CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO............ M020182
RECORD TYPE.......... X1M
INFORMATION SOURCE... 2
MAP CODE NO. OF REC..

REPORTER
NAME......................... FERNS, MARK L. (BROOKS, HOWARD C.)
AFFILIATION.................. DOGMI
DATE......................... 81 05

NAME AND LOCATION
DEPOSIT NAME................. WET BRUSH PROSPECT

COUNTRY CODE................. US
COUNTRY NAME: UNITED STATES

STATE CODE............... OR
STATE NAME: OREGON

COUNTY................... JACKSON
DRAINAGE AREA............ 17100308 PACIFIC NORTHWEST
PHYSIOGRAPHIC PROV....... 13 KLAMATH MOUNTAINS
LAND CLASSIFICATION...... 49

QUAD SCALE	QUAD NO OR NAME
1: 62500	TRAIL (1943)

LATITUDE	LONGITUDE
42-43-15N	122-59-38W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4729600	500500	+10

TWP...... 033S
RANGE.... 003W
SECTION.. 12
MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
COMMODITIES PRESENT.......... CU ZN

OCCURRENCE(S) OR POTENTIAL PRODUCT(S):
POTENTIAL.......
OCCURRENCE...... CU ZN

ORE MATERIALS (MINERALS,ROCKS,ETC.):

EXPLORATION AND DEVELOPMENT
  STATUS OF EXPLOR. OR DEV. 2
  PRESENT/LAST OPERATOR.... NORANDA, 1979

DESCRIPTION OF DEPOSIT

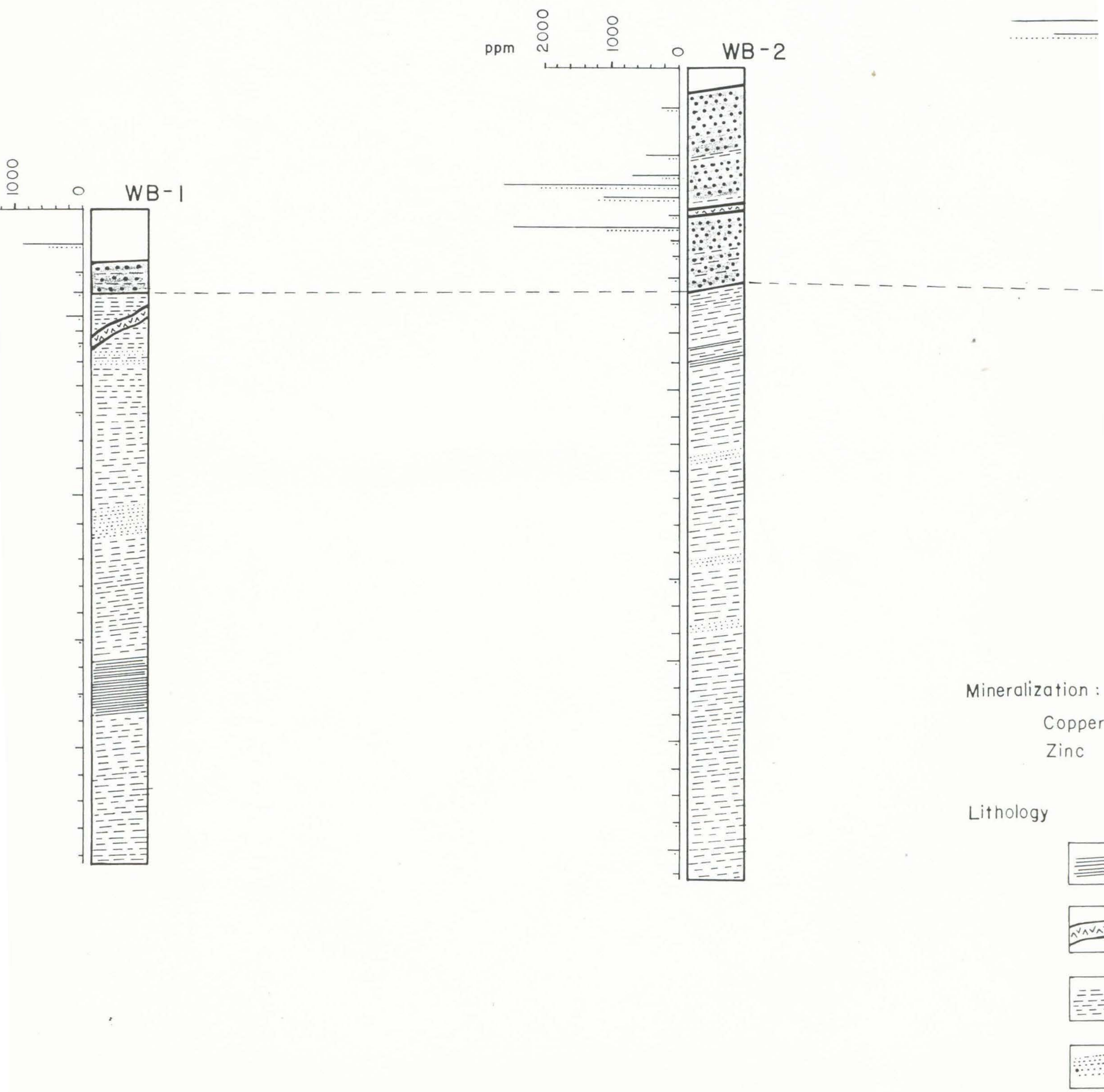
  DEPOSIT TYPES:
    VOLCANOGENIC

PRODUCTION
    NO PRODUCTION

GEOLOGY AND MINERALOGY

  AGE OF HOST ROCKS............ TRI?
  HOST ROCK TYPES.............. CHLORITE SCHISTS

  LOCAL GEOLOGY
    NAMES/AGE OF FORMATIONS,UNITS,OR ROCK TYPES
     1) NAME: MAY CREEK SCHIST
        AGE: TRI?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WB-1
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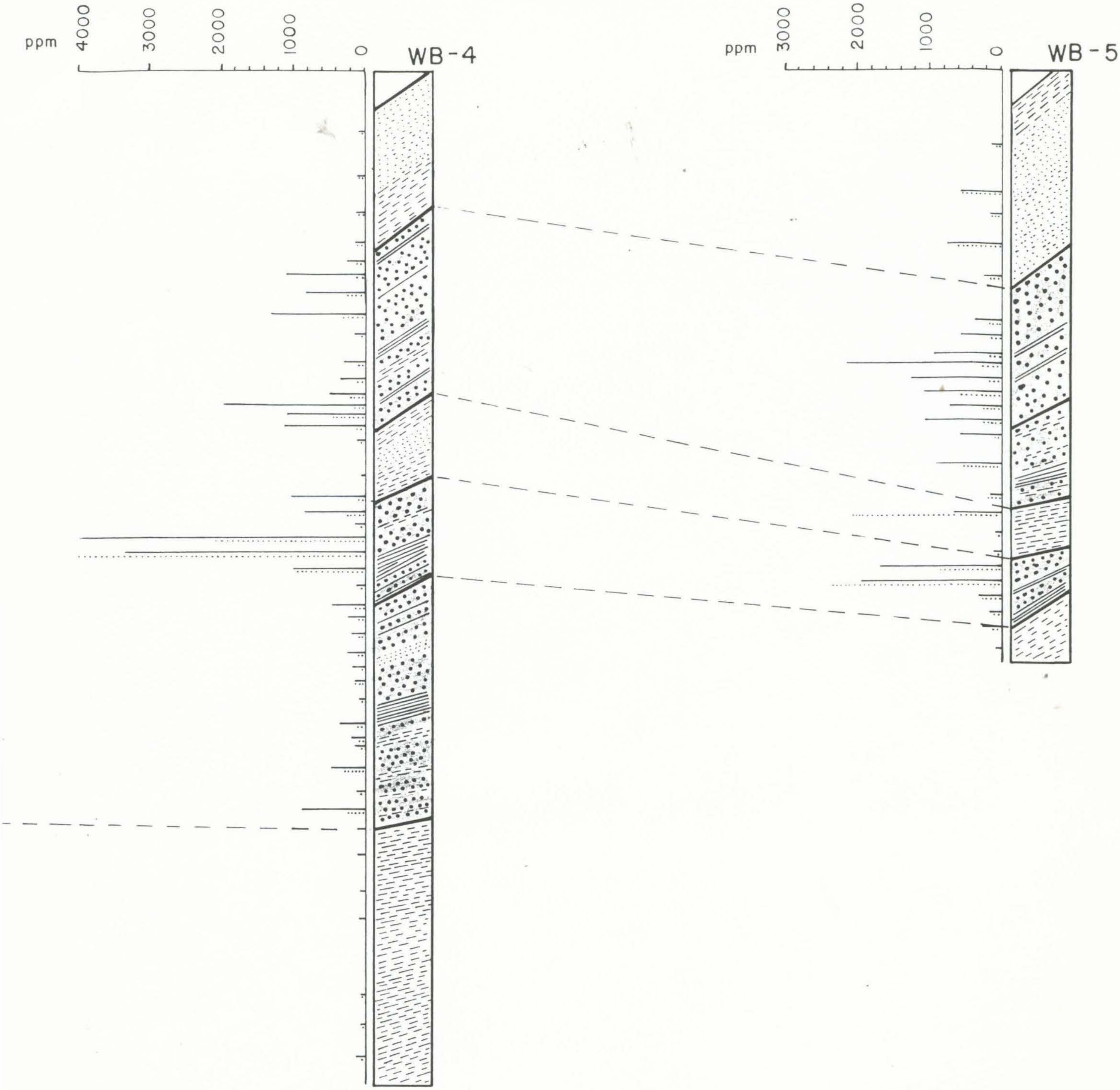
Zinc
Lithology



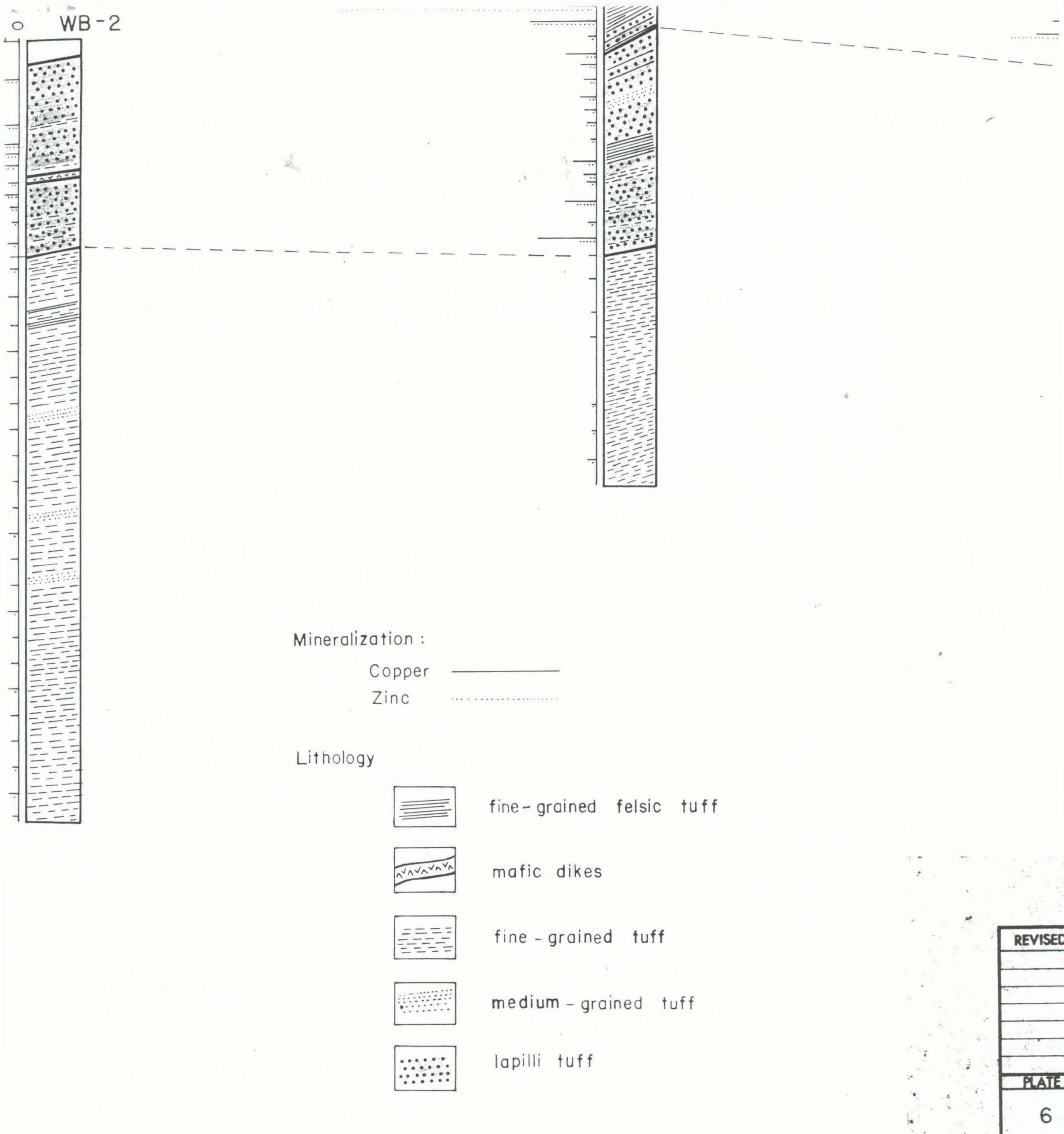
Mineralization :

Copper

Zinc

Lithology

fine-grained felsic tuff



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WB-2
Mineralization :
Copper
Zinc
Lithology
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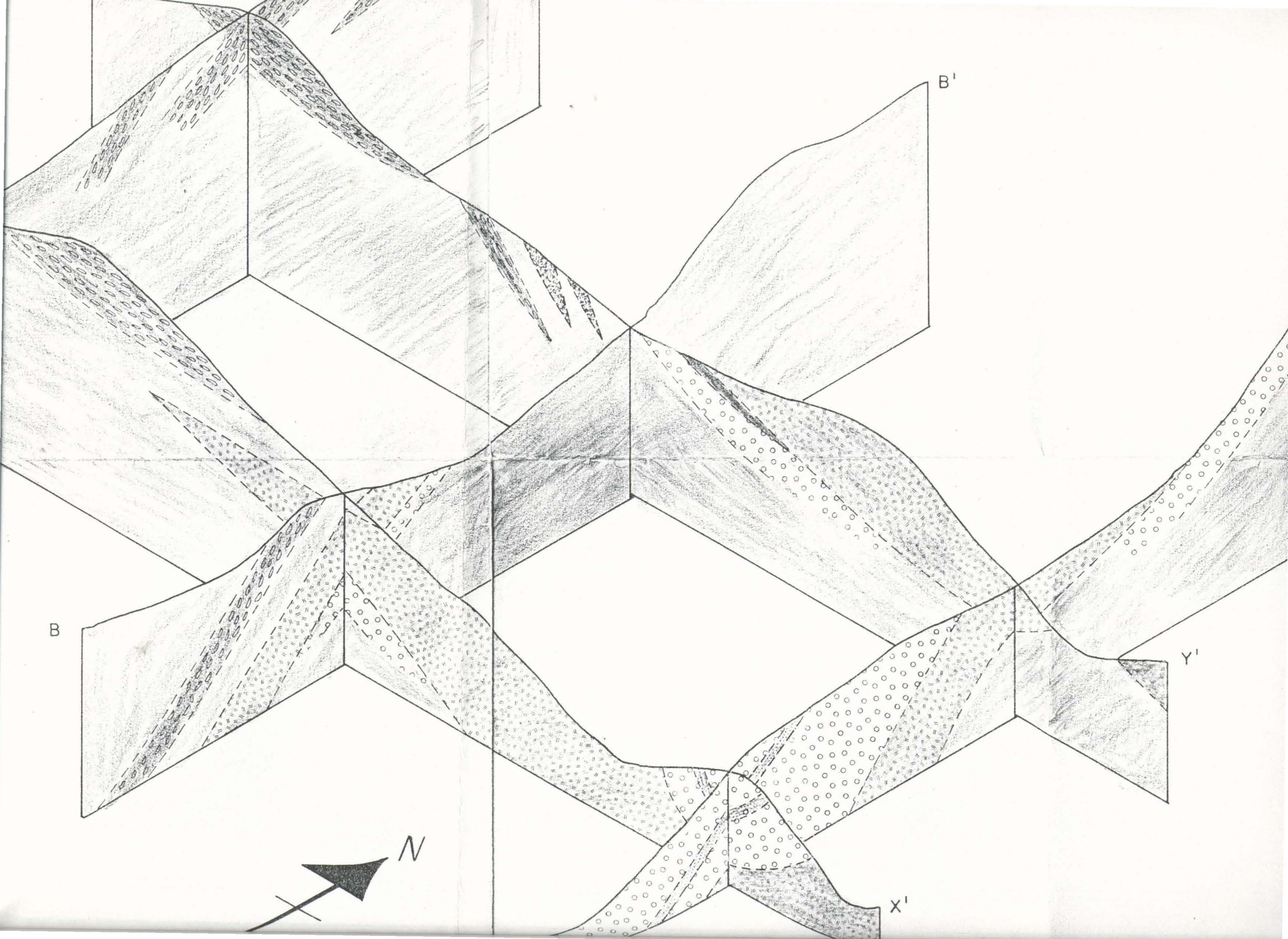
mafic dikes
fine - grained tuff
medium - grained tuff
lapilli tuff
REVISED
PLATE
6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Y'
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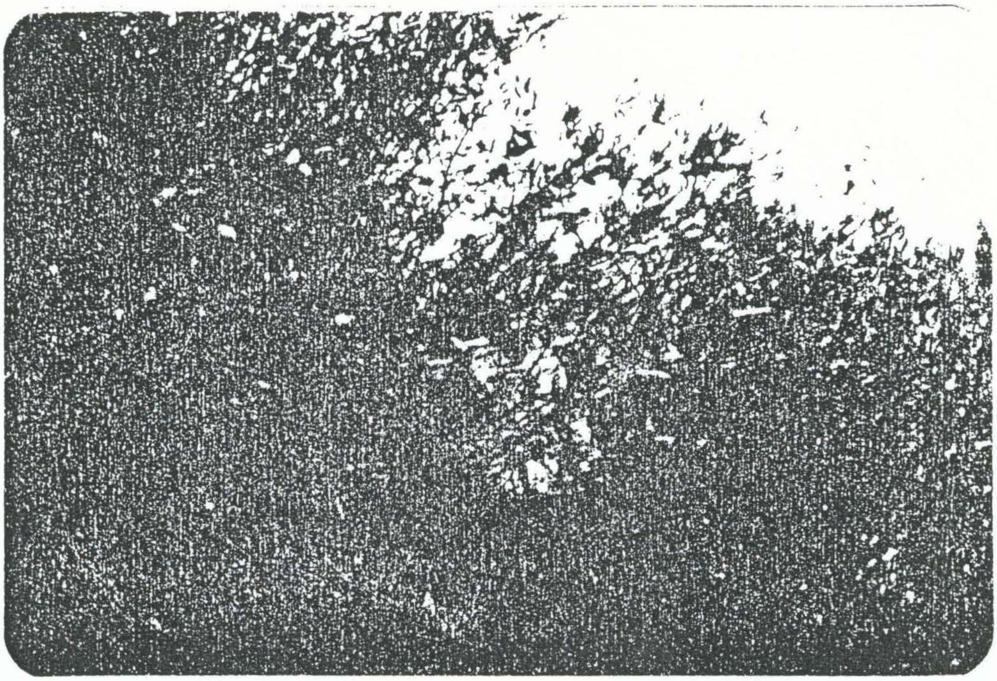
X'

PROGRESS REPORT ON WET BRUSH

(0205)



By

Bruce Otto (right), Roger Howell (center), and Hart Baitis (left)

Noranda Exploration, Inc.
Missoula, Montana

July 30, 1979

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CONCLUSIONS

Copper and zinc mineralization at the Wet Brush property was discovered during the Klamath Mountains massive sulfide reconnaissance program (0203) in 1977. Nineteen claims were located and 160 acres of state land was leased during the fall of 1977 to cover the zone of mineralization. Limited follow-up mapping and soil sampling was carried out during the fall of 1978. Detailed mapping and additional soil sampling of the Wet Brush property was completed during spring of 1979. Five diamond drill holes were completed during this time.

Rocks within the Wet Brush property are part of the May Creek Schist belt. The May Creek Schist was derived from upper greenschist-lower amphibolite facies metamorphism of pelitic and calcareous sedimentary rocks, intermediate to felsic waterlain tuffs, and intermediate to mafic volcanic rocks. Rocks exposed in the Wet Brush area represent a sequence of waterlain, epiclastic, pyroclastic and flow rocks of intermediate to mafic composition.

Copper and zinc mineralization at Wet Brush is associated with coarse-grained lapilli tuffs. Drilling intercepts indicate up to 60 meters of disseminated chalcopyrite and sphalerite associated with coarse-grained fragmental rocks. Assay results show grades of up to 0.47% Cu and 0.43% Zn. Regional mapping and stream sediment sampling indicate mineralization may extend to the south and west of Noranda's property. Additional work is recommended to test the down-dip and strike extensions of mineralization.

INTRODUCTION

During the fall of 1977, Noranda Exploration, Inc. located 19 claims in Jackson County, Oregon to cover the probable source of anomalous stream-sediment values. An additional 160 acres of state-owned land was also leased. During 1978 and early 1979 additional work was carried out to test the extent of massive sulfide mineralization found on the Wet Brush property. The following report summarizes the exploration data, results and conclusions.

Location - Land Position

The Wet Brush property is located approximately 17 kilometers south of Tiller, Oregon (Figure 1). Noranda's land position at the property includes 18 claims located on BLM ground in Section 7, T33S-R2W, a single claim in Section 1, T33S-R3W, and 160 acres of leased ground encompassing the NE¼ of Section 12, T33S-R3W (Plate 1).

Geologic Setting

The Wet Brush area has been mapped on a regional scale as a portion of the May Creek Schist Formation (Diller and Kay, 1924). However, later work (Wells, 1955; Wells and Peck, 1961) indicates that the May Creek Schist Formation may be a higher metamorphic grade portion of the Triassic Applegate Group. In this paper these higher grade rocks are collectively referred to as the May Creek Schist belt.

Regionally, the May Creek Schist belt is an elongate and arcuately northeast-trending belt of regionally metamorphosed eugeosynclinal rocks in the northern Klamath Mountains of Oregon (Figure 1). To the north and east the May Creek Schist belt is overlain by Tertiary volcanic and sedimentary rocks. To the west lie the other crudely arcuate belts of younger eugeosynclinal and plutonic rocks. The May Creek Schist belt is intruded by both quartz dioritic plutons and ultramafic rocks.

Exploration History

Discovery of mineralization at Wet Brush came about as a result of a massive sulfide reconnaissance program (Klamath Reconnaissance - 0203) carried out in southwestern Oregon during 1977 under the direction of Hart Baitis. Follow-up investigation of an anomalous stream-sediment sample (330 ppm Cu, 350 ppm Zn) collected during reconnaissance of portions of the May Creek Schist belt indicated that the anomalous values appeared to originate from a zone of sulfide-rich stratigraphy within a series of relatively coarse-grained fragmental volcanic rocks. Further follow-up silting indicated geochemical values up to 2650 ppm Cu and 1200 ppm Zn.

During October 1977 nineteen claims were staked and 160 acres of land were leased in the area of Wet Brush mineralization. No evidence of previous prospecting of mineralization in the area was found. The closest significant prospect (Mammoth) known in the area is located several kilometers to the northeast of Wet Brush.

Limited mapping and reconnaissance soil sampling of the property was carried out during the fall of 1978. Detailed mapping and additional soil sampling of the Wet Brush property was completed during March and April, 1979, by Howell, Otto, and Baitis. Five holes totalling 1,149 feet of diamond drilling were completed during this time.

Expenditures and capital costs attributed to the Wet Brush program (0205) during 1979 totaled $41,118.87 as summarized in Table 1. Total expenditures to date for the project total $46,913.27.

Table 1

Expenditures Incurred by

Noranda Exploration, Inc., at Wet Brush, 1979

Type of Expenditure	
Salaries - Field Expenses, Vehicles, etc.	$16,437.34
Assays, Geochemistry	911.23
Drilling	22,261.50
Road and Drill Site Preparation	1,508.80
TOTAL	$41,118.87

REGIONAL GEOLOGY

Only limited mapping of a reconnaissance nature has been carried out on the May Creek Schist belt. The first areal geologic study which included the May Creek Schist was that of Diller and Kay (1924). Their work defined the May Creek Schist as a formation of schistose rocks, locally of high grade and probably Devonian in age. Later work (Wells, 1955; Wells and Peck, 1961) indicates that the rocks which Diller and Kay defined as the May Creek Formation are part of the Applegate Group of Triassic age. Mapping by Kays (1970) indicates that Jurassic as well as Triassic rocks are regionally metamorphosed and are part of the May Creek Schist belt. More recent work (Smith and Page, 1977) supports the suggestion of Diller and Kay that the rocks may be Paleozoic in age. Clearly it has not yet been resolved whether the term May Creek Schist should be used to describe a metamorphic-tectonic package of rocks or a stratigraphic package of rocks as it has not yet been determined whether several lithologic units of different age make up the belt.

During the spring of 1977 a six-week reconnaissance silting and mapping program in the May Creek Schist belt was completed as part of a massive sulfide reconnaissance program in southwestern Oregon (see: Final Report of the Klamath Reconnaissance (0203), Southwest Oregon, by Baitis and Young, 1979). Reconnaissance geologic mapping of portions of the belt was done at a scale of 1:24,000 and covered an area of approximately

500 km^2 (Plate 2).

Mapping and correlation of lithologic units in the May Creek Schist belt was complicated by several factors. Regional metamorphism has masked original rock types, and it appears that the degree of metamorphism is variable with higher degrees prevailing to the east. Intrusion by quartz diorite plutons has caused local contact metamorphism and may have disrupted regional trends. Similarly, the intrusion of ultramafic rocks may also have disrupted trends. Regional northeasterly trends often give way to east-west strikes, and in the west central portion of the belt, northwesterly trends dominate (Plate 2).

Metasedimentary rocks in the May Creek Schist belt include quartz-biotite schists, quartzites, and some lenticular bodies of marble. These rocks were probably derived from metamorphism of pelitic and calcareous sedimentary rocks, and possibly some waterlain felsic tuffs. Foliated amphibole-rich rocks that also contain quartz, plagioclase, garnet, and biotite were probably derived from mafic to intermediate volcanic rocks. Commonly, porphyritic textures are still preserved in some of the volcanic units.

Due to structural and metamorphic complexities, it is difficult to generalize about the distribution of sedimentary and volcanic facies in the May Creek Schist belt. Regionally (Plate 2), the eastern portion of the belt is composed of amphibole-(hornblende-tremolite) plagioclase (calcic) gneisses and schists with orthogneisses prevailing to the north and paragneisses occurring along the southeastern margin. Pelitic sediments are found in the center of the belt. To the east, these pelites have undergone a higher grade of metamorphism and form a narrow zone of quartz-biotite schist near their contact with the gneiss belt. Where lower degrees of metamorphism have occurred, these rocks appear as argillites with occasional inter-bedded quartzites. A felsic unit crops out within the pelitic belt. These felsic rocks were originally mapped as metarhyolite flows (Diller and Kay, 1924), but Noranda's work indicates the unit consists of a sequence of thinly-bedded felsic tuffs. Locally, these tuffs are quite pyritic and interbedded with argillites. The western margin of the May Creek Schist belt is comprised of fine-grained mafic metasedimentary rocks and horn-blende-chlorite schists with intercalated greenstone flows.

Significant mineralization in the May Creek Schist belt appears to be restricted to anomalous Cu-Zn-Ag-Au mineralization related to massive sulfide occurrences in the northern portions of the belt. Stratiform mineralization at the Mammoth, Rowley, and Banfield prospects conforms to the regional trend of the eastern belt of metamorphosed volcanic flows and tuffs (Plate 2). The regional extent of this mineralized trend is well illustrated by the results of stream sediment sampling carried out in this portion of the belt (Figure 2). Data from the geochemical sampling indicates a regional NE-SW trending zone of Cu- and Zn-rich stratigraphy that extends from the Banfield Mine at the north to the Wet Brush prospect at the south, a linear distance of at least 16 kilometers.

GEOLOGY OF THE WET BRUSH AREA

Rocks exposed in the Wet Brush area represent a sequence of Paleozoic waterlain, epiclastic, pyroclastic and flow rocks of intermediate to mafic composition. Within this package of rocks six distinct mappable lithologies were identified (Plates 3 and 4).

Sulfides occur in all epiclastic and pyroclastic rocks but mineralization is best developed in coarse-grained lapilli tuff units. The lapilli tuff units, which are up to 60 meters thick and over 1000 meters in strike length, are interlayered with fine- to medium-grained tuffs. Abundant thin basalt flows are intercalated with the fine-medium-grained tuffs. Metamorphism progressed to the upper greenschist-lower amphibolite facies during which time a quartz-chlorite-amphibole-plagioclase mineralogical suite developed. Foliation formed parallel to the original compositional layering. Map units (Plate 3) reflect the primary compositional layering.

Lithologies

Lapilli Tuff

The lapilli tuffs consist of recrystallized intermediate composition pumice lapilli surrounded by a chlorite-amphibole-quartz-plagioclase matrix. Mineralogy of the clasts consists of plagioclase with lesser amphibole, quartz and chlorite. The lapilli fragments range from a few millimeters to a few centimeters in diameter. Differential weathering of these clasts and the chlorite matrix creates a distinctive knotty texture (Figure 3). Mineralized lapilli tuffs contain 5-20% sulfides (pyrite, pyrrhotite, chalcopyrite, covellite, sphalerite). The lapilli tuff units are commonly iron-stained and contain limonitic vugs where knots of sulfide have been weathered out.

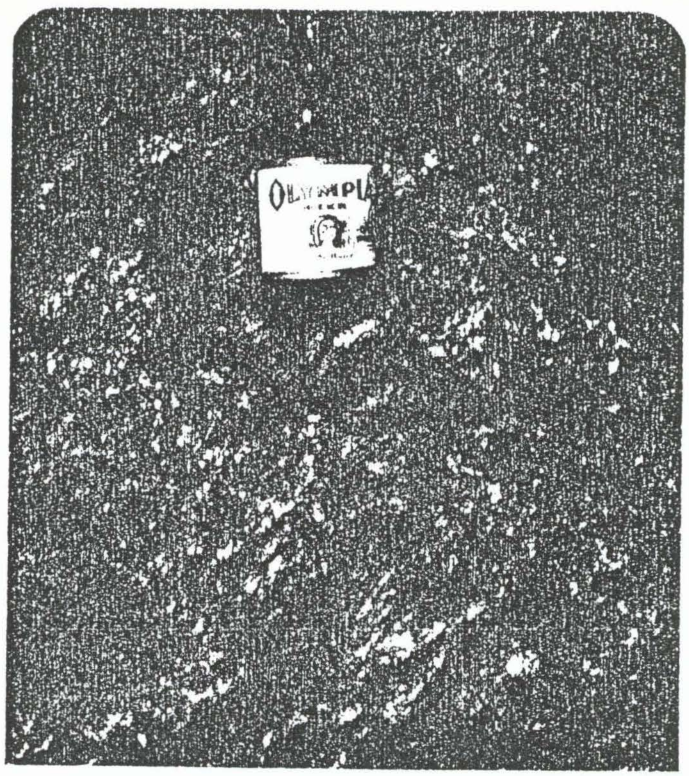

Figure 3. Knotty textured lapilli tuff containing large pyrite blebs (arrows).

Fine-Medium-Grained Tuff

The fine- to medium-grained tuff, which is the most abundant rock type, ranges from latite to dacite in composition. This rock is composed of varying amounts of plagioclase, tremolite/actinolite, chlorite, quartz, calcite, epidote, sphalerite, and pyrite. Large portions of the tuff contain primary laminations of plagioclase alternating with layers of chlorite, amphibole and plagioclase. Amphibole-chlorite selvages lie adjacent to many of the plagioclase laminations. The remainder of this unit consists of poorly foliated, fine- to medium-grained, amphibole-rich tuff. Thin post-metamorphic quartz-calcite veins crosscut the fine-medium-grained tuff.

Felsic Fine-Grained Tuff

Several thin beds of very fine-grained, massive tuffs of rhyolite to dacite composition (map unit FFT, Plate 3; Figure 4) are interlayered with the fine-medium-grained tuff and lapilli tuff.

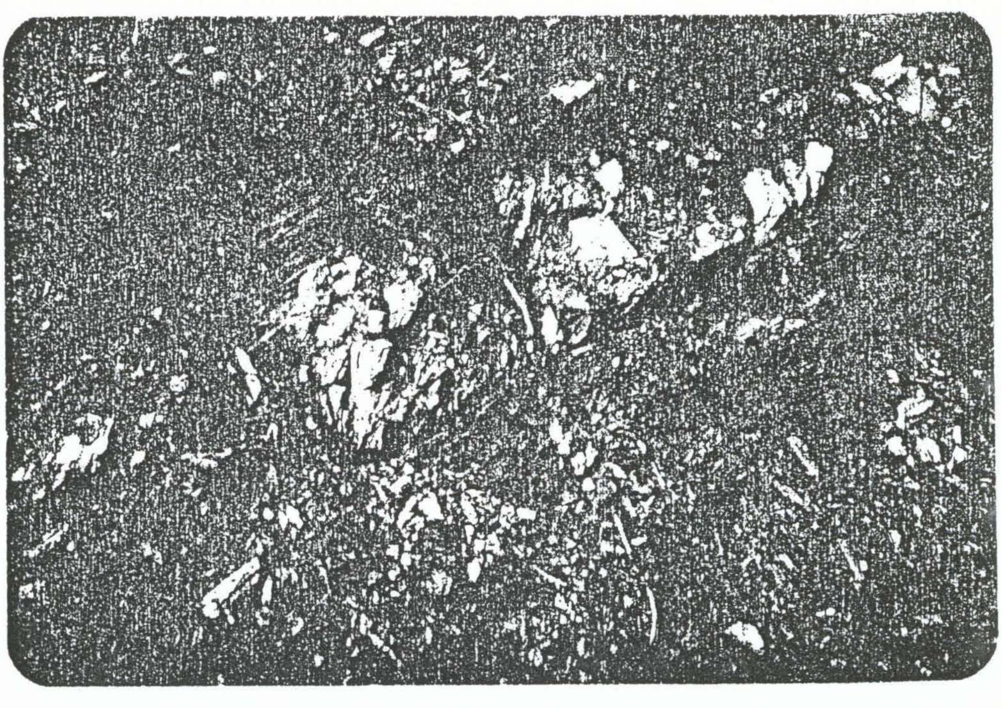

Figure 4. Felsic fine-grained tuff interlayered with fine-medium-grained tuff.

These beds are generally less than 5 meters thick and discontinuous along strike. Mineralogically, they consist of quartz, plagioclase, chlorite, tremolite/actinolite, and lesser biotite, muscovite and epidote. Although sulfides are absent in many of the felsic tuffs, some contain up to 10% fine-grained disseminated pyrite.

Basalt Flows

The eastern portion of the map area is comprised of a sequence of macroscopically similar basalt flows (map unit b, Plate 3). In addition to these, numerous thin basalt flows occur interlayered in fine-medium-grained tuff south and north of the map area (map unit ftb, Plate 3). The basalt is composed of plagioclase and hornblende with trace amounts of biotite and apatite. The plagioclase, which has mostly altered to epidote, has an anorthite content of approximately 52%. These basalt flows are distinguished from the fine-medium-grained tuff by the lack of tremolite/actinolite and presence of randomly-oriented plagioclase phenocrysts (Figure 5). Locally, the basalt flows contain relict pillow structures. The pillows are defined by limonite-rich elliptical surfaces enclosing unoxidized massive porphyritic basalt. Epidote laminations and locally, vesicular horizons occur adjacent to the pillows. Some of the flows display a primary grain size variation from aphanitic near their margin to medium-grained in the interior.

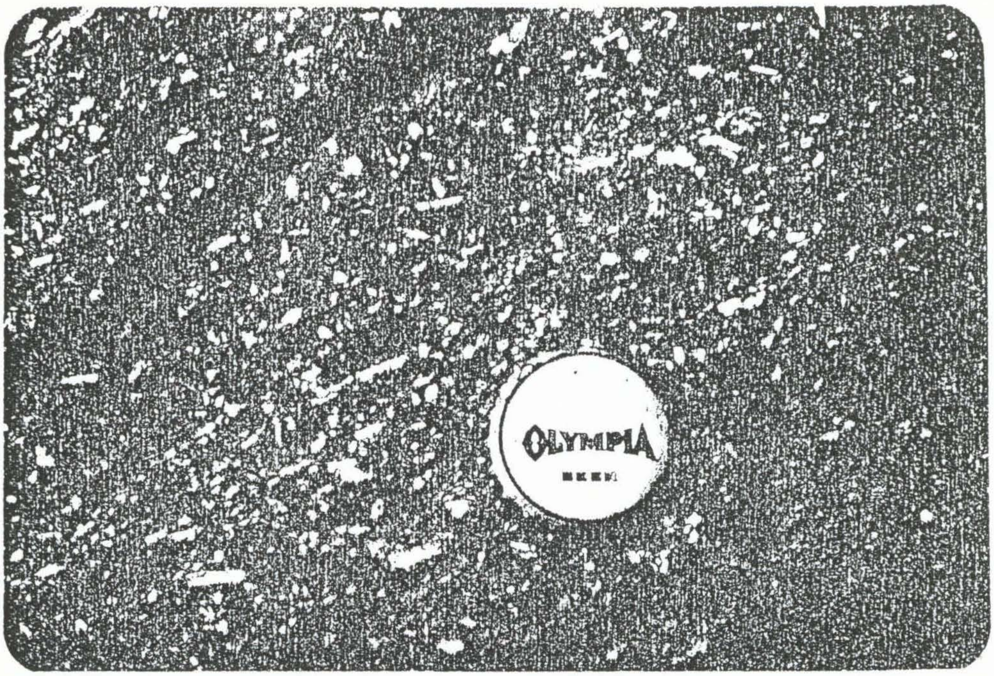

Figure 5. Porphyritic basalt flow (map unit b, Plate 3) exhibiting randomly oriented plagioclase phenocrysts.

Flow Breccia

Located within the sequence of volcanic rocks is an andesite flow breccia. The breccia is composed of medium-grained, massive clasts surrounded by a foliated fine-grained amphibole-quartz-chlorite-plagioclase matrix. The clasts, which are up to 50 centimeters long, have the same mineralogy as the matrix. Other similar flow breccias of basaltic composition occur interlayered in fine-medium-grained tuff and basalt flows north of the map area.

Intrusive Rocks

Several large andesite sills intrude the sequence of epiclastic volcanic rocks (map unit a, Plate 3). These massive, locally porphyritic, medium-grained sills consist of plagioclase and hornblende. The plagioclase, which has a composition of An_{30-40}, has largely altered to epidote.

Small discordant, massive basalt dikes intrude the epiclastic volcanic rocks. These dikes were seen in only a few localities and were not mapped.

Structure

Rocks in the Wet Brush area display two prominent fold systems. The earliest and smallest system is composed of microscopic to hand specimen scale isoclinal and ptygmatic folds. These small structures, which are visible only in the fine-medium-grained tuff, fold primary compositional laminations. The folds may represent soft sediment deformation as they do not disrupt the metamorphic foliation.

Tight, assymetric, similar style folding occurred subsequent to regional metamorphism. These structures, which are developed on all scales, fold metamorphic foliation and compositional layering. Microscopically, the structures are defined by bent and broken amphibole and chlorite grains. Fold axes, which coincide with the thickest portion of the lapilli tuffs, trend and plunge to the southeast (Plate 3). These second generation folds have amplitudes of up to 0.5 kilometers and wave lengths up to 0.4 kilometers. The folds are intrastratal as they die out both up and down section.

The second generation folds have been refolded by a broad regional warping. This is documented by the second generation fold axes not having a consistent orientation. Also, the foliation which defines the second generation folds plots along a very diffuse great circle in stereo projection.

Mineralization

Soil sampling at Wet Brush, conducted in the fall of 1978 and spring of 1979, delineated the source of copper, zinc, lead, and silver stream sediment anomalies discovered in the Klamath reconnaissance program (0203). Results of the geochemical survey (Plate 5) indicate a consistent relationship between anomalously high soil sample values and the lapilli tuff units. Two broad zones defined by anomalously high copper and zinc values correspond to the occurrence of major lapilli tuff units in the northeast corner of Section 12 (Plate 5). Within these areas well developed gossans are exposed. A third extensive zone of moderately high soil geochem values in the southern part of the claim block is also underlain by lapilli tuff.

Soil values on the crest and western flank of Wet Brush Ridge also indicate significant copper and zinc mineralization in the interlayered fine-grained felsic tuff and lapilli tuff. Silver and lead anomalies, also related to the lapilli tuffs, appear to be random within these units. More detailed geochem sampling may reveal a systematic pattern to silver and lead mineralization. Copper/zinc ratios in the Wet Brush area do not show a systematic trend.

Several roadcuts in Section 7 reveal knotty pyrite mineralization in the lapilli tuff (Figure 3). In addition, lapilli tuff at a roadcut near the center of Section 7 and felsic fine-grained tuff interbedded with lapilli tuff at a quarry to the south-west of Noranda's property contains chalcopyrite, covellite, and possibly chalcocite. Rock samples from the roadcut assayed 2.8% Cu; samples from the quarry assayed 6% and 11.8% Cu. Soil sample results on the west flank of Wet Brush Ridge suggest that the lapilli tuff and felsic fine-grained tuffs which crop out at the quarry are an extension of the major lapilli tuff unit to the east.

TARGET EVALUATION

A drilling program initiated in the spring of 1979 evaluated the large lapilli tuff unit in the northeast corner of Section 12. This unit showed the highest and most consistent copper and zinc soil anomalies in the samples collected during the fall of 1978. Results of additional geochem sampling, coincident with the drilling program, suggest further target areas to the south and west of the completed five drill holes.

Plate 3 shows the positions of the five drill holes relative to the geology. Holes WB-1 and WB-2 intersected only a small portion of the large lapilli tuff unit in the northeast corner of Section 12. Hole WB-3 collapsed and was abandoned. WB-4 and WB-5 were drilled from a single drill pad atop Wet Brush Ridge through the lapilli tuff unit.

Plate 3 shows the stratigraphic sequence intersected by the drill holes. Hole WB-4 intersects six generalized horizons. These are: 1) Fine- and medium-grained tuff; 2) a mineralized horizon of lapilli tuff, and lapilli tuff intercalated with felsic fine-grained tuff; 3) a second zone of fine- and medium-grained tuff; 4) a highly mineralized zone of lapilli tuff and thicker units of felsic fine-grained tuff; 5) a slightly mineralized zone of lapilli tuff interbedded with fine- and medium-grained tuff; and 6) fine-medium-grained tuff. WB-5 was drilled through the first four of these horizons, intersecting the two zones of high copper mineralization. The core from WB-1 and WB-2 correlate with the fifth and sixth horizons in WB-4.

Plate 6 shows copper and zinc values relative to the geology. The first zone of mineralization occurs through the interval 62' to 125' in WB-4, and 72' to 151' in WB-5. Sulfide mineralization is concentrated in lapilli tuff and fine-grained felsic tuff throughout the zone. Sphalerite occurs disseminated both in the lapilli fragments and the chloritic matrix of the lapilli tuff. Pyrite, pyrrhotite, chalcopyrite, and galena oc ur as fine-grained disseminations, and in large sulfide knots, primarily in the chloritic matrix, and in quartz veinlets. Chalcopyrite and galena commonly occur as exsolved blebs in larger pyrite knots. Sulfide minerals in the felsic fine-grained tuff occur as disseminations along laminations.

Pyrrhotite is confined to the first mineralized zone in WB-4, though it also occurs in trace amounts in deeper portions of WB-2 and WB-5.

The second zone of mineralization was intersected over the interval 150' to 184' in WB-4, and 170' to 193' in WB-5. Except for the absence of pyrrhotite, mineralization is similar in style to that occurring in the first sulfide-rich zone.

A third zone of slightly mineralized lapilli tuff and fine- and medium-grained tuff is intersected from 184' to 262' in WB-4. Chalcopyrite occurs sporadically in the lapilli tuff beds of this zone in trace amounts (locally up to 1%). Pyrite occurs as small knots in the lapilli tuff intermittently throughout the zone with concentrations up to 7%.

This third mineralized zone occurs in WB-2 through the interval 0' to 83'. Below the oxidized zone, at 39', chalcopyrite occurs locally in concentrations of 2% to 3%, and pyrite of 3% to 5%.

WB-1, collared within the third mineralized zone, intersected the fine tuff at 19'. No sulfides were seen in the oxidized lapilli tuff of the mineralized zone.

WB-5 was stopped 12' into the third mineralized zone, as logging of WB-4 core showed little visible copper mineralization.

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OPERATIONS PLAN

Wet Brush Prospect
(NE¼ Section 12, Township 33 South; Range 3 West)

Noranda Exploration, Inc. is submitting this operations plan in order to conduct further exploration on 160 acres of ground owned by the State Land Board of Oregon. The acreage of concern is located in the NE¼ of Section 12, Township 33 South, Range 3 West (see attached Figure 1) and is referred to as the Wet Brush Prospect in this plan.

Noranda's initial program of geologic mapping and limited geochemical sampling has caused minimal surface disturbance and has resulted in the delineation of potential mineralized zones on the Wet Brush Prospect. In order to further evaluate the potential of this ground, a program of geophysical exploration and diamond drilling is proposed. A brief summary of these programs follows.

Geophysical Program - Electromagnetic Survey

The nature of mineralization at Wet Brush (copper, iron, and zinc sulfides) allows the selection of a geophysical tool (electromagnetic survey) to test for potential target areas. The electromagnetic survey allows one to outline the effect of a local magnetic field (e.g., those caused by anomalous concentrations of sulfide minerals in rocks) upon the earth's magnetic field. Measurements are made by a mechanical link between a receiver and a transmitter, which in this survey will be of portable size (see attached illustration - Figure 2). Carrying out such a survey requires surveying of an accurate grid.

In order to carry out an electromagnetic survey of this nature at the Wet Brush Prospect, it is necessary to clear brush lines. No potential timber will be affected, as only a few such trees exist on the property and brush lines can be planned to avoid these areas. To carry out the geophysical survey, several brush lines that are from 1,500 feet to 2,000 feet in length and spaced approximately 500 feet apart will need to be cut.

Drilling Program

It is anticipated that diamond drilling will commence in early April, 1979, and require approximately two months to complete. Three to four holes are planned, and they will range from 300 to 700 feet in depth. Total drilling anticipated is approximately 1,500 feet. Hole diameters will be less than five inches.

Figure 3 shows the locations of planned drill sites and the approximate location of existing dirt or gravel roads. Access to drill holes #1 and #2 will be by existing gravel and dirt roads that will have to be modified somewhat to allow a truck-mounted rig into the area. Repair and cleanup of approximately one-third mile of road on BLM ground in the adjacent section (Section 7) to the east will be required. Only a few hundred feet of road will have to be repaired and cleaned up on the 160 acres belonging to the State Land Board. Access to drill site location #3 will be along an existing dirt road which requires no further work.

Drilling equipment will consist of a 1-2 ton truck drill rig, one water truck (1,000 to 2,000 gallon capacity), and one pickup truck for rig service and transportation.

Operating plans on the State Land Board ground involve repairing and/or constructing approximately 500 feet of road, constructing three drill pads (approximately 20 by 40 feet), and using tanks for containment of drilling mud. Holes will not be located in stream drainages and drilling mud will not be allowed to enter drainages. Upon hole completion, mud will be ponded at each drill site and buried during site reclamation. The drill holes will be safely plugged after drilling is completed.

APEX MAXMIN II PORTABLE EM

- Five frequencies: 222, 444, 888, 1777 and 3555 Hz.
- Maximum coupled (horizontal-loop) operation with reference cable.
- Minimum coupled operation with reference cable.
- Vertical-loop operation without reference cable.
- Coil separations: 25, 50, 100, 150, 200 and 250 m (with cable) or 100, 200, 300, 400, 600 and 800 ft.
- Reliable data from depths of up to 180 m (600 ft).
- Built-in voice communication circuitry with cable.
- Tilt meters to control coil orientation.

Figure 2: Instrumentation Required for Portable Electromagnetic Survey.