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Quality in Environmental Services

PHASE II ENVIRONMENTAL ASSESSMENT OF THE WAYNE ABANDONED MINE SITE

prepared for:

Action on Waste Program
Indian and Northern Affairs Canada

prepared by:

Environmental Services
Public Works and Government Services Canada

February 1997

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada
Canada

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EXECUTIVE SUMMARY

A phase II environmental assessment was conducted at the Wayne abandoned mine site (63° 53'05" N, 135° 40'28" W) in 1996 by Environmental Services, Public Works and Government Services Canada for the Action on Waste Program, Indian and Northern Affairs Canada. Based on the findings of the Phase I investigation performed in 1994 by DIAND Technical Services, a phase II assessment was conducted to a) identify potential environmental and human health risks associated with the present condition of the mine site, and b) provide recommendations and preliminary cost estimates for remediation of those risks.

A field investigation of the abandoned mine site was conducted to evaluate environmental and human safety concerns with respect to mine openings and workings; buildings and infrastructure, waste disposal areas, waste rock disposal areas, surface water (including adit and waste rock seepage, and receiving waters), and hazardous and non-hazardous materials on the site.

Exploration work conducted at the Wayne exploration site involved clearing of access trails for trenching and drill sites. The results of this investigation found very little evidence of previous activity on this site. No adits, waste rock piles, hazardous materials, buildings or other infrastructure associated with mineral exploration was found on the site. There exists evidence of past trenching however, vegetation has re-established in most of these areas. No other environmental damage was observed.

The most significant impact of mining activity on this site related to trail construction and trench excavating. As these areas have successfully revegetated, no site remediation is recommended. Should further development occur on the site, regulatory agencies should ensure that an acid drainage prevention plan is developed which includes detailed measures for handling and disposal of mineralized waste rock.

SUMMARY OF CONCLUSIONS & RECOMMENDATIONS

ASSESSMENT COMPONENT	RISK	RECOMMENDATION
1. Building, Infrastructure, Equipment		
None Identified on site	None	None
2. Non-Hazardous Waste Material		
None Identified on site	None	None
3. Hazardous Materials		
None Identified on site	None	None
4. Water Quality		
No watercourses adjacent to site	None	None
5. Waste Rock Disposal Areas		
Waste rock piles non acid generating.	None	None
6. Mine Openings		
None	None	None
7. Tailings		
None	None	None

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1.0 INTRODUCTION AND BACKGROUND

In 1993, assessments of 49 abandoned Yukon mine exploration and development sites were completed under the Arctic Environmental Strategy - Action on Waste program by DIAND Technical Services. These assessments were intended to provide a general overview of historical activities, describe site infrastructure, workings and wastes, describe existing environmental or safety concerns on each site, and provide general recommendations for remediation or mitigation work, as appropriate.

For the Wayne abandoned mine site, the 1994 Phase I report recommended further investigation into possible environmental impacts resulting from the previous mining activities. According to this report, the most significant environmental damage at this site resulted from trail construction and trench excavating. However, vegetation has re-established on the trails and areas affected by trenching and any evidence of past activity is difficult to detect. No rock, tailings, soil or water samples were collected during the preliminary assessment.

In light of the preliminary investigation, Indian and Northern Affairs Canada has determined that further investigation is warranted. Environmental Services, Public Works and Government Services Canada was retained to conduct an environmental assessment of the Wayne abandoned mine site to a) identify specific environmental and human safety risks; b) provide clean-up recommendations; and c) provide a Class "D" cost estimate for remediation or mitigation of those risks.

1.1 LOCATION

The Wayne abandoned mine site is located in the central Yukon at 63^{o} 53'05" N latitude and 135^{o}40'28" W longitude **(Figure 1)**. The site is approximately 34 km north of the village of Mayo near the west end of the Elsa airstrip at an elevation of approximately 750 m to 770 m above sea level.

1.2 OVERVIEW OF SITE DEVELOPMENT

The Wayne exploration site was first staked in 1955 by G. Rich and partially overstaked by J. Strebchuk in 1956 as the Alberta claim and the Yukon claim. In 1964, L.T. Chisolm purchased 50% of the Wayne claims. The Alberta group was optioned by Rio Plata Silver Mining Ltd. in 1964 and was explored by bulldozer trenching and 76.2 m of rotary drilling. The Alberta and Yukon groups were optioned from 1967 to 1970 by Fort George Mining and Exploration Ltd., which added Joe claims. Bulldozer trenching was performed in 1968 with 5.9 tonnes shipped to the Trail Smelter and 61 m drilled.

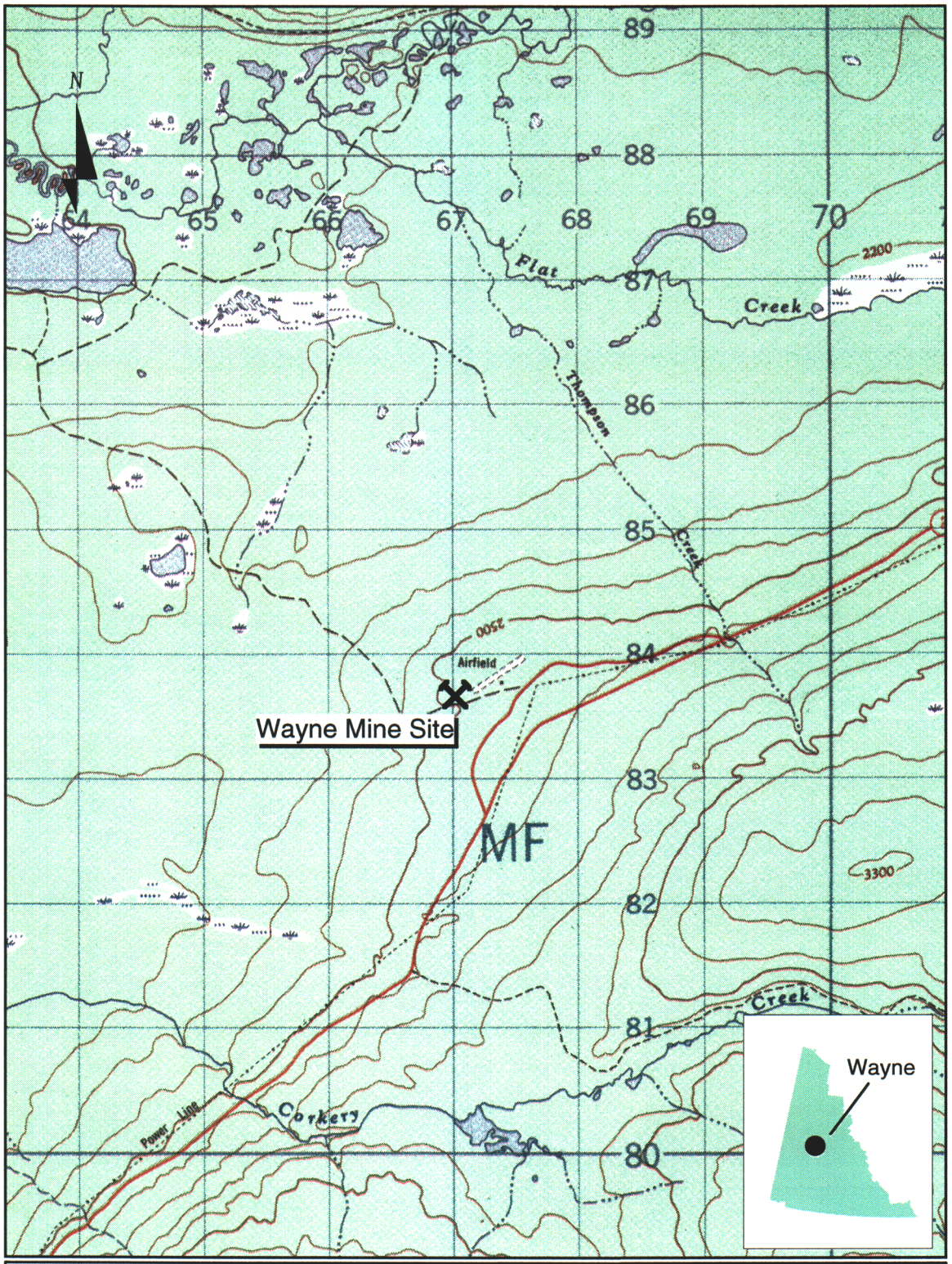


Figure 1: WAYNE SITE

N.T.S. 105 M/13 Map Name: Mount Haldane Map Scale: 1:50,000

Latitude: 63° 53' 05" N Longitude: 135° 40' 28" W

Legend

W/R — Waste Rock

Road

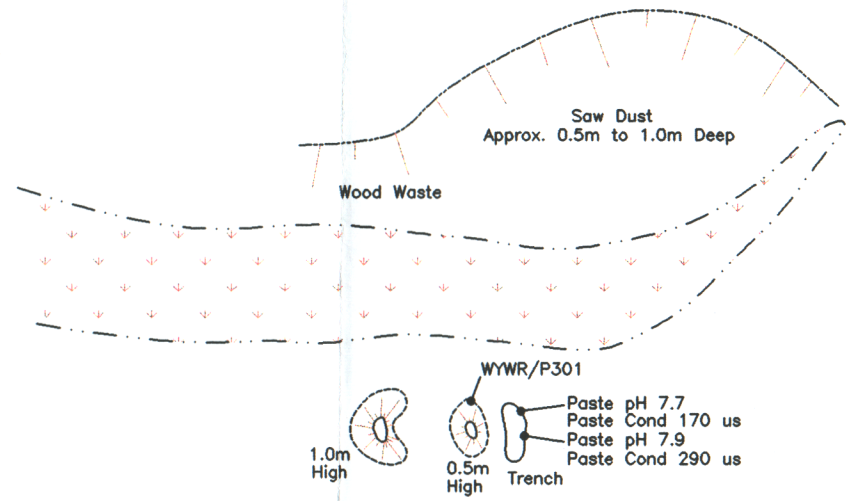
Extent Of Waste Rock

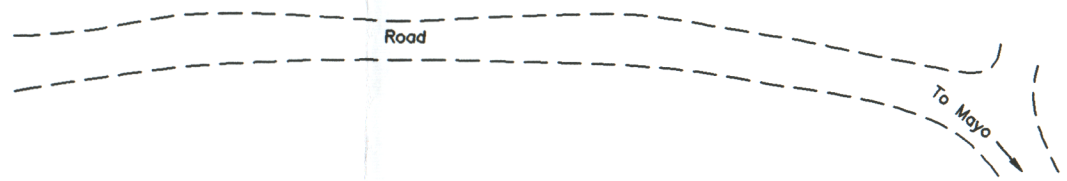
• WYWR/P1/1 — Waste Rock (site designation)

Slope Down

Swamp

Extent of Debris, Timber, Cable, Pipe, etc.





Approx. Scale: 1:1000

PLOT: 1=1
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Public Works And Government Services Canada
Travaux publics et Services gouvernementaux Canada

Architectural & Engineering Services
Western Region

designed by: / concu par: — date:
drawn by: / dessine par: R.N. Nov. /96
approved by: / approuve par:
revisions:

Drawing title: / Titre du dessin:

Wayne Mine Site Development

Yukon Territory

project no. / no. du projet: 626967

dwg. no. / dessin no. 1 of 1

In 1970, the site was reoptioned by Silver Spring Mining Ltd. and was explored in a joint venture with Canadian Reserve Oil & Gas Ltd. Geophysical surveys were conducted in 1971 and bulldozer trenching and 2 holes were drilled in 1972. Silver Spring Mining Ltd. staked additional Alberta claims in 1971 and Evelyn claims in 1972. The nearby Snowdrift claims were added by United Keno Hill Mines Ltd. and were explored with 80 percussion holes (3195.8 m) in 1975 and 46 percussion holes (1606.3 m) in 1982. Approximately 3658 m of percussion drilling and 4 diamond drillholes totaling approximately 610 m when completed in 1984.

More than 60 Zap claims were added to the northeast in 1979 by Canada Tungsten Mining Corporation Ltd. and explored by geochemical and geophysical surveys in 1979 and 1980. In 1980, the Wayne group of claims were optioned to Island Mining and Exploration Co. Ltd. which drilled 14 holes (1212 m) in 1981 and 7 holes (795 m) in 1983. All trenching on the property was conducted with the use of a bulldozer. No underground development occurred. The area has also been used by a sawmill within the past fifty years.

1.3 SITE ACCESS

The Wayne exploration site is located approximately 34 km north of the village of Mayo, approximately 8 km west of the old mining community of Elsa. The site can be reached by traveling from Mayo on Highway 11 to the airstrip near Elsa. Old exploration trails can be found at the west end of the airstrip which lead to the site. These trails have grown over and are accessible primarily by all-terrain vehicles. The site may also be reached from the South McQuesten road that leaves the Mayo-Elsa road near Proctor's sawmill. The site is located approximately 1.6 km west of the Mayo-Elsa road.

2.0 PURPOSE AND SCOPE OF WORK

The following assessment activities were completed:

- Inspection of mine openings and workings, buildings and infrastructure, and waste disposal areas;
- Photo documentation and mapping of relevant site features;
- Sampling of waste rock disposal areas, stained soils, surface water (including adit and waste rock seepage, and receiving waters) and barrel contents;
- Identification and inventory of hazardous and non-hazardous materials on the site;
- Identification of potential or actual environmental pathways and receptors for site contaminants; and
- Assessment of human safety hazards and potential for accidental or deliberate access to hazardous areas.

Upon completion of these activities, preliminary cost estimates were generated to meet the following remediation/mitigation requirements:

- Physical stabilization of waste rock disposal areas;
- Chemical stabilization of the waste rock disposal areas as appropriate to local and background conditions, taking into account impact, on-site resources, and accessibility;
- Sealing of all mine openings;
- Consolidation and landfill of all non-hazardous, non-combustible solid wastes;
- Remediation or removal and disposal of contaminated soils as required to meet the more stringent of: Yukon Government's Contaminated Sites Regulations (1996) Schedule 1; and Canadian Council of Ministers of the Environment's Interim Canadian Environmental Quality Criteria for Contaminated Sites (1991) Commercial/Industrial criteria for soils;
- Removal and disposal of hazardous solid wastes;
- Draining, cleaning and disposal of drums or other containers containing petroleum products or other liquid hazardous wastes;
- Onsite flaring or removal and off-site disposal of petroleum products and other liquid hazardous wastes; and
- Demolition of buildings and infrastructure to foundation level and burning of combustible non-hazardous materials in approved location

3.0 SITE ASSESSMENT METHODOLOGY

3.1 Assumptions:

At each mine site, the assessment was limited to the area specifically developed or occupied for mine exploration or mining purposes and immediately adjacent areas within applicable claim boundaries as well as off-site environmental resources believed to be affected by mine exploration or development activities. Water samples were taken off-site to determine potential impact to surface water bodies due to mining activities. Access roadways to mine sites were not included in the assessments.

3.2 ASSESSMENT CRITERIA

3.2.1 Criteria and Guidelines

Metal Mining Liquid Effluent Regulations and Guidelines (Environmental Protection Service, Environment Canada, 1977)

The intent of the requirements defined in this document is to limit the discharge of deleterious substances from base-metal, uranium and iron ore mines. These requirements are uniformly applied national standards and intended to provide protection for fish and other aquatic life.

Interim Canadian Environmental Quality Criteria for Contaminated Sites (Canadian Council of Ministers of the Environment, 1992)

The Canadian Council of Ministers of the Environment (CCME) Interim Canadian Environmental Quality Criteria for Contaminated Sites are numerical limits for contaminants in soil and water intended to protect, maintain or improve environmental quality and human health at contaminated sites in general.

CCME criteria include two types of benchmarks for soil and water quality - assessment criteria and remediation criteria. Assessment criteria are approximate background concentrations or approximate analytical detection limits for contaminants in soil and water, and remediation criteria are used as clean-up benchmarks based upon intended land use. Remediation criteria do not address site-specific conditions. They are considered generally protective of human and environmental health for specified uses of soil and water at contaminated sites. The remediation criteria for soil are classified by three land uses:

1) Agricultural,
2) Residential/Parkland, and
3) Commercial/Industrial.

Remediation criteria for water are classified by four uses of water likely of concern at contaminated sites:

1) Freshwater aquatic life,
2) Irrigation,
3) Livestock watering, and
4) Drinking water.

Contaminated Sites Regulations (draft) (Yukon Government, 1996)

According to these draft regulations a site is contaminated if it used for agricultural, commercial, industrial, parkland, or residential land use and contains a substance in concentration greater than or equal to:

(I) the generic numerical soil standard of Schedule 1, or
(ii) the matrix (pathway specific) numerical soil standards of Schedule 2

and, surface or groundwater used for aquatic life, irrigation, livestock, or drinking water which exceeds a concentration greater than or equal to:

(I) the generic numerical water standard of Schedule 3, or
(ii) the local background concentration of that substance in the soil, surface water, or groundwater.

Below 3 metres of the surface, commercial land use criteria is applicable.

Mine Reclamation in Northwest Territories and Yukon (INAC, 1992)

This report defines factors which are to be considered in reclamation of abandoned mine sites operating in northern climates. Factors include:

- open pit and underground mines;
- special mines such as uranium, sand and gravel, and coal;
- waste rock and tailings disposal;
- acid generation and leaching; and
- estimating cleanup costs.

3.2.2 Application of Criteria and Guidelines

The following assessment criteria were used for the Silver Hart abandoned mine site:

A. Soils:

CCME:	Remediation Criteria for Soil - Commercial/Industrial standard
YUKON RENEWABLE RESOURCES	Draft Contaminated Sites Regulations - used for hydrocarbon screening parameters

B. Water:

Envir. Canada:	Metal Mining Liquid Effluent Regulations and Guidelines - are compared to seepage from mine openings, and river/stream water quality
Background:	Downstream water quality results of rivers and streams are compared to the results of upstream (background) water quality.

CCME: Remediation Criteria for Water - Freshwater Aquatic Life guideline for river and stream water quality

[Note: In this screening assessment of water quality, analytical results are primarily compared to background values which may more accurately characterize the local environment.]

C. Mine Clean-Up and Reclamation:

INAC: Mine Reclamation in Northwest Territories and Yukon

3.3 METHODS

3.3.1 Background Information

Available background information was consolidated from the Yukon Chamber of Mines mine records, Whitehorse Public Library, Yukon Archives holdings, and records and reports from the Yukon Renewable Resources Library, Yukon Water Board, DIAND Lands Branch, DIAND Water Resources, and DIAND Library. INAC (1994) provided an overview assessment of the Silver Hart mine site to that date. Other published information sources were examined for site or regional information as applicable. On the basis of available information, knowledge gaps regarding existing or potential safety and environmental risks at the site were identified and a site assessment plan was developed.

3.3.2 Site Assessment Components

A site assessment was conducted to identify existing or potential safety and environmental risks on the site. The assessment included the following components:

Waste Rock disposal areas were inspected and sampled by a professional geologist to assess acid rock drainage potential by:

- Identifying waste rock mineralization with potential to release acidic and/or metal-contaminated drainage
- Mapping and logging waste rock, tailings, pit walls and rock faces
- Collecting and field testing representative samples of mine wastes

Mine Openings were inspected and documented to identify closure requirements.

Non-Hazardous Site Debris was inventoried.

Contaminated Soil Areas were measured and sampled to determine the degree and type of contamination and estimate soil volumes for remediation.

Hazardous Materials were inventoried and sampled for identification of contaminant constituents, as necessary.

Buildings and other Structures were inspected for hazardous material and assessed for stability.

Borrow Sources were identified and assessed for accessibility and approximate quantity and type of granular material.

Scale site plans were prepared to identify the dimensions and locations site structures, mine workings and adits, waste rock disposal areas, on-site sampling locations (as applicable), and any other pertinent information.

3.3.3 Sampling Methods and Quality Assurance

Test Pit Sampling

Test pits were excavated to a depth of about 0.3 m to 1.0 m. Horizons in the test pit walls were logged, noting colour/weathering, rock composition, primary and secondary mineralization, particle size distribution, paste pH and paste conductivity, and moisture content. The test pit and was photographed and its location was marked on the field map. Approximately 2 kg of rock was collected at each sample site. For test pits showing a homogeneous wall face, a plastic sheet was placed at the bottom of the test pit and the pit wall was cut vertically down with a cleaned shovel. All rock larger than 75 mm in size was discarded. The sample was coned and quartered, discarding opposite quarters, until a 2 kg sample was obtained. For test pit walls showing clearly-distinguishable horizons (distinguishable by the sulphide and carbonate contents), the horizons were sampled individually.

Water Sampling

Samples were collected from surface streams upstream and downstream of mine related flows, and from representative seeps emanating from waste rock, tailings, pit walls, and/or adits. 250 ml water samples were collected by hand, facing upstream, ensuring that the sample is not contaminated by disturbed sediment, debris and other floating materials. Sample bottles were rinsed three times with water from the sample stream prior to collecting the sample.

Two (2) ml of HNO_3 were immediately added to water samples destined for metals analyses. For analyses of non-metallic parameters, water samples were brim-filled to minimise head space, placed in a cooler, and maintained at 4° C until delivery to the laboratory.

Soil Sampling

Soil lithology was recorded from observations of the side walls of the test pit, and soil samples for both field and laboratory testing were collected. Observations were recorded for each soil sample site, including soil particle size, consistency, colour, moisture, discolouration, stratification, odour, and any other observations of significance. Samples were collected at depth intervals selected on the basis of stratigraphic observations and anticipated or apparent contamination. The lab samples were collected using disposable latex gloves and decontaminated stainless steel sampling utensils. All samples intended for organic analyses were stored in laboratory-cleaned 250 ml glass jars; samples intended for metals analyses were placed in new "Whirl-Pak" bags. All samples were placed in a cooler for shipment to the laboratory.

Barrel, Pail, and Above-Ground Storage Tank Sampling

Barrels and pails suspected as containing hydrocarbons were sampled with 1.2 m clean hollow glass rods ("drum thieves"), capable of extracting up to 25 ml of product. The rods were inserted into the drum or pail, and the uppermost open tip was sealed to maintain the sample within the rod as it was extracted from the drum or pail. The sampled hydrocarbon was then drained into a 40-ml laboratory-cleaned vial. The extractions were repeated until at least 20-30 ml of product was obtained. The vial was then sealed and placed in a container for shipment to the laboratory. Each used drum thief rod was subsequently destroyed to prevent accidental re-use.

No barrels, pails or storage tanks of any type were identified at this mine site.

Quality Assurance

Quality Assurance (QA) is a set of procedures for ensuring that the results of chemical analyses are, and can be shown to be, accurately representative of field conditions. A complete QA program includes both a field component and a laboratory component.

In addition to the standard sample collection methods outlined above, the field QA measures that were implemented for this assessment study include:

- chain of custody procedures and forms;
- a sample labelling and sample location identification scheme;
- laboratory preparation of all sampling containers;
- laboratory defined sample preservation and shipping procedures; and
- regular maintenance (including re-calibration) and cleaning of field equipment.

Laboratory QA measures included replicate analyses of selected soil and water samples. Replicate analytical results were submitted with each analytical report.

4.0 ENVIRONMENTAL SETTING

4.1 MINERALIZATION

A quartz-siderite vein carrying small pods of massive galena strikes about N 15^{o}E and cuts northeast-trending, southeast dipping quartz-sericite schist containing intercalated blue-grey quartzite bands of the Keno Hill quartzite. Sulphide mineralization appears to be limited in extent and the largest massive sulphide lens observed was about 5 feet long and 6 inches thick. The mineralization consists of galena, sphalerite and tetrahedrite in a carbonate gangue (Yukon Minefile 105M 029). The major commodities identified at this site are silver, lead, zing, gold and tungsten. A minor commodity identified at this site is copper.

4.2 SURFACE HYDROLOGY

No surface water features were observed at this site. The site is located well above the McQuesten river and the topography between the Wayne abandoned mine site and the river is undulating and gently sloping.

4.3 CLIMATE

The closest climatological information is from the town of Elsa, 63 55' N, 135 29' W; 814 m above sea level (Environment Canada, 1980). Total annual precipitation is 413.0 mm. This consists of 219.5 mm of rainfall and 202.9 mm of snowfall. Highest levels of rainfall occur in July and highest levels of snowfall occur in October. Temperatures range from -25.1 C in January to 14.1 C in July. The mean annual temperature is -4.4 C.

4.4 VEGETATION

The Wayne exploration site is located within the Mayo Lake-Ross River Ecoregion at an approximate elevation of 750 m to 770 m a.s.l. The Wayne exploration site is overgrown with black spruce, alder and willow. In this Ecoregion, the terrain below the treeline (1350 m to 1500 m a.s.l.) consists of extensive forests of open black spruce, and occasionally lodgepole pine, with moss, ericaceous shrubs, and willows, dominating the understory.

White spruce, occasionally with aspen or lodgepole pine, occurs on warmer and better drained sites. In drier environments, lichen development is common. Alpine fir occurs in the subalpine and alpine vegetation consists of mountain avens, dwarf willow, birch, ericaceous shrubs, grasses, and mosses.

4.5 FISH AND WILDLIFE RESOURCES

This area supports a number of carnivorous species including wolf, coyote, grizzly bear, and black bear. Ungulates include caribou, Dall's sheep, and moose. Beaver, fox, and hare are also common. Typical bird species include raven, rock and willow ptarmigan, and golden eagle. No fish habitat appears to be close to the site.

4.6 SITE TOPOGRAPHY AND SOILS

Site topography is undulating and sloping gently to the northwest dropping towards the McQuesten River. The portion of the site near the airstrip is well-drained and granular at the surface. Within 2 km of the northwest of the airstrip, the site becomes poorly drained and boggy. Surficial soils are still quite granular but become more silty away from the airstrip. The dominant soil development in the area is turbic cryosolic and eutric brunisolic, with the occasional occurrence of dystric brunisols over coarse materials.

4.7 PERMAFROST

The Wayne site lies in a discontinuous permafrost zone. No attempt was made to establish the presence or absence of permafrost at this site.

5.0 SITE DESCRIPTION AND FINDINGS

5.1 BUILDING, INFRASTRUCTURE, EQUIPMENT

No buildings, equipment or any other material associated with mineral exploration were left on site. Work undertaken at the Wayne exploration site involved trenching, drilling, geochemical sampling, and geophysical surveys. The only evidence of past activity are a few remaining trenches. Most of the trenching is overgrown and evidence of past activity is difficult to identify **(See Photos 1 & 2)**.

5.2 NON-HAZARDOUS WASTE MATERIALS

Sawdust, from an old sawmill, covers undulating hills immediately west of the old runway leading down to the trenched areas of the Wayne site. Otherwise, no landfills, equipment or other non-hazardous waste materials were observed on site.

5.3 HAZARDOUS MATERIALS

No hazardous materials were found at the site.

5.4 WASTE ROCK DISPOSAL AREAS

Waste rock at this mine site is limited to small piles located near trenches. The rock piles are situated on relatively high ground and no additional surface drainage passes through them. The largest trench was 1.0 m deep, 5.0 m long and 1.5 m wide. One sample (WY/WR/P301) was collected from a rock pile approximately 10 tons in size, located beside the largest trench. Significant results from the above analysis are presented in Table 1 and detailed results are presented in **Appendix A**. The paste pH of the waste rock sample was 7.9, indicating that the material is not currently generating acid. The ratio of the Neutralizing Potential to the Acid Potential (NP/AP) was 1.3 and the total sulphur content was 0.06%. The sample contains concentrations of approximately 200 ppm of arsenic, manganese, and zinc, and 112 ppm of chromium.

Table 1 **Summary Acid/Base Accounting Test Results**

Sample #	Paste pH	Total S (%)	SO4 (%)	AP	NP	Net NP	NP/AP
WY/WR/P301	7.94	0.06	n/a	1.88	2.44	0.56	1.30

5.5 MINE OPENINGS

No underground development has occurred on this property. Therefore, there are no mine openings.

5.6 TAILINGS

No milling of ore was done on site. Therefore, no tailings are present.

6.0 CONCLUSIONS

The primary concern at the Wayne exploration site is the environmental risk associated with the waste rock disposal areas. However, the waste rock poses a low environmental risk since the quantity of waste rock is small and the potential for acid generation is insignificant. There are no health and safety concerns or aesthetic concerns at the Wayne exploration site. The overall priority rating assigned to the clean-up and remediation recommendations for the Wayne abandoned mine site is Low.

6.1 HEALTH AND SAFETY

There are no health and safety concerns on the Wayne exploration site.

6.2 ENVIRONMENTAL RISKS

The environmental risk associated with the waste rock at the Wayne site is low primarily due to the small volume of waste rock at the site. The NP/AP ratio of the material is 1.3, suggesting that it is potentially acid generating. However, the total quantity of rock is very small and the total sulphur available for generating acid is small (0,06%). Therefore, the potential for impacts from acid generation is considered insignificant. Since the host rock is schistose (platy and fine grained), the neutralizing components contained within the schist are likely available to react with the acid generating components.

There is no indication of acid generation occurring.

6.3 AESTHETIC CONCERNS

There are no aesthetic concerns on the Wayne exploration site.

7.0 RECOMMENDATIONS

Recommended remediation and management actions are compliant with applicable federal or territorial regulations and criteria, are reliant upon available technology, and are intended to be appropriate for local conditions and sensitivities.

No further test work is recommended on the waste rock. In addition, no work is required with regards to health and safety and aesthetic considerations. Should further development occur on the site, regulatory agencies should ensure that an acid drainage prevention plan is developed which includes detailed measures for handling and disposal of mineralized waste rock.

8.0 COST ESTIMATES TO IMPLEMENT RECOMMENDATIONS

There is no cost associated with implementation of the above recommendations as no further work is required.

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APPENDIX A
DETERMINATION OF
ACID ROCK POTENTIAL

Wayne Waste Rock Sample ABA and ICP Results

PARAMETER	UNITS	SAMPLE NUMBER WY/WR/P301
Field Conductivity	uS/cm	n/a
Field Paste pH		n/a
Lab Paste pH		7.94
Total Sulfur	%	0.06
Sulfate	%	n/a
AP	*	1.88
NP	**	2.44
Net NP	***	0.56
NP/AP		1.30
Aluminum	%	0.83
Antimony	ppm	5
Arsenic	ppm	217
Barium	ppm	62
Beryllium	ppm	< 0.1
Bismuth	ppm	< 1
Cadmium	ppm	< 0.1
Calcium	%	0.12
Chromium	ppm	112
Cobalt	ppm	7
Copper	ppm	25
Gallium	ppm	< 1
Iron	%	2.30
Lead	ppm	45
Lithium	ppm	15
Magnesium	%	0.35
Manganese	ppm	233
Molybdenum	ppm	9
Nickel	ppm	20
Potassium	%	0.21
Phosphate	ppm	230
Silver	ppm	1.5
Sodium	%	< 0.01
Strontium	ppm	20
Thorium	ppm	< 1
Tin	ppm	< 1
Titanium	%	0.02
Tungsten	ppm	5
Vanadium	ppm	6.1
Zinc	ppm	216

*AP = Acid Potential in tonnes $CaCO_3$ equivalent per 100 tonnes of material

**NP = Neutralization Potential in tonnes $CaCO_3$ equivalent per 1000 tonnes of material

***Net NP = Net Neutralization Potential = tonnes $CaCO_3$ equivalent per 1000 tonnes of material

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

APPENDIX B
SITE PHOTOGRAPHS

Photo 1.Access trail into Wayne site. Note gently undulating topography, mound of waste fuel (rear) and gradual slope up to right.

Photo 2. Northern extreme of site area with progressively more intense vegetative cover.

Photo 3. Waste fuel mound at eastern edge of site.

Photo 4. Transition zone between waste fuel areas covering site and plateau leading to abandoned runway to east.

Photo 5. Shallow mound south of wood waste area.

Photo 6. Looking west at deepest pit (less than 1 m deep).

Photo 7.Vegetation reestablishing itself along southern transition zone of site.

Photo 8. Looking north at sample WY-WR-P301.