DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1053D
FOLIO OF THE CHIGNIK AND SUTWIK ISLAND QUADRANGLES, ALASKA
GEOCHEMICAL MAP, Pb
SHEET 2 OF 2

Base from U.S. Geological Survey, 1963

Geology from Detterman and others, 1979.

LEAD IN MINUS-80-MESH STREAM-SEDIMENT SAMPLES

SCALE 1:250 000

5 0 5 10 MILES
5 0 5 10 KILOMETERS

CORRELATION OF MAP UNITS

SURFICIAL DEPOSITS AND SEDIMENTARY ROCKS	VOLCANIC ROCKS	INTRUSIVE ROCKS		
Qs	Qad Qck Qv		Holocene and Pleistocene	QUATERNARY
Tmb Unconformity	Tv	Tt	Pliocene and Miocene	TERTIARY
	Tm		Miocene or Oligocene	
Tt Unconformity		Tgd	Eocene and Paleocene	
			Paleocene	
Khc Unconformity			Upper Cretaceous	CRETACEOUS
KJhs			Lower Cretaceous to Middle Jurassic	CRETACEOUS AND JURASSIC

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS AND SEDIMENTARY ROCKS

Qs — SURFICIAL DEPOSITS--Unconsolidated alluvium, colluvium, glacial, marine, swamp and eolian deposits; mainly sand, silt, gravel and pumice

Tmb — MILKY RIVER FORMATION OF GALLOWAY (1974) AND BEAR LAKE FORMATION--Milky River Formation (Pliocene), mainly volcanogenic sandstone and conglomerate, non-marine. Bear Lake Formation (Miocene); sandstone, conglomerate, siltstone, shale, and coal; shallow marine to non-marine

Tt — TOLSTOI FORMATION OF BURK (1965) (Paleocene and Eocene)--Sandstone, conglomerate, siltstone, dark shale, coal; high percent volcanic debris; mainly non-marine

Khc — HOODOO AND CHIGNIK FORMATIONS--Hoodoo Formation (Upper Cretaceous); dark shale and siltstone; deep water deposits. Chignik Formation (Upper Cretaceous); sandstone, shale, conglomerate, siltstone, and coal; shallow water to non-marine

KJhs — HERENDEEN LIMESTONE AND STANIUKOVICH, NAKNEK, AND SHELIKOF FORMATIONS--Herendeen Limestone (Lower Cretaceous); thin-bedded calcareous sandstone composed of Inoceramus prisms and thin calcareous sandstone. Staniukovich Formation (Upper Jurassic and Lower Cretaceous); thin-bedded feldspathic to tuffaceous graywacke sandstone. Naknek Formation (Upper Jurassic); thin-bedded feldspathic to tuffaceous sandstone in upper part. Tight arkosic sandstone and conglomerate in lower part. Shelikof Formation (Middle Jurassic); dark siltstone and shale

VOLCANIC ROCKS

Qad — ASH AND DEBRIS FLOW DEPOSITS--Volcanic ash, pumice, tuff, and breccia; includes air-fall, ash flow, and avalanche deposits; unsorted to well-sorted; poorly- to well-stratified; includes some lava flows

Qck — CINDER AND SPATTER CONES, AND DOMES--Cinders, scoria, and associated pyroclastic rock

Qv — VOLCANIC ROCKS--Andesite and dacite flows, tuff, volcanic breccia, and lahars

Tv — VOLCANIC ROCKS--Rhyolite, andesite, dacite, and basalt flows; tuff, volcanic rubble flows, and lahars; includes hypabyssal plugs and domes

Tm — MESHIK FORMATION (Miocene or Oligocene)--Basalt flows, volcanic rubble flows, and lahars; minor volcanogenic sedimentary rock

INTRUSIVE ROCKS

Tt — INTRUSIVE ROCKS--Quartz diorite, diorite, and gabbro; medium- to coarse-grained; mainly small plutons

Tgd — GRANODIORITE--Semidi Islands pluton; medium- to coarse-grained; hornblende- and biotite-bearing

GEOLOGIC MAP SYMBOLS

Contact--Dotted where concealed

Fault--Dashed where approximately located, dotted where concealed, queried where probable. U, upthrown side; D, downthrown side. Arrows indicate relative lateral movement

Thrust or high-angle reverse fault--Dotted where concealed; sawteeth on upper plate

Folds--Showing trace of axial plane; dashed where approximately located; dotted where concealed. Arrow indicates direction of plunge

Anticline

Syncline

Volcanic crater

Volcanic vent or cinder cone

Hornfels

Alteration

Dikes and sills

Exploratory drill hole

Hot spring

Native Corporation boundary

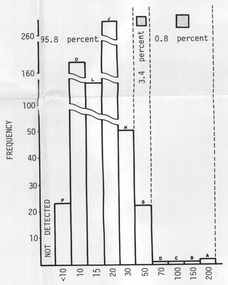

Figure 2.--Histogram for lead in 637 minus-80-mesh stream-sediment samples, Chignik and Sutwik Island quadrangles, Alaska, showing: symbols denoting anomalous concentrations, percentage of total number of samples represented by each range, and letters corresponding to concentrations in parts per million. Statistics are based on all unqualified values (614) within the sample population; arithmetic mean, 19.3; standard deviation, 14.6; geometric mean, 17.1; and geometric deviation, 1.5.

Table 2.--*Copper, zinc, molybdenum, and silver associated with anomalous lead values in minus-80-mesh stream-sediment samples, Chignik and Sutwik Island quadrangles, Alaska*

[Values reported in parts per million; Pb, Cu, Mo, and Ag determined by semiquantitative emission spectroscopy; Zn by atomic absorption; N, not detected; L, detected but below value shown; lower limits of detection for Mo and Ag are 5 and 0.5, respectively; *, anomalous concentrations of Cu, Zn, Mo, or Ag. Map number corresponds to sample site on stream-sediment map]

Map no.	Field no.	Pb	Cu	Zn	Mo	Ag
1	SM028	50	150*	85	N	N
2	034	50	150*	60	N	N
3	029	50	70	85	N	1*
4	090	50	70	110*	N	N
5	088	70	100	110*	N	N
6	092	200	700*	350*	20*	1*
7	093	200	700*	45	20*	1*
8	CG488	50	70	60	N	N
9	502	50	70	105*	N	N
10	415	50	150*	90*	15*	N
11	197	50	50	90*	N	N
12	SM125	50	200*	140*	N	N
13	131	50	70	300*	N	N
14	CG166	50	100	75	L(5)	0.5*
15	165	50	70	100*	N	N
16	173	50	50	50	L(5)	N
17	171	50	100	90*	N	N
18	172	100	100	80	10*	N
19	176	50	100	85	N	N
20	174	50	70	80	N	N
21	175	50	100	120*	N	N
22	178	50	70	90*	N	N
23	048	50	100	90*	N	N
24	139	50	100	250*	L(5)	N
25	060	150	50	25	N	N
26	277	50	50	35	N	N
27	439	50	150*	50	N	N

Table 3.--*Statistical summary of lead results obtained from the analysis of representative rock samples collected from the generalized units listed in the geologic explanation, Chignik and Sutwik Island quadrangles, Alaska*

[The statistics are calculated using only the unqualified values (those not coded with an N, L, or fl); leaders indicate insufficient data to calculate value; method of analysis is semiquantitative emission spectroscopy]

Rock unit	Number of samples: Qualified	fl	Unqualified	Data based on the unqualified population: Geometric mean	Geometric deviation	Arithmetic mean	Standard deviation	Range of values	Percentile distribution based on n samples analyzed: 25th	50th	75th	90th	95th
Volcanic rocks, (Tv)----	0	0	2	14.1	1.6	15	7.1	10- 20	--	--	--	--	--
Milky River and Bear Lake Formation, (Tmb)-	0	0	3	12.6	1.5	13.3	5.8	10- 20	--	--	--	--	--
Volcanic rocks, (Tv)----	0	0	17	30.7	3.1	62.0	85.1	10-300	--	--	--	168	--
Intrusive rocks, (Tt)---	0	4	27	16.3	2.3	28.5	30.2	10-200	--	--	--	49	88
Meshik Formation, (Tm)--	0	2	22	16.2	1.7	18.4	11.1	10- 50	--	17	21	27	--
Tolstoi Formation, (Tt)-	0	0	9	20.8	1.7	23.3	12.2	10- 50	18	23	29	--	--
Hoodoo and Chignik Formations, (Khc)-----	0	5	0	15	13.4	2.8	31.7	48.4	10-200	--	--	--	58	74
Herendeen, Staniukovich, Naknek, and Shelikof Formations, (KJhs)----	0	3	0	4	25.0	1.7	28.7	15.5	15- 50	--	--	26	--	--

DISTRIBUTION AND ABUNDANCE OF LEAD IN MINUS-80-MESH STREAM-SEDIMENT AND NONMAGNETIC HEAVY-MINERAL-CONCENTRATE SAMPLES CHIGNIK AND SUTWIK ISLAND QUADRANGLES, ALASKA

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1980

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