3) Amphibole-chlorite-plagioclase metadiorite or melagabbro.

Quartzite: (2a) Thick bedded, blocky gray quartzite;

(2b) Thin bedded, broken, quartzite with carbonaceous phyllite interbeds;

(2c) Calcareous quartzite.

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

(1b) Carbonaceous phyllite.



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designed by:
conceded per:
drawn by:
checked per:
approved by:
approved per:
revisions:

C.S. Nov. /99

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1 of 1



Scale 1:1000

CAD FILE SITE66.DGN



Photo 66-1 : Moon. The first 10m of the portal structure into the Moon adit has collapsed. (Azimuth 216°)



Photo 66-2 : Moon. Ore stockpiled in a truck box, portal structure in the background. (Azimuth 275°)

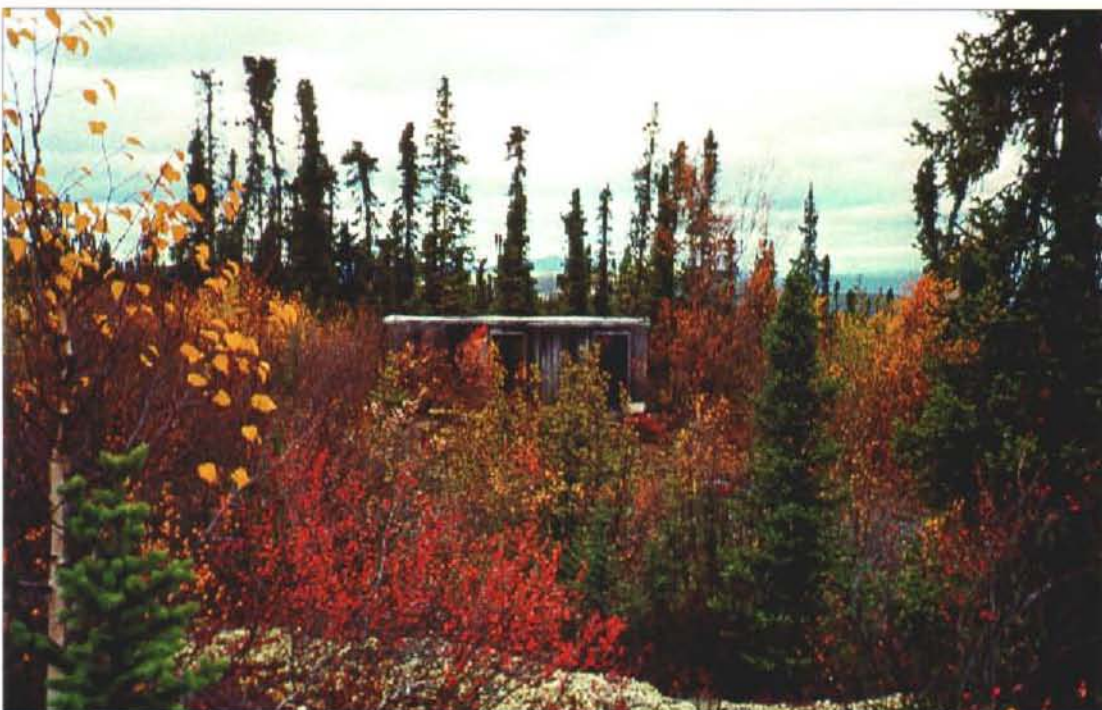


Photo 66-3 : Moon. Building 66A, most likely it was used as sleeping quarters. (Azimuth 315°)

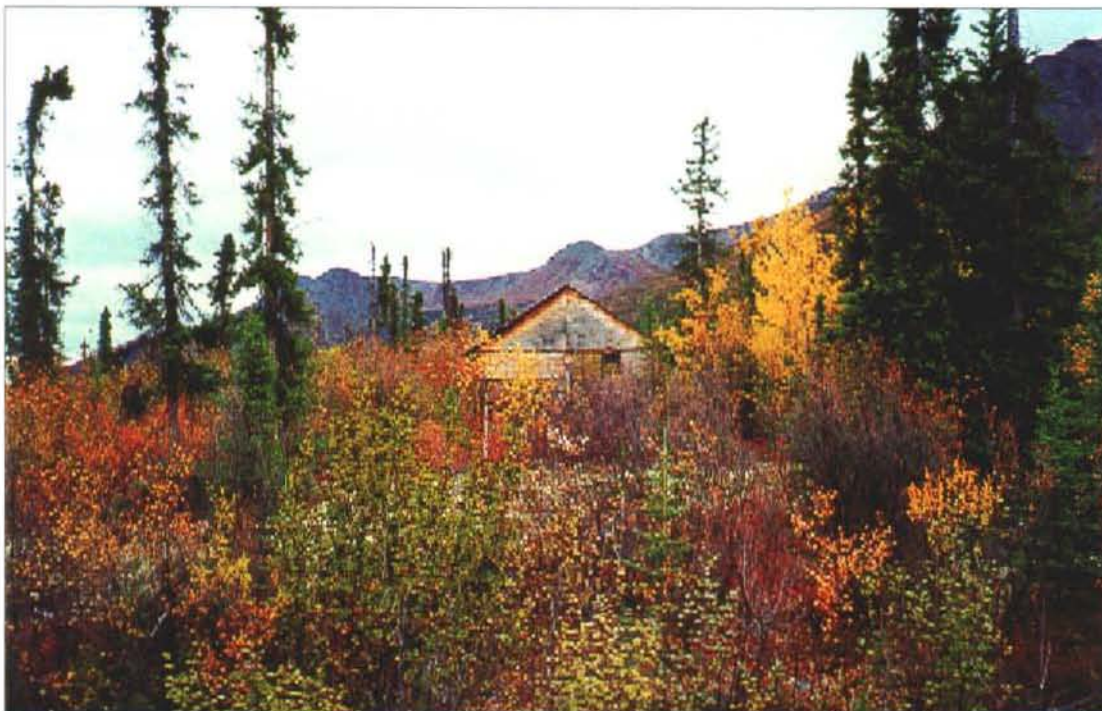


Photo 66-4 : Moon. Building 66B, possibly it was a workshop. (Azimuth 135°)

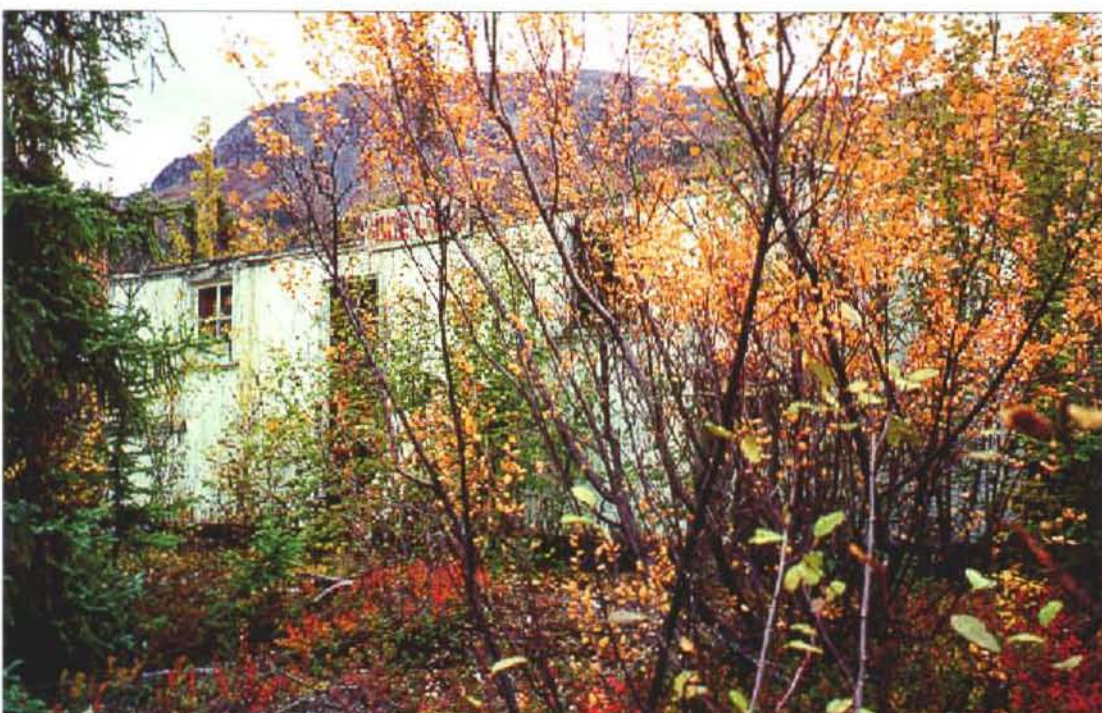


Photo 66-5 : Moon. Building 66C, the kitchen is on an iron skid. (Azimuth 180°)

MT. HINTON (#68)
MINFILE# 105M 052

1. LOCATION AND ACCESS

The Mt. Hinton site lies on the northern face of Mount Hinton at the head of McNeil Gulch. The site can be accessed in good weather conditions by helicopter. It is about 11 km east-southeast from Keno City. There were two workings observed at the site during a helicopter fly-by. Poor flying conditions prevented access to the site. The UTM coordinates for the adits are approximately 7083250 m N 494450 m E and 7083370 m N 495070 m E. The minfile reports the presence of three occurrences at the Mt. Hinton site. The workings observed from the air are presumed to be the Centre occurrence and the Northeast occurrence. The elevation of the Centre occurrence is about 1750 m. The elevation of the Northeast occurrence is about 1600 m. A Southwest occurrence was not observed.

2. SITE PHYSIOGRAPHY

The Mt. Hinton site lies on a very steep rocky slope, part of the McNeil cirque. Surface water runoff from this area drains towards McNeil Gulch.

3. GEOLOGY AND MINERALIZATION

The geology of the site could not be verified due to access problems. The minfile reports the occurrence of 35 veins in the area. The host rocks are medium to thick bedded quartzite and carbonaceous phyllite with greenstone lenses. The veins are mineralized with arsenopyrite, galena, jamesonite, pyrite, sphalerite, siderite and gold in a quartz gangue.

4. SITE HISTORY

The minfile reports that the Mt. Hinton site was first developed at the Northeast occurrence in 1941. The workings consisted of hand trenching and a 37 m adit. Trenching, drilling and shafting took place at the Centre occurrence from 1966 to 1968. Drilling occurred at the Southwest occurrence in 1980. In 1984, a 48 m crosscut adit and 49 m of drifting was developed at the site.

5. MINE DEVELOPMENT

5.1 Mine Openings and Excavations

Poor flying conditions prevented access to the site and exploration of the mine workings. The minfile reports that the Mt. Hinton site has two adits and a shaft. It appears as if there is an adit at

the Northeast occurrence (photo 68-1). The Centre occurrence appears to be the site of a shaft and possibly an adit (photo 68-2). The Southwest occurrence was not observed.

5.2 Waste Rock Disposal Areas

Any waste rock disposal areas at the Mt. Hinton site would have been covered in snow and therefore unobservable from the helicopter.

5.3 Tailings Impoundments

No tailings were observed at the Mt. Hinton site.

5.4 Minesite Water Treatment

No water treatment occurs at the Mt. Hinton site.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

A small wooden shack was observed at the Northeast occurrence. The details about the structure and contents of the shack are unknown.

6.2 Fuel Storage

There was no fuel storage observed at the Mt. Hinton site.

6.3 Rail and Trestle

There was no evidence of rail and trestle at the Mt. Hinton site.

6.4 Milling and Processing Infrastructure

There was no evidence or record of milling or processing activities occurring at the Mt. Hinton site.

6.5 Electrical Equipment

There was no electrical equipment observed at the Mt. Hinton site.

7. SOLID WASTE DUMPS

No solid waste dumps were observed at the Mt. Hinton site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were observed at the Mt. Hinton site.

9. WATER QUALITY

No surface water was observed at the Mt. Hinton site. Surface water runoff from the area drains towards McNeil Gulch. No water quality samples were taken at this site.

10. RECLAMATION

The Mt. Hinton site lies on the face of a steep rocky slope unsuitable for significant vegetation growth. There have been no known reclamation measures carried out by past or present operators of the site.

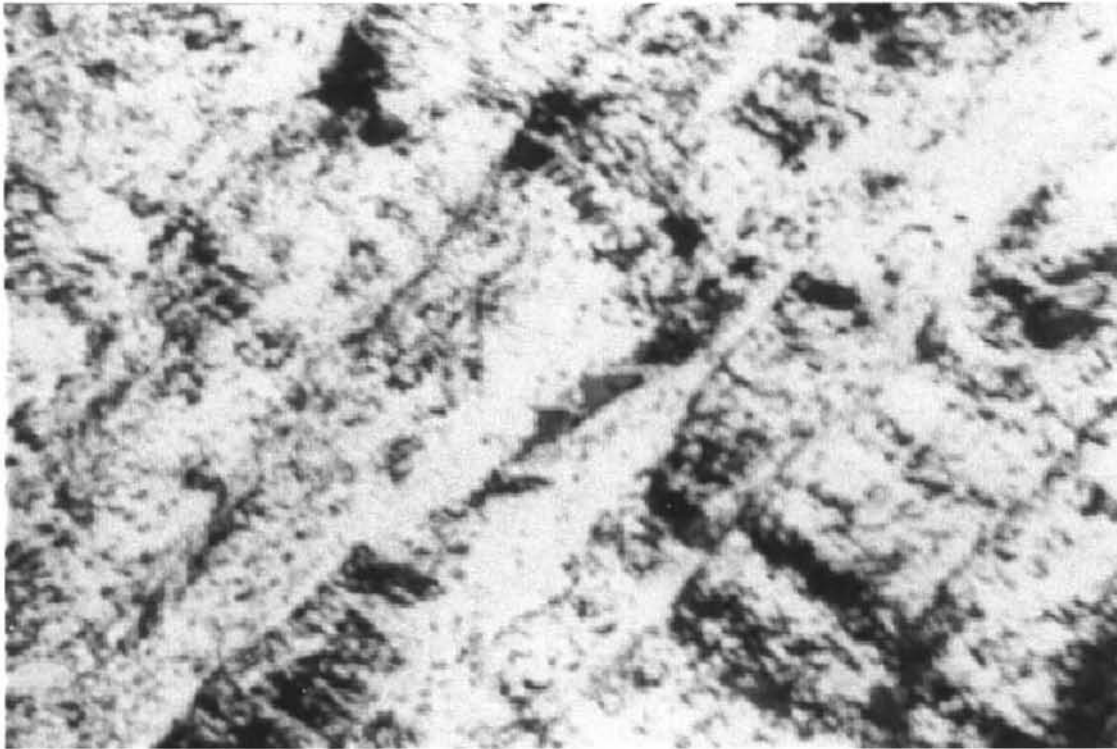


Photo 68-1: Aerial photograph of Mt. Hinton Adit1 located at centre of photograph.

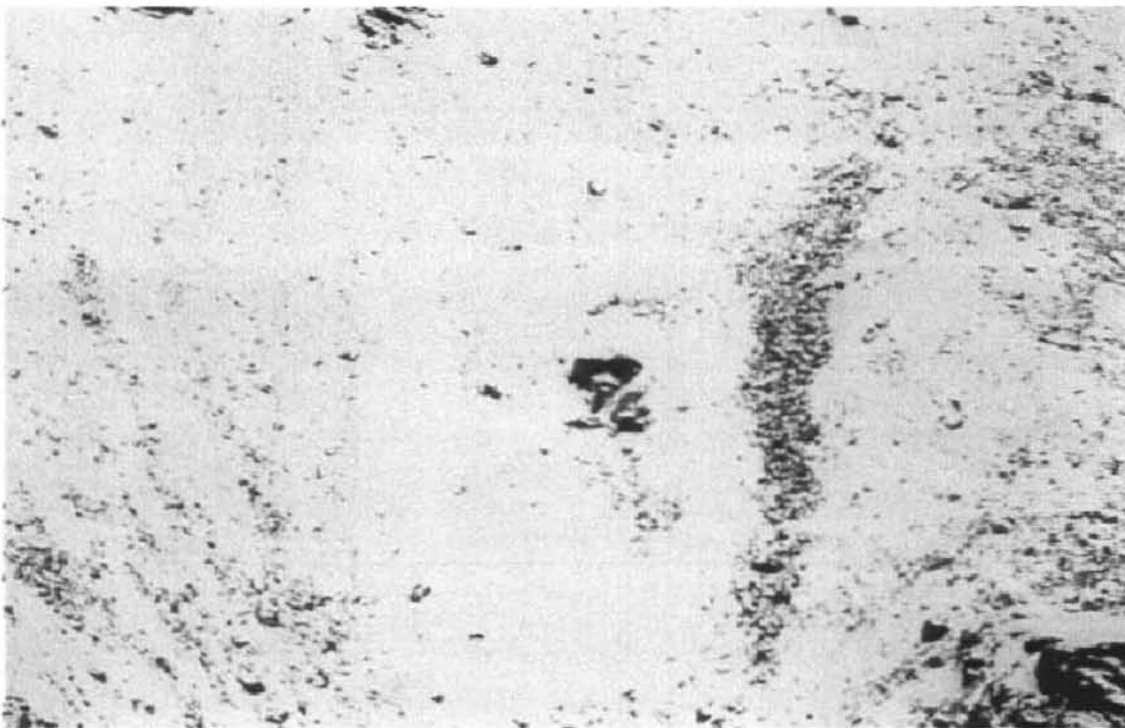


Photo 68-1: Aerial photograph of Mt. Hinton Adit2 located at centre of photograph.

AVENUE (#69)
MINFILE# 105M 053

1. LOCATION AND ACCESS

The Avenue site is accessible by helicopter. It is located about 10 km northeast of Keno City on a plateau midway between the Caribou Hill and Beauvette Hill summits. The elevation of the site is about 1525 m. It lies at the edge of a slope that drops steeply to the north towards Keno Ladue Creek. There are two series of trenches at this site. A rough trail leading up the southeastern slope of Keno Hill can be seen from the air. This trail leads to a series of trenches at the western side of the site. The UTM coordinates for the western trenches are 7091700 m N 493500 m E. The UTM coordinates for the eastern trenches are 7091900 m N 493940 m E.

2. SITE PHYSIOGRAPHY

The Avenue site lies on a plateau between Caribou Hill and Beauvette Hill above the tree line (photo 69-2). Permafrost lies under the entire site. Most of the site slopes gently to the southeast and drains down the slope towards Faith Creek. A series of trenches at the eastern side of the site slope to the north at the edge of a cliff. These trenches drain off the cliff towards Keno Ladue Creek.

3. GEOLOGY AND MINERALIZATION

Greenstone boulders predominated in the overburden at the Avenue site. The major rock types observed at the site included greenstone sills and green and grey non-calcareous phyllite. The greenstone in areas was weathered to a dun brown color. The mineralization observed at the site included quartz with limonitic alteration and minor sphalerite, galena and possibly siderite. Minor occurrences of the sulphide sphalerite were observed in gossanous limonitic material. The minfile reports the presence of a narrow vein with argentiferous galena over a strike length of 1220 m in quartzite and phyllite and a 10 cm pyrrhotite vein. The carbonate siderite may also be present. There were minor occurrences of calcite observed in vein material.

4. SITE HISTORY

The minfile for the site reports that bulldozer trenching occurred at Avenue beginning in 1953 and continued intermittently until 1979.

5. MINE DEVELOPMENT

5.1 Mine Openings And Excavations

There were 8 trenches observed at the Avenue site. Five are located on western side of the site at the end of a trail leading up the southeast slope of Keno Hill (photo 69-1). They lie at the base of a small hill. Three more trenches lie about 200 m to the east. Two are at the edge of a cliff sloping to the north. The other lies on the plateau about 75 m further east. A pit is located among the western series of trenches. Trenches 1 to 8 and Pit 1 are described below in order from the west to east.

Trench 1

Shallow trench

Location: westernmost trench at the Avenue site lying about 30 m west of Trench 2

Dimensions (L x W x H): 60 m x 2.5 m x 0.5 m - longitudinal bearing AZ 300

Condition: stable - 90% revegetated

Trench 2

Shallow trench with a small pit at the NW end (photo 69-3)

Location: about 30 m east of Trench 1 and about 30 m west of Pit 1

Dimensions (L x W x H): 78 m x 4 m x 1 m - longitudinal bearing AZ 330

Condition: stable - 30% revegetated

Pit 1 (photo 69-4)

Narrow pit

Location: at the SW end of Trench 3 about 30 m east of Trench 2

Dimensions (L x W x H): 6 m x 3 m x 3 m - longitudinal bearing AZ 260

Condition: stable - gentle slopes are 30% revegetated

Trench 3 (photo 69-5)

Shallow trench

Location: runs between Pit 1 and Trench 4

Dimensions (L x W x H): 30 m x 6 m x 1 m - longitudinal bearing AZ 219

Condition: stable - 20% revegetated

Trench 4

Narrow trench

Location: runs perpendicular to Trench 3

Dimensions (L x W x H): 30 m x 3 m x 2 m – longitudinal bearing AZ 309

Condition: stable - 5% revegetated

Trench 5

Trench

Location: about 10 m east of Trench 4

Dimensions (L x W x H): 20 m x 5 m x 2 m – longitudinal bearing AZ 51

Condition: stable - 5% revegetated

Trench 6 (photo 69-6)

Trench

Location: about 200 m east of Trench 5 and parallel to Trench 7 - longitudinal bearing is approximately NNW

Dimensions (L x W x H): 30 m x 3 m x 1.5 m

Condition: stable - 70% revegetated

Trench 7

Shallow trench

Location: parallel to Trench 6 about 10m to east - longitudinal bearing is approximately NNW

Dimensions (L x W x H): 30 m x 3 m x 0.5 m

Condition: stable - 70% revegetated

Trench 8 (photo 69-7)

Trench

Location: 75 m east of Trench 7

Dimensions (L x W x H): 30 m x 2.5 m x 1 m – longitudinal bearing AZ 33

Condition: stable - 70% revegetated

5.2 Waste Rock Disposal Areas

There were piles of overburden observed at each trench at the Avenue site. The size of the piles varied with the size of the trenches. Three piles of overburden totaling about 750 tonnes of material are associated with Pit 1 and Trenches 1 and 2. There were no waste rock piles containing major mineralization observed at the site.

5.3 Tailings Impoundments

No tailings were observed at the Avenue site.

5.4 Minesite Water Treatment

No water treatment occurs at the Avenue site.

6. MINE SITE INFRASTRUCTURE

No infrastructure was observed at the Avenue site.

7. SOLID WASTE DUMPS

No solid waste dumps were observed at the Avenue site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were observed at the Avenue site.

9. WATER QUALITY

No surface water was observed at the Avenue site. Surface water drainage from the area drains toward Faith Creek and Keno Ladue Creek. No water quality samples were taken at this site.

10. RECLAMATION

The disturbed areas of the Avenue site have largely been reclaimed by natural vegetation. The extent of revegetation varies from 15 to 90 percent depending on the suitability of the soils.



Photo 69-1: Aerial photograph of Avenue site showing western trenches. Pit 1 and Trench 4 are clearly visible just below centre of photograph. Trench 2 can be seen in upper righthand corner. Trail leading up southeastern slope of Keno Hill enters photograph from upper lefthand corner.



Photo 69-2: Aerial photograph of Avenue site with a good view of plateau. Trench 2 is visible just below centre of photograph.

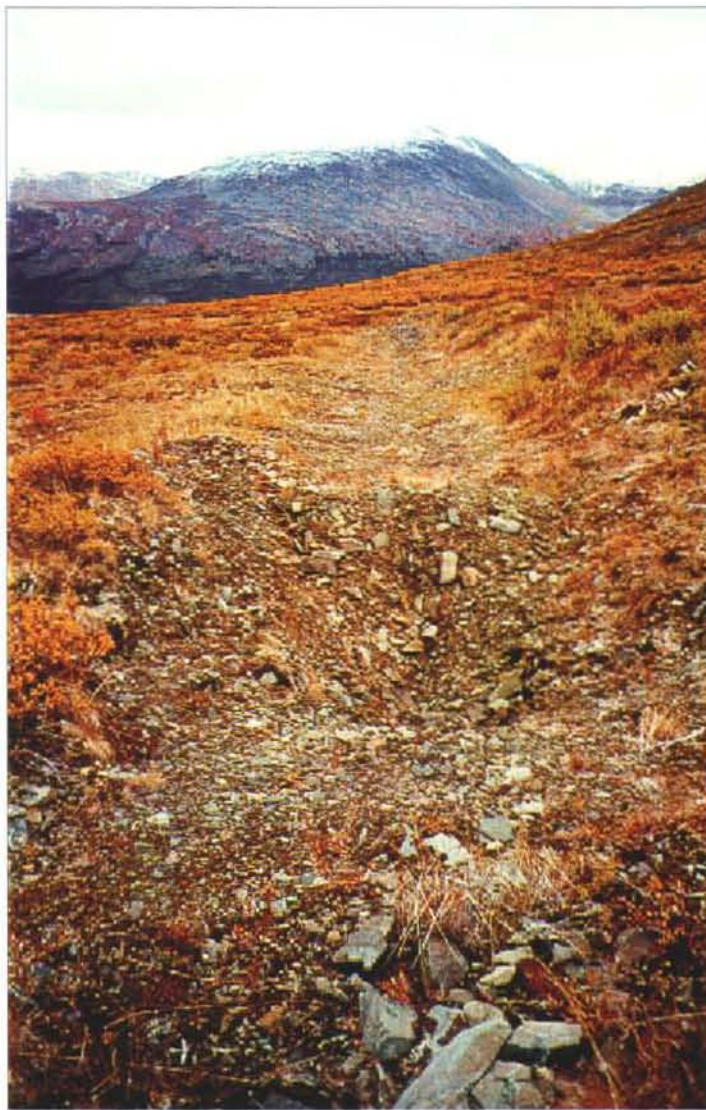


Photo 69-3: View along length of Trench 2 with small pit in foreground. (AZ 149)

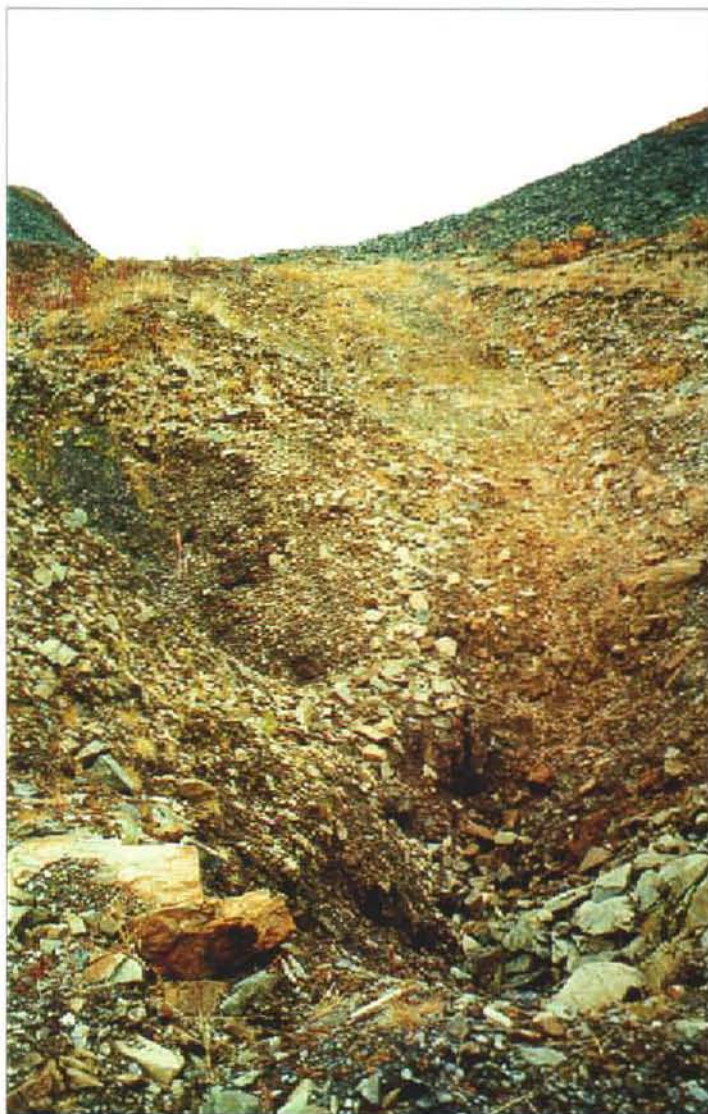


Photo 69-4: View of Pit 1 at Avenue site. (AZ 266)



Photo 69-5: View along length of Trench 3 with Trench 4 crossing it in foreground. (AZ 219)



Photo 69-6: View about NNW along length of Trench 6.



Photo 69-7: View along length of Trench 8. (AZ 033)

YONO (#70)
(MINFILE# 105M 55)

1. LOCATION AND ACCESS

The Yono site is in Thunder Gulch on the southwest side of Bunker Hill. It can be accessed in a four-wheel drive vehicle on Upper Thunder Gulch Trail that leads up and over the western slope of Bunker Hill (photo 70-1). This trail switches back from Thunder Gulch Trail a few hundred metres past Bellekeno. The UTM coordinates of the Yono site are 7085660 m N 489400 m E. The elevation of the site is about 1300 m.

2. SITE PHYSIOGRAPHY

The Yono site is near the bottom of Thunder Gulch. The trenches on site lie on a gentle hill sloping towards the creek.

3. GEOLOGY AND MINERALIZATION

The major rock type observed at the Yono site is grey and light brown quartzite. Minor white quartz veining was found with minor limonite. The minfile reports the presence of minor amounts of argentiiferous galena in a small vein.

4. SITE HISTORY

The minfile reports that the work conducted at the Yono site included hand and bulldozer trenching at various times between 1963 and 1994. No major development has occurred.

5. MINE DEVELOPMENT

5.1 Mine Openings and Excavations

Trench 1 (photo 70-2)

Location: up hill from Upper Thunder Gulch Trail, 102 m east of Trench 2

Dimensions: 22 m x 5 m x 0-2 m – longitudinal bearing AZ 189

Condition: stable – 40% revegetated

Access: by foot from Upper Thunder Gulch Trail

Trench 2

Location: beside Upper Thunder Gulch Trail

Dimensions: 48 m x 5 m x 0-4 m – longitudinal bearing AZ 030

Condition: stable – 20% revegetated

5.2 Waste Rock Disposal Areas

Trench 1 waste rock pile (Photo 70-3)

A pile of waste rock from Trench 1 was bulldozed at the mouth of the trench. It consists mostly of overburden with traces of rusting on 30% of the rocks.

5.3 Tailings Impoundments

No tailings were observed at the Yono site.

5.4 Minesite Water Treatment

No water treatment occurs at the Yono site.

6. MINE SITE INFRASTRUCTURE

No infrastructure was observed at the Yono site

7. SOLID WASTE DUMPS

No solid waste dumps were observed at the Yono site.

8. POTENTIAL CONTAMINANTS OF CONCERN

No potential contaminants of concern were observed at the Yono site.

9. WATER QUALITY

There was no surface water observed at the Yono site. Water runoff from the site drains towards Thunder Gulch.

10. RECLAMATION

There is significant reclamation of the Yono site by natural vegetation. Revegetation was observed in both trenches. There have been no known reclamation measures carried out by past or present operators of the site.



Photo 70-1 View from east of Thunder Gulch and access to Yono site. Sourdough Hill is visible in lefthand background.



Photo 70-2: View of Trench 1 at Yono site. (AZ 189)



Photo 70-3: Bulldozed overburden at the mouth of Trench 1.