Bureau of Mines
Report of Investigations 4669

INVESTIGATION OF TAYLOR CREEK LEAD-ZINC DEPOSIT, KUPREANOF ISLAND PETERSBURG, ALASKA

BY W. H. KERNS

United States Department of the Interior —— March 1950

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UNITED STATES DEPARTMENT OF THE INTERIOR
Oscar L. Chapman, Secretary
BUREAU OF MINES
James Boyd, Director

March 1950

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by

W. H. Kerns[1/]

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ILLUSTRATIONS

1/ Mining engineer, Bureau of Mines, Juneau, Alaska.

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INTRODUCTION AND SUMMARY

The Taylor Creek lead-zinc deposit is on Taylor Creek, approximately 1-1/2 miles from tidewater, at the head of Duncan Canal, on the east side of Kupreanof Island, Petersburg district, southeastern Alaska.

The property was located in 1903, and a 30-foot discovery cut was put into the west bank of the creek. Very little prospecting and developing has been done since that time.

The property was examined by J. C. Roehm, associate mining engineer, Territorial Department of Mines, Juneau, Alaska, in June 1946. From exposure in the creek, a mineralized zone with possible dimensions of 1,700 feet by 1,000 feet was indicated. The general strike was northwest, and the dip was low and variable to the northeast.

During September through November 1948, the Bureau of Mines conducted a diamond-drilling project on the property. Four diamond-drill holes, totaling 770.5 linear feet, were drilled from the surface and 280 lineal feet of hand trenching done.

The mineral deposit was found to occur as patches that appear to be a replacement in dolomitic limestone. The patches of mineralization are small, irregularly shaped, and irregularly distributed.

Maps showing the location of the drill holes and trenches, analyses of the cores from the drill holes, and analyses of the samples from the trenches accompany this report (see, also, appendixes A, B, and C).

ACKNOWLEDGMENTS

Field investigations were made by the Bureau of Mines under the general direction of G. D. Jermain, chief, Alaska Branch, former Mining Division. Analyses were made at the Intermountain Experiment Station, U. S. Bureau of Mines, Salt Lake City, Utah.

Special mention is made of the co-operation and assistance received from W. S. Twenhofel, geologist, U. S. Geological Survey.

The many courtesies received from the owners, O. P. Schoonover and G. P. Beckett, also are acknowledged.

LOCATION AND ACCESSIBILITY

The position of the Taylor Creek lead-zinc deposit is shown on the sketch map of southeastern Alaska (fig. 1). It is situated at latitude 56 degrees

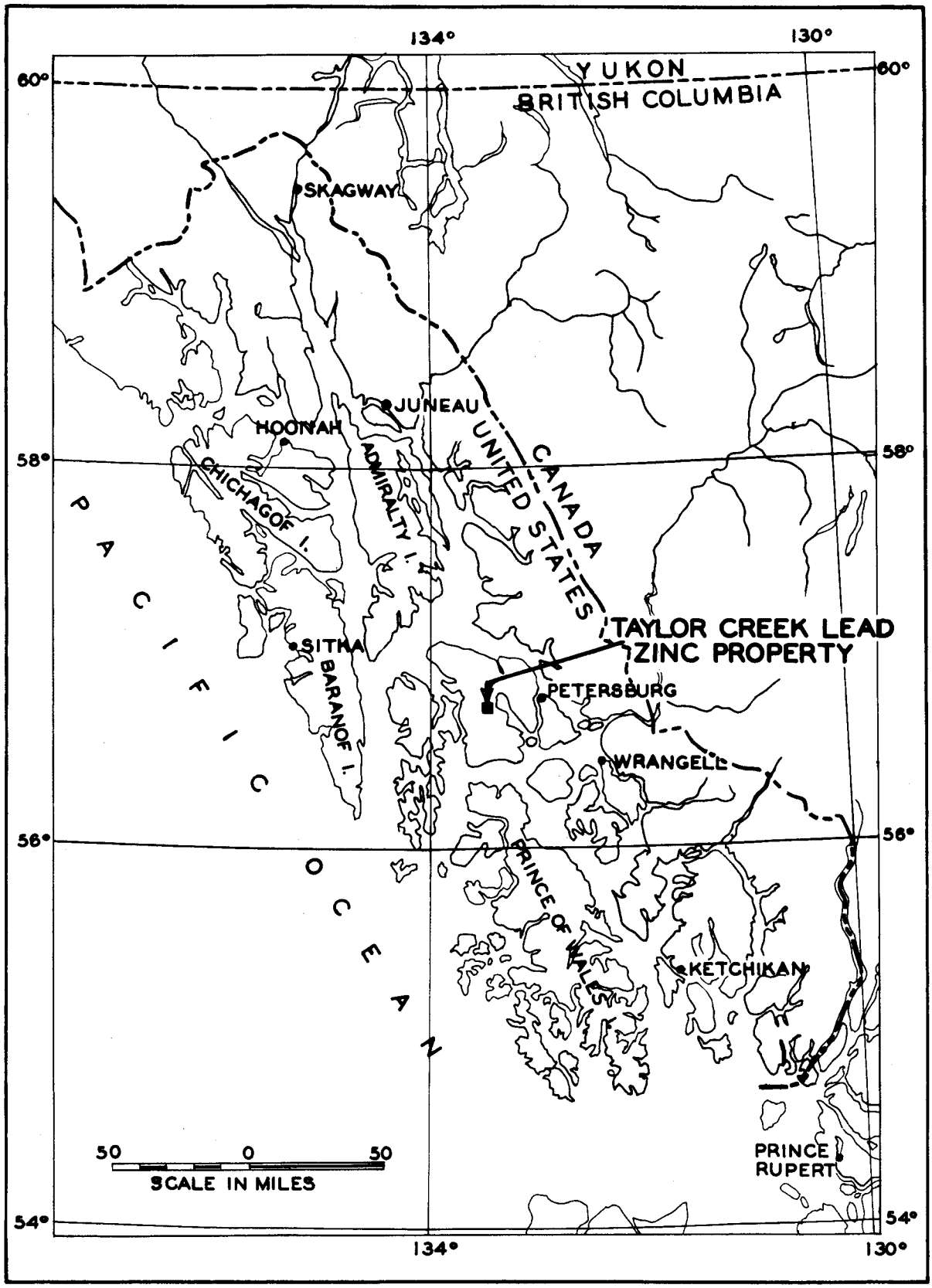


Figure 1. - Sketch map of southeastern Alaska showing location of Taylor Creek lead zinc property.

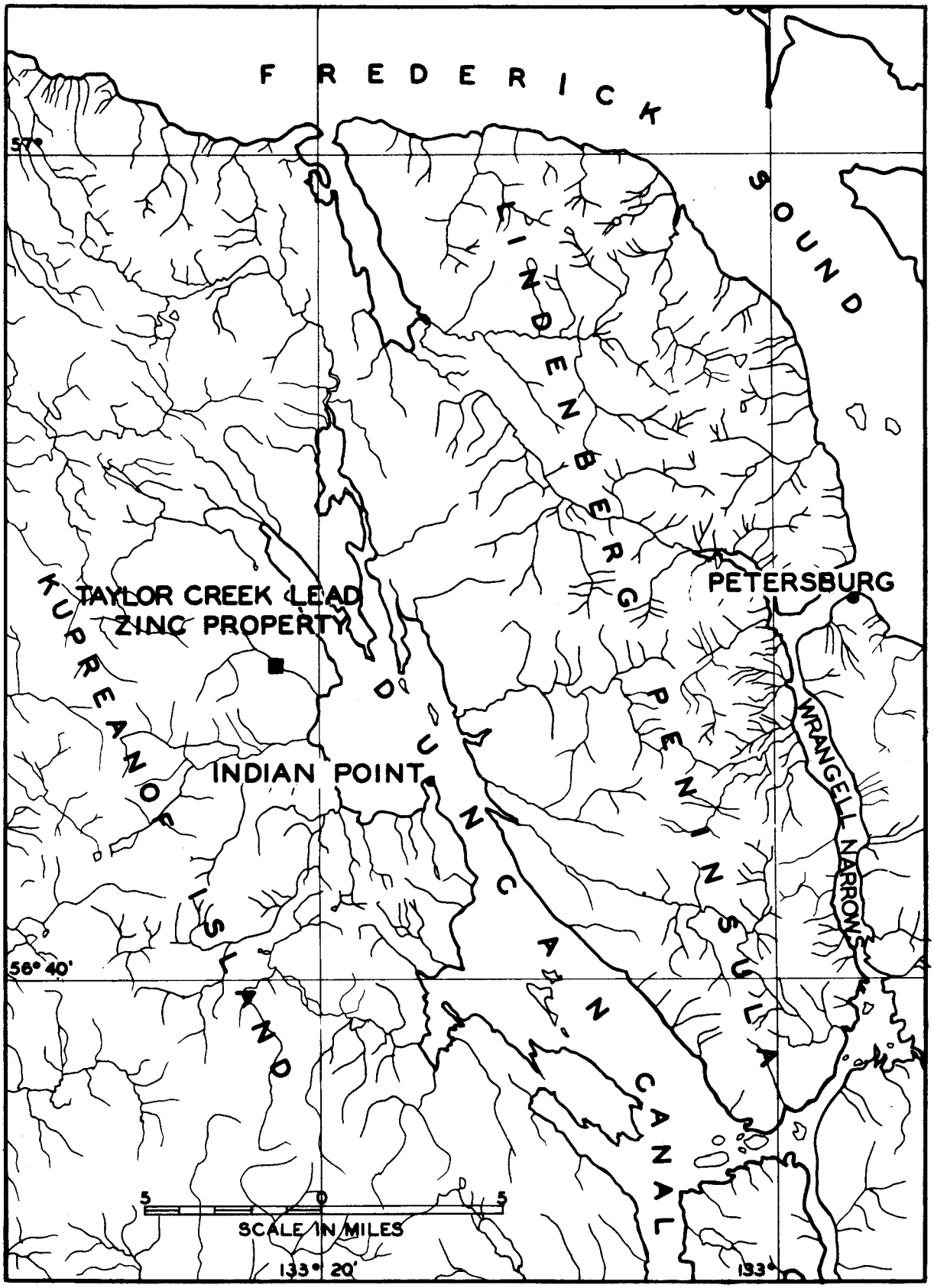


Figure 2. - Sketch map of Duncan Canal and vicinity.

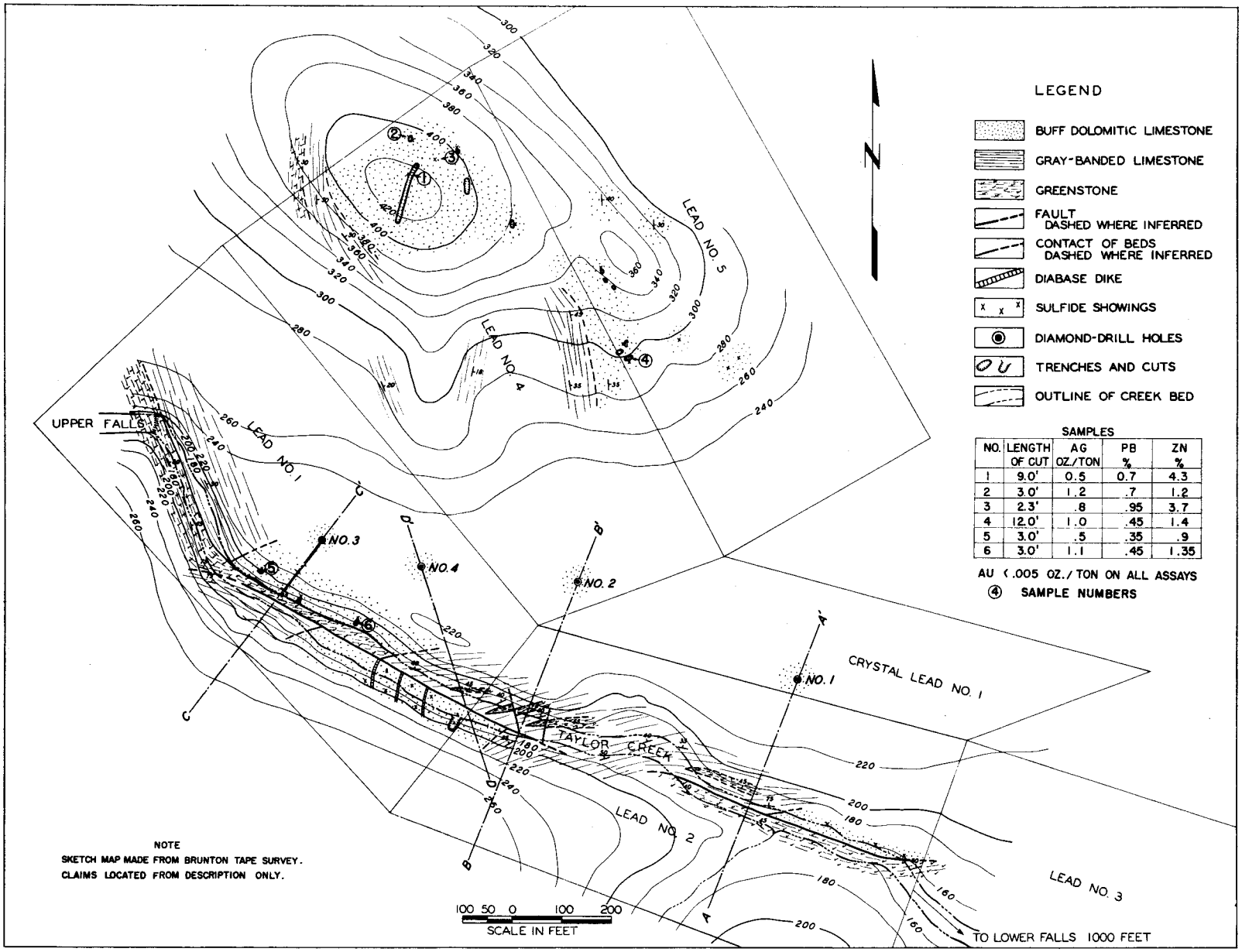


Figure 3. - Topographic and geologic map showing location of diamond-drill holes and trenches.

47 minutes 30 seconds N. and longitude 133 degrees 21 minutes 30 seconds W., at elevations of 150 to 435 feet, near the head of Duncan Canal on the east side of Kupreanof Island, southeastern Alaska. The property is about 16 air-line miles west of Petersburg, Alaska (fig. 2). It is on Taylor Creek, approximately 1-1/2 miles from tidewater of Duncan Canal, which is navigable by barges and shallow-draft boats at high tide (fig. 3). Taylor Creek is navigable by skiff and barge on high tide for 1/2 mile from Duncan Canal. A trail 1-1/2 miles long was built from this point to the property.

There are no boat schedules for this vicinity from Petersburg, the nearest source of supply. Petersburg is on the regular steamship lane of the Inside Passage. Boats can be chartered at Petersburg for transporting supplies to Taylor Creek. This is approximately a 40-mile run via Wrangell Narrows, Beechers Pass, and Duncan Canal, and takes 4 to 5 hours each way (fig. 2). All supplies must be landed by boat at Indian Point and transported by skiff or barge at high tide over the 4 miles of mud flats to Taylor Creek. Planes can be chartered at Petersburg, and supplies can be landed at Indian Point at low tide or at Taylor Creek at high tide. This is a 15-minute (flying time) run from Petersburg to Taylor Creek.

A C.A.A. station at Indian Point offers good radio communication to Petersburg.

PHYSICAL FEATURES AND CLIMATE

The Taylor Creek deposit is on a small creek of low gradient that drops about 20 feet in the 4,500-foot length of the property on the creek. The banks of the creek are steep, ranging from 40 to 50 degrees. The top of the bank is about 60 feet above the creek level. The property is bounded on both ends by water falls in the creek each of which drops about 25 feet. The surrounding country is low rolling hills and muskeg flats. The elevation of the creek on the property is 155 to 175 feet. The highest elevation on the property is on the small knoll, which attains 435 feet.

The property is thickly timbered with spruce, hemlock, and yellow cedar of good size and quality for use as mine timbers and lumber for camp buildings. There are many windfalls in the timbered areas, which make getting around very difficult. Except for the muskeg flats, the area is covered by a dense undergrowth of vegetation.

The creek contains enough water for mining and camp use, except in extremely cold winters, when it freezes over.

Climate in this area is similar to that of Petersburg, Alaska. The winters are generally mild and the summers cool, and the annual precipitation is about 110 inches. About 120 inches of snow falls from November to April. Operations could continue the year around without too much difficulty.

HISTORY AND PRODUCTION

The property was originally located in 1903, when R. J. Walker and G. L. Kiss located two claims. They located six additional claims in 1904. In 1912,

three claims were relocated on the property by J. G. Heid. In 1948, the property consisted of six claims located in 1946 - Lead Nos. 1, 2, 3, 4, and 5, held by O. P. Schoonover, and Crystal Lead No. 1 held by G. P. Beckett.

The property was examined by R. C. Roehm, associate mining engineer, Territorial Department of Mines, Juneau, Alaska, in June 1946. From exposures in the creek, a mineralized zone with possible dimensions 1,700 by 1,000 feet was indicated. The general strike was northwest, and the dip was low and variable to the northeast.

The only work done on the property is a 30-foot discovery cut on the west bank of the creek by the original locators and a few scattered pits by the present owners.

No production has been made from the property.

GENERAL GEOLOGY

The rocks of Duncan Canal comprise the core of the Duncan anticlinorium[2], which separates the Mesozoic rocks to the northeast from the Mesozoic and Tertiary rocks to the southwest. Buddington[3] has mapped all the Duncan Canal as Devonian and states that the rocks are comprised of three major rock units: (1) volcanic rocks; (2) massive limestone and slate with intercalated beds of chert and chloritic and hornblende schists; and (3) dark slate and dark chert. The slate and chert series appears to underlie the limestone-slate series, and the volcanic rocks occupy synclinal troughs in the limestone-slate series. Fossils from limestone-slate series in the west and middle arms of Duncan Canal are identified as Middle Devonian age.[4]

The mineral deposit at Taylor Creek is within the limestone-slate series of rocks. Presumably, the chlorite schist (greenstone) in the vicinity of the deposit represents a member of the intercalated chloritic schists that are contained within the limestone-slate series of rocks.

DEPOSITS AND OCCURRENCE

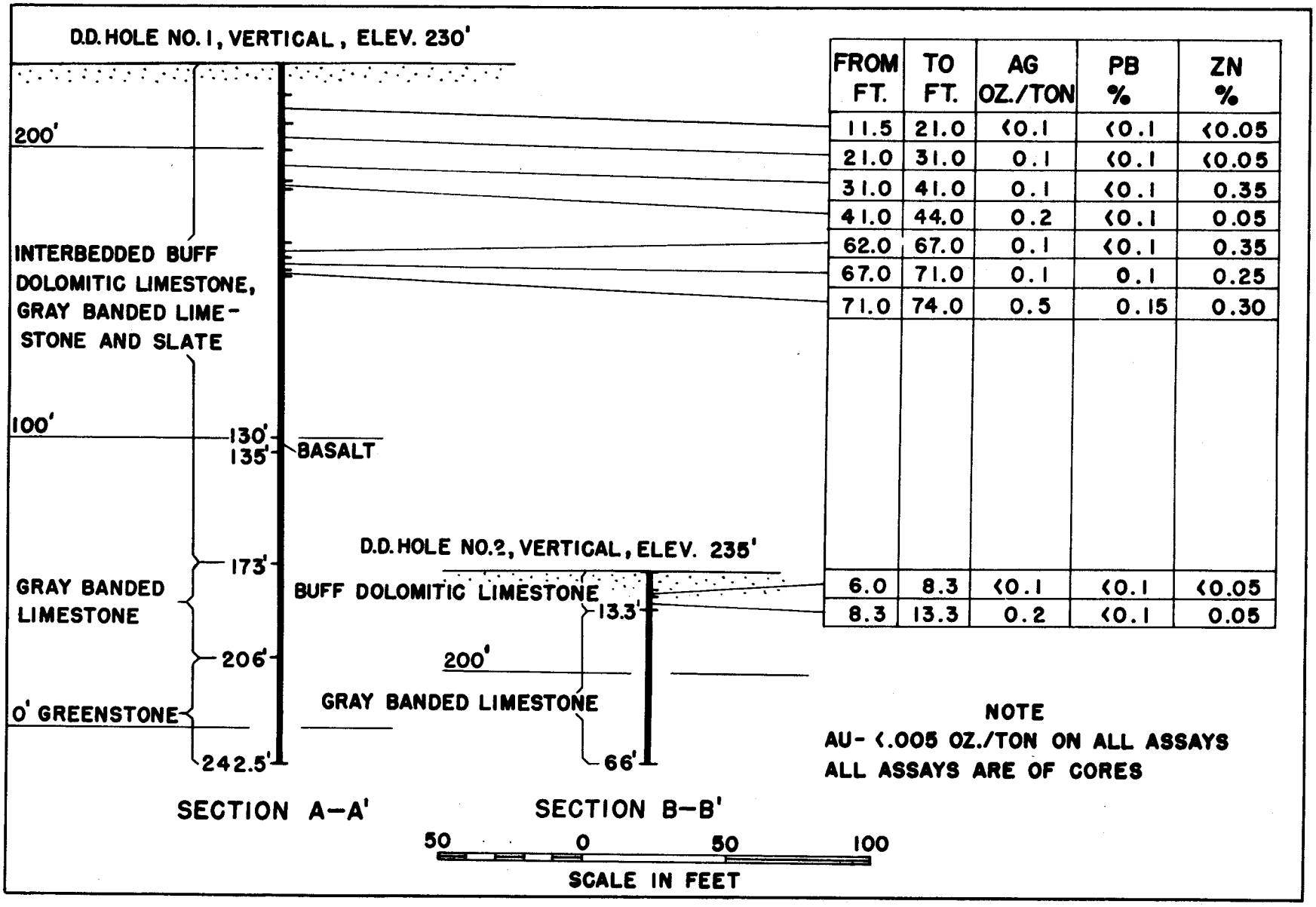
The mineral deposit is exposed along the creek banks and on a small knoll northeast of the creek showings (fig. 5).

The deposit was found to occur as patches that appear to replace the dolomitic limestone. The patches of mineralization are small, irregularly shaped and distributed, and do not occur in any recognizable pattern. The mineralized sections of the dolomitic limestone are better-cemented and more blocky than the surrounding broken and fractured dolomitic limestone. The patches of minerals range from 2 to 12 feet in width and 4 to 10 feet in length.

2/ Buddington, A. F., and Chapin, Theodore, Geology and Mineral Deposits of Southeastern Alaska: U. S. Geol. Survey Bull. 800, 1929, pp. 299-300.

3/ Buddington, A. F., Mineral Deposits of the Wrangell District, Southeastern Alaska: U. S. Geol. Survey Bull. 739-B, 1923, pp. 52-53.

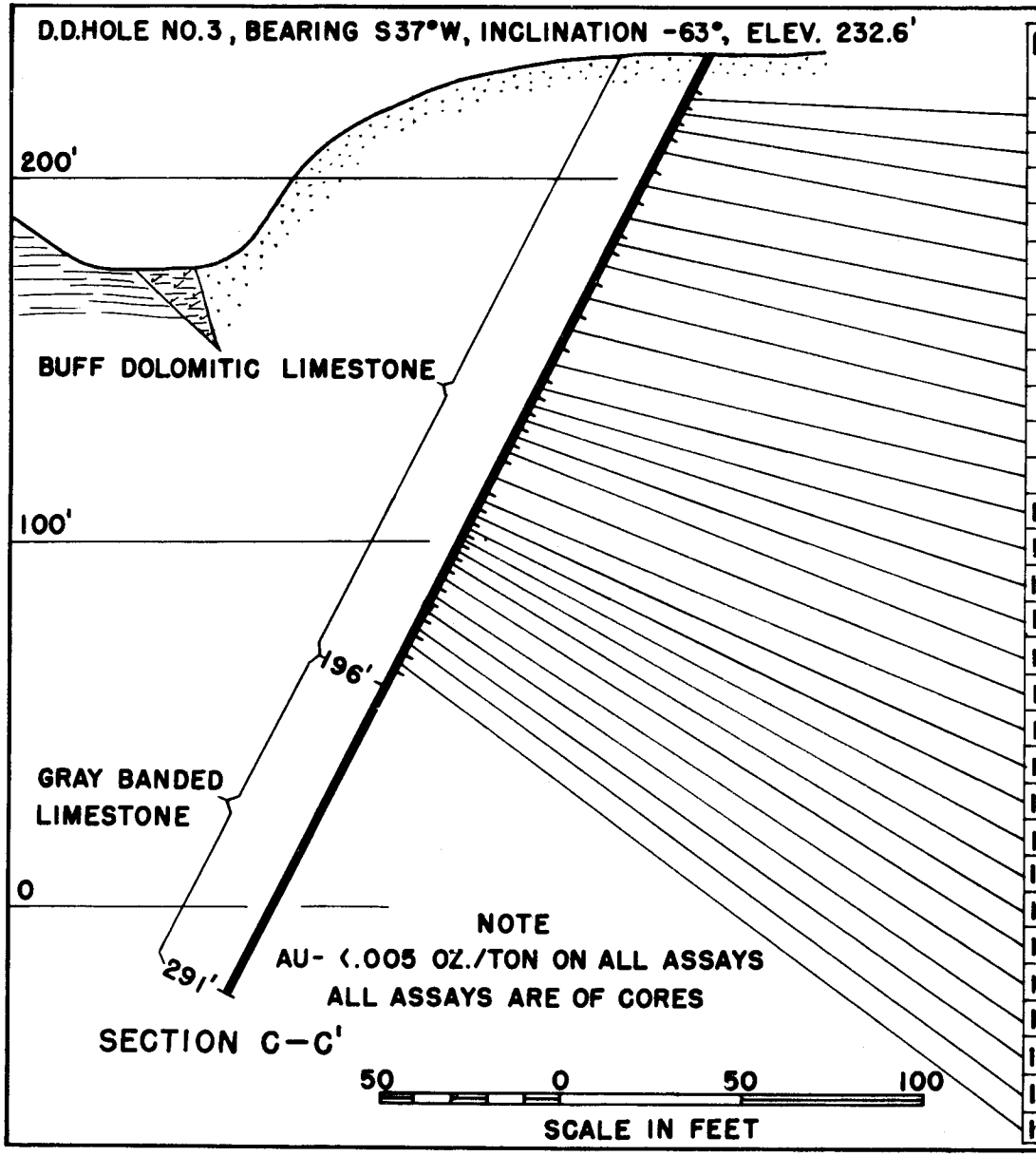
4/ Buddington, A. F., and Chapin, Theodore; Geology and Mineral Deposits of Southeastern Alaska: U. S. Geol. Survey Bull. 800, 1929, p. 105.



FROM FT.	TO FT.	AG OZ./TON	PB %	ZN %
11.5	21.0	<0.1	<0.1	<0.05
21.0	31.0	0.1	<0.1	<0.05
31.0	41.0	0.1	<0.1	0.35
41.0	44.0	0.2	<0.1	0.05
62.0	67.0	0.1	<0.1	0.35
67.0	71.0	0.1	0.1	0.25
71.0	74.0	0.5	0.15	0.30
6.0	8.3	<0.1	<0.1	<0.05
8.3	13.3	0.2	<0.1	0.05

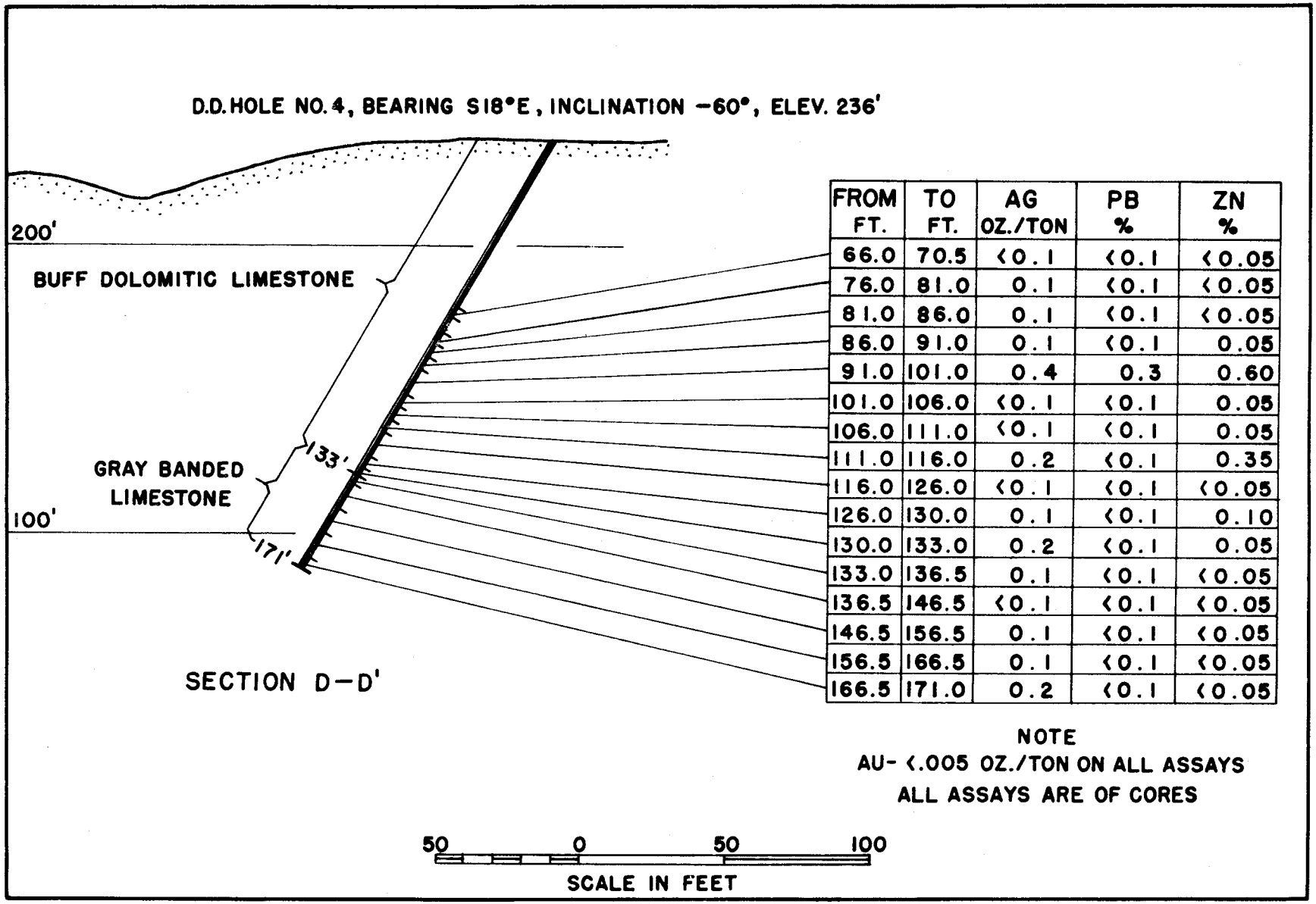
NOTE
AU- <.005 OZ./TON ON ALL ASSAYS
ALL ASSAYS ARE OF CORES

Figure 4. - Sections diamond-drill holes 1 and 2.



FROM FT.	TO FT.	AG OZ./TON	PB %	ZN %
11.0	16.0	0.1	<0.1	<0.05
16.0	21.0	0.1	<0.1	<0.05
21.0	26.0	<0.1	<0.1	0.35
26.0	36.0	<0.1	<0.1	<0.05
36.0	46.0	0.2	<0.1	<0.05
46.0	56.0	<0.1	<0.1	<0.05
56.0	61.0	0.1	<0.1	<0.05
61.0	71.0	0.1	<0.1	<0.05
71.0	81.0	0.1	<0.1	0.05
81.0	91.0	0.1	<0.1	0.05
91.0	101.0	0.1	<0.1	<0.05
101.0	106.0	0.1	<0.1	<0.05
106.0	111.0	0.1	<0.1	0.15
111.0	116.0	<0.1	<0.1	<0.05
116.0	121.0	<0.1	<0.1	0.05
121.0	126.0	0.2	<0.1	0.10
126.0	136.0	0.5	<0.1	0.30
136.0	141.0	<0.1	<0.1	0.10
141.0	145.0	0.1	<0.1	0.25
145.0	149.0	0.2	0.15	0.45
149.0	152.0	0.5	0.6	0.35
152.0	156.0	0.5	0.15	0.35
156.0	160.0	0.2	<0.1	0.10
160.0	165.0	0.1	<0.1	0.10
165.0	170.0	0.1	<0.1	0.30
170.0	175.0	0.8	<0.1	2.50
175.0	180.0	0.4	<0.1	0.60
180.0	186.0	0.1	<0.1	0.10
186.0	191.0	0.2	<0.1	<0.05

Figure 5. - Section diamond-drill hole 3.



FROM FT.	TO FT.	AG OZ./TON	PB %	ZN %
66.0	70.5	<0.1	<0.1	<0.05
76.0	81.0	0.1	<0.1	<0.05
81.0	86.0	0.1	<0.1	<0.05
86.0	91.0	0.1	<0.1	0.05
91.0	101.0	0.4	0.3	0.60
101.0	106.0	<0.1	<0.1	0.05
106.0	111.0	<0.1	<0.1	0.05
111.0	116.0	0.2	<0.1	0.35
116.0	126.0	<0.1	<0.1	<0.05
126.0	130.0	0.1	<0.1	0.10
130.0	133.0	0.2	<0.1	0.05
133.0	136.5	0.1	<0.1	<0.05
136.5	146.5	<0.1	<0.1	<0.05
146.5	156.5	0.1	<0.1	<0.05
156.5	166.5	0.1	<0.1	<0.05
166.5	171.0	0.2	<0.1	<0.05

NOTE
AU- <.005 OZ./TON ON ALL ASSAYS
ALL ASSAYS ARE OF CORES

Figure 6. - Section diamond-drill hole 4.

The dolomitic limestone is gray. It alters to buff on the outside, where it is exposed to the surface, and on its fractures.

On the knoll, mentioned under PHYSICAL FEATURES and CLIMATE, the mineral deposit is associated with a soft, reddish-brown material, probably surface oxidation product of the pyrite associated with lead and zinc minerals.

The deposit consists of a dissemination of galena and sphalerite associated with much pyrite and some marcasite. Pyrite is the predominant mineral, and the greatest amount of galena and sphalerite occurs where there is an abundance of pyrite.

Very little sulphide was found in the gray-banded limestone that appears to underlie the buff dolomitic limestone or in the greenstone that appears to underlie the gray-banded limestone.

A number of sink holes were noted in the area of diamond-drill holes 3 and 4, and were encountered in drilling in No. 4 hole.

INVESTIGATION BY BUREAU OF MINES

A program of diamond drilling was laid out by the Bureau of Mines to explore the extensions of the mineralized zone as indicated in the creek for lateral extensions and to explore the extensions of the mineral deposits down-dip, as indicated in the creek on a low and variable dip to the northeast.

From September through November 1948, the Bureau of Mines diamond-drilled four holes ranging in length from 66 to 291 feet, for a total footage of 770.5 feet. The location of the holes drilled is shown in figure 3. Sections of the holes and analyses of cores are shown in figures 4, 5, and 6. All cores showing any sulphide minerals were analyzed.

Sludges from the core drilling were saved whenever pannings of the sludge showed any mineral, and were analyzed as a check on the core samples. The sludge analyses compared very well with the corresponding core sample analyses.

The mineralized exposures on the knoll and in the creek were hand-trenched. Fourteen trenches with a combined length of 280 feet were dug on the knoll and on the creek banks. Six samples were taken from the trenches. Location of the trenches and location of the samples taken with their assays are shown in figure 3.

APPENDIX A. - LOGS OF DIAMOND-DRILL HOLES

Project: 15-235
Name: Taylor Creek lead-zinc deposit
Location: Taylor Creek, Alaska
Logged by: W. S. Twenhofel, geologist, U. S. Geological Survey

Hole 1

Elevation of collar: 230 feet
Depth: 242.5 feet
Bearing:

Inclination: Vertical
Date begun: Sept. 28, 1948
Date finished: Oct. 28, 1948

Footage	Description
0 - 11.5	No recovery.
11.5 - 44	Fractured and recrystallized buff dolomitic limestone. Some parts are coarsely crystalline, but most of it is finely crystalline. No apparent bedding of any kind. Contains disseminated cubes of pyrite of pin-head size and pyrite as fillings in tiny seams and fractures. Pyrite comprises less than 1 percent of the rock. A little galena appears in core from 35 to 44 feet mixed with pyrite in seams. Galena is more sparse than pyrite.
44 - 49	Intermixed, buff, dolomitic limestone and gray bedded limestone. No sulfides. Dip of bedding about 40 degrees.
49 - 62	Black, limey slate with no sulfides.
62 - 73	Buff, dolomitic limestone with a very little pyrite and galena.
73 -130	Gray bedded limestone with shaley partings. No sulfides.
130 -135	Black, fine-grained, dense, hard basalt. Either a dike or a sill. Same rock as exposed in bed of Taylor Creek above the discovery cut.
135 -206	Gray bedded limestone with shaley partings. Dip of bedding about 35 to 40 degrees.
206 -208	Intermixed, gray, bedded limestone and foliated greenstone.
208 -229	Foliated greenstone with a few seams of quartz. The greenstone is finely laminated and has a well-developed foliation caused by the alinement of the abundant chlorite.
229 -242.5(T.D.)	Massive greenstone with epidote and quartz seams. The foliated greenstone represents a metamorphosed ash bed, and the massive greenstone represents a lava flow.

Hole 2

Elevation of collar: 235 feet
Depth: 66 feet
Bearing:

Inclination: Vertical
Date begun: Oct. 29, 1948
Date finished: Nov. 3, 1948

Footage		Description
0	- 6	No recovery.
6	- 13	Buff dolomitic limestone with a few specks of galena and pyrite.
13	- 66	Gray bedded limestone with no sulfides. Dip of bedding was from 0 to 10 degrees.

Hole 3

Elevation of collar: 232.6 feet
Depth: 291 feet
Bearing: S. 37° W.

Inclination: -63°
Date begun: Nov. 6, 1948
Date finished: Nov. 16, 1948

Footage		Description
0	- 11	No recovery.
11	- 17	Brecciated limestone mottled gray and white; with a few sulfides, mostly pyrite.
17	-186	Bluish-gray crystalline limestone; locally contains several percent of sulfides (pyrite, galena, and sphalerite). Sulfides disseminated rather than occurring in seams. No bedding apparent.
186	-196	Gray and white limestone with graphitic partings. No sulfides.
196	-198	Chlorite schist (greenstone).
198	-265	Gray banded limestone with black shaley partings; no sulfides except for pyritized zones from 216 - 240; bedding makes angle of 25 degrees with hole.
265	-291(T.D.)	Coarse-grained, mottled gray and black limy shale; no sulfides.

Hole 4

Elevation of collar: 236 feet
Depth: 171 feet
Bearing: S. 18° E.

Inclination: -60°
Date begun: Nov. 18, 1948
Date finished: Nov. 23, 1948

Footage		Description
0	- 17	No recovery.
17	- 23.5	Buff, dolomitic, fractured limestone with no sulfides. Solution cavities present.
23.5	- 25	Black, fine-grained limestone; brecciated and cemented with white limestone; no sulfides.
25	- 30	Black, fine- to medium-grained porphyritic dike rock; slightly altered to give greenish hue. A very little marcasite present.
30	- 36	Greenish-gray, fine-grained dike rock.

Hole 4 (Cont'd.)

Footage		Description
36	- 41	Same as 25 - 30; 25 - 41 probably represents a single dike with chilled borders of dark rock.
41	- 56	Same as 17 - 23.5.
56	- 63	Cave (sink hole).
63	- 66	Same as 17 - 23.5.
66	- 75	Mottled bluish-gray and buff limestone with a few specks of pyrite.
75	- 80	Cave (sink hole).
80	- 85.5	Same as 66 - 75.
85.5	- 91	Buff, dolomitic limestone with a few sulfides.
91	-133	Bluish, mottled limestone with several percent of sulfides. Pyrite, galena, and sphalerite occur in seams irregularly spaced and oriented. Calcite crystals of limestone range downward from 1/4 inch. (Note: No bedding apparent from 0 - 133).
133	-171 (T.D.)	Gray-banded limestone with black shaley partings; no sulfides; angle of bedding with hole about 45°.

APPENDIX B. - CORE AND SLUDGE ASSAYS

(All gold assays = <0.005 ounce per ton.)

Hole 1

Footage			Core recovery		Samples				Assays					
					Core		Sludge		Core			Sludge		
From:	To:	Ft.	Ft.	Percent	From:	To:	From:	To:	Ag, oz./ton	Pb, percent	Zn, percent	Ag, oz./ton	Pb, percent	Zn, percent
11.5	21	9.5	6.9	73	11.5	21			<0.1	<0.1	<0.05			
21	31	10.0	9.0	90	21	31			0.1	<0.1	<0.05			
31	41	10.0	10.0	100	31	41			0.1	<0.1	0.35			
41	51	10.0	10.0	100	41	44			0.2	<0.1	0.05			
51	59.3	8.3	6.6	80										
59.3	61	1.7	2.3	100										
61	67	6.0	6.5	100	62	67			0.1	<0.1	0.35			
67	71	4.0	3.8	95	67	71			0.1	0.1	0.25			
71	75.9	4.9	5.0	100	71	74			0.5	0.15	0.3			
75.9	80.3	4.4	3.0	68										
80.3	86	5.7	3.4	60										
86	96	10.0	0.8	8										
96	106	10.0	3.2	32										
106	116	10.0	2.7	27										
116	118	2.0	1.8	90										
118	128	10.0	6.5	65										
128	136	8.0	4.0	50										
136	146	10.0	5.3	53										
146	151	5.0	1.8	36										
151	156	5.0	1.3	26										
156	161	5.0	3.3	66										
161	171	10.0	7.5	75										
171	176	5.0	4.4	88										
176	181	5.0	5.7	100										
181	186	5.0	4.3	86										
186	196	10.0	6.3	63										
196	206	10.0	4.0	40										
206	216	10.0	4.4	40										
216	226	10.0	5.3	53										
226	236	10.0	9.1	91										
236	242.5	6.5	6.2	95										

Hole 2

Footage			Core recovery		Sample				Assays					
					Core		Sludge		Core			Sludge		
From:	To:	Ft.	Ft.	Percent	From:	To:	From:	To:	Ag, oz./ton	Pb, percent	Zn, percent	Ag, oz./ton	Pb, percent	Zn, percent
6.0	8.3	2.3	2.0	87	6.0	8.3			<0.1	<0.1	<0.05			
8.3	13.3	5.0	3.6	72	8.3	13.3			0.2	<0.1	0.05			
13.3	18.3	5.0	1.9	38										
18.3	23.3	5.0	3.0	60										
23.3	31.0	7.7	4.8	63										
31.0	36.0	5.0	4.6	92										
36.0	41.0	5.0	3.8	76										
41.0	46.0	5.0	4.2	84										
46.0	51.0	5.0	4.3	86										
51.0	56.0	5.0	4.6	92										
56.0	61.0	5.0	3.7	74										
61.0	66.0	5.0	4.8	96										

Hole 3

11	16	5.0	2.5	50	11	16			0.1	<0.1	<0.05			
16	21	5.0	4.7	94	16	21			0.1	<0.1	<0.05			
21	26	5.0	4.2	84	21	26			<0.1	<0.1	0.35			
26	36	10.0	2.5	25	26	36			<0.1	<0.1	<0.05			
36	46	10.0	5.8	58	36	46			0.2	<0.1	<0.05			
46	56	10.0	4.8	48	46	56			<0.1	<0.1	<0.05			
56	61	5.0	1.5	30	56	61			0.1	<0.1	<0.05			
61	71	10.0	1.8	18	61	71			0.1	<0.1	<0.05			
71	81	10.0	2.1	21	71	81			0.1	<0.1	0.05			
81	91	10.0	2.5	25	81	91			0.1	<0.1	0.05			
91	101	10.0	1.5	15	91	101			0.1	<0.1	<0.05			
101	106	5.0	2.3	46	101	106			0.1	<0.1	<0.05			
106	111	5.0	2.1	42	106	111			0.1	<0.1	0.15			
111	116	5.0	3.3	66	111	116			<0.1	<0.1	<0.05			
116	121	5.0	1.3	26	116	121			<0.1	<0.1	0.05			
121	126	5.0	0.7	14	121	126			0.2	<0.1	0.1			
126	136	10.0	0.5	5	126	136			0.5	<0.1	0.3			

Hole 3 (Cont'd.)

Footage			Core recovery		Samples				Assays					
					Core		Sludge		Core			Sludge		
From:	To:	Ft.	Ft.	Percent	From:	To:	From:	To:	Ag, oz./ton	Pb, percent	Zn, percent	Ag, oz./ton	Pb, percent	Zn, percent
136	141	5.0	1.0	20	136	141			<0.1	<0.1	0.1			
141	145	4.0	0.4	10	141	145			0.1	<0.1	0.25			
145	149	4.0	0.3	8	145	149	146	149	0.2	0.15	0.45	0.1	<0.1	0.2
149	152	3.0	1.5	50	149	152			0.5	0.6	0.35			
152	156	4.0	1.1	28	152	156			0.5	0.15	0.35			
156	160	4.0	0.8	20	156	160	156	160	0.2	<0.1	0.1	0.1	<0.1	0.3
160	165	5.0	1.3	26	160	165	160	165	0.1	<0.1	0.1	<0.1	<0.1	0.05
165	170	5.0	1.3	26	165	170	165	170	0.1	<0.1	0.3	0.2	0.3	1.7
170	175	5.0	0.9	18	170	175	170	175	0.8	<0.1	2.5	0.3	0.35	1.5
175	180	5.0	0.5	10	175	180	175	180	0.4	<0.1	0.6	0.1	<0.1	0.7
180	186	6.0	0.5	8	180	186	180	186	0.1	<0.1	0.1	<0.1	<0.1	0.05
186	191	5.0	1.4	28	186	191	186	191	0.2	<0.1	<0.05	0.1	<0.1	0.15
191	196	5.0	1.0	20			191	196				<0.1	<0.1	0.1
196	198	2.0	1.9	95										
198	203	5.0	1.0	20			196	203				0.1	0.1	0.05
203	208	5.0	2.8	58			203	208				0.2	<0.1	<0.05
208	210	2.0	1.5	75										
210	218	8.0	9.0	100	210	215			0.1	0.1	<0.05			
					215	218			<0.1	0.1	<0.05			
218	228	10.0	6.5	65	218	228			<0.1	<0.1	<0.05			
228	238	10.0	6.3	63	228	238			0.1	<0.1	<0.05			
238	245	7.0	4.5	65	238	245			0.2	<0.1	<0.05			
245	255	10.0	3.2	32			245	255				0.1	<0.1	0.05
255	265	10.0	5.1	51										
265	275	10.0	4.2	42										
275	277	2.0	1.3	65										

Hole 4

Footage			Core recovery		Samples				Assays					
					Core		Sludge		Core			Sludge		
From:	To:	Ft.	Ft.	Percent	From:	To:	From:	To:	Ag, oz./ton	Pb, percent	Zn, percent	Ag, oz./ton	Pb, percent	Zn, percent
17	21	4.0	2.9	73										
21	26	5.0	1.8	38										
26	34	8.0	7.2	90										
34	36	2.0	2.0	100										
36	39	3.0	2.2	77										
39	51	12.0	2.5	21										
51	56	5.0	2.4	48										
56	66	10.0	3.3	33										
66	70.5	4.5	2.4	53	66	70.5			<0.1	<0.1	<0.05			
70.5	76	5.5	1.8	31										
76	81	5.0	0.8	16	70.5	81			0.1	<0.1	<0.05			
81	91	10.0	7.0	70	81	86			0.1	<0.1	<0.05			
					86	91			0.1	<0.1	.05			
91	101	10.0	4.3	43	91	101	90	96	0.4	0.3	0.6	0.1	0.3	0.55
							96	101				<0.1	<0.1	<0.05
101	111	10.0	1.8	18	101	106	101	106	<0.1	<0.1	0.05	<0.1	<0.1	<0.05
					106	111	106	111	0.1	<0.1	0.05	0.2	0.1	0.15
111	116	5.0	2.1	42	111	116	111	116	0.2	<0.1	0.35	0.2	0.3	0.25
116	126	10.0	1.2	12	116	126	116	121	<0.1	<0.1	0.05	<0.1	<0.1	<0.05
							121	126				0.2	0.1	0.25
126	130	4.0	2.0	50	126	130	126	130	0.1	<0.1	0.1	0.2	0.2	0.3
130	136.5	6.5	4.4	68	130	133			0.2	<0.1	0.05			
					133	136.5	130	136.5	0.1	<0.1	0.05	<0.1	<0.1	0.05
136.5	146.5	10.0	2.9	29	136.5	146.5	136.5	141.5	<0.1	<0.1	0.05	0.1	0.1	0.1
							141.5	146.5				<0.1	<0.1	<0.05
146.5	156.5	10.0	0.7	7	146.5	156.5	146.5	151.5	0.1	<0.1	<0.05	<0.1	0.1	0.1
							151.5	156.5				0.1	<0.1	<0.05
156.5	166.5	10.0	2.2	22	156.5	166.5	156.5	161.5	0.1	<0.1	<0.05	<0.1	<0.1	<0.05
166.5	171	4.5	1.5	33	166.5	171			0.2	<0.1	<0.05			

APPENDIX C. - DIAMOND-DRILL RECORDS

	Footage		Size drilled, feet			Reaming, feet, EX to AX			Casing set, feet		Remarks
	From:	To:	BX	AX	EX	From:	To:	Feet	AX	EX	
Hole 1.....	0	11.5	11.5						11.5		
	11.5	242.5		231							
Total....			11.5	231					11.5		
Hole 2.....	0	8.5	8.5						8.5		
	8.5	66		57.5							
Total...			8.5	57.5					8.5		
Hole 3.....	0	11	11						11		
	11	51		40						51	Lost water at 26 feet.
	51	106			55	51	106	55			Lost water at 100 feet.
	106	111		5							
	111	291			180					111	
Total...			11	45	235			55	11	111	
Hole 4.....	0	17	17						17		
	17	51		34						51	Lost water at 44 feet.
	51	56			5	51	56	5			Lost water at 56 feet.
	56	70.5		14.5						70	
	70.5	80.5			10	70.5	80.5	10			Lost water at 73 feet.
	80.5	91		10.5						91	
	91	171			80	91	116	25			
Total...			17	59	95			40	17	91	
Grand total..			(48	393	329.5)			95	48	202	
				770.5							