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ALCOR MINERALS LTD.

1970 EXPLORATION OF PROPERTIES IN THE CLARK RANGE SOUTHWESTERN ALBERTA

February 6, 1971

L. B. Halferdahl & Associates Ltd.
401 - 10049 Jasper Avenue
Edmonton 15, Alberta

ECONOMIC MINERALS

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1970 EXPLORATION OF PROPERTIES IN THE CLARK RANGE SOUTHWESTERN ALBERTA

Geographic Coordinates
49° 15' N
114° 15' W

by

L. B. HALFERDAHL, Ph. D., P. Geol.

February 6, 1971

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INTRODUCTION

Field work on the properties of Alcor Minerals Ltd. in the Clark Range of southwestern Alberta began on June 24, 1970 and was completed on October 29, 1970. The work was divided into 3 parts: conventional prospecting and noting geological structures, geochemical survey, and detailed work including mapping, trenching, and drilling of the Spionkop Showing. The work on the three parts overlapped to some extent, but except for some experimental work on the type of geochemical survey to be conducted, the geochemical work did not receive priority until after the conventional prospecting was completed in late August. This order was determined in part by factors affecting the type of geochemical survey conducted as explained herein, and by the availability of field crew. The conventional prospecting was conducted mostly by undergraduate university students taking geology, while most of the geochemical survey with one or two exceptions was conducted by field men essentially inexperienced in such work. A graduate student under the direction of the writer mapped the Spionkop Showing and supervised the rest of the program until September; then the program was supervised by the writer. The program was designed to evaluate the Alberta property of Alcor Minerals Ltd. so that areas warranting further detailed work would be outlined and to honor a work commitment on the Spionkop Showing. To gain more information on the area, some land outside the Alcor property was included in the program, and some land under option from Alcor at the time of the field work was not included. In late October the geochemical survey was extended to the Alcor property on the British Columbia side of the North Kootenay

Pass. A tent camp was used for the field work except in October, when other accommodation was rented. Two rented 4 x 4's equipped with winches and a $\frac{3}{4}$-ton pickup provided transportation, and were supplemented with other 4-wheel drive vehicles occasionally.

This report describes the evaluation of the Alcor property in the Clark Range, southwestern Alberta based on the exploration undertaken in 1970. It has been supplemented in a few places by reports from Cominco Ltd., Geowest Services Ltd., Kennco Exploration (Western) Limited, from the notes of traverses conducted in 1968 and other information obtained from Akamina Minerals Ltd. The sections on Geographic Setting and Regional Geology have been kept brief. More detailed information on these is available in published reports in the list of references, and on maps available from the Alberta Department of Lands and Forests.

SUMMARY

The properties of Alcor Minerals Ltd. in southwestern Alberta consist of nine wholly owned Exploration Permits totalling 105,292 acres, two partly owned Exploration Permits totalling 26,106 acres, four quarter section claims, and 75 optioned mineral claims. These properties lie within and adjacent to the Clark Range, which extends in a northwesterly direction for about 40 miles in Alberta and British Columbia and is about 20 miles wide. It contains mountains rising to elevations greater than 8,000 feet. Access is via provincial highways and gravelled roads, with railways not more than 30 miles from any part of the properties. Exploration in the area has been conducted by Kennco Explorations Limited, Cominco Ltd., Falconbridge Nickel Mines Ltd., and by smaller companies and prospectors.

The rocks in the area are Late Precambrian strata of the Purcell Series, which form part of the Lewis Thrust Sheet. They consist of limestones, dolomites, argillites, siltstones, sandstones, quartzites, and andesitic lava flows, and are cut by basic dykes and sills. These Precambrian rocks have been superimposed on younger Paleozoic and Mesozoic strata by the Lewis Thrust.

A geochemical survey involving the collection of more than 1400 samples of stream, spring, and lake waters has outlined 21 anomalous or slightly anomalous areas for one or more of copper, lead, and zinc. The anomalies northeast of Victoria Peak, on Drywood Mountain, on Pincher Ridge, along upper Gardiner Creek, in the Ruby Lake area, north of Whistler Mountain, near Table Mountain, and south of the North Kootenay Pass are considered important.

Forty-two mineral occurrences were found by conventional prospecting and during some previous work; they have been classified into four main types of which some of the Grinnell and siltstone types are important. Many of the Grinnell-type occurrences appear to be related to faults, whereas the siltstone-type occurrences may be related to faults or to a stratigraphic horizon above the Purcell Lava. The more important occurrences coincide with the important geochemical anomalies, except that faulting, but no mineralization was noted at the best geochemical anomaly northeast of Victoria Peak.

Mapping, trenching, and drilling of the Spionkop Showing showed that at least some of the copper mineralization is related to a fault, but is too low grade and not extensive enough to be economically important.

The source of the lead and zinc mineralization is apparently in the Sheppard Formation where what appears to be a sedimentary deposit has been discovered by Cominco in the Carbondale River area. A similar source for the copper mineralization in strata younger than the Sheppard Formation is favored, with the copper having been leached from it, carried in solution along faults and other channelways, and deposited in suitably porous rocks or other dilatant zones in the Grinnell and other formations.

RECOMMENDATIONS

1. Acquire Permit 148 or at least the ground covered by the best geochemical anomaly northeast of Victoria Peak.
2. Drop all ground beyond the Lewis Thrust Sheet in Permits 66, 68, 160, and 161, and NE 5-3-30 W4, SW 36-3-1W5. If possible, modify Permit 161 to include all the Lewis Thrust Sheet north of Permit 64.
3. Much ground in other Permits can be dropped as well, but this is not urgent.
4. No further work should be done on the Goble option.
5. Analyse the geochemical data by computer in an effort to identify any favorable mineralized horizons.
6. Investigate initially by study of geological reports and subsequently by field examination whether a sedimentary-type copper deposit is present in Purcell Strata younger than the Sheppard Formation. If so, such a deposit could extend through a wide area of southeastern British Columbia and northwestern Montana.
7. Conduct a study of aerial photographs to delineate faults in addition to those already identified.

8. Conduct a geochemical survey similar to that of 1970, for the areas of Permits 64, 65, and 148 (when acquired) not covered by the 1970 survey and to include the previously dry streams on Lys Ridge, in the Ruby Lake area, along Jutland Brook, and upper Gardiner Creek.

9. Investigate by sampling, mapping and possibly by geophysical survey, trenching, and drilling the important mineral occurrences and geochemical anomalies including

   a) northeast of Victoria Peak
   b) Drywood Mountain,
   c) Pincher Ridge
   d) Ruby Lake area
   e) upper Gardiner Creek
   f) Lys Ridge

10. Check the Sheppard Formation for lead-zinc mineralization, particularly north of Whistler Mountain, near Table Mountain, and south of the North Kootenay Pass for the sources of the zinc anomalies at these places.

PROPERTY

The property in Alberta consists of nine wholly owned Quartz Mineral Exploration Permits totalling 105,292 acres, two partly owned Quartz Mineral Exploration Permits totalling 26,106 acres, 4 quarter section claims or parts thereof, and 75 optioned mineral claims, all listed below. Each of the optioned claims was originally located according to the regulations in effect prior to Alberta Regulation 377/67 and so is expected to comprise approximately 51 acres except for Bighorn Fraction 95 which is smaller. None of the claims has been surveyed and none of the claim posts has been checked in the field. Nevertheless they are believed to have been located according to the regulations in effect at the time of their locations.

Quartz Mineral Exploration Permit No.	Acres	Date of Permit
	Wholly Owned	
58	9,453	5 - 7 - 68
64	9,920	29 - 8 - 68
65	9,920	29 - 8 - 68
66	9,440	3 - 10 - 68
67	19,840	3 - 10 - 68
68	9,279	3 - 10 - 68
147	9,600	5 - 2 - 70
160	9,920	28 - 9 - 70
161	17,920	5 - 10 - 70
	30% Undivided Interest	
70	19,652	7 - 11 - 68
71	6,454	7 - 11 - 68

Claim	Record Number	Record Date
Quarter Section Claims		
SW 36 - 3 - 1W5	870	24 - 3 - 70
NE 5 - 3 - 30W4 (part)	871	24 - 3 - 70
SW 26 - 3 - 1W5 (part)	872	24 - 3 - 70
NW27 - 3 - 1W5	883	28 - 4 - 70
Bighorn Optioned Claims		
1, 4, 6, 2, 7, 3, 5, 8	595 to 602	5 - 3 - 68
9 and 10	677 and 678	16 - 7 - 68
12 and 13	603 and 604	5 - 3 - 68
18 to 21	605 to 508	5 - 3 - 68
22 to 30	610 to 618	5 - 3 - 68
31 and 32	654 and 655	31 - 5 - 68
33 to 43	632 to 642	31 - 5 - 68
44 and 45	656 and 657	31 - 5 - 68
46 to 51	643 to 648	31 - 5 - 68
53 to 55	649 to 651	31 - 5 - 68
56	653	31 - 5 - 68
57 to 61	682 to 686	13 - 8 - 68
62 and 63	696 and 697	13 - 8 - 68
64	687	13 - 8 - 68
81 to 86	688 to 693	13 - 8 - 68
87 to 91	715 to 719	3 - 10 - 68
92 and 93	694 and 695	13 - 8 - 68
Fraction 95	412	17 - 11 - 67
101 to 103	420 to 422	21 - 11 - 67

GEOGRAPHIC SETTING

The Alberta property lies within and adjacent to the Clark Range of southwestern Alberta. It comprises a large part of this range north of Waterton Lakes National Park in Alberta. The Clark Range forms part of the southern Canadian Rocky Mountains, and straddles the Alberta - British Columbia border for about 40 miles extending northwesterly from the 49th Parallel. It contains many rugged mountains, some rising to elevations greater than 8,000 feet; the elevation of the lower valleys is about 4,500 feet.

Parts of the periphery of the Clark Range can be reached by Alberta and British Columbia Highway 3, by Alberta Highways 5 and 6, and by the southern transmountain line of the Canadian Pacific Railway and some of its branch lines in Alberta. Supplies and accommodation can be obtained in Pincher Creek or Waterton Park, Alberta or Fernie, British Columbia. Within the area are a number of all-weather Forestry, gas-well-service, and other gravel roads. In addition, dry-weather and 4-wheel-drive roads, and numerous trails provide access to many of the larger valleys and some of the mountain passes and ridges. Some of the mountain tops are suitable for landing helicopters, but strong winds can seriously hinder their use.

Most of the valleys contain streams or rivers of various sizes, the largest being the Flathead and Castle Rivers; hence, ample water is available except on some of the higher mountains.

Most of the lower parts of the mountain slopes are heavily timbered with spruce and other trees. Some parts are being exploited by lumber companies. Parts of the area were burned over many years ago with the resulting deadfall and second growth making travel on foot very slow in some of these areas.

Conventional prospecting, surface geological work, and geochemical field work are possible without serious hindrance from snow and ice during June, July, and August in the Clark Range. Some interruption of work can be expected by snow in September, but delays may be only short through much of September and October. One cannot count on conducting field work in May. July and August, are frequently so hot and dry that the forests are closed because of fire hazard in parts of August and September. Such closures generally apply only to recreational use.

Shell Canada Limited operates a large gas processing plant 12 miles southwest of Pincher Creek. Coal was produced until the 1920's from large deposits near Corbin, which is west of the Flathead Range, the range immediately north of the Clark Range.

PREVIOUS EXPLORATION

The Clark Range and adjoining country have received considerable attention because of the petroleum possibilities in the Paleozoic rocks of the area. This resulted in the discovery of the Waterton gas field in 1957, and the subsequent building of the gas processing plant of Shell Canada Ltd. near Pincher Creek.

For many years the metallic mineral possibilities of the Clark Range appear to have received only cursory attention. Scattered reports of copper occurrences had been made by prospectors, hunters, and trappers over the years, but not until 1963 and subsequent years did the staking of a number of claims in the vicinity of Yarrow and Spionkop Creeks on the east side of the Range almost adjoining north of Waterton Lake National Park by Frank Goble, his associates, and rivals, begin to attract the attention of mining interests.

In 1966 and 1967, Kennco Explorations Limited prospected, mapped, and drilled some of these claims, north of Yarrow Creek, and prospected several Quartz Mineral Exploration Permits in the Alberta part of the Clark Range, and some claims and adjoining ground in the Commerce Peak area of British Columbia. Subsequently Kennco terminated its interest in the Clark Range.

From time to time other interests have acquired Quartz Mineral Exploration Permits, but little exploration appears to have been conducted.

In 1968, Akamina Minerals Ltd. conducted a program of prospecting, sampling, and trenching, on 75 of the Goble claims, on a number of Quartz Mineral Exploration Permits in Alberta, and on a large number of claims located in British Columbia.

In 1969, Cominco Ltd. mapped, sampled, and trenched parts of Quartz Mineral Exploration Permits No. 64 and 65. Cominco continued this work including the drilling of five holes on the Grizzly Showing in 1970. It also conducted some mapping and drilling on Quartz Mineral Exploration Permit No. 71. In early 1971 it terminated its interest in these three permits.

In late 1969, Falconbridge Nickel Mines Ltd. acquired a large number of claims in the British Columbia part of the Clark Range and in early 1970, Quartz Mineral Exploration Permit No. 148 between permits 64 and 66 in Alberta. It conducted an exploration program on these lands in 1970.

Other interests, some based in Vancouver, have staked claims in the British Columbia part of the Clark Range in 1969 and 1970.

REGIONAL GEOLOGY

The general features of the geology of the Clark Range are well known through mapping by officers of the Geological Survey of Canada and by drilling and other geological investigations by individual companies. In the Clark Range, a block of Late Precambrian dominantly sedimentary rocks known as the Purcell Series forms part of the Lewis Thrust Sheet, a major structure of the Rocky Mountains in the southern part of Canada and the northern part of the United States. The Lewis Thrust carried the Precambrian rocks and some of the overlying Paleozoic rocks now constituting the Clark Range eastward from the vicinity of Cranbrook, superimposing them on younger Paleozoic and Mesozic strata. The maximum stratigraphic separation is 25,000 feet to 30,000 feet, and the maximum thickness of the sheet is 20,000 feet. Other thrust faults are known particularly close to the Lewis Thrust.

The Flathead Fault is a major southwest-dipping normal fault along the west side of the Clark Range in the Flathead Valley; it extends for 50 miles or more both north and south of the Clark Range. It has dropped the strata of the Lewis Thrust Sheet at least 20,000 feet on its west side.

The Lewis Thrust Sheet in the Clark Range forms a broad synclinorium extending from the Akamina syncline in the southeast near Cameron Lake to a series of smaller synclines and anticlines in the northwest near Mount McCarty. In addition to the structures mentioned above, many smaller folds and faults are present.

Rocks of the Purcell Series have been divided into several formations; from bottom to top as designated by officers of the Geological Survey of Canada they are Waterton, Altyn, Appekunny, Grinnell, Siyeh, Purcell, Sheppard, Gateway, Phillips, and Roosville. If the minimum and maximum thicknesses measured for each formation are totalled, the thickness of the Purcell Series ranges from about 10,000 feet to more than 21,000 feet. The rocks include limestones, dolomites, argillites, siltstones, sandstones, quartzites, and andesitic lava flows. Most are cut by basic dykes and sills which are generally considered to be related to the Moyie intrusions of the Cranbrook area to the west.

Work reported herein indicates that some of these intrusions, particularly the sills, contain low grade copper mineralization with local higher grade pockets, but such mineralization is present mostly in the fine grained margins, while very close by are dark basic intrusives essentially barren of copper minerals. While not conclusive, this suggests that there may be two periods of intrusion of basic rocks with the mineralization taking place between them. Douglas (1952) noted the presence of dark green basic sills which locally contain stellate aggregates of feldspar up to 2 inches or more in size. In some of these rocks the writer observed ellipsoidal structures resembling pillows, as well as vesicular tops, features which suggest that some may be lava flows.

Other much younger porphyritic trachytes or syenites have been noted by Price (1962). One of these is shown along La Coulotte Ridge on his map. Sill-like bodies, apparently petrographically similar, were encountered during this project at the west side of the headwaters of the West Castle River, on the ridge north of La Coulotte Peak, and at the south end of Barnaby Ridge southwest of Ruby Lake, all in the lower part of the Gateway Formation. One sill where observed is up to 250 feet thick. It consists of flesh-colored feldspar phenocrysts to 5 mm in size in a very fine grained dark brownish purple groundmass near its contacts. In the central part, the groundmass is grey, with a grain size up to 1 mm and consists of feldspars, some partly altered to epidote and with the ferromagnesium minerals mostly altered to chlorite.

GEOCHEMICAL SURVEY

A geochemical survey involving the collection of more than 1400 samples of stream, spring, and lake waters in the Clark Range and adjacent to it in southwestern Alberta and southeastern British Columbia was conducted in August, September, and October 1970. Previous geochemical surveys had been conducted in part of the Clark Range by Kennco Exploration (Western) Limited in 1967, and by Cominco Ltd. in 1969. The results of these surveys have not been studied by the writer but they are reported to have been based on stream sediments and soils, and to have been unsuccessful, possibly because of the minimal geochemical dispersion in the Clark Range where rapid mechanical erosion is predominant. If this is accepted, then a geochemical survey was warranted only if it could be based on a type of sample with a reasonable level of geochemical dispersion. Spring and stream waters were a possibility. Although geochemical surveys based on such waters are known to the writer to have been successful in only a limited number of other places, it was thought that the Clark Range offered a reasonable chance because of the generally hot, dry summers and dry falls, if the sampling was conducted after the streams had subsided from the spring runoff. Accordingly it was decided to defer the geochemical survey until the latter part of the field season after conducting some field tests. During the survey many streams or parts of them were dry, and so could not be sampled. Possibly this could have been avoided if the survey had started in late July. On the other hand, snow in September and October appeared to have little or no effect on the streams except that the accompanying cold froze some at higher elevations.

Field Tests

The field tests consisted of attempts to adopt dithizone field testing methods for stream sediments and soils to stream waters; the concentrations of copper, lead, and zinc are usually measured in parts per million in sediments and soils, but in parts per billion in waters. Analytical results for copper in these field tests along with laboratory analyses of water and stream sediment samples from a stream draining the Grizzly Showing are given in Table 1.

TABLE 1

Field Tests of Stream Water
and Laboratory Analyses of Stream Water and Sediment - Copper

Sample No.	Field Test of Water P - Detected n - Not Detected	Laboratory Analyses of Water ppb	Laboratory Analyses of Stream Sediment ppm
W1	n	4	20
W2	P	3	22
W3	P	3	18
W4	P	4	23
W5	P	7	20
W6	P	7	18
W9	n	5	13
W12	n	4	18
W15	n	4	14
W17	n	4	21

These results show that copper was detectible in stream waters by the field tests in parts of the streams draining the Grizzly Showing and not detected in other parts. Although the copper concentrations in the stream sediments cannot be correlated with those in the waters determined by laboratory analyses, they may be slightly correlated with the field tests of waters. These and other tests showed that copper could be detected by these field tests and hence that stream waters in the Clark Range appeared suitable for a geochemical survey. However, as the field test results were rather subjective and only semiquantitative, all the samples were sent to a commercial laboratory for analyses by atomic absorption techniques.

In September another attempt was made to use stream sediments. This was done on Drywood Mountain where a copper showing had been previously located and anomalous concentrations of copper in stream waters obtained. The results are shown in Fig. 9: -- possibly two anomalous concentrations of copper and one of lead all at or very close to the copper showing. This appears to confirm the results previously obtained by Kennco and Cominco for stream sediments in the Clark Range. The geochemical survey of stream sediments conducted by Geowest Services Ltd. on the Alcor properties in the Flathead Valley also confirms these results: only two minor copper showings are located by this method, while the more promising copper occurrences located by conventional prospecting were not detected in the stream sediment analyses.

Analysis of Data

Details of the sampling, sample treatment, analytical methods, and the data obtained from the geochemical survey of stream, spring and lake waters are in appendix 1. Sample locations and sample numbers are shown in Fig. 2. Some creeks were resampled for three reasons: to provide check analyses; initial samples were analysed for copper only; one shipment of samples was temporarily misplaced. This resampling accounts for the density of sample locations in a few parts of Fig. 2. In general it was found that smaller tributary streams and springs were more useful. As explained in appendix 1, the geochemical data are ready for analyses by a computer, but time has not permitted such analyses. Instead simple statistical analyses are shown in Fig. 3 to 5. The similarity of geochemical behaviour of copper and lead in waters and the difference of zinc is clearly displayed by the shapes of the histograms in Fig. 3 to 5. Based on these statistical analyses, the analytical data for copper, lead, and zinc have been grouped into background, slightly anomalous, and anomalous. In Fig. 6 to 8, low background values are shown by the sample location only; high background values by arrows indicating the direction of increasing values. Slightly anomalous and anomalous values are shown by the concentrations of copper, lead, and zinc, in parts per billion. Although this method of analysing the data has detected several anomalous areas, the field tests of the water showed that subtler analytical methods such as those available with a computer may be needed to detect such showings as Grizzly* (occurrence 41, Fig. 11, appendix 2).

Fig. 6 to 8 show data for all water samples collected except for 5 very high copper concentrations omitted from a westerly-flowing tributary of Gardiner Creek on Permit 160. Check analyses failed to confirm these high copper concentrations, although 3 slightly anomalous zinc concentrations were obtained from the same creek. In general, it is thought that copper concentrations much above 100 or 200 parts per billion are probably from contaminated samples. For this reason the high copper concentrations along Jutland Brook in Permit 67 (Fig. 6) were not checked, but for reasons outlined in the section on Origin of Mineralization checking may be warranted. A lead concentration of 1260 parts per billion on a tributary at the head of the West Castle River on Permit 58 (Fig. 7) may also be due to contamination.

Geochemical Anomalies

Anomalous or slightly anomalous areas in Fig. 6 to 8 are listed in Table 2, where each anomalous area is rated for copper, lead, and zinc by scoring 1 for each high background concentration, 3 for each slightly anomalous concentration, and 5 for each anomalous concentration determined.

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*In this connection it may be significant that the mineralized strata of the Grizzly Showing are dipping into the side of Barnaby Ridge so that streams flowing down the ridge have minimal contact with the mineralized strata.

TABLE 2: GEOCHEMICAL ANOMALIES

	Anomalous Area	Cu	Pb	Zn
1.	NE of Victoria Peak, Permits 66 and 148	53	60	34
2.	Pincher Ridge N of Drywood Creek, Permit 147	23	2	6
3.	Drywood Mountain, Permit 66 and adjoining land	18	26	80
4.	NW 27-3-1W5 and adjoining land	7	31	42
5.	SW 26-3-1W5 and adjoining land	9	11	11
6.	Spionkop Creek, SE corner of Permit 147	3	30	23
7.	Spionkop Creek, Goble Option	0	11	23
8.	Blind Canyon, Goble Option	8	15	12
9.	Yarrow Showing, Goble Option	3	0	15
10.	South of Yarrow Creek	0	0	19
11.	South of Victoria Ridge, Permits 70 and 140	2	3	12
12.	Jutland Brook, Permit 67 and adjoining land	25*	0	31
13.	South of Windsor Ridge, Permits 70 and 72	5	3	10
14.	S, E, and N of Table Mountain, Permit 161 and adjoining land	0	0	49
15.	North of Whistler Mountain, Permits 64, 161 and adjoining land	0	0	42
16.	Grizzly Creek, N central part of Permit 67	8	0	10
17.	SW side of Barnaby Ridge, Permit 67	5	1	15
18.	Ruby Lake area, Permits 58 and 67	25	0	10
19.	Upper Gardiner Creek, Permit 68	25	2	1
20.	Syncline Brook, Permits 65, 68 and adjoining land	5	1	17
21.	South of N. Kootenay Pass, B.C.	0	0	42

* Samples may have been contaminated

In addition to the anomalous areas in Table 2, there are three other areas slightly anomalous for zinc: west side of Castle River below the confluence of West and South Castle Rivers; O'Hagen Creek area; and the westerly-flowing tributary of Gardiner Creek previously mentioned. These and anomalous areas 9, 10, 11 probably 12, 13, 14, 15, 20, and 21 in Table 2 are anomalous or slightly anomalous for zinc only, with anomalous concentrations of copper and lead being absent or almost absent. The three not included in Table 2 are in Cretaceous strata beyond the limit of the Lewis Thrust. If the zinc which has produced these concentrations originated in the rocks of the Lewis Thrust Sheet, then the geochemical mobility of zinc is clearly demonstrated. The histograms in Fig. 3 to 5 can also be interpreted as showing the mobility of zinc as distinct from that of copper and lead. Fig. 10 shows the results of other samples collected from an area underlain by Cretaceous strata east of Waterton Lakes National Park. One value for zinc is anomalous and another is slightly anomalous; all others are background. These observations on the geochemical mobility of zinc mean that geochemical anomalies in the Clark Range and adjacent regions based only on zinc, particularly in Cretaceous strata, may not be significant unless confirmed by other evidence.

Of the anomalous areas in Table 2, that northeast of Victoria Peak is clearly the best. Other important anomalous areas are Drywood Mountain, Pincher Ridge, Ruby Lake area, and upper Gardiner Creek. Other anomalous areas that <u>may</u> have merit are 4 and 5 in Table 2. The existence of anomalies for all three metals - copper, lead, and zinc - in some of the above areas appears to confirm their significance, and also suggests that the copper, lead, and zinc forming the anomaly may have the same genesis. Further evaluation of the geochemical anomalies based on the results of the prospecting is in the next section.

PROSPECTING

Conventional prospecting was conducted during 104 traverses mostly by 2-man parties provided with compasses and altimeters and instructed to note particularly geological structures and other features that might provide clues to the origin of the copper mineralization.* The traverses conducted, the mineral occurrences found, and observations on the structures and other features of the geology are shown in Fig. 11. In Fig. 11 some of the geological formations noted on the traverses do not always coincide with the published geological maps. Such discrepancies are to be expected between maps published at scales of one and two miles to the inch, and the prospectors' traverses. The mineral occurrences found, along with a few obtained from other sources, are numbered in Fig. 11 and in appendix 2, where they are described. A considerable amount of work has been done on four occurrences: 9 - Spionkop (see section headed Spionkop Showing in this report), 10 - Yarrow, 41 - Grizzly, 42 - Whistler.

In addition in Fig. 11 are several unnumbered copper occurrences whose locations are not precisely known. They have been reported by others not far north of the boundary of Waterton Lakes National Park from Mount Glendowen to Newman Peak and northwest to Bovin Lake and beyond to Victoria Ridge, and in a few other places but details are not available. Some of these occurrences appear to be related to a stratigraphic horizon in the Sheppard Formation. Near the top

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* The prospecting had been completed before news of Cominco's find of sphalerite and galena in the Sheppard Formation had leaked out.

of the Sheppard Formation, chalcopyrite very sparsely disseminated in about 6 feet of massive grey, very fine grained, thickly bedded dolomite was found just south of the North Kootenay Pass by the writer in 1968 and in the Carbondale River area by Cominco in 1970. Similar chalcopyrite at the same stratigraphic horizon elsewhere in the Clark Range including Beavertail Valley, Yarrow Creek, Sage Creek, Drywood Creek, Castle River, and North Fork of Kishinena Creek, was reported by Frank Goble in 1968. Assays range from trace to 0.16% copper, but the more reliable assays do not exceed 0.03% copper. Although this type of occurrence in the Sheppard Formation appears to differ considerably from sedimentary copper deposits such as the Kupferschiefer, its fine grained nature and wide areal extent at one stratigraphic horizon suggest that it may well be sedimentary. Even if it is, field examination and assays indicate that, at least where examined and sampled, it is too low grade to be economic.

Types of Mineralization

The occurrences in appendix 2 can be grouped into four main types: Grinnell, sill-margin, siltstone, and vesicle-filling. Grinnell mineralization is characterized by chalcocite in the interstices of quartz grains in sandstone, along contacts of and fractures in green argillite pebbles in sandstone and along bedding planes and fractures in sandstone. In some occurrences the chalcocite is accompanied by bornite and to a lesser extent chalcopyrite. Malachite staining may be abundant or virtually absent. Because malachite is a secondary copper mineral it has been included in appendix 2 in only a few descriptions, although it is present more or less in all. Grinnell-type occurrences also include disseminated chalcopyrite, bornite, and chalcocite in more highly cemented sandstones or quartzites. Many of the occurrences are only a few inches to one foot or so thick, even if they can be traced for as much as 1/2 mile, most for very much less. Most of these occurrences have been found at various stratigraphic levels in the Grinnell Formation with the better occurrences present at the very top of the formation and a part of the middle. Grinnell-type occurrencesare also found in quartzites at the bottom of the Siyeh and at the top of the Appekunny, where chalcopyrite is as common or more so than chalcocite. Most of the occurrences of this type in appendix 2 are minor, but in addition to the four occurrences (9, 10, 41, 42) which have been drilled or trenched, occurrences 16 (Pincher Ridge), 19 and 20 (Drywood Mountain), and possibly 37 (upper Gardiner Creek) appear to have thick enough mineralized zones to warrant additional work.

Sill-margin mineralization, as explained in the section on Origin of the Mineralization, is believed to be genetically related to Grinnell mineralization. It is characterized by disseminated very fine grained chalcopyrite and chalcocite in the margins of green basic sills, for thicknesses seldom exceeding one foot. Its distribution in the sill margins is erratic, and some appears to penetrate locally to the center of the sills along joints. In one sill with this mineralization on Yarrow Creek at or near the top of the Appekunny Formation, the sill margin appeared to have been bleached, and the magnetite present elsewhere in the sill had been destroyed. Grinnell mineralization is common in sandstones adjacent to sills with sill-margin mineralization. In general, sill-margin mineralization is not regarded as economically important.

Siltstone mineralization consists of fine grained chalcocite or chalcopyrite in siltstones or argillites in the Gateway and possibly other formations above the Purcell Lava. Assays of grab samples range from 0.26% to 1.30% copper. The stratigraphic and lateral extents of these occurrences are not known but occurrences 25 (Lys Ridge west of Grizzly Creek), 26, 31 and 32 (Ruby Lake area), and 40 (North Kootenay Pass), warrant additional work.

Vesicle-filling is fairly common in vesicles in the Purcell Lava. Most of the vesicles in the lava are filled with calcite or chlorite; a few contain quartz, and even fewer contain blobs of chalcopyrite up to 5mm in size. Except for the top 2 or 3 inches of the formation, nowhere have the chalcopyrite-filled vesicles been found to be abundant enough to make them economically interesting. In the top few inches they are abundant enough in one or two places, but the mineralized zone is far too thin.

Other types of mineralization include the minor occurrences of chalcopyrite along dolomite contacts in the Waterton Formation, accessary sulfides in basic intrusives, and the sphalerite in occurrence 23 which is interesting but probably of minor extent.

Mineral Occurrences and Geochemical Anomalies

Grinnell mineralization on Drywood Mountain, Pincher Ridge, and upper Gardiner Creek appears to be responsible for the geochemical anomalies in these locations. During the prospecting many of the Grinnell-type occurrences were found to be close to faults, many of which have displacements of up to a few tens of feet. Many of the remaining Grinnell-type occurrences can be related to faults on the published geological maps, possibly even the Whistler Showing. A fault is shown on the published map along the best geochemical anomaly northeast of Victoria Peak and another was found along it during the prospecting, although no mineralization was reported. In summary, most of the more interesting Grinnell-type occurrences are related to faults and coincide with some of the better geochemical anomalies. The best geochemical anomaly is crossed by at least two faults, but base metal mineralization was not noted during the prospecting.

Siltstone mineralization in the Ruby Lake area coincides with scattered anomalous concentrations of copper. Some of these and the occurrence on Lys Ridge appear to be possibly related to a stratigraphic horizon in the Gateway Formation. Published geological maps show faults near some of these occurrences. Hence it is uncertain whether the siltstone mineralization is strata-bound or fault controlled.

Anomalous areas 4 and 5 and a few of the others in Table 2 show more determinations of higher lead and zinc concentrations than copper. Small amounts of galena and sphalerite have been reported from some of the 1970 Alcor traverses and some of the earlier traverses by Frank Goble. The significance of these lead and zinc anomalies can probably be learned from further work on the Drywood Mountain occurrence, which shows both high lead and zinc, and high copper.

Zinc anomalies in the Cretaceous strata have been discussed previously. Those in rocks of the Lewis Thrust Sheet near Table Mountain, north of Whistler Mountain, and south of North Kootenay Pass appear similar. The zinc may have come from nearby lead-zinc occurrences in the Sheppard Formation similar to those discovered by Cominco in the Carbondale River area. Some of the other high background or anomalous lead and zinc concentrations may be similarly explained.

SPIONKOP SHOWING

Location

The Spionkop Showing is south of Spionkop Creek, along the northwest side of Spionkop Ridge. Most of it is in Sec. 24, Tp. 3, R. 1, W 5th Mer., Alberta. It is reached by turning west from Alberta Highway No. 6 on the gravel road to the Waterton gas plant of Shell Canada Limited, south just before reaching the plant and following gas-well-service roads up Spionkop Creek. A bulldozed trail about 3 miles long and suitable for 4-wheel drive vehicles leaves this road just north of its crossing of Spionkop Creek and continues to the showing near the top of Spionkop Ridge. Earlier work indicated that the Spionkop Showing extends for several thousand feet along the northwest side of Spionkop Ridge, but the best copper mineralization is in the upper part of the Grinnell Formation at elevations between 6,000 and 6,600 feet at the northeast end of Spionkop Ridge.

Stratigraphy and Lithology

The general features of the geology are shown in Fig. 12. On Spionkop Ridge more than 300 feet of the Grinnell Formation are exposed. The upper part consists of generally thickly bedded white, greenish, or red sandstone with little interbedded argillite or pebbles of argillite. Below this, the Grinnell Formation is dominantly red argillite, and below the red argillite is a sequence of thinly bedded, somewhat argillaceous sandstone. This sequence grades down into interbedded sandstones and dominantly red argillite. The argillite beds become more and more abundant until the strata are mostly argillite with some thin sandstone beds. The foregoing stratigraphy is generalized: more details are in appendix 4. Individual beds can be traced for a few hundred feet, but they change in thickness and character so that correlations without actual tracing are difficult.

Bleaching of the red argillite appears to be related to thin sandstone beds within the argillite. This suggests that the solutions that were responsible for the bleaching may have flowed along the sandstone beds. Bleaching is slightly more common or thicker below the sandstone than above; this may be due to lithological changes in the argillite related to the depositional environment as a sandstone bed is approached, rather than indicating the direction from which the bleaching solutions have come.

Igneous Rocks

Within the Grinnell Formation on Spionkop Ridge is at least one sill up to 8 or 9 feet thick which is generally medium grained with fine grained margins and green in color. Petrographic details are in appendix 4. The sill at the northwest part of Fig. 12 is only 18 inches thick and contains ellipsoidal features 12 to 15 inches across. It may be a lava flow. Some of these sills or lava flows can be traced a few hundred feet before they pinch out.

Adjacent to the easterly-trending fault and possibly intruded along it, is a darker grey basic dyke up to 8 or 10 feet thick, which dips steeply. The relation of this dyke to the sills is not clear, but the dyke appears to be much later.

Structure

With variations the Grinnell strata on Spionkop Ridge strike north-west and dip mostly between 20° and 35° southwest. As shown in Fig. 12, one of the sills and a sandstone bed have been offset at a northerly-trending fault with one or two subsidiary faults. The dips of these faults are not known, but they are believed to be steep. The sills offset by this fault may, in fact, all be part of the same sill.

An easterly-trending fault possibly intruded later by a basic dyke crosses about the centre of Fig. 12. The vertical displacement has been to drop the north side down a few hundred feet. Prior to this fault, the mineralized sandstone bed on its north side may have been part of the one on its south side, and the sill or flow at the northwest of Fig. 12 and near the parking lot may have been part of the sill or sills on its south side.

Mineralization

The mineralization is present in sandstone beds and sills, which as just explained may, prior to faulting, have been one sandstone interval and one sill. Chalcocite is present in the interstices of quartz grains of the green sandstone, and with bornite, as aggregates in the sandstone, in fractures in the sandstone and green argillite, and along the contacts of sandstone and green argillite pebbles. Chalcocite and chalcopyrite are present erratically in the fine grained margins and possibly along fractures of the green sills. Fig. 12 shows that the mineralization south of the easterly-trending fault, at least, is closely related to the northerly-trending fault. All is too low grade and not extensive enough to be of economic interest. This was recognized after the mapping and trenching had been completed: drilling was undertaken to honor a work commitment.

After deposition of the Grinnell strata with the intercalated flow, or intrusion of the slightly younger sill, faulting on the northerly-trending fault is believed to have occurred. This fault provided access for the mineralizing solutions which spread out from it and deposited copper sulfides in suitable rocks: porous sandstone and along the contacts of the sills or flows. Later displacement along the easterly-trending fault took place, and subsequently intrusion of the basic dyke along it.

ORIGIN OF THE MINERALIZATION

Any theories postulated to explain the copper and other mineralization in the Clark Range are restricted by the following observations:

1. Copper occurrences have been found in most of the Beltian rocks throughout the whole extent of the Clark Range in Canada, and south into the United States, an area of more than 40 miles by 20 miles.
2. Most of the known copper occurrences have been found in white or greenish sandstone of the Grinnell Formation, and sills or flows within it. Some are present in similar rocks at or near the top of the Appekunny Formation.
3. Copper mineralization in sandstone is found in different stratigraphic units of the Grinnell Formation in different parts of the area. On Spionkop, Whistler, and on Sage Creek in the Flathead Valley, it is in the middle Grinnell. On Drywood Mountain, Pincher Ridge, and Grizzly, it is in the upper Grinnell. In several places beds generally not more than one foot thick are mineralized at or near the contact of the Appekunny.
4. The sandstone units that are mineralized are generally not over 5 feet thick and in many places the mineralization is confined to one bed only a few inches to one foot thick.

5. The mineralized beds can seldom be traced for more than a few hundred feet or perhaps 1000 feet, although a sparsely mineralized bed from 6 to 12 inches just below the bottom of the Grinnell was traced for more than 3000 feet on Pincher Ridge, and mineralized intervals from 2-1/2 to 17 feet thick at the top of the Grinnell Formation were traced in Cominco's drilling of the Grizzly Showing for about 3000 feet.
6. In the Grinnell Formation generally the more porous sandstones many of which show ripple marks contain chalcocite in the interstices between subrounded grains of quartz.
7. In the Grinnell Formation chalcocite and bornite are present in fractures in sandstone and green argillites, and along the borders of pebbles of green argillite within the white quartzites.
8. Assays of the green and grey argillite adjacent to mineralized sandstone beds in the Grinnell Formation at the Spionkop Showing show only traces of copper.
9. Many of the red argillites of the Grinnell Formation are irregularly bleached to green. Much of this bleaching is found above and below white or green sandstone beds or laminae, with that below the sandstone being somewhat more extensive.
10. Most of the copper sulfide minerals in the sills or flows in the Grinnell Formation or near it in the Appekunny Formation consist of chalcopyrite and chalcocite. They are present mostly along the margins of the sills, but also along fractures and joints in the sills. Their distribution in the sill margins is erratic.
11. Some of the sills contain a moderate amount of magnetite which appears to have been destroyed in the mineralized parts of their margins.

12. On Spionkop the mineralization is clearly related to an apparently steeply dipping early fault. On Grizzly, Cominco's drill holes are along the trend of what is believed to be a fault. Those holes close to the fault encountered richer mineralized intervals than those farther away. In one place on Drywood, sparse copper mineralization is present near a small fault and decreases to nil within 100 feet of the fault.
13. Chalcopyrite, chalcocite, and bornite have been found in sandstones at the top of the Appekinny Formation and at the bottom of the Siyeh Formation.
14. Small amounts of galena and sphalerite have been noted with the copper minerals in some occurrences in the Grinnell Formation.
15. Chalcopyrite fills vesicles in the Purcell Lava, but in most places those containing chalcopyrite are not numerous. In one place near the North Kootenay Pass a layer a few inches thick at the top of the lava is moderately well mineralized.
16. A zone with fine grained lead and zinc has been found in the Sheppard Formation north of the North Kootenay Pass.
17. A few occurrences of a chalcocite-bearing siltstone have been found in the Upper Gateway Formation. At one of these near a sill, chalcopyrite not chalcocite was present.
18. Where examined, the Altyn and Waterton Formations are almost barren of copper minerals.
19. All three of copper, lead, and zinc are present in geochemical anomalies based on water samples. Many of these anomalies coincide with copper occurrences in the Grinnell Formation.

20. Scattered anomalous copper concentrations are related to copper occurrences in Precambrian strata younger than the Purcell Lava.

21. Some zinc anomalies are spatially related to areas of outcrop of the Sheppard Formation, others are found in areas now underlain by Creteceous strata.

These observations clearly indicate to the writer that the copper mineralization in the Grinnell and nearby formations is epigenitic, that is, it was introduced after the deposition of the Grinnell. The source of this copper is not yet certain. Its haphazard distribution and relation to faults indicate that it was deposited from solutions which permeated much of the region. The bleaching of the red argillites, and the destruction of magnetite in some of the sills suggest that these solutions might be hydrothermal whose source was a magma at depth. However, there is no direct evidence that the bleaching occurred at high temperatures or even that it is related to the copper mineralization. Furthermore, there is little replacement of the type that might be expected by hot mineralizing solutions. Also the carbonates of the Waterton and Altyn Formations which might be a more acceptable host for ore deposits, where examined, are almost barren of copper minerals.

An alternative is that a chalcocite-bearing siltstone unit of the Upper Gateway Formation, or similar unit above the Purcell Lava is the source of the copper. If so, it means that essentially meteoric waters leached the copper from these strata, percolated downwards along faults and other channelways and deposited it in porous rocks or other dilatant regions that were encountered. If this is correct, any high temperature effects such as the destruction of magnetite would have to be explained as the result of local intrusion, local hot hydrothermal solutions, or possibly deep burial. Such a source for the copper might explain the high geochemical copper concentrations along Jutland Brook previously thought to be due to contamination. It seems most likely that the source of the lead and zinc is in the Sheppard Formation. A similar source for the copper might explain why lead and zinc are present with copper in some of the geochemical anomalies. The zinc anomalies in Cretaceous strata might merely be the result of the greater geochemical mobility of zinc.

CONCLUSIONS

An extensive geochemical survey of streams, springs, and lake waters in the Clark Range detected more than 21 areas with anomalous and slightly anomalous concentrations of one or more of copper, lead, and zinc.

Prospecting and previous investigations have located more than 42 mineral occurrences, mostly of copper. Most of these are minor, but many of them, even some of the minor ones can be closely correlated with some of the geochemical anomalies. Many of the occurrences can be related to faults. No mineralization was noted at the best geochemical anomaly, but it is crossed by two faults.

Occurrences and anomalies regarded as important are northeast of Victoria Peak, Drywood Mountain, Pincher Ridge, upper Gardiner Creek, Ruby Lake area, part of Lys Ridge, north of Whistler Mountain, near Table Mountain, and south of the North Kootenay Pass. Mapping, trenching and drilling of the Spionkop Showing showed that at least some of the mineralization is related to a fault, and that there it is too low grade, and not extensive enough to be economic.

Three probably unimportant, slightly anomalous concentrations of zinc are present in 3 or 4 areas underlain by Cretaceous strata beyond the Lewis Thrust Sheet.

Respectfully submitted

[redacted]

L. B. Halferdahl, P. Geol.

Edmonton, Alberta
February 6, 1971

REFERENCES

Douglas, R.J.W., (1952) - Preliminary map, Waterton, Alberta, Geol. Surv. Can., Paper 52-10.

Duncan, N. J. (1970) - Report on exploration permits and claims in the Clark Range, southwestern Alberta and southeastern British Columbia; Canford Engineering Limited, Edmonton, 20 p, 3 maps, unpublished.

Hage, C.O. (1943) - Beaver Mines, Geol. Surv. Can., Map 739A.

Halferdahl, L. B. (1969) - Geological notes on the property of Akamina Minerals Ltd., Clark Range southwestern Alberta and southeastern British Columbia; L. B. Halferdahl & Associates Ltd., Edmonton, 26 p, 1 map, unpublished.

Heddle, D. W. (1969) Progress report, Akamina option (permits 64 and 65) for the period August 25 -- September 30, 1969; Cominco Ltd., Vancouver, 2 p, unpublished.

Mawer, A. B. (1970) -- Final report, Carbondale project - 1970, Cominco Ltd., Vancouver, 9 p, 1 map, drill logs and sections, unpublished.

Murphy, J. G. and Sproule, J.C. (1968) - Cursory field examination, mineral showings, Clark Range, southwestern Alberta and southeastern British Columbia; J. C. Sproule and Associates Ltd., Calgary, 7 p, 1 map, unpublished.

Nagy, L.J. (1970) - Progress report, Whistler (Akamina), September 1 - December 31, 1969; Cominco Ltd., Vancouver, 1 p, unpublished.

Nagy, L. J. (1970) - Progress report - August, 1970, Akamina option, Cominco Ltd., Vancouver, 4 p, 1 map, unpublished.

Norris, D. K. (1959) - Carbondale River; Geol. Surv. Can., Map 5 - 1959.

Price, R.A. (1962) - Fernie map-area, east half, Alberta and British Columbia; Geol. Surv. Can. Paper 61-24, 65 p, 1 map.

Price, R.A. (1965) - Flathead map-area, British Columbia and Alberta; Geol. Surv. Can., Mem. 336, 221 p, 5 maps.

Sinclair, A. J. (1968) - Mineralographic report for Akamina Minerals; 3 p, unpublished.

Stevenson, R. W. (1968) - Final report - 1967, Waterton copper project, Waterton area, Alberta; Kennco Explorations (Western) Limited, Vancouver, 20 p, 2 appendices, 2 maps, unpublished.

Trueman, E. A. G. (1970) - Exploration - 1970 Flathead project, Fort Steele Mining Division, British Columbia; Geowest Services Ltd., Edmonton, 18 p, 5 appendices, 15 maps, unpublished.

Unknown (1967) - Commerce Creek examination, Kennco Explorations (Western) Limited, Vancouver, 1 p, 1 map, unpublished.

Unknown (1969) - Internal report to the board of management, Akamina Minerals Limited, copper project - Clark Range, British Columbia - Alberta, 50 p, 1 appendix, 5 maps, unpublished.

CERTIFICATE

I, Laurence B. Halferdahl, with business and residence addresses in Edmonton, Alberta do hereby certify that

1. I am a consulting geological and mineralogical engineer.
2. I am a licensed Professional Geologist in the Province of Alberta and a licensed Professional Engineer in the Province of British Columbia.
3. I am a graduate of Queen's University, Kingston, Ontario (B. Sc. in 1952 and M. Sc. in 1954 in Geological Sciences in the Faculty of Applied Science) and of The Johns Hopkins University, Baltimore, Maryland (Ph. D. in 1959 in the Department of Geology).
4. From 1957 to 1969 I was on the staff of the Research Council of Alberta as a mineralogist and geologist where I was in charge of the mineralogy laboratory and conducted various field and laboratory investigations.
5. Prior to 1955 I obtained experience in mineral exploration and mining geology with a number of mining companies.
6. The data in this report were obtained from published and unpublished reports and by personal direction of the field program on which it is based from June 24 to October 29, 1970.

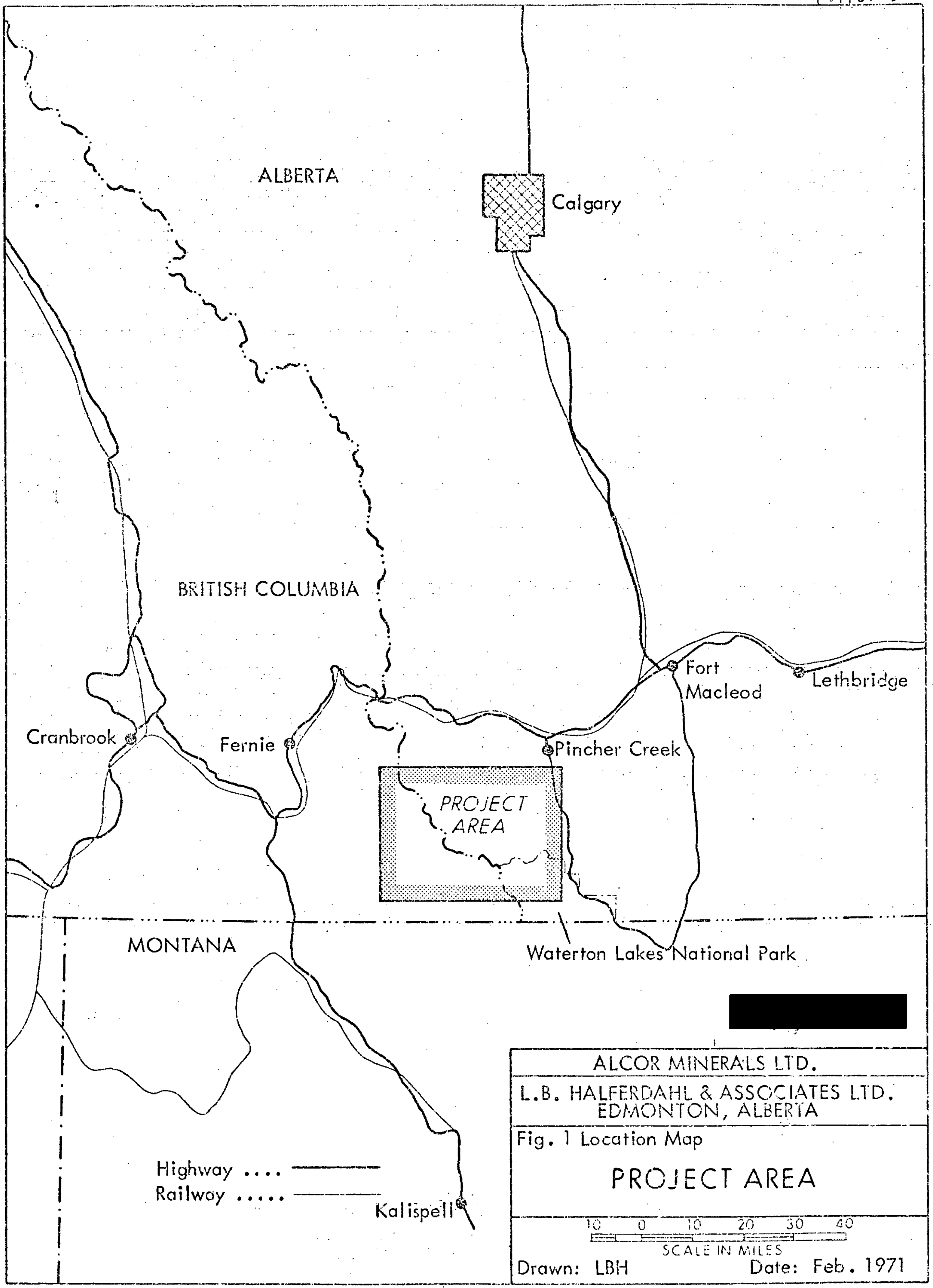
Respectfully submitted,

[redacted]

Edmonton, Alberta
February 6, 1971

L. B. Halferdahl, P. Geol.

1971 0002


ALBERTA
Calgary
BRITISH COLUMBIA
Fort Macleod
Lethbridge
Cranbrook
Fernie
Pincher Creek
PROJECT AREA
MONTANA
Waterton Lakes National Park
[redacted]
Highway ....
Railway .....
Kalispell
ALCOR MINERALS LTD.
L.B. HALFERDAHL & ASSOCIATES LTD.
EDMONTON, ALBERTA
Fig. 1 Location Map
PROJECT AREA
10 0 10 20 30 40
SCALE IN MILES
Drawn: LBH
Date: Feb. 1971

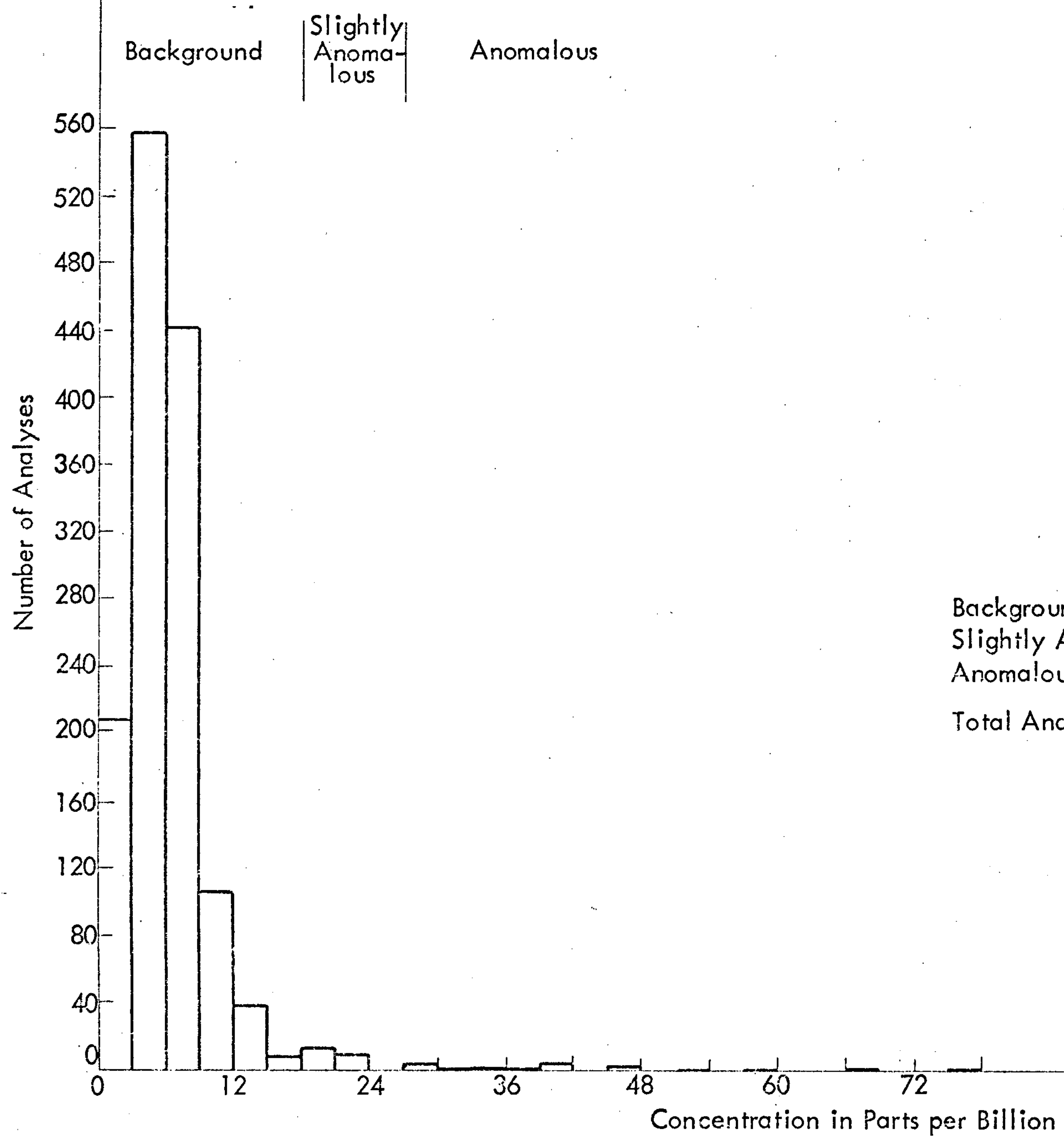


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Fig. 3 Histogram of Copper Analyses of Water Samples

CLARK RANGE PROPERTIES

Drawn: LBH Date: Feb. 1971

Background Analyses	1351	96.2%
Slightly Anomalous Analyses	22	1.5
Anomalous Analyses	33	2.3
Total Analyses	1406	100.0%

[redacted]

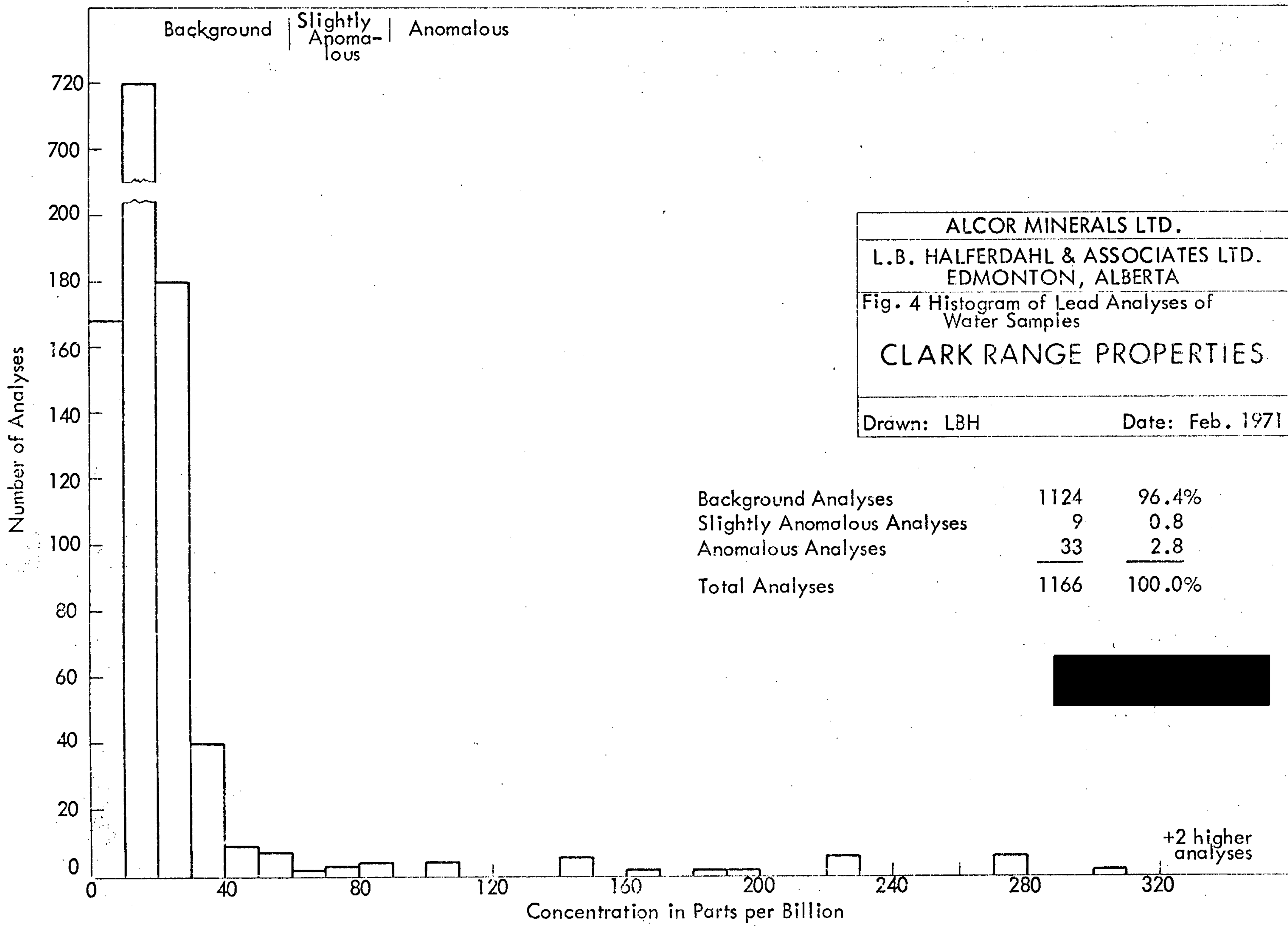

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Fig. 4 Histogram of Lead Analyses of Water Samples

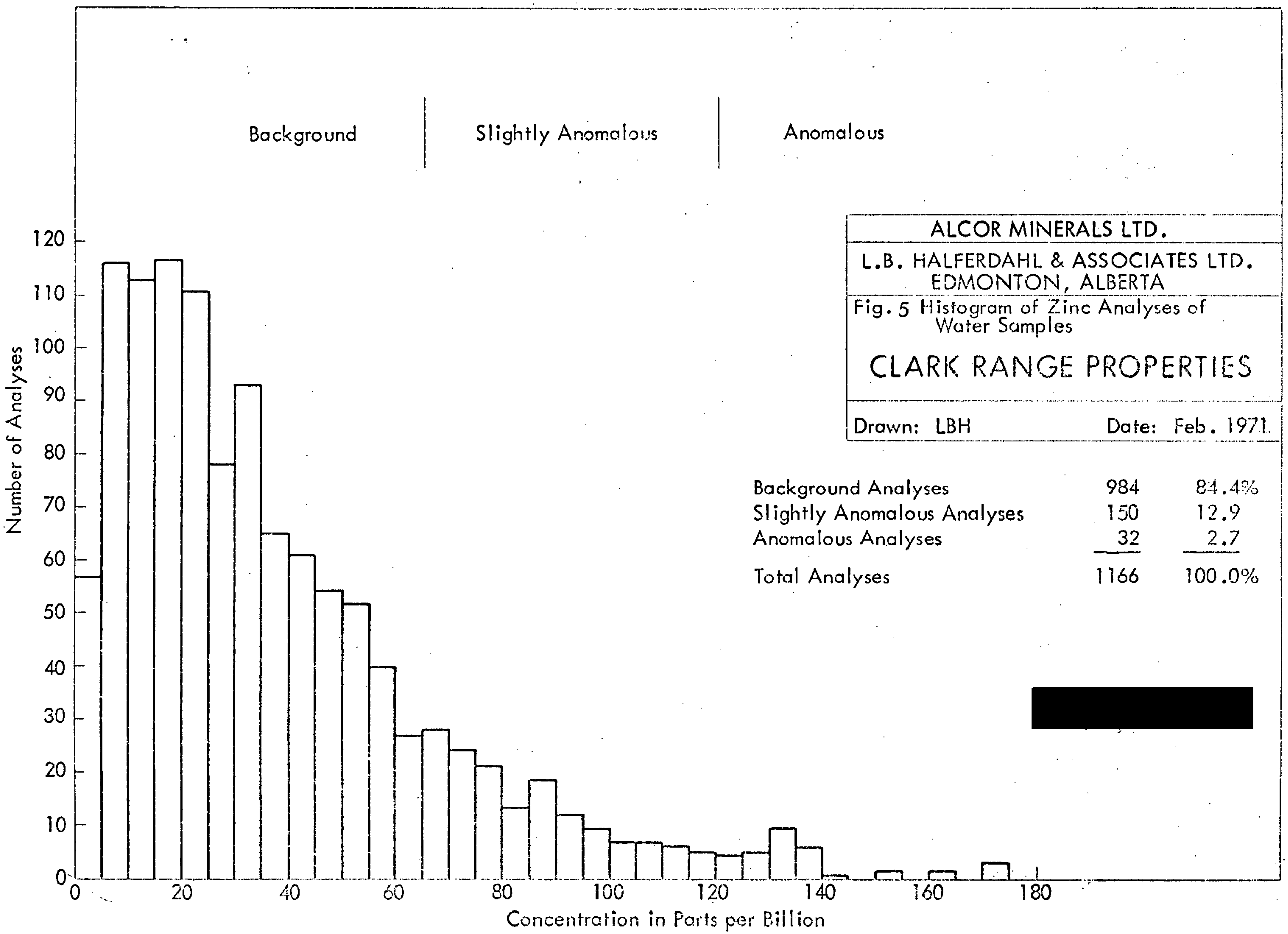
CLARK RANGE PROPERTIES

Drawn: LBH Date: Feb. 1971

Background Analyses	1124	96.4%
Slightly Anomalous Analyses	9	0.8
Anomalous Analyses	33	2.8
Total Analyses	1166	100.0%

[redacted]

19710002


Background
Slightly Anomalous
Anomalous
ALCOR MINERALS LTD.
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EDMONTON, ALBERTA
Fig. 5 Histogram of Zinc Analyses of Water Samples
CLARK RANGE PROPERTIES
Drawn: LBH
Date: Feb. 1971
Background Analyses 984 84.4%
Slightly Anomalous Analyses 150 12.9
Anomalous Analyses 32 2.7
Total Analyses 1166 100.0%
[redacted]
Number of Analyses
Concentration in Parts per Billion
0
10
20
30
40
50
60
70
80
90
100
110
120
140
160
180

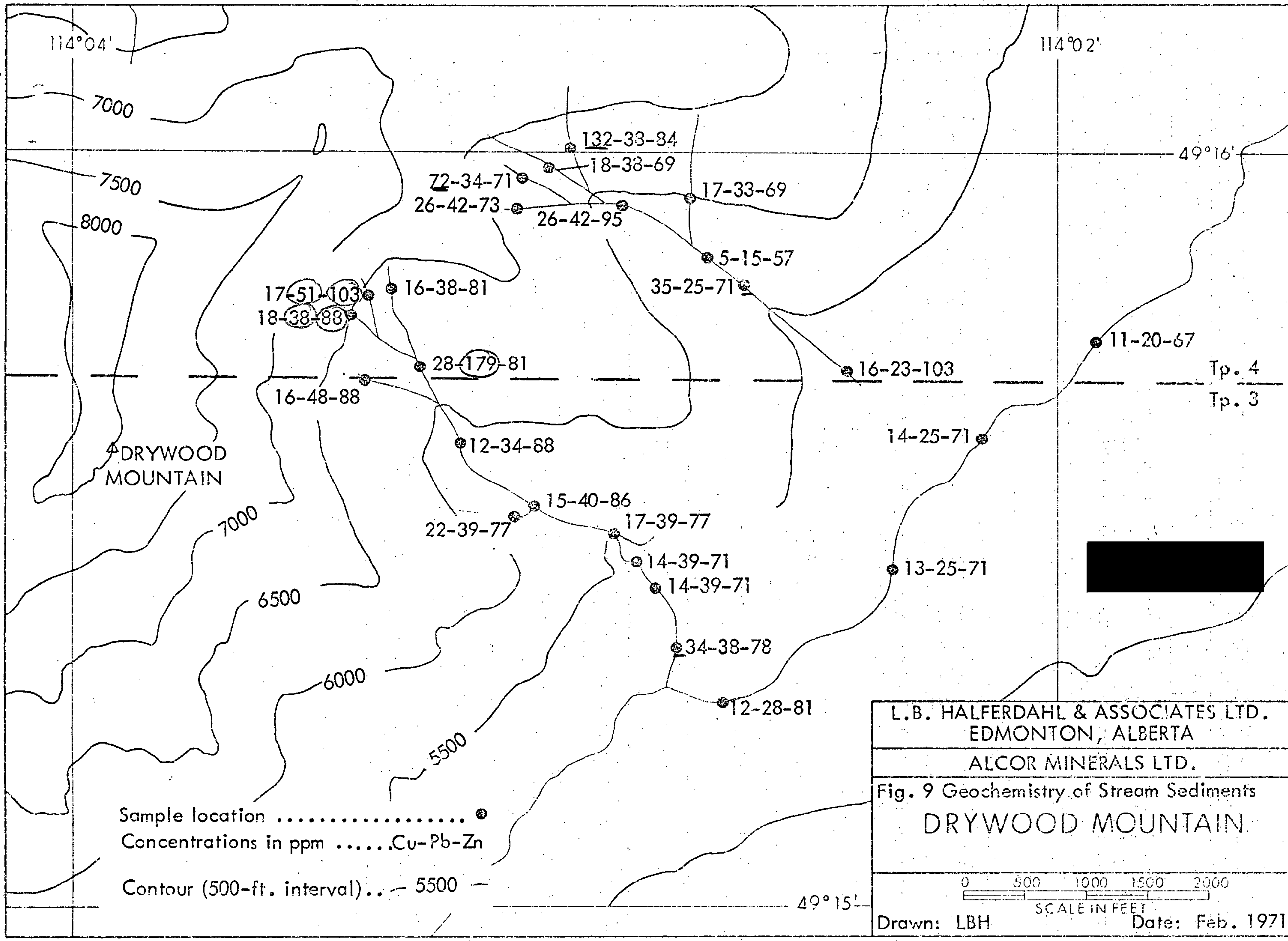
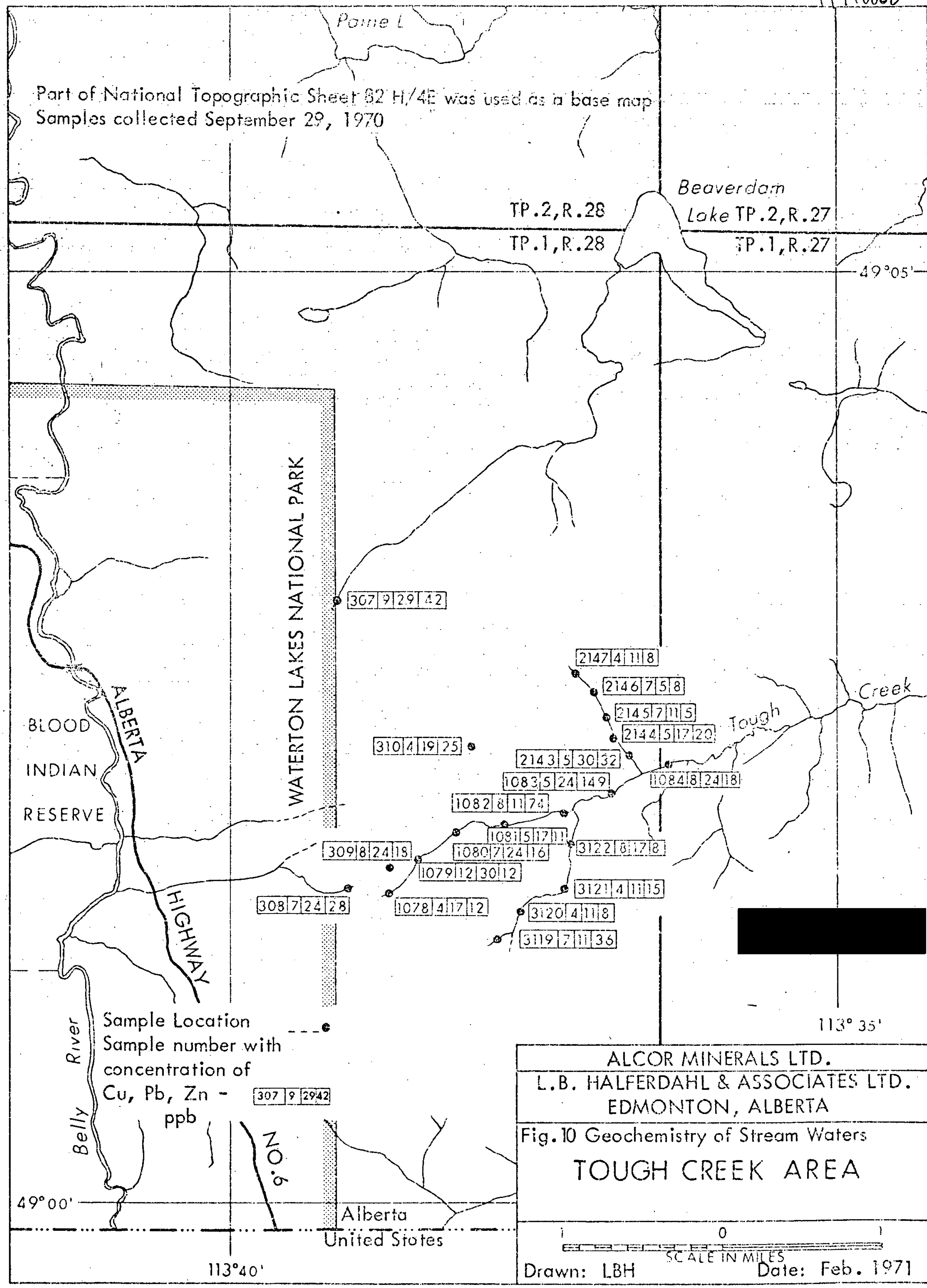


Fig. 9 Geochemistry of Stream Sediments
DRYWOOD MOUNTAIN

1971 0002

1971 0002



Paine L
Part of National Topographic Sheet 82 H/4E was used as a base map
Samples collected September 29, 1970
Beaverdam Lake
TP.2,R.28
TP.1,R.28
TP.2,R.27
TP.1,R.27
49°05'
WATERTON LAKES NATIONAL PARK
307 9 29 42
2147 4 11 8
2146 7 5 8
2145 7 11 5
2144 5 17 20
Tough Creek
310 4 19 25
2143 5 30 32
1083 5 24 149
1084 8 24 18
1082 8 11 74
1081 5 17 11
3122 8 17 8
309 8 24 18
1080 7 24 16
1079 12 30 12
3121 4 11 15
308 7 24 28
1078 4 17 12
3120 4 11 8
3119 7 11 36
[redacted]
BLOOD INDIAN RESERVE
ALBERTA HIGHWAY NO. 6
Belly River
113° 35'
Sample Location
Sample number with concentration of Cu, Pb, Zn - ppb
307 9 29 42
49°00'
Alberta
United States
113°40'
ALCOR MINERALS LTD.
L.B. HALFERDAHL & ASSOCIATES LTD.
EDMONTON, ALBERTA
Fig. 10 Geochemistry of Stream Waters
TOUGH CREEK AREA
1 0 1
SCALE IN MILES
Drawn: LBH
Date: Feb. 1971

APPENDIX 1: FIELD AND ANALYTICAL DATA ON WATER ANALYSES

EXPLANATORY NOTES

The data in this appendix was reproduced by computer because it is the least expensive way of so doing. Although time has not yet permitted sophisticated statistical or other analyses of the data by use of a computer, the data were punched in cards and subsequently reproduced herein so that for most types of analyses that have been anticipated as providing useful information, little or no additional punching of cards is required, even to the extent of having the data plotted by computer. The column headings in the computer print-out are explained below.

MAN - Samples were collected by 13 different field men each designated by a letter from A to L.

SAMP# - Sample numbers as designated in the field and in the analytical reports. A few sample numbers in the sequences are missing due to accidents to the samples, inadvertent gaps in the field notes, check analyses that indicated that some samples had been contaminated, and samples collected in areas not shown in Fig. 2, and 6 to 8.

X and Y CORD - Coordinates are based on the One Thousand Metre Universal Tranverse Mercator Grid. The Grid Zone Designation is 11U. The X coordinate is measured east, and the Y, measured north. Although both are recorded to the nearest 10 metres, the locations of the sample points on the maps are probably not much better than 100 metres.

ELEV - Elevations were obtained from topographic maps with scale 1:50,000 and contour intervals of 100 feet and by means of pocket altimeters. Figures are in feet above mean sea level.

FORM - Geological formations as shown on the geological maps for the area published by the Geological Survey of Canada. The formations are coded as follows: 1 - Waterton, 2 - Altyn, 3 - Appekunny, 4 - Grinnell, 5 - Siyeh, 6 - Purcell Lava, 7 - Sheppard, 8 - Lower Gateway, 9 - Upper Gateway, 10 - Phillips, 11 - Roosville, 12 - Cambrian formations, 13 - Devonian formations, 14 - Lower Cretaceous formations, 15 - Upper Cretaceous formations. Where two of the above numbers are separated by a dash, the location of that sample is at or near the contact of the two formations.

TEMP - Temperatures of the waters sampled were measured with pocket thermometers mostly to the nearest one-half degree Centigrade, although the thermometers could be read to the nearest one-tenth degree, and were by the samplers on some days.

FLOW - This refers to the flow of the stream or spring. These figures are in gallons per minute as estimated in the field by the samplers; only one or two figures are significant. They are regarded as rather subjective but the estimates should be relative to each other for each sampler.

SIZE - This refers to the size of the stream. This was measured or estimated in the field by the samplers. All figures are in inches but only two figures are significant. The first is the breadth of the water surface, and the second is the maximum depth. These measurements are given as a more objective means of estimating the flow at each sample site than the estimated flow discussed above even though the flows estimated from them will depend on the average stream velocity which was not measured.

CU, PB, ZN - These refer to the concentrations in parts per billion of copper, lead and zinc in the waters sampled. Samples were collected in wide mouth 10 oz. or 16 oz polyethylene bottles with bakelite caps, lined with cardboard and waterproof paper. Before use each bottle and cap was thoroughly rinsed, (at least 6 times) with the water to be sampled; then the sample was collected; the bottle tightly closed, and numbered, and notes made. Bottles were reused as many as three times.

At the field camp, most turbid samples were filtered, and then all samples were acidified with concentrated HCl about 12 N at approximately 5 cc of acid per 300 ml of sample. An effort was made to adhere closely to this amount of acid so that any copper, lead, or zinc present in the acid would be added at the same concentration to each sample. In all, four winchesters of HCl were used. Samples were then shipped to Loring Laboratories Ltd., Calgary for analyses.

Initially only copper was determined, but copper, lead, and zinc were determined in most of the samples. At the laboratory, 200 ml of sample were evaporated to dryness in carefully cleaned glassware, the residue taken up with 25 ml of HCl and analyzed by standard atomic absorption techniques. In samples with appreciable concentrations of copper, lead, or zinc a portion of the sample as received was checked against the concentrated sample. This precaution ensured that any serious contamination of samples occurring in the laboratory was detected, but not contamination during collection or acidification. Loring Laboratories Ltd. has stated that the detection limits for samples evaporated as above for copper, lead, and zinc are 2, 9, and 2, ppb respectively, so that zeros in the data means concentrations below these limits. In spite of this, concentrations as low as 5 ppb for lead have been reported.

ACID - This refers to which winchester of HCl was used for acidification of the samples as explained above.

TYPE - This refers to the type of water sampled and is coded as follows: 1 - stream, 2 - spring or well, 3 - lake.

TURB - This refers to whether the water sample was clear or turbid and to the treatment of turbid samples. It is coded as follows: 1 - clear, 2 - turbid and filtered, 3 - turbid and not filtered. Turbidity was caused mostly by organic material, but also by inorganic clays and silts in a few samples.

PH - The pH was measured in the field by means of alkacid test paper. Most pH measurements were between $5\frac{1}{2}$ and 6; this is the pH interval between the ranges of pH covered by two rolls of alkacid paper with adjacent ranges of pH and is designated 5.8.

An N in the table means that data so designated were not obtained.

Astericks in the last column indicate that not easily codible data is given at the end of the computer print-out. In this additional data, the date is given as day - month - year.

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH
A	W1	69345	546418	5010	4	4.0	5.00	N	4	N	N	1	2	1	6.5
A	W2	69339	546409	5080	4	N	N	N	3	N	N	1	1	1	5.8
A	W3	69330	546332	5150	4	4.5	N	18X 3.0	3	N	N	1	1	1	5.8
A	W4	69294	546460	5200	4- 5	3.0	5.00	N	4	N	N	1	2	1	6.5
A	W5	69293	546470	5100	4	3.0	5.00	N	7	N	N	1	1	1	6.5
A	W6	69304	546472	5100	4	6.0	N	36X 6.0	7	N	N	1	1	1	5.8
A	W7	69336	546499	4890	4	6.0	N	30X 5.0	7	N	N	1	1	1	5.8
A	W8	69353	546420	4950	4	5.5	N	24X 3.0	7	N	N	1	1	1	5.8
A	W9	69387	546330	5000	4- 5	7.5	N	96X 6.0	5	N	N	1	1	1	5.8
A	W10	69365	546400	4975	4	7.5	N	96X 6.0	5	N	N	1	1	1	5.8
A	W11	69354	546431	4925	4	6.0	N	48X 6.0	4	N	N	1	1	1	5.8
A	W12	69351	546433	4920	4	7.0	N	36X10.0	4	N	N	1	1	1	5.8
A	W13	69342	546458	4900	4	7.0	N	96X 8.0	5	N	N	1	1	1	5.8
A	W14	69329	546490	4900	4	6.5	N	30X 8.0	9	N	N	1	1	1	5.9
A	W15	69332	546506	4850	4	7.5	N	84X 8.0	4	N	N	1	1	1	5.8
A	W16	69340	546525	4820	4	8.0	N	60X10.0	7	N	N	1	1	1	5.8
A	W17	69344	546552	4790	4- 5	7.5	N	72X14.0	4	N	N	1	1	1	5.9
A	G1	69159	546190	5310	5	N	N	N	6	N	N	1	1	1	5.8
A	G2	69145	546135	5400	5	N	N	N	8	N	N	1	1	1	5.8
A	G3	69130	546200	5390	5	N	N	N	6	N	N	1	1	1	5.8
A	G4	69110	546210	5300	5	N	N	N	20	N	N	1	1	1	5.8
A	G5	69085	546201	5300	5	N	N	N	6	N	N	1	1	1	5.8
A	G6	69055	546211	5090	4	N	N	N	6	N	N	1	1	1	5.8
A	G7	69070	546201	5090	4	N	N	N	7	11	36	1	1	1	5.8
A	G8	69091	546130	5000	4	N	N	N	3	N	N	1	1	1	5.8
A	G9	69118	546179	5110	4	N	N	N	5	N	N	1	1	1	5.8
A	G10	69130	546168	5100	4	N	N	N	6	N	N	1	1	1	5.8
B	J1	68970	546360	5200	5	N	N	N	8	N	N	1	1	1	5.8
B	J2	69050	546290	5500	5	N	N	N	8	N	N	1	1	1	5.8
B	J3	69106	546280	5900	5	N	N	N	3	N	N	1	1	1	5.8
B	J4	69160	546251	6100	5	N	N	N	4	N	N	1	1	1	5.8
B	J5	69119	546278	5960	5	N	N	N	6	N	N	1	1	1	5.8
B	J21	69876	546030	4900	11	7.0	N	72 N	8	N	N	1	1	1	5.8
B	J22	69869	546013	5050	11	6.0	N	84X 5.0	6	N	N	1	1	1	5.8
B	J23	69899	545985	5050	11	8.0	N	24X 6.0	6	N	N	1	1	1	5.8
B	J24	69894	545950	5090	11	5.0	N	18X 2.0	3	N	N	1	1	1	5.8
B	J25	69898	545991	4890	11	7.0	N	90X18.0	2	N	N	1	1	1	5.8
B	J26	69991	546020	4900	11	9.0	N	54 N	5	N	N	1	1	1	5.8
B	J7	69870	546213	4890	11	6.0	N	24X 2.0	4	N	N	1	1	1	5.8
B	J8	69822	546220	4650	10	5.5	N	36X 2.0	3	N	N	1	1	1	5.8
B	J9	69805	546245	4825	10	5.0	N	24X 4.0	35	N	N	1	1	1	5.8
B	J10	69791	546222	5010	10	4.0	N	48X 7.0	4	N	N	1	1	1	5.8
C	2	69705	546229	5175	10	N	8.00	N	2	N	N	1	1	1	5.3
C	2A	69285	545616	5175	8	8.5	23.00	120X12.0	2	N	N	1	1	1	5.8
C	3	69315	546105	5275	5	N	N	N	4	N	N	1	1	1	5.8
C	5	69321	545427	5700	8	9.0	2.00	72X50.0	6	N	N	1	1	1	5.8
C	6	69310	545410	6000	7- 8	3.0	10.00	36X24.0	4	N	N	1	1	1	5.8
C	7	69260	545774	5200	5	7.0	1.00	N	4	N	N	1	2	1	5.8
C	8	69270	545785	5150	5	6.5	75.00	120X35.0	4	N	N	1	1	1	5.8
C	9	69246	545771	5225	6	6.5	75.00	240X60.0	3	N	N	1	1	1	5.8
C	10	69241	545760	5250	6	6.0	75.00	96X24.0	3	N	N	1	1	1	5.8
C	11	69235	545745	5275	6	6.0	63.00	48X12.0	6	N	N	1	1	1	5.8
C	12	69231	545731	5300	6	6.0	75.00	72X12.0	10	N	N	1	1	1	5.8
C	13	69226	545721	5325	7	6.0	75.00	60X12.0	2	N	N	1	1	1	5.8

TJ022

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH
C	14	69232	545720	5400	7	5.0	8.00	N	4	N	N	1	2	1	5.8
C	15	69230	545710	5450	7	9.5	.50	N	6	N	N	1	2	1	5.8
C	16	69209	545709	5425	7	7.0	10.00	N	5	N	N	1	2	1	5.8
C	17	69219	545710	5375	7	7.0	75.00	240X12.0	3	N	N	1	1	1	5.8
C	18	69212	545704	5400	7	7.0	75.00	60X24.0	6	N	N	1	1	1	5.8
C	19	69210	545698	5400	7	7.0	75.00	180X24.0	6	N	N	1	1	1	5.8
C	20	69202	545689	5450	7	6.0	75.00	240X12.0	6	N	N	1	1	1	5.8
C	21	69190	545680	5500	7	6.0	75.00	180X48.0	8	N	N	1	1	1	5.8
C	22	69170	545690	5600	7	6.0	1.00	N	11	N	N	1	2	1	5.8
C	23	69176	545666	5575	7	6.0	75.00	240X24.0	N	N	N	1	1	1	5.8
C	24	69161	545650	5625	7	6.0	75.00	180X24.0	6	N	N	1	1	1	5.8
C	25	69150	545645	5630	7	6.0	50.00	180X12.0	2	N	N	1	1	1	5.8
C	26	69140	545635	5650	7	6.0	50.00	96X12.0	4	N	N	1	1	1	5.8
C	27	69135	545630	5675	6	6.0	37.00	96X24.0	8	N	N	1	1	1	5.8
C	28	69125	545619	5700	6	6.0	.50	N	42	N	N	1	2	1	5.8
C	29	69119	545612	5800	6	6.0	1.00	N	6	N	N	1	2	1	5.8
C	30	69035	545595	6000	5	9.5	38.00	120X24.0	4	N	N	1	1	1	5.8
C	31	69078	545628	6200	5	8.0	25.00	36X12.0	6	N	N	1	1	1	5.8
C	32	69065	545620	6300	5	8.0	25.00	24X 6.0	4	N	N	1	1	1	5.8
C	33	69041	545609	6325	5	12.0	18.00	24X24.0	4	N	N	1	1	1	5.8
C	34	69021	545613	6400	5	12.5	.10	N	6	N	N	1	2	1	5.8
C	35	69009	545611	6500	5	9.0	5.00	24X12.0	4	N	N	1	1	1	5.8
C	36	68998	545610	6600	5	12.5	2.00	36X12.0	4	N	N	1	1	1	5.8
C	37	69195	546070	5000	5	9.0	8.00	96X30.0	7	11	43	1	1	1	5.8
C	38	69178	546048	5200	5	3.0	50.00	N	3	11	56	1	1	1	5.8
C	39	69150	546028	5525	5	6.0	50.00	600X50.0	4	18	41	1	1	1	5.8
C	40	69130	546021	5600	5	7.0	10.00	240X36.0	3	11	21	1	1	1	5.8
C	41	69168	546010	5675	5	7.0	5.00	N	3	18	23	1	2	1	5.8
C	42	69155	545995	6175	5	6.0	2.00	N	9	11	21	1	2	1	5.8
C	43	69150	545988	6200	5	10.0	1.00	48X24.0	3	11	39	1	1	1	5.8
C	44	68849	545532	5050	8- 1	8.0	5.00	72X12.0	7	5	19	1	1	1	5.8
C	45	69854	545501	5500	9	8.0	150.00	360X50.0	3	11	5	1	1	1	5.8
C	46	69852	545468	5900	9	7.0	75.00	240X60.0	7	11	8	1	1	1	5.8
C	47	69845	545420	6175	9	9.0	75.00	60X12.0	8	11	25	1	1	1	5.8
C	48	67991	547092	6100	2	8.0	5.00	N	7	N	N	1	2	1	5.8
C	49	68080	547072	6100	2	8.0	8.00	N	4	N	N	1	2	1	5.8
C	50	68092	547099	5900	2	8.0	25.00	60X12.0	4	N	N	1	1	1	5.8
C	51	68182	547120	5650	2	8.0	18.00	120X24.0	3	N	N	1	1	1	5.8
C	52	68161	547130	5500	3	8.0	25.00	96X12.0	4	N	N	1	1	1	5.8
C	53	68305	547128	5100	3	7.0	15.00	N	58	N	N	1	2	1	5.8
C	54	68155	547520	4950	14	6.0	100.00	60X24.0	3	N	N	1	1	1	5.8
C	55	68190	577515	5075	14	6.0	50.00	36X 6.0	4	N	N	1	1	1	5.8
C	56	68210	577505	5175	14	5.5	50.00	48X24.0	4	N	N	1	1	1	5.8
C	57	68244	577468	5400	14	9.0	5.00	N	3	N	N	1	2	1	5.8
C	58	68245	577478	5400	14	9.0	2.00	N	7	N	N	1	2	1	5.8
C	59	68235	577465	5300	14	5.5	75.00	60X24.0	4	N	N	1	1	1	5.8
C	60	68243	577455	5500	14	5.5	75.00	60X 6.0	2	N	N	1	1	1	5.8
C	61	68250	577465	5500	14	6.0	2.00	N	4	N	N	1	2	1	5.8
C	62	68251	577449	5625	14	7.0	3.00	N	4	N	N	1	2	1	5.8
C	63	68252	577441	5700	14	6.0	.50	N	3	N	N	1	2	1	5.8
C	64	68245	577429	5750	14	7.0	.25	N	3	N	N	1	2	1	5.8
C	65	68246	577421	5800	14	8.0	2.00	N	2	N	N	1	2	1	5.8
C	66	68240	577412	5825	14	3.0	3.00	N	4	N	N	1	2	1	5.8
C	67	68221	577414	5875	14	6.0	50.00	60X 6.0	3	N	N	1	1	1	5.8

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH
C	63	68219	577408	5900	14	9.0	.25	N	4	N	N	1	2	1	5.8
C	69	68219	577401	5925	14	10.0	1.00	N	8	N	N	1	2	1	5.8
C	70	68219	577391	5925	14	12.0	1.50	N	1	9	40	2	2	1	5.8
C	71	68229	577390	5900	14	12.0	.50	N	23	19	11	2	2	2	5.8
C	72	68231	577372	6000	14	7.0	25.00	48X24.0	4	N	N	1	1	1	5.8
C	73	69532	545556	6500	9	6.0	5.00	48X12.0	3	N	N	1	1	1	5.8
C	74	69546	545565	6500	9	6.5	25.00	60X60.0	3	N	N	1	1	1	5.8
C	75	69555	545530	6200	9	6.5	75.00	300X48.0	4	N	N	1	1	1	5.8
C	76	69595	545510	6000	9	7.0	2.00	N	2	N	N	1	2	1	5.8
C	77	69570	545507	6000	9	8.0	.10	N	2	N	N	1	2	1	5.8
C	78	69579	545509	6000	9	6.5	50.00	180X36.0	4	N	N	1	1	1	5.8
C	79	69584	545501	5900	9	8.0	.25	N	6	14	135	2	2	1	5.8
C	80	69589	545499	5900	9	9.0	.25	N	5	N	N	1	2	1	5.8
C	81	69594	545499	5900	9	9.0	.25	N	4	N	N	1	2	1	5.8
C	82	69605	545500	5900	9	7.0	.75	N	8	N	N	1	2	1	5.8
C	83	69610	545496	5800	9	9.0	.30	N	7	N	N	1	2	1	5.8
C	84	69620	545501	5775	9	7.0	63.00	96X24.0	7	N	N	1	1	1	5.8
C	85	69635	545502	5725	9	8.0	.25	N	40	N	N	1	2	1	5.8
C	86	69648	545499	5600	9	7.0	75.00	60X24.0	7	N	N	1	1	1	5.8
C	87	69662	545503	5500	9	8.0	2.00	N	4	N	N	1	2	1	5.8
C	88	69682	545503	5400	9	8.0	100.00	360X48.0	8	N	N	1	1	1	5.8
C	89	69726	545480	5200	8-9	8.0	13.00	60X12.0	9	5	34	2	1	1	5.8
C	90	68884	546285	4750	3	6.0	150.00	120X12.0	7	N	N	1	1	1	5.8
C	91	68861	546273	4825	3	6.0	150.00	144X24.0	7	N	N	1	1	1	5.8
C	92	68858	546269	4825	3	8.0	.10	N	5	N	N	1	2	1	5.8
C	93	68839	546246	4975	3	6.0	150.00	120X48.0	7	N	N	1	1	1	5.8
C	94	68812	546217	5100	2	6.0	100.00	96X12.0	7	N	N	1	1	1	5.8
C	95	68805	546217	5100	2	9.0	.50	N	7	N	N	1	2	1	5.8
C	96	68810	546201	5200	2	6.5	8.00	36X12.0	8	N	N	1	1	1	5.8
C	97	68800	546198	5200	2	7.0	5.00	60X 6.0	9	N	N	1	1	1	5.6
C	98	68785	546200	5200	2	6.0	75.00	96X24.0	5	N	N	1	1	1	5.8
C	99	68760	546200	5300	2	4.0	1.00	N	11	N	N	1	2	1	5.8
C	100	68740	546182	5400	2	5.5	50.00	144X24.0	11	N	N	1	1	1	5.9
C	101	68717	546168	5500	2	6.5	.28	N	9	N	N	1	2	1	5.8
C	102	68703	546165	5500	2	5.5	5.00	120X24.0	7	N	N	1	1	1	5.8
C	103	68692	546175	5600	2	7.0	13.00	48X24.0	8	N	N	1	1	1	5.8
C	104	68672	546139	5600	1	6.0	25.00	192X12.0	8	N	N	1	1	1	5.8
C	105	68635	546125	5700	1	6.0	8.00	96X24.0	9	N	N	1	1	1	5.8
C	106	69912	545692	5350	10	7.0	5.00	N	6	9	32	2	2	1	5.8
C	107	69902	545701	5300	10	6.0	13.00	84X 6.0	9	19	34	2	1	1	5.8
C	108	69898	545702	5450	10	7.0	.10	N	9	5	15	2	2	1	5.8
C	109	69892	545696	5400	10	7.0	10.00	36X12.0	4	19	40	2	1	1	5.8
C	110	69878	545690	5500	10	7.0	9.00	36X 4.0	7	19	48	2	1	1	5.8
C	111	71908	545312	5075	4	6.0	100.00	120X12.0	9	9	40	2	1	1	5.8
C	112	71911	545291	5200	4	6.5	100.00	96X 6.0	6	9	11	2	1	1	5.8
C	113	71911	545272	5425	4	6.0	75.00	144X12.0	7	14	25	2	1	1	5.8
C	114	71903	545255	5500	4	6.0	75.00	36X24.0	9	28	43	2	1	1	5.8
C	115	71908	545238	5550	4	4.0	5.00	N	3	23	23	2	2	1	5.8
C	116	71890	545231	5575	5	5.0	75.00	60X24.0	6	23	9	2	1	1	5.8
C	117	71875	545212	5600	5	5.0	100.00	180X36.0	6	19	10	2	1	1	5.8
C	118	71879	545191	5900	5	4.0	4.00	N	4	14	61	2	2	1	5.8
C	119	71855	545191	5800	5	5.0	100.00	96X12.0	4	23	20	2	1	1	5.8
C	120	71839	545180	5900	5	5.0	75.00	60X 6.0	6	28	23	2	1	1	5.8
C	121	71821	545150	6150	5	5.5	38.00	24X12.0	5	14	23	2	1	1	5.8

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
C	122	71819	545101	6275	5	5.0	50.00	60X12.0	4	9	33	2	1	1	5.8	
C	123	71807	545080	6375	5	5.0	50.00	24X12.0	5	14	71	2	1	1	5.8	
C	124	71846	545163	6000	5	5.0	25.00	60X 6.0	7	19	133	2	1	1	5.8	
D	201	69372	545460	5500	8	5.0	2.00	6X 2.0	10	N	N	1	2	1	5.8	
D	202	69402	545462	5900	8	3.5	1.00	3X 2.0	9	N	N	1	2	1	5.8	
D	203	69399	545475	5900	9	5.0	1.00	N	3	N	N	1	2	1	5.8	***
D	204	69373	545471	5500	8	6.0	2.00	8X 2.0	8	N	N	1	2	1	5.8	
D	205	69373	545485	5500	8	6.0	3.00	12X 2.0	9	N	N	1	2	1	5.8	
D	206	69396	545486	5925	8	4.0	1.00	N	12	N	N	1	2	1	5.8	***
D	207	69361	545554	5400	8	4.5	6.00	24X 4.0	9	N	N	1	1	1	5.8	
D	209	69365	545562	5425	8	4.0	6.00	24X 4.0	9	N	N	1	1	1	5.8	
D	209	69465	545647	6700	10	7.0	.10	N	29	N	N	1	2	1	6.5	***
D	210	69436	545638	6400	10	11.0	.10	N	31	N	N	1	2	1	5.8	***
D	211	69410	545635	6000	9	6.0	2.00	12X 2.0	4	N	N	1	2	1	6.5	
D	212	69422	545620	6200	9	4.5	1.00	6X 2.0	3	N	N	1	2	1	6.5	
D	213	69376	545632	5700	8	2.5	1.00	4X 2.0	4	N	N	1	2	1	5.5	
D	214	69380	545648	5500	8	8.0	3.00	12X 4.0	5	N	N	1	1	1	6.5	
D	215	69356	545648	5500	8	5.0	2.00	6X 2.0	40	N	N	1	1	1	6.5	
D	216	69345	545668	5900	8	4.0	2.00	6X 1.0	3	N	N	1	2	1	5.8	
D	217	69320	545670	5700	8	8.5	10.00	24X 6.0	6	N	N	1	1	1	5.8	
D	218	69354	545535	5300	8	4.0	4.00	24X 2.0	4	11	16	1	1	1	5.8	
D	219	69375	545538	5600	8	3.5	1.50	8X 2.0	5	11	51	1	2	1	5.8	
D	220	69375	545530	5600	8	2.5	2.00	8X 4.0	3	11	20	1	2	1	5.8	
D	221	69370	545518	5500	8	4.0	1.00	2X 1.0	4	18	43	1	2	1	5.8	
D	222	69365	545509	5400	9	6.0	2.50	6X 3.0	3	18	35	1	1	1	5.8	
D	223	69390	545510	5900	8	3.0	1.50	120X .5	4	18	36	1	2	1	5.8	
D	224	69399	545520	5900	8	4.0	1.50	24X .5	8	11	20	1	2	1	5.8	
D	225	68290	547078	5150	3	11.0	10.00	48X 8.0	36	N	N	1	1	1	5.8	
D	226	68282	547075	5175	3	9.0	4.00	6X 2.0	5	N	N	1	1	1	5.8	
D	227	68278	547036	5300	3	5.0	4.00	5X 2.0	7	N	N	1	2	1	5.8	
D	228	68308	546995	5475	3	10.0	8.00	24X 6.0	4	N	N	1	1	1	5.8	
D	229	68315	546980	5575	3	8.0	5.00	N	47	N	N	1	2	1	5.6	***
D	230	68320	546940	5675	2	10.0	7.00	24X 4.0	5	N	N	1	1	1	5.8	
D	231	68338	546905	5790	2	10.0	7.00	24X 4.0	5	N	N	1	1	1	5.8	
D	232	68354	546875	5900	2	9.0	6.00	24X 8.0	2000	N	N	1	1	1	5.8	
D	233	68375	546808	6100	2	9.0	6.00	36X 2.0	8	N	N	1	1	1	5.8	
D	239	68353	546780	6350	2	8.0	3.00	24X 6.0	7	N	N	1	1	1	5.8	
D	235	68365	546765	6400	2	9.0	4.00	1X 3.0	47	N	N	1	1	1	5.8	
D	242	70168	545570	5000	11	7.0	55.00	240X36.0	831	N	N	1	1	1	5.8	
D	243	70150	545550	5100	11	5.0	45.00	240X36.0	425	N	N	1	1	1	5.8	
D	244	70145	545520	5225	11	6.0	20.00	240X36.0	15	N	N	1	1	1	5.8	
D	245	70107	545390	5375	11	7.0	30.00	N	1200	N	N	1	1	1	5.8	
D	246	70101	545330	5450	11	6.0	25.00	180X60.0	15	N	N	1	1	1	5.8	
D	247	70101	545311	5500	11	6.0	10.00	96X36.0	16	N	N	1	1	1	5.8	
D	248	70100	545311	5500	11	6.0	15.00	240X48.0	4	N	N	1	1	1	5.8	
D	249	70095	545305	5550	11	6.0	8.00	N	5	N	N	1	1	1	5.8	
D	250	70101	545239	5700	11	6.0	9.00	N	9	N	N	1	1	1	5.8	
D	251	70110	545301	5600	11	5.0	10.00	72X48.0	93	N	N	1	1	1	5.8	
D	252	70110	545342	5450	11	8.0	2.00	29X 1.0	9	N	N	1	2	1	5.8	***
D	253	70140	545560	5200	11	4.0	4.00	24X 6.0	8	N	N	1	2	1	5.8	
D	254	68975	546039	5950	3	3.0	10.00	60X12.0	8	N	N	1	1	1	5.8	
D	255	68864	546041	5900	3	4.0	8.00	120X .5	8	N	N	1	2	1	5.8	***
D	256	68880	546053	5850	3	5.0	6.00	N	9	N	N	1	2	1	5.8	***
D	257	68890	546056	5775	3	4.0	4.00	N	9	N	N	1	2	1	5.8	***

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
D	259	68890	546065	5900	3	6.0	6.00	120X24.0	9	N	N	1	1	1	5.8	
D	260	68915	546075	5550	3	7.5	25.00	144 N	7	N	N	1	1	1	5.8	
D	261	68925	546104	5375	3	8.0	15.00	120X60.0	7	N	N	1	1	1	5.8	
D	262	68936	546128	5250	3	10.0	15.00	96X36.0	7	N	N	1	1	1	5.8	
D	263	70050	545628	5650	10	8.0	2.00	24X 8.0	9	23	10	2	2	1	5.8	
D	264	70070	545670	5200	11	8.0	3.00	24X 1.0	6	9	42	2	1	1	5.8	
D	265	70093	545675	5000	11	9.0	3.00	24X 1.0	6	14	61	2	1	1	5.8	
E	301	71213	546107	5500	5	5.0	10.00	12X 2.0	9	5	11	3	1	1	5.8	
E	302	71232	546076	6300	5	4.0	5.00	6X 1.0	5	N	2	3	1	1	5.8	
E	303	71271	546055	6990	5	4.0	5.00	6X 1.0	5	5	8	3	1	1	5.8	
E	304	71275	546043	7175	6	2.0	5.00	N	9	25	6	3	1	1	5.8	***
E	305	71260	546045	7000	6	2.0	5.00	6X 1.0	4	11	64	3	1	1	5.8	
E	306	71230	546110	5625	5	5.0	5.00	3X .5	15	11	33	3	1	1	5.8	
F	400	68870	545950	6300	3	2.5	5.00	18X 2.0	7	11	23	1	2	1	5.8	
F	401	68901	545955	6300	4	3.5	3.00	10X 2.0	4	11	93	1	1	1	5.8	
F	402	68900	545969	6200	3	5.0	6.00	20X 2.0	4	11	51	1	1	1	5.8	
F	403	68910	545974	6150	3	7.5	8.00	24X 2.0	8	11	25	1	1	1	5.8	
F	404	68925	545981	6000	3	8.0	.12	N	9	11	18	1	1	1	5.9	***
F	405	68940	546008	5800	3	10.0	4.00	20X 2.0	7	11	15	1	1	1	5.8	
F	406	68942	546014	5775	3	9.0	1.00	4X 2.0	5	11	18	1	1	1	5.8	
F	407	68932	546015	5850	3	8.5	.10	N	8	11	38	1	2	1	5.8	
F	408	68946	546021	5700	3	8.5	.10	N	9	11	53	1	2	1	5.8	
F	409	68948	546028	5700	3	8.0	1.00	8X 2.0	8	18	8	1	2	1	6.5	
F	410	68950	546040	5600	3	10.5	10.00	24X 3.0	2	18	45	1	1	1	5.8	
F	411	68951	546050	5500	3	9.0	.50	6X 1.0	11	18	38	1	1	1	5.8	
F	412	68950	546141	5200	3	11.0	20.00	24X 3.0	7	11	8	1	1	1	5.8	
F	413	71551	546050	5175	15	4.0	20.00	120X24.0	10	9	109	2	1	1	5.8	
F	414	71508	546076	5550	3	4.0	20.00	60X24.0	7	14	112	2	1	1	5.8	
F	415	71475	546035	5900	3	4.0	20.00	48X18.0	23	19	109	2	1	1	5.8	
F	416	71462	546097	6000	4	5.0	15.00	60X12.0	11	28	71	2	1	1	5.8	
F	417	71460	546102	6150	4	7.0	5.00	24X12.0	20	23	119	2	1	1	5.8	***
F	418	71464	546109	6250	4	8.0	1.00	6X 2.0	18	14	137	2	2	1	5.8	
F	419	71464	546109	6250	4	9.0	2.00	4X 2.0	13	19	35	2	2	1	5.8	
F	420	71465	546108	6300	4	8.0	N	N	58	9	79	2	2	1	5.8	***
F	421	71447	546105	6300	4	8.0	15.00	144X12.0	22	9	122	2	1	1	5.8	
F	422	71435	546111	6500	4- 5	4.0	5.00	24X12.0	7	9	117	2	1	1	5.8	
F	423	71430	546115	6650	5	4.0	10.00	48X12.0	11	9	109	2	1	1	5.8	
F	424	71430	546120	6900	5	4.0	6.00	36X12.0	9	9	105	2	1	1	5.8	
F	425	71432	546125	6800	5	4.0	4.00	24X12.0	12	9	171	2	1	1	5.8	***
F	426	71429	546128	6725	5	4.0	2.00	12X12.0	9	19	85	2	1	1	5.8	
F	427	71405	546086	7000	5	5.0	5.00	24X12.0	4	9	36	2	1	1	5.9	
F	428	71410	546085	6850	5	5.0	10.00	36X12.0	8	96	117	2	1	1	5.8	
F	429	71418	546060	6300	5	7.0	10.00	36X12.0	9	230	175	2	1	1	5.8	
F	430	71441	546070	6400	5	7.0	10.00	36X12.0	6	81	135	2	1	1	5.8	
F	431	71419	546050	6200	5	6.0	5.00	36X12.0	13	272	133	2	1	1	5.8	
F	432	71435	546030	5900	4	6.0	30.00	60X24.0	6	387	99	2	1	1	5.8	
F	433	71475	546010	5450	3	7.0	35.00	120X36.0	6	272	133	2	1	1	5.8	
F	434	71385	545860	5400	5	4.0	5.00	24X12.0	4	34	41	2	1	1	5.8	
F	435	71374	545862	5650	5	4.0	N	N	4	37	28	2	2	2	5.8	***
F	436	71381	545861	5650	5	4.0	N	N	6	230	105	2	2	1	5.8	***
F	437	71416	545860	5600	5	4.0	3.00	60X24.0	8	306	99	2	1	1	5.9	
F	438	71415	545849	5800	5	4.0	10.00	120X24.0	8	169	115	2	1	1	5.8	
F	439	71419	545838	5875	5	6.0	2.00	24X12.0	14	57	155	2	1	1	5.8	
F	440	71423	545830	5900	5	7.0	3.00	48X24.0	11	230	161	2	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
F	441	71439	545818	6100	5	7.0	3.00	60X12.0	9	86	72	2	1	1	5.8	
F	442	71329	545890	5600	5	9.5	10.00	72X12.0	13	77	133	2	1	1	5.6	
F	443	71330	545907	5750	5	9.0	10.00	60X12.0	9	38	74	2	1	1	5.8	
F	444	71325	545945	6450	5	9.0	12.00	84X12.0	9	150	112	2	1	1	5.8	
G	600	68878	547105	4600	15	N	700.00	96X 6.0	3	N	N	1	1	1	5.8	
G	601	68860	547115	4650	15	N	40.00	48X 2.0	5	N	N	1	1	1	5.8	
G	602	68930	547120	4675	15	N	300.00	60X 4.0	5	N	N	1	1	1	5.8	
G	603	68849	547150	4800	15	N	700.00	84X 7.0	4	N	N	1	1	1	5.8	
G	604	68820	547173	4900	15	N	1000.00	96X 6.0	5	N	N	1	1	1	5.8	
G	605	68799	547196	5100	15	N	800.00	96X 6.0	6	N	N	1	1	1	5.8	
G	606	68781	547201	5250	15	N	700.00	96X 4.0	5	N	N	1	1	1	5.8	
G	607	68766	547210	5375	15	N	800.00	96X 4.0	10	N	N	1	1	1	5.8	
G	608	68760	547212	5400	15	N	20.00	24X 1.0	6	N	N	1	1	1	5.8	
G	609	68753	547201	5400	14	N	700.00	96X 4.0	5	N	N	1	1	1	5.8	
G	610	68716	547195	5675	14	N	2.00	6X 5	6	N	N	1	2	1	5.8	
G	611	68740	547185	5500	14	N	700.00	96X 4.0	4	N	N	1	1	1	5.8	
G	612	68721	547170	5600	14	N	700.00	N	4	N	N	1	1	1	5.8	***
G	613	68715	547150	5650	1	N	20.00	18X 2.0	8	N	N	1	1	1	5.6	
G	614	68710	547150	5650	1	N	10.00	N	5	N	N	1	2	1	5.0	
G	615	68690	547155	5750	1	N	300.00	60X 4.0	6	N	N	1	1	1	5.8	
G	616	68692	547169	5850	1	N	30.00	24X 1.0	5	N	N	1	1	1	5.8	
G	617	68695	547154	5825	1	N	300.00	60X 3.0	5	N	N	1	1	1	5.8	
G	618	68731	547146	5700	1	N	200.00	24X 1.0	5	N	N	1	1	1	5.0	
G	619	68890	547090	4575	15	N	1200.00	96X10.0	5	N	N	1	1	1	5.8	
G	620	68890	546359	4650	4	N	20.00	N	3	N	N	1	2	1	5.8	***
G	621	68830	546362	4675	4	N	200.00	108X10.0	4	N	N	1	1	1	5.8	
G	622	69982	545713	4960	10	N	10.00	N	14	43	74	1	2	1	5.6	***
G	623	69686	545342	5500	9	N	10.00	24X 1.5	9	11	56	1	1	1	5.8	
G	624	69665	545339	5725	9	N	50.00	48X 2.0	9	24	31	1	1	1	5.8	
G	625	69670	545303	5900	9	N	5.00	2X 5	8	11	31	1	2	1	5.8	
G	626	69555	545313	5800	9	N	30.00	48X 1.0	9	11	69	1	1	1	5.8	
G	627	69610	545370	5890	9	N	N	N	7	11	10	1	3	1	5.8	
G	628	69611	545399	5800	9	N	150.00	N	7	18	29	1	1	1	5.0	***
G	629	69635	545408	5700	9	N	10.00	N	4	18	11	1	2	1	5.8	
G	630	69640	545417	5600	9	N	300.00	N	10	18	41	1	1	1	5.8	***
G	631	69651	545426	5500	9	N	10.00	24X 5	8	57	63	1	1	1	5.8	
G	632	69661	545427	5450	9	N	300.00	60X 5	4	11	39	1	1	1	5.8	
G	633	69676	545425	5300	9	N	250.00	48X 5	4	5	49	1	1	1	5.8	
G	634	69690	545430	5200	9	N	300.00	48X 1.0	5	11	31	1	1	1	5.8	
G	635	69714	545455	5150	8	N	5.00	6X 5	3	18	25	1	1	1	5.8	
G	636	69739	545490	5125	8	N	20.00	6X 5	4	11	16	1	1	1	5.8	
A	800	68820	547000	4650	3	N	1.00	12X 1.0	4	N	N	1	1	1	5.8	
A	801	68791	547028	4900	3	N	50.00	12X 3.0	8	N	N	1	1	1	5.8	
A	802	68745	547040	5100	3	N	75.00	24X 3.0	6	N	N	1	1	1	5.8	
A	803	68732	547042	5300	3	N	75.00	36X 2.0	8	N	N	1	1	1	5.8	
A	804	68738	547050	5400	3	N	4.00	36X 1.0	5	N	N	1	1	1	5.8	
A	805	68739	547050	5400	3	N	75.00	24X 6.0	6	N	N	1	1	1	5.8	
A	806	68740	547070	5600	3	N	.13	N	4	N	N	1	2	1	5.8	
A	807	69730	547070	5600	3	N	10.00	N	9	N	N	1	1	1	5.8	
A	808	68712	547080	5650	3	N	.03	N	11	N	N	1	2	3	5.8	***
A	809	68703	547085	5700	3	N	2.00	N	11	N	N	1	2	1	5.8	
A	810	68500	546632	5075	2	N	5.00	8X 5	7	11	45	1	1	1	5.8	
A	811	68473	546640	5500	2	N	3.00	4X 1.0	5	11	50	1	1	1	5.8	
A	812	68446	546648	5700	2	N	20.00	10X 2.0	5	11	49	1	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
A	813	68410	546560	5850	2	N	200.00	24X 5.0	5	11	38	1	1	1	5.8	
A	814	68930	546560	5700	2	N	200.00	36X 6.0	7	5	74	1	1	1	5.8	
A	815	68460	546560	5400	2	N	200.00	24X 4.0	9	18	21	1	1	1	5.8	
A	816	68481	546560	5125	1	N	200.00	24X 4.0	5	11	21	1	1	1	5.8	
A	817	68478	546547	5100	1	N	50.00	24X 2.0	7	18	41	1	1	1	5.8	
A	818	68500	546530	5200	1	N	100.00	12X 3.0	5	11	21	1	1	1	5.8	
A	819	68439	546498	5400	1	N	50.00	12X 2.0	12	18	56	1	1	1	5.8	
A	820	68480	546470	5600	2	N	50.00	12X 2.0	5	11	69	1	1	1	5.8	
A	821	68500	546431	5925	2	N	40.00	12X 2.0	9	5	35	1	1	1	5.8	
A	822	68465	546495	5400	1	N	10.00	6X 1.0	5	11	15	1	1	1	5.8	
A	823	68470	546498	5400	1	N	100.00	60X 2.0	8	11	25	1	1	1	5.8	
A	824	68472	546509	5300	1	N	100.00	36X 5.0	7	11	11	1	1	1	5.8	
A	825	68478	546521	5200	1	N	100.00	36X 3.0	5	11	23	1	1	1	5.8	
A	826	68481	546539	5150	1	N	10.00	10X 2.0	5	11	31	1	1	1	5.8	
A	827	68500	546570	5025	2	N	200.00	36X 5.0	4	5	54	1	1	1	5.8	
A	828	68515	546607	5000	2	N	200.00	48X 6.0	8	11	43	1	1	1	5.8	
A	829	68523	546632	4900	2	N	250.00	36X 6.0	7	5	45	1	1	1	5.8	
A	830	68540	546664	4900	2	N	250.00	36X 6.0	4	11	11	1	1	1	5.8	
A	831	68365	547100	5400	3	N	40.00	8X 3.0	7	N	N	1	1	1	5.8	
A	832	68378	547081	5700	3- 4	N	20.00	8X 1.0	9	N	N	1	1	1	5.8	
A	833	68389	547071	5900	4- 5	N	10.00	4X 1.0	8	N	N	1	1	1	5.8	
A	834	69457	546040	5875	5	N	200.00	24X 4.0	9	N	N	1	1	1	5.8	
A	835	69449	546095	5700	5	N	200.00	36X 5.0	9	N	N	1	1	1	5.8	
A	836	69451	546140	5600	5	N	200.00	24X12.0	9	N	N	1	1	1	5.8	
A	837	69446	546190	5375	5	N	200.00	36X 6.0	7	N	N	2	1	1	5.8	
A	838	69436	546229	5275	5	N	250.00	36X 6.0	8	N	N	1	1	1	5.6	
A	839	69420	546270	5200	5	N	250.00	72X12.0	13	N	N	1	1	1	5.8	
A	840	69410	546315	5100	5	N	300.00	48X 8.0	7	N	N	1	1	1	5.8	
A	841	69390	546356	5050	5	N	300.00	96X 6.0	181	N	N	1	1	1	5.8	
A	842	69464	546180	5700	5	N	15.00	9X 1.0	9	N	N	1	1	1	5.8	
A	844	69503	546110	6200	7	N	15.00	6X 3.0	5	N	N	1	1	1	5.8	
A	845	69778	545530	5100	8	N	100.00	19X 3.0	4	N	N	1	1	1	5.8	
A	846	69770	545575	5400	9	N	150.00	24X 6.0	8	48	32	2	1	1	5.8	
A	847	69743	545618	5950	9	N	100.00	18X 2.0	8	N	N	1	1	1	5.8	
A	848	69731	545608	6000	9	N	100.00	18X 2.0	7	N	N	1	1	1	5.8	
A	849	69692	545621	6500	10	N	75.00	18X 3.0	200	N	N	1	1	1	5.8	
A	850	69690	545632	6550	9	N	N	N	8	N	N	1	3	1	5.8	***
A	851	69497	545719	6700	9	N	N	N	14	N	N	1	3	3	5.8	***
A	852	69501	545803	6590	8	N	10.00	8X 5	9	N	N	1	1	1	5.8	
A	853	69478	545841	6500	6	N	50.00	12X 6.0	7	N	N	1	1	1	5.8	
A	854	69452	545894	6390	6	N	75.00	48X 3.0	5	N	N	1	1	1	5.8	
A	855	69443	545897	6390	6	N	.13	4X 5	7	N	N	1	1	1	5.8	***
A	856	69435	545949	6090	5	N	125.00	48X 3.0	5	N	N	1	1	1	5.8	
A	857	69821	546353	5100	3	N	.06	1X 5	9	N	N	1	1	1	5.8	
A	858	68818	546292	5400	3	N	.06	2X 5	7	N	N	1	1	1	5.8	
A	859	68779	546275	5800	3	N	.06	1X 5	7	N	N	1	1	3	5.8	
A	860	68795	546271	5600	3	N	10.00	6X 1.0	7	N	N	1	1	1	5.8	
A	861	68840	546260	5000	3	N	50.00	6X 3.0	7	N	N	1	1	1	5.8	
A	862	71731	545725	5500	4	9.0	40.00	6X 3.0	9	57	130	2	1	1	5.8	
A	863	71736	545700	5600	4	8.0	10.00	3X 1.0	4	48	125	2	1	1	5.8	
A	864	71748	545700	5675	4	8.0	2.00	1X 5	11	67	171	2	1	1	5.8	
A	865	71750	545672	6000	4	8.0	2.00	2X 5	6	106	99	2	1	1	5.8	
A	866	71738	545670	6000	4	6.0	1.00	1X 5	9	77	138	2	1	1	5.8	
A	867	71455	545545	6150	5	6.0	30.00	36X 5	8	145	79	2	1	1	5.0	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
A	858	71420	545503	6350	5	10.0	N	N	6	150	66	2	1	1	5.8	***
A	859	71561	545510	7250	5	7.0	5.00	5X 1.0	9	57	25	2	1	1	5.8	
A	870	71579	545530	7000	5	7.0	20.00	12X 3.0	4	19	10	2	1	1	5.8	
A	871	71584	545551	6800	5	7.0	2.00	3X 5	5	9	3	2	1	1	5.8	
A	872	71534	545670	5800	5	5.0	50.00	12X 1.0	6	9	26	2	1	1	5.8	
A	873	71519	545689	6000	5	8.0	10.00	6X 1.0	9	19	11	2	1	1	5.8	
A	874	71508	545701	6300	5	7.0	40.00	60X 5	8	38	24	2	1	1	5.8	
A	875	71509	545722	6550	5	7.0	15.00	12X 1.0	8	19	89	2	1	1	5.8	
A	876	71500	545722	6600	5	7.0	20.00	10X 1.0	21	34	133	2	1	1	5.8	
A	877	71476	545752	7500	6	6.0	5.00	2X 2.0	8	14	56	2	1	1	5.8	
A	878	71530	545765	7350	5	6.0	20.00	10X12.0	39	306	48	2	2	1	5.8	***
A	879	71550	545790	7350	5	5.0	10.00	6X 5	14	29	30	2	1	1	5.8	
A	880	71569	545781	6750	5	6.0	15.00	6X 5	9	38	12	2	1	1	5.8	
A	881	71568	545780	6350	5	6.0	20.00	8X12.0	8	19	10	2	1	1	5.8	
A	882	71679	545760	5400	4	5.0	40.00	20X 1.0	11	169	79	2	1	1	5.8	
A	883	71385	545570	5850	5	9.0	25.00	12X 1.0	9	10	76	2	1	1	5.8	
A	884	71371	545535	6100	5	8.0	75.00	36X 2.0	11	190	92	2	1	1	5.8	
A	885	71363	545597	6400	5	6.0	40.00	20X 1.0	12	230	12	2	1	1	5.8	
A	886	71347	545610	6550	5	6.0	20.00	15X 1.0	9	272	85	2	1	1	5.8	
A	887	71317	545611	6900	6	8.0	10.00	10X 2.0	9	81	22	2	1	1	5.8	
A	888	71303	545631	6900	6	7.0	10.00	6X 1.0	13	57	56	2	1	1	5.8	
A	889	71392	545660	6900	6	8.0	5.00	6X 1.0	22	38	155	2	1	1	5.8	
A	890	71412	545641	6550	5	8.0	10.00	10X 1.0	9	19	18	2	1	1	5.8	
A	891	71430	545619	5975	5	9.0	20.00	10X 5	15	14	94	2	1	1	5.8	
A	892	71450	545609	5800	5	9.0	5.00	15X 5	15	34	53	2	1	1	5.8	
A	892	71514	546240	5690	15	9.0	10.00	3X 5	5	24	48	2	2	3	5.8	***
A	893	71506	546193	5690	3	3.0	100.00	36X 1.0	6	17	48	2	1	1	5.8	
A	894	71572	546235	5400	15	3.0	25.00	6X 1.0	6	12	28	2	1	3	5.8	
A	895	71621	546290	5175	15	6.0	20.00	4X 1.5	8	12	30	2	2	1	5.8	
A	896	71635	546268	5125	15	5.5	20.00	12X 1.0	4	37	37	2	1	3	5.8	
A	897	70392	546308	5590	5	7.0	50.00	10X 1.0	22	17	35	2	1	1	5.8	
A	898	70858	546318	6000	5	8.0	35.00	10X 1.0	8	12	67	2	1	1	5.8	***
A	899	70832	546329	6250	5	5.0	15.00	4X 1.0	15	12	33	2	1	1	5.8	
A	900	70807	546324	6525	6	6.0	35.00	12X 2.0	4	12	35	2	1	1	5.8	
A	901	70736	546252	6500	8	3.0	2.00	2X 5	17	31	25	2	1	1	5.8	
A	902	70770	546240	6200	8	3.0	20.00	6X 1.0	8	12	10	2	1	1	5.8	
A	903	70777	546219	6000	8	4.0	30.00	12X10.0	4	49	12	2	1	1	5.8	
A	904	70802	546218	5800	7	4.0	35.00	12X 2.0	4	24	15	2	1	1	5.8	
A	905	71475	546169	6100	3	4.0	15.00	4X 1.0	8	12	12	2	1	1	5.8	
A	906	71447	546157	6400	4	3.0	15.00	6X 1.0	6	12	19	2	1	1	5.8	
A	907	71387	546162	6400	4- 5	4.0	2.00	1X 5	6	12	47	2	1	1	5.8	
A	908	71419	546229	6200	3	4.0	10.00	5X 1.0	8	12	33	2	1	1	5.8	
A	909	71389	546239	5800	3	4.0	15.00	10X 5	9	24	86	2	1	1	5.8	
A	910	71386	546202	6000	3	5.0	30.00	12X12.0	4	24	51	2	1	1	5.8	
A	911	71382	546231	5800	3	5.0	30.00	6X 2.0	9	12	53	2	1	1	5.8	
A	912	71376	546247	5700	3	5.0	45.00	12X 1.0	15	12	86	2	1	1	5.8	
A	913	71370	546258	5600	3	5.0	20.00	10X 1.0	11	12	49	2	1	1	5.8	
A	914	71341	546277	5375	3	4.0	2.00	2X 5	8	24	53	2	1	1	5.8	
A	915	71856	545575	5500	3	6.0	100.00	24X 2.0	9	29	38	2	1	1	5.8	
A	916	71828	545591	5600	4	5.0	75.00	18X 1.0	11	9	48	2	1	1	5.8	
A	917	71812	545587	5700	4	4.0	15.00	6X 5	2	19	28	2	1	1	5.8	
A	918	71804	545583	5825	4	4.0	25.00	96X12.0	6	150	57	2	1	1	5.8	
A	919	71780	545568	6200	5	6.0	10.00	3X 5	8	29	28	2	1	1	5.8	
A	920	71785	545561	6200	5	6.5	10.00	6X 1.0	8	34	51	2	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
A	921	71788	545528	6100	4- 5	5.0	20.00	8X 1.0	8	14	23	2	1	1	5.8	
A	922	71789	545495	6000	4	4.0	20.00	10X 1.0	10	14	58	2	1	1	5.8	
A	923	71792	545493	6000	4	3.0	30.00	14X 1.0	6	19	56	2	1	1	5.8	
A	924	71809	545516	5700	4	5.0	60.00	24X 2.0	4	19	21	2	1	1	5.8	
A	925	71828	545457	6300	5	4.0	30.00	12X 2.0	8	9	30	2	1	1	5.8	
A	926	71839	545471	6000	5	4.0	40.00	16X 1.0	3	9	41	2	1	1	5.8	
A	927	71855	545463	5700	5	5.0	5.00	3X .5	3	14	23	2	1	1	5.9	
A	928	71845	545483	5625	4	5.0	50.00	10X 3.0	6	9	17	2	1	1	5.8	
A	929	71850	545485	5500	4	6.0	2.00	1X .5	8	19	21	2	1	1	5.8	
A	930	71850	545540	5475	3- 4	5.0	75.00	14X 5.0	3	19	30	2	1	1	5.8	
A	931	71840	545545	5400	4	5.0	100.00	24X 3.0	6	29	34	2	1	1	5.8	
A	932	71653	545554	5300	3	6.0	200.00	36X 5.0	6	9	17	2	1	1	5.8	
A	933	71082	546596	5700	5	5.0	3.00	2X 1.0	48	14	46	2	1	1	5.8	
A	934	71098	546573	5500	15	5.0	25.00	8X 1.0	77	19	63	2	1	1	5.6	
A	935	71117	546544	5225	15	6.0	15.00	3X 1.0	5	29	48	2	1	1	5.8	
A	936	71211	545534	5625	7	3.0	50.00	14X 2.0	6	29	17	2	1	1	5.8	
A	937	71180	545545	6900	7	1.0	40.00	18X 1.0	6	24	30	2	1	1	5.8	
A	938	71200	545530	6700	7	2.0	2.00	1X .5	11	19	15	2	1	1	5.6	
A	939	71220	545520	6400	6	3.0	60.00	12X 2.0	11	29	35	2	1	1	5.8	
A	940	71236	545498	6175	5	3.0	25.00	10X 1.0	6	14	16	2	1	1	5.8	
A	941	71301	545500	6000	5	4.0	200.00	30X 4.0	10	48	10	2	1	1	5.8	
A	942	71165	545181	6800	6	2.5	100.00	24X 3.0	10	19	55	2	1	1	5.8	
A	943	71143	545180	7000	7	1.0	25.00	10X 1.0	6	14	57	2	1	1	5.8	
A	944	71148	545157	6850	6	.5	35.00	15X 1.0	12	19	41	2	1	1	5.8	
A	945	71202	545200	6650	5	5.0	N	N	8	19	30	2	3	1	5.8	***
A	946	71253	545235	6575	5	3.0	200.00	48X 7.0	8	9	28	2	1	1	5.8	
A	947	71310	545270	6400	5	3.0	200.00	36X10.0	13	19	35	2	1	1	5.8	
A	948	71353	545300	6250	5	3.0	250.00	36X 8.0	6	9	58	2	1	1	5.8	
A	949	71391	545325	6300	5	4.0	20.00	6X 1.0	5	19	33	2	2	1	5.8	
A	950	71410	545315	6100	5	3.5	300.00	60X 6.0	6	19	44	2	1	1	5.8	
A	951	71461	545326	6000	5	4.0	300.00	36X 8.0	8	19	30	2	1	1	5.8	
A	952	71500	545350	5975	5	4.5	15.00	4X 1.0	3	19	25	2	1	1	5.8	
A	953	71510	545349	5975	5	4.0	300.00	48X 6.0	10	24	30	2	1	1	5.8	
A	954	71541	545364	5700	5	4.5	350.00	48X 6.0	2	24	25	2	1	1	5.8	
A	955	71575	545372	5575	5	5.0	375.00	48X10.0	4	19	15	2	1	1	5.8	
A	956	71560	545390	5800	5	6.0	10.00	5X 1.0	4	24	12	2	1	1	5.8	
A	957	71551	545418	6100	5	5.0	45.00	10X 2.0	13	24	7	2	1	1	5.8	
A	958	71541	545440	6500	5	5.0	15.00	6X 1.0	12	24	10	2	1	1	5.8	
A	959	70980	545570	6800	8	4.0	10.00	6X 1.0	8	14	43	2	1	1	5.8	
A	960	70990	545581	6800	8	2.0	15.00	3X 1.0	2	19	15	2	2	1	5.6	
A	961	70990	545610	6700	8	4.0	30.00	10X 1.0	8	14	15	2	1	1	5.8	
A	962	71011	545670	6600	7	3.0	20.00	5X 1.0	6	14	28	2	2	1	5.8	
A	963	71020	545640	6400	7	4.0	50.00	20X 3.0	11	14	12	2	1	1	5.8	
A	964	71041	545670	6300	7	4.0	100.00	24X 4.0	6	9	50	2	1	1	5.8	
A	965	71179	545681	6375	5- 6	2.0	10.00	5X 1.0	11	19	44	2	1	1	5.8	
A	966	71160	545708	6175	5	3.0	35.00	10X 2.0	13	19	15	2	1	1	5.8	
A	967	71155	545729	6025	5	3.0	25.00	4X 1.0	8	24	20	2	1	1	5.8	
A	968	70857	545706	6500	10	4.0	N	N	8	18	97	2	3	1	5.8	***
A	969	70861	545736	6375	9	3.0	10.00	6X 1.0	7	18	15	2	1	1	5.8	
A	970	70880	545762	6300	9	3.0	75.00	24X 2.0	5	18	23	2	1	1	5.8	
A	971	70900	545790	6225	8	3.0	150.00	36X 6.0	7	30	58	2	1	1	5.8	
A	972	70780	545800	6880	9	N	15.00	5X 1.0	12	18	79	2	1	1	5.8	
A	973	70820	545801	6700	9	N	25.00	10X 2.0	4	11	46	2	1	1	5.8	
A	974	70860	545798	6500	8	N	50.00	20X 4.0	9	18	21	2	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
A	975	70898	545800	6300	8	N	20.00	10X 1.0	4	9	12	2	2	1	5.8	
A	976	70883	545791	6250	8	3.0	75.00	24X 3.0	8	18	35	2	1	1	5.8	
A	977	70910	545901	6150	8	3.0	250.00	36X 6.0	4	11	9	2	1	1	5.8	
A	978	70916	545810	6150	8	2.0	10.00	4X .5	4	11	19	2	2	1	5.8	
A	979	70928	545831	6100	7	3.0	300.00	36X 6.0	5	11	12	2	1	1	5.8	
A	980	70940	545890	6000	7	4.0	375.00	45X 3.0	7	11	20	2	1	1	5.8	
A	981	70950	545920	6000	7	4.0	500.00	48X 4.0	8	18	21	2	1	1	5.8	
A	982	70960	545923	5950	7	4.0	500.00	48X 6.0	8	14	44	2	1	1	5.8	
A	983	70950	545929	6025	7	2.0	5.00	2X .5	3	24	61	2	2	1	5.8	
A	984	70956	545951	6025	7	3.0	20.00	5X 2.0	6	9	53	2	1	1	5.8	
A	985	70978	545962	5925	7	4.0	500.00	72X 4.0	6	9	46	2	1	1	5.8	
A	986	70991	545995	5850	7	N	500.00	60X 6.0	4	24	16	2	1	1	5.8	
A	987	70987	546018	6000	8	3.0	25.00	10X 1.0	8	9	33	2	1	1	5.8	
A	988	70991	546030	5890	8	4.0	175.00	25X 2.0	4	9	46	2	1	1	5.8	
A	989	71007	546036	5825	7- 8	4.0	750.00	60X 8.0	8	14	15	2	1	1	5.8	
A	990	71028	546067	5730	7	4.0	750.00	48X 6.0	10	19	44	2	1	1	5.8	
A	991	71056	546088	5650	6	4.0	750.00	48X 5.0	8	9	10	2	1	1	5.8	
A	992	70894	546354	5575	5	4.0	75.00	12X 2.0	6	19	27	2	1	1	5.8	
A	993	70874	546358	5800	5	4.0	75.00	10X 2.0	8	14	28	2	1	1	5.8	
A	994	70863	546363	6000	5	3.0	25.00	5X 1.0	5	18	29	2	1	1	5.8	
A	995	70860	546355	6000	5	3.0	30.00	6X 2.0	5	14	34	2	1	1	5.8	***
A	996	70847	546359	6400	5	3.0	20.00	4X 1.0	8	29	37	2	1	1	5.8	
A	997	70902	546208	6200	7	2.0	30.00	10X 2.0	8	9	25	2	1	1	5.0	
A	998	70894	546171	6400	8	1.0	15.00	4X 1.0	8	9	29	2	1	1	5.0	
A	999	70884	546112	6600	9	1.0	5.00	4X .5	8	24	15	2	1	1	5.0	
A	1000	70782	545956	7300	10	1.0	.13	1X .5	8	19	28	2	2	3	5.8	
A	1001	70727	545951	6775	10	2.0	25.00	18X 2.0	4	9	27	2	1	1	5.0	
A	1002	70742	545929	6500	10	2.0	75.00	20X 3.0	6	N	10	2	1	1	5.0	
A	1003	70759	546051	6300	9	2.0	175.00	35X 4.0	3	9	11	2	1	1	5.0	
A	1004	70779	546100	6050	9	2.5	200.00	48X 6.0	5	19	51	2	1	1	5.0	
A	1005	70793	546115	6100	8	2.0	15.00	5X 1.0	6	19	28	2	1	1	5.0	
A	1006	70792	546148	5900	8	3.0	250.00	40X 5.0	3	29	14	2	1	1	5.0	
A	1007	70812	546172	6050	8	2.5	20.00	6X 1.0	8	14	39	2	1	1	5.0	
A	1008	70792	546199	5900	8	3.0	10.00	3X .5	6	19	39	2	1	1	5.0	
A	1009	70805	546205	5800	8	3.0	300.00	60X 3.0	6	29	47	2	1	1	5.0	
A	1010	70819	546222	5700	7	3.0	300.00	48X 8.0	4	19	25	2	1	1	5.0	
A	1011	70852	546248	5650	5	3.0	300.00	60X 8.0	6	14	35	2	1	1	5.0	
A	1012	70626	546457	6050	5	2.0	90.00	24X 1.0	8	9	15	2	1	1	6.5	
A	1013	70659	546434	6300	5	1.0	20.00	6X 2.0	8	9	12	2	1	1	6.5	
A	1014	70646	546477	6200	5	1.5	15.00	6X 1.0	6	14	11	2	1	1	6.5	
A	1015	70617	546498	5750	5	2.0	30.00	8X 2.0	2	14	34	2	1	1	6.5	
A	1016	70602	546496	5600	5	2.0	150.00	36X 4.0	8	29	34	2	1	1	6.5	
A	1017	70582	546547	5400	4	2.0	200.00	24X 6.0	4	14	12	2	1	1	6.5	
A	1018	70593	546586	5300	4	3.0	200.00	48X 4.0	6	19	44	2	1	1	5.8	
A	1019	70619	546591	5400	4	2.0	30.00	6X 2.0	8	24	12	2	1	1	5.8	
A	1020	70646	546572	5550	4	2.0	20.00	4X 1.0	8	19	25	2	1	1	5.8	
A	1021	70661	546543	5700	4	1.5	5.00	4X 1.0	10	19	12	2	1	1	5.8	
A	1022	70621	546519	5250	7	3.0	250.00	48X 6.0	4	19	38	2	1	1	6.5	
A	1023	70493	546362	5490	8	3.0	15.00	3X 1.0	4	14	35	2	1	1	5.8	
A	1024	70539	546344	5700	8	3.0	40.00	10X 2.0	4	19	41	2	1	1	5.8	
A	1025	70559	546332	5850	8	N	N	N	20	23	75	2	1	3	5.8	***
A	1026	70528	546378	6600	7	2.0	45.00	6X 3.0	8	9	34	2	1	1	5.8	
A	1027	70810	546396	6450	6	2.0	20.00	6X 1.0	8	9	16	2	2	1	5.8	
A	1028	70601	546390	6350	7	2.0	75.00	14X 3.0	8	24	11	2	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACIC	TYPE	TURB	PH	
A	1029	70576	546380	6180	7	2.5	100.00	20X 4.0	2	29	20	3	1	1	5.8	
A	1030	70548	546394	5950	7	3.0	100.00	25X 4.0	2	24	30	3	1	1	5.8	
A	1031	70520	546418	5600	5	3.0	125.00	24X 5.0	2	19	44	3	1	1	5.8	
A	1032	70482	546429	5350	5	3.0	125.00	18X 5.0	5	29	51	3	1	1	5.8	
A	1033	68359	546780	6350	2	2.0	.50	1X .5	8	12	51	3	1	3	5.8	
A	1034	68366	546800	6175	2	2.5	15.00	4X .5	8	12	29	3	1	1	5.8	
A	1035	68371	546770	6290	2	2.0	25.00	6X 1.0	6	6	28	3	1	1	5.8	
A	1036	68375	546812	6100	2	2.0	65.00	14X 2.0	8	N	30	3	1	1	5.8	
A	1037	68389	546828	6150	2- 3	3.0	15.00	5X 1.0	4	12	25	3	1	1	5.8	
A	1038	68380	546840	6100	2- 3	3.0	30.00	9X 2.0	4	6	21	3	1	1	5.8	
A	1039	68410	546840	6550	3	2.5	15.00	3X 1.0	6	12	7	3	1	1	5.8	
A	1040	68402	546859	6300	3	2.0	20.00	5X 1.0	8	31	7	3	1	1	5.8	
A	1041	68496	546888	6500	3	3.0	20.00	6X .5	8	19	9	3	1	1	5.8	
A	1042	68495	546912	6425	3	2.0	15.00	6X .5	5	19	15	3	1	1	5.8	
A	1043	68490	546920	6425	3	2.0	25.00	24X .5	5	12	23	3	1	1	5.8	
A	1044	68470	546911	6200	3	3.0	75.00	18X 3.0	4	31	17	3	1	1	5.8	
A	1045	68450	546907	5900	3	3.0	100.00	24X 3.0	6	12	20	3	1	1	5.8	
A	1046	68535	547527	4800	15	6.0	50.00	10X 3.0	4	24	47	3	1	1	5.8	
A	1047	68579	547504	4900	15	6.0	35.00	8X 2.0	4	24	82	3	1	1	5.8	
A	1048	68610	547490	5000	15	5.0	20.00	5X 1.0	4	18	24	3	1	1	5.8	
A	1049	68625	547480	5050	15	5.5	10.00	8X .5	5	24	82	3	1	1	5.9	
A	1050	68635	547515	5200	15	5.0	10.00	4X 1.0	4	24	23	3	1	1	5.8	
A	1051	68480	547550	4900	15	3.0	3.00	3X .5	7	11	5	3	1	3	5.8	
A	1052	68456	547515	5125	15	3.0	1.00	2X .5	5	17	5	3	1	1	5.8	
A	1053	68600	547755	5050	15	6.0	N	N	9	11	12	3	2	3	5.8	***
A	1054	68680	547763	5000	15	7.0	N	N	5	11	2	3	1	1	5.8	***
A	1055	68255	547636	5000	15	5.0	20.00	7X 1.5	9	N	8	3	1	1	5.8	
A	1056	68260	547600	5280	15	4.0	5.00	3X 1.0	3	11	N	3	1	1	5.8	
A	1057	68218	547600	5100	15	4.0	5.00	2X 1.0	3	11	N	3	1	1	5.8	
A	1058	68205	547650	4800	15	6.0	20.00	6X 1.0	7	17	3	3	1	1	5.8	
A	1059	68230	547655	4800	15	6.0	35.00	10X 2.0	5	17	18	3	1	1	5.9	
A	1060	69470	545960	6250	6	3.0	5.00	2X 1.0	4	17	N	3	1	1	5.8	
A	1061	69476	545950	6300	6- 7	3.5	15.00	4X 1.0	5	11	N	3	1	1	5.8	
A	1062	69470	545930	6300	6- 7	4.0	.13	1X .5	5	11	N	3	1	1	5.8	
A	1063	69538	545817	6950	9	3.0	45.00	6X 1.0	3	17	1	3	2	1	5.8	
A	1064	69495	545929	6400	7- 8	2.5	45.00	6X 1.0	4	5	2	3	2	1	5.8	
A	1065	69484	545940	6300	6- 7	3.0	30.00	4X 1.0	4	11	2	3	2	1	5.8	
A	1066	69455	546025	5900	5	2.0	5.00	3X 1.0	4	11	8	3	2	1	5.8	
A	1067	69362	545652	5500	8	4.0	65.00	14X 1.0	7	17	18	3	1	1	5.8	
A	1068	69385	545648	5700	8	3.0	30.00	6X 1.0	9	17	8	3	1	1	5.8	
A	1070	69393	545662	6000	9	6.0	20.00	2X 1.0	4	17	11	3	2	1	5.8	
A	1071	69410	545630	6025	9	3.0	25.00	6X 1.0	7	11	41	3	1	1	5.8	
A	1072	69417	545632	6100	10	3.0	20.00	5X 1.0	7	11	18	3	1	1	5.8	***
A	1073	69450	545640	6700	10	4.0	5.00	3X .5	4	11	25	3	1	1	5.8	
A	1074	69439	545646	6550	10	4.0	15.00	6X 1.0	2	11	18	3	1	1	5.8	
A	1075	69443	545652	6700	10	3.0	3.00	2X .5	5	11	15	3	1	1	5.8	
A	1076	69437	545668	6800	10	4.0	10.00	3X 1.0	3	11	23	3	2	1	5.8	
A	1077	69332	545669	5250	8	4.0	80.00	24X 2.0	7	11	9	3	1	1	5.8	
A	1085	68693	546810	4725	5	8.0	25.00	10X 1.0	8	24	10	3	1	1	5.8	
A	1086	68665	546820	5050	5	7.0	35.00	5X 2.0	7	24	15	3	1	1	5.8	
A	1087	68636	546838	5500	5	7.0	10.00	5X 1.0	7	11	10	3	1	1	5.8	
A	1088	68679	546840	5150	5	6.0	15.00	4X 2.0	8	17	6	3	1	1	5.8	
A	1089	68711	546629	4750	5	8.0	40.00	12X 1.0	5	17	21	3	1	1	5.8	
A	1090	69164	545414	5725	5	1.0	10.00	6X 1.0	8	11	98	3	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
A	1091	69190	545437	5625	5	1.0	50.00	8X 2.0	7	30	15	3	1	1	5.8	
A	1092	69216	545466	5500	5	1.0	75.00	8X 2.0	4	17	10	3	1	1	5.8	
A	1093	69241	545492	5475	6	1.5	120.00	14X 2.0	7	24	73	3	1	1	5.8	
A	1094	69260	545521	5425	7	1.5	150.00	25X 2.0	8	17	66	3	1	1	5.8	
A	1095	69278	545560	5400	8	2.0	200.00	16X 3.0	8	17	59	3	1	1	5.8	
A	1096	69290	545605	5200	8	3.0	200.00	48X 2.0	8	11	66	3	1	1	5.8	
A	1097	69298	545646	5125	7	3.0	225.00	36X 4.0	7	24	9	3	1	1	5.8	
A	1098	69357	545441	5400	8	2.0	200.00	40X 4.0	8	17	23	3	1	1	5.8	
A	1099	69380	545410	5550	8	2.0	150.00	40X 3.0	9	24	121	3	1	1	5.8	
A	1100	69402	545388	5775	8	1.5	20.00	4X .5	7	24	89	3	1	1	5.8	
A	1101	69397	545376	5700	8	1.0	100.00	30X 3.0	7	11	32	3	1	1	5.8	
A	1102	69420	545350	5975	9	1.0	65.00	15X 2.0	3	19	10	3	1	1	5.8	
A	1103	69442	545322	6200	9	1.0	40.00	10X 1.0	2	19	6	3	1	1	5.8	
A	1104	69445	545361	6200	9	1.0	10.00	3X 1.0	5	19	8	3	1	1	5.8	
A	1105	69176	546046	5200	5	1.0	15.00	3X 1.0	4	11	47	3	1	1	5.8	
A	1106	69150	546020	5700	5	1.0	25.00	6X 2.0	7	24	64	3	1	1	5.8	
A	1107	69115	546000	6025	5	1.0	10.00	6X 1.0	3	5	56	3	1	1	5.8	
A	1108	69131	545941	6375	5	2.0	N	N	8	11	39	3	3	1	5.8	***
A	1109	69155	545985	6200	5	1.0	15.00	8X .5	7	17	48	3	1	1	5.8	
A	1110	69167	546010	5690	5	1.0	5.00	3X .5	12	17	59	3	1	1	5.8	
A	1111	69720	545491	5200	9	2.0	180.00	20X 2.0	3	5	11	3	1	1	5.8	
A	1112	69702	545515	5400	9	2.5	.25	1X .5	4	17	32	3	2	3	5.8	
A	1113	69681	545502	5400	9	1.5	150.00	24X 3.0	5	17	26	3	1	1	5.8	
A	1114	69643	545498	5600	9	1.0	100.00	24X 3.0	3	5	57	3	1	1	5.8	
A	1115	69636	545502	5700	9	1.0	10.00	40X .5	3	19	11	3	2	1	5.8	***
A	1116	69605	545500	5800	9	1.0	75.00	18X 2.0	5	14	6	3	1	1	5.8	
A	1117	69562	545520	6100	9	1.0	40.00	12X 3.0	7	9	18	3	1	1	5.8	
A	1118	69550	545549	6300	9	1.0	15.00	10X 1.0	8	19	9	3	1	1	5.8	
A	1119	69846	545439	6050	9	1.0	20.00	15X 1.0	7	14	19	3	1	1	5.8	
A	1120	69860	545980	5850	9	1.0	50.00	6X 3.0	9	19	15	3	1	1	5.8	
A	1121	69845	545516	5300	9	1.0	50.00	20X 2.0	5	17	22	3	1	1	5.8	
A	1122	69835	545540	5050	9	1.5	15.00	6X 2.0	4	14	8	3	1	1	5.8	
A	1123	68375	547757	4990	15	1.5	10.00	3X 1.0	7	24	22	3	1	1	5.8	
A	1124	68320	547736	4880	15	2.0	20.00	6X .5	5	24	64	3	1	1	5.8	
A	1125	68495	547640	4720	15	2.0	5.00	2X 1.0	7	30	35	3	1	1	5.8	
A	1126	68545	547539	4800	15	1.5	15.00	5X 1.0	3	24	41	3	1	1	5.8	
A	1127	68570	547537	4950	15	1.0	15.00	3X 1.0	7	17	53	3	1	1	5.8	
A	1128	68598	547542	5100	15	1.0	15.00	5X .5	4	17	23	3	1	3	5.8	
A	1129	69472	546127	5750	5	1.5	50.00	18X 1.0	4	17	20	4	1	1	5.8	
A	1130	69502	546115	6100	6	1.0	30.00	7X 2.0	4	17	39	4	1	1	5.8	
A	1131	69530	546080	6500	8	1.0	15.00	4X 1.0	4	17	64	4	1	1	5.8	
A	1132	69472	546180	5700	5	1.5	30.00	6X 1.0	3	11	59	4	1	1	5.8	
A	1133	69507	546182	6100	6	1.5	20.00	8X 2.0	2	11	20	4	1	1	5.8	
A	1134	69520	546186	6400	7	1.0	7.00	6X 1.0	3	17	33	4	1	1	5.8	
A	1135	69536	546175	6500	8	1.0	10.00	5X .5	3	11	29	4	1	1	5.8	
A	1136	70079	545410	5700	11	1.0	40.00	20X .5	5	5	68	4	1	1	5.8	
A	1137	70075	545399	5700	11	1.0	25.00	6X 1.5	2	17	14	4	1	1	5.8	
A	1138	70091	545361	5500	11	2.0	20.00	3X 1.0	7	11	135	4	2	1	5.8	
A	1139	70106	545311	5500	11	1.5	150.00	18X 3.0	3	17	11	4	1	1	5.8	
A	1140	70108	545301	5575	11	2.0	5.00	2X .5	3	11	38	4	2	1	5.8	
A	1141	70120	545299	5700	11	1.5	50.00	10X 2.0	4	11	20	4	1	1	5.8	
A	1142	70119	545289	5700	11	1.5	100.00	24X 2.0	3	11	5	4	1	1	5.8	
A	1143	70139	545272	6100	11	1.0	65.00	18X 1.0	4	11	68	4	1	1	5.8	
A	1144	70160	545255	6300	11	1.0	15.00	6X 1.0	8	17	93	4	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
A	1145	70118	545201	6200	11	1.0	15.00	4X 2.0	7	17	36	4	1	1	5.8	
A	1146	70097	545210	6150	11	1.0	20.00	4X 1.0	8	17	73	4	1	1	5.8	
A	1147	70090	545230	6000	11	1.0	50.00	10X 1.0	8	11	61	4	1	1	5.8	
A	1148	70079	545225	6075	11	1.0	20.00	5X 1.0	3	11	27	4	1	1	5.8	
A	1149	70059	545216	6200	11	1.0	5.00	2X 5	7	11	41	4	1	1	5.8	
A	1150	70012	545179	6300	11	1.0	50.00	18X 1.0	3	5	2	4	1	1	5.8	
A	1151	70040	545228	6200	11	1.5	20.00	12X 1.0	3	11	43	4	1	1	5.8	
A	1152	70053	545250	5900	11	1.0	50.00	24X 2.0	3	5	8	4	1	1	5.8	
A	1153	70060	545260	5900	11	1.0	20.00	5X 2.0	4	11	6	4	1	1	5.8	
A	1154	70080	545291	5700	11	1.0	100.00	20X 2.0	7	11	39	4	1	1	5.8	
A	1155	70079	545299	5700	11	1.5	100.00	36X 2.0	4	11	71	4	1	1	5.8	
A	1156	67645	546955	5475	5	1.5	15.00	4X 1.0	5	11	76	4	1	1	5.0	
A	1157	67611	546896	5150	13	2.0	30.00	15X 1.0	5	5	69	4	1	1	5.0	
A	1158	67599	546688	5100	13	1.0	5.00	2X 5	6	11	87	4	2	2	5.0	
A	1159	67572	546876	5050	13	1.0	.50	1X 5	3	11	19	4	2	2	5.0	
A	1160	67546	546860	4950	13	2.0	60.00	20X 2.0	4	18	57	4	1	1	5.0	
A	1161	67851	546970	5125	2	1.5	15.00	3X 5	6	11	80	4	2	2	5.0	
A	1162	67830	546978	5300	2	1.5	20.00	7X 1.0	5	11	59	4	1	2	5.0	
A	1163	67793	547013	5900	3	1.0	10.00	4X 1.0	4	11	16	4	1	1	5.0	
A	1164	67745	546972	5800	3	1.0	15.00	5X 5	5	5	76	4	1	1	5.0	
A	1165	67732	546965	5800	3	1.5	20.00	6X 1.0	4	5	69	4	1	1	5.0	
A	1166	67762	546949	5400	3	1.5	50.00	10X 1.5	6	11	106	4	1	1	5.0	
A	1167	67782	546926	5150	3	1.5	25.00	8X 1.0	5	11	107	4	1	1	5.0	
A	1168	67690	547097	6350	4	1.0	1.00	3X 5	8	5	66	4	1	2	5.0	
A	1169	67590	547011	6400	4	1.0	20.00	10X 1.0	5	5	23	4	1	1	5.0	
A	1170	67745	547121	6100	3	1.0	25.00	5X 1.0	7	11	11	4	1	1	5.0	
A	1171	67748	547133	6200	3	1.0	5.00	5X 5	7	5	31	4	1	1	5.0	
A	1172	67760	547140	6200	3	1.0	20.00	6X 1.0	5	5	21	4	1	1	5.0	
A	1173	67790	547150	6200	2	1.0	2.00	2X 5	4	N	28	4	1	1	5.0	
A	1174	67780	547105	5550	2	1.0	45.00	15X 1.0	5	5	79	4	1	1	5.0	
A	1175	67778	547034	5525	2	1.5	3.00	3X 5	4	5	23	4	2	1	5.0	
A	1176	67763	547085	5125	2	1.5	7.00	4X 5	4	5	35	4	2	1	5.0	
A	1177	67770	547080	5510	2	1.0	50.00	6X 2.0	7	5	53	4	1	1	5.0	
A	1178	69128	547495	4900	15	1.5	1.00	3X 5	6	18	74	4	1	1	5.8	
A	1179	69269	547575	4450	15	1.0	.25	1X 5	6	18	38	4	1	2	5.8	
A	1180	69180	547549	4690	15	1.5	1.00	3X 5	14	11	87	4	1	3	5.8	
A	1181	69221	547539	4550	15	1.5	5.00	8X 1.0	9	13	98	4	1	3	5.8	
A	1182	69230	547587	4600	15	1.0	N	N	9	18	76	4	1	3	5.8	***
A	1183	69260	547521	4450	15	1.0	1.00	1X 5	6	11	69	4	1	3	5.8	
A	1184	69250	547537	4490	15	1.0	1.00	2X 5	11	24	78	4	1	3	5.8	
A	1185	69275	547510	4590	15	1.5	2.00	3X 5	9	18	36	4	1	3	5.8	
A	1186	69160	547610	4880	15	1.0	1.00	1X 5	5	24	49	4	1	1	5.8	
A	1187	69201	547634	4760	15	1.5	3.00	2X 1.0	11	24	162	4	1	1	5.8	
I	2000	71050	546618	5950	5	4.0	5.00	24X 3.0	8	19	33	2	1	1	5.8	
I	2001	71019	546619	6300	7	4.0	5.00	18X 2.0	11	38	46	2	1	1	5.8	
I	2002	71005	546634	6450	7- 8	4.0	2.00	24X 7.0	13	19	53	2	1	1	5.8	
I	2003	71004	546623	6400	8	4.0	2.00	24X 2.0	8	34	38	2	1	1	5.8	
I	2004	71018	546734	6400	6- 7	4.0	2.00	24X 1.0	8	29	29	2	1	1	5.8	
I	2005	71036	546732	6200	5- 6	4.0	2.00	30X 2.0	11	29	35	2	1	1	5.8	
I	2006	71095	546708	5690	15	4.0	5.00	36X 1.0	26	29	15	2	1	1	5.8	
I	2007	71107	546712	5710	15	4.0	5.00	12X 2.0	8	34	15	2	2	1	5.8	
I	2008	71128	546700	5550	15	4.0	10.00	48X 6.0	8	29	53	2	1	1	5.8	
I	2009	71151	546698	5460	15	4.0	10.00	48X 5.0	29	38	66	2	1	1	5.8	
I	2010	71180	546668	5380	15	6.0	8.00	36X 3.0	11	19	28	2	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACIC	TYPE	TURB	PH	
I	2011	71210	546659	5280	15	6.0	5.00	18X 3.0	8	38	20	2	1	1	5.8	
I	2012	71240	546638	5125	15	6.0	.50	12X 1.0	11	34	46	2	1	1	5.8	
I	2013	71286	546327	5300	3	5.0	5.00	12X 2.0	20	24	28	2	1	1	5.8	
I	2014	71278	546332	5500	3	5.0	5.00	12X 2.0	13	29	25	2	1	1	5.8	
I	2015	71262	546331	5650	3	4.0	2.00	24X 1.0	12	57	46	2	1	1	5.8	
I	2016	71248	546323	5900	3	4.0	2.00	12X 1.0	13	19	17	2	1	1	5.8	
I	2017	71242	546332	5950	3	4.0	2.00	6X 5	8	34	17	2	1	1	5.8	
I	2018	71228	546338	6250	4	4.0	2.00	12X 1.0	15	29	45	2	1	1	5.8	
I	2019	71221	546291	6200	4- 5	7.0	1.00	12X 5	6	29	37	2	2	1	5.8	
I	2020	71223	546289	6000	4	6.0	N	3X 5	52	14	34	2	2	1	5.8	***
I	2021	71210	546276	6000	5	5.0	2.00	12X 2.0	11	14	86	2	1	1	5.8	
I	2022	71210	546254	6000	5	5.0	2.00	18X 2.0	11	29	61	2	2	1	5.8	
I	2023	71226	546252	5750	4	5.0	2.00	19X 2.0	8	24	46	2	2	1	5.8	
I	2024	71216	546267	5800	5	5.0	2.00	12X 2.0	20	29	45	2	2	1	5.8	
I	2025	71244	546246	5450	4	5.0	10.00	48X 2.0	8	14	35	2	1	1	5.8	
I	2026	71257	546237	5250	3- 4	5.0	5.00	24X 2.0	8	14	53	2	1	1	5.8	
I	2027	71920	545510	5060	5	6.0	1.00	12X 1.0	20	190	57	2	1	1	5.8	
I	2028	71917	545578	5200	5	6.0	1.00	24X 1.0	11	9	23	2	1	1	5.8	
I	2029	71930	545563	5300	3- 5	3.0	1.00	4X 5	68	230	80	2	1	1	5.8	
I	2030	71920	545560	5300	3	3.0	4.00	24X 1.0	13	24	48	2	1	1	5.8	
I	2031	71911	545548	5500	3	4.0	1.00	6X 5	8	9	23	2	2	1	5.8	
I	2040	71985	545420	5550	3	7.0	N	N	19	26	105	2	2	1	5.8	***
I	2041	71490	545990	5210	3	6.0	10.00	24X 4.0	10	19	53	2	1	1	5.8	
I	2042	71477	546010	5480	3	6.0	15.00	18X 1.0	10	12	27	2	1	1	5.8	
I	2043	71452	546021	5600	3- 4	6.0	10.00	24X 6.0	5	12	94	2	1	1	5.8	
I	2044	71753	545278	5300	5	3.0	50.00	72X 6.0	5	12	48	2	1	1	5.8	
I	2045	71727	545260	5490	5	3.0	175.00	216X30.0	4	19	23	2	1	1	5.8	
I	2046	71702	545231	5600	5	3.0	150.00	120X 4.0	6	19	67	2	1	1	5.8	
I	2047	71696	545193	5800	5	3.0	.50	12X 5	6	19	12	2	2	1	5.8	
I	2048	71690	545170	5850	5	3.0	.50	8X 5	4	26	15	2	2	1	5.6	
I	2049	71679	545154	5900	5	3.0	75.00	96X 6.0	5	12	43	2	1	1	5.8	
I	2050	71655	545107	6210	5	3.0	50.00	72X 7.0	4	31	51	2	1	1	5.8	
I	2051	71633	545072	6310	5	3.0	10.00	24X 2.0	2	19	109	2	2	1	5.8	
I	2052	71618	545074	6700	5	3.0	N	N	4	31	28	2	1	1	5.8	***
I	2053	71609	545064	6350	5	3.0	50.00	60X 3.0	5	31	24	2	1	1	5.8	
I	2054	71632	545093	6310	5	3.0	.50	24X 5	11	12	107	2	2	1	5.8	
I	2055	71260	545850	5690	5	5.0	2.00	12X 1.0	4	19	7	2	1	1	5.8	
I	2056	71247	545870	5950	5	4.0	10.00	36X 5	8	19	15	2	1	1	5.8	
I	2057	71230	545890	6300	6	4.0	10.00	30X 1.0	6	12	6	2	1	1	5.8	
I	2058	71232	545977	6550	6	6.0	.50	6X 5	5	6	12	2	2	1	5.8	
I	2059	71199	545980	7150	7	9.0	.50	12X 5	8	12	87	2	2	1	5.8	
I	2060	71110	545914	6980	8	1.0	30.00	36X 6.0	8	12	51	2	1	1	5.8	
I	2061	71124	545936	6800	8	1.0	50.00	60X 5.0	8	19	5	2	1	1	5.8	
I	2062	71141	545980	6300	7	2.0	5.00	18X 2.0	4	6	89	2	1	1	5.8	
I	2063	71156	546029	6100	5	3.0	5.00	12X 1.5	5	12	33	2	2	1	5.8	
I	2064	71161	546060	5900	5	4.0	2.00	6X 5	5	6	5	2	1	1	5.8	
I	2065	71156	546074	5890	5	4.0	5.00	12X 5	6	12	6	2	2	1	5.8	
I	2066	71168	546092	5700	5	4.0	20.00	24X 4.0	8	12	12	2	1	1	5.8	
I	2070	70954	546417	5450	3	4.0	10.00	12X 1.0	8	11	94	2	1	1	5.8	
I	2071	70921	546422	5750	4	4.0	10.00	18X 1.0	4	18	12	2	1	1	5.8	
I	2072	70089	546423	6110	4- 5	4.0	15.00	12X 2.0	7	18	74	2	1	1	5.8	
I	2073	70090	546419	5950	4- 5	4.0	10.00	12X 5	9	11	45	2	1	1	5.8	
I	2074	70972	546411	6400	5	4.0	10.00	19X 5	7	30	51	2	1	1	5.8	
I	2075	70859	546412	6700	5	3.0	1.00	3X 5	7	11	37	2	1	1	5.6	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH
I	2076	71098	546399	5580	3	3.0	100.00	48X 3.0	10	24	48	2	1	1	5.8
I	2077	71170	546322	6200	3	2.0	1.00	24X .5	8	24	38	2	1	1	5.8
I	2078	71152	546345	5900	3	2.0	1.00	6X .5	5	19	6	2	1	1	5.8
I	2079	71209	546384	6100	2	.5	1.00	2X .5	5	19	37	2	1	1	5.8
I	2080	71219	546395	6100	1	1.0	.50	1X .5	6	19	20	2	1	1	5.8
I	2081	71196	546402	5800	1	3.0	10.00	12X 1.5	8	14	27	2	1	1	5.8
I	2082	71173	546409	5600	1	3.0	15.00	12X 1.0	5	9	48	2	1	1	5.8
I	2083	71145	546372	5700	2	2.0	5.00	18X 1.0	8	19	19	2	1	1	5.8
I	2084	71145	545399	5550	1	2.0	10.00	12X 1.5	5	14	89	2	1	1	5.8
I	2085	71149	546431	5400	1	4.0	25.00	36X 2.0	6	14	27	2	1	1	5.8
I	2086	71122	546424	5460	1	4.0	50.00	42X 3.0	5	9	39	2	1	1	5.8
I	2087	71160	546456	5325	3	4.0	50.00	42X 3.0	6	14	37	2	1	1	5.8
I	2088	71192	546439	5250	15	4.0	100.00	60X 4.0	14	19	17	2	1	1	5.8
I	2089	71247	546516	5225	15	3.0	50.00	24X 3.0	6	19	47	2	1	1	5.8
I	2090	71276	546562	5025	15	3.0	100.00	72X 4.0	8	19	62	2	1	1	5.8
I	2091	70912	546733	6100	8	3.0	1.00	6X .5	4	14	27	2	1	1	5.8
I	2092	70900	546742	6200	8	5.0	.50	2X .5	4	14	25	2	2	1	5.8
I	2093	70885	546726	5900	8	3.0	5.00	12X 1.5	3	14	15	2	1	1	5.8
I	2094	70862	546748	5790	7	3.0	20.00	36X 2.0	4	9	35	2	1	1	5.8
I	2095	70831	546739	5600	7	3.0	10.00	30X 1.5	6	9	10	2	1	1	5.8
I	2096	70816	546744	5600	7	4.0	.25	1X .5	10	14	35	2	2	1	5.8
I	2097	70798	546723	5450	8	3.0	50.00	60X 2.0	6	19	42	2	1	1	5.8
I	2098	70860	546679	5700	8	3.0	2.00	12X .5	6	9	29	2	1	1	5.8
I	2099	70813	546682	5490	8	3.0	5.00	12X 1.0	6	9	32	2	1	1	5.8
I	2100	70784	546700	5400	8	3.0	30.00	36X 3.0	4	9	25	2	1	1	5.8
I	2101	70758	546683	5270	8	3.0	20.00	36X 1.0	10	14	74	2	1	1	5.8
I	2102	70736	546678	5250	8	3.0	10.00	24X 1.5	3	9	32	2	1	1	5.8
I	2103	70891	546811	6300	7	2.0	.50	3X .5	3	19	43	2	1	1	5.8
I	2104	70883	546836	6000	7	2.0	5.00	12X .5	6	19	24	2	1	1	5.8
I	2105	70874	546863	5750	6	3.0	10.00	12X 2.0	4	19	11	2	1	1	5.8
I	2106	70944	546963	6100	6	3.0	.50	4X .5	3	9	35	2	1	1	5.8
I	2107	70938	546899	5900	7	4.0	.50	8X .5	4	9	30	2	1	1	5.8
I	2108	70713	546917	5080	6	4.0	10.00	18X 1.0	6	14	21	2	1	1	5.8
I	2109	70718	546880	5200	7	4.0	5.00	12X 2.0	5	14	19	2	1	1	5.8
I	2110	70734	546890	5200	7	4.0	15.00	30X 2.0	8	9	25	2	1	1	5.8
I	2111	70732	546875	5350	7	4.0	2.00	6X 1.0	4	9	30	2	2	1	5.8
I	2112	70758	546855	5500	7	4.0	2.00	12X 1.0	4	9	38	2	1	1	5.8
I	2113	68495	547283	5090	14	N	10.00	24X 2.0	3	9	28	3	1	1	5.8
I	2114	68510	547256	5325	1	N	20.00	48X 2.0	5	14	23	3	1	1	5.8
I	2115	68539	547244	5500	1	N	15.00	18X 2.0	3	9	29	3	1	1	5.8
I	2116	68571	547213	5800	4	N	20.00	36X 4.0	8	17	38	3	1	1	5.8
I	2117	68480	547188	6000	3	N	.50	3X .5	6	11	36	3	2	1	5.8
I	2118	68474	547137	5700	3	N	1.00	2X .5	4	11	24	3	1	1	5.8
I	2119	68468	547128	5850	3	N	50.00	12X 3.0	9	N	8	3	1	1	5.8
I	2120	68456	547166	5490	3	N	50.00	60X 2.0	8	5	9	3	1	1	5.8
I	2121	68427	547176	5190	3	N	50.00	48X 2.0	9	5	9	3	1	1	5.8
I	2122	68871	547419	5053	15	6.0	5.00	12X 3.0	9	5	8	3	1	1	5.8
I	2123	68900	547444	5000	15	7.0	5.00	24X 3.0	8	5	15	3	1	1	5.8
I	2124	68907	547480	4990	15	7.0	2.00	12X .5	8	N	34	3	1	1	5.8
I	2125	68895	547512	4975	15	6.0	5.00	18X 2.0	13	5	74	3	1	1	5.8
I	2126	68901	547565	4900	15	5.0	5.00	18X 1.0	10	5	75	3	1	1	5.8
I	2127	68699	547610	4880	15	6.0	3.00	24X 2.0	8	11	64	3	1	1	5.8
I	2128	68921	547660	4790	15	6.0	.50	12X 1.0	9	5	42	3	1	1	5.8
I	2129	68941	546379	5350	5	6.0	N	N	4	11	11	3	1	1	5.8

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MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
I	2130	68943	546390	5850	5	7.0	.13	2X .5	4	24	9	3	1	1	5.8	***
I	2131	68943	546400	5750	5	7.0	.13	2X .5	4	11	18	3	1	1	5.8	***
I	2132	68941	546418	5500	5	9.0	2.00	12X .5	7	11	9	3	1	1	5.8	
I	2133	69343	545586	5280	8	6.0	5.00	12X 1.5	3	11	3	3	2	1	5.8	
I	2134	69358	545580	5380	8	5.0	2.00	4X .5	3	17	2	3	2	1	5.8	
I	2135	69373	545592	5600	8	4.0	1.00	12X .5	3	17	2	3	2	1	5.8	
I	2136	69313	545475	6210	9	5.0	1.00	8X 1.0	4	11	5	3	2	1	5.8	
I	2137	69377	545497	5600	8	7.0	1.00	12X .5	2	5	2	3	2	1	5.8	
I	2138	69384	545465	5650	8	5.0	.50	3X .5	3	24	20	3	2	2	5.8	
I	2139	69390	545455	5700	8	4.0	3.00	8X .5	9	5	10	3	2	1	5.8	
I	2140	69364	545445	5610	8	4.0	2.00	6X 1.0	7	11	18	3	2	1	5.8	
I	2141	69388	545425	5620	8	5.0	2.00	12X .5	3	5	N	3	2	1	5.8	
I	2142	69392	545404	5690	8	9.0	2.00	12X .5	4	11	N	3	2	1	5.8	
I	2150	68610	546746	4900	3	8.0	30.00	60X 3.0	5	11	8	3	1	1	5.8	
I	2151	68590	546770	5100	4	7.0	25.00	36X 3.0	3	19	9	3	1	1	5.8	
I	2152	68565	546778	5300	3	7.0	20.00	18X 3.0	5	11	8	3	1	1	5.8	
I	2153	68540	546795	5550	3- 4	6.0	20.00	24X 2.0	5	17	3	3	1	1	5.8	
I	2154	68540	546812	5900	4	9.0	.50	4X .5	9	17	53	3	1	1	5.6	
I	2155	68524	546816	5900	4	6.0	20.00	24X 2.0	5	11	8	3	1	1	5.8	
I	2156	68505	546841	6400	4	7.0	15.00	12X 2.0	5	17	23	3	1	1	5.8	
I	2157	68830	546729	4750	3	8.0	5.00	12X .5	4	17	24	3	1	1	5.8	
I	2158	70700	546983	4900	15	2.0	5.00	18X 2.0	5	24	11	3	1	1	5.8	
I	2159	70680	547010	4800	15	2.0	2.00	12X 2.0	7	24	10	3	1	1	5.8	
I	2160	70705	547250	4610	15	3.0	.50	6X .5	5	11	16	3	1	1	5.8	
I	2161	69635	545268	6000	9-10	3.0	25.00	36X 4.0	7	11	140	3	1	1	5.8	
I	2162	69660	545299	5900	9	3.0	20.00	30X 3.0	9	5	9	3	1	1	5.8	
I	2163	69669	545342	5700	9	2.0	45.00	36X 6.0	5	11	47	3	1	1	5.8	
I	2164	69692	545350	5400	9	2.0	45.00	72X 3.0	7	11	47	3	1	1	5.8	
I	2165	69603	545380	5870	9	3.0	N	N	5	30	12	3	3	1	5.8	
I	2166	69615	545400	5800	9	2.0	10.00	12X 1.0	4	24	38	3	1	1	5.8	
I	2167	69622	545398	5800	9	3.0	.50	18X .5	2	43	7	3	2	1	5.8	
I	2168	69640	545416	5600	9	3.0	20.00	18X 2.0	5	29	28	3	1	1	5.8	
I	2169	69659	545421	5500	9	3.0	10.00	12X 2.0	5	17	4	3	1	1	5.8	
I	2170	69662	545427	5400	9	2.0	30.00	18X 2.0	7	11	10	3	1	1	5.8	
I	2171	69690	545430	5220	9	3.0	5.00	6X .5	8	19	20	3	1	1	5.8	
I	2172	68780	546628	4610	5	3.0	1.00	24X 2.0	8	19	25	3	1	1	5.8	
I	2173	68749	546612	5000	5	3.0	N	N	9	24	59	3	1	1	5.8	***
I	2174	68749	546627	5000	5	3.0	N	N	5	29	25	3	1	1	5.8	***
I	2175	68745	546590	5000	5	3.0	10.00	36X 2.0	3	19	45	3	1	1	5.8	
I	2176	68728	546592	5300	4	3.0	5.00	12X .5	8	19	64	3	2	1	5.8	
I	2177	68723	546582	5300	4	2.0	2.00	6X .5	4	14	10	3	1	1	5.8	
I	2178	69920	546015	4850	11	5.0	5.00	12X 2.0	4	19	33	3	1	1	5.8	
I	2179	69850	546024	5100	11	3.0	.50	12X .5	5	14	21	3	2	1	5.8	
I	2180	69890	546045	4900	11	N	2.00	18X 1.0	5	14	11	3	2	1	5.8	
I	2181	69925	546080	4800	11	N	N	N	7	29	20	3	2	1	5.8	
I	2182	69815	546230	4900	10	2.0	1.00	2X 1.0	2	11	4	3	1	1	5.8	
I	2183	69781	546210	5060	10	1.0	1.00	12X 1.0	5	11	69	3	1	1	5.8	
I	2184	69749	546152	5350	11	1.5	N	36X 3.0	12	11	76	3	1	1	5.8	***
I	2185	69135	546195	5400	5	2.0	N	36X 2.0	9	11	113	4	1	1	5.8	***
I	2186	69132	546170	5110	4	2.0	.13	3X .5	4	11	11	4	1	1	5.8	***
I	2187	69100	546190	5100	4	2.0	10.00	30X 2.0	10	11	10	4	1	1	5.8	
I	2188	69115	546215	5400	5	1.0	10.00	36X 3.0	5	17	18	4	1	1	5.8	
I	2189	69106	546221	5425	5	1.0	3.00	6X 1.0	3	5	14	4	1	1	5.8	
I	2190	69080	546191	5050	4	2.0	5.00	8X 1.0	7	17	41	4	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
I	2191	69080	546222	5200	5	2.0	45.00	72X 5.0	3	11	8	4	1	1	5.8	
I	2192	69099	546240	5500	5	2.0	45.00	30X 3.0	5	11	26	4	1	1	5.8	
I	2193	69180	546239	6000	5	N	20.00	30X 5	8	11	103	4	1	1	5.8	
I	2194	69165	546260	6300	5	1.0	.13	36X 5	7	11	31	4	1	1	5.8	***
I	2195	69156	546270	6350	5	N	5.00	48X 5	8	5	16	4	1	1	5.8	
I	2196	69142	546277	6250	5	1.0	10.00	36X 5	8	11	50	4	1	1	5.8	
I	2197	69132	546290	6450	5	2.0	15.00	12X 1.0	8	11	83	4	1	1	5.8	
I	2198	69180	546301	6400	5	2.0	15.00	12X 1.0	4	11	51	4	1	1	5.8	
I	2199	69099	546307	6250	5	2.0	2.00	12X 5	5	11	63	4	1	1	5.8	
I	2200	69720	546462	4600	8	1.0	15.00	18X 1.0	4	17	42	4	1	1	5.8	
I	2201	69760	546476	4950	8	5	50.00	72X 1.0	8	11	31	4	1	1	5.8	
I	2202	69808	546475	5100	8	1.0	40.00	36X 6.0	7	17	23	4	1	1	5.8	
I	2203	69835	546489	5275	7	1.0	40.00	48X 4.0	3	17	23	4	1	1	5.8	
I	2204	69870	546503	5490	6	1.0	25.00	36X 2.0	4	11	15	4	1	1	5.8	
I	2205	69905	546503	5700	7	1.0	.13	36X 5	11	17	41	4	1	1	5.8	
I	2206	69937	546497	6000	8	1.0	1.00	12X 1.0	3	17	20	4	1	1	5.8	
I	2207	69935	546480	5900	8	1.0	1.00	12X 1.0	7	24	51	4	1	1	5.8	
I	2208	69970	546470	6400	9	1.0	.50	3X 5	4	24	38	4	1	1	5.8	
I	2209	68512	546630	4990	2	3.0	1.00	3X 5	4	24	14	4	1	1	5.8	
I	2210	68489	546551	5090	1	2.0	15.00	60X 1.0	4	24	20	4	1	1	5.8	
I	2211	68491	546541	5100	1	5	10.00	24X 3.0	7	17	23	4	1	1	5.3	
I	2212	68502	546530	5300	2	1.5	N	N	2	17	32	4	2	1	5.8	***
I	2213	68500	546510	5350	2	5	45.00	96X 5	4	17	5	4	1	1	5.8	
I	2214	68601	546508	5400	2	1.0	N	N	2	30	9	4	2	1	5.8	***
I	2215	68599	546408	5400	2	3.0	1.00	3X 5	2	24	19	4	1	1	5.8	
I	2216	68486	546478	5550	2	1.0	15.00	24X 3.0	7	24	31	4	1	1	5.8	
I	2217	68490	546442	5890	2	1.0	10.00	24X 3.0	10	11	51	4	1	1	5.8	
I	2218	68509	546430	5990	2	1.0	15.00	36X 2.0	10	17	10	4	1	1	5.8	
I	2219	68462	546491	5400	1	1.5	60.00	72X 2.0	10	17	39	4	1	1	5.8	
I	2220	68461	546509	5400	1	3.0	N	N	7	11	8	4	2	2	5.8	***
I	2221	68477	546518	5225	1	2.0	45.00	36X 1.0	9	17	57	4	1	1	5.8	
I	2222	68478	546510	5190	1	2.0	20.00	24X 1.0	38	17	59	4	1	1	5.8	
I	2223	68477	546560	5190	1	3.0	25.00	36X 2.0	4	30	5	4	1	1	5.8	
I	2224	68446	546560	5550	2	3.0	10.00	36X 1.0	2	30	60	4	1	1	5.8	
I	2225	68406	546561	5830	2	4.0	10.00	24X 1.5	4	11	51	4	1	1	5.8	
I	2226	68361	546560	6200	2	3.0	5.00	24X 2.0	7	24	41	4	1	1	5.8	
I	2227	70590	545430	5190	9	2.0	75.00	72X 2.0	7	24	20	4	1	1	5.8	
I	2228	70615	545453	5300	8	1.0	75.00	48X 4.0	9	36	21	4	2	1	5.8	
I	2229	70622	545460	5300	8	4.0	.13	4X 5	7	36	21	4	2	1	5.8	
I	2230	70639	545478	5350	8	2.5	50.00	48X 4.0	7	17	15	4	1	1	5.8	
I	2231	70662	545490	5425	8	2.5	40.00	96X 6.0	7	24	42	4	1	1	5.8	
I	2232	70671	545503	5500	8	2.5	50.00	48X 2.0	3	24	17	4	1	1	5.8	
I	2233	70661	545529	5600	9	2.0	50.00	36X 3.0	4	17	38	4	1	1	5.8	
I	2235	70665	545570	5800	9	2.0	35.00	48X 1.0	3	24	31	4	1	1	5.8	
I	2236	70666	545590	5990	9	2.0	20.00	30X 2.0	4	36	17	4	1	1	5.8	
I	2237	70689	545498	5500	8	2.0	50.00	48X 3.0	11	30	111	4	1	1	5.8	
I	2238	70714	545506	5550	8	2.0	40.00	36X 3.0	7	24	85	4	1	1	5.8	
I	2239	70750	545518	5675	8	2.0	40.00	36X 3.0	14	24	50	4	1	1	5.8	
I	2240	70780	545545	5800	8	2.0	30.00	36X 2.0	11	11	43	4	1	1	5.8	
I	2241	70790	545533	6000	8	2.0	N	N	9	11	17	4	2	1	5.8	
I	2242	70800	545560	5900	8	1.0	20.00	24X 2.0	13	24	50	4	1	1	5.8	
I	2243	70801	545589	6000	8	1.0	5.00	12X 1.0	7	24	9	4	1	1	5.8	
I	2244	70819	545593	6100	8	1.0	5.00	12X 1.0	9	17	15	4	1	1	5.8	
I	2245	70004	546020	5600	11	2.0	25.00	30X 2.0	13	17	64	4	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
I	2246	70030	546031	5100	11	2.0	50.00	36X 1.0	10	17	59	4	1	1	5.8	
I	2247	70049	546031	5300	12	3.0	5.00	6X 5	12	17	54	4	2	1	5.8	
I	2248	70045	546041	5310	12	3.5	.13	3X 5	10	24	43	4	2	1	5.8	
I	2249	70050	546050	5310	12	3.0	N	N	9	24	12	4	2	1	5.8	***
I	2250	70059	546050	5300	12	2.5	50.00	24X 1.5	5	17	10	4	1	1	5.8	
I	2251	70066	546060	5360	12	3.0	.50	3X 1.0	8	24	18	4	2	1	5.8	
I	2252	70072	546070	5450	12	3.0	5.00	3X 1.5	4	17	23	4	2	1	5.8	
I	2253	70082	546077	5500	12	2.0	2.00	12X 1.0	2	17	8	4	1	1	5.8	
I	2254	70030	546072	5300	11	2.0	5.00	12X 1.0	2	17	37	4	1	1	5.8	
I	2255	70005	546055	5050	11	2.0	5.00	12X 1.0	11	30	62	4	1	1	5.8	
I	2256	69281	547125	4500	15	1.5	10.00	18X 1.0	4	11	19	4	1	1	5.8	
I	2257	69270	547120	4600	15	3.0	.06	2X 5	6	11	15	4	2	2	5.8	
I	2258	69240	547102	4600	15	2.0	15.00	48X 3.0	5	11	38	4	1	1	5.8	
I	2259	69235	547090	4625	15	3.5	2.00	4X 5	5	18	20	4	2	1	5.8	
I	2260	69213	547069	4700	15	2.0	10.00	48X 6.0	4	5	34	4	1	1	5.8	
I	2261	69210	547059	4710	15	1.5	1.00	2X 5	2	11	10	4	2	1	5.8	
I	2262	69179	547049	4800	15	1.0	20.00	36X 2.0	3	11	11	4	1	1	5.8	
I	2263	69142	547022	4900	15	1.0	15.00	30X 2.0	4	11	18	4	1	1	5.8	
I	2264	69112	547008	5025	14	2.0	20.00	36X 2.5	5	11	23	4	1	1	5.8	
I	2265	69084	546985	5180	14	5	20.00	24X 1.0	4	11	10	4	1	1	5.8	
I	2266	69045	546940	5700	3	1.0	30.00	48X 4.0	5	5	25	4	1	1	5.8	
I	2267	69040	546967	6020	4	5	20.00	36X 2.0	4	11	22	4	1	1	5.8	
I	2268	69025	546810	6280	5	5	N	N	6	18	21	4	3	1	5.8	
I	2269	69319	546964	4590	15	2.0	5.00	12X 1.0	5	18	33	4	1	1	5.8	
I	2270	69282	546952	4725	15	2.0	5.00	12X 1.0	4	11	10	4	1	1	5.8	
I	2271	69735	547292	4810	15	1.5	1.00	8X 5	4	11	18	4	1	1	5.8	
I	2272	69776	547275	4960	15	2.0	1.00	12X 1.0	3	11	8	4	1	1	5.8	
I	2273	69799	547259	5090	15	2.0	.50	6X 1.0	3	18	12	4	1	1	5.8	
I	2274	69685	547215	4825	15	1.0	3.00	12X 1.5	3	11	29	4	2	1	5.8	
I	2275	69655	547194	4810	15	2.0	1.50	36X 1.0	3	11	25	4	2	1	5.8	
I	2276	69632	547160	4790	15	1.5	1.00	4X 5	4	11	36	4	2	1	5.8	
I	2277	69280	547030	4590	15	2.0	20.00	36X 2.0	5	11	25	4	1	1	5.8	
I	2278	69240	547002	4700	15	2.0	20.00	36X 2.0	6	24	19	4	1	1	5.8	
I	2279	69225	546986	4750	15	3.0	5.00	12X 1.0	4	5	15	4	2	1	5.8	
I	2280	69201	546970	4890	15	2.0	10.00	24X 1.0	4	11	31	4	1	1	5.8	
I	2281	69190	546960	4885	14	3.0	5.00	12X 1.0	6	11	38	4	2	1	5.8	
I	2282	69169	546916	5375	1	2.0	5.00	12X 5	4	11	12	4	1	1	5.8	
I	2283	70010	546890	5300	6	5	50.00	96X 4.0	5	11	57	4	1	1	5.8	
I	2284	69986	546875	5390	7	5	30.00	72X 4.0	6	11	66	4	1	1	5.8	
I	2285	69950	546830	5450	6	5	30.00	48X 3.0	2	18	16	4	1	1	5.8	
I	2286	69915	546800	5590	5	5	20.00	36X 3.0	3	11	41	4	1	1	5.8	
I	2287	69893	546785	5600	5	5	30.00	72X 4.0	3	11	37	4	1	1	5.8	
I	2288	70012	546900	5300	8	5	25.00	48X 4.0	2	11	53	4	1	1	5.8	
I	2289	69980	546905	5500	7	5	20.00	36X 2.0	2	5	15	4	1	1	5.8	
I	2290	69955	546910	5600	5	5	20.00	36X 2.0	2	11	55	4	1	1	5.8	
I	2291	69945	546933	5900	7	5	5.00	12X 1.0	3	11	105	4	1	1	5.8	
I	2292	70360	547130	4900	15	5	.50	4X 5	4	11	31	4	2	1	5.8	
I	2293	70355	547070	4825	15	1.5	.06	8X 5	4	11	28	4	2	1	5.6	
I	2294	70380	547106	4800	15	5	.13	6X 5	9	11	97	4	2	1	5.8	
I	2295	70363	547155	4850	15	2.0	.13	4X 5	6	18	94	4	2	1	5.8	
I	2296	70365	546950	4875	6	4.0	5.00	48X 1.5	5	11	65	4	1	1	5.8	
I	2297	70350	546955	4900	7	4.5	2.00	36X 1.0	5	5	43	4	2	1	5.8	
I	2298	70345	546945	5000	7	5.0	N	48X 3.0	14	18	53	4	1	1	5.8	
I	2299	70338	546972	5050	7	3.5	3.00	12X 1.0	3	11	12	4	2	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
I	2300	70350	546987	4950	6	5	5.00	36X 3.0	9	11	59	4	2	1	5.8	
I	2301	58582	547499	4900	15	5	10.00	48X 3.0	2	18	31	4	1	1	5.8	
I	2302	68560	547520	4980	15	5	10.00	36X 1.5	3	11	39	4	1	1	5.8	
I	2303	68510	547540	4700	15	4.0	15.00	36X 3.0	4	11	119	4	1	1	5.8	
I	2304	70045	545960	4900	12	3.0	N	18X 2.0	5	11	38	4	2	2	5.8	***
J	3000	70973	546433	5400	3	2.5	2.00	48X12.0	58	190	125	2	1	1	5.8	
J	3001	70946	546454	5700	3	2.5	N	12X 2.0	34	272	39	2	1	1	5.8	
J	3002	70943	546469	6000	3	4.5	N	N	42	230	49	2	1	1	5.8	***
J	3003	70918	546462	5800	3	3.0	N	66X12.0	78	159	69	2	1	1	5.8	
J	3004	70903	546481	6000	3	3.0	1.50	30X 4.0	20	272	49	2	1	1	5.8	
J	3005	70900	546499	6170	3	4.0	1.00	8X 5	28	110	49	2	1	1	5.8	
J	3006	70952	546662	6600	8	4.0	.50	24X 4.0	22	110	39	2	1	1	5.8	
J	3007	70946	546641	6500	7	5.0	2.00	48X 6.0	19	110	60	2	1	1	5.8	
J	3008	70939	546628	6400	8	5.0	2.00	12X 2.0	29	150	135	2	1	1	5.8	
J	3009	70932	546591	6300	7	5.0	2.00	12X 5	16	73	117	2	1	1	5.8	
J	3010	70981	546558	6250	7	6.0	1.50	18X 2.5	16	273	25	2	1	1	5.8	
J	3011	70989	546546	6000	6	5.0	1.00	5X 2.0	11	184	115	2	2	1	5.8	
J	3012	71000	546530	5800	6	5.0	3.00	24X18.0	10	19	47	2	1	1	5.8	
J	3013	70990	546498	5560	3	5.0	6.00	84X 5.0	9	36	67	2	1	1	5.8	
J	3014	70999	546487	5490	3	5.0	6.00	60X 6.0	8	34	12	2	1	1	5.8	
J	3015	71169	546239	6600	5	3.0	.67	N	4	14	20	2	1	1	5.8	***
J	3016	71174	546248	6500	5	3.0	.33	N	21	34	32	2	2	1	5.8	
J	3017	71179	546242	6300	5	3.0	1.00	18X 5.0	19	29	35	2	1	1	5.8	
J	3018	71191	546240	6050	5	6.0	1.50	12X 2.0	66	38	45	2	1	1	5.8	
J	3019	71223	546231	5550	5	4.0	3.00	24X 3.0	2	14	53	2	1	1	5.8	
J	3020	71281	546202	5360	4	5.0	3.00	24X 3.0	6	9	42	2	1	1	5.8	
J	3021	71295	546187	5500	4	5.5	3.00	36X 9.0	5	29	38	2	1	1	5.8	
J	3022	71329	546170	5800	4- 5	5.0	4.00	48X 6.0	11	14	15	2	1	1	5.8	
J	3023	71345	546165	5960	4	2.5	2.00	24X 5.0	5	19	9	2	1	1	5.8	
J	3024	71330	546149	6200	5	3.0	3.00	18X 7.0	3	29	18	2	1	1	5.8	
J	3025	71329	546134	6600	5	3.0	2.00	24X 5.0	4	29	65	2	1	1	5.8	
J	3026	71372	546138	6500	5	3.0	2.00	18X 6.0	3	14	24	2	1	1	5.8	
J	3027	71350	546128	6560	5	3.0	1.00	12X 2.0	2	19	52	2	1	1	5.8	
J	3028	71970	545540	4950	15	7.0	1.00	12X 2.0	9	31	71	2	1	1	5.8	
J	3029	71957	545560	5010	15	8.0	1.00	6X 3.0	6	12	60	2	1	1	5.8	
J	3030	71920	545580	5200	4	8.0	.75	12X 1.0	8	12	35	2	1	1	5.8	***
J	3031	71845	545550	5600	3	8.0	2.00	12X 6.0	8	12	38	2	1	1	5.8	
J	3032	71830	545646	6050	3	8.0	1.00	18X 1.0	6	12	48	2	1	1	5.8	
J	3033	71833	545678	6100	3	9.0	N	N	4	17	81	2	1	1	5.8	***
J	3034	71660	545548	5500	3	8.0	3.00	60X24.0	9	17	53	2	1	1	5.8	
J	3035	71850	545565	5700	3	8.0	.33	12X 5	8	12	33	2	1	1	5.8	
J	3036	71879	545560	5310	3	6.0	10.50	18X 2.0	6	24	43	2	1	1	5.8	
J	3037	71900	545365	5500	4	7.0	3.00	12X 6.0	11	14	37	2	1	1	5.8	
J	3038	71880	545376	5800	4- 5	7.0	2.00	18X 6.0	5	11	72	2	1	1	5.8	
J	3039	71881	545385	5900	4	8.0	2.00	18X 6.0	6	14	32	2	1	1	5.8	
J	3040	71872	545380	5950	5	6.0	1.50	4X 5	6	14	48	2	1	1	5.8	
J	3041	71905	545373	5550	4	7.0	2.00	18X 1.0	11	24	78	2	1	1	5.8	
J	3042	71899	545397	5950	4	7.0	2.00	12X 5	8	9	89	2	1	1	5.8	
J	3043	71850	545370	6100	5	5.0	3.00	12X 5	4	9	86	2	1	1	5.8	
J	3044	71855	545354	5900	4- 5	8.0	1.50	N	3	9	43	2	1	1	5.8	
J	3045	71870	545337	5250	4	5.0	2.00	24X 3.0	3	14	17	2	1	1	5.8	
J	3046	71912	545353	5250	4	7.0	3.00	60X18.0	8	11	55	2	1	1	5.8	
J	3047	71612	545290	5600	5	11.0	N	N	10	11	43	2	2	1	5.8	***
J	3048	71607	545299	5700	5	3.5	50.00	60X18.0	5	11	21	2	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
J	3049	71600	545280	5850	5	9.0	20.00	12X 6.0	13	36	61	2	2	1	5.8	
J	3050	71564	545265	6150	5	4.0	50.00	96X18.0	5	11	12	2	1	1	5.8	
J	3051	71580	545270	6050	5	2.0	N	N	4	11	29	2	2	1	5.8	***
J	3052	71491	545210	6400	5	2.0	45.00	5X 1.0	10	17	53	2	2	1	5.8	
J	3053	71455	545134	6690	5	2.0	50.00	12X 2.0	6	11	27	2	1	1	5.8	
J	3054	71430	545150	6690	5	2.0	20.00	36X12.0	8	17	51	2	1	1	5.8	
J	3055	71460	545160	6600	5	2.0	45.00	42X 6.0	6	11	56	2	2	1	5.8	
J	3056	71480	545192	6490	5	4.0	50.00	72X 5.0	3	11	10	2	1	1	5.8	
J	3057	71679	545290	5410	5	4.0	50.00	12X12.0	5	11	35	2	1	1	5.8	
J	3058	71069	546094	5625	6	4.0	50.00	60X 3.0	9	11	19	2	1	1	5.8	
J	3059	71058	546142	6200	7	9.0	10.00	12X 5	4	11	14	2	2	1	5.8	
J	3060	71051	546131	6100	7	3.5	50.00	48X 6.0	5	11	12	2	1	1	5.8	
J	3061	71041	546163	6450	8	7.0	N	48X 1.0	5	11	20	2	1	1	5.8	***
J	3062	71130	546155	6050	5	3.5	10.00	48X 3.0	8	17	19	2	1	1	5.8	
J	3063	71142	546132	5650	5	6.5	N	12X 1.0	4	11	8	2	1	1	5.8	***
J	3064	70996	546029	5875	8	2.0	50.00	72X 1.0	24	11	25	2	1	3	5.8	
J	3065	70906	546012	6500	8	1.0	50.00	60X 1.0	9	24	27	2	1	1	5.6	
J	3066	70955	546046	6490	8	2.0	50.00	36X 6.0	14	11	137	2	1	1	5.8	
J	3067	71459	545917	5350	4	2.0	30.00	36X 2.0	11	11	71	2	1	1	5.8	
J	3068	71480	545890	5800	5	1.0	10.00	12X 1.0	7	24	50	2	1	1	5.8	
J	3069	71473	545887	5800	5	2.0	5.00	12X 1.0	24	11	69	2	1	1	5.8	
J	3070	71478	545873	5950	5	2.0	3.00	36X 5.0	11	11	97	2	1	1	5.8	
J	3071	71485	545859	6350	5	N	N	N	11	24	29	2	1	1	5.8	
J	3072	71493	545858	6500	5	N	N	N	4	11	64	2	1	1	5.8	
J	3073	71506	545945	5400	3	3.0	10.00	24X 4.0	6	N	30	2	1	1	5.8	
J	3074	71576	545932	5690	3	2.0	25.00	18X 1.0	4	11	19	2	1	1	5.8	
J	3075	71590	545943	5680	4	1.5	7.00	12X 1.0	8	11	32	2	1	1	5.8	
J	3076	71585	545940	5790	3	2.0	5.00	12X 2.0	9	11	35	2	1	1	5.8	
J	3077	71591	545939	5700	3	1.0	5.00	18X 6.0	21	11	33	2	1	1	5.8	
J	3078	71593	545938	5700	1	1.0	3.00	6X 2.0	8	17	32	2	1	1	5.8	
J	3079	71605	545984	5525	5	1.5	20.00	60X 1.0	6	17	25	2	1	1	5.8	
J	3080	71591	545988	5490	5	4.0	5.00	42X 4.0	5	11	30	2	1	1	5.8	
J	3081	71560	546022	5160	15	4.0	5.00	36X 6.0	8	11	12	2	1	1	5.8	
J	3082	70828	546525	5800	3	2.0	50.00	48X 5.0	6	11	60	2	1	1	5.8	
J	3083	70742	546544	5700	4	2.5	50.00	60X 6.0	4	N	8	2	1	1	5.8	
J	3084	70753	546633	5325	8	3.0	50.00	96X 6.0	6	11	19	2	1	1	5.8	
J	3085	70738	546792	5750	8	3.0	10.00	36X 4.0	5	11	21	2	2	1	5.8	
J	3086	70726	546776	5650	8	3.0	5.00	12X 2.0	6	N	10	2	2	1	5.8	
J	3087	70640	546739	5200	8	3.0	5.00	48X 2.0	9	11	56	2	1	1	5.8	
J	3088	70578	546826	5000	7	2.5	25.00	12X 2.0	4	11	10	2	1	1	5.8	
J	3089	70542	546850	5100	7	3.0	1.00	12X 1.5	9	24	10	2	1	1	5.8	
J	3090	68600	547102	6000	3- 4	2.0	50.00	72X 3.0	9	24	27	3	1	1	5.8	
J	3091	68590	547088	6110	4	2.0	1.00	12X 1.0	15	11	23	3	2	1	5.8	
J	3092	68588	547070	6150	5	2.0	5.00	18X 3.0	5	17	27	3	2	1	5.8	
J	3093	68570	547065	6200	5	2.0	50.00	48X 6.0	4	24	20	3	1	1	5.8	
J	3094	68555	547025	6500	5	4.0	50.00	60X12.0	2	24	8	3	1	1	5.8	
J	3095	68541	546975	6610	5	4.0	1.00	18X 2.0	2	11	19	3	2	1	5.8	
J	3096	68533	546985	6600	5	5.0	10.00	48X 6.0	2	11	14	3	1	1	5.8	
J	3097	68530	545968	6690	5	3.0	10.00	12X 6.0	6	11	20	3	2	1	5.8	
J	3098	68505	546992	7000	5	2.5	15.00	24X12.0	2	87	10	3	2	1	5.8	
J	3099	68502	546979	6850	5	1.5	5.00	12X 1.0	5	11	11	3	2	1	5.8	
J	3100	68508	546970	6775	5	2.5	10.00	18X 6.0	3	17	33	3	1	1	5.8	
J	3101	68313	546990	5500	3	4.5	50.00	72X 6.0	7	5	8	3	1	1	5.8	
J	3102	68340	547001	6100	3	6.5	1.00	6X 1.0	10	11	28	3	2	1	5.6	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
J	3103	68350	546992	6000	3	4.5	50.00	84X 6.0	8	5	2	3	1	1	5.8	
J	3104	68370	546995	6400	4	4.5	25.00	36X 1.0	8	11	23	3	1	1	5.8	
J	3105	68390	546994	6800	5	4.0	25.00	24X 3.0	7	N	5	3	1	1	5.8	
J	3106	68411	546999	7300	5	5.0	25.00	36X 6.0	7	11	8	3	1	1	5.8	
J	3107	68475	547033	6500	4	3.0	5.00	12X 1.0	9	11	8	3	1	1	5.8	
J	3108	68378	547048	6400	4	3.0	5.00	36X 1.0	7	11	N	3	2	1	5.8	
J	3109	68393	547065	6000	4	4.5	5.00	12X 1.0	8	5	33	3	1	1	5.8	
J	3110	68375	547090	5600	3	4.0	10.00	18X 2.0	7	N	N	3	1	1	5.8	
J	3111	68339	547125	6250	5	3.0	25.00	12X 3.0	5	11	3	3	1	1	5.8	
J	3112	69213	546419	6725	5	1.5	25.00	18X 2.0	11	N	15	3	1	1	5.8	
J	3113	69201	546339	5500	5	4.5	2.00	6X 1.0	4	17	10	3	1	1	5.8	
J	3114	69269	546430	5050	4	4.5	5.00	12X 2.0	3	11	28	3	1	1	5.8	
J	3115	69135	545630	5680	6	8.5	50.00	96X 8.0	7	17	18	3	1	1	5.8	
J	3116	69170	545680	5600	7	5.0	2.00	12X 2.0	9	24	37	3	2	1	5.8	
J	3117	69239	545751	5360	6	8.0	50.00	72X12.0	5	11	25	3	1	1	5.8	
J	3118	69290	545800	5050	5	6.0	50.00	132X18.0	5	17	10	3	1	1	5.8	
J	3123	71106	546947	5400	15	N	15.00	36X 1.0	7	11	16	3	1	1	5.8	
J	3124	71133	547057	4920	15	1.0	1.00	24X 2.0	9	29	18	3	1	1	5.8	
J	3125	71246	547068	4880	15	3.0	2.00	72X 1.0	7	29	25	3	1	1	5.8	
J	3126	71278	547072	4850	15	1.0	1.00	12X 1.0	7	34	15	3	1	1	5.8	
J	3127	71220	546983	5000	15	N	1.00	24X 3.0	12	19	11	3	1	1	5.8	
J	3128	71164	546917	5280	15	1.0	1.00	12X 2.0	4	14	9	3	1	1	5.8	
J	3129	69645	545625	6680	9	N	N	N	5	14	51	3	3	1	5.8	
J	3130	69696	545620	6500	9	1.0	25.00	60X 6.0	4	9	41	3	1	1	5.8	
J	3131	69700	545650	6580	9-10	1.0	10.00	36X 3.0	3	19	6	3	1	1	5.8	
J	3132	69717	545629	6350	9	1.5	.10	N	5	9	50	3	2	1	5.8	
J	3133	69740	545620	6000	9	5	10.00	84X 6.0	8	24	15	3	1	1	5.8	
J	3134	69756	545598	5690	9	1.0	50.00	60X 3.0	7	9	12	3	1	1	5.8	
J	3135	69770	545572	5400	8	1.0	50.00	60X 6.0	11	24	25	3	1	1	5.8	
J	3136	69780	545525	5100	8	1.5	10.00	24X 6.0	4	14	15	3	1	1	5.8	
J	3137	68931	546360	5000	5	2.5	.10	12X 3.0	7	9	9	3	1	1	5.8	
J	3138	69002	546363	5500	5	1.0	.50	2X 1.0	9	29	41	3	1	1	5.8	
J	3139	69040	546375	6100	5	5	1.00	60X 3.0	9	11	74	3	1	1	5.8	
J	3140	69070	546381	6800	5	2.0	.25	1X 3.0	10	24	17	3	1	1	5.8	
J	3141	69069	546396	6980	5	3.5	.10	1X 5	8	11	3	3	1	1	5.8	
J	3142	69090	546333	6500	5	2.0	10.00	24X 3.0	8	24	21	3	1	1	5.8	
J	3143	69071	546307	5920	5	1.0	1.00	12X 2.0	5	24	8	3	1	1	5.8	
J	3144	69015	546261	5000	4	1.0	1.00	24X 3.0	4	36	31	3	1	1	5.8	
J	3145	69869	545945	5150	11	2.0	25.00	60X12.0	10	11	28	3	1	1	5.8	
J	3146	69712	546305	5000	10	N	N	N	7	11	15	3	1	3	5.8	•••
J	3147	69610	546430	4900	8	1.0	1.00	36X 2.0	3	17	10	3	2	1	5.8	
J	3148	69615	546449	4750	8	1.0	1.00	36X 2.0	8	24	33	4	2	1	5.8	
J	3149	69270	546170	5850	5	2.0	3.00	5X 1.0	4	5	21	4	1	1	5.8	
J	3150	69265	546196	6200	5	2.0	5.00	6X 1.0	4	17	81	4	1	1	5.8	
J	3151	69221	546230	6350	5	2.0	5.00	6X 1.0	3	11	32	4	1	1	5.8	
J	3152	69179	546182	4900	5	2.0	5.00	12X 1.0	5	24	20	4	1	1	5.8	
J	3153	69184	546180	5410	5	2.0	5.00	12X 1.0	3	11	5	4	1	1	5.8	
J	3154	69175	546160	5200	5	2.0	5.00	12X 1.0	7	11	29	4	1	1	5.8	
J	3155	70250	545541	5100	11	2.0	N	24X 2.0	32	24	47	4	1	1	5.8	
J	3156	70232	545581	5200	11	2.0	N	60X12.0	3	17	6	4	1	1	5.8	•••
J	3157	70150	545680	4990	11	2.5	.10	12X 1.0	4	11	3	4	1	1	5.8	
J	3158	70151	545700	5050	11	2.0	N	6X 1.0	7	11	23	4	2	1	5.8	
J	3159	70395	545460	5100	10	3.0	10.00	35X 6.0	15	17	87	4	1	1	5.8	
J	3160	70319	545490	5250	10	2.5	.10	12X 2.0	3	11	17	4	2	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH
J	3161	70330	545528	5400	11	3.0	.05	12X 1.0	5	5	5	4	2	1	5.8
J	3162	70329	545540	5700	11	3.0	.10	18X 2.0	5	11	11	4	2	1	5.8
J	3163	70328	545561	5910	11	3.0	.10	12X 1.0	4	11	43	4	2	1	5.8
J	3164	70345	545581	5920	11	3.0	50.00	24X 3.0	10	11	15	4	1	1	5.8
J	3165	68668	547151	5820	1	N	50.00	72X18.0	11	30	33	4	1	1	5.8
J	3166	68682	547160	5810	1	5	.20	18X 2.0	14	24	51	4	2	1	5.8
J	3167	68709	547151	5710	1	2.0	1.00	24X 2.0	8	11	2	4	2	1	5.8
J	3168	68781	547200	5200	1	2.0	50.00	60X 6.0	3	5	32	4	1	1	5.8
J	3169	68859	547120	4660	15	2.0	50.00	72X 6.0	8	5	78	4	1	1	5.8
J	3170	71014	544960	6260	8	1.0	10.00	60X 3.0	4	24	42	4	1	1	5.8
J	3171	71020	544978	6230	8	1.5	.10	30X 7.0	7	24	79	4	1	1	5.8
J	3172	71024	544994	6290	8	2.5	.50	18X 2.0	8	17	28	4	2	3	5.8
J	3173	71004	544978	6250	8	2.5	.33	24X 1.0	7	11	20	4	2	3	5.8
J	3174	70960	545037	6000	8	1.0	50.00	36X12.0	9	17	46	4	1	1	5.8
J	3175	70970	545061	5900	8	1.0	50.00	42X 6.0	11	11	24	4	1	1	5.8
J	3176	70932	545090	5700	8	1.5	50.00	30X 7.0	10	11	31	4	1	1	5.8
J	3177	70892	545130	5510	8	1.5	50.00	48X 6.0	8	17	29	4	1	1	5.8
J	3178	70772	545170	5450	8	1.0	50.00	42X 6.0	10	11	73	4	1	1	5.8
J	3179	70729	545201	5350	8	1.5	50.00	48X 8.0	10	17	76	4	1	1	5.8
J	3180	70040	545993	5050	12	2.0	50.00	96X12.0	9	17	33	4	1	1	5.8
J	3181	70078	545986	5200	12	2.0	50.00	144X30.0	11	24	29	4	1	1	5.8
J	3182	70125	545988	5450	13	1.0	50.00	96X24.0	11	17	105	4	1	1	5.8
J	3183	70108	545989	5400	13	2.0	25.00	60X 3.0	4	24	54	4	1	1	5.8
J	3184	70101	545995	5300	12-13	2.5	.50	2X 1.0	4	56	75	4	2	1	5.8
J	3185	70144	545980	5300	12	1.5	3.00	3X .5	9	62	20	4	2	1	5.8
J	3186	70160	545972	5500	12	2.0	3.00	3X .5	10	36	20	4	2	1	5.8
J	3187	70178	545959	5600	12	1.5	3.00	48X .5	9	24	24	4	1	1	5.8
J	3188	70210	545923	5700	11	1.0	3.00	60X .5	2	24	20	4	1	1	5.8
J	3189	70240	545898	5900	11	1.0	3.00	60X .5	9	36	23	4	1	1	5.8
J	3190	70264	545888	6300	11	1.0	2.00	48X .5	2	11	10	4	1	1	5.8
J	3191	70290	545850	6510	11	N	2.50	60X 6.0	4	17	31	4	1	1	5.8
J	3192	70330	545825	6350	11	N	3.00	48X .5	7	17	16	4	1	1	5.8
J	3193	70150	545992	5550	13	1.0	50.00	72X 6.0	12	17	29	4	1	1	5.8
J	3194	70160	545994	5610	12	1.5	.10	12X 2.0	4	36	9	4	2	1	5.8
J	3195	70179	546007	5700	12	1.0	50.00	108X12.0	4	43	56	4	1	1	5.8
J	3196	70212	546017	5950	12	1.0	.05	6X 2.0	4	30	23	4	2	1	5.8
J	3197	70228	546029	6000	12	.5	50.00	36X 8.0	5	24	10	4	1	1	5.8
J	3198	70245	546017	6190	12	1.0	.05	18X 6.0	3	11	15	4	2	1	5.8
J	3199	70266	546009	6300	12	1.5	.05	N 1.0	2	11	28	4	2	1	5.8
J	3200	70280	546008	6350	12	1.5	.05	6X 1.0	3	11	50	4	2	1	5.8
J	3201	70298	545998	6500	12	1.5	.50	48X 3.0	9	30	27	4	2	1	5.8
J	3202	70318	545999	6550	12	1.0	.50	24X 2.0	11	24	74	4	2	1	5.8
J	3203	70328	546004	6590	12	1.5	50.00	48X 3.0	7	11	54	4	1	1	5.8
J	3204	70188	546028	5600	12	2.5	25.00	60X 4.0	16	24	42	4	1	1	5.8
J	3205	69620	546942	5300	5	N	50.00	36X 7.0	2	18	80	4	1	1	5.8
J	3206	69610	546921	5700	5	.5	50.00	48X 5.0	2	18	69	4	1	1	5.8
J	3207	69607	546886	5900	5	N	30.00	30X 3.0	2	11	32	4	1	1	5.8
J	3208	69595	546905	6000	5	3.0	.10	12X 2.0	6	11	69	4	2	1	5.8
J	3209	69613	546965	5210	5	1.0	50.00	48X12.0	4	11	66	4	1	1	5.8
J	3210	69592	547013	5000	15	2.0	50.00	60X 8.0	2	11	28	4	1	1	5.8
J	3211	69540	547060	4800	15	2.5	50.00	36X 6.0	3	5	87	4	1	1	5.8
J	3212	69635	546920	5450	5	.5	1.50	72X 8.0	8	11	129	4	1	1	5.8
J	3213	69650	546905	5500	5	N	1.50	72X 8.0	9	11	94	4	1	1	5.8
J	3214	69679	546888	5600	5	N	.75	18X 6.0	7	5	145	4	1	1	5.8

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
J	3215	69712	546915	6300	5	N	.38	48X12.0	9	19	89	4	1	1	5.8	
J	3216	69672	546862	5710	5	N	1.50	60X 8.0	7	5	93	4	1	1	5.8	
J	3217	69670	546852	5850	5	N	.25	24X .5	7	11	16	4	1	1	5.8	
J	3218	69699	546830	5910	5	5	.75	48X 6.0	11	11	16	4	1	1	5.8	
J	3219	69712	546838	5990	5	N	1.25	72X 8.0	5	11	37	4	1	2	5.8	
J	3220	69736	546840	6100	5	N	.50	60X 8.0	8	5	105	4	1	1	5.8	
J	3221	69750	546840	6225	5	N	.25	24X 6.0	8	5	129	4	1	1	5.8	
J	3222	69734	546826	6100	5	N	1.00	60X 8.0	4	11	28	4	1	1	5.8	
J	3223	69733	546815	6190	5	1.0	.13	5X .5	4	18	20	4	2	1	5.8	
J	3224	69756	546777	6450	3	N	.38	36X .5	4	N	19	4	1	1	5.8	
J	3225	69879	546260	4800	10	2.5	1.00	18X 1.0	3	11	20	4	2	2	5.8	
J	3226	69895	546255	4890	10	4.5	3.00	18X 6.0	7	11	5	4	2	1	5.8	
J	3227	69895	546270	4880	10	5.0	.10	18X 2.0	5	5	25	4	2	1	5.8	
J	3228	69925	546200	4900	10	1.0	.05	N	5	5	33	4	1	1	5.8	***
J	3229	70110	547048	5000	7	.5	30.00	72X 7.0	4	11	89	4	1	1	5.8	
J	3230	70092	547068	5150	7	N	5.00	12X 2.0	3	18	68	4	2	1	5.8	
J	3231	70071	547068	5210	15	2.0	1.00	24X 3.0	3	11	75	4	2	1	5.8	
J	3232	70038	547069	5450	15	2.0	30.00	24X 6.0	2	11	87	4	1	1	5.8	
J	3233	70100	547046	5050	15	2.5	.05	12X 1.0	8	11	65	4	2	2	5.8	
J	3234	70094	547033	5050	15	3.0	10.00	12X 3.0	4	11	83	4	2	1	5.8	
J	3235	70108	547160	5180	15	N	2.00	12X 3.0	2	11	23	4	1	1	5.8	
J	3236	70384	546871	4900	6	1.5	50.00	60X12.0	4	11	38	4	1	1	5.8	
J	3237	70353	545860	5100	6	3.0	10.00	24X 6.0	5	18	35	4	2	1	5.8	
J	3238	70313	546888	5200	7	2.5	40.00	60X24.0	4	11	64	4	1	1	5.8	
J	3239	70372	546852	4910	7	3.5	.05	12X12.0	4	11	53	4	2	1	5.8	
J	3240	70230	547256	4800	15	.5	10.00	12X 3.0	6	18	50	4	1	1	5.8	
J	3241	70163	547197	5000	15	.5	15.00	36X 2.2	4	11	20	4	1	1	5.8	
J	3242	70116	547196	5150	15	N	1.00	12X 2.0	8	18	75	4	2	1	5.8	
J	3243	70084	547196	5200	15	1.0	1.00	12X 1.0	4	11	90	4	1	1	5.8	
J	3244	70034	547213	5300	15	.5	2.00	18X12.0	6	11	56	4	1	1	5.8	
J	3245	70101	547264	4980	15	.5	5.00	24X 2.0	6	18	65	4	1	1	5.8	
J	3246	69992	547361	4850	15	3.5	1.00	24X 3.0	8	24	71	4	1	1	5.8	
J	3247	70059	547345	4700	15	2.0	2.00	18X 6.0	4	18	33	4	1	1	5.8	
K	4001	70910	546254	6000	6	3.0	2.00	4X 1.5	3	17	5	2	1	1	5.8	
K	4002	70928	546238	6250	7	2.0	5.00	24X 2.0	5	17	41	2	1	1	5.8	
K	4003	70966	546198	6600	5	1.0	5.00	24X 2.0	4	17	36	2	1	1	5.8	
K	4004	71013	546232	6850	7	1.0	8.00	36X 1.0	4	18	65	2	1	1	5.8	
K	4005	71012	546250	6550	6	1.0	8.00	48X 1.0	4	24	41	2	1	1	5.8	
K	4006	71018	546273	6300	5	2.0	6.00	36X 1.0	5	24	35	2	1	1	5.8	
K	4007	71038	546318	5960	5	3.0	8.00	36X 2.0	4	24	46	2	1	1	5.8	
K	4008	71088	546391	5600	3	4.0	3.00	36X 6.0	6	24	18	2	1	1	5.8	
K	4009	71141	546434	5400	5	4.0	4.00	48X 6.0	4	24	20	2	1	1	5.8	
K	4010	71130	545770	6200	5	4.0	1.00	6X .5	5	24	50	2	1	1	5.8	
K	4011	71130	545791	6850	6- 7	4.0	1.00	6X .5	6	30	33	2	1	1	5.8	
K	4012	71248	545460	6200	5	1.0	5.00	24X 1.0	5	11	23	2	1	1	5.8	
K	4013	71230	545457	6280	5	1.0	5.00	6X 2.0	4	11	17	2	1	1	5.8	
K	4014	71211	545451	6350	5	1.0	100.00	60X 4.0	5	17	32	2	1	1	5.8	
K	4015	71162	545424	6690	6	1.0	25.00	60X 4.0	5	17	5	2	1	1	5.8	
K	4016	71141	545412	6700	7	1.0	5.00	12X 1.0	3	11	20	2	1	1	5.8	
K	4017	71120	545399	6880	7	1.0	10.00	36X 2.0	5	11	3	2	1	1	5.8	
K	4018	71101	545396	6900	7	1.0	15.00	36X 2.0	4	17	10	2	1	1	5.8	
K	4019	71199	545381	6550	5- 6	1.0	N	N	6	30	11	2	1	3	5.8	***
K	4020	71139	545330	6625	6	1.0	5.00	12X 1.0	4	11	8	2	1	1	5.8	
K	4021	71218	545353	6490	5	1.0	20.00	36X 3.0	6	11	15	2	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
K	4022	71244	545399	6400	5	1.0	5.00	2X 2.0	4	11	30	2	2	1	5.8	
K	4023	71260	545411	6390	5	2.0	15.00	24X 2.0	4	11	28	2	1	1	5.8	
K	4024	71280	545445	6210	5	2.0	15.00	24X 2.0	5	17	18	2	1	1	5.8	***
K	4025	71275	545472	6090	5	3.0	80.00	36X 4.0	3	11	8	2	1	1	5.8	
K	4026	70526	546271	5725	9	3.0	.50	2X 5	4	11	56	2	1	1	5.8	
K	4027	68527	547418	5200	15	2.0	8.00	24X 2.0	5	17	33	3	1	1	5.8	
K	4028	68576	547375	5400	15	2.0	4.00	12X 5	4	17	21	3	1	1	5.8	
K	4029	68586	547373	5500	15	2.0	10.00	24X 2.0	4	17	16	3	1	1	5.8	
K	4030	68608	547330	5300	15	2.0	5.00	12X 2.0	3	24	24	3	1	1	5.8	
K	4031	68620	547315	5200	15	2.0	1.00	12X 1.0	3	17	28	3	1	1	5.8	
K	4032	68572	547340	5100	15	2.0	2.00	6X 5	2	24	17	3	2	1	5.8	
K	4033	68432	547385	5000	14	4.0	1.00	12X 5	6	30	16	3	1	1	5.8	
K	4034	68451	547375	5100	15	4.0	3.00	24X 1.0	5	24	33	3	1	1	5.8	
K	4035	68895	547790	4700	15	5.0	1.00	12X 5	11	11	53	3	1	1	5.8	
K	4036	68916	547795	4650	15	9.0	N	N	9	5	12	3	3	3	5.8	***
K	4037	68925	547720	4750	15	5.0	1.00	12X 5	7	5	23	3	1	1	5.8	
K	4038	68890	547623	4890	15	5.0	1.00	12X 5	10	11	16	3	1	1	5.8	
K	4039	69450	546295	5550	5	3.0	.50	6X 5	4	11	24	3	1	1	5.8	
K	4040	69470	546295	6000	5	2.0	.13	6X 5	8	11	5	3	1	1	5.8	***
K	4041	69479	546297	6250	5	2.0	1.00	6X 1.0	9	11	69	3	1	1	5.8	
K	4042	69456	546348	5780	5	2.0	5.00	24X 1.0	7	11	20	3	1	1	5.8	
K	4043	69440	546348	5510	5	2.0	1.00	12X 1.0	4	17	5	3	1	1	5.8	
K	4044	69428	546345	4850	5	3.0	5.00	24X 1.0	18	11	138	3	1	1	5.8	
K	4045	69412	546344	4690	5	3.0	1.00	12X 5	9	5	21	3	1	1	5.8	
K	4046	69500	546275	6700	5- 6	4.0	5.00	6X 1.0	4	11	3	3	1	1	5.8	
K	4047	69495	546240	5650	5	4.0	5.00	6X 1.0	9	5	20	3	1	1	5.8	
K	4048	69475	546241	5750	5	5.0	10.00	12X 2.0	7	11	27	3	1	1	5.8	
K	4049	69450	546230	6150	5	5.0	20.00	24X 2.0	4	17	5	3	1	1	5.6	
K	4050	69345	545450	5400	8	3.0	15.00	36X 2.0	11	24	18	3	1	1	5.8	
K	4051	69322	545428	5700	8	3.0	5.00	12X 1.0	4	11	8	3	1	1	5.8	
K	4052	69295	545395	6100	7	4.0	15.00	24X 3.0	7	1260	18	3	1	1	5.3	
K	4053	69277	545365	6225	7	6.0	N	N	3	11	N	3	3	1	5.8	***
K	4054	69289	545370	6200	7	4.0	2.00	12X 5	8	24	14	3	1	1	5.8	
K	4055	69339	545286	6360	8	11.0	N	N	8	11	11	3	3	1	5.8	***
K	4056	69386	545342	6000	9	6.0	N	N	12	11	5	3	1	1	5.8	***
K	4057	69385	545355	5900	8	6.0	N	N	8	17	20	3	1	1	5.8	***
K	4058	69382	545373	5700	8	4.0	10.00	12X 3.0	7	11	26	3	1	1	5.8	
K	4059	69370	545409	5500	8	4.0	5.00	6X 2.0	2	11	N	3	1	1	5.8	
K	4060	69362	545431	5450	8	5.0	N	N	8	24	53	3	1	1	5.8	***
K	4061	68507	546567	5100	2	4.0	5.00	N	5	11	4	3	1	1	5.8	
K	4062	68530	546565	5500	2	4.0	10.00	N	4	11	23	3	1	1	5.8	
K	4063	68551	546558	5900	2	4.0	3.00	N	8	11	15	3	1	1	5.8	
K	4064	71178	546830	5450	15	1.0	N	N	8	11	12	3	1	1	5.8	***
K	4065	69886	545147	6000	11	1.0	1.00	12X 5	2	11	6	3	1	1	5.8	
K	4066	69870	545155	5890	11	1.0	.50	12X 5	12	11	11	3	1	1	5.8	
K	4067	69863	545150	5910	11	1.0	10.00	24X 2.0	5	30	20	3	1	1	5.8	
K	4068	69842	545133	6200	11	1.0	4.00	12X 2.0	5	17	5	3	1	1	5.8	
K	4069	69820	545110	6490	11	1.0	1.00	1X 5	5	17	11	3	1	1	5.8	
K	4070	69845	545193	5710	10-11	1.0	.50	12X 5	2	17	11	3	1	1	5.8	
K	4071	69825	545216	5650	10	1.0	2.00	12X 1.0	4	30	28	3	1	1	5.8	
K	4072	69780	545222	5800	10	1.0	5.00	12X 1.0	4	24	5	3	1	1	5.8	
K	4073	69760	545188	6290	11	1.0	5.00	12X 1.0	5	24	9	3	1	1	5.8	
K	4074	69752	545176	6500	11	1.0	5.00	12X 1.0	7	17	10	3	1	1	5.8	
K	4075	68790	546545	4750	4	1.0	50.00	36X 6.0	8	24	54	3	1	1	5.8	

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB	PH	
K	4076	68762	546520	4990	3	1.0	50.00	36X 6.0	7	11	45	3	1	1	5.8	
K	4077	68740	546500	5200	3	1.0	4.00	24X .5	9	11	8	3	1	1	5.8	
K	4078	68745	546482	5100	3	1.0	30.00	36X 3.0	5	24	31	3	1	1	5.8	
K	4079	68700	546426	5590	2	1.0	25.00	48X 1.0	5	24	47	3	1	1	5.8	
K	4080	68591	546340	4890	2	1.0	N	N	10	17	93	3	3	1	5.8	***
K	4081	69897	546111	4810	11	3.0	2.00	12X 2.0	5	11	20	3	1	1	5.8	
K	4082	69280	546155	5750	5	1.0	N	1X .5	10	17	56	3	1	1	5.8	***
K	4083	69290	546170	6100	5	1.0	.50	2X .5	9	24	59	4	1	1	5.8	
K	4084	69910	546314	5300	10	5.0	.50	12X .5	7	11	14	4	2	1	5.8	
K	4085	69920	546320	5500	10	5.0	1.00	24X .5	4	11	6	4	2	1	5.8	
K	4086	69930	546335	5600	10	5.0	.50	24X .5	5	17	41	4	2	1	5.8	
K	4087	69896	546355	5310	10	3.0	3.00	12X 1.0	3	5	2	4	2	1	5.8	
K	4088	69928	546390	5700	10	5.0	5.00	2X 2.0	4	11	19	4	1	1	5.8	
K	4089	69890	546390	5300	10	5.0	20.00	48X 6.0	3	5	56	4	1	1	5.8	
K	4090	69850	546359	4990	9	5.0	35.00	48X 1.0	4	11	33	4	1	1	5.8	
K	4091	69819	546360	4800	9	5.0	5.00	36X .5	5	11	45	4	1	1	5.8	
K	4092	69871	546385	5300	9	5.0	20.00	24X 3.0	4	5	8	4	1	1	5.8	
K	4093	69880	546407	5500	9	5.0	10.00	12X 1.0	4	5	49	4	1	1	5.8	
K	4094	67519	547046	5250	5	2.0	15.00	6X 1.0	9	18	122	4	1	1	5.8	
K	4095	67486	547070	5250	5	2.0	5.00	4X .5	4	11	57	4	1	1	5.8	
K	4096	67435	547040	5050	14	2.0	20.00	24X 1.0	5	18	85	4	1	1	5.8	
K	4097	67393	546941	5000	13	4.0	N	N	5	18	56	4	1	1	5.8	***
K	4098	67764	546866	5090	3	3.0	10.00	24X 1.0	4	5	27	4	1	1	5.8	
K	4099	67722	546868	5300	3	3.0	15.00	24X 1.5	5	5	25	4	1	1	5.8	
K	4100	67697	546868	5550	4	3.0	5.00	12X .5	7	5	69	4	1	1	5.8	
K	4102	67703	546852	5590	4	3.0	2.00	2X 1.0	3	5	36	4	2	1	5.8	
K	4103	67692	546735	5500	5	3.0	5.00	12X 1.0	7	11	51	4	1	1	5.8	
K	4104	67740	546806	5100	3	3.0	5.00	12X 1.0	5	18	79	4	1	2	5.8	
K	4105	67870	546971	5150	2	2.0	5.00	6X 1.0	4	11	38	4	1	1	5.8	
K	4106	67933	546962	5990	2	2.0	3.00	6X .5	4	18	20	4	1	1	5.8	
K	4107	67962	546939	5900	1	2.0	5.00	12X .5	7	11	42	4	1	1	5.8	
K	4108	67950	546908	5550	1	2.0	1.00	6X .5	4	11	25	4	1	1	5.6	
K	4109	67911	546993	5290	1	2.0	2.00	12X .5	3	11	38	4	1	1	5.8	
K	4110	67868	546888	5150	2	2.0	1.00	12X .5	3	11	35	4	1	1	5.8	
K	4111	67849	546828	5050	3	2.0	5.00	12X 1.0	4	5	51	4	1	1	5.8	
K	4112	67810	546800	4950	3	2.0	10.00	12X 2.0	3	11	25	4	1	1	5.8	
K	4113	70151	547093	5000	15	1.0	1.00	2X 1.0	2	11	25	4	1	1	5.8	
K	4114	70193	547053	5500	5	1.0	2.00	6X .5	3	11	61	4	1	1	5.8	
K	4115	70177	547013	5550	6	1.0	2.00	4X 1.0	5	11	85	4	1	1	5.8	
K	4116	70170	546974	5670	8	1.0	4.00	6X 1.0	4	11	85	4	1	1	5.8	
K	4117	70106	546828	5680	8	1.0	5.00	6X 1.0	5	11	69	4	1	1	5.8	
K	4118	70043	546844	5375	6	1.0	N	N	7	17	23	4	1	1	5.8	***
K	4119	70093	547003	5090	5	1.0	5.00	6X 1.0	10	17	130	4	1	1	5.8	
L	5000	68829	546990	4600	3	1.5	5.00	6X 1.0	7	11	66	4	1	1	5.8	
L	5001	68810	547002	4700	3	2.0	10.00	12X 1.0	9	17	69	4	1	1	5.8	
L	5002	68790	547019	4900	3	3.0	15.00	18X 1.0	9	30	17	4	1	1	5.8	
L	5003	68769	547030	5100	3	3.0	15.00	18X 1.0	9	11	38	4	1	1	5.8	
L	5004	68755	547039	5250	3	2.0	.06	6X .5	11	36	97	4	2	1	5.8	
L	5005	68729	547071	5600	3	3.0	10.00	12X 1.0	3	30	23	4	1	1	5.8	
L	5006	68731	547041	5400	3	3.0	5.00	6X 1.0	5	11	23	4	1	1	5.8	
L	5007	68699	547090	5800	3	3.0	5.00	6X 1.0	7	36	51	4	1	1	5.8	
L	5008	70750	545397	5300	9	2.5	25.00	24X 1.5	8	17	31	4	1	1	5.8	
L	5009	70765	545410	5390	9	2.5	30.00	24X 2.0	8	17	32	4	1	1	5.8	
L	5010	70799	545430	5750	8	3.0	5.00	6X .5	5	5	37	4	1	1	5.8	

70022

MAN	SAMP#	X CORD	Y CORD	ELEV	FORM	TEMP	FLOW	SIZE	CU	PB	ZN	ACID	TYPE	TURB.	PH
L	5011	70799	545420	5500	8	2.0	30.00	24X 2.0	3	5	19	4	1	1	5.8
L	5012	70820	545412	5600	8	2.5	30.00	24X 2.0	5	5	11	4	1	1	5.6
L	5013	70838	545410	5700	8	3.0	20.00	18X 1.5	7	11	20	4	1	1	5.8
L	5014	70871	545430	5750	8	3.0	1.00	6X .5	4	11	8	4	1	1	5.8
L	5015	70873	545450	6050	8	2.0	1.00	6X .5	7	11	79	4	1	1	5.8
L	5016	70884	545430	6300	8	2.0	10.00	12X 1.0	4	43	51	4	1	1	5.8
L	5017	70903	545441	6050	8	2.0	10.00	12X 1.0	4	36	39	4	1	1	5.8
L	5018	70917	545419	6100	8	2.0	10.00	24X .5	9	17	36	4	1	1	5.8
L	5019	70950	545430	6500	8	2.0	10.00	24X .5	5	43	63	4	1	1	5.8
L	5020	70926	545370	6200	8	2.0	5.00	12X .5	9	24	47	4	1	1	5.8
L	5021	70946	545400	6300	8	2.0	5.00	12X .5	9	24	21	4	1	1	5.8
L	5022	70893	545399	5850	8	2.0	20.00	18X 1.5	3	17	37	4	1	1	5.8
L	5023	70870	545400	5790	8	3.0	20.00	18X 1.5	4	24	39	4	1	1	5.8
L	5024	69320	546408	5080	4	2.0	10.00	12X 1.0	3	11	41	4	1	1	5.8
L	5025	69338	546410	5250	4	3.0	.13	3X .5	4	11	10	4	2	1	5.8
L	5026	69330	546384	5200	5	2.0	10.00	12X 1.0	8	5	47	4	1	1	5.8
L	5027	69311	546375	5400	5	1.0	.50	6X .5	5	5	10	4	1	1	5.8
L	5028	69380	546255	6400	5	.5	.50	6X .5	4	11	8	4	1	1	5.6
L	5029	69355	546250	6900	5	.5	.50	6X .5	4	5	51	4	1	1	5.8
L	5030	69601	547131	4800	15	3.0	20.00	24X 2.0	3	11	19	4	1	1	5.8
L	5031	69619	547130	4830	15	3.0	.06	6X .5	2	11	28	4	2	1	5.8
L	5032	69620	547111	4870	15	2.0	25.00	36X 2.0	2	11	6	4	1	1	5.8
L	5033	69629	547087	4900	15	3.0	25.00	36X 2.0	2	11	20	4	1	1	5.8
L	5034	69650	547072	5000	15	3.0	30.00	42X 2.0	2	11	16	4	1	1	5.8
L	5035	69665	547058	5100	15	3.0	30.00	42X 2.0	2	11	11	4	1	1	5.8
L	5036	69677	547040	5250	6	2.0	30.00	42X 2.0	2	11	55	4	1	1	5.6
L	5037	69809	546980	6310	6	1.0	10.00	12X .5	3	11	11	4	1	1	5.8
L	5038	69810	547000	6490	7	1.0	5.00	6X .5	4	18	57	4	1	1	5.8
L	5039	69815	547020	6600	7	1.0	1.00	6X .5	4	5	12	4	1	1	5.8
L	5040	69834	547038	6800	7- 8	1.0	1.00	6X .5	4	5	19	4	1	1	5.8
L	5041	69855	547004	6800	8	1.0	.50	3X .5	4	11	9	4	1	1	5.8
L	5042	69846	546986	6700	7	1.0	1.00	6X .5	5	N	12	4	1	1	5.8
L	5043	69838	546971	6600	7	1.0	1.00	6X .5	7	11	25	4	1	1	5.8
L	5044	69820	546965	6400	6	2.0	5.00	6X 1.0	3	5	10	4	1	1	5.8
L	5045	69783	546975	6100	6	2.0	15.00	12X 1.0	3	5	12	4	1	1	5.8
L	5046	69760	546969	5900	5	1.0	20.00	24X 2.0	4	11	10	4	1	1	5.8
L	5047	69735	546978	5700	5	2.0	20.00	24X 2.0	4	11	10	4	1	1	5.8
L	5048	69731	547000	5600	5	2.0	20.00	24X 2.0	13	18	18	4	1	1	5.8
L	5049	69716	547020	5450	5	2.0	25.00	36X 2.0	10	18	43	4	1	1	5.9
L	5050	69691	547092	5350	6	2.0	30.00	42X 2.0	8	11	31	4	1	1	5.8
L	5051	70039	545310	6000	11	2.0	3.00	6X .5	3	11	15	4	1	1	5.8
L	5052	70010	545303	6150	11	1.0	1.00	6X .5	3	18	6	4	1	1	5.8
L	5053	69986	545323	6400	11	1.0	.50	3X .5	3	11	21	4	1	1	5.8
L	5054	69980	545295	6390	11	1.0	.50	3X .5	2	11	10	4	1	1	5.8
L	5055	69835	547429	4725	15	N	1.00	6X 1.0	3	13	11	4	1	1	5.8
L	5056	69822	547464	4650	15	N	1.00	6X 1.0	3	18	36	4	1	1	5.8
L	5057	68645	547472	5080	15	N	3.00	12X 1.0	2	18	28	4	1	1	5.8
L	5058	68609	547490	5000	15	1.0	N	3X 4.0	9	11	31	4	2	2	5.8
L	5059	68599	547482	4990	15	N	3.00	1X 1.0	3	18	39	4	1	1	5.8
L	5060	68585	547481	4960	15	N	5.00	12X 2.0	4	17	41	4	1	1	5.8
L	5061	70139	545755	5200	11	2.0	5.00	12X 2.0	7	17	81	4	1	1	5.8
L	5062	70162	545760	5500	11	2.0	5.00	12X 2.0	8	11	139	4	1	1	5.8
L	5063	70149	545740	5200	11	2.0	15.00	3X 2.0	2	11	10	4	1	1	5.9
L	5064	70180	545738	5500	11	2.0	10.00	12X 3.0	2	18	39	4	1	1	5.8

Sample Numbers	General Location	Date	Additional Information
W1 - W17	Grizzly Creek	10 - 8 - 70	
G1 - G10	NE side of W. Castle R. at SW end of Barnaby Ridge	18 - 8 - 70	
J1 - J5	NE side of W. Castle R. at SW end of Barnaby Ridge	18 - 8 - 70	
J21 - J26	W side of S. Castle R. E of Lys Ridge	19 - 8 - 70	
J7 - J10	W side of S. Castle R. E of Lys Ridge	20 - 8 - 70	
2	W side of S. Castle R. on Lys Ridge	19 - 8 - 70	
2A	W side of W. Castle R. near S end	23 - 8 - 70	
3,5,6	NE side of W. Castle R. near SW end	18 - 8 - 70	
7 - 36	W side of W. Castle R. near S end	24 - 8 - 70	
37 - 43	W side of W. Castle R. E of Mid. Koot. Pass	25 - 8 - 70	
44 - 47	S side Scarpe Cr. N of Jutland Mt.	26 - 8 - 70	
48 - 53	Trib. on W side of Gardiner Cr.	26 - 8 - 70	
54 - 72	Trib. on S side of Carbondale R. N of Mt. McCarty	30 - 8 - 70	
73 - 89	NW side of Scarpe Cr.	31 - 8 - 70	
90 - 105	W side of W. Castle R. N of Mid. Koot. Pass	1 - 9 - 70	
106 - 110	NW side of Scarpe Cr.	2 - 9 - 70	
111 - 124	S side of Yarrow Cr.	4 - 9 - 70	
201 - 206	E side of W. Castle R. at S end	23 - 8 - 70	#203 and #206 - trickle
207 - 217	E side of W. Castle R. SW of Ruby Lake	24 - 8 - 70	#209 - very small trickle, #210 - small trickle
218 - 224	E side of W. Castle R. at S end	25 - 8 - 70	
225 - 235	Head of Gardiner Cr.	27 - 8 - 70	#229 - trickle
242 - 253	Jutland Br.	31 - 8 - 70	#252 - trickle
254 - 257	W side of W. Castle R. N of Mid. Koot. Pass	1 - 9 - 70	#255, #256, and #257 - seepage
259 - 262	W side of W. Castle R. N of Mid. Koot. Pass	1 - 9 - 70	
263 - 265	W side of S. Castle R. S of Scarpe Cr.	2 - 9 - 70	
301 - 306	S side of Drywood Cr.	30 - 9 - 70	#304 - seepage
400 - 412	N side Mid. Koot. Pass	1 - 9 - 70	#404 - minute trickle

Sample Numbers	General Location	Date	Additional Information
413 - 433	SE side of Drywood Mt.	9 - 9 - 70	#417 - malachite in place a short distance to east; #420 - trickle; #425 - 5 ft. quartzite bed with Cu minerals
434 - 441	S side of S. Drywood Cr.	10 - 10 - 70	#435 and #436 - trickle
442 - 444	N side of S. Drywood Cr.	10 - 10 - 70	
600 - 619	Suicide Cr. W side of W. Castle R.	23 - 8 - 70	#612 - pool in stream
620 - 621	W. Castle R.	23 - 8 - 70	#620 - from old well casing
622	NW side of Scarpe Cr.	26 - 8 - 70	flowing seismic shot hole
623 - 636	W side of Scarpe Cr.	26 - 8 - 70	#628 - braided stream; #630 - braided stream
800 - 809	W side of W. Castle R. S of Suicide Cr.	25 - 8 - 70	#808 - slow seep
810 - 830	Head of Syncline Br.	26 - 8 - 70	
831 - 833	E side of Gardiner Cr.	27 - 8 - 70	
834 - 842	Grizzly Cr.	30 - 8 - 70	
844	Grizzly Cr.	30 - 8 - 70	
845 - 850	NW side of Scarpe Cr. from SE end of Lys Ridge	31 - 8 - 70	#850 - lake 300' x 150'
851 - 856	Grizzly Cr.	31 - 8 - 70	#851 - lake 450' x 250'; #855 - seep in nearly dry stream bed
857 - 861	W side of W. Castle R. E of Mt. Haig	1 - 9 - 70	
862 - 871	S side of Spionkop Cr.	7 - 9 - 70	#868 - pool in dry stream bed
872 - 882	N side of Spionkop Cr.	9 - 9 - 70	#878 - runoff
883 - 892	N side of Spionkop Cr.	10 - 9 - 70	
892 - 896	NE end of Drywood Mt.	15 - 9 - 70	#892 - near Shell Waterton #19
897 - 904	NW side of Pincher Cr.	16 - 9 - 70	#898 - no cap liner
905 - 914	N side of Drywood Mt.	17 - 9 - 70	
915 - 932	Blind Canyon between Yarrow and Spionkop Creeks	18 - 9 - 70	
933 - 935	N side of Pincher Cr. S of Prairie Bluff	19 - 9 - 70	

Sample Numbers	General Location	Date	Additional Information
936 - 941	N side of Spionkop Cr.	19 - 9 - 70	
942 - 958	Head of Yarrow Cr.	20 - 9 - 70	#945 - lake 300' x 500'
959 - 967	Head of S. Drywood Cr.	20 - 9 - 70	
968 - 991	Head of Drywood Cr.	21 - 9 - 70	#968 - lake 150' x 160'
992 - 996	NW side of Pincher Cr. from Victoria Pk.	23 - 9 - 70	#995 - from bottom of basic intrusive
997 - 1011	SE side of Pincher Cr. and head of Pincher Cr.	24 - 9 - 70	
1012 - 1022	Head of Whitney Cr.	25 - 9 - 70	
1023 - 1032	E side of Mill Cr.	26 - 9 - 70	#1025 - non-organic,ice where water seeps from cliff
1033 - 1045	Head of Gardiner Cr.	27 - 9 - 70	
1046 - 1059	E side of Gardiner Cr.	28 - 9 - 70	#1053 - mud hole; #1054 - streamlet
1060 - 1066	Head of Grizzly Cr.	29 - 9 - 70	
1067 - 1068	E side of W. Castle R. SW of Ruby Lake	30 - 9 - 70	
1070 - 1077	E side of W. Castle R. SW of Ruby Lake	30 - 9 - 70	#1072 - malachite float
1085 - 1089	NW side of Syncline Br.	4 - 10 - 70	
1090 - 1104	Head of W. Castle R.	8 - 10 - 70	
1105 - 1110	SW of W. Castle R. E of Mid. Koot. Pass	9 - 10 - 70	#1108 - lake 200' x 150'
1111 - 1118	NW side of Scarpe Cr.	13 - 10 - 70	#1115 - drip only
1119 - 1122	S side of Scarpe Cr.	13 - 10 - 70	
1123 - 1124	N side of Carbondale R.	14 - 10 - 70	
1125	W side of Gardiner Cr.	14 - 10 - 70	
1126 - 1128	E side of Gardiner Cr.	14 - 10 - 70	
1129 - 1135	E side of Grizzly Cr.	15 - 10 - 70	
1136 - 1155	Head of Jutland Br.	16 - 10 - 70	
1156 - 1160	E side of Flathead R. NW of Pollock Cr.	19 - 10 - 70	
1161 - 1167	Head of Pollock Cr.	20 - 10 - 70	
1168 - 1177	Head of Pollock Cr.	22 - 10 - 70	
1178 - 1187	W side of Castle R. N of Ranger station	26 - 10 - 70	#1182 - not flowing
2000 - 2012	N side of Pincher Cr. S of Prairie Bluff	16 - 9 - 70	

Sample Numbers	General Location	Date	Additional Information
2013 - 2026	N side of Drywood Cr. at SE end of Pincher Ridge	17 - 9 - 70	#2020 - malachite and azurite in quartz
2027 - 2031	Blind Canyon between Yarrow and Spionkop Creeks	18 - 9 - 70	
2040	NW side of Yarrow Cr. S of Blind Canyon	19 - 9 - 70	seepage
2041 - 2043	NW side of S. Drywood Cr. from Drywood Mt.	19 - 9 - 70	
2044 - 2054	S side of Yarrow Cr.	20 - 9 - 70	#2052 - seepage
2055 - 2059	N side of S. Drywood Cr.	21 - 9 - 70	
2060 - 2066	S side of Drywood Cr.	21 - 9 - 70	
2070 - 2075	N side of Pincher Cr. from Victoria Pk.	23 - 9 - 70	
2076 - 2090	Little Pincher Cr. on N side of Pincher Ridge	24 - 9 - 70	
2091 - 2102	Head of Whitney Cr. SW of Prairie Bluff	25 - 9 - 70	
2103 - 2112	NW side of Prairie Bluff	26 - 9 - 70	
2113 - 2121	SE side of Gardiner Cr.	27 - 9 - 70	
2122 - 2128	O'Hagen Cr.	28 - 9 - 70	
2129 - 2132	E side of Grizzly Cr.	29 - 9 - 70	#2129 - seepage; #2130 and #2131 - trickle
2133 - 2142	E side of head of W. Castle R.	30 - 9 - 70	
2150 - 2157	NW side of Syncline Br.	4 - 10 - 70	
2158 - 2160	Lower part of Whitney Cr.	8 - 10 - 70	
2161 - 2171	W side of Scarpe Cr.	9 - 10 - 70	
2172 - 2177	W side of W. Castle R. S of Syncline Br.	10 - 10 - 70	#2173 and #2174 - trickle
2178 - 2181	W side of S. Castle R. E of Lys Ridge	3 - 10 - 70	
2182 - 2184	W side of S. Castle R. E of Lys Ridge	14 - 10 - 70	#2184 - pool in stream
2185 - 2199	E side of W. Castle R. SW of Barnaby R.	15 - 10 - 70	#2185 - pool in stream; #2186 and #2194 - trickle
2200 - 2208	E side of S. Castle R. W of Mt. Gladstone	16 - 10 - 70	
2209 - 2226	Head of Syncline Br.	17 - 10 - 70	#2212, #2214 and #2220 - seepage
2227 - 2233	NE side of S. Castle R. S of Victoria Ridge	19 - 10 - 70	
2235 - 2244	NE side of S. Castle R. S of Victoria Ridge	19 - 10 - 70	
2245 - 2255	E side of S. Castle R. SW of Castle Pk.	21 - 10 - 70	#2249 - seepage

Sample Numbers	General Location	Date	Additional Information
2256 - 2270	W side of S. Castle R. NE of Southfork Mt.	22 - 10 - 70	
2271 - 2276	NW side of Table Mt.	24 - 10 - 70	
2277	W side of S. Castle R.	24 - 10 - 70	
2278 - 2282	NE of Southfork Mt.	24 - 10 - 70	
2283 - 2291	W side of Gladstone Cr.	26 - 10 - 70	
2292 - 2300	W side of Mill Cr.	27 - 10 - 70	
2301 - 2303	E side of Gardiner Cr.	28 - 10 - 70	
2304	E side of S. Castle R. near Scarpe Cr.	28 - 10 - 70	seepage
3000 - 3014	N side of Pincher Cr.	16 - 9 - 70	#3002 - pool in stream bed 36" x 3"
3015 - 3019	NW side of Drywood Cr.	17 - 9 - 70	#3015 - trickle
3020 - 3027	SE side of Drywood Cr.	17 - 9 - 70	
3028 - 3036	Blind Canyon between Yarrow and Spionkop Creeks	18 - 9 - 70	#3030 - cap liner missing; #3033 - trickle
3037 - 3046	N side of Yarrow Cr.	19 - 9 - 70	
3047 - 3057	S side of Yarrow Cr.	20 - 9 - 70	#3047 and #3051 - trickle
3058 - 3063	N side of Drywood Cr.	21 - 9 - 70	#3061 and #3063 - trickle
3064 - 3066	NW side of Drywood Cr.	23 - 9 - 70	
3067 - 3072	S side of S. Drywood Cr.	23 - 9 - 70	
3073 - 3081	S side of S. Drywood Cr.	24 - 9 - 70	
3082 - 3084	Head of Whitney Cr.	25 - 9 - 70	
3085 - 3087	E side of Whitney Cr.	26 - 9 - 70	
3088 - 3089	W side of Whitney Cr.	26 - 9 - 70	
3090 - 3100	Upper part of Suicide Cr.	27 - 9 - 70	
3101 - 3110	E side of Gardiner Cr.	28 - 9 - 70	
3111 - 3114	W side of Grizzly Cr.	29 - 9 - 70	
3115 - 3118	W side of W. Castle R. NE of Scarpe Mt.	30 - 9 - 70	
3123 - 3128	NE of Prairie Bluff	8 - 10 - 70	
3129 - 3136	NW side of Scarpe Cr. at SE end of Lys Ridge	9 - 10 - 70	

Sample Numbers	General Location	Date	Additional Information
3137 - 3145	NE side of W. Castle R. on W side of Barnaby Ridge	10 - 10 - 70	
3145	W side of S. Castle R. from Lys Ridge	13 - 10 - 70	
3146	W side of S. Castle R. from Lys Ridge	14 - 10 - 70	pool in stream; bad odour
3147 - 3148	W side of S. Castle R. at N end of Lys Ridge	14 - 10 - 70	
3149 - 3154	NE side of W. Castle R. at SW end of Barnaby Ridge	15 - 10 - 70	
3155 - 3164	NE side of S. Castle R. at SW end of Windsor Ridge	16 - 10 - 70	#3156 - pool in stream
3165 - 3169	Lower part of Suicide Cr. W of W. Castle R.	17 - 10 - 70	
3170 - 3178	Head of S. Castle R.	19 - 10 - 70	
3179 - 3204	E side of S. Castle R. W of Windsor Ridge	21 - 10 - 70	
3205 - 3224	N side of Whistler Mt.	22 - 10 - 70	
3225 - 3228	E side of S. Castle R. W of Windsor Ridge	24 - 10 - 70	#3228 - hole
3229 - 3235	W side of Gladstone Cr.	26 - 10 - 70	
3236 - 3239	W side of Mill Cr.	27 - 10 - 70	
3240 - 3247	NW side of Gladstone Cr. NE of Table Mt.	28 - 10 - 70	
4001 - 4009	S side of Pincher Cr.	23 - 9 - 70	
4010 - 4011	N side of S. Drywood Cr.	24 - 9 - 70	
4012 - 4025	Head of Spionkop Cr.	25 - 9 - 70	#4019 - pond 10' x 10' x 4"; #4024 - no cap liner
4026	E side of Mill Cr.	26 - 9 - 70	
4027 - 4032	SE side of Gardiner Cr.	27 - 9 - 70	
4033 - 4034	NW side of Gardiner Cr.	27 - 9 - 70	
4035 - 4038	Trib. of O'Hagen Cr.	28 - 9 - 70	#4036 - beaver pond 10' x 10' x $1\frac{1}{2}$'
4039 - 4049	E side of Grizzly Cr.	29 - 9 - 70	#4040 - only dripping
4050 - 4060	Head of W. Castle R.	30 - 9 - 70	#4053 - pond 10' x 10' x 5"; #4055 - lake 50' x 50' x 4"; #4056 - pool in stream 4' x 3' x 6"; #4057 - pool in stream 6' x 6' x 1'; #4060 - pool in stream 4' x 4' x 4"
4061 - 4063	E side of Syncline Br.	4 - 10 - 70	

Sample Numbers	General Location	Date	Additional Information
4064	E of Prairie Bluff	5 - 10 - 70	pool in stream 3' x 3' x ½"
4065 - 4074	Head of Scarpe Cr.	9 - 10 - 70	
4075 - 4080	W side of W. Castle R. S of Gravenstafel Ridge	10 - 10 - 70	#4080 - lake 75' x 75' x 1'
4081	W side of S. Castle R. E of Lys Ridge	13 - 10 - 70	
4082 - 4083	NE side of W. Castle R. near SW end of Barnaby Ridge	15 - 10 - 70	#4082 - only dripping
4084 - 4093	E side of S. Castle R. W of Castle Pk.	16 - 10 - 70	
4094 - 4096	E side of Pincher Cr. B.C.	18 - 10 - 70	
4097	E side of Flathead R. E of Pincher Cr. B. C.	19 - 10 - 70	pool in stream 2' x 2' x 2"
4098 - 4100	W side of Pollock Cr.	20 - 10 - 70	
4102 - 4104	W side of Pollock Cr.	20 - 10 - 70	
4105 - 4112	E side of Pollock Cr.	22 - 10 - 70	
4113 - 4119	E side of Gladstone Cr.	26 - 10 - 70	#4118 - pool in stream 1' x 1' x 1"
5000 - 5007	NW side of W. Castle R. N of Syncline Br.	17 - 10 - 70	
5008 - 5023	NE side of S. Castle R. SE of Loaf Mt.	19 - 10 - 70	
5024 - 5029	W side of Grizzly Cr.	21 - 10 - 70	
5030 - 5050	W side of Table Mt.	22 - 10 - 70	
5051 - 5054	W side of Jutland Br.	26 - 10 - 70	
5055 - 5056	SE side of Beaver Mines Cr.	27 - 10 - 70	
5057 - 5060	E side of Gardiner Cr.	27 - 10 - 70	
5061 - 5064	E side of S. Castle R. near Scarpe Cr.	27 - 10 - 70	

APPENDIX 2: DESCRIPTIONS OF MINERAL OCCURRENCES

Occurrence 1 — Traverse Z-6 — Grinnell

Sparse chalcopyrite and bornite are present in aggregates to 2 mm parallel to or irregularly cutting pale green, flattened argillite pebbles to 1" in size in a moderately well cemented, white sandstone composed of subangular to subrounded quartz grains. Sparse chalcopyrite and very sparse galena are present in some of the interstices of the quartz grains. Pyrite nodules to 2 mm with radiating structure are present in one layer. This mineralization is present in patches wherever the sandstone contains pebbles of green argillite. Its extent was not obvious but is not confined to a single bed. It is in the Grinnell Formation just below the contact of the Siyeh. The mineralization here is very much below ore grade.

Occurrence 2 — Traverse Z-10 — Grinnell

Chalcocite is present in the less well cemented parts of medium grained white sandstone between the interstices of subrounded quartz grains and in fractures and laminae of thin green argillite pebbles. In one of these the chalcocite is perhaps 0.1 mm thick by 10 to 15 mm long. Mineralization is present across an interval of 2' in a faulted area, but the offset at these mineralized beds is very small. Some distance up the creek valley, the vertical component of the fault displacement is about 25' with the SW side up-thrown. This mineralization appears to be below ore grade, and is of limited stratigraphic extent.

Occurrence 3 — Traverse Z-11 — Grinnell

Chalcopyrite and traces of bornite are disseminated in grains mostly less than ½ mm in a 6-inch zone in the margin of a basic sill, and in grains up to 1 mm in the adjacent meta-argillite and well cemented or recrystallized sandstone. Some of this mineralization in the sill may be of ore grade, but its limited thickness does not warrant an assay.

Occurrence 4 — Traverse H-4 — Sheppard ?

An occurrence of copper mineralization of unstated size or type was reported here by Frank Goble. It was not confirmed by Hildebrandt on his traverse, so, if present, is likely of limited extent. It is shown because of the fault reported by Hildebrandt.

Occurrence 5 Traverse H-6 Siyeh

Chalcopyrite and chalcocite are disseminated along the upper contact of a basic sill about 25' thick. The thickness of the mineralized zone was not reported but is believed to be not more than 1 ft, and so is unimportant.

Occurrence 6 Traverse H-8 Grinnell

Sparse chalcopyrite is present in grains to 1 mm along the edges and in fractures and laminations of green argillite pebbles in a white, medium grained sandstone with subrounded quartz grains. This mineralization could not be traced far and is too low grade to be interesting.

Occurrence 7 Traverse H-11 Grinnell

Chalcopyrite in grains to 2 mm with minor associated bornite is present along contacts of green argillite pebbles with white sandstone and disseminated in the white sandstone for a thickness of 6" in the metamorphosed sediments along the lower contact of a basic sill about 70' thick. This zone of mineralization is too thin to have economic interest.

Occurrence 8 Traverse D-4 Purcell Lava and Sheppard ? Float

Chalcopyrite in aggregates up to 5 mm in size fills vesicles in the Purcell Lava and is sparsely disseminated in grains up to $\frac{1}{2}$ mm in light grey dolomite probably in the Sheppard Formation. A fault has been reported nearby. The chalcopyrite in the Purcell Lava is similar to that found elsewhere in the Clark Range - not abundant enough to be of interest. The chalcopyrite in the Sheppard? is too sparse for an assay; it appears similar to that found in the Sheppard in other places in the Clark Range.

Occurrence 9 Spionkop Showing Grinnell

Chalcocite, bornite, chalcopyrite are present in sandstones and sills. See section of report headed Spionkop Showing.

Occurrence 10 Yarrow Showing Grinnell and Appekunny

The Yarrow Showing was mapped at a scale of 1 in.=500 ft. and four holes were drilled by Kennco Exploration (Western) Limited in 1966 and 1967: one BQ wireline, and 3 X-ray. Two of the X-ray holes appear to have been checking the spotty malachite staining in Appekunny quartzite

Occurrence 10 - continued

at the top of the Appekunny Formation and testing a diorite sill near the top of the Appekunny Formation. Drill logs and assays indicate that no significant mineralization was encountered. The other two holes appear to have been checking the lower Siyeh Formation near its contact with the Grinnell and a few hundred feet of the upper Grinnell Formation for strata-bound mineralization. One of the holes encountered one or more intervals containing chalcocite, bornite, or chalcopyrite with the best section grading 0.7% Cu across 1.6'. There the mineralization consisted dominantly of chalcocite in the interstices of quartz grains and chalcocite and bornite along the borders of green argillite pebbles in quartzite.

The Yarrow Showing was examined by the writer in October, 1969 and on July 27, 1970. In general little can be added to the report of Stevenson (1968) except to note that a green sill in the lower Grinnell graded 0.22% Cu across 6.5' with most of the values in the fine-grained margins. This sill is overlain by about 3 feet of green argillite and underlain by argillite. This suggests that it was a competent body in which fractures permitted the entry of copper-bearing solutions while the argillites above and below were incompetent and impervious to the copper-bearing solutions. At an elevation of 6025' in the middle part of the Grinnell, a ripple-marked, 6" bed of medium grained, poorly cemented, white sandstone contains a 3" layer with interstitial chalcocite. The Kennco exploration and subsequent examinations indicate that the Yarrow Showing is not economic.

Occurrence 11 Traverse D-5 Sheppard or Lower Gateway

Malachite stains and hematite are present but primary copper minerals were not observed. Specimens available are pinkish dolomite, with small amounts of a disseminated steel grey mineral. The samples seem to have a higher than normal density. A grab sample assayed 0.01% Cu, and traces of Pb and Zn. It does not appear to warrant more attention.

Occurrence 12 Traverse L-1, D-10 Grinnell

Copious malachite stains are confined to bedding planes in white, well cemented sandstone with subrounded medium grained quartz. Some of the bedding planes are marked by seams of green argillite to ¼" thick. The beds are up to 1½' thick but mostly less than 1'. Sparse chalcocite was observed. The copper mineralization is confined to 4' or 5' of the Grinnell sandstone immediately below the Siyeh. For a few hundred feet up and

Occurrence 12 - continued

down the creek relatively small scale anticlinal folding and crumpling of the beds were observed. A fault striking about 15° with displacement about 10' cuts the Grinnell here and extends up into the Siyeh. The copper mineralization dies out in less than 100 feet on either side of this fault. This occurrence is not economic in itself, but its presence indicates that there may be favourable structures and lithologies nearby.

Occurrence 13 | Traverse L-1 | Appekunny

Sparse chalcocite is present in 2" of somewhat porous crossbedded white sandstone near the contact of the Grinnell Formation. The part of the bed cemented with quartz is free of copper mineralization. This is a minor occurrence.

Occurrence 14 | Traverse L-1 | Siyeh

Chalcopyrite and bornite or chalcocite? are sparsely disseminated in aggregates to 5 mm in white medium grained sandstone near the contact with the Grinnell Formation. This is a minor occurrence.

Occurrence 15 | Traverse Z-5, K-1, L-2 | Appekunny

Sparse chalcocite and bornite are present in slightly porous sandstone, and in somewhat greater amounts along the contacts of thin green argillite pebbles and layers. Copper mineralization is confined to a bed not more than 6" thick about 25' below the top of the Appekunny. It can be traced intermittently for about ½ mile to the northwest where its maximum thickness is about 1'. This zone is too thin and the mineralization too sparse to be of interest.

Occurrence 16 | Traverse Z-5, K-1, L-2 | Grinnell

Chalcocite and bornite are present mostly in the interstices of medium to coarse grained subrounded quartz grains in a white to light brown sandstone through an interval of 4' or 5' about 5' below the contact of the Siyeh Formation. Below this is about 4' of well cemented sandstone barren or almost barren of copper minerals, and below this is another 4' of moderately well cemented medium grained sandstone with chalcocite less abundant than in the upper bed: much of it is in fractures and along bedding planes. These beds were traced about 200'. Additional sampling and possibly stripping of this occurrence appears warranted.

Occurrence 17 Traverse K-4 Grinnell

Chalcocite with accompanying malachite was found in a 7" bed of brownish sandstone that could be traced for about 20' about the middle of the Grinnell Formation. This appears to be a minor occurrence.

Occurrence 18 Traverse Z-9 Grinnell

Chalcocite in grains to 1 mm with traces of bornite and chalcopyrite is sparsely disseminated in clean, well sorted, white sandstone in a zone 1' thick. Copper mineralization is present only close to a fault with a stratigraphic displacement of about 100' with the SW side down thrown. Similar mineralization along bedding planes and in slightly porous sandstone was encountered on this traverse at the Grinnell-Siyeh contact. These appear to be minor occurrences.

Occurrence 19 Traverse Z-8 Grinnell

Chalcocite and associated malachite occur along bedding planes, fractures, and discontinuites in white, fine grained, subrounded, well sorted sandstone in a zone about 3' thick at or near the Grinnell-Siyeh contact. This occurrence warrants sampling.

Occurrence 20 Traverse C-12 Grinnell

Bornite is present in stringers to 2 cm by 3 mm, associated with chalcopyrite in grains to 2 mm, mostly along small fractures and along the contacts of green argillite pebbles. The copper mineralization is present in two zones: an upper which varies in thickness up to 5' and a lower 8" bed. Although the mineralization in the samples collected appears to be fairly low grade, this occurrence warrants more detailed sampling and possibly mapping.

Occurrence 21 Traverse H-25 Lower Gateway

Malachite was found on joints in a fine grained grey limestone bed about 1' thick, overlain and underlain by green argillites. This occurrence appears to have no economic importance but its existence is worth noting.

Occurrence 22 Traverse Z-13, H-12 Purcell Lava

Sparse chalcopyrite fills vesicles in andesitic lava. This is of no economic significance here.

Occurrence 23 Traverse Z-20 Appekunny

Abundant sphalerite is associated with pyrite in white medium grained sandstone at contacts with green argillite pebbles. The extent of this mineralization is not know: it may warrant checking.

Occurrence 24 Traverse C-3 Siyeh

Minor malachite and pyrite was found in float.

Occurrence 25 Traverse C-7 Gateway

Malachite and very fine copper sulfides? were found in a grey argillite bed 4' thick. A grab sample assayed 1.31% Cu. This occurrence requires further sampling and tracingof its extent.

Occurrence 26 Traverse D-17 Gateway

Malachite stains were found along joints and bedding planes in a 2' bed of green grey argillite which appears to contain a very fine grained copper mineral. A grab sample assayed 0.26% Cu. This occurrence requires further sampling and tracing of its extent.

Occurrence 27 Traverse H-13 Siyeh

Malachite staining on greenish grey slaty argillite which appears to contain very fine grained disseminated sulfides. The mineralization is of local occurrence only.

Occurrence 28 Traverse H-13, L-3 Grinnell

Chalcopyrite was found in aggregates to 4 mm along contacts and fractures of green argillite pebbles in white sandstone. This sparse copper mineralization is present in two beds: a lower 4' bed, and 15' stratigraphically higher, an upper 6" bed. This is a minor occurrence.

Occurrence 29 Traverse H-13, L-3 Grinnell

Chalcocite is present in white sandstone, interstitial to medium grained, subrounded quartz. Four quartzite beds are mineralized but the

Occurrence 29 - continued

maximum thickness of beds is 4" and mineralized zones are up to 1" thick. Some of the red argillite interbedded with the quartzite is bleached: below one bed is a prominent bleached zone 2" to 4" thick with irregular border. This occurrence appears to be minor.

Occurrence 30 Traverse H-16 Purcell Lava

Chalcopyrite was found in vesicles and disseminated in andesitic lava. This is a minor occurrence.

Occurrence 31 Traverse H-20 Gateway

Chalcopyrite in grains less than ½ mm is abundantly disseminated in grey siltstone at the contact of a syenitic intrusion. A grab sample assayed 0.43% Cu. Another sample a short distance away has malachite and possibly very fine grained copper sulfides in a grey silty argillite. These occurrences appear to warrant sampling and tracing their extents.

Occurrence 32 Traverse H-24 Gateway

Chalcopyrite, bornite and, possibly chalcocite are present along planes of fissility in a green grey argillite. A grab sample assayed 0.70% Cu. Malachite stained the contact of a pebble of grey green argillite in a green siltstone. This occurrence appears to warrant additional sampling.

Occurrence 33 Traverse H-22 Float - Waterton?

Very sparse chalcopyrite and bornite? in grains less than ½ mm are present along a minor contact between grey and buff-grey dolomite. This is a minor occurrence.

Occurrence 34 Traverse H-22 Waterton

Sparse chalcopyrite is present similar to occurrence 33. This is a minor occurrence.

Occurrence 35 Traverse C-5, K-3 Grinnell

Chalcopyrite is disseminated in white quartzite below a basic intrusive. The intrusive is described as a dyke at this location but appears to become a sill a short distance to the NW. Chalcopyrite and pyrite are disseminated near but not at the contacts of the intrusive. This occurrence appears unimportant.

Occurrence 36 | Traverse C-6, K-3 | Grinnell

Chalcopyrite in aggregates to 5 mm long is associated with green argillite pebbles in a white medium grained sandstone bed about 6" thick. About 8' below is another similar bed. This occurrence is near the upper contact of the Grinnell and is regarded as a minor one. A similar occurrence was located a few hundred feet below in Grinnell sandstone near the lower Grinnell contact.

Occurrence 37 | Traverse Z-21, C-5 | Grinnell

Chalcocite? and bornite are present in the interstices of medium grained subrounded quartz in white sandstone. Chalcopyrite and bornite are along contacts and in fractures of green argillite pebbles in the sandstone. The mineralized zone is in the Grinnell just below the Siyeh contact and is 5' to 7' thick. This appears to be a minor occurrence but warrants checking.

Occurrence 38 | Traverse Z-21 | Grinnell

Chalcocite in white sandstone very similar to that described for occurrence 37, and with chalcopyrite and bornite occurring in the same way. The mineralized zone is at the contact of the Appekunny and appears to be a minor one.

Occurrence 39 | Traverse H-28 | Grinnell

Chalcopyrite is disseminated in white sandstone at the Siyeh contact. A similar occurrence was found a few hundred feet to the east at the same stratigraphic horizon. Both are apparently minor occurrences.

Occurrence 40 | L-23-6-68 | Upper Gateway

Chalcocite is present in a layer of grey argillite about 6' thick that was traced for about 200' down the mountain side. A grab sample assayed 0.98% Cu. Further sampling and tracing of this zone appears warranted.

Occurrence 41 Grizzly Showing Grinnell

The Grizzly Showing was trenched by Cominco in 1969, and mapped and five holes totalling 2018' drilled in 1970. This work showed that chalcocite, bornite, and lesser chalcopyrite are present in sandstone or quartzites near the upper contact of the Grinnell Formation for a length of 2700'. Individual mineralized units range from $2\frac{1}{2}$' to 17' in thickness and are present through a stratigraphic interval of about 43'. In three of the drill holes, approximately aligned in a southerly trend, thicknesses of 3' to 6' or 7' grade 0.6% to 0.7% Cu with the best intersection being 4' grading 0.95% Cu and 0.10 oz. Ag. The mineralization in two holes drilled a few hundred feet west of the southerly-trending line of the first three holes is lower grade. In general, there appears to be slightly more than 0.1 oz. Ag for each 1% Cu in each interval assayed. One interval of 5' in one of the holes graded 0.3% Cu and 1.19% Pb.

The Grizzly Showing has been examined in a cursory manner three or four times by the writer. His interpretation is that the southerly-trending line of the three drill holes is close to a fault, and that the other two holes were drilled some distance west of the fault. Some additional work here appears warranted.

Occurrence 42 Whistler Showing Grinnell

The Whistler Showing was trenched and mapped by Cominco in 1969 and 1970. More than 25 beds of sandstone in the lower and middle part of the Grinnell Formation are erratically mineralized with chalcocite, lesser bornite, and minor chalcopyrite at or near a dip slope on Whistler mountain for a strike length of about 2500 feet. The down-dip extent of the better mineralized beds is limited to a few hundred feet because of erosion at the upper and lower ends of the dip slope. In the lower Grinnell the mineralized beds are 1" to 2" thick, contain less than 0.02%Cu and are separated by up to 10' of red argillite. In the middle Grinnell, the typical mineralization consists of chalcocite in the interstices between rounded quartz grains. Mineralized beds range from 2" to 6" in thickness, and many are ripple-marked. In one place sand outlining fossil mud craks in argillite has been mineralized with chalcocite. Only rarely is the complete thickness of any one bed mineralized, and individual mineralized beds cannot be traced for more than a few hundred feet. Samples grading as much as 5% and 7% Cu have been obtained across thicknesses of 6" and 4" respectively, but grades fall to 0.5% Cu or less across widths of 4' or 5'. Cominco has concluded that this deposit is too small to mine.

APPENDIX 3: LIST OF PROSPECTING TRAVERSES

In the list below the members of each traversing party are designated as follows: J. Card - C, D. Danyluk - D, J. Gorham - G, G. Hildebrandt - H, M. Judd - J, A. Kahil - K, L. Halferdahl - L, J. Plummer - P, G. Russell - R, M. Zander - Z. Some of the initial traverses in June, 1970 were orientation traverses on Spionkop Ridge and on the north side of Yarrow Creek and have not been plotted in Fig. 11. A few days were spent from time to time learning about access roads to parts of the properties. Although some of these were designated by traverse numbers, they have not been plotted in Fig. 11.

Traverse	Date	Men	Traverse	Date	Men
C-1	4 - 8 - 70	C, J	D-19	1 - 8 - 70	D, C
C-2	5 - 8 - 70	C, R	D-20	31 - 7 - 70	D, C
C-3	6 - 8 - 70	C, R	D-21	1 - 8 - 70	D, C
C-4	7 - 8 - 70	C, R	H-1	28 - 6 - 70	H
C-5	8 - 8 - 70	C, R	H-2	29 - 6 - 70	H, D
C-6	9 - 8 - 70	C, R	H-3	1 - 7 - 70	H, J
C-7	11 - 8 - 70	C, R	H-4	2 - 7 - 70	H, J
C-8	12 - 8 - 70	C, R	H-5	4 - 7 - 70	H, J
C-9	13 - 8 - 70	C, R	H-6	6 - 7 - 70	H, J
C-10	21 - 8 - 70	C, G	H-7	7 - 7 - 70	H, J
C-11	22 - 8 - 70	C, R	H-8	8 - 7 - 70	H, J
C-12	9 - 9 - 70	C	H-8A	11 - 7 - 70	H, J
D-1	28 - 6 - 70	D, C	H-9	12 - 7 - 70	H, R
D-2	29 - 6 - 70	D, H	H-10	14 - 7 - 70	H, R
D-3	1 - 7 - 70	D, C	H-11	15 - 7 - 70	H, J
D-4	2 - 7 - 70	D, C	H-12	16 - 7 - 70	H, J
D-5	3 - 7 - 70	D, H	H-12A	19 - 7 - 70	H, J
D-6	4 - 7 - 70	D, C	H-13	20 - 7 - 70	H, Z
D-7	5 - 7 - 70	D, C	H-14	21 - 7 - 70	H, J
D-8	6 - 7 - 70	D, R	H-15	22 - 7 - 70	H, J
D-9	7 - 7 - 70	D, C	H-16	1 - 8 - 70	H, J
D-10	10 - 7 - 70	D, R	H-17	4 - 8 - 70	H, G
D-11	11 - 7 - 70	D, C	H-18	5 - 8 - 70	H, J
D-12	12 - 7 - 70	D, C	H-19	6 - 8 - 70	H, J
D-13	16 - 7 - 70	D, R	H-20	7 - 8 - 70	H, J
D-14	19 - 7 - 70	D, C	H-22	9 - 8 - 70	H, Z
D-15	20 - 7 - 70	D, C	H-23	10 - 8 - 70	H, J
D-16	21 - 7 - 70	D, C	H-24	11 - 8 - 70	H, J
D-17	22 - 7 - 70	D, C	H-25	13 - 8 - 70	H, J
D-18	23 - 7 - 70	D, C	H-26	14 - 8 - 70	H, R

Traverse	Date	Men
H-27	15 - 8 - 70	H, R
H-28	16 - 8 - 70	H, R
H-29	19 - 8 - 70	H, C
H-30	20 - 8 - 70	H, R
H-31	21 - 8 - 70	H, C
K-1	4 - 8 - 70	K, Z
K-2	13 - 8 - 70	K, G
K-3	18 - 8 - 70	K, H
K-4	20 - 8 - 70	K, C
L-1	5 - 7 - 70	L, J
L-2	9 - 8 - 70	L, K
L-3	13 - 8 - 70	L, Z
L-4	27 - 7 - 70	L, P
R	7 - 8 - 70	R
Z-1	27 - 6 - 70	Z
Z-2	1 - 7 - 70	Z, G
Z-3	2 - 7 - 70	Z, G
Z-4	3 - 7 - 70	Z, G
Z-5	4 - 7 - 70	Z, G
Z-6	5 - 7 - 70	Z, G
Z-7	6 - 7 - 70	Z, G
Z-8	8 - 7 - 70	Z, G
Z-9	10 - 7 - 70	Z, G
Z-10	11 - 7 - 70	Z, G
Z-10A	14 - 7 - 70	Z, G
Z-11	15 - 7 - 70	Z, G
Z-12	16 - 7 - 70	Z, G
Z-13	19 - 7 - 70	Z, G
Z-14	21 - 7 - 70	Z, G
Z-15	22 - 7 - 70	Z, G
Z-16	23 - 7 - 70	Z, G
Z-17	30 - 7 - 70	Z, G
Z-18	31 - 7 - 70	Z, G
Z-20	5 - 8 - 70	Z, G
Z-21	6 - 8 - 70	Z, G
Z-22	7 - 8 - 70	Z, G
Z-23	8 - 8 - 70	Z, G
Z-24	9 - 8 - 70	Z, G
Z-25	10 - 8 - 70	Z, G

Traverse	Date	Men
Z-26	11 - 8 - 70	Z, G
Z-27	14 - 8 - 70	Z, G
Z-28	15 - 8 - 70	Z, G
Z-29	16 - 8 - 70	Z, G
Z-30	22 - 8 - 70	Z, G

APPENDIX 4

LOGS OF DIAMOND DRILL HOLES

SPIONKOP RIDGE

DRILL LOGS

Company: Alcor Minerals Ltd.   Property: Goble Option
Drill Hole No: 1   Page 1   Location: Top of Spionkop Ridge

Azimuth: -   Elevation: 6600' (approx.)   Started: September 24, 1970
Dip: -90°   Total Length: 337'   Completed: September 28, 1970
Core: BQ wl   Total Recovery: 323.6'   Logged by: L. B. Halferdahl

Interval	Recovery	Description
0' - 7'	0'	Casing
7' - 12'	3.0'	SANDSTONE, mostly medium grained, pinkish, whitish, and wine colored; subrounded quartz grains, some cemented with hematite; but with fine quartz well cemented with quartz in places; some laminations at 70° to core axis. 11.0' - 12.0' - sandstone is whiter but contains up to 5% irregularly distributed blobs of reddish, dark brownish material that colors the quartz grains; numerous holes to 1 mm or slightly more throughout this sandstone; some are completely hollow; others look as if a mineral grain had weathered out and this may be what produces the dark brown spots. 12.0' - one flat pebble of red argillite in the whitish spotted sandstone.
12' - 17'	5.0'	SANDSTONE and ARGILLITE 12.0' - 15.9' - whitish red sandstone, medium to fine grained; cement variable; some with pebbles of red argillite to ½"; red argillite on partings to 1 mm; some argillite with irregular green bleaching; some pebbles of red argillite to ½" thick by 1" or more long. 13.5' - 15.9' - some sandstone is spotted irregularly as in previous interval. 15.9' - 17.0' - red argillite and siltstone with green mottling here and there, some to ½"; fissility at 70° to core axis.

Company: Alcor Minerals Ltd. Property: Goble Option
Drill Hole No: 1 Page 2

Interval	Recovery	Description
17' - 21'	2.8'	SANDSTONE, mostly 17.0' - 17.4' - red argillite, mottled with irregular greenish grey blobs 2 mm in size to larger layers ½" thick roughly parallel to fissility but with irregular contacts. 17.4' - 17.6' - reddish white sandstone, medium grained, well cemented with red argillite, some in blobs. 17.8' - 21.0' - reddish and reddish white sandstone; medium grained, gradations between colors are fairly abrupt, but are dependent, in part, on abundance of red argillite pebbles which are up to ½" thick and 1" to 2" long, some pebbles are irregularly bleached to a greenish grey.
21' - 25'	4.9'	ARGILLITE and SILTSTONE 21.0' - 22.3' - dark red with sparse greyish green blobs to ½" in size. 22.3' - 23.5' - greenish with red in a few layers or irregular blobs to ¼" thick.
25' - 30'	7.0'	SANDSTONE, mostly 25.0' - 25.4' - red argillite with a layer of medium grained only moderately well cemented sandstone, ½" thick at middle with a ½" layer of green argillite with irregular contacts above, all about middle of interval. 25.4' - 30.0' - sandstone, mostly white medium grained, moderately to well cemented, some is pinkish (banded white sandstone and sandstone with some hematite or red argillite cement which gives it a pinkish cast); contains a few pebbles of argillite, green mostly but some red; argillite partings to 1mm or less, mostly green but with some irregular red areas.

Company: Alcor Minerals Ltd. Property: Goble Option
Drill Hole No: 1 Page 3

Interval	Recovery	Description
30' - 37'	6.6'	SANDSTONE, mostly 30.0' - 30.2' - sandstone as in previous interval. 30.2' - 31.4' - interbedded dark red sandstone, argillite, siltstone with a few layers of green argillite to $\frac{1}{2}$", green argillite layer $\frac{1}{4}$" thick right above white sandstone at 31.4'. 31.4' - 34.3' - well cemented medium grained sandstone, white in upper two-thirds, with reddish intervals in lower one-third, the red color produced by red argillite cement and pebbles. Bedding is at about 70° to core axis and is marked by partings of green argillite some of which contains irregular remnants of red; one bed of sandstone is nearly 2' thick. 34.3' - 34.6' - red argillite with green argillite along a fracture inclined about 45° to core axis and minor irregular mottling by green argillite; green argillite is at bottom right above sandstone at 34.6'. 34.6' - 37.0' - white sandstone in upper 0.4' then irregularly banded with reddish white and white; the red color caused by red cement and concentrations of red argillite pebbles in some layers; green argillite on bedding planes to 3 mm thick with some irregular remnants of red; $\frac{1}{4}$" blobs of greenish sandstone sparsely and irregularly scattered in lower 0.5' of red sandstone.
37' - 47'	10.0'	SANDSTONE, medium grained; some beds up to 1.0' cemented with quartz, others with red clay; some intervals contain numerous pebbles of red argillite, others are free of them; bedding planes are marked by argillite, mostly red but some partly or completely turned to green; laminated at 70° to core axis.

Company: Alcor Minerals Ltd.
Drill Hole No: 1

Property: Goble Option
Page 4

Interval	Recovery	Description
47' - 54'	7.3'	SANDSTONE, medium grained in alternating white and red layers up to 1.0' thick, mostly less; red sandstone is cemented with red argillite (clay) and/or contains abundant pebbles of red argillite with thin partings of red argillite up to ¼" on bedding planes, some with irregular green blobs to ½" or so in size; laminated at 70° to core axis.
54' - 57'	2.3'	SANDSTONE, as above but little or no green argillite at partings and only one reddish white sandstone bed 3" thick at 55.0'.
57' - 60'	1.4'	SANDSTONE, as above, with a few pebbles of argillite, mostly red, very few green; some red argillite pebbles have been squeezed and distorted.
60' - 65'	5.0'	ARGILLITE and SANDSTONE interbedded 60.0' - 61.2' - red argillite with sparse green spots 3 mm across; one joint at 61.2' with thin layer of rust has about ¼" green argillite, then in next ¼" grades through dark purplish grey into red argillite. 61.2' - 61.8' - below rusty joint is 1/8" green argillite then medium grained whitish sandstone with tiny rust spots among subrounded quartz grains; this sandstone contains pebbles up to 3/8" thick by 1" long of green argillite parallel to bedding which is at 70° to core axis; rest of interval is well cemented white sandstone. 61.8' - 62.8' - red argillite irregularly and incompletely mottled with grey argillite with green argillite in joints; fissibility at 70° to core axis; ¼" layer of reddish sandstone at 62.8'. 62.8' - 63.5' - red argillite with very sparse green spots to 2 mm in size.

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Interval	Recovery	Description
60' - 65' cont'd	5.0'	63.5' - 64.0' - reddish white sandstone with pebbles of red argillite and one 0.1' layer of red argillite with sparse green spots at 63.6'; one 2 mm parting of green argillite. 64.0' - 64.3' - red argillite with green spots as above. 64.3' - 65.0' - whitish sandstone with a few pebbles of red argillite with 3 mm parting of green argillite at 65.0'.
65' - 75'	10.3'	SANDSTONE and ARGILLITE 65.0' - 66.8' - sandstone, medium grained, subrounded, with numerous pebbles of red argillite from 2 or 3 mm in size to ¼" by 1" or more, mostly inclined at 70° to core axis; a few pebbles and partings of green argillite. 66.8' - parting of green argillite is mottled with dark grey. 66.8' - 67.0' - grey argillite with a bit of green mottling and a 3 mm layer of white sandstone. 67.0' - 67.2' - mostly white sandstone, with pebbles of grey and green argillite. SAMPLE 1551 66.8' - 67.2' 0.4' 0.005% Cu 67.2' - 67.6' - red sandstone with numerous pebbles of red argillite and one of green argillite. 67.6' - 68.6' - white sandstone with abundant pebbles and layers to ½" of green argillite with an odd red blob to ¼" in size; planer features at 60° to core axis SAMPLE 1552 67.6' - 68.6' 1.0' 0.005% Cu. 68.6' - 69.3' - green argillite with occasional black dendrites and other black minerals. 69.3' - ¼" layer of black argillite SAMPLE 1553 68.6' - 69.3' 0.7' 0.005% Cu.

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Interval	Recovery	Description
65' - 75' cont'd	10.3'	69.3' - 70.0' - white sandstone with irregular layers of green argillite; mostly less than 3 mm; some contain interstitial chalcocite with accompanying malachite; odd pebble of black argillite; chalcocite is concentrated in laminae parallel to bedding. 70.0' - 70.25' - green argillite. 70.25' - 70.9' - white sandstone with interstitial chalcocite in some laminae; it appears to be more abundant above green argillite partings and layers to $\frac{1}{4}$" thick, also in fractures and possibly replacing green argillite; chalcocite blobs are up to 5 mm in size. SAMPLE 1554 69.3' - 70.9' 1.6' 1.09% Cu, 0.22 oz. Ag. 70.9' - 71.6' - green argillite grading to grey towards bottom with fine black dendrites on planes of fissility. SAMPLE 1555 70.9' - 71.6' 0.7' 0.01% Cu. 71.6' - 73.0' - finely laminated red argillite with sparse green argillite elongated parallel to fissility but in discontinuous blobs to 1" long; irregular upper contact with green argillite; odd laminae to $\frac{1}{4}$" of reddish sandstone. 73.0' - 74.6' - mostly reddish sandstone with layers to $\frac{3}{4}$" of red argillite, and pebbles to $\frac{1}{2}$" of green and black argillite irregularly distributed from 74.2' to 74.5'. 74.6' - 76.0' - grey siltstone grading down to finely laminated red argillite with layers or irregular blobs of green argillite, some with fine black dendrites on planes of fissility, which are about 60° to axis of core.

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Interval	Recovery	Description
75' - 85'	8.5'	ARGILLITE and SANDSTONE 75.0' - 76.0' - laminated red and green argillite with layers to $\frac{1}{4}$" of whitish sandstone; some green argillite shows fine black dendrites extending 2 mm or so from closed cracks which are about parallel to core axis. 76.0' - 77.2' - white to pinkish sandstone with laminae with abundant red cement at 60^{o} to core axis; with layers of red argillite to $\frac{1}{2}$", and with pebbles of red and green argillite. 77.2' - 78.0' - red argillite, banded, with layers to 1" in upper part irregularly mottled with green argillite. 78.0' - 78.5' - whitish sandstone with pebbles and laminae of red and green argillite. 78.5' - 80.7' - mostly red argillite with green layers with irregular contacts to 1" and smaller blobs of green argillite; 1" layer of pinkish white sandstone at 79.5'. 80.7' - 82.9' - white and reddish white sandstone with pebbles of green argillite in upper part, and abundant reddish cement in lower part. 82.9' - 83.5' - red argillite with sparse blobs of green argillite.
85' - 92'	7.5'	ARGILLITE and SANDSTONE 85.0' - 90.3' - mostly red argillite, laminated at 60^{o} to core axis, with green argillite layers to 2" thick, and pinkish white sandstone layers to 4" thick with pebbles of red argillite and a few of green argillite. 90.3' - 92.5' - sandstone, whitish with pebbles of green argillite to $\frac{3}{4}$" with sparse malachite staining along edges of green pebbles and in small streaks in fractures; with a 2" interval of green argillite with medium grained quartz grains and a $\frac{1}{4}$" streak with a black mineral (chalcocite?). SAMPLE 1556 90.3' - 92.5' 2.2' 0.04% Cu.

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Interval	Recovery	Description
92' - 94'	1.5'	SANDSTONE, white with pebbles of green argillite to 1"; sparse malachite in lowest 3", associated with green argillite pebbles, and thin seams of rust along contact of green argillite pebbles and white sandstone. SAMPLE 1557 92.0' - 94.0' 2.0' 0.02% Cu.
94' - 97'	1.8'	SANDSTONE, white with green argillite pebbles in upper part with sparse malachite stains in top 2"; in lower part white sandstone is spotted with dark brown or rusty spots 1 to 2 mm in size (remnants of pyrite?); some have been dissolved out completely leaving holes. SAMPLE 1558 94.0' - 97.0' 3.0' 0.01% Cu.
97' - 106'	9.5'	ARGILLITE and SANDSTONE 97.0' - 98.1' - argillite, red and green irregularly interlayered and mixed; top 3" are grey argillite. 98.1' - 99.5' - white and reddish sandstone, with red cemented laminae at 60° - 70° to core axis. 99.5' - 100.2' - red argillite. 100.2' - 100.8' - green argillite with $\frac{1}{4}$" layer of white sandstone at 100.4' and a few bands and irregular blobs of red argillite at bottom; irregular contact with underlying red argillite. 100.8' - 104.5' - red argillite, banded with layers to $\frac{1}{4}$" of greyish white argillite and whitish sandstone; irregularly mottled with grey for about 8" at 103.0'; sparse blobs of green to $\frac{1}{2}$" in places. 104.5' - 105.7' - 0.2' green argillite, greyish in top $\frac{1}{2}$"; 0.4' white sandstone with layer of green argillite; 0.4' green argillite; 0.2' banded red argillite; green argillite contains fine black dendrites adjacent to a crack about parallel to core axis. 105.7' - 106.5' - mostly white sandstone, pink in places; green argillite pebbles and partings; red argillite pebbles.

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Interval	Recovery	Description
106' - 111'	4.0'	SANDSTONE, mostly 106.0' - 108.3' - white sandstone, with green argillite pebbles and partings; 0.3' layer of green argillite at 106.2' with black dendrites and other shapes on planes of fissility; chalcocite to 3 mm along contacts of argillite pebbles with sandstone but chalcocite is sparse; grains to 1 mm of chalcopyrite? or pyrite on fissility planes in green argillite partings. SAMPLE 1559 106.0' - 108.3' 2.3' 0.11% Cu, 0.02 oz. Ag. 108.3' - 109.9' - 0.2' red argillite, banded with irregular layers to $\frac{1}{4}$" of green argillite and white sandstone; 0.2' green argillite and white sandstone with irregular contact with underlying red argillite; 0.6' red argillite with $\frac{1}{2}$" layer of white sandstone with $\frac{1}{4}$" of greyish black argillite at lower contact with green argillite; 0.6' green argillite with black and brown dendrites along crack roughly parallel to core axis. 109.9' - 110.1' - white sandstone, medium grained, well cemented.
111' - 119'	7.0'	SANDSTONE, mostly 111.0' - 112.3' - greenish white sandstone, laminated with dark streaks at about 70° to core axis, with pebbles and partings of green argillite with abundant black dendrites. SAMPLE 1560 111.0' - 112.3' 1.3' 0.005% Cu, 0.02 oz. Ag. 112.3' - 114.7' - mostly whitish sandstone with some intervals with abundant pebbles of red argillite and partings; a few pebbles of green argillite, with two

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Interval	Recovery	Description
111' - 119' cont'd	7.0'	intervals: 2" and 4" of argillite, irregularly mottled red and green. 114.7' - 116.3' - red argillite with the central 0.5' mostly green argillite with irregular sandy layers to ¼" and some red blobs; green argillite contains black dendrites. 116.3' - 117.0' - whitish sandstone with layers and irregular pieces of green and red argillite. 117.0' - 118.0' - red argillite.
119' - 125'	5.8'	ARGILLITE and SANDSTONE 119.0' - 120.5' - red argillite, blotchily mottled with grey green in upper 0.3' with layers to 1" of green argillite and white sandstone in lower part. 120.5' - 122.2' - whitish sandstone with pebbles and partings of red argillite. 122.2' - 124.8' - uniform red argillite with 0.2' layer of white sandstone at 123.4'.
125' - 129'	4.0'	ARGILLITE, red, laminated with grey siltstone in upper foot with 0.2' layer of white sandstone at 126.3', and 0.2' layer of grey green argillite at 126.5'; rest of interval is irregularly banded red argillite with sparse grey or green spots to ¼".
129' - 139'	9.4'	ARGILLITE, red, regularly and irregularly laminated; with sparse green or grey spots; a few argillite pebbles, irregular veins; with greyish silty intervals at 130.7', 0.8' thick at 131.4', and 1.0' thick at 134.9'; 0.2' green argillite at 132.7'; 0.2' white sandstone at 134.6'; 1" to 2" of green mottling in red argillite at 137.4'.

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Interval	Recovery	Description
139' - 147'	8.6'	ARGILLITE, red with irregular layers to ½" of green argillite and irregular blotchy mottling in upper 1.3'; 0.2' layer of white sandstone at 140.7'; 0.2' sandy interval at 141.9'; 0.9' of greyish silty argillite with irregular red blobs at 142.1'; 2.0' feet uniform red argillite with a few grey or green spots at 143.0'; 1.1' of mixed red argillite and white sandstone at 145.0'. 146.1' - 147.8' - red argillite, laminated with irregular green mottling and layers in upper part.
147' - 155'	8.3'	ARGILLITE, mostly 147.0' - 148.3' - sandstone with layers, partings and pebbles of red argillite and grey argillite. 148.3' - 150.9' - red argillite, irregular layers of white sandstone in upper 0.6'; prominent green layers or mottling at 150.3'. 150.9' - 151.7' - sandstone; white and reddish, with pebbles and cement of red argillite. 151.7' - 153.2' - red argillite with irregular ¼" layers, of white sandstone in upper 0.2'; blobs of green to ¾", and 0.2' layer of green argillite at 152.6'. 153.2' - 155.4' - interlayered white and reddish sandstone in layers to 0.5' and red argillite; sandstone contains red argillite pebbles; odd 0.2' layer of grey silty argillite.
155' - 165'	10.4'	ARGILLITE, mostly 155.0' - 155.2' - white sandstone mottled here and there with reddish spots. 155.2' - 155.8' - red argillite with ¼" layer of green argillite. 155.8' - 156.5' - interbedded white sandstone and red argillite with pebbles of red argillite in the sandstone, and a few of green argillite; ¼" layer of green argillite at 156.5'. 156.5' - 157.0' - red argillite with 2 irregular ¼" layers of green.

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Interval	Recovery	Description
155' - 165' cont'd	10.4'	157.0' - 157.3' - white sandstone with layers of red argillite and pebbles of red argillite; green argillite pebbles at the bottom. 157.3' - 165.4' - red argillite with one 0.2' layer of white sandstone; one 0.4' layer of white sandstone with red argillite pebbles; green mottling in red argillite ranging from negligible to almost complete in interval of 0.2', a few other layers to ½" of white sandstone.
165' - 167'	1.4'	ARGILLITE, red with layers to 0.1' of white sandstone with red argillite pebbles, ¼" green argillite layer on upper side of one sandstone layer; irregular grey mottling in lower part.
167' - 175'	8.2'	ARGILLITE 167.0' - 167.2' - greyish siltstone with red mottling. 167.2' - 172.0' - red argillite, with ½" layer of white sandstone at 167.7'; argillite is slightly mottled with green, with largest blob 2" in size and irregular. 172.0' - 172.3' - red argillite grades down within ½" to purplish to black to green argillite which is 0.1' thick with copious black dendrites and then 0.1' layer of sandstone; below is ½" of greyish argillite. 172.3' - 175.3' - argillite, red with irregular blobs of green and irregular layers to 0.2' prominent at 172.5' and 173.0'.
175' - 185'	10.4'	ARGILLITE 175.0' - 175.8' - red argillite with irregular 1" layer of white sandstone containing pebbles of red argillite. 175.8' - 176.0' - white sandstone with pebbles of green argillite. 176.0' - 176.4' - irregular ½" layer of red argillite at top; grey silty argillite below. 176.4' - 185.4' - red argillite, irregularly laminated, mottled and layered with grey and grey green argillite, with 3 or 4 layers of white sandstone to 2".

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Interval	Recovery	Description
185' - 195'	10.6'	ARGILLITE, red, some sparsely spotted with up to $\frac{1}{4}$" spots of green; some mottled irregularly for intervals of 2" with green or grey; some laminated; some appear very dark and somewhat graphitic; white sandstone layers to 1" at places.
195' - 205'	10.0'	ARGILLITE, red, very similar to previous interval.
205' - 209'	3.4'	ARGILLITE, red, similar to previous interval, sandstone to 2" with green argillite above and below; lower contact with red argillite is regular.
209' - 217'	8.5'	ARGILLITE, red, similar to previous interval; 1" interval contains a thin sandstone layer sandwiched between 2 thin layers of green argillite with regular contacts.
217' - 226'	9.3'	ARGILLITE, red, mottled and layered as in previous intervals with 0.5' layer at 221.8' of white to pinkish sandstone with pebbles of green argillite.
226' - 231'	4.6'	ARGILLITE, mostly 226.0' - 226.8' - whitish sandstone with red argillite in layers to $\frac{3}{4}$", pebbles and partings; a few pebbles of green argillite. 226.8' - 230.6' - red argillite; a few sandy layers and about 3 layers of green argillite to 1" with irregular contacts.
231' - 240'	8.3'	ARGILLITE, mostly 231.0' - 232.2' - red argillite with some grey green mottling. 232.2' - 232.4' - sandstone, white with pebbles of red argillite.

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Interval	Recovery	Description
231' - 240' cont'd	8.3'	232.4' - 232.6' - red argillite, irregularly bleached to a greenish color. 232.6' - 233.0' - buff colored sandstone? cemented with calcite or carbonatized sandstone. 233.0' - 233.5' - green argillite; one grey purplish streak; irregular sandy intervals. 233.5' - 234.2' - buff colored sandy, very fine grained limestone, with fine to medium grained quartz. 234.2' - 234.4' - grey and green argillite with sandy layer at bottom. 234.4' - 239.3' - green, greyish green and red argillite, some finely laminated, mostly green with scattered blobs of red to 2"; two 0.5' intervals contain more red than green; layers to 0.4' of white sandstone, and sandstone with pebbles of red argillite.
240' - 250'	10.3'	ARGILLITE, mostly 240.0' - 242.8' - red argillite with 0.5' white sandy interval near middle; argillite is uniform above this except for sparse spots of green to ½", and is finely laminated below. 242.8' - 243.9' - sandstone with layers to 1" of green argillite; thin layers and pebbles of red argillite. 243.9' - 247.9' - red argillite, fissility at 70° to core axis; a few blobs of green to ½"; layers of green argillite and two layers of white sandstone to 0.1'; red argillite finely and somewhat irregularly laminated in lower part. 247.9' - 248.3' - white sandstone with red argillite pebbles with irregular ¾" layer of green argillite at bottom. 248.3' - 250.4' - red argillite, fissility at 70° to core axis with irregular distribution of blobs of green to 2" but mostly smaller; 3 layers to 1½" of white sandstone and associated green argillite in the lowest 0.6'.

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Interval	Recovery	Description
250' - 260'	10.1'	ARGILLITE 250.0' - 251.0' - mostly red argillite with 2 layers of green to 0.1' and a 0.3' interval of white sandstone with red argillite pebbles in the middle. 251.0' - 251.3' - white sandstone, cross bedded, with laminae and pebbles of red argillite. 251.3' - 260.1' - red argillite, fissility at 70° to core axis, 0.3' interval with greyish spots to 2 mm; a few larger green blobs to 1"; ½" layers of green argillite above and below 0.1' layer of white sandstone.
260' - 270'	9.9'	ARGILLITE AND SILTSTONE Mostly red argillite, some intervals to 0.5' of white sandstone, some with cross bedding and red argillite pebbles. 260.9' - 262.7' - greyish laminated siltstone; two or three 0.1' irregular layers of green argillite, sparse spots of grey green to 3 mm.
270' - 279'	9.0'	ARGILLITE, red, with intervals of white sandstone with pebbles and 2 mm layers of red argillite; interval of white sandstone with green argillite above and below; a few irregular layers to 1" of green argillite.
279' - 287'	8.3'	ARGILLITE, red, as above; few layers of green argillite and sandstone some with red argillite pebbles; few irregularly distributed green or grey spots.
287' - 291'	4.0'	ARGILLITE, red, as above with ½" layer white sandstone with thicker white sandstone and green argillite at 287.9' and 288.7'.
291' - 297'	4.0'	ARGILLITE, red, with a few layers to 0.2' of whitish red sandstone.

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Interval	Recovery	Description
297' - 307'	10.3'	ARGILLITE, red, with several intervals to 0.5' of white sandstone with red argillite pebbles; a few blobs to 2" of green argillite and one 0.3' interval at 298.0' of green argillite with sandy grains and a 2 mm layer of black graphitic argillite.
307' - 317'	10.5'	ARGILLITE 307.0' - 310.6' - uniform red argillite; laminations and pebbles. 310.6' - 312.8' - red argillite with some green mottling and green spots to 1"; white sandstone 0.1' layer at 310.7'. 312.8' - 313.2' - green argillite with irregular contact with overlying and underlying red argillite; thin sandy layer in middle, some green argillite is mottled with grey. 313.2' - 317.5' - red argillite with white sandstone layers to 0.3'; one sandstone layer has red and green argillite pebbles; sandstone layers all have green argillite above or below or both; some layers of green argillite.
317' - 327'	10.3'	ARGILLITE, red, with blobs of irregular green mottling to 1" in size; several layers of white sandstone to 0.2' with green argillite to ½" above and below.
327' - 337'	10.3'	ARGILLITE, red as above; one 0.3' layer of coarse sandstone with pink and white quartz grains.
337'		End of hole.

DRILL LOGS

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Azimuth: -
Dip: -90°
Core: BQ wl

Elevation: 6459'(based on DDH#1 at 6500')
Total Length: 162'
Total Recovery: 152.3'

Started: September 28, 1970
Completed: September 29, 1970
Logged by: L. B. Halferdahl

Interval	Recovery	Description
0' - 7'	0'	Casing
7' - 10'	1.5'	ARGILLITE, red with layers to 0.2' of white sandstone, composed of medium grained, well cemented quartz, fissility at 70° to core axis.
10' - 17'	6.4'	ARGILLITE, red with grey mottling in some intervals, and with greyish siltstone layers to 0.3', white sandstone layers of 0.2' sandwiched between green argillite; some greyish green blobs to ½" in red argillite.
17' - 25'	6.9'	ARGILLITE, mostly red, some pale mottling with grey, laminated, siltstone in upper 0.5' grading down to grey green argillite with red mottling; irregular layers and blobs to 1" of green or dark grey argillite, some with black dendrites.
25' - 29'	4.0'	ARGILLITE, mostly red, with irregular layers and blobs of green argillite to 2". 25.3' - 25.6' - green argillite which contains and grades into dark greyish graphitic argillite; some sandy layers with red argillite cement.
29' - 37'	7.7'	ARGILLITE and SANDSTONE 29.0' - 34.8' - red argillite with one or two intervals to 0.2' of white sandstone with red argillite pebbles; blobs and layers to 3" of green argillite with irregular contacts.

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Interval	Recovery	Description
29' - 37' cont'd	7.7'	34.8' - 36.6' - coarse grained sandstone with white and pink quartz grains in upper part with green argillite pebbles and red argillite irregularly mottled with grey green in lower part.
37' - 42'	4.4'	ARGILLITE 37.0' - 37.5' - green with ½" layer of white sandstone in top 1" and an irregular blackish area about 1" in size at 37.4' BASIC INTRUSIVE 37.5' - 41.4' 37.5' - 38.5' - buffish green grey, very fine grained to aphanitic groundmass with lath-shaped crystals to 3 mm is size; 1.0' zone appears to be the chilled margin or alternatively the zone that has been altered by later solutions; no sulfides are visible. SAMPLE 1561 37.5' - 38.5' 1.0' 0.01% Cu. 38.5' - 41.4' - medium grained groundmass, dark greenish grey with lath-shaped feldspar phenocrysts to ½" and in radiating stellate aggregates to 2" in size; malachite staining is visible on fractures and joints; some joints contain copious black dendrites, others are rusty; in places the rock takes on a purplish cast with irregular greenish areas. SAMPLE 1562 38.5' - 41.4' 2.9' 0.16% Cu.
42' - 47'	5.1'	BASIC INTRUSIVE 42.0' - 46.1' medium grained sill, very similar to previous interval; no copper mineralization visible except for a trace on joints; some joints have copious black dendrites; phenocrysts are less numerous; margin becomes somewhat buff colored at 45.1'.

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Interval	Recovery	Description
42' - 47' cont'd	5.1'	SAMPLE 1563 42.0' - 46.1' 4.1' 0.15% Cu. ARGILLITE, greenish grey, 46.1' - 47.1'.
47' - 51'	3.8'	ARGILLITE, red, with 2" of green at top and white sandstone with red argillite pebbles for 0.7' in middle; irregular layer of green argillite to 0.2'.
51' - 61'	11.0'	ARGILLITE, red with white sandstone layer to 0.3' with red argillite pebbles; layers and irregular green blobs to 1".
61' - 71'	11.0'	ARGILLITE, red with white sandstone layers to 0.6'; with pebbles of red argillite, and layers of red and green argillite; some sandstone is coarse grained; red argillite is irregularly layered to 2" and in blobs.
71' - 91'	21.2'	ARGILLITE, mostly 71.0' - 75.1' - red argillite finely laminated in top 0.4' with irregular layer of green argillite to 1" thick; white sandstone layers to 1" with copious pebbles and layers of red argillite, one ½" irregular layer of green argillite. 75.1' - 76.6' - white sandstone with pebbles and partings of red argillite; one irregular ¼" layer of green argillite. 76.6' - 77.3' - red argillite. 77.3' - 78.0' - red argillite interbedded with white sandstone with red argillite pebbles. 78.0' - 82.3' - red argillite with sandy layers to 0.1' and very sparse blobs of green. 82.3' - 84.3' - mostly red argillite interbedded with greenish grey argillite to 0.2', white sandstone with red argillite to 0.2', and grey siltstone to 0.2'. 84.3' - 91.0' - argillite as in previous intervals; some greyish blobs grading into green; laminated red argillite; grey silty layers; white sandstone.

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Interval	Recovery	Description
91' - 101'	10.4'	ARGILLITE, red, interbedded with white sandstone; 0.3' laminated greyish red argillite with mottling in upper 1.5'; one interval of white sandstone with green argillite pebbles; sparse green blobs.
101' - 111'	10.1'	ARGILLITE and SANDSTONE 101.0' - 104.2' - red argillite, with a few layers of white sandstone to 1", some with pebbles of red argillite and some sandwiched between layers to ½" of green argillite. 104.2' - 105.5' - sandstone with red argillite layers, partings and pebbles and green argillite pebbles; banding at 70° to core axis. 105.5' - 111.0' - red argillite with 0.7' sandstone layer at 109.1', and other sandstone layers to 0.2', some with red argillite pebbles, others sandwiched between ½" layers of green argillite, with a few blobs of green argillite.
111' - 121'	9.8'	ARGILLITE, red, interbedded white SANDSTONE Upper part contains white sandstone layers to 0.5' thick with green argillite pebbles and layers, and red argillite pebbles; lower 3½' is uniform red argillite with fissility at 70° to core axis.
121' - 126'	5.5'	ARGILLITE and SANDSTONE 121.0' - 126.0' - red argillite, sandstone, green argillite as in previous interval; with white sandstone and green argillite in lowest ½'.
126' - 132'	6.0'	SANDSTONE, white and green ARGILLITE, 126.0' - 126.8', as in previous interval. BASIC INTRUSIVE 126.8' - 130.8' - green with chilled margins about 0.5' thick on top and bottom, with very fine grained matrix and lath-shaped feldspar

Company: Alcor Minerals Ltd.
Drill Hole No: 2

Property: Goble Option
Page 5

Interval	Recovery	Description
126' - 132' cont'd	6.0'	phenocrysts to 2 mm; middle part consists of an interlocking aggregate (intersertal texture ?) of buffish lath-shaped grains in a grey green intergrowth with a few clots of greenish feldspars to 1" or more and a few single feldspar phenocrysts to ½". SANDSTONE, white and grey green argillite, 130.8' - 132.0'
132' - 137'	5.5'	ARGILLITE and SANDSTONE 132.0' - 132.5' - white sandstone with green argillite layers and pebbles in upper half, green argillite in lower half. 132.5' - 137.0' - mostly uniform red argillite with 3 intervals to 0.3' of white sandstone with green argillite pebbles and layers, with irregular contacts.
137' - 144'	4.0'	ARGILLITE, red with layers to 0.1' of white sandstone and green argillite.
144' - 148'	4.0'	ARGILLITE, red with white sandstone and green argillite as in previous interval.
148' - 152'	4.0'	ARGILLITE, red, white sandstone, and green argillite as in previous interval, with one interval of sandstone to 0.3' with coarse white and red quartz grains.
152' - 162'	10.0'	ARGILLITE, red with white sandstone and green argillite as in previous interval; with 0.7' of sandstone and green argillite at top of interval; few layers or blobs of green argillite to 0.3'.
162'		End of hole.

DRILL LOGS

Company: Alcor Minerals Ltd.
Drill Hole No: 3 Page 1

Property: Goble Option
Location: NW side of Spionkop Ridge

Azimuth: -
Dip: -90°
Core: BQ wl

Elevation: 6250'
Total Length: 272'
Total Recovery: 248.0'

Started: September 29, 1970
Completed: October 1, 1970
Logged by: L. B. Halferdahl

Interval	Recovery	Description
0' - 11'	0'	Casing
11' - 17'	4.5'	SANDSTONE, white with reddish laminae in planes at 30° to core axis; with pebbles to 1" of red argillite; intervals to 0.3' with green argillite pebbles and partings.
17' - 19'	1.3'	SANDSTONE as in previous interval.
19' - 25'	3.0'	QUARTZITE, white, tough, well cemented (poor recovery as a result); few vugs or solution cavities to $\frac{1}{4}$".
25' - 27'	1.5'	QUARTZITE, white, as in previous interval.
27' - 29'	2.0'	QUARTZITE as in previous interval; with partings of green argillite and a few pebbles of red and green argillite.
29' - 33'	3.4'	QUARTZITE, white, more green argillite partings at 45° to core axis, and pebbles of red and green argillite.
33' - 41'	6.4'	SANDSTONE, mostly white or greenish, with partings and pebbles of green argillite, and a few of red argillite, some partings show an abrupt but irregular change from red to green.
41' - 43'	2.0'	SANDSTONE, white with partings of green argillite, pebbles of green argillite to 1", and of red argillite to 2".

Company: Alcor Minerals Ltd.
Drill Hole No: 3

Property: Goble Option
Page 2

Interval	Recovery	Description
43' - 47'	4.0'	SANDSTONE, white and greenish, pebbles and partings of green argillite, with two intervals to 1' with a considerable number of red argillite pebbles and partings at about 45° to core axis.
47' - 53'	6.0'	SANDSTONE, white and greenish as in previous intervals.
53' - 60'	5.5'	SANDSTONE, white and greenish with green and red argillite as in previous intervals.
60' - 62'	0.2'	SANDSTONE, reddish, with pebbles and partings of red argillite.
62' - 67'	4.2'	SANDSTONE and ARGILLITE 62.0' - 62.6' - white sandstone with green argillite pebbles and partings. 62.6' - 64.3' - uniform red argillite, fissility at 70° to core axis. 64.3' - 65.0' - whitish sandstone with red argillite partings and pebbles. 65.0' - 66.1' - interbedded red argillite and white sandstone with 0.1' of green argillite.
67' - 72'	5.3'	SANDSTONE, mostly, some white and free of argillite; some contains numerous partings and pebbles of red argillite; two or three intervals to 0.3' of red argillite.
72' - 80'	7.2'	SANDSTONE and ARGILLITE 72.0' - 73.2' - white sandstone with green argillite pebbles to 1½" and partings. 73.2' - 73.5' - green argillite with red argillite blobs to 1". 73.5' - 75.1' - banded, greyish red, argillite and siltstone. 75.1' - 76.3' - white and red sandstone, with red argillite pebbles and partings. 76.3' - 76.6' - white sandstone. 76.6' - 77.3' - white sandstone with red argillite partings and pebbles.

Company: Alcor Minerals Ltd. Property: Goble Option
Drill Hole No: 3 Page 3

Interval	Recovery	Description
72' - 80' cont'd	7.2'	77.3' - 79.2' - mostly dark red argillite, some greyish and greenish, with pebbles of argillite of other color; laminated; fissility at 70° to core axis.
80' - 90'	10.5'	SANDSTONE and ARGILLITE 80.0' - 81.1' - white sandstone with green argillite pebbles and partings. 81.1' - 86.0' - mostly red argillite with layers of white sandstone with red argillite pebbles and partings, two intervals of white sandstone to 0.4' with green or mixed green and red argillite partings. 86.0' - 89.2' - white sandstone, medium to fine grained, well cemented with partings in lower $1\frac{1}{2}$"; and pebbles of green argillite; 0.3' interval of white sandstone and and green argillite; 0.3' interval of mixed white sandstone and green argillite. 89.2' - 91.1' - red argillite, with blobs and layers of green and grey.
90' - 95'	5.5'	ARGILLITE and SANDSTONE 90.0' - 90.2' - red argillite with green blobs. 90.2' - 91.0' - white sandstone with partings of red argillite in upper part; sparse partings and pebbles of green argillite in lower part. 91.0' - 93.4' - red argillite with layers of sandstone, 1/8" to $\frac{1}{2}$" at 70° to core axis, irregular 1" layer of green argillite at top. 93.4' - 93.8' - white sandstone with pebbles of green argillite and a few of red. 93.8' - 96.0' - red argillite with irregular layers to 0.4' of green argillite.
95' - 100'	5.5'	SANDSTONE, white, medium to fine grained quartz, well cemented, with sparse green argillite partings and pebbles.
100' - 101'	0.9'	SANDSTONE, white as in previous interval.

Company: Alcor Minerals Ltd. Property: Goble Option
Drill Hole No: 3 Page 4

Interval	Recovery	Description
101' - 110'	8.7'	ARGILLITE and SANDSTONE 101.0' - 101.6' - red argillite with green layers to ½" and blobs. 101.6' - 102.1' - green argillite with fissility at 70° to core axis. 102.1' - 104.5' - white sandstone; one bed 0.5' thick; rest has partings, layers, and pebbles of green argillite with 0.2' of green argillite at the bottom. 104.5' - 109.4' - red argillite with one 0.2' layer of white sandstone, and green argillite in a few blobs and layers to ½".
110' - 117'	7.0'	ARGILLITE and SANDSTONE 110.0' - 112.6' - red argillite with some indistinct greyish mottling; two layers of grey argillite to ¼". 112.6' - 113.7' - 0.6' of white sandstone with green argillite and white sandstone above and below. 113.7' - 114.9' - sandy red argillite with irregular fragments to 2" of white sandstone, some of which contain pebbles of green argillite. 114.9' - 115.6' - sandy green argillite with one ½" layer of white sandstone, and irregular red blobs. 115.6' - 116.9' - white sandstone, medium grained, few partings of green argillite. 116.9' - 117.0' - red argillite.
117' - 127'	11.0'	SANDSTONE and ARGILLITE 117.0' - 117.7' - greyish mottling in red argillite and one ½" layer of green argillite. 117.7' - 118.7' - red argillite with green blobs to ¾" and ½" layer of white sandstone. 118.9' - 124.4' - white sandstone, some free of green argillite at the top, but the rest has conspicuous green argillite partings and pebbles; 0.1' of red argillite at bottom. 124.4' - 125.7' - red argillite with ½" white sandstone layer and other sandy layers.

Company: Alcor Minerals Ltd.
Drill Hole No: 3

Property: Goble Option
Page 5

Interval	Recovery	Description
117' - 127' cont'd	11.0'	125.7' - 126.6' - white sandstone with 0.2' of red argillite at middle and other thinner layers of red argillite. 126.6' - 128.1' - red argillite with irregular layers to $1\frac{1}{2}$" of green argillite.
127' - 137'	10.4'	ARGILLITE and SANDSTONE 127.0' - 128.5' - uniform red argillite, with very sparse blobs of green. 128.5' - 130.6' - white sandstone with abundant partings, irregular layers and pebbles of red argillite; slickensides on some partings; one interval with pebbles of green argillite. 130.6' - 137.4' - red argillite with fissility at 60° - 70° to core axis; 0.2' layer of white sandstone at 134.0' and several layers to 0.1' of greenish grey argillite with irregular contacts interbedded with red argillite both above and below the white sandstone for 1.2'; irregular blobs of grey green argillite.
137' - 147'	3.5'	ARGILLITE, banded reddish and reddish grey, and siltstone; some sandy layers.
147' - 157'	9.4'	ARGILLITE, mostly 147.0' - 148.1' - red argillite with irregular green layers to 0.1' and smaller green spots. 148.1' - 148.8' - green argillite; white sandstone with green argillite pebbles and partings, and green argillite interlayered with sandstone. 148.8' - 152.0' - red argillite with white quartz grains for 0.4' at 149.4' and sparse spots to $\frac{1}{2}$" of green at 150.5' for $\frac{1}{2}$'. 152.0' - 153.0' - white sandstone and green argillite, interbedded and mixed.

Company: Alcor Minerals Ltd. Property: Goble Option
Drill Hole No: 3 Page 6

Interval	Recovery	Description
147' - 157' cont'd	9.4'	SAMPLE 1564 152.0' - 153.0' 1.0' 0.005% Cu 153.0' - 154.9' - red argillite with a few irregular green layers and blobs to ½". 154.9' - 156.5' - white sandstone and green argillite interbedded and mixed. SAMPLE 1565 154.9' - 156.5' 1.6' Trace Cu. 156.5 - 157.0' - red argillite
157' - 160'	3.8'	ARGILLITE and SANDSTONE 157.0' - 158.4' - red argillite with 2" layer of white sandstone with green argillite partings. 158.4' - 160.0' - white sandstone, some fine grained, well cemented, some with green argillite pebbles and partings. 160.0' - 160.9' - interbedded red and green argillite.
160' - 167'	7.5'	SANDSTONE and ARGILLITE 160.0' - 160.5' - red argillite. 160.5' - 164.2' - white sandstone, with green argillite in layers above and below; sandy argillite; green argillite partings. 164.2' - 164.7' - red argillite. 164.7' - 165.2' - white sandstone with green argillite layers and pebbles. 165.2' - 167.5' - red argillite with a few blobs of green, and a 0.2' layer of white sandstone about the middle with irregular white sandstone layers towards the top.
167' - 173'	5.3'	ARGILLITE, red, with layers to 0.3' of grey argillite or siltstone and sandstone with some green argillite.

Company: Alcor Minerals Ltd. Property: Goble Option
Drill Hole No: 3 Page 7

Interval	Recovery	Description
173' - 181'	9.0'	ARGILLITE, red, with layers to 0.3' of white sandstone with red argillite pebbles; some green argillite pebbles and $\frac{1}{2}$" layers; some red argillite mottled with greyish red; few green spots to $\frac{1}{2}$".
181' - 183'	2.0'	ARGILLITE, red, with 2" layer of green argillite at the top and a few green blobs.
183' - 193'	11.2'	ARGILLITE 183.0' - 184.0' - red argillite, $\frac{1}{4}$" sandstone layer, blobs of green argillite to $\frac{1}{2}$". 184.0' - 185.6' - red argillite, white sandstone, grey siltstones in irregular layers to 0.5', and thin green argillite layers. 185.6' - 190.9' - red argillite, with layers of grey siltstone to 0.5', and layers and irregular masses of green argillite to 1". 190.9' - 191.2' - white sandstone with 1" of green argillite below. 191.2' - 191.9' - red argillite with irregular green layers to $\frac{1}{4}$" and blobs; fissility at 45° to core axis. 191.9' - 193.0' - grey siltstone with layers to $\frac{1}{4}$" of red argillite and to $\frac{1}{2}$" of white sandstone. 193.0' - 194.2' - uniform red argillite.
193' - 197'	3.7'	ARGILLITE, red, interbedded with green argillite in bands to 6" and white sandstone in $\frac{3}{4}$" bands; contacts are generally irregular, laminations are wavy; green argillite is generally above or below white sandstone.
197' - 207'	10.8'	ARGILLITE 197.0' - 198.0' - interbanded red and green argillite with the green in layers to 2". 198.0' - 198.4' - mostly red argillite, mottled with grey. 198.4' - 201.0' - red argillite with 3 layers of green to $\frac{1}{2}$", and mottled with grey at 199.0'.

Company: Alcor Minerals Ltd.
Drill Hole No: 3

Property: Goble Option
Page 8

Interval	Recovery	Description
197' - 207' cont'd	10.8'	201.0' - 201.3' - white sandstone with red argillite pebbles underlain by 2" of green argillite. 201.3' - 207.8' - red argillite, some mottled greyish; 3" layers of green argillite, and sandy intervals to 0.4'; some red argillite is irregularly laminated, and contains pebbles of red argillite.
207' - 217'	10.0'	ARGILLITE, red and green, and grey siltstone, all with some mottling; white sandstone; as in previous interval.
217' - 227'	10.0'	ARGILLITE, red with irregular blobs of green; white sandstone; grey siltstone; as in previous interval.
227' - 237'	10.0'	ARGILLITE, red and green; grey siltstone; white sandstone; as in previous interval.
237' - 247'	10.0'	ARGILLITE, red and green; siltstone; sandstone; as in previous intervals.
247' - 254'	7.8'	ARGILLITE, mostly red, some green; grey siltstone; white sandstone; as in previous intervals.
254' - 267'	13.0'	ARGILLITE, siltstone, sandstone, as in previous intervals.
267' - 272'	5.0'	ARGILLITE, siltstone, sandstone, as in previous intervals.
272'		End of hole.

APPENDIX 5: CERTIFICATES OF ASSAY

A77

SHEET No. 1

FILE No. 320100/111

J. R. WILLIAMS & SON LTD.

MUTUAL 5-5821

PROVINCIAL ASSAYERS

580 NELSON STREET

VANCOUVER 2. B.C. October 15th 1969

RESULTS of Assays made on samples of ore submitted by: MESSRS. L. B. HALFERDAHL & ASSOCS.

MARK		Copper %
13317	$6\frac{1}{2}$' sill, Yarrow	0.22
3634	4.2' ss bed, Spionkop	0.21
3635	6.5' ss bed, Spionkop	0.18
3636	8.3' sill, Spionkop	0.13
3637	5.5' ss bed, Spionkop	0.62
3638	5.5' ss bed, Spionkop	0.21
3639	grab sample - 6" bed, Whistler	5.28
3640	grab sample - 2" bed, Whistler	1.97
3641	grab sample - 3" bed, Whistler	1.02
3642	grab sample - 4" bed, Whistler	0.78
3643	grab sample - Grizzly	0.36
3644	grab sample - Grizzly	0.46

Assays made by: [redacted]

To: ALCOR MINERALS LTD.
c/o L. B. Halferdahl & Associates,
401 - Northgate Bldg.,
10049 Jasper Ave.,
Edmonton 15, Alberta.

File No. 3558
Date November 16th 1970
Samples Core

Certificate of ASSAY
LORING LABORATORIES LTD.

SAMPLE No.	OZ./TON SILVER	Cu %	Spionkop
1551	---	.005	DDH #1 66.8' - 67.2'
1552	---	.005	DDH #1 67.2' - 68.6'
1553	---	.005	DDH #1 68.6' - 69.3'
1554	.22	1.09	DDH #1 69.3' - 70.9'
1555	---	.01	DDH #1 70.9' - 71.6'
1556	---	.04	DDH #1 90.3' - 92.5'
1557	---	.02	DDH #1 92.5' - 94.0'
1558	---	.01	DDH #1 94.0' - 97.0'
1559	.02	.11	DDH #1 106.0' - 108.3'
1560	.02	.005	DDH #1 111.0' - 112.3'
1561	---	.01	DDH #2 37.5' - 38.5'
1562	---	.16	DDH #2 38.5' - 41.4'
1563	---	.15	DDH #2 42.0' - 46.1'
1564	---	.005	DDH #3 152.0' - 153.0'
1565	---	Trace	DDH #3 154.9' - 156.5'

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.
Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

A79

To: L.B. HALFERDAHL & ASSOCIATES LTD.
401 Northgate Bldg.
10049 Jasper Ave
Edmonton 15, Alberta

File No. 3577
Date November 20th 1970
Samples Grab

Certificate of
ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	OZ./TON SILVER	Cu %	Spionkop
1566	.40	.24	Sill on W side
1567	---	.82	Sill - upper part
1568	---	.11	Sill - lower part
1569	Trace	.04	Parking Lot Sill - upper part
1570	Trace	.04	Parking Lot Sill - lower part

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]

Licensed Assayer of British Columbia

To: L. B. HALFERDAHL & ASSOCIATES LTD.
401 Northgate Bldg.,
10049 Jasper Ave.,
Edmonton 15, Alberta.

File No. 3805
Date February 10th 1971
Samples Grab

Certificate of ASSAY
LORING LABORATORIES LTD.

SAMPLE No.		Cu %	Pb %	Zn %
6071	Grab sample, occurrence '25	1.31	---	---
6072	Grab sample, occurrence '26	.26	---	---
6073	Grab sample, occurrence '32	.70	---	---
6074	Grab sample, occurrence '31	.43	---	---
6075	Grab sample, occurrence '11	.01	Trace	Trace

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.
Pulps Retained one month
unless specific arrangements
made in advance.

[redacted]
Licensed Assayer of British Columbia

APPENDIX 6: FIELD CREW AND FIELD TIME

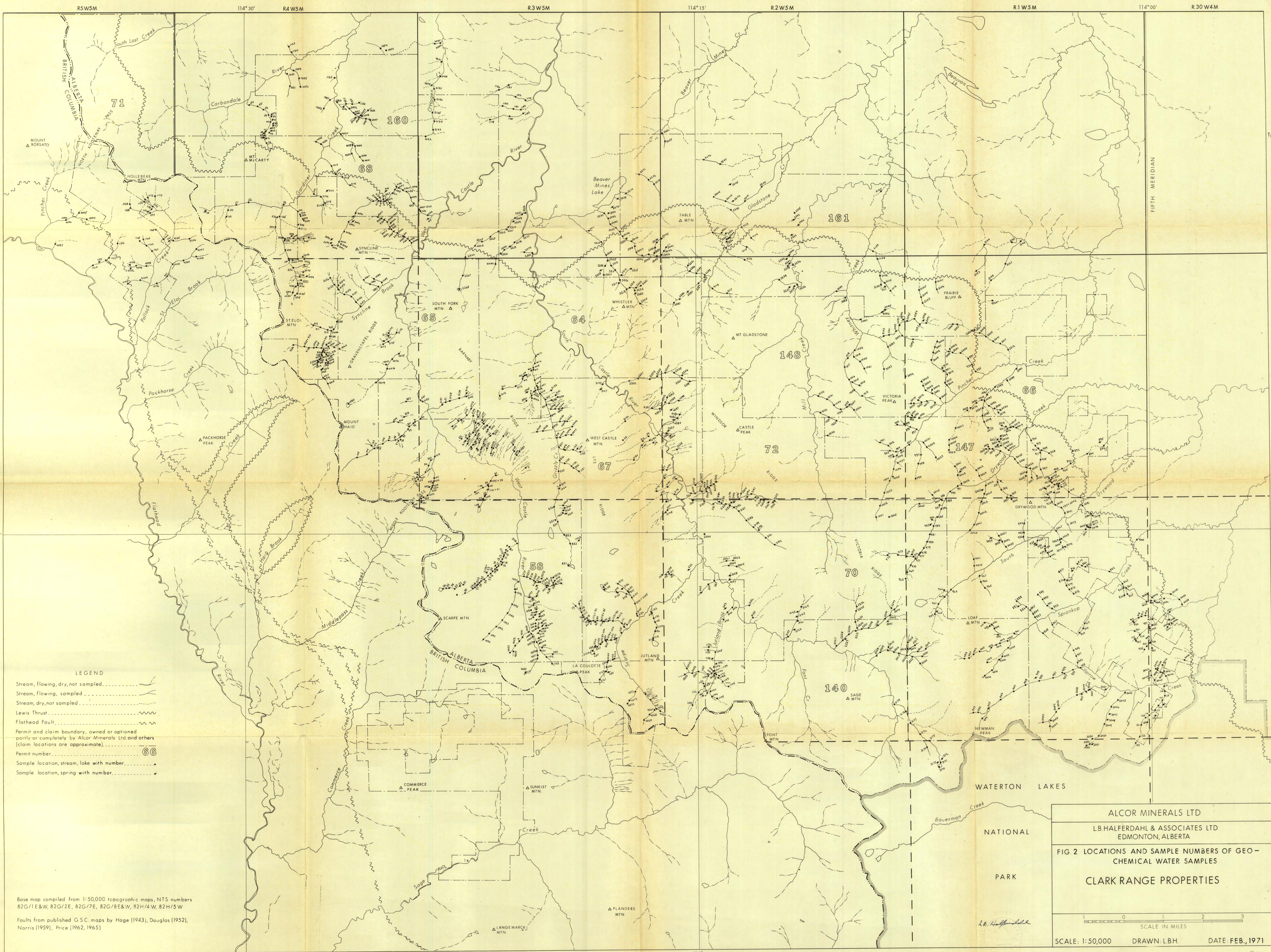
FIELD CREW

M. Barcelo	Water Sampler	September 11 - October 8
L. Bawel	Water Sampler	September 11 - October 29
J. Card	Prospector	June 25 - July 23, July 27 - September 5, September 9 - 12
D. Danyluk	Prospector	June 24 - July 23, July 29 - August 2
J. Duthie	Cook	June 24 - October 29
J. Gorham	Prospector	June 25 - July 23, July 29 - September 2
L. Halferdahl	Geologist	June 25 - July 7, July 11, July 19 - 23, July 27 - 28, August 8 - 14, August 24 - 28, August 30 - September 5, September 11 - October 1 October 7 - 8, October 13 - 17, October 22 - 29
F. Hewko	Technician	June 24 - 28
G. Hildebrandt	Prospector	June 24 - July 23, July 29 - September 5
D. Jackson	Water Sampler	September 22 - October 27
M. Judd	Prospector	June 29 - August 15
T. Judd	Water Sampler	September 8 - October 29
A. Kahil	Geologist	June 24 - July 19 July 27 - September 9
F. Nicholls	Water Sampler	September 27 - October 29
J. Plummer	Prospector	July 27 - July 28
B. Redpath	Water Sampler	September 10 - October 29
G. Russell	Prospector and Water Sampler	July 3 - October 27
W. Stadnyczuk	Water Sampler	September 11 - October 27
M. Zander	Prospector	June 24 - July 23 July 29 - September 5

FIELD TIME

In the summary below the field time has been divided into three divisions: geological work and administration, camp work and travelling, and days off. The first can be considered productive work; the second is necessary work including moving camp, vehicle problems as well as cooking and camp chores; the third includes time off because of bad weather and the break at the end of July. The time of the drillers on the Spionkop Showing is not included.

	Geological Work Administration		Camp Work Travelling		Time Off		Total	
	Days	%	Days	%	Days	%	Days	%
June 24 - 30	21	35	32	53½	7	11½	60	100
July 1 - 31	172	59	70	24	49	17	291	100
August 1 - 31	165	67	51½	21	29½	12	246	100
September 1 - 30	139	60½	69½	30	21½	9½	230	100
October 1 - 29	127	51	66	26	57	23	250	100
Total	624	58	289	27	164	15	1077	100


ALCOR MINERALS LTD
L.B. HALFERDAHL & ASSOCIATES LTD
EDMONTON, ALBERTA
FIG. 2 LOCATIONS AND SAMPLE NUMBERS OF GEO-CHEMICAL WATER SAMPLES
CLARK RANGE PROPERTIES
SCALE: 1:50,000
DRAWN: L.B.H.
DATE: FEB., 1971
SCALE IN MILES
LEGEND
Stream, flowing, dry, not sampled
Stream, flowing, sampled
Stream, dry, not sampled
Lewis Thrust
Flathead Fault
Permit and claim boundary, owned or optioned partly or completely by Alcor Minerals Ltd. and others (claim locations are approximate)
Permit number
66
Sample location, stream, lake with number
Sample location, spring with number
Base map compiled from 1:50,000 topographic maps, NTS numbers 82G/1 E&W, 82G/2E, 82G/7E, 82G/8E&W, 82H/4 W, 82H/5 W
Faults from published G.S.C. maps by Hage (1943), Douglas (1952), Norris (1959), Price (1962, 1965)
R5W5M
R4W5M
R3W5M
R2W5M
R1W5M
R30W4M
114°30'
114°15'
114°00'
49°15'
Tp.5
Tp.4
Tp.3
Tp.2
FIFTH MERIDIAN
ALBERTA
BRITISH COLUMBIA
WATERTON LAKES
NATIONAL
PARK
MOUNT BORSATO
HOLLEBEKE MTN
MT McCARTY
SYNCLINE MTN
ST. ELOI MTN
MOUNT HAIG
PACKHORSE PEAK
SOUTH FORK MTN
WHISTLER MTN
TABLE MTN
MT GLADSTONE
PRAIRIE BLUFF
VICTORIA PEAK
CASTLE PEAK
WEST CASTLE MTN
DRYWOOD MTN
SCARPE MTN
LA COULOTTE PEAK
JUTLAND MTN
SAGE MTN
FONT MTN
LOAF MTN
NEWMAN PEAK
COMMERCE PEAK
SUNKIST MTN
FLANDERS MTN
LANGEMARCK MTN
Beaver Mines Lake
Beauvais L.
160
161
68
71
65
64
148
66
147
72
67
58
70
140
Carbondale
South Lost Creek
Castle River
Gladstone
Syncline Brook
Pincher Creek
Packhorse Creek
Flathead
Middlepass Creek
Commerce Creek
Sage Creek
Bauerman Creek
Drywood Creek
Spionkop
Haig Brook
Pollock
St. Eloi Brook
1972/0002


R5W5M
114°30'
R4W5M
R3W5M
114°15'
R2W5M
R1W5M
114°00'
R30W4M
Tp.5
Tp.4
Tp.3
Tp.2
49°15'
FIFTH MERIDIAN
ALBERTA
BRITISH COLUMBIA
71
160
68
161
65
64
148
66
72
147
67
58
70
140
South Lost Creek
Carbondale
River
Castle River
Beaver Mines Lake
Gladstone Cr.
MOUNT BORSATO
MT McCARTY
HOLLEBEKE MTN
SYNCLINE MTN
TABLE MTN
SOUTH FORK MTN
WHISTLER MTN
PRAIRIE BLUFF
ST. ELOI MTN
MT GLADSTONE
VICTORIA PEAK
MOUNT HAIG
PACKHORSE PEAK
WEST CASTLE MTN
CASTLE PEAK
DRYWOOD MTN
SCARPE MTN
LA COULOTTE PEAK
JUTLAND MTN
LOAF MTN
SAGE MTN
FONT MTN
NEWMAN PEAK
COMMERCE PEAK
SUNKIST MTN
FLANDERS MTN
LANGEMARCK MTN
Pincher Creek
Pollock
St. Eloi Brook
Syncline Brook
Packhorse Creek
Cate Creek
Flathead
Haig Brook
Middlepass Creek
West Castle River
Grizzly Cr.
South Castle River
Drywood Creek
Pincher Creek
Spionkop
Yarrow Creek
Jutland Brook
Font Cr.
Commerce Creek
Sage Creek
Bauerman Creek
VICTORIA RIDGE
WINDSOR RIDGE
BARNABY RIDGE
GRAVENSTAFEL RIDGE
WATERTON LAKES
NATIONAL
PARK
LEGEND
Stream, flowing, dry, not sampled
Stream, flowing, sampled
Stream, dry, not sampled
Lewis Thrust
Flathead Fault
Permit and claim boundary, owned or optioned partly or completely by Alcor Minerals Ltd. and others (claim locations are approximate)
Permit number 66
Sample location, stream, lake
Sample location, spring
Background <18 ppb - location sample only
Slightly anomalous 18 to 27 ppb
Anomalous >27 ppb
concentration in ppb
Direction of increase to high background analyses
Base map compiled from 1:50,000 topographic maps, NTS numbers 82G/1E&W, 82G/2E, 82G/7E, 82G/8E&W, 82H/4W, 82H/5W
Faults from published G.S.C. maps by Hage (1943), Douglas (1952), Norris (1959), Price (1962, 1965)
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FIG.6 COPPER CONCENTRATIONS IN STREAM, SPRING AND LAKE WATERS
CLARK RANGE PROPERTIES
SCALE IN MILES
SCALE: 1:50,000
DRAWN: L.B.H.
DATE: FEB., 1971
19710002

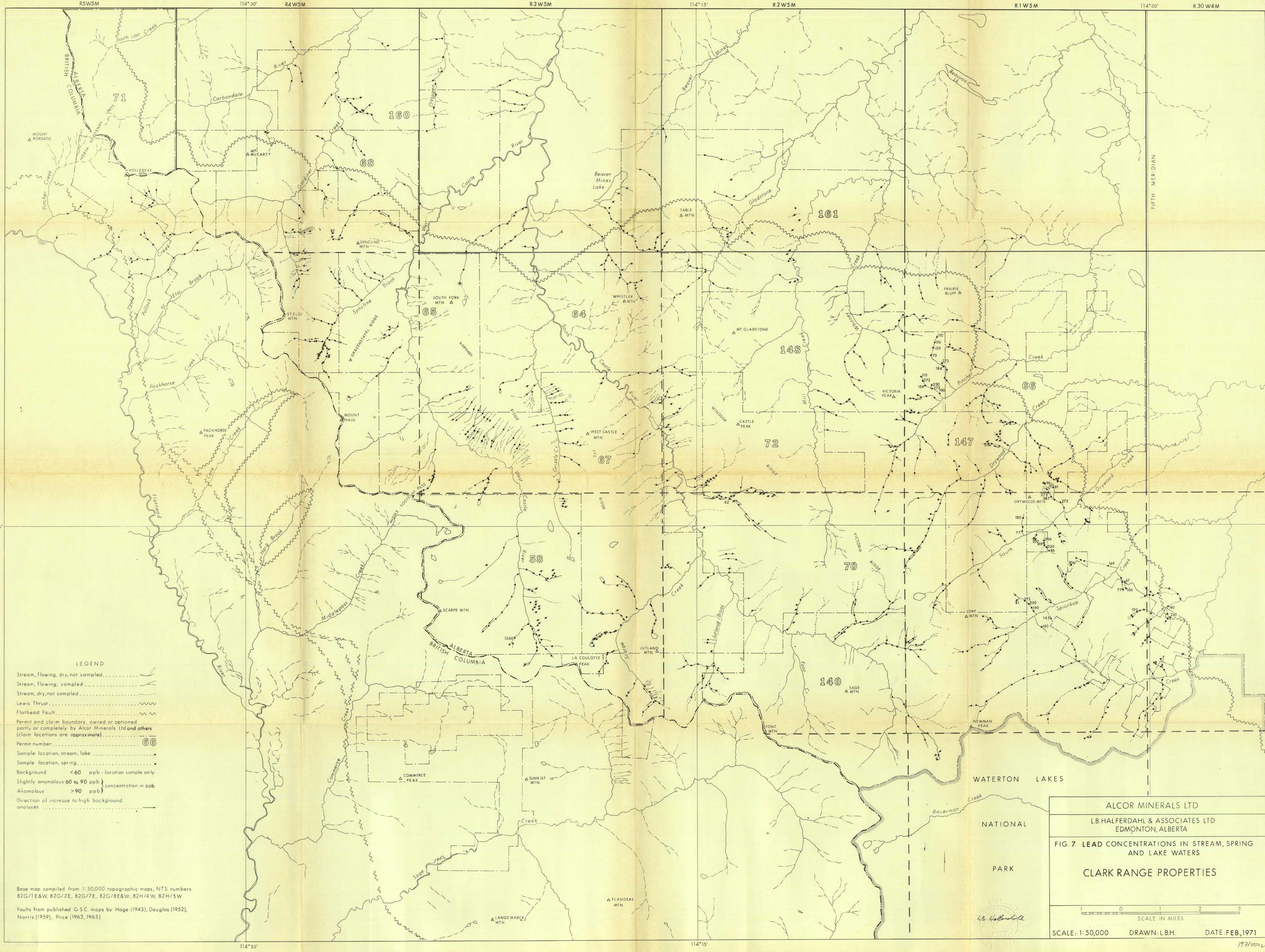
R5W5M
114°30'
R4W5M
R3W5M
114°15'
R2W5M
R1W5M
114°00'
R.30W4M
Tp.5
Tp.4
49°15'
Tp.3
Tp.2
FIFTH MERIDIAN
ALBERTA
BRITISH COLUMBIA
71
160
68
161
65
64
148
66
67
72
147
58
70
140
MOUNT BORSATO
MT McCARTY
HOLLEBEKE MTN
SYNCLINE MTN
SOUTH FORK MTN
WHISTLER MTN
TABLE MTN
MT GLADSTONE
PRAIRIE BLUFF
VICTORIA PEAK
ST ELOI MTN
MOUNT HAIG
PACKHORSE PEAK
WEST CASTLE MTN
CASTLE PEAK
DRYWOOD MTN
SCARPE MTN
JUTLAND MTN
LA COULOTTE PEAK
SAGE MTN
LOAF MTN
NEWMAN PEAK
FONT MTN
COMMERCE PEAK
SUNKIST MTN
FLANDERS MTN
LANGEMARCK MTN
Beaver Mines Lake
Beauvais Lake
Castle River
Carbondale River
South Lost Creek
Gardiner Creek
Gladstone Cr.
Beaver Mines Cr.
Pincher Creek
Drywood Creek
Spionkop
Yarrow Creek
Flathead River
Sage Creek
Commerce Creek
Middlepass Creek
Haig Brook
Packhorse Creek
Syncline Brook
Pollock
St. Eloi Brook
West Castle River
Grizzly Cr.
Font Cr.
Jutland Brook
Bauerman Creek
GRAVENSTAFEL RIDGE
WINDSOR RIDGE
VICTORIA RIDGE
WATERTON LAKES NATIONAL PARK
LEGEND
Stream, flowing, dry, not sampled
Stream, flowing, sampled
Stream, dry, not sampled
Lewis Thrust
Flathead Fault
Permit and claim boundary, owned or optioned partly or completely by Alcor Minerals Ltd. and others (claim locations are approximate)
Permit number 66
Sample location, stream, lake
Sample location, spring
Background <60 ppb - location sample only
Slightly anomalous 60 to 90 ppb
Anomalous >90 ppb
concentration in ppb
Direction of increase to high background analyses
Base map compiled from 1:50,000 topographic maps, NTS numbers 82G/1E&W, 82G/2E, 82G/7E, 82G/8E&W, 82H/4W, 82H/5W
Faults from published G.S.C. maps by Hage (1943), Douglas (1952), Norris (1959), Price (1962, 1965)
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FIG. 7. LEAD CONCENTRATIONS IN STREAM, SPRING AND LAKE WATERS
CLARK RANGE PROPERTIES
1 0 1 2 3
SCALE IN MILES
SCALE: 1:50,000
DRAWN: L.B.H.
DATE: FEB., 1971
1971/0002

R5W5M
R4W5M
R3W5M
R2W5M
R.1W5M
R30W4M
114°30'
114°15'
114°00'
49°15'
Tp.5
Tp.4
Tp.3
Tp.2
FIFTH MERIDIAN
ALBERTA
BRITISH COLUMBIA
WATERTON LAKES
NATIONAL
PARK
MOUNT BORSATO
HOLLEBEKE MTN
MT McCARTY
SYNCLINE MTN
SOUTH FORK MTN
WHISTLER MTN
TABLE MTN
PRAIRIE BLUFF
MT GLADSTONE
VICTORIA PEAK
CASTLE PEAK
WEST CASTLE MTN
ST.ELOI MTN
GRAVENSTAFEL RIDGE
MOUNT HAIG
PACKHORSE PEAK
DRYWOOD MTN
SCARPE MTN.
LA COULOTTE PEAK
JUTLAND MTN
SAGE MTN
LOAF MTN
NEWMAN PEAK
FONT MTN
COMMERCE PEAK
SUNKIST MTN.
FLANDERS MTN
LANGEMARCK MTN
Beaver Mines Lake
Carbondale
Castle River
Flathead
Pincher Creek
Gladstone
Drywood Creek
Spionkop
South
Sage Creek
Bauerman Creek
71
160
68
65
64
161
148
66
147
72
67
58
70
140
LEGEND
Stream, flowing, dry, not sampled
Stream, flowing, sampled
Stream, dry, not sampled
Lewis Thrust
Flathead Fault
Permit and claim boundary, owned or optioned partly or completely by Alcor Minerals Ltd and others (claim locations are approximate)
Permit number
66
Sample location, stream, lake
Sample location, spring
Background <65 ppb - location sample only
Slightly anomalous 65 to 120 ppb
Anomalous >120 ppb
concentration in ppb
Direction of increase to high background analyses
Base map compiled from 1:50,000 topographic maps, NTS numbers 82G/1E&W, 82G/2E, 82G/7E, 82G/8E&W, 82H/4W, 82H/5W
Faults from published G.S.C. maps by Hage (1943), Douglas (1952), Norris (1959), Price (1962, 1965)
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FIG.8 ZINC CONCENTRATIONS IN STREAM, SPRING AND LAKE WATERS
CLARK RANGE PROPERTIES
1 0 1 2 3
SCALE IN MILES
SCALE: 1:50,000
DRAWN: L.B.H.
DATE: FEB., 1971
1971000?


R5W5M
114°30'
R4W5M
R3W5M
114°15'
R2W5M
R1W5M
114°00'
R30W4M
49°25'
49°20'
49°15'
49°10'
Tp. 5
Tp. 4
Tp. 3
Tp. 2
71
160
68
161
65
64
148
66
72
147
67
58
70
140
Castle River
Gladstone Creek
Pincher Creek
WHISTLER MTN.
Drywood Creek
South Drywood Creek
DRYWOOD MTN.
VICTORIA RIDGE
Castle River
Bovin Lake
MT. GLENOWAN
COMMERCE PEAK
Sage Creek
Flathead River
LEGEND
Formation
Roosville .... R
Phillips .... Ph
Upper Gateway .... uG
Lower Gateway .... lG
Sheppard .... Sh
Purcell lava .... P
Siyeh .... S
Grinnell .... Gr
Appekunny .... Ap
Altyn .... A
Waterton .... W
Lewis Thrust
Flathead Fault
Fault, minor
Anticline
Syncline
Strike and dip .... 20°
Sill, dyke
Permit and claim boundary, owned or optioned by Alcor Minerals Ltd. and others (claim locations are approximate)
Permit number 64
Stream
Traverse with number H-14
Copper occurrence with number in appendix (Alcor, 1970) 9
Copper occurrence (previously reported)
Base map compiled from 1:50,000 topographic maps, NTS numbers 82G/1E&W, 82G/2E, 82G/7E, 82G/8E&W, 82H/4W, 82H/5W
Faults, Grinnell and Upper Gateway Formations modified from published G.S.C. maps by Hage (1943), Douglas (1952), Norris (1959), Price (1962, 1965)
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FIG. 11 TRAVERSES AND MINERAL OCCURRENCES
CLARK RANGE PROPERTIES
SCALE IN MILES
SCALE: 1:50,000
DRAWN: L.B.H.
DATE: FEB, 1971
L.B. Halferdahl
1971-0002

LEGEND

Dy / Sl — Basic intrusive dyke / sill

Ss — Sandstone, quartzite

Ar — Argillite

Thin bed, sill

Copper mineralization in thin sandstone beds, sills

Sample, % copper – true length in ft.-oz. silver ..... 0.24-1.5'-0.40

Lithological boundary, sandstone with minor argillite to the south; argillite with minor sandstone to the north

Strike and dip ..... 18°

Drill hole with number 2

Contour (20-ft. interval) 6320

Road, trench

Map based on tape and compass measurements supplemented by altimeter readings.

Area mapped is in Sec. 24, Tp. 3, R. 1, W5 Mer., Alberta.

Geology and contours by A. Kahil, July, 1970.

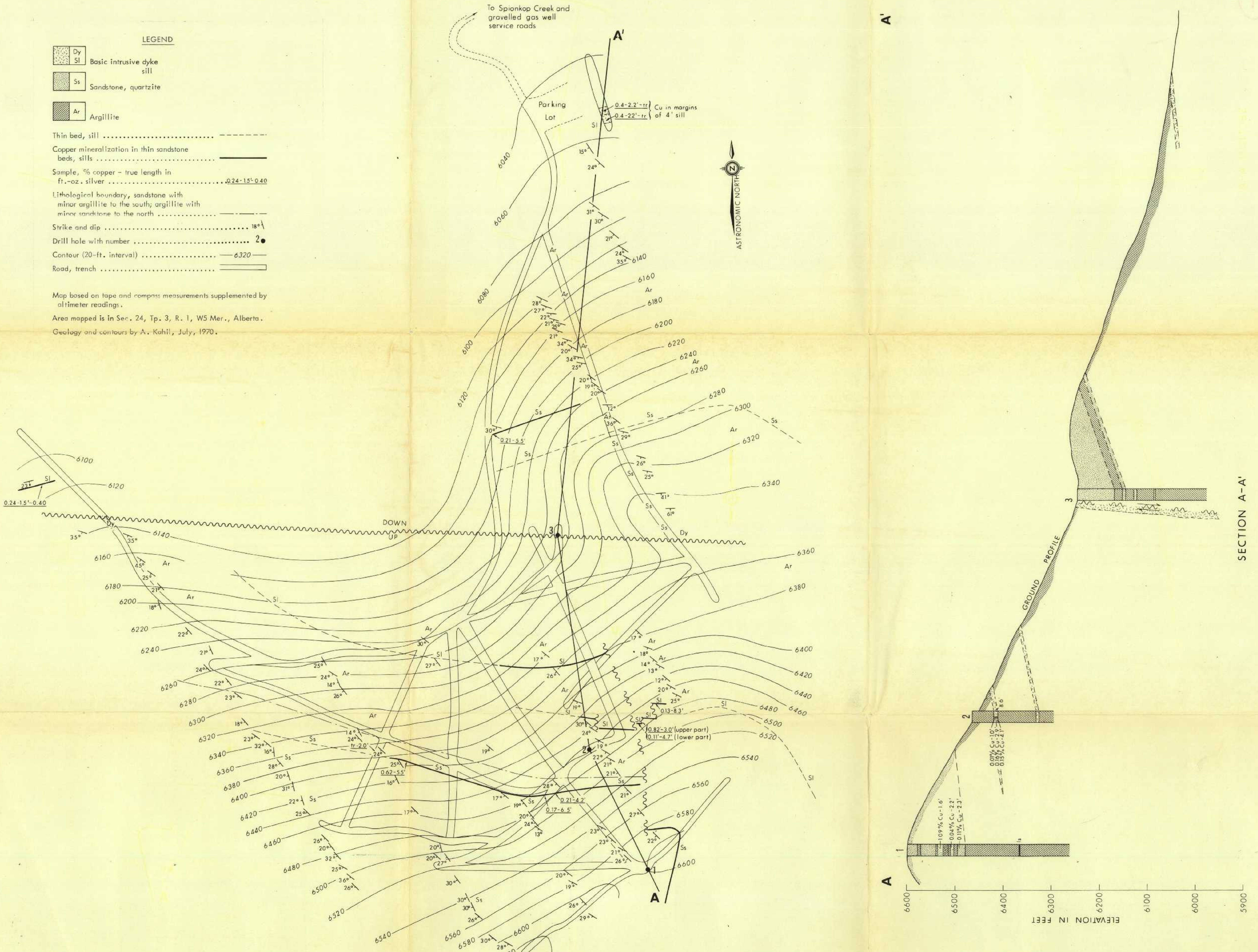

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FIG 12 GEOLOGY, MINERALIZATION & TOPOGRAPHY

SPIONKOP SHOWING

L.B. Halferdahl

100 0 100 200 300
SCALE IN FEET

SCALE: 1in.= 100ft DRAWN: L.B.H DATE. FEB, 1971

19710002