

**ROCK TYPES  
in the  
FARO MINESITE WASTE DUMPS**

**Field work completed September 9-14, 1991**

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## 1.0 INTRODUCTION

The Faro Minesite has been in operation since 1970. During this interval waste rock dumps have been created in the immediate vicinity of the Faro pit (see Figure 1). As part of the Faro pit closure plan, the various waste rock types present on the surface of the dumps was documented. The purpose of the waste rock mapping was to delineate the distribution of potentially acid generating rock types on the dump surfaces.

During the interval September 9-14, 1991, I completed a map of the distribution of rock types on the surface of the Northwest, Faro valley, Northeast, and Main waste dumps. Mapping was undertaken at a scale of 1:2400 (200 feet = 1 inch). Most of the time was spent mapping the free dump top surfaces and the dump slopes. In most cases the smoothed floors and ramps consisted of fine gravel composed dominantly of schist particles. In some instances these floors were a distinctive colour suggesting the possible rock type parent for the gravel. These coloured areas have been noted on the waste dump maps.

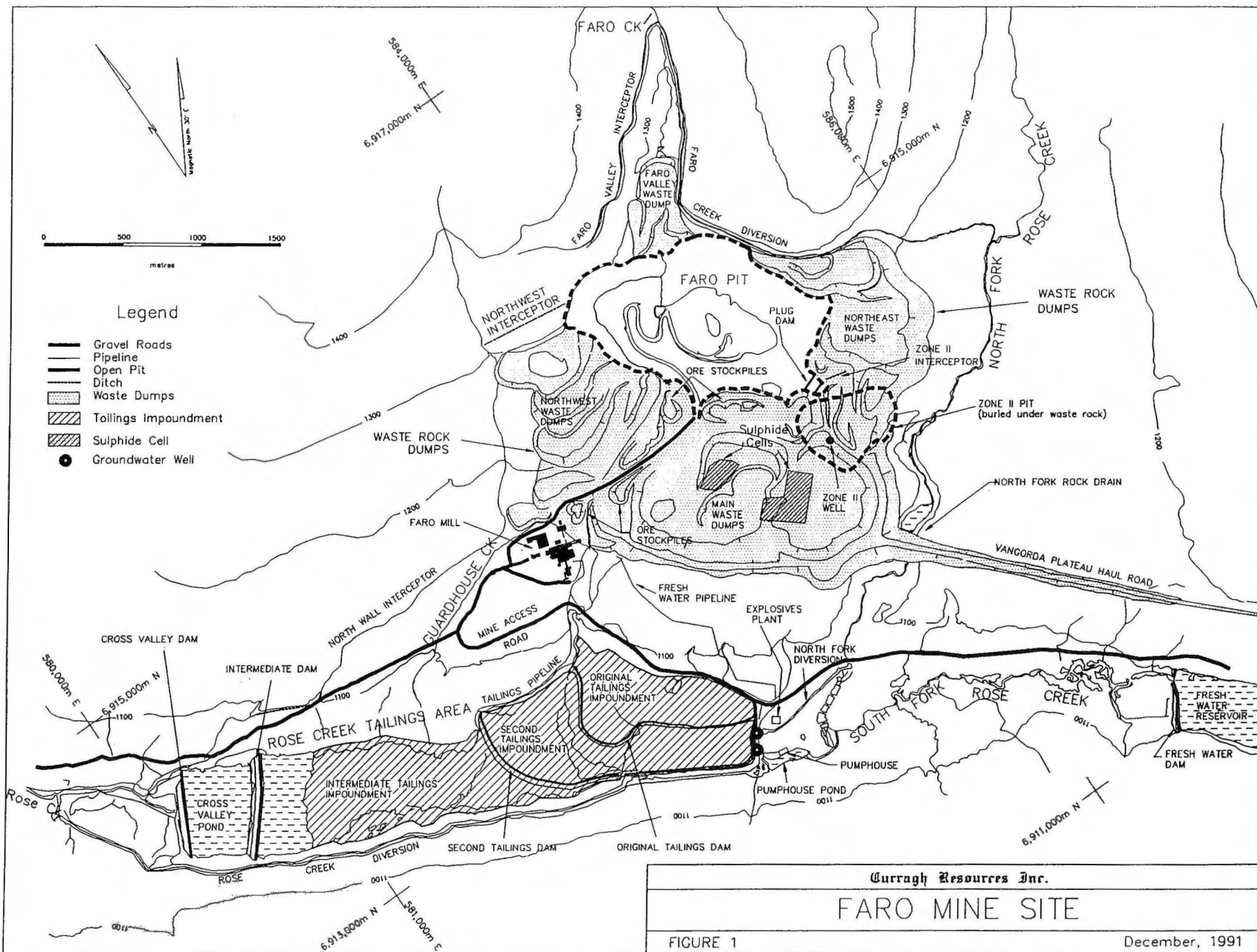
The base map for the project consisted of the topographic contour maps prepared by The Orthoshop (Calgary) from the September, 1990 low level aerial photography. This base map consists of 9 sheets for the Faro pit area. The coordinate system for these sheets is the Mine Grid; distances are expressed in feet. Elevations are in feet relative to the Faro Mine Grid elevation datum.

The Northwest Dumps occur on sheets 2, 3, and 5. The Faro Valley Dump is contained on sheet 3. The Northeast Dumps are located on sheets 6, and 7. The Main Dumps are located on sheets 5 and 6. For all areas except the Main Waste Dumps, the topography from the maps corresponded very closely with the topography encountered in the field. With the Main Dumps the topography for the central part of the dumps had been modified subsequent to the time of the air photography.

Figures 2, 3, 4, 5, and 6 contain the waste rock distribution for sheets 2, 3, 5, 6, and 7 respectively. The maps also include the various groundwater monitoring stations that were encountered in the field (approximate location). Groundwater monitoring stations with surveyed collar coordinates were also incorporated into the maps. Figure 7 (sheet 8) was included in this report because of the groundwater monitoring stations which were present on this map sheet.

## 2.0 WASTE ROCK TYPES

The various rock types in the immediate Faro pit area include schists, greenstones, calc-silicates, quartzites, massive sulphides, and intrusive diorites. Cyprus Anvil geologists devised a complicated alphanumeric lithostratigraphic code to distinguish the different rock types. Although the field maps for this project utilized this alphanumeric code, Figures 2 - 7 use a simplified rock code. The complete code was simplified because many of the different rock types have very similar acid generating potential characteristics.



Legend

- Gravel Roads
- Pipeline
- Open Pit
- Ditch
- Waste Dumps
- Tailings Impoundment
- Sulphide Cell
- Groundwater Well

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FARO MINE SITE

FIGURE 1

December, 1991

Rock type 1 consists of the noncalcareous, grey, muscovite-biotite schists of the Mount Mye formation. In the detailed code it would include rock types 1C, 1D, 1CD, and 1D2. This unit forms the host for the Faro ore deposit.

Rock type 1\* is the altered white mica schists immediately surrounding the Faro deposit. It is an altered variant of the Mount Mye formation and consists of a pale cream to white muscovite-quartz schist. It typically contains small stringers of pyrite and/or pyrrhotite which causes the rock to weather to an orange or yellow colour. It may also contain minor amounts of sphalerite and galena. The small sulphide content makes this rock type a net acid generator. In the detailed code it corresponds to rock type 1D4. This unit does not constitute a large volume of the waste dumps.

Anvil District ores consist of quartzites containing disseminated sulphides, massive pyritic sulphides which may contain barite, and massive pyrrhotitic sulphides. All of these lithologies are strong net acid generators. During the waste dump mapping they were grouped together as rock type 2. In the detailed code rock type 2 would correspond to units 2A, 2C, 2D, 2E, 2EC, 2F, 2G, and 2H. The massive pyrrhotitic sulphides weather with a strong dark reddish brown to orange surface resulting from the formation of iron oxides. In contrast the sulphides in the quartzites and massive pyritic sulphide ores are commonly only slightly tarnished to a bronze-brown colour.

Rock type 3 is a hard, green to dark green, slightly to moderately calcareous, calc-silicate of the Vangorda formation. Minerals present in this unit include quartz, tremolite, epidote, diopside, calcite, and plagioclase. Typically it weathers as large, angular, striped green and brown blocks. In the detailed code it is represented by rock type 3D. It is a net acid consumer because of its calcite content.

All of the intrusive rocks were grouped together as rock type 4. In the detailed code this would include rock types 10AB (Anvil Batholith), 10E, and 10F. These units have compositions ranging from quartz diorite to granite. They are equigranular to porphyritic and typically have a salt and pepper appearance with the mafic minerals biotite and hornblende being disseminated in a pale grey matrix consisting of quartz and feldspar. This rock type is not an acid generator.

Unit 5 consists of gravel and till. In some instances it appears to be undisturbed overburden. In other cases it has obviously been mined and dumped in its present location.

Greenstones were not included in the simple rock code classification. In the dumps this rock type has a very similar appearance to unit 3. Earlier drill logs often lumped the greenstones with the calc-silicates during the core logging. The mineralogy is also similar to unit 3. Its acid generation potential would therefore be approximately the same. In addition it does not form a large volume of the rock types found in the Faro pit area.

## 3.0 RESULTS

### 3.1 Northwest Dumps

Distribution of rock types for the Northwest Dumps is shown on figures 2, 3, and 4. The northernmost portion of the dumps consists dominantly of unit 4 with lesser amounts of unit 1. The southern and southwest portions of the dumps contain largely units 1 and 3. Sulphides (units 1\* and 2) are scattered throughout the dumps as local zones consisting of several truck loads. Most of the mapped sulphides occur as areas of free dumping on top of a nondescript floor. Sulphides on the dump slopes cascade down the slope as truck loads which were released from the edge of the existing floor. Some areas of yellow or orange floor indicate possible sulphides underneath the floor. The dark green floor area will consist of unit 3.

### 3.2 Faro Valley Dump

Rock types for the Faro Valley Dump are shown on Figure 3. The composition of the Faro Valley Dump is similar to that encountered in the northern part of the Northwest Dumps. The dominant rock type is unit 4 with lesser amounts of units 1 and 2. Unit 2 (sulphides) occur as groupings of loads throughout the entire dump area. The presence of unit 2 on a lower lift located on the western fringe of the dump suggests that sulphides may also be present beneath the present dump lift south of the Faro Creek dam. The local presence of a yellow floor in this area reinforces this possibility. Immediately adjacent to the Faro pit the dump is built on undisturbed gravel till; the overburden was not stripped off before the dump was created.

### 3.3 Northeast Dumps

Figures 5 and 6 illustrate the rock types on the surfaces of the Northeast Dumps. The western portion of these dumps has infilled the Zone II pit. The locations of the Zone II production well and monitoring well occur in the deepest part of the infilled Zone II pit.

Units 1 and 3 are the dominant units found on these dumps. Minor amounts of unit 4 occur at scattered localities. On the northeast margins of the dumps unit 5 consists of undisturbed till overburden. Unit 5 on the slopes on the eastern margin of the dumps must have been mined and trucked to their present locations.

Unit 2 occurs only in very minor amounts in the Northeast Dumps. The areas defined in Figure 6 consist of mixed loads containing units 1, 5, and 2. They appear to represent areas of temporary berms which happen to contain sulphides. Pyritic massive sulphides occur extensively in the floor of the unit 3 ramp in the northeast portion of Figure 5. Other occurrences of unit 2 in Figure 5 are limited to scattered areas north and east of the Zone II production well.

### 3.4 Main Dumps

Figures 4 and 5 delineate the rock type distribution on the surfaces of the Main Dumps. The central, highest portions of these dumps were not mapped because of location problems due to continued dumping after the aerial photographs were taken. These dumps are the only active dumps outside the areas of in-pit dumping.

The major rock types recorded on the surface consist of unit 1 in the north and units 1 and 3 in the central and southern portions of the dumps. Units 4 and 5 occur in minor amounts throughout the dumps.

Unit 2 has two major occurrences in the higher elevations of the Main Dumps. These areas occur in the north-central and central portions of the dumps. In Figure 1 their locations are indicated as the sulphide cell areas. The north sulphide cell is the current area of active sulphide waste dumping; this sulphide cell has not yet been covered with schist waste. The central sulphide occurrence is the earlier sulphide waste dumping area. The sulphides in this area also have not yet been fully covered by schist waste. The ramps leading to the earlier sulphide dump sites contain extensive sulphides in their floors.

Immediately south of the Zone II production well, the exposed portion of the lowermost lift in the Main Dumps contains extensive amounts of units 1\* and 2. This suggests that significant amounts of unit 2 may be buried under the central and southern portions of the Main Dumps. The uppermost dump slopes adjacent to the North Fork Rose Creek contain numerous scattered occurrences of unit 2.

## 4.0 CONCLUSIONS

Surface mapping of the rock types in Faro waste dumps was completed during the interval September 9-14, 1991. Mapping was conducted largely on the free dump areas and the dump slopes; the ramps and floors generally consisted of a fine schist or calc-silicate gravel. The mapping could only provide hints at the contents of the lower lifts of the dumps. Distribution of the different waste rock types at the surface was not chaotic, with extensive areas consisting of a single rock type.

Massive and disseminated sulphides occur widely throughout the waste dumps. Only the Northeast Dumps contain a minimal amount of sulphides. Exposed sulphide waste at the edges of earlier lifts in the dumps strongly suggest that significant amounts of sulphide waste have been buried by later lifts.

The north and central sulphide cells in the Main Dumps continue to expose significant amounts of sulphide waste. Both cells need further dumping of schist or calc-silicate waste to cover exposed sulphides. In both cell areas the sulphide waste cascades over the outermost

dump slopes, indicating that sulphide dumping extended out to the safety berm at the edge of the existing dump. Covering these slopes will be difficult. The extensive occurrence of sulphides in the ramp floors leading to these dumps delineate the problems inherent in trying to prevent contamination of the dump roads during the trucking of sulphide waste.

## 5.0 RECOMMENDATIONS

Schedule D calls for a trenching programme to evaluate the contents of the dumps below the present surface. Such a programme would probably only provide limited information. The trench could only evaluate the material immediately beneath the floor; deeper lifts would remain unexamined. Many of the unit 2 occurrences at the exposed surface consist of isolated truck loads or small groups of truck loads. A limited extent trenching programme would not be able to pinpoint or evaluate this sort of sulphide distribution effectively.

The sulphide cells in waste dumps should be designed so that they do not extend to the margins of the existing dump slopes. This would allow for a reasonable buffer zone of waste rock between the sulphides and the dump slope. Ramps leading into the sulphide cells should be considered as strongly contaminated areas which will have to be adequately accounted for during the covering of the sulphide cells. Two alternative approaches to the ramp contamination problem are possible. The first would consist of simply covering the ramp with schist waste. The second would consist of stripping off the contaminated rock in the top of the ramp, depositing this material in the sulphide cell, and then covering the cell. These recommendations obviously require a reasonable estimate of the amount of sulphide waste that will be mined during the life of the operation.


**CURRAGH RESOURCES INC.**

Inter-Office Memorandum

TO: Those listed below

FROM: Bette Boyd  
Executive Secretary  
Whitehorse Office

RE: **Rock Types in the Faro Minesite Waste Dumps  
Report #WH9201**



**DATE: 02 13 1992**

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To date I have distributed the following copies:

- 1 Gerry Acott
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- 1 Faro - Eric Soprovich/Bill Dunn
- 1 Steffen Robertson & Kirsten - Dave Harpley

The original document as well as the mylar copies of figures 2 - 7 have been retained in the Whitehorse Office. If you require further copies, please contact me.