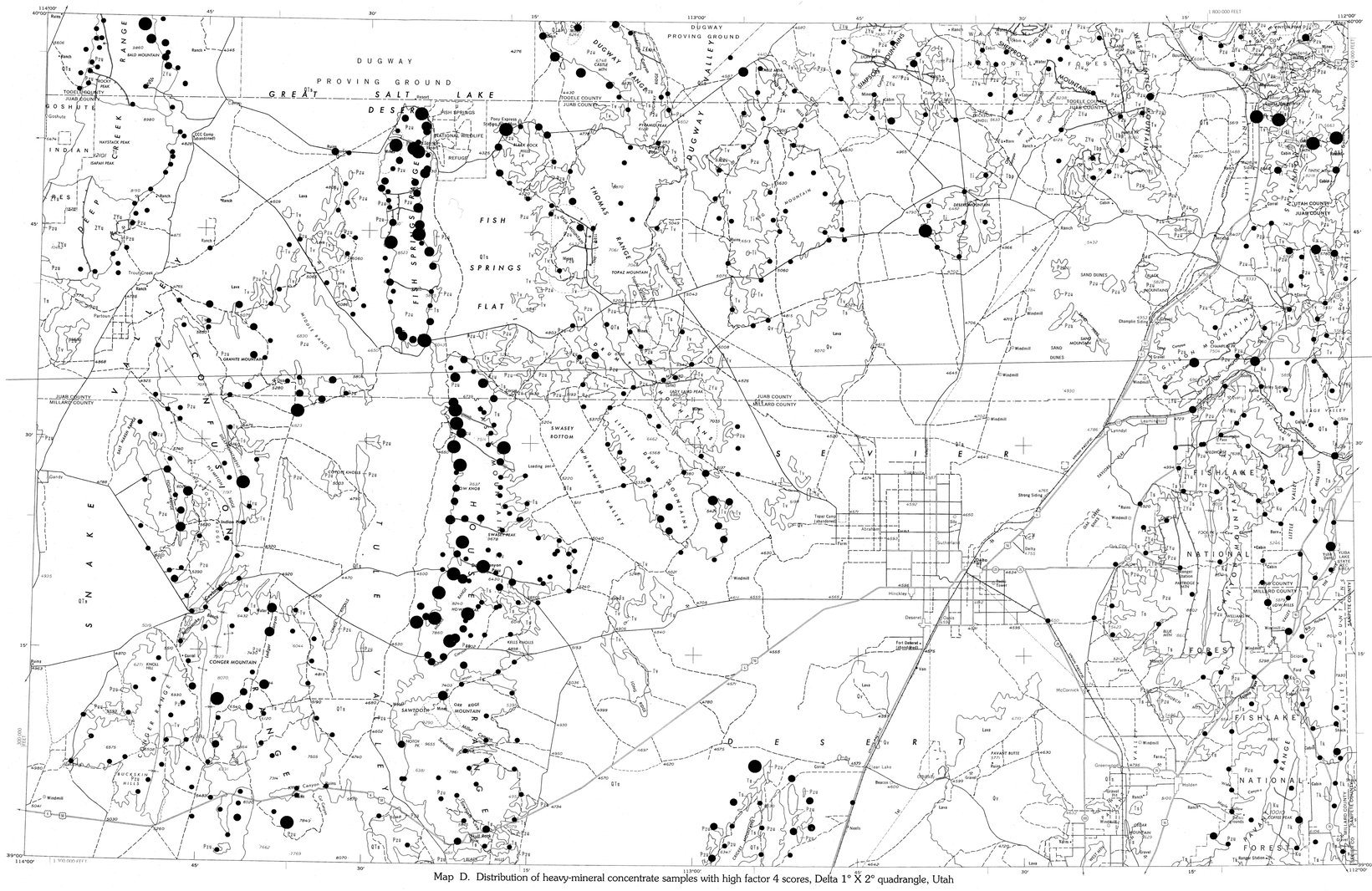


Map D. Distribution of heavy-mineral concentrate samples with high factor 4 scores, Delta 1° X 2° quadrangle, Utah

EXPLANATION, FACTOR 4

Lower boundary	Upper boundary	Symbol	Approximate percentile
-2.68	0.72	•	<75
0.72	1.37	●	75-90
1.37	1.74	●	90-95
1.74	2.77	●	>95

Samples located at geometric midpoint of symbols.

Table 1. Lower and upper determination limits, and occurrence of censored data for selected elements analyzed in heavy-mineral concentrate samples, Delta 1° x 2° quadrangle, Utah

[LDL, lower determination limit; UDL, upper determination limit; B, not analyzed; L, detected, but below LDL; N, not detected; G, greater than UDL; DR, detection ratio; na, not applicable; *, element not used in factor analysis; LDL and UDL for all elements reported in ppm except Ca, Fe, Mg, Na, P, and Ti, which are given in percent; all elements analyzed by emission spectrography]

ELEMENT	LDL	UDL	B	L	N	G	DR
Ag*	1	10000	0	2	620	0	3.3
As*	500	20000	0	0	636	1	0.9
Au*	20	1000	0	0	643	0	0.0
B	20	5000	0	9	0	0	98.6
Ba	50	10000	0	4	0	60	90.0
Be	2	2000	1	246	103	0	45.6
Bi*	20	2000	2	10	581	3	7.3
Ca-%	0.1	50	0	0	0	2	99.7
Cd*	50	1000	0	4	628	0	1.7
Co	10	5000	0	228	250	0	25.7
Cr	20	10000	0	88	4	0	85.7
Cu	10	50000	0	257	0	0	60.0
Fe-%	0.1	50	0	0	0	0	100.0
La	50	2000	0	87	21	1	83.0
Mg-%	0.05	20	0	0	0	0	100.0
Mn	20	10000	0	0	0	1	99.8
Mo*	10	5000	0	19	588	0	5.6
Nb	50	5000	0	81	224	0	52.6
Ni*	10	10000	0	36	523	0	13.1
Pb	20	50000	2	92	15	3	82.6
Sb*	200	20000	1	4	631	0	1.1
Sc	10	200	0	89	42	2	79.3
Sn	20	2000	0	37	421	15	26.4
Sr	200	10000	9	77	236	5	49.1
Th*	200	5000	0	81	442	0	18.7
Ti-%	0.005	2	0	0	0	268	58.3
V	20	20000	0	1	0	0	99.8
W*	100	20000	0	16	378	0	7.6
Y	20	5000	0	2	0	0	99.7
Zn*	500	20000	0	2	611	1	4.5
Zr*	20	5000	0	0	0	618	3.9

DESCRIPTION OF MAP UNITS

Qv **Quaternary volcanic deposits (Pleistocene and Holocene)**--Flows and pyroclastic deposits of basalt and basaltic andesite

QTs **Alluvium and valley fill deposits (Holocene, Pleistocene, and Pliocene)**--Colluvium and alluvium in upland areas and fanglomerate, lacustrine units, eolian deposits, and tuffaceous beds in valleys and basins

Tbp **Breccia pipes (Oligocene)**--Plug- and dike-like bodies containing large and small blocks of Tertiary, Paleozoic, and Precambrian rocks embedded in a matrix of rock fragments, rock flour, and volcanic microbreccia

Tis **Sills (Oligocene)**--Extensive sheets of porphyritic latite injected into eruptive rocks of the Tintic Mountain Volcanic Group

Ti **Intrusive bodies (Tertiary)**--Stocks, plugs, and dikes ranging in composition from basic monzonite and latite to alkali granite and rhyolite; chiefly associated with volcanic rocks in the eruptive centers

Tv **Tertiary volcanic deposits (Pliocene through Eocene)**--Flows, ignimbrites, pyroclastic deposits, and agglomerates ranging in composition from basalt to alkali rhyolite generally localized in well-defined eruptive centers in northern part of quadrangle

Ts **Tertiary sedimentary deposits (Pliocene through Paleocene)**--Conglomerate, sandstone, shale, limestone, and other continental deposits including Flagstaff, Colton, Green River, Crazy Hollow, Sale Pool, and other pre-volcanic formations, and Oak City, Pool Creek, and other post-volcanic units

Tk **North Horn Formation (Tertiary and Cretaceous)**--Red and green post-orogenic shale, sandstone, conglomerate, and limestone. Contains mammalian remains in upper part and dinosaurian remains in the lower part

Ku **Cretaceous strata, undivided**--Red orogenic conglomerate, sandstone, and minor shale commonly characterized by large, semi-rounded clasts of quartzite and carbonate rocks. Chiefly consists of Canyon Range, Price River, and Indianola Conglomerates; locally includes some Paleocene strata

Ji **Jurassic pluton**--Pinkish-gray to white, coarsely crystalline quartz monzonite porphyry stock cutting Cambrian strata in House Range. Age is estimated to be 143 Ma

JTu **Jurassic and Triassic strata, undivided**--Includes Thaynes Limestone in western part of quadrangle and Moenkopi, Chinle, and Navajo Formations in eastern part of quadrangle

Pzu **Paleozoic strata, undivided (Permian through Cambrian)**--Includes strata deposited during each period of the Paleozoic Era. These strata are composed of about 60 percent carbonate rock, 30 percent quartzite and sandstone, and 10 percent shale, and are subdivided into as many as 20 or 30 formational units in any one area

ZYu **Precambrian Z and Y strata, undivided (upper and middle Proterozoic)**--Chiefly quartzite, argillite, and glaciogenic diamictite, with some local beds of algal limestone all subdivided into 6 or more formational units or sequences

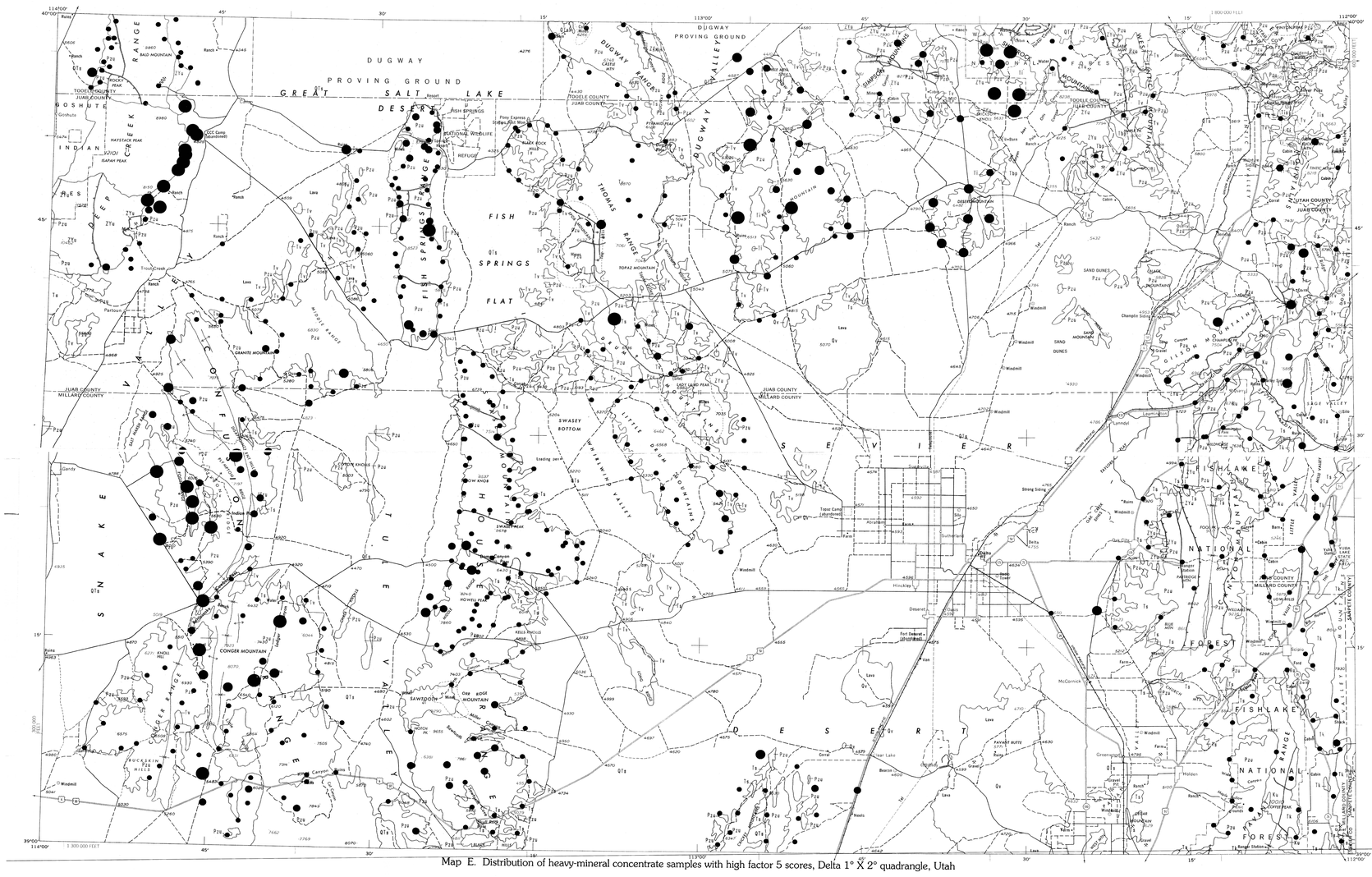
Contact--Dashed where approximately located

High-angle fault--Bar and ball on downthrown side; arrows show direction of relative horizontal displacement

Thrust fault--Sawteeth on upper plate. Dotted where concealed; groups of three dots where inferred and concealed. Most concealed positions approximately located

Anticline--Showing trace of axial plane; dotted where concealed

Syncline--Showing trace of axial plane; dotted where concealed



Map E. Distribution of heavy-mineral concentrate samples with high factor 5 scores, Delta 1° X 2° quadrangle, Utah

EXPLANATION, FACTOR 5

Lower boundary	Upper boundary	Symbol	Approximate percentile
-2.27	0.58	•	<75
0.58	1.27	●	75-90
1.27	1.72	●	90-95
1.72	3.94	●	>95

Samples located at geometric midpoint of symbols.

Table 2. R-mode varimax factor matrix of chemical data for 643 heavy-mineral concentrate samples collected from the Delta 1° x 2° quadrangle, Utah.

Element	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
B	0.76	0.18	-0.08	0.11	-0.07	0.12
Ba	0.00	0.03	0.09	0.86	-0.12	0.04
Be	-0.01	0.08	-0.05	0.04	0.10	0.82
Ca	-0.32	0.17	-0.20	0.38	0.03	-0.67
Co	0.06	0.67	0.10	0.00	0.10	0.07
Cr	0.70	0.05	0.01	-0.06	0.33	-0.19
Cu	0.07	0.37	0.56	0.15	0.13	-0.11
Fe	0.37	0.81	0.05	-0.03	-0.01	-0.11
La	0.19	0.25	0.10	0.03	0.87	0.05
Mg	-0.26	0.13	-0.23	0.28	-0.37	-0.56
Mn	0.05	0.84	0.02	0.09	0.06	-0.01
Nb	0.34	0.29	0.22	-0.27	0.35	0.24
Pb	0.16	-0.05	0.79	0.26	-0.09	0.09
Sc	0.63	0.05	0.09	-0.15	0.37	0.49
Sn	-0.11	0.06	0.68	-0.31	0.17	0.14
Sr	-0.21	0.04	0.02	0.76	0.09	-0.26
Ti	0.76	0.06	0.13	-0.24	0.23	0.29
V	0.73	0.30	0.12	-0.08	0.16	0.06
Y	0.48	-0.07	0.02	-0.07	0.69	0.32

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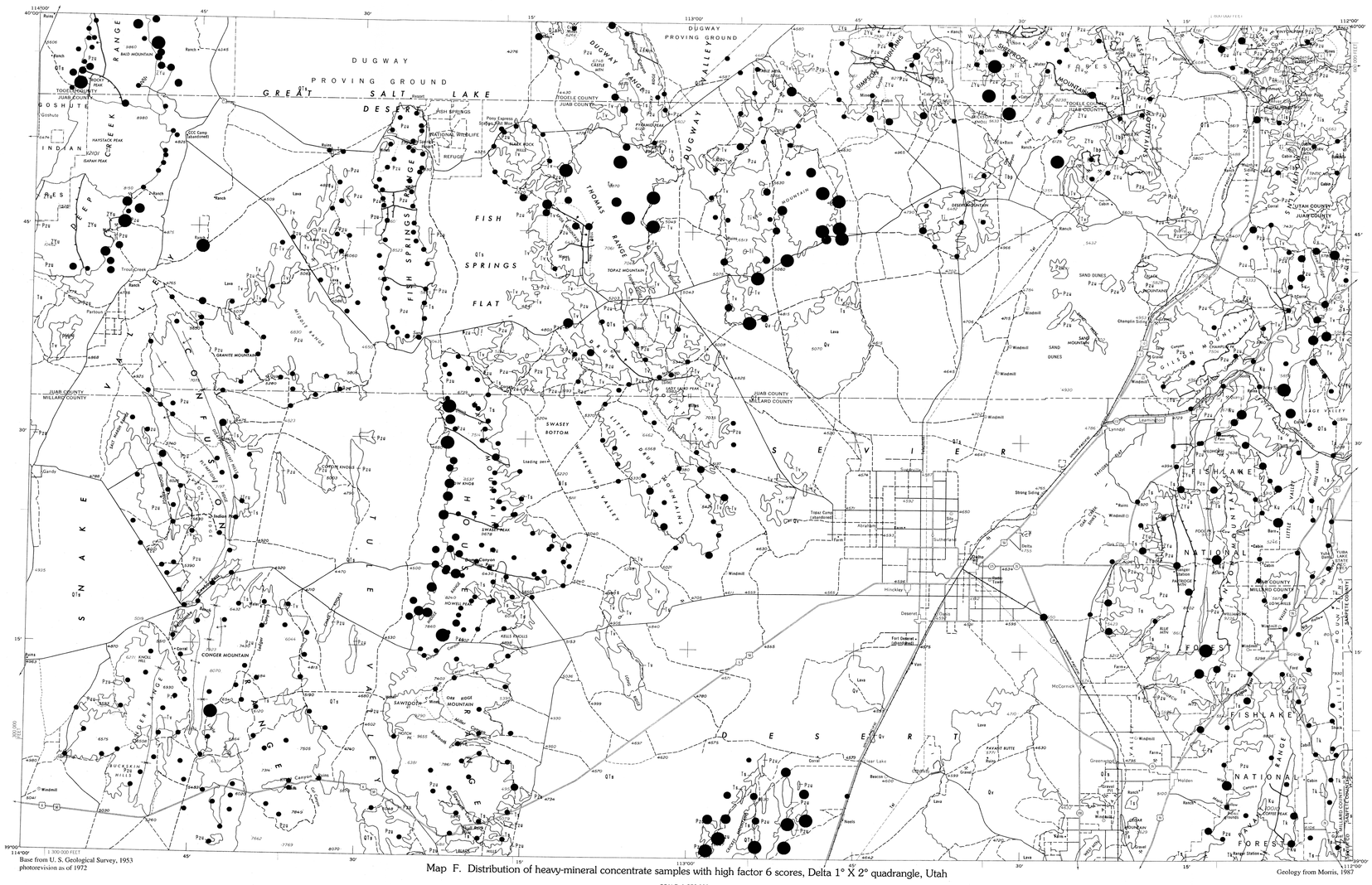
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Map F. Distribution of heavy-mineral concentrate samples with high factor 6 scores, Delta 1° X 2° quadrangle, Utah

Base from U. S. Geological Survey, 1953
photorevision as of 1972

Geology from Morris, 1987

SCALE 1:250 000

EXPLANATION, FACTOR 6

Lower boundary	Upper boundary	Symbol	Approximate percentile
-2.86	0.50	•	<75
0.50	1.28	●	75-90
1.28	1.96	●	90-95
1.96	3.73	●	>95

Samples located at geometric midpoint of symbols.

Approximate factor loadings	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
+1.0						
+0.9		Mn Fe		Ba	La	Be
+0.8	B Ti V Cr		Pb	Sr		
+0.7	Sc	Co	Sn		Y	
+0.6			Cu			
+0.5						
+0.4						
0						
-0.4						
-0.5						
-0.6						Mg
-0.7						Ca
-0.8						
-0.9						
-1.0						

Figure 2. Diagrammatic representation of factors from R-mode varimax solution of chemical data for heavy-mineral concentrate samples, Delta 1° x 2° quadrangle, Utah.

MAPS SHOWING INTERPETATION, USING R-MODE FACTOR ANALYSIS, OF TRACE-ELEMENT ABUNDANCES IN HEAVY-MINERAL CONCENTRATE SAMPLES, DELTA 1° X 2° QUADRANGLE, UTAH

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1994

Manuscript approved for publication January 26, 1994

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