

ONEK MINESITE (#19)

MINFILE# 105M 001u

1. LOCATION AND ACCESS

The 400 level adit discharges within City limits, with occupied residences within 100 m of the portal and is accessible via a residential streets/roads. Some of the old minesite buildings have been occupied by residents of the town. (These buildings were not included in this assessment). The site is positioned at an elevation of 1050 m. The location is given as 63°54'42"N and 135°15'24"W. UTM co ordinates are 7087196.331m N 487406.286m E.

2. SITE PHYSIOGRAPHY

The site has been developed on the south slope of Keno Hill immediately north east of Keno City. The main open pit area is located on a relatively flat plateau above the Town with the large excavations perpendicular to the hillside (photo 19-1). The north (uphill) end of the pit area is at a considerably higher elevation than the southern end and due to the site aspect and slope is not visible from the compound area immediately south of the pits. The former site has been developed down the hillside and is crisscrossed with gravel roads up to the pit area. The intermediate area has been overgrown with second growth forest and former buildings in this area are difficult to locate. The adit opens to the south at the bottom end of the slope. The adit itself is at a slightly higher elevation than the adjacent buildings and the site is forested immediately above the adit.

Site drainage from the 400 level portal (photo 19-2) and adjacent compressor building/garage site (lower site) is along a well defined discharge seep (photo 19-3) from the adit, extending south across the main site access road and flowing past residential buildings located within town limits. No clear drainage pathways were identified at the upper site. Drainage from the upper site appears to be partially downhill toward the lower (adit) site as well as down the steep slope south east towards Lightning Creek.

A portion of the minesite also occupies an area south of the town road that accesses the site. This area is partially overgrown and is downhill from the lower site. Drainage from the portal runs to the north of this location.

3. GEOLOGY AND MINERALIZATION

The host rocks are Keno Hill Quartzite, medium to thick-bedded, with carbonaceous phyllite and greenstone lenses. The vein is a fault breccia zone 3 m to 6 m wide. Near surface galena, freibergite, chalcopyrite, anglesite, cerussite and oxidized siderite are the ore minerals. Sulphide

minerals were noted to be very rare during inspection of the open pit and its waste dumps, due to intense weathering prior to mining. Limonite and manganese oxides are common.

On the 400 level, sulphides are common, and the vein is dominated by sphalerite in a siderite gangue. Galena, freibergite, and pyrite are present.

4. SITE HISTORY

In the period 1920 to 1924 two shafts were sunk at the site, one to a depth of 41 m. Drifting was done on two levels. Between 1950 and 1952, the shafts were rehabilitated and an adit was driven in at the 400 level. 396 m of drifting, raising and mining of development ore was done through this adit. In 1987 and 1988, open pit production was completed from the crown pillars and around the shafts. This mine is scheduled for future underground production. The adit is subject to ice plug formation and damming, with at least three plug failures in the past.

5. MINE DEVELOPMENT

5.1 Mine Openings And Excavations

The site consists of the 400 level adit at the lower area and two large joined pits above the upper camp. A shaft formerly present within the pits was destroyed during development of the pits. See map in Figure 1.

400 Level Portal (photo 19-2)

The portal was constructed circa 1950 and has been damaged by ice plug damming. Recent rehabilitation includes excavation of rotten timbers and removal of the track to improve flow of water away from residences. The adit has been sealed to restrict air-flow and a heat-traced pipe was installed to prevent future ice plug damming.

Location: See map. North east edge of Keno City.

Dimensions (L x W x H): About 2 m x 2 m, over 1000 m of underground development.

Supports: Wooden timbers in fair condition.

Condition: The portal timbers appear to be sound, recent rehabilitation.

Accessibility: Adit is sealed with boards. Nearby residents can inspect regularly.

Lone Star Shaft

The shaft is mostly filled with open pit rock. Some timbers and pipes are visible from the pit.

Location: See map.

Dimensions (L x W x H): Unknown dimensions; originally depth approximately 100m.

Supports: Timbers are present, however, they have been extensively filled in and do not appear to be supporting the structure.

Condition: Appears to be stable. The material inside the shaft may be settling.

Accessibility: Inaccessible, except for 5 m deep hole within open pit. Material filling shaft may settle. Low risk site, hazard similar to adjacent open pit walls.

Open Pits (photo 19-1)

The Lone Star and Fisher pits are joined to form one open-cut pit. There is a highwall to the northeast, with level access from the southwest.

Location: See map.

Dimensions (L x W x H): The pit is approximately 600 m long and averages approximately 75 m wide. Maximum depth is 56m at the northeast end.

Condition: Pit walls appear to be stable, with some sloughing of loose material (especially from the northwest wall).

Accessibility: The pit is easily accessible by road from below or above the pit. It is possible to drive into or around the pit.

5.2 Waste Rock Disposal Areas

Waste rock pile – Open Pit (photo 19-4)

Pit waste is stored in approximately six major dumps around the perimeter of the pit. These dumps total 544,300 tonnes, and are described in the Access Site Characterization report. In addition to the waste rock, there are several small (approx. 1000 tonnes) piles of low grade ore stockpiled on the tops of the waste dumps. These dumps are siderite-rich, and highly oxidized. The waste rock has local natural revegetation where there is enough fine-grained material and water. The waste rock was highly oxidized prior to mining, and has only trace amounts of sulphide minerals (less than 0.1% average). Overburden material is a small percentage of the waste dump. Water does not flow on surface in the pit area, and is likely funneled through the underground workings.

Location: See map.

Dimensions (L x W x H): Not applicable.

Sampling: No samples of open pit material were collected (see Access data). A sample of the low grade/oxide ore was tested for paste pH and conductivity (19_WR_TPBM_05).

Waste rock pile – 400 Level Portal (photo 19-3)

Waste rock from underground was dumped along the rail tracks on surface, and spread around the work area. There is approximately 5000 to 10,000 tonnes of mine waste in this area. Much of this material is mineralized with iron sulphides, with traces of sphalerite and galena. Most of this area is

not revegetated despite clearing ca. 1950. There is local evidence of vegetation mortality. There is local staining related to sulphide oxidation, with yellow and orange colours developed on originally grey rock. Analytical results show high metal levels and indicate Acid Rock Drainage, however sulphide sulphur levels are moderate to low (1.69%, 0.29%).

Location: See map.

Dimensions (L x W x H): About 100m x 50m (measure from map). Estimated average depth of mine waste 1 m.

Samples: Four sites were tested for paste pH and conductivity in the field (19_WR_TPBM_01, 10_WR_TPBM_02, "03" and "04") and two of these samples were analyzed.

Laboratory and field results are provided in Attachment B.

5.3 Tailings Impoundments

No tailings impoundments were observed at the site.

5.4 Minesite Water Treatment

No water treatment facilities were observed at the site.

6. MINE SITE INFRASTRUCTURE

6.1 Buildings

The buildings have been constructed down the steep slope of Keno Hill at five separate locations. There are: four buildings located at the upper camp site; the remains of four buildings located at the lower site; a small explosives shed at the top end of the site above the pit; the remains of three large warehouse type buildings approximately half way between the two main sites; and the remains of approximately two buildings at the loadout area below the lower site.

Building 19A (photo 19-5)

With the exception of the trailer, this is the largest building at the upper site. The building appears to have been used for miscellaneous storage including some hazardous material.

Location: Southernmost building on gravel pad at upper camp (adjacent to open pits).

Dimensions (L x W x H): 7 m x 2 m x 2.5 m.

Construction: Painted wood frame; unpainted wood floor interior; rolled asphalt roof; building was formerly electrified.

Paint: Weathered green painted exterior (not sampled).

Asbestos: None.

Non-Hazardous contents: Small maintenance materials; miscellaneous supplies; filters; stretcher; safety clothing.

Foundation: None; building on metal skids.

Hazardous products: 22 L pail lube oil; small vol. waste oil; 2 – 22 L pails antifreeze; < 1 L unidentified clear liquid in large acid bottle.

Surrounding area: 205 L barrel containing high grade ore; empty barrel; 2 used oil filters; 1 used car battery.

Building 19B (photo 19-5)

Structure is a smaller version of building #1 and appears to have been used exclusively as POL storage shed. Gravel under shed was stained and had a strong hydrocarbon odour.

Location: 3 m north of building #1 on gravel pad at upper camp (adjacent to open pits).

Dimensions (L x W x H): 3 m x 2 m x 2.5 m.

Construction: Painted wood frame; unpainted wood interior; no floor; rolled asphalt roof; non-electrified.

Paint: Weathered green painted exterior (not sampled).

Asbestos: None.

Non-Hazardous contents: 2 used air filters; 1 empty 22 L lube oil pail.

Foundation: None; building directly on ground surface.

Hazardous products: 3 L waste oil; 8 L chain lube oil.

Surrounding area: 2 empty 22 L pails; miscellaneous non-hazardous materials (plastic pipe; plywood).

Building 19C (photo 19-6)

Structure is a larger shed directly adjacent to the trailer. South area of building appears to have been used by electrician or other trade. North area formerly contained furnace but has since been gutted.

Location: 25 m north of building 19A on gravel pad at upper camp (adjacent to open pits).

Dimensions (L x W x H): 6 m x 2 m x 2.5 m.

Construction: Painted wood frame; partially painted plywood interior; plywood floor; partitioned into 2 rooms one of which formerly contained a furnace; formerly electrified.

Paint: Weathered green painted exterior (not sampled).

Asbestos: None.

Non-Hazardous contents: None.

Foundation: Building on metal skids.

Hazardous products: None.

Surrounding area: Small amount of miscellaneous non-hazardous debris.

Building 19D (photo 19-6)

Structure is a mobile trailer formerly used as both an office and living quarters at the upper camp. Interior is water damaged.

Location: 30 m north of building 19A on gravel pad at upper camp (adjacent to open pits). Building is the northernmost structure at the site.

Dimensions (L x W x H): 10 m x 3 m x 3 m.

Construction: Metal clad; newer linoleum flooring; pressboard walls; tile ceiling; fibreglass insulated walls and ceiling; two furnaces; formerly electrified.

Paint: Yellow painted exterior (not sampled); painted interior walls.

Asbestos: None.

Non-Hazardous contents: Miscellaneous non-hazardous materials (office materials and maps).

Foundation: Building on metal rails on wood blocks.

Hazardous products: None.

Surrounding area: Adjacent outhouse; small amount of miscellaneous non-hazardous debris; flat-bed trailer in storage in clearing north of the trailer.

Building 19E (photo 19-7)

Building appears to have formerly served as a combination storage and compressor building but has partially collapsed and much of the former heavy generator equipment has since been removed.

Location: Building is located in the extreme north west corner of the lower site approximately 70 m west of the 400 portal and immediately north of Building 19F.

Dimensions (L x W x H): 14 m x 7 m x 3 m.

Construction: Wood frame; formerly with wood roof and rolled asphalt roofing; roof has now collapsed; exterior walls clad in asbestos tar paper.

Paint: No painted surfaces remain.

Asbestos: Asbestos tar paper on entire exterior of building.

Non-Hazardous contents: metal pipes; wood debris (some burned); fibreglass insulation; old pump; two compressors; compressed gas cylinder; 6" pipe entering concrete; various supplies including electrical, carpentry and mechanical equipment.

Foundation: concrete; many pipes encased in concrete; concrete sumps (with hydrocarbon staining) (photo 19-8) and stands for compressors and other heavy equipment.

Hazardous products: Used six-volt battery. Partially full barrels and pails (photo 19-9). Note: all partially full pails and barrels at the lower site were placed in this building prior to sampling.

Surrounding area: Large amount of debris including discarded construction materials from this building; adjacent building (19F); metal and wood debris; barrels (empty and partially full); oil stains to the east.

Building 19F (photo 19-7)

Only a concrete pad remains. The former usage of the building could not be ascertained, however, a large amount of obsolete equipment remains on the pad.

Location: Building is located in the extreme north west corner of the lower site approximately 70 m west of the 400 portal and immediately south of Building 19E.

Dimensions (L x W x H): 10 m x 7 m.

Construction: Only concrete pad remains; formerly wood frame construction.

Paint: None.

Asbestos: None.

Non-Hazardous contents: obsolete mine equipment; miscellaneous wood and metal debris.

Foundation: Concrete.

Hazardous products: Partially full barrels and pails. Note: all partially full pails and barrels at the lower site were placed in this building prior to sampling.

Surrounding area: Large amount of debris including discarded construction materials from this building and building 19E; metal and wood debris; barrels (empty and partially full); oil stains to the east.

Building 19G (photo 19-11)

All that remains is a concrete foundation that appears to have formerly been used as a multi-bay garage.

Location: Building is located on the level area adjacent to buildings 19E and 19F approximately 55 m west of the 400 portal.

Dimensions (L x W x H): 13 m x 10 m.

Construction: Only a concrete pad remains; former building construction unknown.

Paint: None.

Asbestos: None.

Non-Hazardous contents: Wood and metal debris; empty barrels.

Foundation: Concrete.

Hazardous products: Partially full barrels and pails. Note: all partially full pails and barrels at the lower site were placed in this building prior to sampling.

Surrounding area: Large amount of demolition debris in a single pile (metal cladding, small equipment, wood) (photo 19-12) that has been extensively burned; metal and wood debris; vehicle hulk; barrels and pails (empty and partially full).

Building 19H

Building is a five-stall outhouse.

Location: Approximately 15 m east of 400 portal at lower site.

Dimensions (L x W x H): 3 m x 2 m x 2.5 m.

Construction: Wood frame.

Paint: None.

Asbestos: None.

Non-Hazardous contents: None.

Foundation: None.

Hazardous products: None.

Surrounding area: Rail and trestle adjacent to the 400 level portal.

Building 19I (photo 19-13)

Building appears to be a small explosives storage shed a considerable distance from nearest infrastructure.

Location: Approximately 100 m north of pits at top end of property.

Dimensions (L x W x H): 1 m x 1.5 m x 2.5 m.

Construction: Heavy wood frame; door is solid metal; walls filled with sand; stainless steel roof.

Paint: None.

Asbestos: None.

Non-Hazardous contents: Unknown (locked); possibly still contains explosives.

Foundation: None; building mounted on timbers.

Hazardous products: Unknown (locked); possibly still contains explosives.

Surrounding area: Bare level gravel surface.

Buildings 19J –19M

Only the collapsed wood frame remains for all three of the buildings. The area has extensively overgrown and the buildings are difficult to locate.

Location: Approximately 300 m north of the lower site; below the upper camp site.

Dimensions (L x W x H): All approximately 25 m x 5 m (collapsed).

Construction: Wood frame walls and roofs (all that remains).

Paint: None.

Asbestos: Portion of one building still has asbestos tarpaper cladding.

Non-Hazardous contents: None.

Foundation: None.

Hazardous products: None.

Surrounding area: Overgrown thicket.

Building 19N (photo 19-14)

Large collapsed building at loadout area probably used as the loadout building.

Location: Approximately 200 m downhill from the lower site.

Dimensions (L x W x H): Approximately 12 m x 10 m (collapsed).

Construction: Wood frame with wood floor and metal roof.

Paint: None.

Asbestos: None.

Non-Hazardous contents: Building debris strewn throughout area including construction waste from the former loadout ramp (photo 19-15).

Foundation: None noted but probably on wood piles

Hazardous products: None.

Surrounding area: Debris from other loadout facility building; abandoned vehicles; miscellaneous wood and metal debris; two empty barrels.

Building 19O (photo 19-16)

Building located at loadout facility but former usage unknown. Only concrete foundation of building remains. Large amount of debris in area may have formed portions of other former buildings.

Location: Approximately 225 m from the lower site; approximately 25 m from the loadout facility.

Dimensions (L x W x H): 15 m x 12 m (only foundation remains).

Construction: Former construction unknown; only concrete foundation remains.

Paint: None.

Asbestos: None.

Non-Hazardous contents: Some construction waste wood debris.

Foundation: Concrete.

Hazardous products: None.

Surrounding area: Metal and wood debris; empty barrels and pails; small piles of coal.

6.2 Fuel Storage

There is currently no fuel in stored at the site. A number of barrels and pails containing waste hydrocarbon products were noted throughout the lower site.

6.3 Rail and Trestle (photo 19-17)

Location: South of 400 level portal. Much of the material has been removed and is piled south east of the portal.

Fabrication: Metal rail; wood trestle.

Amount of materials: Approximately 80 m of material (from portal to adjacent compressor/garage site).

Condition: Most of this infrastructure has been demolished; rail has been piled to south east of portal and trestle has been pushed aside to the north of original location.

6.4 Milling and Processing Infrastructure

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

6.5 Electrical Equipment

No electrical equipment was identified at the site. Transformers were noted on a utility line that runs uphill parallel to the upper camp site.

7. SOLID WASTE DUMPS

Location & access: Immediately west (below) waste rock pile comprising upper camp site (photo 19-18).

Dimensions (L x W x H): 30 m x 10 m (surface only).

Drainage: South towards lower site. No defined drainage from area.

General composition: Used oil and filters; empty barrels and pails; miscellaneous wood and metal debris. No hazardous wastes noted.

Impacted vegetation: None noted.

% covered: 0

Sampling: Due to an absence of hazardous materials and obvious runoff pathways from the site, no samples were collected.

8. POTENTIAL CONTAMINANTS OF CONCERN

8.1 Out-of-Service Transformers

No out-of-service transformers were noted at the site. A utility line adjacent to the upper camp site did contain a number of transformers, however, it could not be determined whether this line remained in usage.

8.2 Metals and Hydrocarbons in Soil

A number of hydrocarbon stained surfaces that appeared to be attributable to waste oil disposal were identified at both the upper camp and lower sites.

Extensive staining was also noted under the POL shed at the upper camp that appeared to be attributable to leakage and spillage from various hydrocarbon based liquids stored in the building in the past (photo 19-19). The surface area of the stain was approximately 6 m².

Due to the limited extent and lack of potential receptors in the area, none of the upper camp stains were sampled. Seven stains were identified to the east of buildings 19A to 19C and to the south of building 19D. The total area of the stained surfaces was estimated at approximately 20 m². Faint hydrocarbon odours associated with waste oil were noted at each of the locations. Soils at the site are extremely thin or nonexistent since the site was constructed from waste rock removed from the adjacent pits.

Approximately five large waste oil stains were also noted at the lower site. Four of these were present to the north of building 19G and one stain immediately to the south. The total surface area of these stains was approximately 30 m². Soils within unlined sumps in building 19G (garage) were also heavily stained and appeared to be representative of the staining at the site (photo 19-20). One sump was excavated to a depth of approximately 0.6 m. Staining was noted to depth and a composite sample was taken from the excavation. A duplicate sample was also collected. PCBs were not detected in either sample. Elevated concentrations of heavy metals were noted in both samples. Laboratory analysis are provided in Attachment B.

Sample ID	Location	Sample Depth
19-SLCD-01	Sump in building 19G	Composite; 0 – 60 cm
19-SLCD-02	Duplicate	Duplicate

8.3 Liquid Hazardous Materials

One 205 L barrel and 10 - 22 L pails containing varying quantities of liquid were noted at the lower site. The contents of most of these barrels were easily identifiable and did not appear to have been contaminated. Three full 205 L barrels identified to the east of this site contained Aviation gas only. These barrels were not moved from their original location. Many other barrels and a few pails were noted in the surrounding brush and all were found to be empty.

Four containers, including three 22 L pails and one 205 L barrel contained unknown liquids. Two of the pails contained similar contents and only one of these, as well as the other pail and barrel, were sampled.

Location(s): All pails and barrels containing liquids that were identified at the lower site, were moved to the storage area of the compressor building for storage and sampling. See Table 1 below for waste container ID#'s, locations and volumes.

Table 1: Hazardous Liquid Waste Information

Sample ID	Drum/pail ID & Location	Volume
19-WaCD-01	Compressor bldg. (01)	10 L pail
19-WaCD-02	Compressor bldg. (02)	50 L barrel
19-WaCD-03	Compressor bldg. (03)	12 L pail

Laboratory analyses are provided in Attachment B.

8.4 Solid Hazardous Materials

No solid hazardous materials were identified at the site, however, the explosives storage shed at the upper (north) end of the site was locked and its contents were not inventoried.

9. WATER QUALITY

The runoff channel from the 400 level adit has formed a permanent channel from the portal. Water flow from the adit was estimated at approximately 5 L/sec. This water was sampled (19-WQ-ACD-01). The water disappeared into the ground within 120 m of the adit. At the time of the site visit, water was flowing at surface only for approximately the first 120 m. The channel was followed for approximately 400 m and it appears to enter Christal Lake, greater than 1 km downstream.

Samples were also collected from Christal Lake, however, other mine sites and activities would impact on the quality of the lake including the Mackeno tailings which were disposed of directly into the lake.

Laboratory analyses are provided in Attachment B.

10. RECLAMATION

There has been no reclamation at the upper camp site and pits and it is possible that this site may continue to be mined in the future. Buildings at the lower area have deteriorated over the years and there appears to have been significant salvaging of materials from the property. Materials from building 19G have recently been burned and only buildings 19E and 19H remain intact. Rail and trestle at the portal have been removed and the rail stockpiled at the site. Much of the surrounding area is covered in thick second growth, however, the site itself remains unvegetated. The middle area of buildings 19J to 19M does not appear to have ever been extensively used. This area is covered in extensive second growth.

11. OTHER SOURCES OF INFORMATION AND DATA

Note that people live very close to the 400 level portal, in old mine buildings within approximately 100 m of the portal.

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.

	Detection Limit	Units	19-WaCD-01	19-WaCD-02	19-WaCD-03	19-SLCD-01	19-SLCD-02	19-SLCD-03 - Onek
PCBs								
Total PCBs	0.1	ppm	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
pH in Saturated Paste								
pH	0.1	pH	na	na	na	5.9	6.8	6.5
pH in Soil (1:2 water)								
pH	0.01	pH	na	na	na	6.31	6.5	6.6
ICP Semi-Trace Scan - Metals								
Aluminum	10	µg/g wet	<10	42	<10	53000	39000	10100
Antimony	4	µg/g wet	<4	<4	6	160	55	160
Arsenic	4	µg/g wet	<4	<4	<4	422	691	1040
Barium	0.1	µg/g wet	8.2	3.44	12.9	858	576	111
Beryllium	0.2	µg/g wet	<0.2	<0.2	<0.2	1	1	0.5
Bismuth	10	µg/g wet	<10	<10	<10	10	<10	31
Cadmium	0.2	µg/g wet	0.7	7.3	1	37	1220	1300
Calcium	10	µg/g wet	970	229	1420	5150	21200	670
Chromium	1	µg/g wet	1	2.2	1	80.5	68.7	13.2
Cobalt	0.2	µg/g wet	<0.2	0.7	<0.2	12	19	10
Copper	1	µg/g wet	55.4	389	51.2	315	488	714
Iron	2	µg/g wet	490	570	43	87000	55000	27000
Lead	2	µg/g wet	10	29	8	11700	2110	3980
Lithium	1	µg/g wet	<1	<1	<1	33.2	24.9	2.9
Magnesium	2	µg/g wet	7	32	10	4650	4080	546
Manganese	1	µg/g wet	2.4	11	1	7580	3220	2490
Mercury	0.02	µg/g wet	<0.02	<0.02	<0.02	<0.02	<0.02	2
Molybdenum	2	µg/g wet	<2	<2	<2	6	9	5
Nickel	0.4	µg/g wet	0.7	5	<0.4	36.5	47.4	9.7
Phosphorus	10	µg/g wet	1530	503	1260	1170	1220	345
Potassium	40	µg/g wet	<40	<40	<40	15000	10000	3290
Selenium	4	µg/g wet	<4	<4	<4	<4	<4	<2
Silicon	10	µg/g wet	910	590	<10	802	348	3670
Silver	1	µg/g wet	<1	<1	<1	93.6	27.3	79.4
Sodium	10	µg/g wet	<10	10	<10	3010	1500	198
Strontium	2	µg/g wet	3	<2	3	99	130	9
Sulphur	20	µg/g wet	5180	2390	4860	3340	69900	69000
Thorium	2	µg/g wet	<2	<2	<2	<2	4	4
Tin	2	µg/g wet	7	10	8	57	310	380
Titanium	0.4	µg/g wet	1	3.1	3.2	549	96.7	32.5
Uranium	10	µg/g wet	<10	<10	<10	<10	<10	<5
Vanadium	2	µg/g wet	<2	<2	<2	96	67	16
Zinc	1	µg/g wet	1570	337	1520	3950	93500	115000
Zirconium	0.2	µg/g wet	<0.2	<0.2	<0.2	31.3	36.9	10.6

1999 Water Quality Results, Onek Site

Sample Number	Detection Limit	Units	19-WQ-ACD-01-Onek
Site Description			
pH (field)	0.01	pH	6.9
Conductivity (field)	0.01	µS/cm	830
Total Alkalinity	5	mg CaCO3/L	102
Chloride	0.5	mg/L	0.6
Electrical Conductivity	0.01	µS/cm	1200
Hardness (CaCO3 equiv)	5	mg/L	683
Nitrate-N	0.1	mg/L	<0.1
Nitrite-N	0.003	mg/L	0.003
pH	0.01	pH	7.28
Sulphate	0.5	mg/L	537
Total Dissolved Solids	5	mg/L	999
ICP-USN Total Metals Scan in Water			
Aluminum	0.0008	mg/L	0.0074
Antimony	0.005	mg/L	0.008
Arsenic	0.01	mg/L	0.05
Barium	0.00004	mg/L	0.00489
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	0.998
Calcium	0.002	mg/L	204
Chromium	0.00006	mg/L	<0.00006
Cobalt	0.00003	mg/L	0.00922
Copper	0.00003	mg/L	0.00364
Iron	0.00001	mg/L	0.847
Lead	0.0003	mg/L	0.0027
Lithium	0.001	mg/L	0.021
Magnesium	0.0005	mg/L	18.7
Manganese	0.00002	mg/L	3.85
Mercury	0.0001	mg/L	<0.0001
Molybdenum	0.00007	mg/L	0.0003

Waste Rock Field Data Table

Location	Sample ID	paste pH	Conductivity
30 m NW of adit	19_WR_TPBM_01	5.3	5.30 mS
50 m NW of adit	19_WR_TPBM_02	3	0.97 mS
75m WSW of adit	"03"	6.1	1.28 mS
50 m S of adit	"04"	6.1	0.85 mS
Top of main SW pit dump	19_WR_TPBM_05	7.6	0.10 mS

		Detection Limit	Units	19-WaCD-01	19-WaCD-02	19-WaCD-03	19-SLCD-01	19-SLCD-02	19-SLCD-03 - Onek
PCBs									
Total PCBs		0.1	ppm	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
pH in Saturated Paste									
pH		0.1	pH	na	na	na	5.9	6.8	6.5
	Nickel	0.00001	mg/L	0.0268					
	Phosphorus	0.03	mg/L	<0.03					
	Potassium	0.4	mg/L	0.4					
	Selenium	0.004	mg/L	0.018					
	Silicon	0.004	mg/L	4.81					
	Silver	0.00005	mg/L	0.00031					
	Sodium	0.004	mg/L	1.2					
	Strontium	0.00002	mg/L	0.202					
	Sulphur	0.008	mg/L	188					
	Thallium	0.001	mg/L	0.006					
	Titanium	0.00002	mg/L	<0.00002					
	Vanadium	0.00003	mg/L	<0.00003					
	Zinc	0.0002	mg/L	24.2					
Total Arsenic by Hydride AA									
	Arsenic	0.0002	mg/L	<0.0002					
Total Selenium by Hydride AA									
	Selenium	0.0001	mg/L	<0.0001					

**ATTACHMENT B: 1999 ONEK WASTE ROCK SAMPLES
LABORATORY RESULTS**

Site Number	Detection Limit	Units	19_WR_TPBM_01	19_WR_TPBM_02
Sample Description			Waste rock pile associated with the 400 Level portal	Waste rock pile associated with the 400 Level portal
Paste pH (field)	N/A	pH	-	-
Conductivity (field)	N/A	µS/cm	-	-
pH in Saturated Paste				
pH	0.1	pH	4.7	3.6
pH in Soil (1:2 water)				
pH	0.01	pH	4.2	3.4
ICP Semi-Trace Scan				
Aluminum	5	µg/g	23800	19600
Antimony	2	µg/g	200	13
Arsenic	2	µg/g	1220	1230
Barium	0.05	µg/g	332	171
Beryllium	0.1	µg/g	<0.1	0.5
Bismuth	5	µg/g	27	8
Cadmium	0.1	µg/g	765	13.1
Calcium	5	µg/g	724	1050
Chromium	0.5	µg/g	30.8	33.2
Cobalt	0.1	µg/g	6.6	2.5
Copper	0.5	µg/g	1020	51.1
Iron	1	µg/g	110000	28000
Lead	1	µg/g	3860	670
Lithium	0.5	µg/g	6.4	10.4
Magnesium	1	µg/g	1290	766
Manganese	0.5	µg/g	15700	535
Mercury	0.01	µg/g	4.2	0.11
Molybdenum	1	µg/g	3	<1
Nickel	1	µg/g	10	7.9
Phosphorus	5	µg/g	494	520
Potassium	20	µg/g	8400	5400
Selenium	2	µg/g	<2	<2
Silicon	5	µg/g	250	414
Silver	0.5	µg/g	188	10.1
Sodium	5	µg/g	595	462
Strontium	1	µg/g	22	23
Sulphur	10	µg/g	43300	3950
Thorium	1	µg/g	<1	5
Tin	1	µg/g	360	41
Titanium	0.2	µg/g	53.8	28.2
Uranium	5	µg/g	<5	<5
Vanadium	1	µg/g	37	32
Zinc	0.5	µg/g	53800	1610
Zirconium	0.1	µg/g	19.8	11.9

**ATTACHMENT B: 1999 ONEK 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
19_WR_TPBM_01	Waste rock pile associated with the 400 Level portal	5.3	1.85	0.16	52.8	2.8	-50.1	0.1
19_WR_TPBM_02	Waste rock pile associated with the 400 Level portal	4.5	0.38	0.09	9.1	-0.9	-9.9	<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.

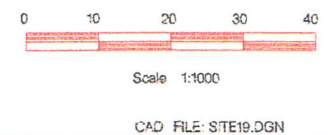
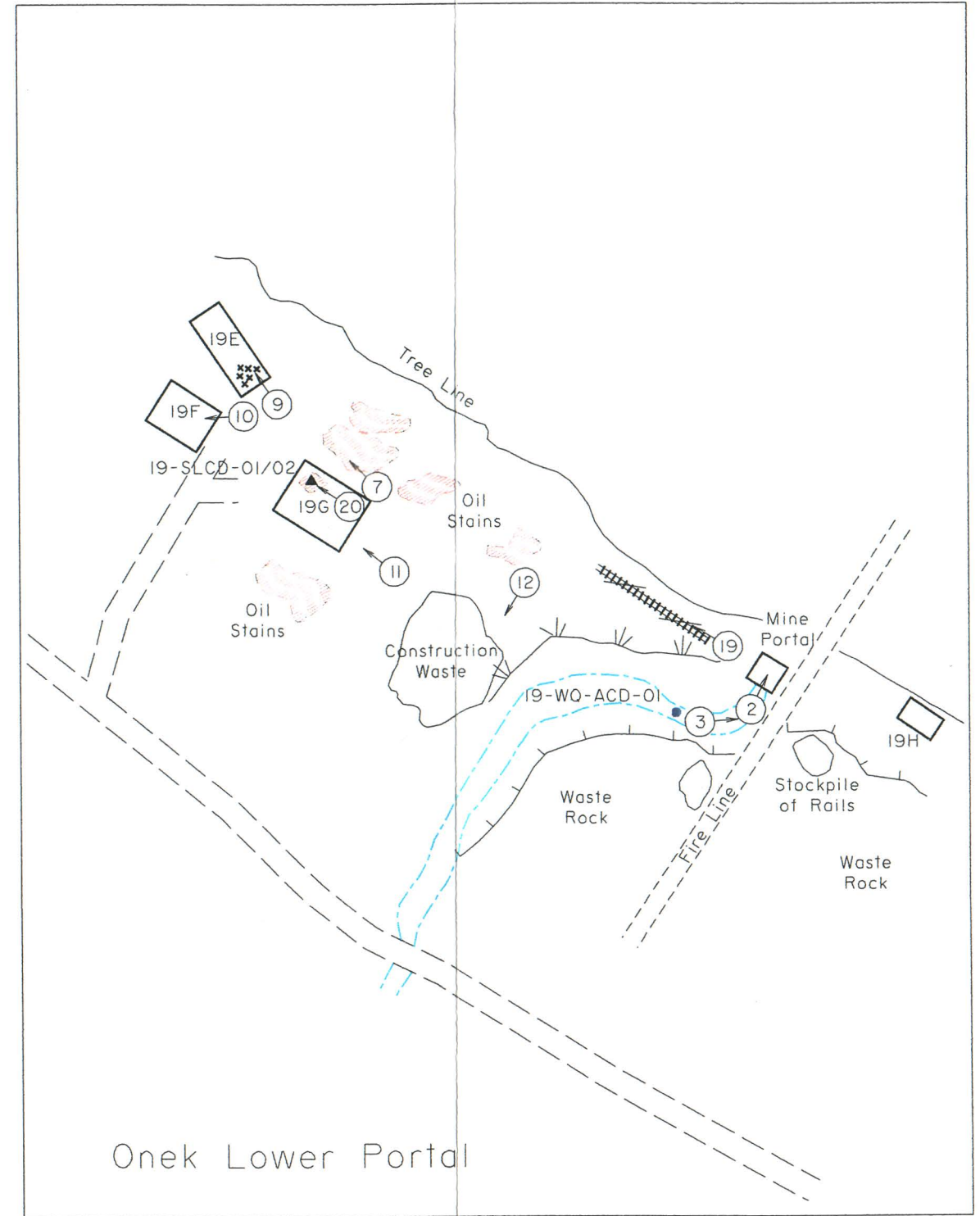
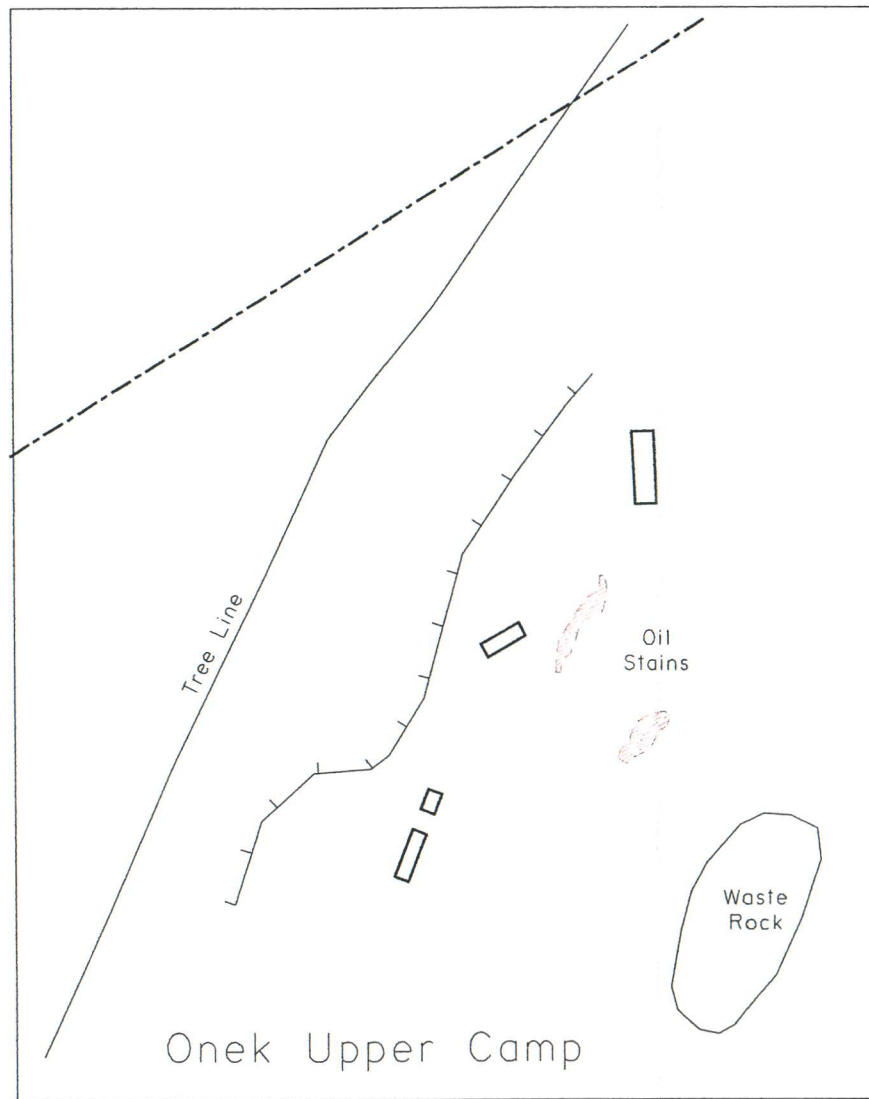
N/D = NO DUPLICATE ASSAY. CALCULATIONS ARE BASED ON ASSAY RESULTS OF THE INITIAL SAMPLE.

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)
- 25WR04-01 1999 Waste Rock Sample (this study)
- Pre 1999 Waste Rock Sample (other sources)
- WQ-12-06 1999 Water Sample
- Pre 1999 Water Sample
- Tension Cracks
- Mass Movement (note: for Forms; BelleKeno)
- Groundwater Seep
- Surface Water Flow (Stream, Creek, River)
- Lake
- Settling Pond / Water Treatment Pond
- Tailings Dam / Tailings Pond / Mill Tails
- Ponded Water / Trench
- Barrels
- Abandoned Equipment (compressors, ore cars, rails, air and water pipe)
- Mine Rails / Trestle
- Collapsed Trestle
- Solid Waste Disposal Site
- Area of Soil Contamination
- *(6) Transformer Location (number of transformer in brackets)
- Power Line
- Power Line Collapsed
- Aerial Transmission Towers
- (5) Photo Site (arrow shows view direction)
- GPS Survey Location
- Former Building Site (Elsa)



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	approved by: approuvé par:	C.S.
Drawing title: Onek Site #19 Site Assessment Yukon Territory	Titre du dessin:	revisions:
project no. no. du projet:	125-12.01	dwg. no. dessin no.: 1 of 1



Photo 19-2: 400 level portal and runoff channel. Note debris at entrance.



Photo 19-3: Runoff channel below 200 level portal. Note adjacent waste rock.



Photo 19-5: Buildings 19A & 19B at upper camp.



Photo 19-6: Buildings 19C & 19D at upper camp. Note oil staining in foreground.



Photo 19-7: Remains of building 19E at lower area. Note oil staining in foreground.

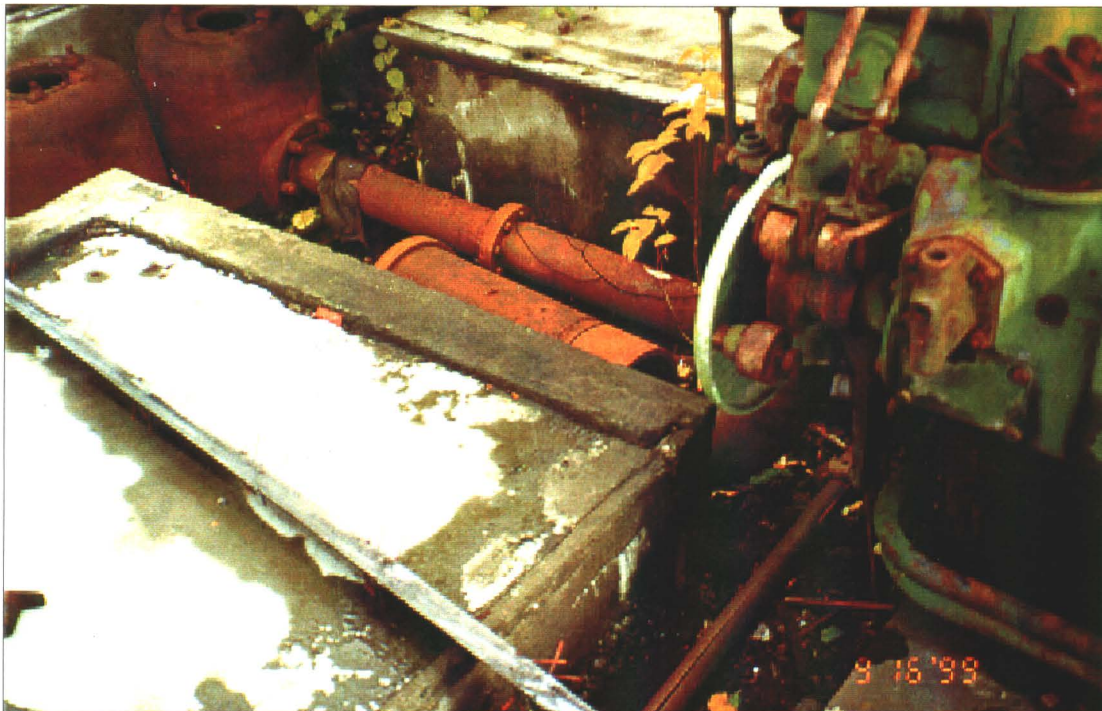


Photo 19-8: Equipment and staining in sumps at compressor building (19E).



Photo 19-9: Former storage area in building 19E where hazardous liquids stored.



Photo 19-10: Concrete foundation (building 19F) with much metal and debris.



Photo 19-11: Concrete foundation (building 19G) and much debris.



Photo 19-12: Construction waste debris remaining from demolition of building 19G.

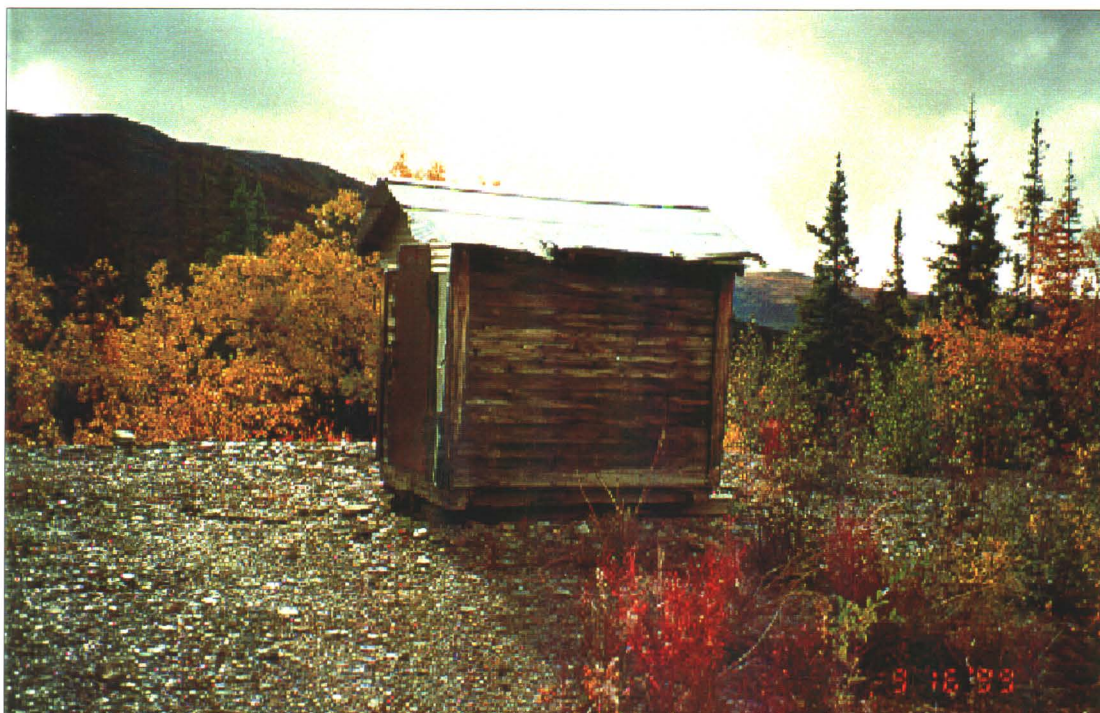


Photo 19-13: Explosives shed above pit site.



Photo 19-14: Remains of building 19N at loading site below lower road.



Photo 19-15: Wood debris at loadout site.



Photo 19-16: Concrete foundation (building 190) at loadout site.



Photo 19-17: Former trestle area at 400 level portal.



Photo 19-18: Solid waste dump at bottom of waste rock dump at upper camp.



Photo 19-19: Hydrocarbon containers and extensive staining inside building 19C.



Photo 19-20: Extensive staining in sumps at building 19G.