GEOLOGICAL SURVEY OF CANADA

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Drift composition of till and sand samples from the Red Lake/Woman Lake area, District of Red Lake, northern Ontario

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INTRODUCTION

The Canada-Northern Ontario Mineral Development Agreement is a program to assist in stimulating mining activity in northern Ontario. The Red Lake/Woman Lake area was chosen because producing gold mines and former base metal mines are located in the area and there is potential for further mining development, particularly in the Woman Lake-Confederation Lake area. Glacial sediment covers large parts of the area and conceals promising geological targets. Increased use of drift composition methods has required the use of glacial geology as an aid to exploration (Coker and DiLabio, 1990). The present survey was designed to investigate the stratigraphy, sedimentology, composition, and source of glacial sediments, especially till, in areas of potential bedrock mineralization. This open file presents data on drift composition, element distribution and indicator minerals which may aid exploration (e.g., gold and base metals).

Prior to this study, the surficial geology of the area was examined by Zoltai (1961, 1965), Prest (1963, 1981, 1982) and Ford (1982). Surficial geology maps of the area have been compiled by Sado and Carswell (1987) and Barnett *et al.*, (1991). Studies in similar shield terrain using drift compositional methods indicate that gold is the best indicator for gold deposits (Thorleifson and Kristjansson, 1990; Minning *et al.*, in press). Some areas of northern Ontario have a calcareous drift cover, derived from Paleozoic terrain, which hampers surface drift composition methods (Geddes, 1984), but the Red Lake area appears to be beyond the limit of thick calcareous drift.

Field data were obtained from hand-dug holes and natural exposures along the paved, gravel and lumber roads. Thorough descriptions and records of the 138 till and 40 sand samples were taken along with careful location information.

Location

The Red Lake/Woman Lake study covers six 1:50,000 NTS (within 52 N and K) map sheets straddling and south of Trout Lake and about 150 km northwest of Dryden, Ontario. The area is traversed by Highway 105 from the Trans-Canada Highway at Vermilion Bay.

PRECAMBRIAN GEOLOGY

The survey area lies within the Canadian Shield and contains elements of both the Uchi and English River Subprovinces of the Superior Province, separated in part by the Sydney Lake-Lake St Joseph Fault (Breaks et al.,1975). The Uchi Subprovince is characterized by greenstone belts and intrusive rock (Stott and Corfu, 1991), and the English River Subprovince comprises high grade metamorphic terrain of metasedimentary and intrusive rocks (Breaks, 1991) found only in the southeastern part of the area.

Dominant elements of the Uchi Subprovince are two greenstone belts named Redlake and

Birch-Uchi; to the south are subordinate metavolcanic belts named Dixie Lake, Papaonga Lake, and Slate Lake (Breaks et al., 1974). The Redlake greenstone belt comprises three tectonic assemblages (Balmer, Woman, and Confederation) in the Birch-Uchi greenstone belt (Stott and Corfu, 1991). Correlation between belts is tentative, with only the Confederation assemblage correlated with certainty (Wallace et al., 1986). Lithologies from these assemblages vary from basaltic tholeiites and komatiites, through andesitic flows and pyroclastic rocks, to rhyolitic pyroclastic rocks, and minor carbonate and clastic sedimentary rock (Thurston, 1985; Stott and Corfu, 1991).

Intrusions range in size up to batholiths and are syn-volcanic, pre- to syntectonic, and syn- to post-tectonic in relative age (Stott and Corfu, 1991). The batholiths occur at the margins of the greenstone belts, i.e., Trout Lake and Bamaji-Blackstone. The intrusions range in composition from granitic to monzonitic and dioritic, to mafic and ultramafic.

Structural deformation has been in response to both horizontal tectonic forces and intrusive activity. The greenstone belts are folded, with stratigraphic reversals and stacking, and have been compressed around the batholiths. Deformation zones have a complex history of alteration and vein development, i.e., ferron carbonate, quartz and tourmaline, and quartz veins (Fyon and O'Donnell, 1986). The regional metamorphic pattern increases from subgreenschist in the north to granulite in the English River subprovince (Thurston and Breaks, 1986) and local metamorphic grade increases to amphibolite grade (Fyon and O'Donnell, 1986).

Mineralization within the Uchi subprovince includes asbestos, silver, gold, iron, molybdenum, nickel, lead, and zinc. Economic deposits include active and defunct gold mines, and a silver, lead and zinc mine, all within the greenstone belts. Near Red Lake, gold mineralization is concentrated in deformation zones within the lower komatiitic-tholeiitic sequence volcanics, possibly related to syntectonic intrusive events (Pirie, 1983; Anderson et al., 1986). Potential geochemical pathfinders associated with gold related alteration are; arsenic, antimony and anomalously low values of sodium (Pirie, 1983). Little exploration activity has been directed toward the intrusive suites.

A single economic stratiform massive sulphide lead/zinc/silver deposit has been mined in the Uchi Subprovince, the South Bay base metal mine. The deposit occurs in the uppermost rhyolitic sequence of the Confederation assemblage.

The English River subprovince contains a supracrustal domain dominated by partially migmatized metasediments of greywacke and mudstone protolith and the quartz diorite, Bluffy Lake Batholith (Breaks et al., 1978). The economic mineral potential of this subprovince relates to uranium-rich metasedimentary migmatites, iron formations, cobalt-copper-nickel-platinum group metals, massive sulphide mineralization, and gold showings (Breaks, 1991). At Bruce Lake, an oxide facies iron formation was mined.

SURFICIAL GEOLOGY

Quaternary geology has been mapped for three (52N/4;52K/13;52K/14) of the six map sheets (52N/2,3; 52K/13) in the survey area, Red Lake (Prest, 1981), Madsen (Prest, 1982), and Pakwash (Ford, 1982). The main sediments are glacial diamicton (till), and glaciofluvial, glaciolacustrine, and organic deposits. Major landforms include the northwest-trending Lac Seul moraine and a series of eskers in the area south of Trout Lake.

Drift thickness

Glacial drift thickness is variable, ranging from clay-covered terrain with 10's of metres of drift to thin or no sediment on exposed rock. Exposures at the former Bruce Mine indicate up to 15 m of till on rock whereas most of the area shows a metre or less. Down ice of rock rises, and occasionally on their stoss sides, sediment is 3-5 m or more thick.

Glacial erosion on bedrock

Ice-flow directions are southwestward in the northwest portion of the area and almost westward in the southeast. Scattered locations show evidence of subglacial-fluvial erosion features oriented similar to the striations.

Glacial sediment

Compactness of till, the common presence of striated clasts and the regional sediment cover indicate deposition of till at the base of active glacier ice. Till is the most common glacial sediment sampled although it is covered by glaciolacustrine silt and clay in many areas. Good exposures of till reveal a massive to fissile sandy silt to sand till with only moderate cohesion. Slightly weathered till sampled 0.5-1.0 m from the surface is olive-grey and forms a BC horizon. Surface (0.5 m or less in depth), weathered till is brown to yellowish brown and forms a B horizon reflecting accumulation of iron, manganese and organic matter.

Glaciofluvial and glaciolacustrine sediments

Glacial meltwater deposited eskers, kames and outwash as ridges of sand and gravel which cross the area. Most common are eskers and subaqueous outwash, deposited in topographic lows by continuous sediment-laden currents (underflows) derived from the ice margin. These currents were driven by their own density and flowed into deeper parts of the adjacent proglacial Lake (Lake Agassiz). Proximal sandy underflow deposits were sampled across the area. The proximity to and direct derivation of these meltwater sediments to the products of glacier erosion, till, made this an important sediment to sample for heavy mineral evaluation.

Glacial Lake Agassiz covered the area to elevations of 480 m near Pakwash Lake to over 500 m a.s.l. in the northeast part of the area were the glacial load was greater. This accounts for the wide cover of glaciolacustrine silt and clay across the area in thicknesses of 2-10 m, particularly below 390-420 m.

Post glacial sediment

Post glacial sediments include minor eolian deposits, derived from subaqueous outwash sand, and alluvium on the floodplains and peat accumulation in poorly drained lows.

COMPOSITIONAL ANALYSES AND RESULTS

Sampling methods

Till, the main sampling media, was sampled (15 km) from exposures along roadways, from hand dug pits, and from borrow pits used in construction of the many lumbering roads in the area. Two kilograms of glaciofluvial sediment was sampled from pits in subaqueous sand deposits scattered across the area.

Rock type, texture and depth were noted for each sample. Moist colour was determined using a Munsell colour chart (Appendix 1).

Preparation and analytical methods

A homogenized 15 kg sample was split into five samples for: i) sediment geochemistry (1 kg), ii) heavy mineral analysis (~10 kg), iii) grain size (0.5 kg), iv) supplemental analyses (1 kg), and v) archive reference (1 kg).

Overburden Drilling Management Ltd. of Nepean, Ontario processed the heavy mineral samples with a shaker table and with methylene iodide (s.g.=3.3) using a <2 mm (10 mesh) sample. Visible gold grains from the table and from panning were classified on the basis of size and morphology (Appendix 4). Concentrates were panned if more than three gold grains were found on the table.

Lithologic analysis of the 5.6-16 mm fraction (~1 Kg) (Appendix 2) was done by Consorminex, Gatineau, Quebec following washing and cleaning during table preparation. The > 0.25 mm fraction of the nonmagnetic heavy mineral concentrate was examined by Consorminex using an ultraviolet lamp and the number and mineralogy of fluorescent grains determined (Appendix 2). A few milligrams of the 0.063-0.250 mm fraction of selected nonmagnetic heavy mineral concentrates from different rock types was mounted in araldite on glass slides for heavy mineral counts by Consorminex (Appendix 2). Nonmagnetic heavy mineral concentrate splits (<2 mm) weighing about 10 grams, were analyzed by Bondar-Clegg Ltd., Ottawa, Ontario by instrumental neutron activation analysis (INAA), for gold and several other elements (Appendix 5)

For geochemical analysis, the <0.063 mm fraction was obtained by sieving a one kilogram split of the original sample with a dry stainless steel screen (230 mesh). A 30 gram sample was analyzed for gold, platinum and palladium by fire assay/DCP (Appendix 6) and a 0.5 gram split was analyzed by Bondar Clegg for trace elements by ICP-AES (inductively coupled plasma-atomic emission spectrometry) methods following nitric-aqua regia partial extraction.

RESULTS

Lithology

The drift samples contain a high percentage of local rock debris (>90%; greenstone, granite and migmatite) in pebbles (Appendix 1) and in the sand fraction of the heavy mineral concentrates. A small percentage (1-5, 10 % at most) of rock fragments originate from the Hudson Bay Lowland several hundred kilometres to the northeast. Some Shield areas up-ice from Red Lake have as much as 60% of the drift fragments derived from such exotic carbonate terrain (e.g. Thorleifson and Kristjansson, 1990; 1992).

Testing for carbonate reaction in the field with hydrochloric acid (10%) showed a few random reactions. This is probably due to local carbonitization of volcanic rocks rather than incorporation of Paleozoic carbonate into the matrix.

Processing for heavy mineral concentrates produced about 1.2 gm of -10 mesh, > 3.3 S.G. nonmagnetic heavy minerals and 1.0 gm magnetic concentrate per kg of sediment from a 10 kg sample. Weakly magnetic minerals occur in the nonmagnetic concentrate because the method only removes strongly magnetic minerals. The nonmagnetic concentrate from oxidized samples are dominated by epidote, amphiboles, garnet, hematite, pyroxene, ilmenite, and other minerals such as zircon, leucoxene, and goethite (Appendix 2). Oxidized samples contain no sulphides: unoxidzed samples may contain ~5-75% sulphides in addition to the above mineral suite and concentrates may compare to those from massive sulphide rocks (Allen and Nichol, 1984).

Amphiboles and clinopyroxenes are excluded from the calculations of percentages for heavy minerals because their specific gravity spans that of methylene iodide (Thorleifson and

Kristjansson, 1990), leading to variable results.

Some nonmagnetic heavy mineral concentrates examined under short wave ultraviolet light revealed blue or greenish grains identified as scheelite averaging about 1-125 grains per gram counted.

Visible gold grains

Visible gold grains ranging in size from 20 to 350 microns (0.020 to 0.35 mm) occur in till and sand samples. Background gold counts of several grains per sample occur on granitic rocks apart from known mineraliztion, in the southeast (Appendix 8c). Predicted assay values of gold (ppb) are given based on laboratory experience relating visible gold counts and assay values (Appendix 3a,8b).

The shape and surface morphology of the gold grains may be indicative of distance of transport by glacial processes (Averill and Zimmerman, 1986). Grains were assigned to one of three categories by Overburden Drilling Management (Appendix 3a):

1. Grains classified as delicate are characterized by primary crystal faces, pitted leaf surfaces and intact ragged leaf edges.

2. Irregularly-shaped gold grains are pitted, with the grains either retaining their gross primary shape or having become curled.

3. Abraded gold grains are considered primary leaves reduced to smaller flakes and spindled forms with polished surfaces.

Averill and Zimmerman (1986) found that if most of the grains in an anomalous sample conform to one class, then discounting some exceptions, transport distances of less than 100 m, 100-1000 m, and more than 1 km can be inferred for delicate, irregular and abraded gold grains, respectively. This guide to transport distances may apply in this area but it has not been tested.

Indicator minerals

The 0.25 to 2.0 mm fraction of nonmagnetic heavy mineral concentrates was visually inspected under a stereoscopic binocular microscope for kimberlite indicator minerals (Janse *et al.*, 1989). One pyrope garnet and one magnesian ilmenite were identified and confirmed by electron microprobe.

Geochemical quality control

Accuracy and precision in geochemical analysis were monitored using standards and duplicates (Appendix 4). The use of accumulated GSC sample materials, although not certified, has been verified by repeated use and they provide informal standards for many procedures. For example sample TCA-8010 has been used as a gold standard with good reliability (Appendix 4b). More systematic assessment of accuracy was assumed to have come from the commercial laboratories (e.g. Appendix 4a).

Analysis of <0.063 mm fractions by ICP-AES indicates good reproducibility. Duplicate samples show the values to be within 5% of other each other (see duplicate pairs, Appendix 4b)

Geochemistry

Nonmagmatic heavy mineral concentrates were analyzed by neutron activation (Appendix 5). The most prominent general trend in the data is indicated by lower values for sulphide-hosted elements such as arsenic in oxidized sediment, compared to unoxidized samples. This trend indicates destruction by oxidation of virtually all sulphide mineral grains in olive grey C horizon material obtained from excavations in well drained sites (cf. Thorleifson and Kristjansson, 1990), and confirmed by visual counts for percent sulphide in nonmagnetic heavy mineral concentrates (Appendix 7). Sampling strategies which take into account oxidation of sulphides have been discussed by Shilts (1975). Oxidized heavy mineral concentrates should be analyzed for elements which are not common in fine grained fractions and which reside in resistate minerals such as gold or scheelite. (Resistate minerals may be more difficult to analyse geochemically if elements are locked in the lattice structure and extraction methods become crucial) In contrast, heavy mineral concentrates from unoxidized till should be analyzed in order to detect sulphide-hosted metals.

In heavy mineral concentrates, gold concentrations can be several thousand ppb and concentrations can be correlated with the number of gold grains observed during processing of the concentrate (Appendices 3 and 5; see maps Appendix 8). In association with the greater gold concentrations, elevated levels of arsenic, antimony and chromium occur in heavy mineral concentrates and in matrix material (<0.063 mm fraction) from tills north of Narrow Lake, Skinner Township (NTS 52N/4), an area with nearby reported gold showings (Parker and Atkinson, 1992).

A sample with large numbers of grains identified as scheelite also contain several thousand ppm tungsten (<0.063 mm fraction), well above background (20-40 ppm). Oxidized heavy mineral concentrates from an area near Narrow Lake and southwest of the former South Bay mine show elevated values for nickel and copper (Appendix 8). Oxidized heavy mineral concentrates also have elevated levels of tantalum and tungsten. Oxidized heavy mineral concentrates from the southeast part of the area show elevated concentrations of rare earth elements (Appendix 8).

Analysis of the <0.063mm fraction for gold by fire assay indicate values up to several tens of ppb (Appendix 6) and concentrations are generally correlated with gold grain counts and neutron activation analysis of heavy mineral concentrates (cf. Thorleifson and Kristjansson, 1990). Arsenic values and base metals are in general well above detection. Concentrations of these and other chalcophile elements are commonly greater in the <0.002 mm fraction where a higher anomaly to background ratio is found. Because metals preferentially reside in the clay fraction, analysis of this fraction alone avoids the influence of variable contents of metal-poor silt (Shilts, 1971). Patterns are better defined by the clay fraction but the geochemical patterns in the clay plus silt fraction are of use to guide exploration.

Observations of geochemical trends in soil profiles in similar terrain and climate indicate three tendencies (Thorleifson and Kristjansson, 1990). Carbonate may have been leached from the B horizon, although it was probably low in this area. High values for some elements were observed low in this leached horizon (Appendix 7). In contrast, the grayish brown (2.5 Y) C horizon may include carbonate, but sulphide minerals in this horizon have been destroyed by oxidation to a depth of several metres. Pit samples collected across the area at 0.5-1.0 m depth generally seem to be from the transition from the B to the C horizon.

DISCUSSION/CONCLUSIONS

Programs appling soil sampling to mineral exploration in the Red Lake/Woman Lake area must take into account the several environments of glacial sedimentation, some variable directions of glacial transport, and the effects of post glacial weathering. Locally derived till, an ideal sampling medium for geochemistry or mineral tracing may be sampled at the surface in areas of thin till but is difficult to access in some areas covered by lacustrine silt and clay. This material is oxidized to a depth of several metres in well drained sites, so sulphides have been destroyed and their metals redistributed, possibly into the fine-grained fraction of the oxidized till (Shilts, 1984). The geochemical characteristics of surface samples therefore differ from unweathered sulphide-bearing till which can be obtained by drilling in areas of thick or buried till. Glaciofluvial sediments, thought to have a longer and more complex transport history than till, is a viable sampling medium for heavy minerals as indicated by the recovery of gold grains.

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APPENDIX 1. Description and lithology of sample

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LOCATION				BEDROCK		SAMPLE DESCRIPTION			SAMPLE PREPARATION				SHORTWAVE UV	5.6-16mm PEBBLE LITHOLOGY			
Sample Number	Location	UTM Zone 16 Easting (m)	UTM Zone 16 Northing (m)	Lithology	Map Unit	Depth (m)	Texture	Munsell Colour	Total Sample Weight (kg)	Heavy Mineral -10 mesh > 3.3 S.G. Nonmag. (g)	Heavy Mineral -10 mesh > 3.3 S.G. Mag. (g)	Gold Grains (/10kg)	Blue Grains (grains/g)	Granitic (%)	Metavolc. (%)	Metased. (%)	Carbonate (%)
91SBB- 1	Papaonga River	551100	5632400	granite, mafic bands	13	0.6	cob., silty sand	5Y5/4	8.5	5.9	4.2	0	3.8	63	3	28	6
91SBB- 2	Papaonga River	546000	5633200	granite	13	0.8	peb., silty sand	2.5Y6/4	9.1	9.3	7.1	1	2.0	60	7	20	13
91SBB- 3	Papaonga River	540750	5634000	banded mafic diorite	14	1.5	stny, silty sand	5Y5/3	8.6	9.3	10.7	0	5.7	65	9	20	6
91SBB- 4	Perky Creek Rd.	534500	5633800	granite, banded diorit	13	2	sndy, cbls, bldrs	5Y6/2	9.3	14.2	15.4	3	4.1	64	3	25	8
91SBB- 5	Perky Creek	540500	5631500	tonalite	12	1.5	sandy	5Y6/3	9.0	13.4	9.6	4	0.9	80	2	8	10
91SBB- 6	Perky Creek	539050	5631370	tonalite	12	2	sandy, stoney	5Y6/3	8.8	11.5	13.9	1	0.9	71	1	19	8
91SBB- 7	Perky Creek	539050	5631370	tonalite	12	1.5	sandy, stoney	2.5Y7/2	8.7	9.6	10.2	3	2.0	68	8	17	7
91SBB- 8	Perky Creek	539050	5631370	tonalite	12	1	sandy, stoney	2.5Y6/4	8.7	8.9	9.8	4	2.4	69	8	21	2
91SBB- 9	Perky Creek	539050	5631370	tonalite	12	0.5	sandy, stoney	5Y6/4	8.5	12.2	10.8	1	0.4	65	14	19	2
91SBB- 10	Perky Creek	539050	5631370	tonalite	12	0.25	sandy, stoney	2.5Y6/6	8.4	9.7	10.8	3	0.4	74	9	15	2
91SBB- 11	Perky Creek	537900	5628850	tonalite	12	0.6	sand	2.5Y5/4	8.6	16.6	15.5	1	2.3	81	5	13	1
91SBB- 12	Papaonga River	543900	5635050	granite	13	0.6	sandy	2.5Y5/4	9.0	15.9	8.2	1	2.3	54	5	39	2
91SBB- 13	Perky Lake Rd.	541700	5629850	coarse tonalite	12	0.8	sandy	5Y6/2	8.5	12.9	12.2	6	6.3	75	11	12	2
91SBB- 14	Perky Creek	535350	5630250	tonalite	12	1.5	silty sand	2.5Y6/2	8.8	9.8	12.0	2	6.4	79	7	14	0
91SBB- 15	Perky Creek Rd.	534000	5631000	granite tonalite	12	0.5	sandy	5Y6/3	9.1	10.6	8.8	1	3.9	63	12	21	4
91SBB- 16	Perky Creek, S	531200	5627000	granite tonalite	12	0.5	sandy silt	5Y6/3	9.2	7.2	8.8	0	10.5	86	6	5	3
91SBB- 17	Perky Creek	532700	5628900	tonalite	12	0.6	silty sand	5Y7/3	8.8	8.1	7.5	0	3.8	75	6	16	3
91SBB- 18	White Mud River, S	529000	5625000	amphibolite		0.7	sandy silt	2.5Y4/2	8.6	5.2	7.3	3	3.8	83	7	10	1
91SBB- 19	White Mud River	529000	5629000	amphibolite/granite		0.5	silty sand	2.5Y5/6	9.2	6.7	8.0	2	0.9	79	8	12	1
91SBB- 20	Reid Rd	530000	5633000	tonalite	12	1.5	sandy	5Y6/3	8.4	12.8	10.8	3	28.6	67	8	25	0
91SBB- 21	Hwy 105, Snake Falls	469250	5631150	diorite	14	1.5	sandy	10YR6/4	10.0	17.3	10.5	2	4.9	75	6	18	1
91SBB- 22	Hwy 105, Cianci's	470700	5630700	volcanic	7	1.5	silty sand	5Y6/3	10.0	6.9	2.1	1	40.0	72	3	25	0
91SBB- 23	Snake Falls Rd	477200	5642100	andesite	5	0.9	silty, sandy	5Y6/3	10.0	12.0	12.8	1	13.0	82	7	7	4
91SBB- 24	Perky Ck	527850	5633100	granite	12	1.5	pebbly, sandy	2.5Y6/2	10.0	11.0	9.2	4	5.4	71	6	19	4
91SBB- 25	Horsefly Rd	525000	5631350	migmatitic	7	1.2	sandy	5Y6/2	9.9	21.3	21.0	5	4.9	74	4	8	4
91SBB- 26	Horsefly Rd, junc.	526600	5632900	migmatite	7	1.5	sandy	5Y6/3	10.0	16.8	9.2	0	4.7	82	2	14	2
91SBB- 27	Slate Lake	530000	5642250	volcanic	6	1	sandy, pebbly	5Y5/3	10.0	12.9	9.1	8	3.5	46	14	38	2
91SBB- 28	Slate Lake	531750	5643300	pink granite	15	1.2	silty	5Y5/4	10.0	5.1	3.6	2	9.3	30	12	55	3
91SBB- 29	Slate Lake	534750	5644000	schist	5	2	fine sandy	2.5Y6/2	10.0	7.3	5.8	1	0.0	76	2	19	3
91SBB- 30	Slate Lake	536100	5645850	schist	5	1.6	fine sandy	5Y6/3	9.2	17.5	10.4	0	1.8	74	8	14	4
91SBB- 31	Jubilee Lake	537000	5646500	black slate	6	1.2	fine sandy	5Y6/3	10.0	11.6	8.5	0	5.2	74	5	17	4
91SBB- 32	Badrock Lake	529000	5641450	black slate	6	1.2	sandy	2.5Y6/2	10.0	8.8	10.3	9	4.9	58	8	31	3
91SBB- 33	Ben Rd	524100	5641050	metasediments	6	0.4	silty, sandy	10YR5/6	10.0	3.0	2.0	3	1.1	17	4	79	0

APPENDIX 1. Description and lithology of samples.

LOCATION				BEDROCK		SAMPLE DESCRIPTION			SAMPLE PREPARATION				SHORTWAVE UV	5.6-16mm PEBBLE LITHOLOGY			
Sample Number	Location	UTM Zone 16 Easting (m)	UTM Zone 16 Northing (m)	Lithology	Map Unit	Depth (m)	Texture	Munsell Colour	Total Sample Weight (kg)	Heavy Mineral -10 mesh > 3.3 S.G. Nonmag. (g)	Heavy Mineral -10 mesh > 3.3 S.G. Mag. (g)	Gold Grains (/10kg)	Blue Grains (grains/g)	Granitic (%)	Metavolc. (%)	Metased. (%)	Carbonate (%)
91SBB- 34	Ben Rd	515900	5639850	slate	7	0.6	sandy, stoney	2.5Y5/4	10.0	12.8	1.7	0	21.3	13	10	72	5
91SBB- 35	Ben Rd	514800	5638850	pink granite	15	0.6	sandy	2.5Y6/4	9.2	10.1	7.7	2	22.4	24	13	54	9
91SBB- 36	Papaonga River	525800	5639400	black slate	6	0.6	sandy	5Y6/3	10.0	9.0	7.4	1	24.4	37	1	62	0
91SBB- 37	Bonder Rd	532750	5640400	black slate	6	0.6	sandy	5Y6/4	9.1	13.0	9.5	1	4.2	54	3	38	5
91SBB- 38	Bonder Rd	534400	5639850	black metasediment	7	1.8		5Y6/3	10.0	11.9	10.0	0	3.3	64	9	25	2
91SBB- 39	Bonder Rd	531200	5640500	black slate	6	0.6	sandy, stoney	5Y6/3	10.0	11.4	10.1	0	7.4	45	10	40	3
91SBB- 40	White Mud Lake	514800	5633000	migmitized sediments	7	0.6	sand	5Y7/3	10.0	19.5	14.5	1	3.3	63	10	23	4
91SBB- 41	White Mud Lake	512300	5632200	black metasediment	7	0.4	sandy	2.5Y6/8	6.9	10.0	8.9	0	11.0	69	4	19	8
91SBB- 42	White Mud Lake	517650	5633400	migmatite (diorite)	7	0.6	silty, sandy	5Y6/2	8.9	12.5	10.9	0	3.5	53	6	37	4
91SBB- 43	Bottle Lake Rd	521900	5628500	tonalite	12	0.7	sandy	2.5Y7/4	10.0	21.6	33.5	11	4.1	82	3	13	2
91SBB- 44	Bottle Lake Rd	523550	5627300	tonalite	12	2	silty sand	5Y4/2	10.0	3.4	5.5	1	20.0	52	2	45	1
91SBB- 45	Bottle Lake Rd	525070	5628400	migmitized grnt/drt	7	0.8	very sandy	5Y6/3	7.9	7.7	8.7	0	2.5	81	4	14	1
91SBB- 46	Wenasaga Rd.	518450	5628200	tonalite	12	0.5	sandy	5Y7/3	9.9	11.2	9.5	1	5.2	85	3	8	4
91SBB- 47	E of Taber Lake?	516750	5626650	tonalite	12	1.8	sandy	5Y7/2	9.9	8.3	12.0	3	2.5	88	4	6	2
91SBB- 48	Belanger Rd.	516100	5655050	basalt (pillowed)	5	0.6	sandy silt	5Y5/4	9.6	4.2	3.1	0	3.1	2	98	0	0
91SBB- 49	Belanger Rd.	513250	5651100	tonalite	12	1	sandy	5Y5/2	9.2	9.0	8.5	0	16.9	29	63	8	0
91SBB- 50	Belanger Rd.	512550	5650700	volcanic	5	0.8	fine sandy	5Y6/1	8.2	9.8	5.7	0	3.3	30	66	4	0
91SBB- 51	Belanger Rd.	512550	5651800	granodiorite	12	0.5	sandy	5Y6/3	8.1	10.3	7.4	1	28.9	61	24	15	0
91SBB- 52	Belanger Rd.	514150	5653150	granite-diorite	12	0.5	sandy, pebbly	5Y5/2	8.9	6.8	3.3	16	19.3	40	50	10	0
91SBB- 53	Belanger Rd.	516800	5654450	mafic volcanic	5	0.6	very fine sandy	5Y5/3	7.6	9.2	7.9	0	42.9	7	85	8	0
91SBB- 54	Uchi Rd. E. Belanger	517200	5654950	mafic volcanic	5	0.8	sandy	5Y6/2	8.5	8.2	7.9	0	55.0	4	93	3	0
91SBB- 55	South Bay	516350	5655500	mafic volcanic	5	0.4	loose sandy	5Y6/4	7.8	13.5	5.0	12	9.1	3	97	0	0
91SBB- 56	Narrow Lake	505100	5672400	granite	12	1.8	sandy, fresh	5Y5/4	7.8	9.6	12.6	1	22.1	35	42	23	0
91SBB- 57	Narrow Lake	505100	5672400	granite	12	1	sandy, oxidized	5Y4/3	8.6	11.0	12.9	0	9.4	26	64	10	0
91SBB- 58	Narrow Lake	505100	5672400	granite	12	0.5	sandy, oxidized	2.5Y5/6	8.0	9.6	6.0	23	5.0	23	57	19	1
91SBB- 59	Narrow Lake	504300	5671950	granite	12	1	sandy pebbly	5Y6/3	9.5	10.9	13.0	13	38.2	16	78	6	0
91SBB- 60	Narrow Lake	502700	5671450	granite	12	0.8	sandy	5Y6/3	9.3	11.3	16.2	22	31.6	21	68	11	0
91SBB- 61	Narrow Lake	500850	5671300	granite	12	0.6	sandy	5Y6/3	9.7	22.4	25.8	60	20.0	43	44	13	0
91SBB- 62	W Narrow Lake	499150	5670700	granite	12	0.6	fine sandy	5Y7/3	8.2	13.6	14.8	32	36.0	66	20	13	1
91SBB- 63	W Narrow Lake	500100	5670150	pink granite	12	2	sandy	5Y5/3	10.0	16.1	17.6	0	3.5	42	41	15	2
91SBB- 64	W Narrow Lake	498500	5669450	granite dyke	12	1	silty sandy	5Y4/2	9.6	17.8	11.5	1	1.1	76	19	4	1
91SBB- 65	NE Trout Lake	496300	5669250	diorite	12	1.5	sandy	5Y6/3	8.4	14.7	9.2	1	10.6	77	18	4	1
91SBB- 66	Trout Lake	497550	5667750	granite, volc. inclus.	11	0.7	sandy	5Y5/4	8.6	17.5	9.6	5	3.6	46	31	21	2

APPENDIX 1. Description and lithology of samples.

LOCATION				BEDROCK		SAMPLE DESCRIPTION			SAMPLE PREPARATION				SHORTWAVE UV	5.6-16mm PEBBLE LITHOLOGY			
Sample Number	Location	UTM Zone 16 Easting (m)	Northing (m)	Lithology	Map Unit	Depth (m)	Texture	Munsell Colour	Total Sample Weight (kg)	Heavy Mineral -10 mesh > 3.3 S.G. Nonmag. (g)	Mag. (g)	Gold Grains (/10kg)	Blue Grains (grains/g)	Granitic (%)	Metavolc. (%)	Metased. (%)	Carbonate (%)
91SBB- 67	Narrow Lake	502000	5659100	granite	12	0.7	sandy	5Y6/2	7.6	8.9	11.9	8	14.7	60	7	32	1
91SBB- 68	Spud Rd.	502150	5667050	granite	12	0.6	sandy	5Y5/4	8.6	12.5	12.9	13	7.7	41	52	6	1
91SBB- 69	Spud Rd.	507650	5667150	granite	12	0.7	sandy	5Y5/3	9.8	13.4	17.1	1	16.1	24	64	11	1
91SBB- 70	Spud Rd.	505300	5667200	granite, volc. frags.	11	0.5	sandy	2.5Y6/6	8.8	11.4	11.1	15	9.1	36	50	13	1
91SBB- 71	Spud Rd.	506250	5669350	granite	12	0.6	sandy	5Y6/3	9.9	18.2	17.3	16	4.0	53	34	13	0
91SBB- 72	Joyce lake	502100	5664850	granite	12	1.2	sand	5Y6/2	10.0	19.1	18.4	1	8.1	55	39	6	0
91SBB- 73	E Joyce Lake	503200	5664350	diorite, volc. frags.	11	1.1	sandy	5Y6/3	8.5	12.3	12.3	7	26.2	55	37	6	2
91SBB- 74	Coreless Lake Rd.	504100	5663150	granite, volc. xenos.	11	1.1	sandy	5Y5/2	10.0	12.0	13.3	24	13.1	43	43	11	2
91SBB- 75	Joyce Lake Rd	502850	5660700	diorite	12	0.5	sandy	5Y5/2	7.6	3.7	5.1	13	43.3	23	69	7	1
91SBB- 76	Joyce Lake Rd	502250	5659000	granite	12	0.5	sandy	5Y6/2	9.0	13.5	11.4	9	15.9	44	52	3	1
91SBB- 77	Joyce Lake Rd	500900	5658400	diorite	12	1	sandy	5Y5/2	7.6	10.1	10.9	9	30.4	40	52	7	1
91SBB- 78	Otter Lake Rd	499100	5656250	diabase	10	0.8	silty sandy	5Y4/2	9.2	11.3	10.0	9	5.0	72	25	2	1
91SBB- 79	Otter Lake Rd	497250	5657000	granite	12	1.5	sandy	5Y5/2	10.0	15.4	11.0	7	25.1	57	43	0	0
91SBB- 80	Martin Rd	495200	5660250	granite	12	1.2	fine sandy	5Y7/2	9.4	23.6	5.4	7	3.6	84	14	2	0
91SBB- 81	Martin Rd	492800	5662950	diorite/migmatite	12	0.6	sandy	2.5Y6/6	8.6	16.4	8.6	7	3.7	60	35	4	1
91SBB- 82	Hwy 105 Madsen	460350	5637250	granite	15	0.7	sandy	2.5Y6/6	9.0	5.4	7.1	8	5.7	90	8	2	0
91SBB- 83	Dixie Ck	457100	5633600	volcanic	5	0.6	sandy, stoney	10YR4/4	8.2	5.3	6.2	1	80.0	64	14	22	0
91SBB- 84	Dixie Ck Rd	456300	5633800	volcanic	5	0.75	sandy, stoney	5Y7/3	8.9	14.1	20.3	9	15.0	80	13	6	1
91SBB- 85	Dixie Ck Rd	455200	5635750	volcanic	5	4	sandy, gravelly	5Y6/3	8.7	8.6	6.8	1	37.2	75	16	9	0
91SBB- 86	Hwy. 105	450300	5638200	volcanic	5	1	sandy, stoney	5Y6/2	9.2	11.5	14.5	1	0.9	84	15	1	0
91SBB- 87	Hwy. 105	449100	5638300	volcanic	5	1.5	sandy, stoney	5Y7/2	8.7	15.0	20.0	5	9.7	85	11	4	0
91SBB- 88	Hwy. 105, G. R. Lake	448050	5639950	volcanic	5		v. sandy, stoney	5Y5/3	10.0	12.0	17.6	1	5.2	81	13	6	0
91SBB- 89	Hwy 105	447800	5641050	granite	15	1	sandy, stoney	5Y5/4	10.0	19.9	25.4	0	4.8	71	27	0	2
91SBB- 90	Hwy 105	446100	5642400	granite	15	1.5	sandy	5Y6/2	10.0	20.2	32.0	0	3.3	74	11	12	3
91SBB- 91	Red Lake	440400	5653400	granite	15	0.5	sandy	10YR5/6	9.8	15.6	26.8	8	5.3	47	13	39	1
91SBB- 92	Peterson Lake	446600	5644600	volcanic	6	1.8	sandy, pebbly	5Y6/1	9.7	15.8	29.3	1	3.0	87	9	2	2
91SBB- 93	Sully Lake	445750	5647100	volcanic	6	1.5	sandy	5Y6/2	10.0	16.8	30.6	1	4.1	80	12	7	1
91SBB- 94	Hwy 105 Red Lake	443250	5650900	volcanic	3	1.8	fine sandy	5Y5/3	8.9	13.6	18.8	1	1.8	65	25	2	8
91SBB- 95	Hwy 125	446250	5651500	basalt	3	2	fine sandy	5Y5/2	10.0	8.4	16.2	1	0.0	86	10	1	3
91SBB- 96	Hwy 125	446550	5653600	basalt	3	1.5	sandy	5Y5/2	9.0	17.2	26.2	0	0.0	82	12	6	0
91SBB- 97	Hwy 125 McNeely	445750	5654400	volcanic	3	1.5	fine sandy	5Y6/3	9.5	13.7	23.8	0	4.1	76	6	18	0
91SBB- 98	Dickenson Mine	450750	5656400	basalt	7	0.9	sandy	5Y5/2	9.6	11.1	19.1	0	1.9	79	21	19	1
91SBB- 99	Dickenson Mine	450400	5656600	volcanic	7	0.7	sandy	5Y6/1	8.3	8.7	16.9	2	1.5	81	11	4	4

APPENDIX 1. Description and lithology of samples.

LOCATION				BEDROCK		SAMPLE DESCRIPTION			SAMPLE PREPARATION				SHORTWAVE UV	5.6-16mm PEBBLE LITHOLOGY			
Sample Number	Location	UTM Zone 16 Easting (m)	Northing (m)	Lithology	Map Unit	Depth (m)	Texture	Munsell Colour	Total Sample Weight (kg)	Heavy Mineral -10 mesh > 3.3 S.G. Nonmag. (g)	Mag. (g)	Gold Grains (/10kg)	Blue Grains (grains/g)	Granitic (%)	Metavolc. (%)	Metased. (%)	Carbonate (%)
91SBB- 100	Dickenson Mine	449450	5657600	volcanic	3	3	sandy	5Y7/1	9.9	9.6	18.5	0	1.5	86	13	1	0
91SBB- 101	Campbell Mine	448250	5656550	volcanic	3	1.2	sandy, stoney	5Y7/2	9.7	15.5	28.1	2	1.8	64	16	18	2
91SBB- 102	Hwy 125 Balmertown	446900	5656300	volcanic	5	1.4	sandy	5Y6/3	10.0	15.5	40.9	14	3.5	95	4	1	0
91SBB- 103	Nungesser Rd	453450	5668750	volcanic	3	0.7	sandy, stoney	2.5Y5/4	9.4	12.0	23.9	0	6.7	89	10	1	0
91SBB- 104	Nungesser Rd	456800	5671400	volcanic	3	1.5	sandy	5Y7/2	9.4	11.3	27.2	3	5.6	94	3	2	1
91SBB- 105	Mixie Lake Rd	448150	5629700	granite	17	2	sandy, pebbly	5Y6/1	10.0	6.7	9.3	4	4.2	91	8	0	1
91SBB- 106	Mixie Lake Rd. S	446350	5626550	volcanic	5	3	sandy	5Y7/2	8.2	1.6	2.0	0	91.4	80	20	0	0
91SBB- 107	Dixie Lake Rd. S	447550	5625850	volcanic	5	0.7	sandy	5Y6/3	9.9	18.0	14.0	5	3.9	90	6	44	0
91SBB- 108	Dixie Lake Rd	445000	5629900	gabbro, grnt. dyke	10	1.3	sandy	5Y6/1	9.9	9.8	10.2	1	5.6	94	5	1	0
91SBB- 109	Cochenor Rd	445150	5656800	volcanics	6	0.8	sandy	5Y7/3	10.0	15.5	33.7	3	3.6	76	19	5	0
91SBB- 110	Red Lake Airport	443800	5656800	andesite	5	2	sandy	5Y5/2	9.5	11.2	25.6	0	0.0	88	8	1	3
91SBB- 111	Red Lake Airport	443800	5656800	andesite	5	1.5	sandy	5Y6/2	10.0	10.4	22.9	1	1.7	81	8	11	0
91SBB- 112	Red Lake Airport	443800	5656800	andesite	5	0.9	sandy	5Y5/2	8.4	6.9	16.5	2	1.3	88	8	1	3
91SBB- 113	Red Lake Airport	443800	5656800	andesite	5	0.6	sandy	5Y6/2	8.6	11.3	25.3	0	7.4	81	12	6	1
91SBB- 114	McFinley Mine Rd	445600	5663150	volcanic	3	0.8	sandy	5Y6/3	9.1	8.3	17.1	5	32.0	80	19	0	1
91SBB- 115	Wenasaga Rd	514600	5627900	granodiorite	12	1.4	sandy	2.5Y5/4	8.3	12.6	9.2	1	1.3	81	7	8	4
91SBB- 116	Wenasaga Rd	512650	5625950	diorite migmatite	12	0.5	silty sand	10YR5/8	8.0	9.1	1.0	5	4.1	89	4	4	3
91SBB- 117	Wenasaga Rd	512350	5625250	diorite migmatite	12	1.5	sandy, pebbly	5Y6/2	7.9	20.2	17.7	1	6.3	92	4	1	3
91SBB- 118	Wenasaga Rd	510050	5625550	diorite	12	1.2	silty, sandy	5Y7/2	8.3	3.7	5.0	0	12.6	80	14	4	2
91SBB- 119		507100	5622400	diorite/migmatite	14	0.7	sandy	5Y5/2	9.1	5.7	10.3	2	14.1	74	14	5	7
91SBB- 120	Wenasaga Rd	509400	5622550	migmatite	14	0.8	sandy	5Y6/2	10.0	6.8	9.1	3	6.7	68	19	6	7
91SBB- 121	N. Wenasaga Rd	507100	5622400	migmatite	14	1.5	sandy	5Y5/1	10.0	18.7	16.4	0	5.1	83	9	2	6
91SBB- 122	Bowville Rd	503450	5625450	diorite	12	1.2	silty sand	5Y6/2	9.6	9.9	10.3	1	12.6	83	1	6	10
91SBB- 123	Bowville Rd	504850	5624700	diorite	12	1.5	sandy	5Y7/1	7.3	12.0	11.1	2	10.8	94	5	1	0
91SBB- 124	Fly Lake Rd	520650	5656000	volcanic	5	0.8	sandy	10YR5/4	10.0	10.6	11.8	16	15.4	19	53	26	2
91SBB- 125	Fly Lake Rd	520350	5654500	mafic volcanic	5	0.6	sandy	5Y6/3	9.0	8.4	1.2	5	28.7	30	47	23	0
91SBB- 126	Fly Lake Rd	520200	5654500	volcanic	5	0.7	sandy	5Y6/2	10.0	6.6	4.6	13	51.3	15	62	22	1
91SBB- 127	South Bay Line	522950	5661400	mafic volcanic	5	0.6	sandy	5Y6/3	9.0	17.2	14.7	11	74.3	18	80	2	0
91SBB- 128	Uchi Lake Rd	508800	5652250	granite	15a	0.4	silty sand	10YR6/8	8.9	7.6	0.9	0	20.0	45	50	5	0
91SBB- 129	Uchi Lake Rd	508300	5653350	diorite	15a	0.8	sand, cobbly	10YR5/6	8.6	8.9	7.1	8	12.2	73	25	1	1
91SBB- 130	Otter Lake Rd	494150	5657400	migmatite	12	1.2	sandy	5Y6/1	9.8	13.6	7.6	7	12.3	88	12	0	0
91SBB- 131	Otter Lake Rd	493250	5658200	migmatite, mfc. blocks	12	0.6	crs. sandy, stoney	5Y7/2	10.0	33.7	16.8	12	10.1	85	15	0	0
91SBB- 132	Joyce Lake Rd.	499900	5655150	diorite, mafic dykes	12	1.5		5Y6/1	8.8	19.5	10.4	10	43.6	49	50	1	0

APPENDIX 1. Description and lithology of samples.

LOCATION				BEDROCK		SAMPLE DESCRIPTION			SAMPLE PREPARATION				SHORTWAVE UV	5.6-16mm PEBBLE LITHOLOGY			
Sample Number	Location	UTM Zone 16 Easting (m)	UTM Zone 16 Northing (m)	Lithology	Map Unit	Depth (m)	Texture	Munsell Colour	Total Sample Weight (kg)	Heavy Mineral -10 mesh > 3.3 S.G. Nonmag. (g)	Heavy Mineral -10 mesh > 3.3 S.G. Mag. (g)	Gold Grains (/10kg)	Blue Grains (grains/g)	Granitic (%)	Metavolc. (%)	Metased. (%)	Carbonate (%)
91SBB- 133	Key Rd	497200	5652250	granodiorite	12	0.6	silty, sandy	5Y6/1	10.0	11.2	5.6	10	81.5	77	21	1	1
91SBB- 134	Ben Rd W	501150	5639450	granitic/mfc. dykes	15	0.7	sandy	5Y6/4	9.2	11.4	4.2	0	28.1	76	3	21	0
91SBB- 135	Ben Rd W	504300	5639700	granitic	15	0.6	silty sand	5Y7/2	8.7	11.4	5.3	7	43.5	77	13	9	1
91SBB- 136	Ben Rd	513250	5638550	granite	15	0.7	sandy, stoney	5Y7/2				0					
91SBB- 137	Ben Rd	497950	5639000	granite	15	1.2	sandy	5Y6/2				0					
*91SBB- 138	Bruce Mine	473900	5629900	basalt	7	5	fine sandy	5Y7/1				0					
*91SBB- 139	Bruce Mine	473900	5629900	basalt	7	2	fine sandy	5Y5/2	8.6	19.1	33.5	2	514.3	65	17	18	0
*91SBB- 140	Hwy 105	470700	5628900	diorite	14	1.2	sandy	5Y6/3	10.0	15.3	9.9	5	40.0	87	6	7	0

APPENDIX 2. Mineralogy of nonmagnetic heavy mineral concentrates

APPENDIX 2. Mineralogy of the non-magnetic heavy mineral concentrate.
100 grain count, Araldite mounts (n = 1.57)

CP = clinopyroxene
CR = chromite
EP = epidote
Er = clinozoisite
GA = garnet, pink, fractured
Ge = garnet, pink, euhedral
Gj = garnet, orange, fractured
Gr = garnet, pink, rounded
Gy = garnet, orange, euhedral
Gz = garnet, orange, rounded
GO = goethite
HB = hornblende
Hm = hornblende, brown
HE = hematite
IM = ilmenite
Ib = ilmenite, black
KY = kyanite
LE = leucoxene
MN = monozite
OP = orthopyroxene
PY = pyrite, fresh
RU = rutile
SP = titanite
Sb = titanite, blue
ST = staurolite
UK = unknown or unidentifiable
X3 = unknown grey mineral
ZR = zircon, euhedral
Za = zircon, rounded

Sample Number	CP	OP	GA	Gr	Ge	Gj	Gz	Gy	EP	Er	HE	GO	PY	HB	Hm	RU	LE	IM	Ib	Sb	SP	ST	MZ	ZR	Za	KY	CR	X3	UK	Total
	←													(count)																→
91SBB- 1	4	10	31	1	0	2	0	0	28	1	7	0	0	4	0	1	1	9	1	0	0	0	0	0	0	0	0	1	0	101
91SBB- 2	0	6	18	0	0	0	0	0	19	1	17	0	0	11	0	0	2	16	5	0	0	0	0	4	0	0	0	0	1	100
91SBB- 3	8	4	6	0	0	6	0	1	18	4	12	0	0	8	0	1	1	16	8	0	0	0	0	7	0	0	0	0	0	100
91SBB- 6	1	5	18	0	0	2	0	0	12	2	14	0	0	12	0	1	0	15	4	0	0	0	1	8	2	0	0	0	3	100
91SBB- 7	11	8	23	0	0	0	0	0	30	1	6	1	0	4	0	0	1	9	0	0	1	0	0	2	0	1	0	0	2	100
91SBB- 8	9	2	34	0	0	1	0	0	39	1	0	1	0	4	0	0	0	4	0	0	1	0	0	2	0	0	0	0	2	100
91SBB- 9	8	1	18	0	0	2	0	0	43	0	1	1	0	9	0	0	0	13	1	0	1	0	0	1	0	0	0	0	1	100
91SBB- 10	12	3	14	0	0	3	0	0	45	0	4	4	0	2	0	0	2	8	1	0	1	0	0	0	0	0	0	0	1	100
91SBB- 12	3	2	28	0	0	1	0	0	24	0	11	0	0	8	0	0	0	19	2	0	1	0	0	0	0	0	0	0	1	100
91SBB- 14	4	1	24	0	0	5	0	0	32	0	7	0	0	5	0	0	0	14	4	0	1	0	0	1	0	0	0	0	2	100
91SBB- 16	3	1	13	0	0	3	0	0	35	0	4	0	0	13	0	0	0	19	4	0	1	0	0	2	2	0	0	0	0	100
91SBB- 17	6	4	18	0	0	4	0	0	32	0	7	1	0	11	0	0	0	11	2	0	1	0	0	1	0	0	1	0	1	100
91SBB- 18	2	3	22	0	0	7	0	0	29	0	5	1	0	11	0	0	0	9	5	0	2	0	0	3	0	0	0	0	1	100
91SBB- 21	1	5	12	1	3	1	0	0	65	2	0	0	0	5	0	0	0	1	1	0	2	0	0	0	0	0	0	0	1	100
91SBB- 23	5	6	5	0	1	2	0	0	42	1	4	0	0	22	0	0	0	5	0	0	2	0	0	5	0	0	0	0	0	100
91SBB- 27	9	5	23	0	0	4	0	0	24	1	5	0	0	12	0	0	0	13	0	0	2	0	0	1	0	0	0	0	1	100
91SBB- 28	8	1	19	0	0	11	0	0	16	3	5	0	0	21	0	0	0	7	0	0	4	0	0	0	0	0	0	3	2	100
91SBB- 29	15	1	24	1	0	3	0	0	25	0	6	0	0	7	0	0	0	9	3	0	3	0	0	1	0	0	0	1	1	100
91SBB- 30	13	1	14	1	1	0	0	0	32	1	4	0	0	21	0	0	0	5	0	0	2	3	0	0	0	0	0	0	2	100

APPENDIX 2. Mineralogy of the non-magnetic heavy mineral concentrate (cont'd.).

CP = clinopyroxene
CR = chromite
EP = epidote
Er = clinozoisite
GA = garnet, pink, fractured
Ge = garnet, pink, euhedral
Gj = garnet, orange, fractured
Gr = garnet, pink, rounded
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UK = unknown or unidentifiable
X3 = unknown grey mineral
ZR = zircon, euhedral
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Sample Number	CP	OP	GA	Gr	Ge	Gj	Gz	Gy	EP	Er	HE	GO	PY	HB	Hm	RU	LE	IM	Ib	Sb	SP	ST	MZ	ZR	Za	KY	CR	X3	UK	Total
	← (count) →																													
91SBB- 31	10	5	28	0	0	0	0	0	9	2	9	1	0	22	0	0	0	8	1	0	0	3	0	0	0	0	0	0	2	100
91SBB- 32	9	4	31	1	0	3	0	0	18	0	4	0	0	7	0	0	0	5	8	0	3	3	0	1	0	0	0	2	1	100
91SBB- 33	11	2	14	0	0	6	0	1	23	2	14	0	0	2	0	0	1	3	12	0	0	5	0	2	0	0	0	1	1	100
91SBB- 36	10	5	33	1	2	2	0	0	17	1	6	0	0	9	0	0	0	7	3	0	3	0	0	0	0	0	0	0	1	100
91SBB- 39	4	3	28	1	0	1	0	0	27	0	6	0	0	7	0	0	1	9	7	0	2	1	0	1	0	0	0	0	2	100
91SBB- 40	2	7	19	0	0	3	0	0	35	3	3	0	0	13	0	0	1	10	0	0	2	0	0	1	0	0	0	0	1	100
91SBB- 41	0	5	20	0	0	3	0	0	30	2	8	0	0	5	0	0	0	20	3	0	0	0	0	3	0	0	0	0	1	100
91SBB- 42	23	8	25	0	0	4	0	0	14	1	1	0	0	15	0	0	0	2	1	0	5	0	0	1	0	0	0	0	0	100
91SBB- 43	6	8	30	1	0	2	0	0	28	0	4	1	0	6	0	0	0	11	1	0	0	0	0	2	0	0	0	0	0	100
91SBB- 49	3	1	17	0	1	4	0	2	22	2	2	0	0	22	0	0	1	12	6	0	2	0	0	0	0	0	0	0	3	100
91SBB- 50	4	1	12	0	0	0	0	0	2	5	4	0	0	23	0	1	0	3	44	0	0	0	0	0	0	0	0	0	1	100
91SBB- 51	3	5	11	0	0	0	0	0	19	6	3	1	0	8	0	0	0	9	31	0	0	1	0	1	0	0	0	1	1	100
91SBB- 52	0	4	15	0	0	4	0	0	17	15	3	0	0	13	0	0	0	8	13	0	2	0	0	3	0	0	0	1	2	100
91SBB- 53	3	1	31	0	1	3	0	0	24	7	2	1	0	9	0	0	1	7	6	0	0	1	0	1	0	0	0	0	2	100
91SBB- 54	2	2	18	0	1	2	0	0	29	17	4	0	0	5	0	0	0	6	5	0	2	1	0	1	1	0	0	2	2	100
91SBB- 55	1	1	6	0	0	2	0	0	12	71	1	0	0	1	0	0	0	0	4	0	1	0	0	0	0	0	0	0	0	100
91SBB- 56	7	6	21	0	2	2	0	0	28	5	8	2	0	8	0	0	0	1	6	0	1	1	0	2	0	0	0	0	0	100
91SBB- 57	7	1	17	0	0	1	0	1	23	2	12	1	0	14	0	1	0	10	7	0	0	0	0	2	0	0	0	0	1	100
91SBB- 58	0	3	19	0	1	3	0	0	25	1	11	0	0	10	0	0	0	17	6	0	0	0	0	4	0	0	0	0	0	100

APPENDIX 2. Mineralogy of the non-magnetic heavy mineral concentrate (cont'd.).

CP = clinopyroxene
CR = chromite
EP = epidote
Er = clinozoisite
GA = garnet, pink, fractured
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Gj = garnet, orange, fractured
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Sample Number	CP	OP	GA	Gr	Ge	Gj	Gz	Gy	EP	Er	HE	GO	PY	HB	Hm	RU	LE	IM	Ib	Sb	SP	ST	MZ	ZR	Za	KY	CR	X3	UK	Total
	←													(count)																→
91SBB- 59	2	5	20	0	1	9	0	0	33	6	2	2	0	12	0	0	0	4	0	0	0	0	0	1	0	0	0	0	3	100
91SBB- 60	7	3	17	0	0	3	0	0	15	1	8	0	0	8	0	0	2	27	3	0	0	0	0	6	0	0	0	0	0	100
91SBB- 61	11	6	10	0	1	3	0	0	39	2	4	2	0	7	0	0	3	10	1	0	0	0	0	1	0	0	0	0	0	100
91SBB- 63	1	0	17	0	0	1	0	0	33	1	6	1	0	8	0	1	0	27	0	0	0	0	0	2	0	0	0	0	2	100
91SBB- 64	2	2	12	0	1	1	0	0	30	16	4	0	0	9	0	0	1	12	0	0	6	0	0	4	0	0	0	0	0	100
91SBB- 66	1	4	7	0	0	1	0	0	66	3	1	0	0	11	0	0	0	2	0	0	0	1	0	0	0	0	0	0	3	100
91SBB- 67	8	9	19	0	0	2	0	0	13	1	11	0	0	14	0	0	0	15	4	0	0	0	0	3	0	0	0	0	1	100
91SBB- 68	16	5	11	0	1	0	0	0	27	9	9	0	0	6	0	0	0	7	5	0	2	0	0	2	0	0	0	0	0	100
91SBB- 72	13	6	15	0	0	3	0	0	24	2	8	0	0	16	0	1	0	7	3	0	0	0	0	1	0	0	0	0	1	100
91SBB- 73	13	7	18	0	0	2	1	1	21	1	8	0	0	10	0	0	0	14	0	0	0	2	0	2	0	0	0	0	0	100
91SBB- 74	8	1	23	0	0	1	0	0	23	3	10	1	0	5	0	0	2	11	7	0	1	1	0	0	0	0	0	0	3	100
91SBB- 75	4	2	30	1	0	4	0	0	13	1	20	2	0	3	0	0	0	14	3	0	0	1	0	2	0	0	0	0	0	100
91SBB- 76	22	4	20	0	0	8	0	0	22	4	10	2	0	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	100
91SBB- 77	13	1	30	0	0	3	0	0	24	2	3	0	0	5	0	0	0	13	1	0	3	1	0	0	0	0	0	0	1	100
91SBB- 78	5	6	11	0	0	1	0	0	5	0	6	0	0	24	0	0	0	6	27	1	2	0	0	5	0	0	0	0	1	100
91SBB- 87	6	6	17	0	0	1	0	0	13	5	6	0	0	10	0	0	0	9	18	0	3	0	0	5	1	0	0	0	0	100
91SBB- 88	4	10	6	0	1	4	0	0	26	2	7	0	0	11	0	0	0	6	9	0	12	0	0	1	0	0	0	0	1	100
91SBB- 89	9	10	18	0	0	7	0	0	25	1	3	0	0	4	0	0	0	5	4	0	11	0	0	2	0	0	0	0	1	100
91SBB- 90	4	7	12	0	0	4	0	0	17	3	18	0	0	10	0	0	0	8	4	0	7	0	0	5	0	0	0	0	1	100

APPENDIX 2. Mineralogy of the non-magnetic heavy mineral concentrate (cont'd.).

CP = clinopyroxene
CR = chromite
EP = epidote
Er = clinozoisite
GA = garnet, pink, fractured
Ge = garnet, pink, euhedral
Gj = garnet, orange, fractured
Gr = garnet, pink, rounded
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Sb = titanite, blue
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UK = unknown or unidentifiable
X3 = unknown grey mineral
ZR = zircon, euhedral
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Sample Number	CP	OP	GA	Gr	Ge	Gj	Gz	Gy	EP	Er	HE	GO	PY	HB	Hm	RU	LE	IM	Ib	Sb	SP	ST	MZ	ZR	Za	KY	CR	X3	UK	Total
	←													(count)																→
91SBB- 91	3	3	20	0	2	10	0	0	14	4	3	0	0	19	0	0	0	3	16	0	0	0	0	2	0	0	0	0	1	100
91SBB- 92	2	5	10	0	1	3	0	0	28	4	8	0	0	7	0	0	1	4	4	0	19	1	0	2	0	0	0	0	1	100
91SBB- 93	4	1	14	0	1	5	0	0	15	0	12	0	0	11	0	0	0	11	13	0	8	0	0	4	0	0	0	0	1	100
91SBB- 94	3	5	22	0	0	1	0	0	16	1	7	1	0	19	0	0	1	8	5	0	8	0	0	3	0	0	0	0	0	100
91SBB- 103	4	7	7	0	0	2	0	0	20	4	4	0	0	18	0	0	0	15	8	0	6	0	0	4	0	0	0	0	1	100
91SBB- 104	0	0	13	0	0	0	1	0	10	1	6	1	0	22	0	0	1	6	14	0	14	0	0	11	0	0	0	0	0	100
91SBB- 105	5	3	11	0	0	10	0	0	26	2	3	0	0	6	0	0	0	10	14	0	5	0	0	3	0	0	0	0	2	100
91SBB- 106	2	3	8	0	1	1	0	0	38	11	1	1	0	12	0	0	1	2	7	0	6	0	0	5	0	0	0	0	1	100
91SBB- 107	2	0	9	0	0	4	0	0	61	1	1	3	0	8	0	0	0	0	2	0	8	0	0	0	0	0	0	0	1	100
91SBB- 108	5	3	11	0	0	2	0	1	30	3	2	2	0	11	0	0	1	11	0	0	14	0	0	2	1	0	0	0	1	100
91SBB- 109	2	17	13	0	0	1	0	0	30	2	6	0	0	6	0	0	0	0	11	0	11	0	0	0	0	0	0	0	1	100
91SBB- 110	3	2	6	0	0	0	0	0	18	5	10	0	0	34	0	1	1	0	10	0	6	0	0	4	0	0	0	0	0	100
91SBB- 111	3	4	10	0	0	2	0	0	20	2	5	0	0	17	0	0	0	8	2	0	22	0	0	2	0	0	0	0	3	100
91SBB- 112	3	9	14	0	0	1	0	0	21	0	8	3	0	17	0	0	0	7	5	0	10	0	0	2	0	0	0	0	0	100
91SBB- 113	1	3	14	0	0	0	1	1	23	2	2	1	0	9	0	0	0	18	1	0	10	0	0	9	1	0	0	0	1	97
91SBB- 114	8	6	9	0	0	0	0	0	23	0	6	0	0	8	0	0	0	10	8	0	20	0	0	1	0	0	0	0	1	100
91SBB- 115	10	7	18	0	0	0	1	1	31	0	3	0	0	17	0	0	0	3	0	0	3	0	0	1	0	0	0	0	5	100
91SBB- 116	5	9	13	0	0	5	0	1	35	0	6	0	0	23	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	100
91SBB- 117	6	6	10	0	0	0	0	1	28	1	5	0	0	35	0	0	0	1	5	0	0	0	0	1	0	0	0	0	1	100

APPENDIX 2. Mineralogy of the non-magnetic heavy mineral concentrate (cont'd.).

CP = clinopyroxene
CR = chromite
EP = epidote
Er = clinozoisite
GA = garnet, pink, fractured
Ge = garnet, pink, euhedral
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Sample Number	CP	OP	GA	Gr	Ge	Gj	Gz	Gy	EP	Er	HE	GO	PY	HB	Hm	RU	LE	IM	Ib	Sb	SP	ST	MZ	ZR	Za	KY	CR	X3	UK	Total
	← (count) →																													
91SBB- 118	10	5	28	0	0	1	0	0	29	1	7	0	0	2	0	0	0	10	3	0	3	0	0	1	0	0	0	0	0	100
91SBB- 119	0	2	31	1	0	0	0	0	8	1	11	1	0	8	0	2	0	13	5	0	10	0	0	4	0	0	0	0	3	100
91SBB- 120	1	8	17	0	0	2	0	0	22	0	9	1	0	8	0	0	1	13	10	0	2	0	0	4	0	0	0	0	2	100
91SBB- 124	2	2	13	0	0	0	0	0	27	2	3	1	0	13	0	1	0	4	30	0	0	1	0	0	0	0	0	0	1	100
91SBB- 126	7	5	23	0	1	0	0	0	24	8	2	0	0	3	0	1	0	9	10	0	2	1	0	0	2	1	0	0	1	100
91SBB- 127	6	11	22	0	0	1	0	0	21	9	5	0	0	9	0	0	1	5	7	0	1	1	0	0	0	0	0	0	1	100
91SBB- 128	5	12	7	1	0	0	0	0	32	5	4	0	0	12	0	0	0	13	7	0	0	0	0	1	0	0	0	0	1	100
91SBB- 129	6	7	13	0	1	0	0	0	41	1	2	0	0	6	0	0	0	10	10	0	2	0	0	1	0	0	0	0	0	100
91SBB- 131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91SBB- 131	8	15	6	0	0	2	0	0	49	2	1	0	0	8	0	0	0	0	0	0	5	0	0	0	1	0	0	0	0	97
91SBB- 132	2	4	10	0	0	2	0	0	23	6	6	0	0	24	0	0	0	0	17	0	0	0	0	4	0	1	0	0	1	100
91SBB- 133	2	0	9	0	0	1	0	0	37	3	4	1	0	24	0	0	0	1	15	0	0	0	0	2	1	0	0	0	0	100
91SBB- 134	0	4	18	0	0	3	0	0	8	1	1	0	0	11	0	0	2	6	6	0	0	4	0	3	0	0	0	0	3	70
91SBB- 135	10	12	11	0	0	0	0	0	29	1	2	0	0	17	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	100
91SBB- S1	11	4	16	0	0	1	0	0	44	2	3	0	1	8	0	0	0	0	4	0	3	0	0	2	0	0	0	0	1	100
91SBB- S3	2	2	15	0	0	1	0	0	66	1	3	0	0	3	0	0	0	0	0	0	4	3	0	0	0	0	0	0	0	100
91SBB- S9	8	4	24	0	0	0	0	0	18	0	11	0	1	16	0	0	0	1	10	0	5	2	0	0	0	0	0	0	0	100
91SBB- S10	1	7	24	0	0	1	0	0	19	0	10	0	0	10	0	0	0	5	16	0	3	0	0	3	0	0	0	0	1	100

APPENDIX 2. Mineralogy of the non-magnetic heavy mineral concentrate (cont'd.).

CP = clinopyroxene
CR = chromite
EP = epidote
Er = clinozoisite
GA = garnet, pink, fractured
Ge = garnet, pink, euhedral
Gj = garnet, orange, fractured
Gr = garnet, pink, rounded
Gy = garnet, orange, euhedral
Gz = garnet, orange, rounded
GO = goethite
HB = hornblende
Hm = hornblende, brown
HE = hematite
IM = ilmenite
Ib = ilmenite, black
KY = kyanite
LE = leucoxene
MN = monozite
OP = orthopyroxene
PY = pyrite, fresh
RU = rutile
SP = titanite
Sb = titanite, blue
ST = staurolite
UK = unknown or unidentifiable
X3 = unknown grey mineral
ZR = zircon, euhedral
Za = zircon, rounded

Sample Number	CP	OP	GA	Gr	Ge	Gj	Gz	Gy	EP	Er	HE	GO	PY	HB	Hm	RU	LE	IM	Ib	Sb	SP	ST	MZ	ZR	Za	KY	CR	X3	UK	Total
	← (count) →																													
91SBB- S11	0	8	23	0	0	1	0	0	22	0	10	0	3	18	0	0	0	3	7	0	0	1	0	3	0	0	0	0	1	100
91SBB- S12	1	6	35	0	0	0	0	0	16	0	5	0	0	9	0	1	1	10	7	0	4	5	0	0	0	0	0	0	0	100
91SBB- S13	1	6	21	0	0	2	0	0	32	2	6	1	0	13	0	0	1	0	9	0	5	0	0	0	0	0	0	0	1	100
91SBB- S17	2	8	28	0	0	0	0	0	17	2	5	1	0	8	0	0	0	6	15	0	2	1	0	0	0	0	0	0	5	100
91SBB- S18	5	7	12	0	0	2	0	0	32	3	7	0	0	11	0	0	1	7	5	0	1	0	0	4	0	0	0	0	3	100
91SBB- S19	7	6	21	0	0	2	0	0	29	2	5	1	0	11	0	0	0	3	7	0	3	0	0	2	0	0	0	0	1	100
91SBB- S20	15	9	10	0	0	1	0	0	22	4	5	0	0	13	0	0	1	4	7	0	5	0	0	2	1	0	0	0	1	100
91SBB- S21	6	6	15	1	0	2	0	0	27	1	3	1	0	0	0	0	0	13	5	0	18	0	0	0	0	0	0	0	2	100
91SBB- S23	8	3	11	1	0	1	0	0	17	1	9	0	0	8	0	0	2	12	2	0	22	0	0	2	0	0	0	0	1	100
91SBB- S26	0	5	16	0	0	4	0	0	24	1	3	0	0	12	0	0	0	5	18	0	4	0	0	5	0	0	0	0	3	100
91SBB- S27	5	4	34	0	0	1	0	0	12	0	11	0	1	7	0	0	0	7	13	0	0	2	0	3	0	0	0	0	0	100
91SBB- S28	7	5	21	2	0	2	0	0	29	0	4	0	0	9	0	0	0	6	5	0	8	0	0	1	0	1	0	0	0	100
91SBB- S32	7	9	21	0	1	3	0	0	22	1	4	1	0	11	0	0	1	0	14	0	1	1	0	2	0	0	0	0	1	100
91SBB- S34	17	8	10	0	1	0	0	0	23	0	3	1	0	14	0	1	0	3	7	0	9	0	0	3	0	0	0	0	0	100
91SBB- S35	7	5	19	0	0	0	0	0	15	3	6	0	0	18	0	0	0	2	18	0	3	0	0	2	1	0	0	0	1	100
91SBB- S38	10	8	16	0	0	0	0	0	31	2	8	0	0	8	0	0	1	0	3	0	8	3	0	1	0	0	0	0	1	100

APPENDIX 3. Classification of visible gold grains (a) till; (b) sand

APPENDIX 3A. Classification of visible gold grains in till.

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
91SBB- 1	Y	NO VISIBLE GOLD											
91SBB- 2	Y	15 x 25	4 C						1	1			
										1	9.3	1	
91SBB- 3	Y	NO VISIBLE GOLD											
91SBB- 4	Y	25 x 50	8 C		1				1	2			
		125 x 125	25 C							1			
										3	14.2	215	
91SBB- 5	Y	25 x 50	8 C		3					3			
		50 x 75	13 C		1					1			
										4	13.4	46	
91SBB- 6	Y	50 x 75	13 C		1					1			
										1	11.5	32	
91SBB- 7	Y	25 x 25	5 C		1					1			
		25 x 50	8 C		1					1			
		50 x 75	13 C		1					1			
										3	9.6	50	
91SBB- 8	Y	25 x 50	8 C		1		1			2			
		50 x 50	10 C		2					2			
										4	8.9	62	
91SBB- 9	Y	50 x 50	10 C		1					1			
										1	12.2	16	
91SBB- 10	Y	25 x 50	8 C						1	1			
		50 x 75	13 C		1		1			2			
										3	9.7	85	
91SBB- 11	Y	50 x 75	13 C							1			
										1	16.6	22	
91SBB- 12	Y	50 x 75	13 C		1					1			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
										1	15.9	23	
91SBB- 13	Y	25 x 25	5 C				1			1			
		25 x 50	8 C		1		1			2			
		50 x 50	10 C		2					2			
		50 x 75	13 C		1					1			
										6	12.9	73	
91SBB- 14	Y	25 x 50	8 C		1					1			
		50 x 50	10 C				1			1			
										2	9.8	28	
91SBB- 15	Y	50 x 75	13 C		1					1			
										1	10.6	35	
91SBB- 16	N	NO VISIBLE GOLD											
91SBB- 17	N	NO VISIBLE GOLD											
91SBB- 18	Y	25 x 50	8 C		1					2			
		75 x 75	15 C		1					1			
										3	5.2	155	
91SBB- 19	Y	25 x 50	8 C							2			
										2	6.7	24	
91SBB- 20	Y	25 x 25	5 C							1			
		50 x 50	10 C		1		1			2			
										3	12.8	32	
91SBB- 21	Y	25 x 50	8 C				1			1			
		50 x 125	18 C							1			
										2	17.3	63	
91SBB- 22	N	50 x 50	10 C							1			
										1	6.9	28	

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
91SBB- 23	N	50 x 100	15 C							1			
										1	12	53	
91SBB- 24	Y	25 x 25	5 C							2			
		25 x 50	8 C							2			
										4	11	19	
91SBB- 25	Y	50 x 50	10 C		1					1			
		50 x 100	15 C							1			
		100 x 175	27 C							1			
		125 x 150	27 C							1			
		150 x 175	31 C							1			
										5	21.3	691	
91SBB- 26	N	NO VISIBLE GOLD											
91SBB- 27	Y	25 x 25	5 C		1		1			2			
		50 x 50	10 C		1					1			
		50 x 75	13 C		1					2			
		75 x 175	25 C							1			
		75 x 225	29 C							1			
		125 x 250	36 C							1			
										8	12.9	1416	
91SBB- 28	Y	25 x 25	5 C							1			
		25 x 50	8 C							1			
										2	5.1	21	
91SBB- 29	N	25 x 50	8 C							1			
										1	7.3	11	
91SBB- 30	N	NO VISIBLE GOLD											
91SBB- 31	N	NO VISIBLE GOLD											
91SBB- 32	Y	25 x 25	5 C		1		3			4			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		50 x 50	10 C							1			
		50 x 75	13 C		1					3			
		125 x 125	25 C							1			
										9	8.8	489	
91SBB- 33	Y	25 x 25	5 C						1	2			
		50 x 50	10 C							1			
										3	3	80	
91SBB- 34	N	NO VISIBLE GOLD											
91SBB- 35	Y	25 x 50	8 C							1			
		75 x 100	18 C							1			
										2	10.1	108	
91SBB- 36	N	50 x 100	15 C							1			
										1	9	71	
91SBB- 37	N	50 x 50	10 C							1			
										1	13	15	
91SBB- 38	N	NO VISIBLE GOLD											
91SBB- 39	N	NO VISIBLE GOLD											
91SBB- 40	N	75 x 150	22 C							1			
										1	19.5	109	
91SBB- 41	N	NO VISIBLE GOLD											
91SBB- 42	N	NO VISIBLE GOLD											
91SBB- 43	Y	25 x 25	5 C							2			
		50 x 50	10 C		1					1			
		100 x 100	20 C							1			
		100 x 150	25 C							2			
		100 x 250	34 C							2			
		125 x 125	25 C							1			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (μm)	Thickness (C=calculated) (M=measured) (μm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		125 x 175	29 C							1			
		150 x 275	40 C							1			
										11	21.6	2056	
91SBB- 44	N	50 x 50	10 C							1			
										1	3.4	57	
91SBB- 45	N	NO VISIBLE GOLD											
91SBB- 46	N	75 x 75	15 C							1			
										1	11.2	57	
91SBB- 47	Y	25 x 50	8 C							2			
		125 x 200	31 C							1			
										3	8.3	771	
91SBB- 48	N	NO VISIBLE GOLD											
91SBB- 49	N	NO VISIBLE GOLD											
91SBB- 50	N	NO VISIBLE GOLD											
91SBB- 51	N	25 x 50	8 C							1			
										1	10.3	8	
91SBB- 52	Y	25 x 25	5 C		1				1	8			TWO GOLD POPULATIONS: ONE IS
		25 x 50	8 C				2		1	5			RESHAPED BACKGROUND GOLD
		50 x 50	10 C						1	3			OTHER IS MODIFIED TO PRISTINE
										16	6.8	173	GOLD.
91SBB- 53	N	NO VISIBLE GOLD											
91SBB- 54	N	NO VISIBLE GOLD											
91SBB- 55	Y	15 x 25	4 C						2	4			
		25 x 25	5 C							2			TWO GOLD POPULATIONS AS IN
		25 x 50	8 C				1			4			SAMPLE 52
		50 x 50	10 C							1			
		50 x 150	20 C							1			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
										12	13.5	157	
91SBB- 56	N	250 x 275	48 C							1			
										1	9.6	2597	
91SBB- 57	N	NO VISIBLE GOLD											
91SBB- 58	Y	10 x 10	2 C						2	3			
		15 x 15	3 C						2	3			TWO GOLD POPULATIONS: ONE
		25 x 25	5 C				1			3			RESHAPED THE OTHER MOSTLY
		25 x 50	8 C							4			PRISTINE TO SLIGHTLY MODIFIED.
		25 x 75	10 C				1			2			
		50 x 50	10 C						1	2			
		50 x 75	13 C							2			
		75 x 75	15 C				1			2			
		125 x 225	34 C							1			
		200 x 250	42 C							1			
										23	9.6	2810	
91SBB- 59	Y	25 x 25	5 C		1				3	5			
		25 x 50	8 C						1	1			TWO GOLD POPULATIONS ONE
		25 x 75	10 C						2	2			RESHAPED THE OTHER PRISTINE.
		50 x 50	10 C				1		1	3			
		75 x 150	22 C							1			
		200 x 250	42 C							1			
										13	10.9	1771	
91SBB- 60	Y	15 x 15	3 C						2	2			
		25 x 25	5 C		1		1		2	5			TWO GOLD POPULATIONS AS IN
		25 x 50	8 C		1					1			SAMPLE 59
		25 x 75	10 C						2	2			
		50 x 50	10 C		1		1		2	6			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		50 x 75	13 C				1			2			
		50 x 100	15 C							2			
		75 x 75	15 C							1			
		75 x 100	18 C							1			
										22	11.3	481	
91SBB- 61	Y	10 x 10	2 C						1	1			
		15 x 15	3 C				3		2	6			TWO GOLD POPULATIONS AS IN 59.
		25 x 25	5 C				6		6	23			PHOTOMICROGRAPH AVAILABLE
		25 x 50	8 C		1		2		2	10			PICTURE REFERENCE #189
		25 x 75	10 C		1		1			2			
		50 x 50	10 C		5		1			8			
		50 x 75	13 C		3					4			
		50 x 100	15 C		2					3			
		75 x 125	20 C		1					1			
		100 x 150	25 C							1			
		175 x 325	46 C		1					1			
										60	22.4	1465	
91SBB- 62	Y	15 x 15	3 C						5	10			
		25 x 25	5 C		1				5	10			TOW GOLD POPULATIONS, ONE
		25 x 50	8 C				1			6			RESHAPED THE OTHER MAINLY
		25 x 75	10 C							1			PRISTINE TO SLIGHTLY MODIFIED.
		50 x 50	10 C		2		1			3			
		50 x 100	15 C							1			
		125 x 350	44 C							1			
										32	13.6	1537	
91SBB- 63	N	NO VISIBLE GOLD											

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
91SBB- 64	N	75 x 75	15 C							1			
										1	17.8	36	
91SBB- 65	N	50 x 75	13 C							1			
										1	14.7	25	
91SBB- 66	Y	25 x 25	5 C							1			
		25 x 50	8 C				1			2			
		50 x 50	10 C							2			
										5	17.5	33	
91SBB- 67	Y	25 x 50	8 C		1					3			
		25 x 75	10 C							1			PHOTOMICROGRAPH AVAILABLE
		50 x 50	10 C		1					1			PICTURE REFERENCE #189
		50 x 75	13 C							1			
		50 x 100	15 C		1					1			
		75 x 100	18 C		1					1			
										8	8.9	298	
91SBB- 68	Y	25 x 25	5 C		2		1		2	8			
		25 x 50	8 C							2			TWO GOLD POPULATIONS
		25 x 100	13 C						1	1			PRESENT: ONE RESHAPED AND
		50 x 50	10 C				1			1			ONE PRISTINE TO SLIGHTLY
		50 x 75	13 C		1					1			MODIFIED.
										13	12.5	104	
91SBB- 69	N	25 x 25	5 C							1			
										1	13.4	2	
91SBB- 70	Y	25 x 25	5 C				1		1	4			
		25 x 50	8 C		1		2			5			
		50 x 50	10 C		2					2			
		50 x 75	13 C				1			2			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		75 x 75	15 C							1			
		75 x 125	20 C							1			
										15	11.4	331	
91SBB- 71	Y	15 x 15	3 C		1		1			2			
		25 x 25	5 C				2		2	5			
		25 x 50	8 C							5			
		25 x 75	10 C							1			
		75 x 200	27 C							1			
		100 x 100	20 C		1					1			
		100 x 150	25 C							1			
										16	18.2	492	
91SBB- 72	N	25 x 50	8 C							1			
										1	19.1	4	
91SBB- 73	Y	15 x 15	3 C						1	1			
		25 x 25	5 C							3			
		25 x 50	8 C							1			
		50 x 75	13 C		1					1			
		100 x 175	27 C		1					1			
										7	12.3	354	
91SBB- 74	Y	15 x 15	3 C						1	4			
		25 x 25	5 C		1		2		1	14			THREE RESHAPED GRAINS HAVE A DARK OCHRE COATING.
		25 x 50	8 C		1		1			2			
		50 x 50	10 C		1		1			2			
		50 x 125	18 C		2					2			
										24	12	244	
91SBB- 75	Y	15 x 15	3 C							1			
		25 x 25	5 C				1			2			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		25 x 50	8 C							3			
		50 x 50	10 C						1	1			
		50 x 75	13 C		1					4			
		50 x 100	15 C							1			
		75 x 100	18 C							1			
										13	3.7	982	
91SBB- 76	Y	15 x 15	3 C						1	1			
		25 x 25	5 C		3					3			
		25 x 50	8 C		2					4			
		75 x 100	18 C		1					1			
										9	13.5	105	
91SBB- 77	Y	25 x 25	5 C		1		1			2			
		25 x 50	8 C		1					4			
		25 x 75	10 C							1			
		50 x 50	10 C		2					2			
										9	10.1	94	
91SBB- 78	Y	25 x 25	5 C						2	3			
		25 x 50	8 C		2		1			5			
		50 x 50	10 C		1					1			
										9	11.3	60	
91SBB- 79	*	25 x 25	5 C		3					4			
		25 x 50	8 C		1					1			
		50 x 50	10 C		1					1			
		50 x 75	13 C							1			
										7	15.4	48	
91SBB- 80	Y	25 x 25	5 C							3			
		25 x 50	8 C		2					2			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		50 x 50	10 C							1			
		50 x 75	13 C		1					1			
										7	23.6	34	
91SBB- 81	Y	25 x 25	5 C		1				1	5			
		25 x 50	8 C							1			
		75 x 125	20 C		1					1			
										7	16.4	104	
91SBB- 82	Y	25 x 25	5 C		4		1			6			
		25 x 75	10 C							1			
		50 x 50	10 C		1					1			
										8	5.4	98	
91SBB- 83	N	25 x 25	5 C							1			
										1	5.3	5	
91SBB- 84	Y	25 x 25	5 C		1				1	3			
		25 x 50	8 C		1		1			3			PHOTOMICROGRAPH AVAILABLE
		50 x 50	10 C		1					1			PICTURE REFERENCE #190 TYPICAL
		50 x 100	15 C		1					1			BACKGROUND GRAINS.
		75 x 100	18 C		1					1			
										9	14.1	153	
91SBB- 85	N	25 x 25	5 C							1			
										1	8.6	3	
91SBB- 86	N	100 x 150	25 C							1			
										1	11.5	252	
91SBB- 87	Y	25 x 25	5 C		1					1			
		25 x 50	8 C		1					1			
		50 x 50	10 C		1					1			
		50 x 75	13 C		1					2			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
										5	15	70	
91SBB- 88	N	75 x 100	18 C							1			
										1	12	84	
91SBB- 89	N	NO VISIBLE GOLD											
91SBB- 90	N	NO VISIBLE GOLD											
91SBB- 91	Y	25 x 25	5 C						2	2			
		25 x 75	10 C							1			
		50 x 50	10 C						2	3			
		50 x 75	13 C		1					1			
		50 x 100	15 C							1			
										8	15.6	117	
91SBB- 92	N	25 x 25	5 C							1			
										1	15.8	2	
91SBB- 93	N	25 x 25	5 C							1			
										1	16.8	1	
91SBB- 94	N	50 x 75	13 C							1			
										1	13.6	27	
91SBB- 95	N	50 x 75	13 C							1			
										1	8.4	44	
91SBB- 96	N	NO VISIBLE GOLD											
91SBB- 97	N	NO VISIBLE GOLD											
91SBB- 98	N	NO VISIBLE GOLD											
91SBB- 99	Y	25 x 25	5 C		1					1			
		25 x 50	8 C							1			
										2	8.7	12	
91SBB- 100	N	NO VISIBLE GOLD											

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (μm)	Thickness (C=calculated) (M=measured) (μm)		Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
91SBB- 101	Y	25 x 25	5	C		1					1			
		50 x 75	13	C							1			
											2	15.5	26	
91SBB- 102	Y	10 x 10	2	C						1	1			
		15 x 15	3	C						1	1			
		25 x 25	5	C						2	5			
		25 x 50	8	C				2			4			
		50 x 50	10	C				1			1			
		50 x 75	13	C							2			
											14	15.5	90	
91SBB- 103	N	NO VISIBLE GOLD												
91SBB- 104	Y	25 x 25	5	C							1			
		25 x 50	8	C		1					1			
		50 x 75	13	C							1			
											3	11.3	42	
91SBB- 105	Y	15 x 15	3	C							1			
		25 x 50	8	C							1			LARGEST GRAIN COATED WITH
		50 x 75	13	C				1			1			SCALY DARK OCHRE OXIDE.
		125 x 175	29	C				1			1			
											4	6.7	805	
91SBB- 106	N	NO VISIBLE GOLD												
91SBB- 107	Y	25 x 50	8	C		1					1			
		50 x 50	10	C		1					1			
		50 x 75	13	C							1			
		75 x 150	22	C							1			
		75 x 175	25	C							1			
											5	18	315	

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
91SBB- 108	N	50 x 75	13 C							1			
										1	9.8	38	
91SBB- 109	Y	25 x 50	8 C				1			1			
		50 x 50	10 C							1			
		50 x 75	13 C							1			
										3	15.5	42	
91SBB- 110	N	NO VISIBLE GOLD											
91SBB- 111	N	100 x 100	20 C							1			
										1	10.4	144	
91SBB- 112	Y	25 x 50	8 C							1			
		50 x 50	10 C							1			
										2	6.9	40	
91SBB- 113	N	NO VISIBLE GOLD											
91SBB- 114	Y	25 x 50	8 C				1		1	2			
		50 x 75	13 C							1			
		50 x 100	15 C							1			
		50 x 125	18 C							1			
										5	8.3	264	
91SBB- 115	N	75 x 75	15 C							1			
										1	12.6	51	
91SBB- 116	Y	25 x 50	8 C		1		1			3			
		50 x 75	13 C							1			
		75 x 75	15 C							1			
										5	9.1	138	
91SBB- 117	Y	25 x 25	5 C							1			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
										1	20.2	1	
91SBB- 118	N	NO VISIBLE GOLD											
91SBB- 119	Y	50 x 50	10 C							2			
										2	5.7	67	
91SBB- 120	Y	25 x 25	5 C		1					2			
		25 x 50	8 C							1			
										3	6.8	19	
91SBB- 121	N	NO VISIBLE GOLD											
91SBB- 122	N	50 x 75	13 C							1			
										1	9.9	38	
91SBB- 123	Y	50 x 50	10 C							1			
		125 x 200	31 C							1			
										2	12	536	
91SBB- 124	Y	15 x 15	3 C						3	3			
		25 x 25	5 C				2		3	5			
		25 x 50	8 C				1		4	6			
		25 x 75	10 C				1			1			
		75 x 125	20 C							1			
										16	10.6	219	
91SBB- 125	Y	15 x 15	3 C						2	2			
		25 x 25	5 C				1			2			
		25 x 50	8 C							1			
										5	8.4	17	
91SBB- 126	Y	25 x 25	5 C				1		2	3			
		25 x 50	8 C						2	2			
		50 x 50	10 C				2			3			
		50 x 75	13 C				1			1			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		75 x 75	15 C							3			
		75 x 100	18 C							1			
										13	6.6	624	
91SBB- 127	Y	15 x 15	3 C		1				2	3			
		25 x 25	5 C		2				1	3			
		25 x 50	8 C							1			
		50 x 50	10 C							1			
		50 x 100	15 C							1			
		75 x 125	20 C							1			
		300 x 350	58 C							1			
										11	17.2	2802	
91SBB- 128	N	NO VISIBLE GOLD											
91SBB- 129	Y	50 x 50	10 C		1					1			
		50 x 75	13 C		2					2			
		50 x 100	15 C							1			
		75 x 100	18 C							2			
		75 x 125	20 C							1			
		125 x 200	31 C							1			
										8	8.9	1274	
91SBB- 130	Y	15 x 15	3 C						1	1			
		25 x 25	5 C		1				1	2			
		25 x 50	8 C		1					1			
		50 x 50	10 C							1			
		80 x 100	18 C							2			
										7	13.6	186	
91SBB- 131	Y	15 x 15	3 C						1	1			
		25 x 25	5 C						1	3			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		25 x 50	8 C		1					1			
		50 x 50	10 C		1					1			
		50 x 75	13 C							1			
		75 x 100	18 C							2			
		100 x 150	25 C							1			
		125 x 150	27 C							1			
		225 x 250	44 C		1					1			
										12	33.7	836	
91SBB- 132	Y	15 x 75	9 C							1			
		25 x 25	5 C						2	4			
		25 x 50	8 C		1					1			
		25 x 75	10 C							1			
		50 x 75	13 C							1			
		100 x 175	27 C							1			
		150 x 275	40 C							1			
										10	19.5	938	
91SBB- 133	Y	25 x 25	5 C		3		1		1	5			
		25 x 50	8 C						1	2			
		25 x 75	10 C		1					1			
		50 x 50	10 C							1			
		50 x 75	13 C							1			
										10	11.2	93	
91SBB- 134	N	NO VISIBLE GOLD											
91SBB- 135	Y	25 x 25	5 C				1			1			
		25 x 50	8 C				1			1			
		50 x 50	10 C		1					2			
		50 x 75	13 C							1			

APPENDIX 3A. Classification of visible gold grains in till (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (μm)	Thickness (C=calculated) (M=measured) (μm)	Number of Gold Grains (T=table, P=pan) Abraded		Irregular		Delicate		Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
				T	P	T	P	T	P				
		75 x 100	18 C							1			
		100 x 125	22 C							1			
										7	11.4	350.605	
91SBB- 136	N	NO VISIBLE GOLD											
91SBB- 137	N	NO VISIBLE GOLD											
91SBB- 138	N	NO VISIBLE GOLD											
91SBB- 139	Y	25 x 25	5 C		1					1			
		50 x 100	15 C		1					1			EST. 2% TARNISHED PYRITE
										2	19.1	35	
91SBB- 140	Y	25 x 25	5 C		1				1	2			
		25 x 50	8 C				1			3			
										5	15.3	19	

APPENDIX 3B. Classification of visible gold grains in sand.

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)	Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
91SBB- 1S	N	NO VISIBLE GOLD											
91SBB- 2S	N	NO VISIBLE GOLD											
91SBB- 3S	N	NO VISIBLE GOLD											
91SBB- 4S	N	NO VISIBLE GOLD											
91SBB- 5S	N	NO VISIBLE GOLD											
91SBB- 6S	N	NO VISIBLE GOLD											
91SBB- 7S	N	50 x 50	10 C	1						1			
										1			
91SBB- 8S	N	NO VISIBLE GOLD											
91SBB- 9S	N	NO VISIBLE GOLD											
91SBB- 10S	Y	25 x 50	8 C	2						2			TRACE PYRITE AND
		50 x 75	13 C	1						1			ARSENOPYRITE
										3	8.1	66	
91SBB- 11S	N	NO VISIBLE GOLD											
91SBB- 12S	Y	25 x 25	5 C	2						2			
		50 x 100	15 C	1						1			TRACE PYRITE
										3	9.9	70	
91SBB- 13S	N	NO VISIBLE GOLD											
91SBB- 14S	N	NO VISIBLE GOLD											
91SBB- 15S	Y	50 x 50	10 C	1						1			
		50 x 75	13 C	1	1					2			NO SULPHIDES
										3	6.8	138	
91SBB- 16S	N	50 x 50	10 C	1						1			
										1	9.7	20	
91SBB- 17S	Y	25 x 50	8 C	1		1				2			
		50 x 75	13 C			1				1			NO SULPHIDES
										3	7.1	76	
91SBB- 18S	Y	25 x 50	8 C			2				2			

APPENDIX 3B. Classification of visible gold grains in sand (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)		Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		25 x 75	10	C			1				1			NO SULPHIDES
		50 x 75	25	M			1				1			
											4	15.2	72	
91SBB- 19S	N	25 x 25	5	C	3						3			
		25 x 50	8	C	2						2			
		50 x 50	10	C		2					2			NO SULPHIDES
		100 x 100	20	C	1						1			
											8	10	212	
91SBB- 20S	Y	25 x 50	8	C	1						1			
		50 x 100	15	C	1						1			NO SULPHIDES
											2	10.3	70	
91SBB- 21S	Y	25 x 50	8	C	3						3			NO SULPHIDES
											3	11.9	21	
91SBB- 22S	Y	15 x 15	3	C	4						4			
		25 x 25	5	C	1						1			NO SULPHIDES
		25 x 50	8	C	1						1			
											6	7.4	17	
91SBB- 23S	N	NO VISIBLE GOLD												
91SBB- 24S	N	25 x 50	8	C	1						1			
											1	10.1	8	
91SBB- 25S	N	NO VISIBLE GOLD												
91SBB- 26S	N	NO VISIBLE GOLD												
91SBB- 27S	N	NO VISIBLE GOLD												
91SBB- 28S	N	NO VISIBLE GOLD												
91SBB- 29S	N	NO VISIBLE GOLD												
91SBB- 30S	N	NO VISIBLE GOLD												
91SBB- 31S	N	NO VISIBLE GOLD												
91SBB- 32S	Y	15 x 15	3	C		2					2			
		25 x 25	5	C		2					2			

APPENDIX 3B. Classification of visible gold grains in sand (cont'd.).

Sample Number	Panned (Y/N)	Grain Diameter (µm)	Thickness (C=calculated) (M=measured) (µm)		Number of Gold Grains (T=table, P=pan) Abraded T	Abraded P	Irregular T	Irregular P	Delicate T	Delicate P	Total	Non-mag. Conc. Weight (gm)	Predicted Assay (ppb)	Comments
		25 x 50	8	C		1					1			
		50 x 75	13	C	2						2			
		75 x 75	15	C		1					1			
											8	11.1	138	
91SBB- 33S	N	NO VISIBLE GOLD												
91SBB- 34S	N	NO VISIBLE GOLD												
91SBB- 35S	Y	15 x 15	3	C	1		1				2			
		20 x 20	4	C	1		1				2			
		25 x 25	5	C	3						3			
		25 x 50	8	C		1	1				2			
		50 x 50	10	C		1					1			
											10	14.1	33	
91SBB- 36S	Y	25 x 25	5	C	1			1			2			
		25 x 50	8	C	1						1			
		50 x 75	13	C	1	1					2			
		100 x 100	20	C		1					1			
											6	10.8	220	
91SBB- 37S	N	NO VISIBLE GOLD												
91SBB- 38S	Y	50 x 50	10	C	1						1			
		75 x 150	22	C	1						1			
											2	9.2	252	

APPENDIX 4. Geochemical quality control

APPENDIX 4. Geochemical quality control.

a) Neuton activation (INNA) laboratory standards

Sample Number	Na (%)	Sc (ppm)	Cr (ppm)	Fe (%)	Co (ppm)	Ni (ppm)	Zn (ppm)	As (ppm)	Se (ppm)	Br (ppm)	Rb (ppm)	Zr (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Cs (ppm)	Ba (ppm)	La (ppm)	Ce (ppm)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)
Detection Limit	0.02	0.2	20	0.2	5	10	100	0.5	5	0.5	5	200	1	2	5	100	0.1	10	0.5	50	2	5	0.1	1	0.5	2	0.2
GS89-2 *	0.93	13	710	6.2	62	330	620	312	<5	21	58	<200	718	7	<5	<100	72.6	<10	1.9	610	13	27	2.6	<1	0.6	4	0.5
	0.94	13	720	6.2	58	320	620	306	<5	19	48	<200	691	8	<5	<100	70.2	<10	2.1	560	13	25	2.6	<1	0.7	3	0.3
	0.92	13	790	6.4	64	320	700	319	<5	20	83	<200	722	8	<5	<100	72.9	<10	2.7	700	14	21	2.6	<1	0.8	<2	0.7
	0.89	13	730	6.1	56	340	610	309	<5	21	50	<200	690	3	<5	<100	69.9	<10	2.1	660	14	24	2.6	2	0.6	3	0.4
	0.80	12	780	6.2	60	340	730	201	<5	20	57	<200	677	8	<5	<100	67.9	<10	2.4	710	13	33	2.4	<1	0.6	<2	0.5
	0.90	12	730	6.1	57	350	660	316	<5	21	72	<200	707	<2	<5	<100	70.7	<10	2.4	610	14	24	2.7	2	<0.5	3	0.3
	0.87	13	700	6.2	60	350	630	308	<5	20	49	<200	693	6	<5	<100	69.4	<10	2.1	620	14	27	2.6	<1	0.6	<2	0.4
	0.89	13	750	6.4	58	300	700	316	<5	20	58	610	695	8	<5	<100	69.7	<10	2.2	610	14	20	2.7	<1	0.8	<2	0.6
	0.72	12	760	6.5	58	320	720	311	<5	22	63	<200	690	10	<5	<100	70.4	<10	1.9	650	14	20	2.5	<1	<0.5	4	0.5
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Mean	0.87	12.7	741	6.26	59.2	330	666	311	2.5	20.4	59.8	157	698	6.5	2.5	50	70.4	5	2.2	637	13.7	24.6	2.59	0.7	0.56	2.4	0.46
Stand. Dev.	0.07	0.5	31	0.14	2.54	16.6	47.5	5.62	0	0.88	11.5	170	14.6	2.8	0	0	1.55	0	0.26	48	0.5	4.16	0.09	0.46	0.19	1.36	0.12

Sample Number	Hf (ppm)	Ta (ppm)	W (ppm)	Ir (ppm)	Au (ppb)	Th (ppm)	U (ppm)	WT. (gm)
Detection Limit	1	0.5	1	50	2	0.2	0.2	0.01
GS89-2 *	3	<0.5	6	<50	582	6.8	2.5	7.65
	2	<0.5	9	<50	630	7.1	2.3	8.62
	<1	0.7	6	<50	554	8.3	2.5	8.36
	<1	<0.5	6	<50	525	7.7	2.1	8.90
	<1	0.7	4	<50	596	7.5	2.2	9.24
	<1	<0.5	5	<50	540	6.9	1.5	8.41
	<1	0.7	5	<50	570	7.9	2	9.77
	<1	<0.5	12	<50	708	7	1.8	8.59
	2	<0.5	5	<50		7.3	2.2	8.59
	9	9	9	9	8	9	9	9.00
Mean	1.1	0.39	6.5	25	588	7.39	2.12	8.68
Stand. Dev.	0.96	0.21	2.38	0	58.6	0.5	0.32	0.59

* Bondar-Clegg laboratory standard

APPENDIX 4. Geochemical quality control (cont'd).

b) Inductively coupled plasma - atomic emission spectroscopy (ICP-AES) laboratory duplicates.

Sample Number	Al (%)	Fe (%)	Mn (ppm)	Mg (%)	Ca (%)	Na (%)	K (%)	Sc (ppm)	V (ppm)	Cr (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)	Sr (ppm)	Y (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Ba (ppm)	La (ppm)	W (ppm)	Pb (ppm)
Detection Limit	0.01	0.01	1	0.01	0.01	0.01	0.01	5	1	1	1	1	1	1	5	1	1	1	0.2	0.2	20	5	10	1	1	20	2
92-PH-0042	0.82	1.42	160	0.19	0.27	0.04	0.11	<5	23	18	8	18	13	16	<5	8	6	<1	0.2	0.3	<2	5	<10	35	21	<20	11
91-SBB-011	0.82	1.39	154	0.19	0.26	0.04	0.12	<5	23	18	8	16	12	16	6	8	5	2	0.2	0.2	<20	<5	<10	36	19	<20	12
92-PH-0043 (TCA-8010) **	0.94	1.84	331	0.42	0.45	0.04	0.07	<5	28	25	10	22	37	30	11	18	9	2	<0.2	0.3	<2	10	<10	32	21	<20	13
92-PH-0044	1.55	2.97	406	0.87	0.5	0.06	0.43	<5	42	46	15	42	61	69	<5	13	6	<1	<0.2	<0.2	<2	15	<10	105	23	<20	21
91-SBB-028	1.55	2.89	394	0.84	0.49	0.07	0.43	<5	41	46	15	43	60	66	<5	14	6	1	<0.2	2.1	<20	15	<10	106	23	<20	20
92-PH-0045	1.05	1.41	117	0.21	0.26	0.04	0.14	<5	23	23	8	26	16	14	16	8	4	3	0.2	<0.2	<2	<5	<10	37	15	<20	12
91-SBB-041	1.03	1.38	114	0.21	0.26	0.04	0.14	<5	22	22	8	27	15	14	<5	8	4	2	<0.2	0.2	<20	<5	<10	36	16	<20	10
92-PH-0046	1.00	1.74	216	0.47	0.32	0.04	0.13	<5	25	25	8	21	36	43	<5	9	12	<1	<0.2	0.8	<2	10	<10	58	28	<20	14
91-SBB-049	0.98	1.71	215	0.46	0.31	0.04	0.13	<5	23	25	8	21	36	43	<5	9	11	<1	<0.2	<0.2	<20	8	<10	58	29	<20	13
92-PH-0047	0.77	2.01	369	0.44	0.33	0.03	0.07	<5	31	72	13	40	38	21	17	11	5	2	<0.2	0.3	<2	9	<10	25	16	<20	12
91-SBB-060	0.79	2.07	385	0.46	0.35	0.04	0.08	<5	32	78	14	41	39	22	<5	12	5	2	0.2	0.8	<20	9	<10	26	15	<20	14
92-PH-0048	2.73	3.59	997	0.79	0.07	0.03	0.31	6	42	35	17	39	66	97	<5	7	11	<1	<0.2	0.5	<2	13	<10	82	30	<20	35
SBA	-	2.85	-	-	-	-	-	-	-	-	12	31	66	96	27	-	-	2	<0.1	-	9	-	-	-	-	<2	21
92-PH-0049	0.50	1.19	113	0.15	0.32	0.04	0.08	<5	22	16	5	9	11	12	<5	10	5	1	<0.2	<0.2	<2	<5	<10	15	12	<20	10
91-SBB-084	0.55	1.2	119	0.17	0.35	0.04	0.1	<5	22	16	4	10	12	13	<5	10	5	<1	<0.2	<0.2	<20	5	<10	20	12	<20	10
92-PH-0050	0.45	1.12	118	0.12	0.39	0.04	0.07	<5	20	14	3	10	14	10	<5	13	6	1	<0.2	0.9	<2	<5	<10	23	23	<20	7
91-SBB-095	0.5	1.22	133	0.13	0.45	0.05	0.07	<5	22	16	4	10	15	12	<5	15	6	3	<0.2	<0.2	<20	<5	<10	24	24	<20	5
92-PH-0051	0.59	1.32	120	0.17	0.46	0.06	0.11	<5	24	19	4	12	22	16	<5	16	6	3	0.2	<0.2	<2	<5	<10	33	36	<20	7
91-SBB-110	0.6	1.37	122	0.18	0.47	0.06	0.11	<5	25	21	3	13	23	16	<5	17	7	1	0.3	0.3	<20	5	<10	33	37	<20	8
92-PH-0052	1.18	1.79	266	0.43	0.5	0.06	0.24	<5	29	29	7	21	33	30	13	18	11	2	0.3	<0.2	<2	8	<10	78	33	<20	14
91-SBB-119	1.27	1.86	280	0.45	0.55	0.07	0.26	<5	31	30	7	23	35	31	<5	21	12	2	<0.2	0.3	<20	8	<10	82	34	<20	13
92-PH-0053	1.30	1.2	128	0.33	0.15	0.04	0.06	<5	16	17	4	12	17	23	<5	6	5	2	0.3	0.3	<2	6	<10	21	12	<20	13
91-SBB-128	1.3	1.2	130	0.33	0.16	0.04	0.06	<5	16	18	5	13	17	23	<5	6	5	<1	0.2	0.3	<20	6	<10	21	12	<20	12
92-PH-0054 (TCA-8010) **	0.93	1.8	314	0.41	0.45	0.04	0.07	<5	27	24	9	20	37	30	7	18	9	2	<0.2	<0.2	<2	10	<10	32	20	<20	13
92-PH-0055	1.83	2.19	287	0.57	0.41	0.05	0.26	<5	39	37	11	41	72	38	<5	14	6	2	<0.2	<0.2	<2	9	<10	62	25	<20	17
91A-15	1.83	2.19	290	0.58	0.43	0.05	0.26	<5	39	38	11	41	71	39	17	14	6	2	-0.2	<0.2	<2	8	<10	61	23	<20	19
92-PH-0056	1.93	2.1	123	0.2	0.11	0.03	0.05	<5	41	22	7	17	10	30	<5	8	4	2	0.3	<0.2	<2	5	<10	76	21	<20	21
91A-22	2.1	2.26	133	0.22	0.12	0.04	0.06	<5	44	24	7	17	10	32	<5	9	5	<1	0.4	0.6	<2	<5	<10	82	23	<20	20

APPENDIX 4. Geochemical quality control (cont'd).

Sample Number	Bi (ppm)	Pd (ppb)	Pt (ppb)	Au (ppb)
Detection Limit	5	1	3	1
92-PH-0042	<5	2	<3	3
91-SBB-011	<5	4	<3	10
92-PH-0043	<5	2	<3	162
(TCA-8010) **	<5	2	<3	8
92-PH-0044	<5	2	4	6
91-SBB-028	<5	2	<3	8
92-PH-0045	<5	2	<3	4
91-SBB-041	<5	2	8	6
92-PH-0046	<5	2	<3	5
91-SBB-049	<5	2	<3	3
92-PH-0047	<5	2	<3	8
91-SBB-060	<5	2	<3	5
92-PH-0048	<5	2	<3	2
SBA	-	-	-	-
92-PH-0049	<5	2	<3	6
91-SBB-084	<5	<1	6	<1
92-PH-0050	<5	2	<3	4
91-SBB-095	<5	1	<3	1
92-PH-0051	<5	2	<3	2
91-SBB-110	<5	<1	<3	2
92-PH-0052	<5	2	4	4
91-SBB-119	<5	<1	<3	3
92-PH-0053	<5	2	<3	5
91-SBB-128	<5	<1	<3	4
92-PH-0054	<5	4	4	179
(TCA-8010) **				
92-PH-0055	<5	5	5	6
91A-15	<5	3	<2	2
92-PH-0056	<5	2	<3	2
91A-22	<5	1	<3	2

** Used as gold standard: mean value = 171 ppb Au; standard deviation = 10; N = 30; sample weight = 10 g; <0.063 mm fraction; analysis by Chemex using FA/INAA

APPENDIX 5. Geochemical analysis of till heavy mineral concentrates

APPENDIX 5. Geochemical analysis of heavy mineral concentrates (INAA method).

Sample Number	Na (%)	Sc (ppm)	Cr (ppm)	Fe (%)	Co (ppm)	Ni (ppm)	Zn (ppm)	As (ppm)	Se (ppm)	Br (ppm)	Rb (ppm)	Zr (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Cs (ppm)	Ba (ppm)	La (ppm)	Ce (ppm)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)	Hf (ppm)	Ta (ppm)	W (ppm)	Ir (ppm)	Au (ppb)	Th (ppm)	U (ppm)	WT. (gm)
91SBB-1	0.2	78.5	470	23.9	25	<63	<570	2.4	<16	<2.5	<39	9700	<4	<11	<15	<380	0.5	<56	<1.5	<150	322	746	49.9	13	6.6	38	10	225	13	30	<50	<12	143	28	4
91SBB-2	0.2	62.9	390	19	26	<55	320	<1.1	<14	<1.8	<34	12000	<3	<9	<12	<320	0.4	<55	<1.2	<130	426	972	62.1	14	7.7	30	8.8	264	13	25	<50	<8	199	31	7.5
91SBB-3	0.3	70	640	23.8	22	<96	<460	4.5	<27	<2.6	<61	16000	<6	<14	<22	<570	0.7	<87	<2.1	<220	1330	2680	150	13	16	35	15	378	31	44	<110	52	710	55	7.3
91SBB-4	0.3	74.2	590	23.1	36	<83	410	4.7	<24	1.5	<50	14000	<5	<12	<19	<600	0.6	<70	<1.8	<190	1100	2030	132	9	14	42	14	310	35	27	<50	302	567	50	11
91SBB-5	0.3	84.1	480	22.8	26	<69	<310	4	<19	1.1	<41	16000	<4	<10	<16	<490	0.7	<58	<1.5	<180	751	1520	107	12	13	45	14	372	20	13	<50	56	347	60	11
91SBB-6	0.4	65.2	560	23.6	26	<74	470	3.6	<19	2.1	<45	16000	<5	<11	<17	<520	0.6	<62	<1.6	<170	922	1760	111	9	13	39	14	372	24	14	<50	91	490	57	9.6
91SBB-7	0.4	70.3	540	25.1	29	<78	<500	5.4	<22	2.2	<47	16000	<5	<11	<18	<560	0.5	<65	<1.7	<180	932	1820	120	8	13	41	13	345	25	26	<50	318	479	55	7.5
91SBB-8	0.2	69.6	560	23.8	32	<71	<470	3.1	<18	<2.2	<44	14000	<4	<11	<16	<420	0.5	<59	<1.6	<170	822	1680	103	8	12	40	12	317	21	25	<50	53	423	51	7.2
91SBB-9	0.4	74	600	23.1	37	<67	<420	<1.5	<17	<1.9	<41	14000	<4	<10	<16	<480	0.6	<56	<1.5	<160	801	1570	102	6	11	39	14	365	20	11	<50	55	402	57	10
91SBB-10	0.3	73.5	440	24.9	51	<76	<480	3.1	<20	<2.2	<46	18000	<5	<11	<17	<540	0.5	<63	<1.7	<180	921	1780	109	11	12	39	14	377	27	5	<50	190	491	59	7.6
91SBB-11	0.4	84.7	510	26.3	27	<64	320	3.1	<16	<1.7	<37	14000	<4	<10	<15	<370	0.5	<54	<1.4	<150	732	1380	101	8	12	48	14	332	20	30	<50	140	359	54	14
91SBB-12	0.3	135	350	29.6	32	<59	310	2.4	<11	<1.6	<32	9100	<3	<10	<13	<330	0.3	<34	1.6	<110	519	1030	72.9	<4	9.1	77	16	193	16	27	<50	110	252	37	13
91SBB-13	0.2	86.8	600	26.1	22	<62	320	4.9	<16	<1.8	<37	16000	<4	<10	<15	<450	0.6	<52	<1.4	<180	671	1300	93.2	17	11	49	14	366	17	27	<50	255	326	58	10
91SBB-14	0.3	73.9	520	24.1	29	<76	<480	2.1	<21	<2.2	<47	16000	<5	<11	<18	<440	0.6	<64	<1.7	<180	965	1830	124	15	14	44	15	398	28	27	<50	110	502	61	7.8
91SBB-15	0.3	76.4	440	23.7	27	<74	370	2.2	<20	<2.1	<45	14000	<5	<11	<17	<530	0.4	<46	<1.6	<170	957	1750	121	12	13	45	14	309	22	19	<50	89	474	59	8.5
91SBB-16	0.3	80.6	570	24.5	30	<98	640	<2.2	<27	<2.9	<60	17000	<6	<14	<23	<690	0.7	<82	<2.1	<230	1370	2490	153	8	16	41	15	407	39	28	<100	<14	766	63	5.6
91SBB-17	0.2	91	490	25.4	32	<73	<460	<1.7	<18	<2.3	<43	14000	<4	<11	<17	<420	0.2	<60	<1.6	<170	800	1640	107	9	11	50	14	311	22	19	<50	244	446	53	6.5
91SBB-18	0.3	100	380	22.8	23	<80	<560	3.8	<20	0.9	<48	17000	<5	<13	<19	<460	0.5	<64	<1.8	<180	651	1390	108	23	14	51	12	375	22	33	<50	<14	325	44	3.9
91SBB-19	0.1	105	380	23.2	34	<89	470	<2.1	<18	<2.8	<55	18000	<5	<13	<21	<510	<0.1	<55	<1.9	<210	1160	2180	135	8	14	57	16	435	15	15	<50	76	527	61	5.5
91SBB-20	0.2	79.7	420	24.7	28	<78	<480	2.6	<22	<2.2	<47	13000	<5	<12	<19	<450	0.5	<66	<1.7	<180	1050	1940	127	8	13	54	16	290	36	87	<50	99	523	55	11
91SBB-21	0.3	76.4	480	16	28	<38	400	16	<5	<0.5	<21	8100	<2	<6	<5	<270	1.8	<31	<0.5	<50	236	579	61.5	12	7.6	38	8	185	13	33	<50	345	77.7	20	14
91SBB-22	0.2	69.2	300	19	21	<53	250	7.2	<14	1.1	<31	18000	<3	<9	<13	<410	1	<50	<1.2	<130	304	650	65	13	14	108	20.1	448	16	53	<50	288	86.7	28	5.3
91SBB-23	0.3	75.2	480	18	26	<45	250	2.3	<12	<1.6	<27	18000	<3	<8	<11	<330	0.9	<46	<1	<110	322	826	76.1	18	8	39	10	413	17	29	<50	130	123	32	9.7
91SBB-24	0.2	74.8	510	22.7	31	<63	<520	2.5	<20	<2	<42	12000	<4	<10	<20	<390	0.6	<59	<1.4	<160	1050	2050	114	7	12	39	14	281	28	24	<50	31	538	41	8.9
91SBB-25	0.2	82.2	480	28.1	38	<57	<430	3.5	<18	1.4	<37	9400	<4	<9	<15	<360	0.6	<55	<1.3	<140	913	1830	111	10	12	42	17	265	23	45	<50	754	469	50	18
91SBB-26	0.2	64.6	350	25.7	12	<46	330	<1.1	<12	<1.4	<28	6700	<3	<7	<11	<270	0.3	<34	2.1	<110	558	1180	65.5	6	7.3	36	9.4	158	13	30	<50	<9	270	26	14
91SBB-27	0.3	72.7	540	22.6	37	<75	<490	5.2	<20	1.3	<47	9300	<5	<11	<18	<550	0.8	<51	<1.6	<120	1040	2170	126	12	14	42	12	213	29	27	<50	1490	553	40	10
91SBB-28	0.3	55	520	18	29	<83	480	2.6	<21	<3.1	<54	5600	<5	<12	<21	<480	0.6	<51	<1.9	<190	966	2010	109	17	11	31	9.4	138	20	36	<50	223	506	31	4.2
91SBB-29	0.3	66.8	430	19	40	<96	<470	4.3	<28	<2.9	<61	7100	<6	<14	<24	<560	0.6	<98	<2.1	<230	1440	2890	158	10	16	40	13	171	41	27	<100	<18	791	49	6.1
91SBB-30	<1	105	650	28.5	39	<31	340	<8.8	<10	<4.9	<14	5800	<6	<5	<25	<240	0.6	<10	<0.5	<50	1810	3120	178	21	19	18	10	216	36	<26	<50	40	1060	67	15

APPENDIX 5. Geochemical analysis of heavy mineral concentrates (INAA method) (cont'd.).

Sample Number	Na (%)	Sc (ppm)	Cr (ppm)	Fe (%)	Co (ppm)	Ni (ppm)	Zn (ppm)	As (ppm)	Se (ppm)	Br (ppm)	Rb (ppm)	Zr (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Cs (ppm)	Ba (ppm)	La (ppm)	Ce (ppm)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)	Hf (ppm)	Ta (ppm)	W (ppm)	Ir (ppm)	Au (ppb)	Th (ppm)	U (ppm)	WT. (gm)
91SBB-31	0.3	72.8	570	20.9	40	<80	420	<1.9	<21	<2.3	<49	8500	<5	<12	<20	<860	0.6	<49	<1.7	<130	1210	2290	136	15	14	49	13	186	26	50	<50	<15	626	43	9.4
91SBB-32	0.2	66	580	24.9	38	<81	520	3.4	<22	1.7	<52	14000	<5	<12	<20	<480	0.7	<70	<1.8	<190	1210	2360	130	14	15	48	14	316	24	31	<50	140	646	47	7
91SBB-33	0.2	62.1	570	24.6	58	<120	550	10	<31	<0.5	<75	9500	<7	<17	<28	<670	3	<70	<2.6	<270	1170	2490	124	<9	14	35	11	228	34	14	<130	54	636	40	2.1
91SBB-34	0.2	82.6	400	23.4	26	<49	320	3.2	<12	1.1	<29	7300	<3	<8	<12	<280	0.5	<40	<1.1	<110	436	915	54.2	6	7.5	82	14	166	19	75	<50	130	215	22	11
91SBB-35	0.3	67.8	630	22.5	27	<61	370	1.7	<16	<2.1	<38	9900	<4	<9	<15	<350	0.4	<51	<1.4	<140	756	1550	82.3	9	10	44	11	216	24	45	<50	227	392	30	8
91SBB-36	0.2	65.6	420	20.5	25	<66	630	2.1	<17	<2.2	<41	11000	<4	<10	<17	<390	0.6	<41	<1.5	<160	826	1720	112	14	13	56	13	237	23	66	<50	110	404	37	7.4
91SBB-37	0.2	73.9	400	23.6	37	<81	410	2.9	<22	<2.3	<49	9500	<5	<12	<20	<570	0.5	<68	<1.7	<190	1280	2290	136	10	14	44	13	247	32	19	<50	<15	648	48	10
91SBB-38	0.4	56	470	23.7	35	<74	<460	2.8	<21	1.9	<47	11000	<5	<11	<19	<530	0.6	<64	<1.6	<180	1210	2220	129	11	13	38	11	241	31	11	<50	47	611	41	9.4
91SBB-39	0.3	71.6	500	23.2	43	<87	950	<2.3	<24	<2.6	<54	9200	<6	<13	<22	<500	0.3	<74	<1.9	<210	1460	2520	155	15	17	49	15	220	32	21	<50	269	754	51	9.1
91SBB-40	0.3	71.4	410	22.1	26	<54	<320	<1.4	<14	<1.6	<32	12000	<4	<8	<18	<380	0.9	<34	<1.2	<130	736	1340	93.1	14	10	42	11	257	19	18	<50	317	350	36	17
91SBB-41	0.2	71	480	23	26	<69	350	3.6	<29	1.9	<42	13000	<4	<11	<17	<380	0.8	<56	<1.5	<160	801	1550	95.2	12	10	47	12	283	68.5	59	<50	28	408	37	7.8
91SBB-42	0.4	74.8	220	21.1	32	<50	250	2.7	<12	1	<30	10000	<3	<8	<13	<350	0.5	<42	<1.1	<50	476	966	101	23	11	43	10	209	11	31	<50	580	195	32	10
91SBB-43	<1.5	130	900	44.4	46	<38	250	<11	<14	<5.9	<17	13000	<7	<6	<31	<100	0.7	<27	<1.2	<370	2310	3470	208	21	23	21	13	508	58.1	<32	<50	4600	1370	106	18
91SBB-44	<0.1	69.9	730	29.2	33	<110	610	<3.1	<29	<4.7	<73	19000	<7	<16	<30	<650	0.5	<70	<2.5	<260	1410	2770	147	<9	14	32	13	380	31	72	<120	<18	797	52	2.5
91SBB-45	0.2	83.3	480	28.9	27	<76	460	<2.1	<20	<2.6	55	12000	<5	<12	<19	<550	<0.1	<65	<1.7	<180	968	1900	117	9	11	42	13	263	25	28	<50	1370	557	50	6.3
91SBB-46	0.3	81.2	520	23.3	26	<65	440	2.5	<19	<2.2	<41	13000	<5	<10	<17	<380	0.6	<91	<1.5	<160	960	1820	114	13	11	43	13	299	27	24	<50	110	498	47	9.3
91SBB-47	0.3	74.3	490	26.6	23	<73	<520	<2	<20	<2.6	<46	13000	<5	<11	<19	<530	0.5	<76	<1.6	<170	1110	2180	125	9	13	33	13	320	23	24	<50	739	613	52	6.6
91SBB-48	0.3	41.9	320	14	20	<47	350	5.8	<14	<0.5	<29	8300	<3	<8	<13	<280	1.5	<43	<1.1	<110	180	470	34.8	<4	5.7	36	8.2	187	23	42	<50	63	72.1	12	3.4
91SBB-49	0.3	54.5	410	23	47	<60	<510	3.5	<21	1.3	<38	20000	<4	<10	<16	<460	0.7	<57	<1.4	<140	498	1170	102	14	22	151	28.7	467	43	42	<50	343	168	32	7.5
91SBB-50	0.4	45.4	260	25.4	51	<55	370	2	<19	0.7	<34	14000	<4	<9	<14	<430	0.7	<57	1.5	<120	294	676	59.4	7	13	112	21.4	369	43	30	<50	3170	109	25	7.8
91SBB-51	0.4	48.2	260	23.9	34	<56	360	2.6	<18	<2	40	27300	<4	<9	<15	<430	1.1	<39	<1.2	<130	273	586	58.6	12	15	182	33.4	742	42	36	<50	550	107	36	8.3
91SBB-52	0.3	45.8	270	16	25	<53	360	3.5	<16	<2.3	<31	19000	<3	<8	<15	<320	1.5	<34	<1.2	<120	216	555	43.8	11	7.5	76	15	431	25	71	<50	389	85.6	20	5.3
91SBB-53	0.3	54.6	390	20	30	<56	<360	2.9	<16	<2.1	<33	12000	<4	<9	<14	<320	1.4	<46	<1.2	<120	356	814	73.4	14	12	82	15	290	33	44	<50	446	120	22	7.5
91SBB-54	0.3	54.1	350	18	28	<56	<360	4.4	<17	0.7	<32	14000	<3	<8	<14	<320	1.2	<34	<1.2	<120	333	767	67.3	12	11	73	13	290	40	58	<50	916	128	23	7.2
91SBB-55	0.2	53.4	390	14	19	<43	280	4.8	<5	1.7	28	8700	<2	<6	<5	<100	1.7	<21	<0.5	<50	160	390	35.4	10	5	40	7.9	193	18	25	<50	150	58.4	15	12
91SBB-56	0.3	71.6	890	21.2	37	<49	220	11	<13	0.5	<28	18000	<3	<8	<13	<310	2	<33	1.6	<110	296	686	47.2	5	6.4	33	8.3	403	14	93	<50	2420	137	28	7.7
91SBB-57	0.4	75.1	840	21.2	43	<48	390	10	<12	0.9	33	17000	<3	<7	<13	<270	2	<29	1.6	<110	315	719	54.9	8	6.9	37	8.4	395	15	41	<50	337	135	28	9.5
91SBB-58	0.2	79.2	1200	22.7	32	<49	490	8.1	<12	<1.9	<28	19000	<3	<8	<13	<300	2.1	<32	<1.1	<110	323	738	56.5	14	6.5	37	8.7	400	15	27	<50	2700	144	29	8
91SBB-59	0.2	74.5	680	18	27	<52	300	7.7	<11	1.1	<24	17000	<3	<7	<12	<260	1.8	<28	<0.5	<50	236	540	44.8	11	5.3	35	8.1	360	13	67	<50	1220	111	27	8.9
91SBB-60	0.4	68.3	930	24.6	36	<45	300	12	<12	1.9	<27	19000	<3	<7	<12	<340	2.1	<40	1.5	<50	305	753	54.2	11	6.8	35	8.9	414	14	97	<50	1330	143	29	9.5

APPENDIX 5. Geochemical analysis of heavy mineral concentrates (INAA method) (cont'd.).

Sample Number	Na (%)	Sc (ppm)	Cr (ppm)	Fe (%)	Co (ppm)	Ni (ppm)	Zn (ppm)	As (ppm)	Se (ppm)	Br (ppm)	Rb (ppm)	Zr (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Cs (ppm)	Ba (ppm)	La (ppm)	Ce (ppm)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)	Hf (ppm)	Ta (ppm)	W (ppm)	Ir (ppm)	Au (ppb)	Th (ppm)	U (ppm)	WT. (gm)
91SBB-61	0.4	76.4	1000	22.4	44	<38	370	7.9	<5	<1.3	<21	17000	<2	<6	<10	<220	1.5	<33	1	<50	296	659	48.3	10	6.6	38	8.9	377	14	47	<50	839	132	27	19
91SBB-62	0.4	75.3	850	21.7	37	<42	360	8	<11	<1.6	<24	15000	<3	<7	<12	<260	1.4	<28	<0.5	<50	287	641	48.6	13	6.2	37	8.7	352	12	77	<50	2200	136	28	11
91SBB-63	0.3	71.4	890	21	39	<41	<250	11	<11	<1.5	<24	14000	<3	<7	<11	<250	1.8	<27	<0.5	<50	314	779	66.5	14	7.6	40	8.7	335	15	28	<50	1450	119	27	14
91SBB-64	0.3	65.8	550	16	32	<32	280	7.8	<5	<0.5	<18	8800	<1	<5	<13	<100	1.3	<26	<0.5	<50	150	410	45.3	13	5.5	28	5.6	188	10	11	<50	517	48.6	17	15
91SBB-65	0.3	77.6	540	16	24	<40	<250	4.1	<5	0.8	<22	12000	<3	<7	<11	<240	1.4	<26	<0.5	<50	281	716	70.5	18	7.6	36	7.7	270	11	28	<50	894	98.2	24	13
91SBB-66	0.3	66.7	590	16	26	<31	230	8.5	<5	<1.2	<18	9600	<1	<5	<5	<220	1.4	<10	1	<50	170	450	47.7	11	5	29	6.3	217	10	18	<50	299	63.5	17	15
91SBB-67	0.4	70.7	770	24.9	37	<51	400	7.8	<13	0.8	<30	19000	<3	<8	<14	<300	1.4	<44	<1.1	<110	342	799	63	13	7.5	45	11	402	15	27	<50	1080	170	33	7.3
91SBB-68	0.4	72.9	750	23.6	38	<46	360	8.6	<12	<1.8	27	16000	<3	<7	<13	<320	1.9	<39	<1	<110	313	722	58	14	7.1	41	8.9	368	14	29	<50	506	143	29	9.8
91SBB-69	0.2	67.6	830	26.8	34	<48	250	8.9	<13	1.4	<28	17000	<3	<8	<13	<350	2.3	<31	<1.1	<110	388	941	78	17	8.1	41	10	388	20	37	<50	1800	163	32	11
91SBB-70	0.3	73.3	690	22.5	28	<44	440	5.9	<12	1.3	<26	16000	<3	<7	<13	<330	2.2	<31	<1	<100	333	802	59	12	6.9	39	9.4	353	16	23	<50	679	149	27	9
91SBB-71	0.4	69.9	670	20.6	34	<43	260	7.6	<5	1.3	<21	15000	<2	<6	<10	<210	2.5	<37	<0.5	<50	295	724	56.1	13	7.3	34	9	358	13	25	<50	368	122	25	15
91SBB-72	0.4	62	710	23.1	40	<33	240	5.6	<5	1	<21	17000	<2	<6	<5	<250	1.2	<32	1	<50	331	828	63.1	11	7.3	35	10	426	14	17	<50	140	138	27	16
91SBB-73	0.4	60.7	710	26.9	39	<43	<260	4.7	<12	<1.8	<28	18000	<3	<8	<13	<270	1	<43	1.4	<50	316	824	62.3	13	6.3	31	8.7	424	13	24	<50	1550	142	28	10
91SBB-74	0.4	67.5	760	27.1	37	<49	260	10	<13	<1.9	<30	17000	<3	<8	<14	<290	1.5	<38	<1.1	<50	361	960	80.3	16	8	36	10	390	15	25	<50	510	138	31	9.9
91SBB-75	0.4	58.1	950	32.1	37	<68	290	7.7	<16	1.9	<33	20000	<4	<9	<15	<320	1.1	<52	<1.2	<130	355	869	51.3	8	6	33	9.3	459	22	84	<50	731	185	31	3
91SBB-76	0.4	64.7	780	26.6	44	<33	440	7.1	<5	1.6	<19	14000	<2	<5	<5	<100	1.4	<21	1.2	<50	292	764	68	15	7.3	38	8.5	329	14	40	<50	656	123	27	11
91SBB-77	0.5	57.1	730	25.2	39	<48	210	6.3	<13	<2	<28	16000	<3	<8	<14	<270	1.2	<42	<1	<110	306	769	60.1	14	6.2	31	7.5	338	17	62	<50	542	138	27	8.5
91SBB-78	0.4	45.5	620	28.8	43	<47	280	3.4	<11	1.2	<28	14000	<3	<7	<13	<260	0.6	<29	<1.1	<50	308	884	89.7	22	8.1	33	7.4	285	15	27	<50	43	117	26	8.6
91SBB-79	0.4	54.7	1300	22.7	47	<45	290	4.9	<5	0.8	<21	11000	<2	<6	<10	<210	1.2	<23	1.4	<50	210	531	45.8	11	5.7	30	6.8	229	15	62	<50	435	88.4	18	13
91SBB-80	0.2	60.6	260	12	17	<32	150	3.4	<5	0.7	<17	8000	<2	<5	<5	<100	0.8	<20	<0.5	<50	170	597	97.5	26	7.8	29	6	177	14	22	<50	110	52.1	19	20
91SBB-81	0.2	67	410	16	22	<45	330	2.8	<5	<1.5	<21	12000	<3	<6	<11	<260	1.3	<32	<0.5	<50	245	643	74.9	19	7.2	35	7.6	257	14	12	<50	130	106	22	13
91SBB-82	0.2	65.5	540	19	23	<83	<550	3.5	<30	<3.5	<50	23400	<6	<13	<23	<580	0.6	<72	<1.8	<190	753	1910	162	29	18	79	19	566	62.9	14	<50	160	345	76	4.2
91SBB-83	0.2	61.4	430	19	44	<59	250	3.2	<17	<2.9	<35	19000	<4	<10	<18	<450	0.9	<53	<1.3	<140	366	856	68.1	9	8.8	60	13	422	27	291	<50	1120	195	39	4.6
91SBB-84	0.4	67.8	530	20.9	30	<51	550	<1.8	<17	<2	<31	21200	<4	<8	<15	<370	0.5	<46	<1.2	<120	539	1230	101	17	13	59	14	475	39	38	<50	372	268	48	12
91SBB-85	0.3	61.1	410	20.1	42	<61	1300	2.7	<16	1.9	39	15000	<5	<9	<18	<440	0.8	<54	<1.3	<140	511	1170	126	16	25	188	32.9	414	35	237	<50	190	168	42	7.4
91SBB-86	0.4	64.1	590	21	33	<54	280	<2.4	<20	8.9	<32	19000	74	<8	<21	<520	<0.1	<48	<1.2	<180	551	1150	87.2	14	10	48	13	471	30	2720	<50	379	311	42	10
91SBB-87	0.6	67.8	490	22.4	40	<60	<270	2.7	<20	1.4	<36	19000	<5	<9	<18	<350	0.7	<39	<1.3	<170	795	1660	125	23	14	51	14	421	41	49	<50	190	438	54	13
91SBB-88	0.4	65.7	490	20.1	26	<54	<330	1.9	<19	<2.1	<32	20100	<4	<8	<16	<370	0.7	<47	<1.2	<170	484	1240	107	22	12	51	14	461	46	66	<50	<11	269	54	10
91SBB-89	0.3	70.1	440	20.2	25	<45	210	3.9	<14	1.1	<26	19000	<4	<7	<14	<330	0.9	<30	<1	<130	485	1160	108	23	12	52	13	430	28	30	<50	29	200	41	17
91SBB-90	0.4	67.4	540	21	35	<48	220	1.9	<14	<1.9	<29	23700	<4	<8	<15	<360	0.5	<43	<1.1	<140	497	1220	116	24	12	56	13	519	26	51	<50	120	198	46	14

APPENDIX 5. Geochemical analysis of heavy mineral concentrates (INAA method) (cont'd.).

Sample Number	Na (%)	Sc (ppm)	Cr (ppm)	Fe (%)	Co (ppm)	Ni (ppm)	Zn (ppm)	As (ppm)	Se (ppm)	Br (ppm)	Rb (ppm)	Zr (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Cs (ppm)	Ba (ppm)	La (ppm)	Ce (ppm)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)	Hf (ppm)	Ta (ppm)	W (ppm)	Ir (ppm)	Au (ppb)	Th (ppm)	U (ppm)	WT. (gm)
91SBB-91	0.7	57.3	500	20	32	<41	360	8.4	<12	0.9	<24	28300	<3	<7	<13	<250	0.9	<39	<0.5	<100	290	713	58.8	10	7.5	39	11	627	18	34	<50	356	167	45	9.9
91SBB-92	0.4	64.4	580	22.4	34	<51	370	<1.9	<15	<2.1	<30	26900	<4	<8	<15	<380	0.5	<45	<1.1	<160	439	1120	101	17	10	51	13	596	29	24	<50	844	199	49	9.7
91SBB-93	0.4	65	490	23.4	35	<56	<350	3.7	<17	<2.2	<35	25700	<5	<9	<17	<330	0.7	<52	<1.3	<140	592	1420	137	23	14	63	15	577	37	18	<50	75	229	57	11
91SBB-94	0.5	56.3	450	19	28	<47	230	2.5	<14	1.4	<28	22000	<4	<8	<15	<340	0.7	<46	<1.1	<120	436	1090	89	16	10	43	10	474	28	17	<50	92	160	38	8.6
91SBB-95	0.5	60.5	490	23.9	36	<68	<430	4.1	<22	0.7	<43	29800	<5	<11	<22	<520	0.9	<54	<1.5	<170	506	1460	118	26	12	52	14	660	29	23	<50	35	239	54	3.5
91SBB-96	0.4	61.8	530	20	33	<47	<370	8.8	<17	1.6	<30	27900	<4	<8	<16	<360	0.8	<66	1.3	<120	442	1340	114	28	12	43	13	662	27	13	<50	<12	179	49	11
91SBB-97	0.6	72.8	600	22.7	33	<54	420	10	<17	<2.2	<33	29800	<4	<9	<17	<410	1	<45	<1.2	<130	517	1500	130	32	13	53	15	705	29	14	<50	100	205	58	12
91SBB-98	0.5	71.4	1400	22.6	30	<61	360	5.4	<17	<2.5	<37	25100	<5	<9	<19	<360	0.7	<59	<1.4	<160	620	1560	132	32	13	52	13	569	30	7	<50	120	218	50	9
91SBB-99	0.3	62	480	22.2	26	<56	290	4	<15	<2.4	<32	27300	<4	<9	<17	<320	0.7	<49	<1.2	<140	420	974	70	15	7.5	40	11	576	20	22	<50	<12	234	45	7.3
91SBB-100	0.6	63.9	500	20	23	<65	410	5.9	<20	<2.7	<39	29700	<5	<10	<20	<470	0.6	<59	<1.4	<190	732	1800	140	20	14	55	13	636	30	19	<50	39	229	58	7.9
91SBB-101	0.4	68	410	20	38	<62	<370	15	<19	1.9	<37	24400	<5	<10	<20	<460	1	<42	<1.4	<150	748	1930	183	40	18	58	15	536	38	30	<50	21	214	63	13
91SBB-102	0.6	59.6	540	20.5	40	<52	280	22	<17	2.4	<31	28200	<4	<8	<17	<320	2.8	<50	<1.1	<130	589	1460	125	24	13	54	14	644	34	29	<50	246	232	57	13
91SBB-103	0.6	62	530	20.5	29	<47	260	<1.9	<13	<2.1	<27	31900	<4	<7	<14	<350	0.6	<44	<1	<170	375	967	84.5	17	8.4	49	13	698	19	15	<50	51	181	53	10
91SBB-104	0.4	65	590	22	34	<56	280	2.6	<17	<2.4	<34	34100	<5	<9	<18	<430	0.7	<53	<1.3	<140	580	1440	129	26	14	62	16	761	27	31	<50	130	246	61	9.4
91SBB-105	0.2	66.6	540	20.6	39	<74	350	3.7	<22	<3.2	<44	21200	<6	<11	<25	<530	0.8	<66	<1.6	<170	804	1960	156	22	16	58	13	455	45	22	<50	2050	347	52	5.3
91SBB-106	0.5	86.2	610	23.6	44	<120	510	7.9	<30	<8.4	<74	18000	<9	<19	<39	<690	0.6	<78	<2.8	<290	485	1430	126	23	14	53	13	441	32	113	<130	<22	197	41	1.1
91SBB-107	0.3	91	470	15	22	<40	250	<1.6	<11	<1.6	<22	16000	<3	<7	<12	<280	0.5	<26	<0.5	<100	263	704	81.3	17	9.4	39	9	378	23	19	<50	339	135	33	15
91SBB-108	0.6	62.5	490	18	30	<55	<350	<2.2	<17	<2.4	<32	17000	<4	<8	<17	<380	0.6	<48	<1.2	<150	579	1410	124	24	14	51	12	392	38	23	<50	61	232	45	8.5
91SBB-109	0.3	71.8	590	22.1	32	<49	370	5	<14	<2	<28	33100	<4	<8	<16	<360	0.9	<46	<1.1	<120	489	1210	106	22	12	57	15	749	27	33	<50	348	245	60	14
91SBB-110	0.5	58.4	440	19	35	<55	270	2.7	<16	<2.4	<33	26500	<5	<8	<18	<320	0.5	<49	<1.2	<130	650	1540	136	25	14	57	14	592	33	17	<50	36	215	61	9.6
91SBB-111	0.5	59	500	19	33	<67	<350	4.3	<18	1.4	<34	28200	<5	<8	<19	<330	0.5	<64	<1.2	<140	661	1610	142	26	14	50	13	610	33	32	<50	202	235	60	8.9
91SBB-112	0.6	56	530	20.6	26	<57	240	<2.4	<17	1	<34	32900	<5	<9	<18	<410	0.4	<53	<1.2	<140	464	1260	101	21	11	48	12	708	27	16	<50	150	213	56	5.5
91SBB-113	0.4	65.8	530	20.6	39	<56	310	2.8	<16	<2.4	<33	32000	<5	<9	<18	<410	0.6	<51	<1.2	<190	575	1540	136	30	15	56	15	712	30	57	<50	160	217	59	9.4
91SBB-114	0.5	63.9	520	18	31	<71	290	2.6	<17	<2.7	47	24300	<5	<9	<19	<350	0.8	<40	<1.3	<150	586	1530	148	34	15	60	13	566	30	116	<50	508	182	51	7
91SBB-115	0.4	89.9	450	21.5	32	<57	300	3.2	<12	1	<26	26100	<4	<7	<15	<270	0.5	<31	<1	<110	439	900	63.9	7	7.2	42	11	552	16	<6	<50	90	239	38	11
91SBB-116	0.2	100	360	18	26	<59	320	2.8	<15	1.4	<34	20600	<4	<9	<19	<340	0.4	<52	<1.3	<140	664	1360	88.7	11	10	41	11	474	18	14	<50	170	361	40	7.5
91SBB-117	0.6	78.5	290	23.1	38	<43	280	<1.9	<12	<1.8	<26	19000	<4	<7	<15	<320	0.3	<32	<0.5	<110	629	1300	80.8	9	8.7	35	10	421	18	13	<50	17	334	33	17
91SBB-118	0.2	72.8	430	25.8	48	<86	<700	4.1	<23	<4.6	<55	14000	<7	<13	<28	<500	0.6	<67	<1.9	<200	1110	2420	122	16	14	33	12	250	24	35	<100	<17	647	45	2.9
91SBB-119	0.3	77.1	500	25.4	28	<72	<620	<3.4	<22	<3.6	56	19000	<6	<12	<25	<430	0.3	<98	<1.6	<180	1220	2720	140	15	15	28	14	476	27	25	<110	<19	670	50	4.6
91SBB-120	0.5	75.4	500	24.9	31	<82	<510	<3.9	<25	<3.9	<56	22100	<7	<13	<29	<510	0.3	<83	<1.8	<210	1490	3230	159	10	14	19	13	533	31	22	<120	217	811	57	5.5

APPENDIX 5. Geochemical analysis of heavy mineral concentrates (INAA method) (cont'd.).

Sample Number	Na (%)	Sc (ppm)	Cr (ppm)	Fe (%)	Co (ppm)	Ni (ppm)	Zn (ppm)	As (ppm)	Se (ppm)	Br (ppm)	Rb (ppm)	Zr (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Cs (ppm)	Ba (ppm)	La (ppm)	Ce (ppm)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)	Hf (ppm)	Ta (ppm)	W (ppm)	Ir (ppm)	Au (ppb)	Th (ppm)	U (ppm)	WT. (gm)
91SBB-121	0.3	86.7	520	23.1	39	<52	<350	<2.5	<15	<2.2	<33	17000	<5	<9	<18	<410	0.5	<44	<1.2	<130	935	2010	116	14	11	35	12	414	20	<7	<50	180	458	41	16
91SBB-122	0.3	83	510	20.7	33	<59	<370	<2.6	<15	<2.6	<35	15000	<4	<9	<19	<330	0.4	<41	<1.3	<140	694	1520	85	13	10	31	8.8	322	17	<7	<50	120	359	32	8.6
91SBB-123	0.4	85.2	490	20.8	22	<58	290	<2.7	<17	<2.6	<34	19000	<5	<9	<19	<430	0.5	<53	<1.3	<130	730	1570	97	9	10	38	11	433	23	9	<50	810	385	39	10
91SBB-124	0.3	67.2	410	22.4	43	<62	330	4.1	<19	<2.7	<38	15000	<5	<10	<20	<490	1	<59	<1.4	<150	625	1400	121	17	17	81	15	334	39	16	<50	10400	196	27	8.8
91SBB-125	0.3	70.2	430	20.2	22	<80	<410	3.6	<21	3	<38	15000	<5	<10	<21	<450	1	<55	<1.5	<100	624	1350	108	18	20	114	21.1	338	50.8	32	<50	120	281	31	6.9
91SBB-126	0.1	65.6	340	19	40	<75	530	4.4	<20	1.7	<44	12000	<6	<11	<25	<530	1.1	<48	<1.7	<50	713	1630	170	21	41	233	36.6	257	49	26	<50	696	240	30	5.7
91SBB-127	0.4	58.5	440	20.1	35	<41	380	<1.8	<20	<1.7	<24	12000	<3	<7	<14	<230	0.9	<35	<0.5	<50	320	722	56.5	10	7.3	43	9.2	263	51.5	56	<50	1620	168	24	15
91SBB-128	0.2	60.6	390	20	26	<51	<330	4.1	<14	2.7	<30	27600	<4	<8	<17	<300	1.1	<34	<1.1	<120	312	667	53.4	12	9.3	81	16	566	24	18	<50	97	146	44	6.3
91SBB-129	:0.12	63	350	20	27	<54	440	3.1	<14	<2.6	<33	9500	<4	<8	<18	<380	1	<47	<1.2	<130	595	1300	105	13	13	50	12	227	21	21	<50	488	325	27	7.4
91SBB-130	0.3	69.6	300	16	30	<35	190	3.9	<5	<1.8	<20	11000	<3	<6	<12	<100	1	<23	<0.5	<50	170	470	50.1	15	6.6	34	7	243	12	17	<50	130	63.6	21	11
91SBB-131	0.2	61.1	230	17	20	<25	160	2.8	<5	1.3	<14	6200	<2	<4	<5	<100	0.7	<10	<0.5	<50	140	460	69.5	19	6.7	27	5.6	138	11	12	<50	607	54.9	16	30
91SBB-132	0.3	61.7	410	19	38	<39	320	3.5	<5	1	<18	11000	<2	<5	<11	<220	1.2	<27	<0.5	<50	207	531	48	11	6.2	32	6.9	241	15	45	<50	627	88.6	19	17
91SBB-133	0.3	62.9	330	20	37	<40	380	3.7	<11	<2	<23	15000	<3	<7	<14	<230	1.1	<26	<0.5	<50	211	542	48.3	11	6.5	48	10	326	20	95	<50	120	88.5	26	9.3
91SBB-134	0.2	39.7	170	16	16	<59	1700	<2.3	<13	<2.3	<28	11000	<4	<7	<16	<350	0.5	<32	<1	<50	442	949	115	21	26	205	33.8	309	33	62	<50	36	114	28	9.9
91SBB-135	0.3	80.4	240	18	26	<50	400	<2.5	<14	<2.4	<28	18000	<4	<8	<17	<290	0.9	<45	<1.1	<120	446	960	79	14	17	157	28.8	462	32	55	<50	260	208	38	10
91SBB-139	0.4	50.5	240	25.7	180	87	370	1950	<10	17	<22	6800	7	<6	<15	<280	3.8	<35	0.9	<100	238	543	47.3	10	5.9	36	7.6	170	8.7	243	<50	78	68.8	23	16
91SBB-140	0.2	84.5	450	15	23	<38	440	14	<5	1	<21	16000	<3	<6	<13	<270	4	<35	<0.5	<50	279	710	65.7	17	8.6	51	11	382	14	62	<50	34	115	31	14

APPENDIX 6. Geochemical analysis of till <0.063 mm fraction

APPENDIX 6. Geochemical analysis of <63µm fraction (ICP for trace elements; fire assay/DCP for precious metals).
Preparation: nitric-aqua regia partial extraction for trace elements; aqua regia for precious metals.

Sample Number	Al (%)	Fe (%)	Mn (ppm)	Mg (%)	Ca (%)	Na (%)	K (%)	Sc (ppm)	V (ppm)	Cr (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)	Sr (ppm)	Y (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Ba (ppm)	La (ppm)	W (ppm)	Pb (ppm)	Bi (ppm)	Pd (ppb)	Pt (ppb)	Au (ppb)
91SBB- 1	0.8	1.43	281	0.32	0.35	0.07	0.24	<5	26	29	9	25	16	20	<5	15	5	1	0.2	0.5	<20	7	<10	68	21	<20	14	<5	1	<3	<1
91SBB- 2	0.97	1.26	172	0.24	0.33	0.07	0.16	<5	23	22	6	15	15	14	<5	15	5	<1	0.2	0.3	<20	6	<10	56	15	<20	15	<5	3	<3	5
91SBB- 3	0.81	1.21	161	0.23	0.35	0.05	0.15	<5	22	21	5	14	19	18	<5	12	5	2	0.2	1.1	<20	6	<10	44	17	<20	10	<5	2	<3	9
91SBB- 4	0.79	1.32	142	0.2	0.32	0.06	0.16	<5	22	20	5	18	25	18	10	16	5	<1	0.3	0.6	<20	6	<10	49	26	<20	12	<5	2	<3	14
91SBB- 5	0.73	1.2	134	0.2	0.3	0.04	0.12	<5	21	18	6	11	15	13	11	9	6	<1	<0.2	<0.2	<20	5	<10	23	20	<20	12	<5	3	<3	9
91SBB- 6	0.73	1.18	115	0.18	0.38	0.06	0.13	<5	20	18	3	14	21	15	<5	20	7	<1	<0.2	<0.2	<20	5	<10	45	22	<20	10	<5	3	<3	6
91SBB- 7	0.75	1.1	121	0.16	0.33	0.05	0.11	<5	19	16	4	12	17	12	8	15	6	<1	0.2	0.4	<20	<5	<10	60	20	<20	10	<5	4	<3	9
91SBB- 8	1.05	1.34	157	0.23	0.34	0.06	0.16	<5	23	22	6	17	24	17	<5	20	6	4	<0.2	0.5	<20	6	<10	72	25	<20	12	<5	4	<3	7
91SBB- 9	0.9	1.12	92	0.18	0.2	0.04	0.09	<5	20	19	5	13	15	10	<5	9	4	<1	<0.2	0.6	<20	<5	<10	60	17	<20	10	<5	3	<3	4
91SBB- 10	1.31	1.32	98	0.2	0.16	0.05	0.09	<5	23	22	8	19	12	13	<5	10	4	<1	0.4	0.3	<20	<5	<10	52	17	<20	14	<5	4	<3	7
91SBB- 11	0.82	1.39	154	0.19	0.26	0.04	0.12	<5	23	18	8	16	12	16	6	8	5	2	0.2	0.2	<20	<5	<10	36	19	<20	12	<5	4	<3	10
91SBB- 12	1.36	2.22	225	0.57	0.31	0.07	0.49	<5	39	46	11	33	38	32	<5	13	6	<1	0.2	1	<20	11	<10	123	24	<20	18	<5	4	<3	7
91SBB- 13	0.77	1.14	108	0.18	0.23	0.05	0.12	<5	20	18	6	18	14	12	5	9	5	2	0.2	0.7	<20	<5	<10	30	16	<20	13	<5	3	<3	7
91SBB- 14	0.8	1.32	136	0.23	0.31	0.05	0.18	<5	22	18	7	20	25	17	7	10	6	<1	<0.2	<0.2	<20	5	<10	57	20	<20	12	<5	4	<3	7
91SBB- 15	1.13	1.48	190	0.32	0.26	0.05	0.21	<5	25	28	8	24	32	20	<5	9	5	<1	<0.2	0.4	<20	6	<10	66	22	<20	14	<5	4	<3	6
91SBB- 16	1.32	1.4	144	0.35	0.2	0.06	0.1	<5	26	26	5	15	17	18	<5	10	5	<1	0.2	0.4	<20	7	<10	40	20	<20	12	<5	4	4	9
91SBB- 17	0.91	1.16	124	0.25	0.23	0.05	0.11	<5	20	22	5	17	28	14	<5	9	5	<1	0.2	0.3	<20	<5	<10	48	20	<20	10	<5	4	<3	5
91SBB- 18	1.47	2.3	399	0.73	0.53	0.07	0.44	<5	39	38	11	28	33	45	<5	18	7	1	0.3	1.8	<20	12	<10	131	26	<20	20	<5	5	3	7
91SBB- 19	2.16	2.32	244	0.55	0.22	0.05	0.16	<5	39	38	11	25	20	36	<5	13	7	<1	<0.2	0.7	<20	10	<10	105	31	<20	19	<5	5	3	10
91SBB- 20	0.71	1.36	130	0.24	0.3	0.06	0.17	<5	21	22	6	19	25	16	12	12	5	<1	<0.2	<0.2	<20	6	<10	44	25	<20	12	<5	4	<3	17
91SBB- 21	0.97	2.61	338	0.54	0.42	0.04	0.24	<5	41	43	23	32	69	44	106	14	8	5	<0.2	0.7	<20	11	<10	61	28	<20	19	<5	5	6	19
91SBB- 22	1.58	2.74	406	1.2	1.57	0.07	0.55	<5	41	51	14	36	61	60	31	21	16	4	0.2	<0.2	<20	17	<10	115	28	<20	22	<5	5	<3	11
91SBB- 23	0.59	1.17	146	0.21	0.43	0.06	0.11	<5	22	18	3	9	12	14	<5	14	5	<1	<0.2	0.2	<20	6	<10	24	14	<20	5	<5	<1	<3	6
91SBB- 24	0.63	1.03	119	0.17	0.31	0.05	0.13	<5	18	16	4	14	23	14	<5	11	5	<1	0.3	0.5	<20	<5	<10	49	21	<20	10	<5	1	<3	4
91SBB- 25	0.81	2.02	157	0.32	0.33	0.05	0.23	<5	27	32	11	27	25	19	27	9	7	<1	<0.2	<0.2	<20	7	<10	49	30	<20	15	<5	1	<3	3
91SBB- 26	0.89	1.73	183	0.33	0.33	0.05	0.3	<5	27	30	9	29	30	22	11	14	7	2	<0.2	0.9	<20	8	<10	76	30	<20	16	<5	4	<3	4
91SBB- 27	0.7	1.3	147	0.2	0.25	0.05	0.13	<5	18	15	7	19	21	19	<5	9	4	3	<0.2	<0.2	<20	<5	<10	31	15	<20	12	<5	1	<3	7
91SBB- 28	1.55	2.89	394	0.84	0.49	0.07	0.43	<5	41	46	15	43	60	66	<5	14	6	1	<0.2	2.1	<20	15	<10	106	23	<20	20	<5	2	<3	8
91SBB- 29	0.83	0.99	99	0.15	0.31	0.06	0.1	<5	17	13	3	10	15	13	6	21	4	<1	<0.2	1.2	<20	<5	<10	43	18	<20	9	<5	2	<3	4
91SBB- 30	0.54	0.96	102	0.11	0.3	0.07	0.09	<5	15	10	4	10	13	10	5	11	5	<1	0.3	0.7	<20	<5	<10	26	18	<20	9	<5	2	<3	3

APPENDIX 6. Geochemical analysis of <63µm fraction (cont'd.).

Sample Number	Al (%)	Fe (%)	Mn (ppm)	Mg (%)	Ca (%)	Na (%)	K (%)	Sc (ppm)	V (ppm)	Cr (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)	Sr (ppm)	Y (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Ba (ppm)	La (ppm)	W (ppm)	Pb (ppm)	Bi (ppm)	Pd (ppb)	Pt (ppb)	Au (ppb)
91SBB- 31	0.43	0.94	106	0.14	0.35	0.05	0.09	<5	16	10	2	8	11	12	13	10	4	1	0.3	<0.2	<20	<5	<10	29	15	<20	8	<5	2	<3	2
91SBB- 32	0.98	1.54	189	0.39	0.35	0.06	0.18	<5	26	28	7	19	24	22	<5	15	4	<1	<0.2	1	<20	7	<10	42	29	<20	15	<5	2	<3	4
91SBB- 33	1.8	2.64	246	0.69	0.16	0.04	0.11	<5	32	44	16	43	114	37	11	7	5	<1	0.2	<0.2	<20	10	<10	42	22	<20	24	<5	2	3	6
91SBB- 34	1.62	2.22	225	0.81	0.27	0.05	0.32	<5	40	70	12	42	46	35	<5	9	6	<1	0.2	<0.2	<20	12	<10	136	30	<20	19	<5	3	<3	5
91SBB- 36	1.21	2.19	221	0.53	0.43	0.06	0.28	<5	33	35	9	40	51	35	5	16	8	2	<0.2	<0.2	<20	11	<10	82	42	<20	17	<5	3	5	8
91SBB- 37	0.61	1.19	96	0.15	0.25	0.04	0.09	<5	17	14	6	20	15	12	<5	8	4	<1	0.2	0.6	<20	<5	<10	26	14	<20	8	<5	3	<3	5
91SBB- 38	0.9	1.26	138	0.21	0.28	0.05	0.11	<5	20	16	6	17	19	18	<5	10	4	1	<0.2	<0.2	<20	<5	<10	39	16	<20	8	<5	2	<3	4
91SBB- 39	0.97	1.51	153	0.25	0.24	0.05	0.14	<5	20	19	11	33	38	20	<5	9	4	<1	<0.2	0.3	<20	7	<10	51	20	<20	13	<5	1	<3	5
91SBB- 40	0.55	1.2	106	0.18	0.29	0.05	0.12	<5	18	17	4	15	13	14	<5	9	4	<1	0.2	0.2	<20	<5	<10	28	16	<20	8	<5	1	<3	4
91SBB- 41	1.03	1.38	114	0.21	0.26	0.04	0.14	<5	22	22	8	27	15	14	<5	8	4	2	<0.2	0.2	<20	<5	<10	36	16	<20	10	<5	2	8	6
91SBB- 42	1.59	2.83	343	0.99	0.55	0.06	0.48	<5	49	69	14	44	53	53	<5	24	9	<1	0.3	0.5	<20	15	<10	136	50	<20	23	<5	2	<3	3
91SBB- 43	0.46	1.63	145	0.12	0.29	0.04	0.07	<5	26	16	9	11	12	9	6	7	6	2	<0.2	<0.2	<20	5	<10	17	24	<20	13	<5	2	<3	11
91SBB- 44	1.18	1.77	281	0.45	0.43	0.05	0.24	<5	29	29	8	23	24	32	<5	22	6	2	0.2	0.4	<20	8	<10	67	22	<20	16	<5	2	4	5
91SBB- 45	0.71	1.14	123	0.19	0.29	0.05	0.12	<5	20	20	4	15	19	14	<5	13	6	<1	<0.2	<0.2	<20	<5	<10	43	21	<20	11	<5	2	5	13
91SBB- 46	0.76	1.05	109	0.19	0.26	0.04	0.11	<5	17	17	5	14	19	13	<5	8	5	<1	<0.2	0.5	<20	<5	<10	42	17	<20	10	<5	1	<3	5
91SBB- 47	0.6	0.95	85	0.13	0.3	0.05	0.09	<5	16	14	3	11	12	12	<5	16	6	<1	<0.2	<0.2	<20	<5	<10	32	18	<20	8	<5	<1	<3	2
91SBB- 48	1.99	3.39	523	1.29	0.47	0.04	0.18	<5	46	80	28	71	102	90	<5	11	9	2	<0.2	0.2	<20	17	<10	72	31	<20	24	<5	4	<3	9
91SBB- 49	0.98	1.71	215	0.46	0.31	0.04	0.13	<5	23	25	8	21	36	43	<5	9	11	<1	<0.2	<0.2	<20	8	<10	58	29	<20	13	<5	2	<3	3
91SBB- 50	0.93	1.79	216	0.52	0.35	0.05	0.14	<5	25	23	8	22	38	43	<5	11	10	1	<0.2	<0.2	<20	10	<10	43	16	<20	14	<5	2	<3	5
91SBB- 51	0.95	1.68	171	0.4	0.28	0.04	0.1	<5	20	22	7	18	29	36	<5	8	12	<1	0.2	<0.2	<20	8	<10	27	19	<20	12	<5	1	<3	5
91SBB- 52	1.24	1.99	261	0.66	0.32	0.04	0.1	<5	29	38	13	40	55	41	<5	8	11	<1	<0.2	<0.2	<20	11	<10	50	16	<20	15	<5	3	<3	4
91SBB- 53	1.12	2.28	307	0.67	0.31	0.04	0.08	<5	26	36	11	30	39	52	7	9	8	1	<0.2	<0.2	<20	12	<10	27	13	<20	14	<5	2	<3	10
91SBB- 54	0.78	1.68	242	0.44	0.28	0.03	0.09	<5	19	26	8	26	29	44	<5	7	6	<1	<0.2	<0.2	<20	9	<10	19	8	<20	13	<5	2	<3	2
91SBB- 55	0.88	1.68	198	0.38	0.31	0.03	0.05	<5	20	27	11	33	59	42	<5	8	5	<1	<0.2	<0.2	<20	7	<10	15	7	<20	12	<5	4	<3	4
91SBB- 56	1.05	2.33	420	0.64	0.31	0.04	0.08	<5	37	92	13	44	58	32	5	10	8	1	0.2	0.9	<20	11	<10	42	18	<20	16	<5	3	<3	14
91SBB- 57	1.28	2.6	553	0.74	0.34	0.04	0.08	<5	40	107	19	51	57	32	<5	11	5	3	<0.2	<0.2	<20	13	<10	31	15	<20	19	<5	2	<3	12
91SBB- 58	1.51	2.08	277	0.62	0.3	0.04	0.05	<5	34	82	9	34	32	27	<5	10	4	<1	<0.2	0.3	<20	10	<10	17	13	<20	19	<5	1	<3	20
91SBB- 59	1.1	2.48	472	0.76	0.42	0.04	0.12	<5	38	68	14	41	69	38	18	16	9	<1	<0.2	0.3	<20	14	<10	29	29	<20	19	<5	2	4	5
91SBB- 60	0.79	2.07	385	0.46	0.35	0.04	0.08	<5	32	78	14	41	39	22	<5	12	5	2	0.2	0.8	<20	9	<10	26	15	<20	14	<5	2	<3	5
91SBB- 61	0.86	2.26	307	0.48	0.33	0.04	0.06	<5	36	85	12	40	40	23	<5	10	5	<1	<0.2	<0.2	<20	11	<10	16	13	<20	14	<5	2	4	21

APPENDIX 6. Geochemical analysis of <63μm fraction (cont'd.).

Sample Number	Al (%)	Fe (%)	Mn (ppm)	Mg (%)	Ca (%)	Na (%)	K (%)	Sc (ppm)	V (ppm)	Cr (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)	Sr (ppm)	Y (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Ba (ppm)	La (ppm)	W (ppm)	Pb (ppm)	Bi (ppm)	Pd (ppb)	Pt (ppb)	Au (ppb)
91SBB- 62	0.73	2.05	289	0.35	0.34	0.04	0.06	<5	33	55	10	22	34	20	14	11	5	<1	<0.2	<0.2	<20	8	<10	19	19	<20	11	<5	2	3	12
91SBB- 63	0.71	1.94	255	0.45	0.44	0.05	0.09	<5	30	61	6	31	58	24	<5	14	7	<1	<0.2	<0.2	<20	9	<10	34	15	<20	14	<5	2	<3	11
91SBB- 64	0.82	1.95	267	0.47	0.41	0.04	0.14	<5	29	31	11	25	50	27	24	16	6	<1	<0.2	<0.2	<20	9	<10	44	18	<20	14	<5	2	5	13
91SBB- 65	0.6	1.46	221	0.29	0.35	0.04	0.1	<5	22	36	7	20	25	20	7	12	4	<1	<0.2	0.4	<20	7	<10	22	13	<20	11	<5	2	<3	13
91SBB- 66	1.26	2.14	443	0.47	0.35	0.04	0.12	<5	31	41	16	27	39	26	<5	13	4	<1	0.2	<0.2	<20	10	<10	45	16	<20	15	<5	2	<3	6
91SBB- 67	0.63	1.48	220	0.3	0.38	0.04	0.09	<5	23	24	4	15	16	19	14	14	5	<1	0.2	0.3	<20	7	<10	23	19	<20	10	<5	2	<3	13
91SBB- 68	0.96	2.12	327	0.42	0.36	0.04	0.1	<5	30	31	12	24	46	29	10	12	5	<1	0.3	0.9	<20	9	<10	27	15	<20	13	<5	<1	<3	4
91SBB- 69	0.88	2.02	347	0.46	0.46	0.05	0.11	<5	31	36	10	30	66	33	<5	18	9	<1	<0.2	<0.2	<20	9	<10	36	18	<20	13	<5	1	<3	8
91SBB- 70	1.1	2.09	311	0.43	0.31	0.04	0.09	<5	32	33	11	25	38	28	<5	13	5	2	<0.2	1.1	<20	9	<10	40	16	<20	15	<5	<1	<3	4
91SBB- 71	0.69	1.79	236	0.3	0.34	0.04	0.07	<5	27	25	9	20	30	20	<5	12	5	2	<0.2	0.2	<20	8	<10	19	14	<20	14	<5	1	<3	5
91SBB- 72	0.54	1.44	188	0.23	0.39	0.04	0.08	<5	24	21	6	17	24	20	14	12	6	2	<0.2	<0.2	<20	6	<10	21	15	<20	7	<5	<1	<3	5
91SBB- 73	0.77	1.59	194	0.34	0.39	0.04	0.09	<5	27	29	7	19	26	21	<5	13	5	1	<0.2	0.5	<20	7	<10	36	18	<20	10	<5	<1	4	4
91SBB- 74	0.55	1.67	212	0.27	0.41	0.04	0.08	<5	27	23	6	17	45	28	<5	13	7	<1	<0.2	0.4	<20	7	<10	22	18	<20	11	<5	<1	4	5
91SBB- 75	0.67	1.62	211	0.31	0.41	0.04	0.08	<5	28	24	7	16	36	20	6	14	8	<1	<0.2	0.6	<20	7	<10	31	19	<20	10	<5	2	6	11
91SBB- 76	0.75	1.61	187	0.3	0.4	0.04	0.08	<5	27	26	6	18	27	22	<5	12	6	2	<0.2	0.3	<20	8	<10	23	13	<20	10	<5	<1	4	4
91SBB- 77	0.56	1.39	155	0.23	0.4	0.04	0.07	<5	24	23	5	15	21	18	<5	12	6	<1	0.5	<0.2	<20	5	<10	22	14	<20	10	<5	<1	7	12
91SBB- 78	1.35	2.45	352	0.73	0.71	0.07	0.3	<5	45	47	13	34	83	45	<5	23	10	3	0.2	<0.2	<20	12	<10	84	44	<20	18	<5	2	4	3
91SBB- 79	0.94	1.53	197	0.45	0.46	0.06	0.12	<5	24	38	8	40	49	25	<5	13	5	<1	<0.2	0.2	<20	9	<10	31	12	<20	12	<5	2	6	6
91SBB- 80	0.44	1.03	113	0.16	0.42	0.04	0.08	<5	18	11	5	11	13	11	<5	13	5	2	0.2	<0.2	<20	5	<10	13	12	<20	7	<5	1	7	4
91SBB- 81	0.98	1.45	145	0.32	0.29	0.05	0.09	<5	25	19	6	15	21	18	11	14	4	<1	0.5	0.4	<20	6	<10	38	17	<20	12	<5	2	4	4
91SBB- 82	0.57	1.2	135	0.29	0.46	0.06	0.09	<5	23	30	5	14	8	15	<5	17	7	<1	<0.2	0.3	<20	6	<10	24	24	<20	11	<5	<1	<3	<1
91SBB- 83	1.3	2.13	271	0.61	0.33	0.05	0.41	<5	34	42	10	34	31	49	<5	12	5	<1	<0.2	0.5	<20	11	<10	93	23	<20	18	<5	1	3	7
91SBB- 84	0.55	1.2	119	0.17	0.35	0.04	0.1	<5	22	16	4	10	12	13	<5	10	5	<1	<0.2	<0.2	<20	5	<10	20	12	<20	10	<5	<1	6	<1
91SBB- 85	1.69	2.32	355	1.04	0.41	0.06	0.38	<5	31	32	9	24	60	63	<5	20	28	<1	0.2	<0.2	<20	14	<10	94	50	<20	23	<5	1	5	3
91SBB- 86	0.67	0.97	117	0.15	0.29	0.05	0.08	<5	17	14	3	7	15	14	<5	11	4	2	<0.2	<0.2	<20	<5	<10	38	16	<20	8	<5	<1	4	1
91SBB- 87	0.37	1.12	106	0.12	0.38	0.05	0.08	<5	20	13	3	6	15	15	<5	11	7	2	0.2	0.8	<20	<5	<10	19	27	<20	10	<5	<1	8	2
91SBB- 88	0.54	1.41	118	0.23	0.39	0.04	0.11	<5	26	33	6	20	19	16	8	12	6	4	0.3	<0.2	<20	6	<10	24	18	<20	12	<5	<1	<3	<1
91SBB- 89	0.47	1.25	96	0.14	0.4	0.05	0.08	<5	24	17	4	11	10	15	12	12	6	<1	0.2	<0.2	<20	5	<10	15	14	<20	7	<5	<1	<3	7
91SBB- 90	0.41	1.32	131	0.17	0.37	0.04	0.08	<5	25	17	4	7	13	19	<5	11	6	3	<0.2	0.2	<20	5	<10	23	22	<20	11	<5	<1	<3	3
91SBB- 91	0.84	1.58	155	0.24	0.41	0.05	0.09	<5	29	24	7	14	21	16	<5	16	6	<1	0.3	0.6	<20	<5	<10	31	32	<20	9	<5	<1	<3	6

APPENDIX 6. Geochemical analysis of <63µm fraction (cont'd.).

Sample Number	Al (%)	Fe (%)	Mn (ppm)	Mg (%)	Ca (%)	Na (%)	K (%)	Sc (ppm)	V (ppm)	Cr (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)	Sr (ppm)	Y (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Ba (ppm)	La (ppm)	W (ppm)	Pb (ppm)	Bi (ppm)	Pd (ppb)	Pt (ppb)	Au (ppb)
91SBB- 92	0.42	1.22	121	0.18	0.42	0.05	0.08	<5	24	15	4	7	16	11	<5	14	5	1	0.2	<0.2	<20	<5	<10	23	22	<20	6	<5	<1	<3	3
91SBB- 93	0.44	1.32	143	0.15	0.44	0.05	0.08	<5	24	16	3	10	27	15	<5	16	7	<1	<0.2	0.2	<20	<5	<10	24	34	<20	8	<5	<1	<3	1
91SBB- 94	0.9	1.48	167	0.29	0.61	0.06	0.14	<5	26	22	3	12	34	18	<5	20	8	2	0.4	<0.2	<20	7	<10	49	22	<20	9	<5	2	<3	3
91SBB- 95	0.5	1.22	133	0.13	0.45	0.05	0.07	<5	22	16	4	10	15	12	<5	15	6	3	<0.2	<0.2	<20	<5	<10	24	24	<20	5	<5	1	<3	1
91SBB- 96	0.51	1.24	128	0.17	0.47	0.05	0.08	<5	23	18	3	11	15	11	<5	17	6	3	<0.2	1	<20	5	<10	25	18	<20	7	<5	1	<3	4
91SBB- 97	0.5	1.24	142	0.15	0.43	0.05	0.07	<5	23	18	5	14	13	10	15	14	5	1	<0.2	0.6	<20	<5	<10	14	15	<20	7	<5	1	<3	3
91SBB- 98	0.87	1.93	307	0.35	0.6	0.07	0.17	<5	33	39	9	30	30	23	13	22	10	<1	0.3	<0.2	<20	8	<10	53	47	<20	11	<5	1	<3	4
91SBB- 99	0.98	1.33	170	0.21	0.42	0.04	0.1	<5	24	19	7	12	17	16	<5	13	6	<1	0.3	<0.2	<20	5	<10	56	26	<20	10	<5	<1	<3	3
91SBB- 100	0.2	0.83	60	0.27	0.92	0.04	0.04	<5	16	11	1	5	8	6	<5	12	5	3	<0.2	<0.2	<20	6	<10	13	17	<20	7	<5	<1	<3	4
91SBB- 101	0.76	1.8	213	0.31	0.55	0.07	0.16	<5	33	25	6	20	37	26	6	19	9	<1	0.2	0.4	<20	8	<10	52	42	<20	11	<5	3	<3	5
91SBB- 102	0.32	1.43	95	0.11	0.46	0.04	0.06	<5	26	18	3	7	13	9	8	12	7	1	0.2	1.2	<20	<5	<10	16	28	<20	6	<5	1	<3	7
91SBB- 103	0.63	1.57	83	0.12	0.34	0.04	0.05	<5	30	20	4	8	7	10	<5	11	5	3	0.3	<0.2	<20	<5	<10	14	13	<20	7	<5	<1	<3	<1
91SBB- 104	0.23	1.23	65	0.07	0.33	0.04	0.04	<5	23	14	3	6	12	6	11	10	6	2	0.3	0.9	<20	<5	<10	11	21	<20	6	<5	<1	<3	3
91SBB- 105	0.25	1.16	89	0.19	0.7	0.05	0.07	<5	21	14	4	7	21	12	<5	13	7	1	<0.2	0.6	<20	5	<10	12	21	<20	8	<5	1	<3	1
91SBB- 106	0.56	1.27	172	0.45	1.06	0.06	0.18	<5	27	19	5	11	24	20	<5	18	6	4	<0.2	<0.2	<20	8	<10	36	19	<20	10	<5	1	4	1
91SBB- 107	0.89	1.45	198	0.39	0.45	0.06	0.22	<5	28	38	7	16	18	20	<5	15	5	<1	0.3	<0.2	<20	6	<10	41	18	<20	10	<5	1	<3	<1
91SBB- 108	0.31	1.02	101	0.32	0.97	0.05	0.08	<5	20	15	2	8	15	13	9	16	6	2	<0.2	<0.2	<20	7	<10	21	17	<20	7	<5	<1	<3	1
91SBB- 109	0.56	1.72	89	0.11	0.4	0.05	0.05	<5	31	28	4	18	14	9	<5	10	5	2	<0.2	<0.2	<20	<5	<10	14	13	<20	7	<5	<1	<3	2
91SBB- 110	0.6	1.37	122	0.18	0.47	0.06	0.11	<5	25	21	3	13	23	16	<5	17	7	1	0.3	0.3	<20	5	<10	33	37	<20	8	<5	<1	<3	2
91SBB- 111	0.68	1.38	145	0.2	0.47	0.06	0.12	<5	25	19	5	11	21	17	5	16	7	<1	<0.2	<0.2	<20	5	<10	36	35	<20	10	<5	<1	<3	<1
91SBB- 112	0.52	1.23	111	0.16	0.43	0.04	0.08	<5	23	16	4	11	16	11	<5	14	6	1	0.3	<0.2	<20	<5	<10	24	19	<20	6	<5	<1	<3	4
91SBB- 113	0.37	1.21	87	0.09	0.36	0.04	0.06	<5	23	17	4	12	11	7	8	10	5	<1	0.3	<0.2	<20	<5	<10	13	14	<20	4	<5	<1	<3	11
91SBB- 114	1	1.62	180	0.41	0.57	0.07	0.08	<5	29	33	5	19	42	39	<5	19	9	4	0.3	0.3	<20	8	<10	33	37	<20	20	<5	2	<3	8
91SBB- 115	1.27	1.68	196	0.33	0.34	0.04	0.15	<5	32	22	7	15	20	26	<5	19	8	4	0.3	<0.2	<20	6	<10	72	23	<20	12	<5	<1	<3	1
91SBB- 116	1.7	1.48	140	0.36	0.26	0.05	0.12	<5	24	26	7	20	23	21	<5	9	4	<1	0.2	<0.2	<20	6	<10	52	16	<20	14	<5	<1	<3	<1
91SBB- 117	0.78	1.83	205	0.29	0.39	0.06	0.19	<5	33	17	9	15	21	22	<5	11	6	<1	<0.2	<0.2	<20	7	<10	55	21	<20	10	<5	<1	<3	5
91SBB- 118	0.93	1.41	165	0.28	0.34	0.05	0.18	<5	24	23	6	18	30	21	<5	17	6	2	0.3	0.5	<20	6	<10	58	22	<20	11	<5	1	<3	2
91SBB- 119	1.27	1.86	280	0.45	0.55	0.07	0.26	<5	31	30	7	23	35	31	<5	21	12	2	<0.2	0.3	<20	8	<10	82	34	<20	13	<5	<1	<3	3
91SBB- 120	0.71	1.18	170	0.24	0.39	0.04	0.12	<5	21	19	5	11	13	14	6	12	5	<1	<0.2	0.7	<20	5	<10	40	24	<20	8	<5	<1	<3	1
91SBB- 121	0.62	1.14	130	0.17	0.33	0.05	0.1	<5	20	15	5	11	13	13	27	10	5	2	0.3	<0.2	<20	<5	<10	29	16	<20	9	<5	<1	<3	2

APPENDIX 6. Geochemical analysis of <63µm fraction (cont'd.).

Sample Number	Al (%)	Fe (%)	Mn (ppm)	Mg (%)	Ca (%)	Na (%)	K (%)	Sc (ppm)	V (ppm)	Cr (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)	Sr (ppm)	Y (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Ba (ppm)	La (ppm)	W (ppm)	Pb (ppm)	Bi (ppm)	Pd (ppb)	Pt (ppb)	Au (ppb)
91SBB- 122	0.9	1.46	250	0.33	0.38	0.05	0.17	<5	25	24	6	17	16	21	<5	15	6	<1	<0.2	0.2	<20	7	<10	51	22	<20	12	<5	<1	<3	1
91SBB- 123	0.61	1.17	126	0.19	0.31	0.05	0.16	<5	20	13	5	10	15	14	<5	8	4	<1	<0.2	<0.2	<20	5	<10	35	13	<20	9	<5	<1	<3	2
91SBB- 124	1.82	3.1	450	0.92	0.29	0.04	0.13	<5	43	31	13	23	52	118	<5	11	10	<1	0.2	0.8	<20	14	<10	54	31	<20	19	<5	<1	<3	3
91SBB- 125	1.21	1.39	154	0.52	0.21	0.05	0.06	<5	18	22	6	18	21	59	<5	10	6	1	<0.2	0.4	<20	8	<10	33	15	<20	15	<5	1	<3	7
91SBB- 126	1.52	2.27	301	1.19	0.26	0.03	0.09	<5	34	57	11	39	30	62	<5	9	9	<1	0.3	<0.2	<20	17	<10	31	22	<20	20	<5	<1	<3	32
91SBB- 127	0.55	1.61	164	0.19	0.34	0.04	0.07	<5	23	17	11	20	21	31	<5	9	6	<1	0.2	0.7	<20	6	<10	14	11	<20	8	<5	<1	<3	1
91SBB- 128	1.3	1.2	130	0.33	0.16	0.04	0.06	<5	16	18	5	13	17	23	<5	6	5	<1	0.2	0.3	<20	6	<10	21	12	<20	12	<5	<1	<3	4
91SBB- 129	0.92	1.81	235	0.26	0.27	0.04	0.08	<5	24	20	10	17	18	31	9	8	7	2	<0.2	<0.2	<20	6	<10	19	15	<20	14	<5	<1	<3	6
91SBB- 130	0.83	1.52	236	0.37	0.41	0.04	0.14	<5	24	19	8	17	37	27	<5	13	5	2	<0.2	0.9	<20	6	<10	31	15	<20	11	<5	<1	<3	5
91SBB- 131	0.79	2.09	260	0.29	0.4	0.05	0.12	<5	27	19	18	18	48	22	8	13	5	3	<0.2	<0.2	<20	8	<10	25	18	<20	12	<5	1	<3	10
91SBB- 132	0.55	1.32	146	0.2	0.4	0.05	0.07	<5	23	19	6	15	39	16	<5	10	5	3	0.3	<0.2	<20	6	<10	15	10	<20	6	<5	<1	<3	2
91SBB- 133	0.81	1.43	195	0.31	0.44	0.06	0.11	<5	25	22	6	20	34	23	<5	12	6	1	<0.2	0.3	<20	6	<10	25	17	<20	9	<5	<1	<3	5
91SBB- 134	1.53	1.67	190	0.69	0.25	0.05	0.25	<5	18	22	5	15	28	36	<5	13	27	<1	<0.2	<0.2	<20	11	<10	85	75	<20	17	<5	<1	<3	5
91SBB- 135	0.93	1.65	245	0.49	0.35	0.04	0.2	<5	24	30	8	22	28	29	<5	13	18	<1	<0.2	<0.2	<20	9	<10	67	30	<20	12	<5	2	5	5
91SBB- 139	1.71	4.17	387	1.33	0.81	0.05	0.95	<5	48	76	12	43	37	52	8	14	8	<1	0.4	<0.2	<20	18	<10	151	23	<20	24	<5	2	5	6
91SBB- 140	0.47	1.23	114	0.17	0.36	0.03	0.11	<5	19	19	6	11	13	10	<5	10	6	2	0.3	<0.2	<20	<5	<10	17	16	<20	10	<5	2	6	2

APPENDIX 7. Geochemistry of soil profiles

APPENDIX 7. Geochemistry of soil profiles.

a) Heavy mineral concentrates (INNA method).

Sample Number	Depth	Munsell Colour	Na (%)	Sc (ppm)	Cr (ppm)	Fe (%)	Co (ppm)	Ni (ppm)	Zn (ppm)	As (ppm)	Br (ppm)	Rb (ppm)	Zr (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Cs (ppm)	Ba (ppm)	La (ppm)	Ce (ppm)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)	Hf (ppm)	Ta (ppm)	W (ppm)	Ir (ppm)	Au (ppb)	Th (ppm)	U (ppm)	WT. (gm)
91SBB-6	2	5Y6/3	0.4	65.2	560	23.6	26	<74	470	3.6	2.1	<45	16000	<5	<11	<17	<520	0.6	<1.6	<170	922	1760	111	9	13	39	14	372	24	14	<50	91	490	57	9.6
91SBB-7	1.5	2.5Y7/2	0.4	70.3	540	25.1	29	<78	<500	5.4	2.2	<47	16000	<5	<11	<18	<560	0.5	<1.7	<180	932	1820	120	8	13	41	13	345	25	26	<50	318	479	55	7.5
91SBB-8	1	2.5Y6/4	0.2	69.6	560	23.8	32	<71	<470	3.1	<2.2	<44	14000	<4	<11	<16	<420	0.5	<1.6	<170	822	1680	103	8	12	40	12	317	21	25	<50	53	423	51	7.2
91SBB-9	0.5	5Y6/4	0.4	74	600	23.1	37	<67	<420	<1.5	<1.9	<41	14000	<4	<10	<16	<480	0.6	<1.5	<160	801	1570	102	6	11	39	14	365	20	11	<50	55	402	57	10
91SBB-10	0.25	2.5Y6/6	0.3	73.5	440	24.9	51	<76	<480	3.1	<2.2	<46	18000	<5	<11	<17	<540	0.5	<1.7	<180	921	1780	109	11	12	39	14	377	27	5	<50	190	491	59	7.6
91SBB-110	2	5Y5/2	0.5	58.4	440	19	35	<55	270	2.7	<2.4	<33	26500	<5	<8	<18	<320	0.5	<1.2	<130	650	1540	136	25	14	57	14	592	33	17	<50	36	215	61	9.6
91SBB-111	1.5	5Y6/2	0.5	59	500	19	33	<67	<350	4.3	1.4	<34	28200	<5	<8	<19	<330	0.5	<1.2	<140	661	1610	142	26	14	50	13	610	33	32	<50	202	235	60	8.9
91SBB-112	0.9	5Y5/2	0.6	56	530	20.6	26	<57	240	<2.4	1	<34	32900	<5	<9	<18	<410	0.4	<1.2	<140	464	1260	101	21	11	48	12	708	27	16	<50	150	213	56	5.5
91SBB-113	0.6	5Y6/2	0.4	65.8	530	20.6	39	<56	310	2.8	<2.4	<33	32000	<5	<9	<18	<410	0.6	<1.2	<190	575	1540	136	30	15	56	15	712	30	57	<50	160	217	59	9.4

b) <63μm fraction (ICP for trace elements; fire assay/DCP for precious metals).

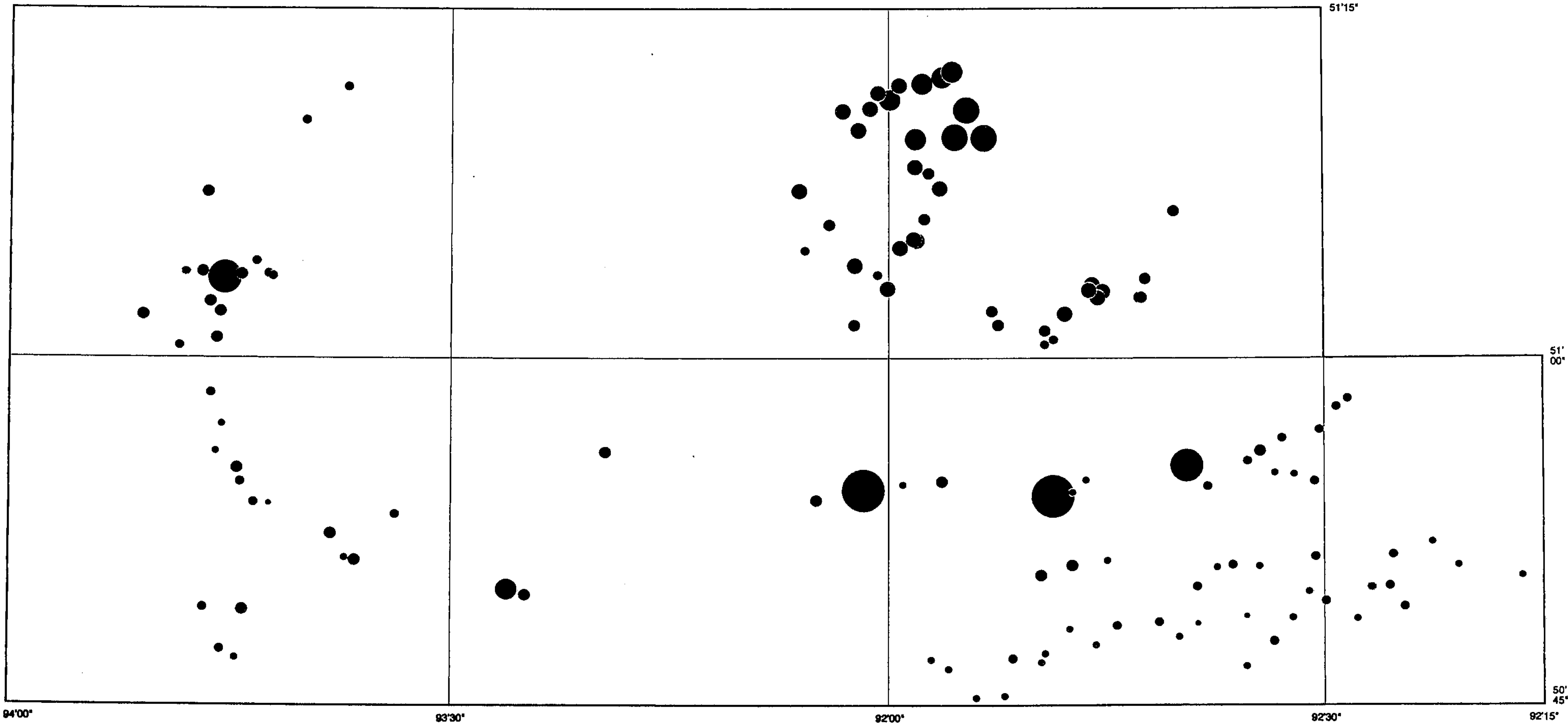
Sample Number	Depth	Munsell Colour	Al (%)	Fe (%)	Mn (ppm)	Mg (%)	Ca (%)	Na (%)	K (%)	Sc (ppm)	V (ppm)	Cr (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)	Sr (ppm)	Y (ppm)	Mo (ppm)	Ag (ppm)	Cd (ppm)	Sn (ppm)	Sb (ppm)	Te (ppm)	Ba (ppm)	La (ppm)	W (ppm)	Pb (ppm)	Bi (ppm)	Pd (ppb)	Pt (ppb)	Au (ppb)
91SBB-6	2	5Y6/3	0.7	1.2	115	0.2	0.4	0.1	0.1	<5	20	18	3	14	21	15	<5	20	7	<1	<0.2	<0.2	<20	5	<10	45	22	<20	10	<5	3	<3	6
91SBB-7	1.5	2.5Y7/2	0.8	1.1	121	0.2	0.3	0.1	0.1	<5	19	16	4	12	17	12	8	15	6	<1	0.2	0.4	<20	<5	<10	60	20	<20	10	<5	4	<3	9
91SBB-8	1	2.5Y6/4	1.1	1.3	157	0.2	0.3	0.1	0.2	<5	23	22	6	17	24	17	<5	20	6	4	<0.2	0.5	<20	6	<10	72	25	<20	12	<5	4	<3	7
91SBB-9	0.5	5Y6/4	0.9	1.1	92	0.2	0.2	0	0.1	<5	20	19	5	13	15	10	<5	9	4	<1	<0.2	0.6	<20	<5	<10	60	17	<20	10	<5	3	<3	4
91SBB-10	0.25	2.5Y6/6	1.3	1.3	98	0.2	0.2	0.1	0.1	<5	23	22	8	19	12	13	<5	10	4	<1	0.4	0.3	<20	<5	<10	52	17	<20	14	<5	4	<3	7
91SBB-110	2	5Y5/2	0.6	1.4	122	0.2	0.5	0.1	0.1	<5	25	21	3	13	23	16	<5	17	7	1	0.3	0.3	<20	5	<10	33	37	<20	8	<5	<1	<3	2
91SBB-111	1.5	5Y6/2	0.7	1.4	145	0.2	0.5	0.1	0.1	<5	25	19	5	11	21	17	5	16	7	<1	<0.2	<0.2	<20	5	<10	36	35	<20	10	<5	<1	<3	<1
91SBB-112	0.9	5Y5/2	0.5	1.2	111	0.2	0.4	0	0.1	<5	23	16	4	11	16	11	<5	14	6	1	0.3	<0.2	<20	<5	<10	24	19	<20	6	<5	<1	<3	4
91SBB-113	0.6	5Y6/2	0.4	1.2	87	0.1	0.4	0	0.1	<5	23	17	4	12	11	7	8	10	5	<1	0.3	<0.2	<20	<5	<10	13	14	<20	4	<5	<1	<3	11

APPENDIX 8. Maps, surface sample data (a) heavy mineral con.; (b) <0.063 mm fraction; (c) gold grains

APPENDIX 8. Maps of surface sample data

a) Heavy mineral concentrates (INAA)

Sb, As, Ce, Co, Cr, Eu, Hf, Fe, Au, La, Lu, Na, Ta, Th, W, Sm, Sc, Te, U, Yb, Zn.



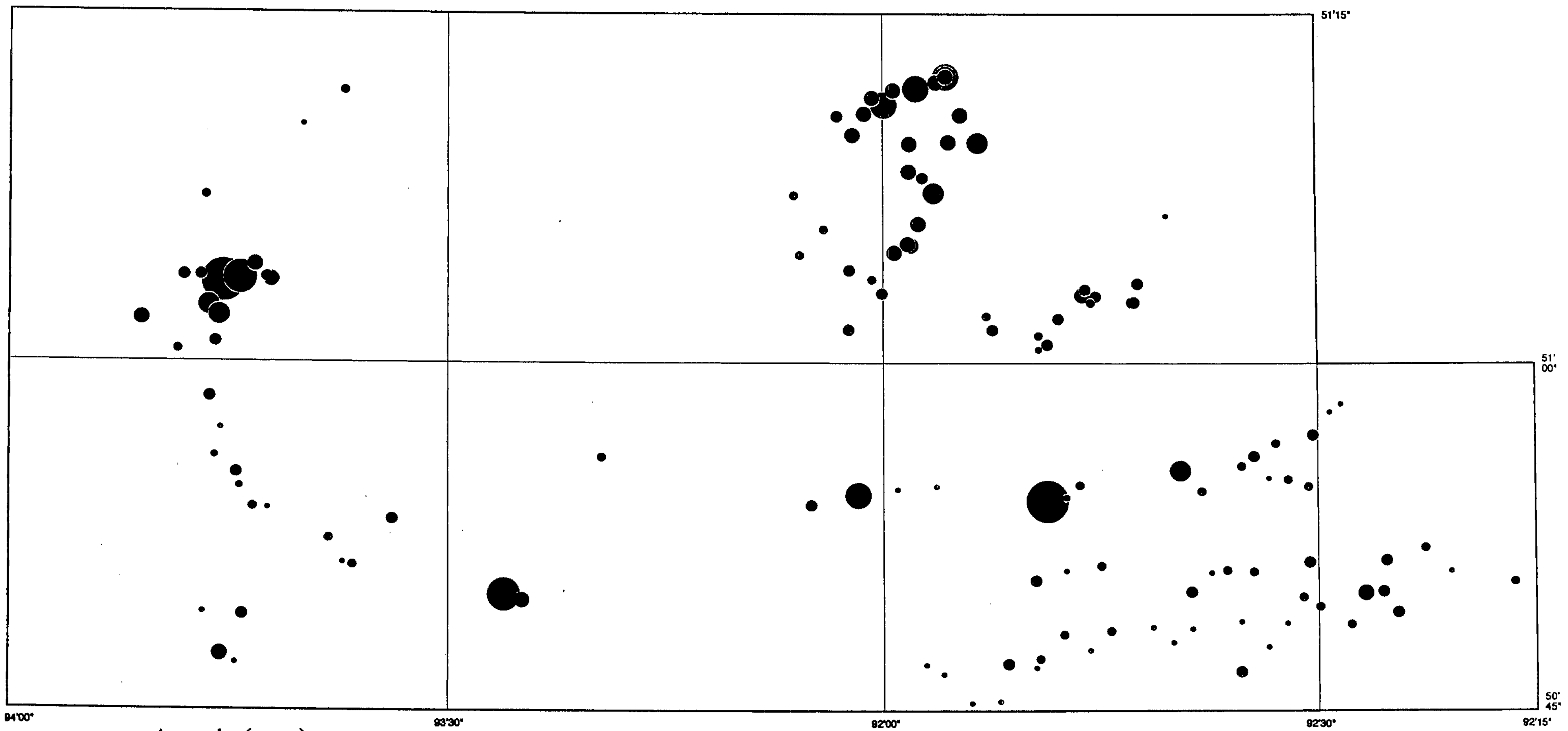
Antimony (ppm)

MIN.	MAX.	#SAMP	%TILE
0	.05	3	2.2
.05	.5	35	27.7
.5	.7	37	54.7
.7	1.1	29	75.9
1.1	1.7	18	89.1
1.7	2.1	8	94.9
2.1	2.5	3	97.1
2.5	3	2	98.5
3	4	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

INAA Technique

Red Lake Area, Ontario



Arsenic (ppm)

MIN.	MAX.	#SAMP	%TILE
0	.5	30	21.9
.5	2	4	24.8
2	3.4	35	50.4
3.4	5.2	33	74.5
5.2	8.6	21	89.8
8.6	10	6	94.2
10	14	4	97.1
14	16	2	98.5
16	1950	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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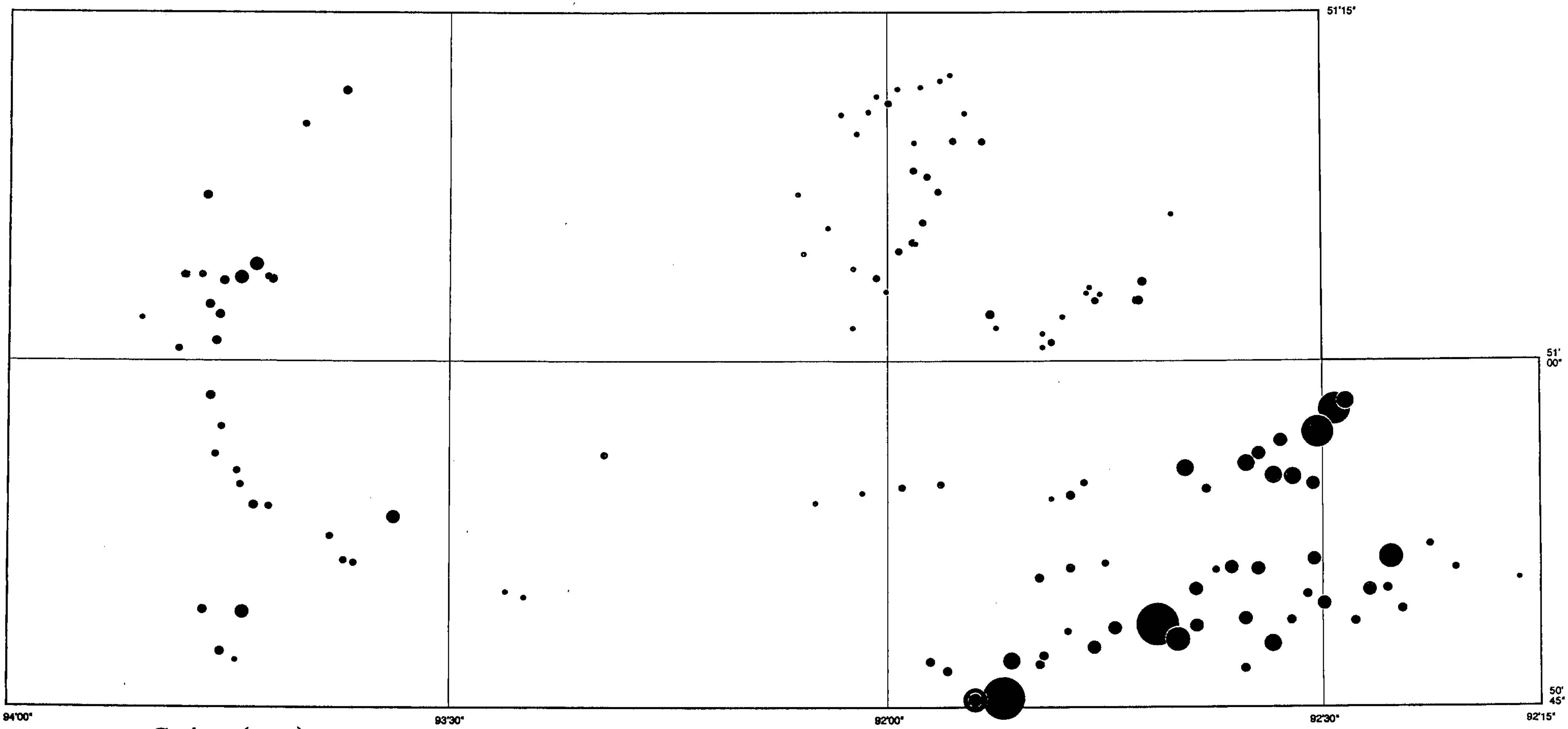
Red Lake Area, Ontario



Cerium (ppm)

MIN.	MAX.	#SAMP	%TILE
389	767	35	25.5
767	1260	34	50.4
1260	1750	34	75.2
1750	2220	20	89.8
2220	2520	7	94.9
2520	2770	3	97.1
2770	3120	2	98.5
3120	3470	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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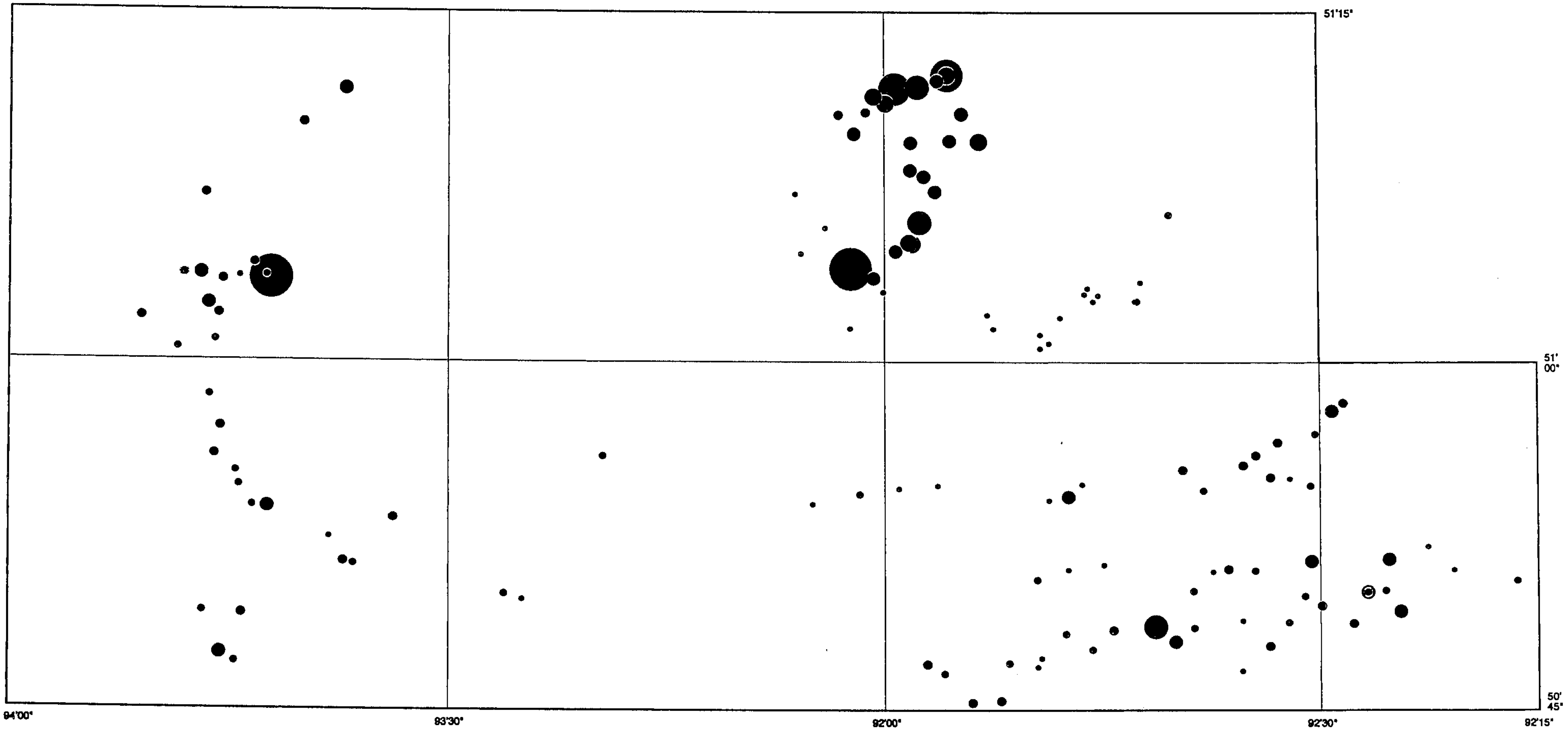
Red Lake Area, Ontario



Chromium (ppm)

MIN.	MAX.	#SAMP	%TILE
169	410	35	25.5
410	490	32	48.9
490	580	34	73.7
580	760	22	89.8
760	890	7	94.9
890	950	3	97.1
950	1200	2	98.5
1200	1400	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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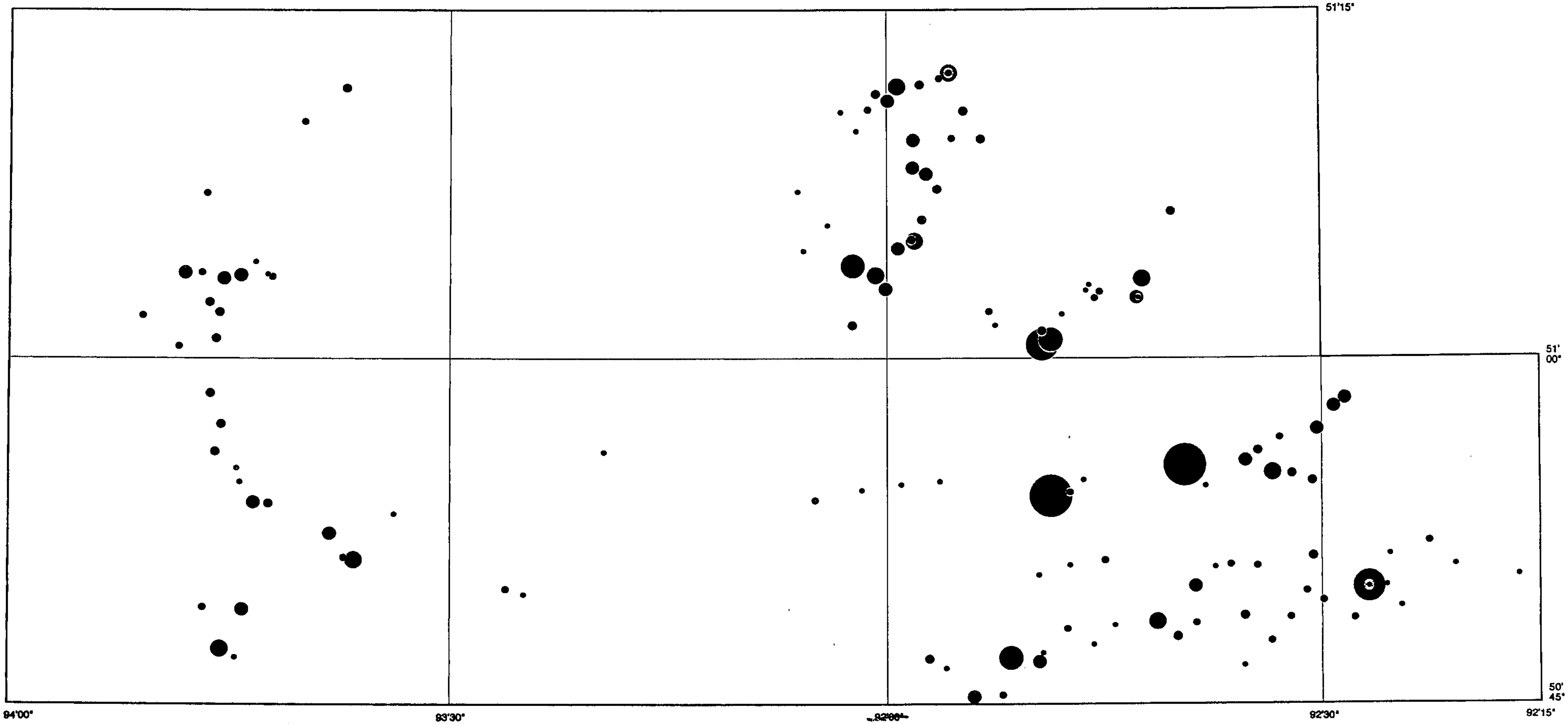

Cobalt (ppm)

	MIN.	MAX.	#SAMP	%TILE
•	.4	26	38	27.7
•	26	32	34	52.6
•	32	37	29	73.7
●	37	42	20	88.3
●	42	46	9	94.9
●	46	48	3	97.1
●	48	51	2	98.5
●	51	180	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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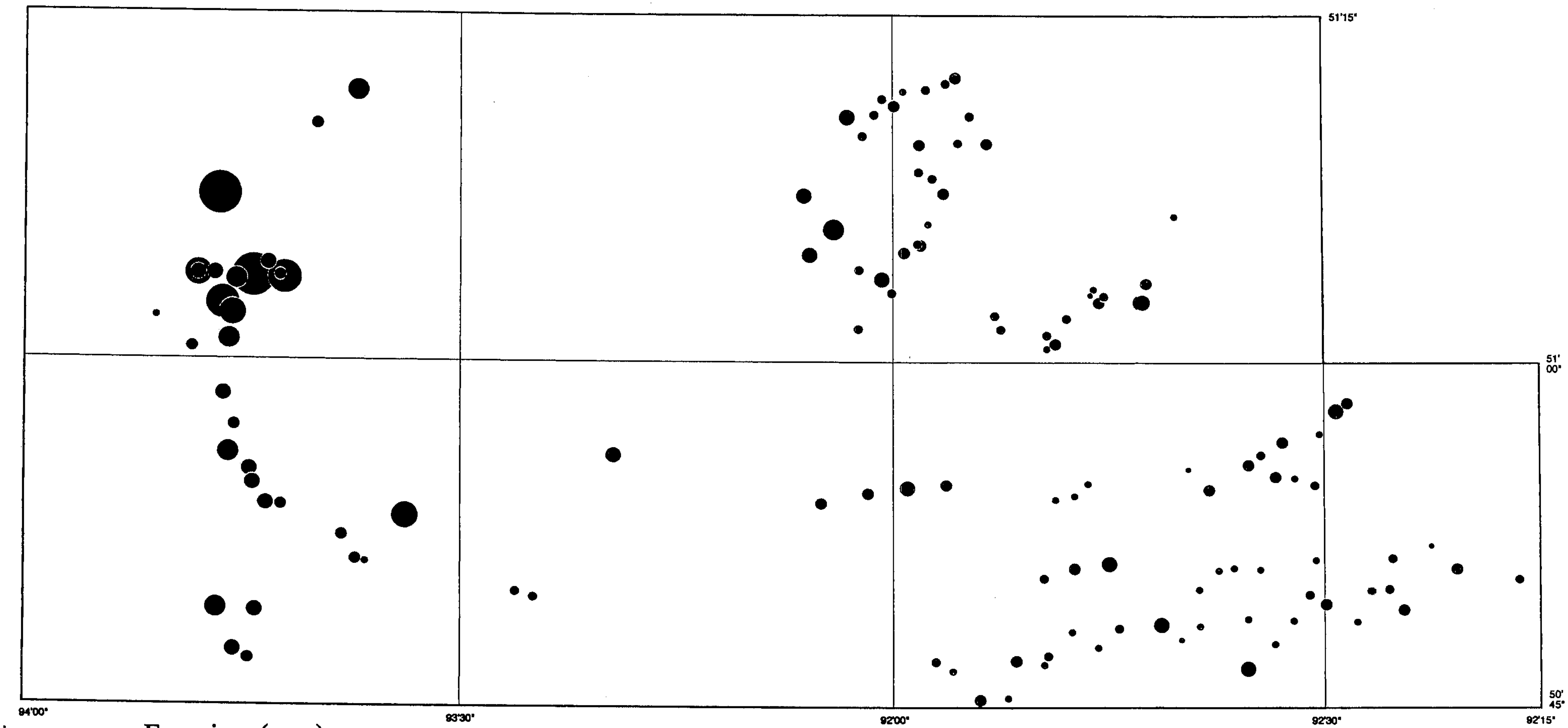

Europium (ppm)

	MIN.	MAX.	#SAMP	%TILE
•	0	.5	4	2.9
•	.5	10	33	27
•	10	13	31	49.6
•	13	17	33	73.7
•	17	23	21	89.1
•	23	26	8	94.9
•	26	30	3	97.1
•	30	32	2	98.5
•	32	40	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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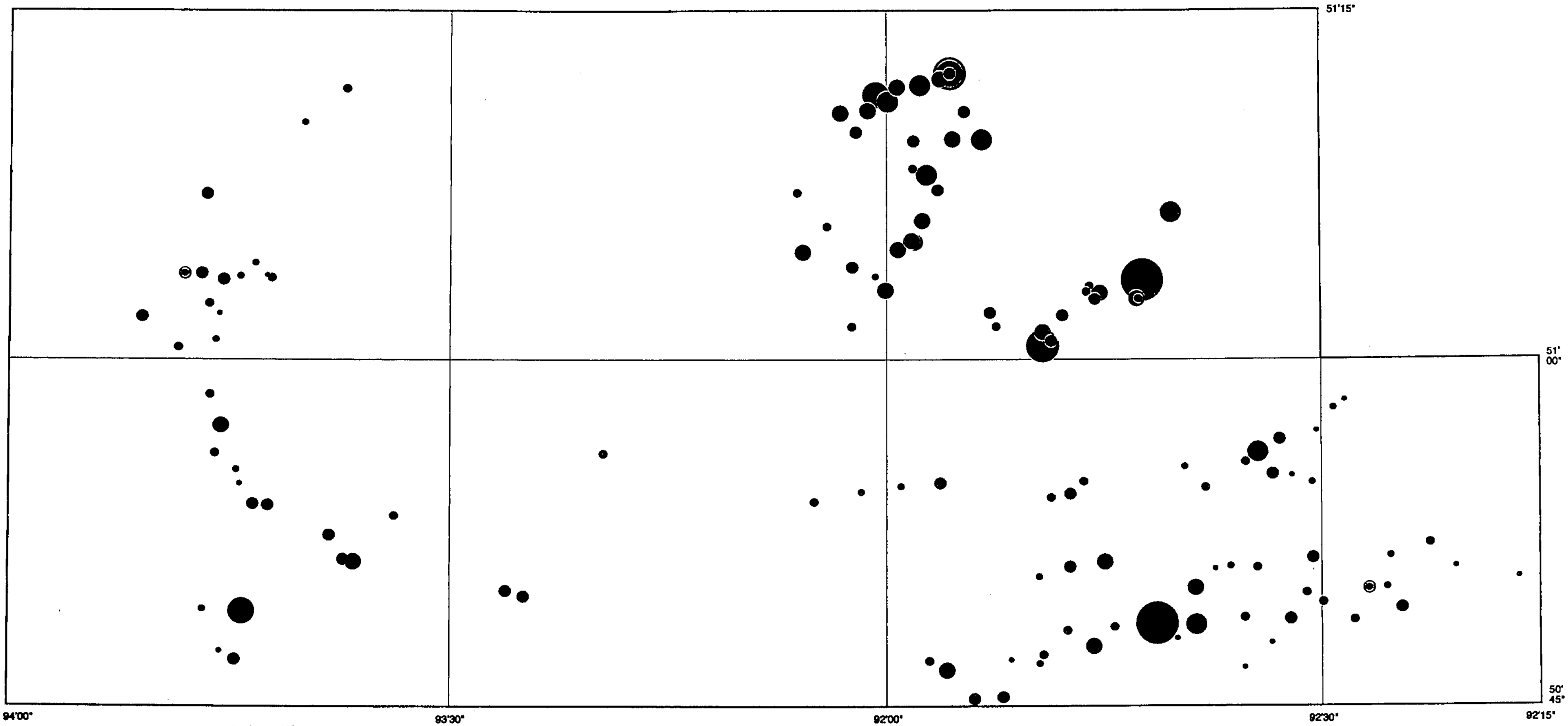
Red Lake Area, Ontario



Gold (ppb)

MIN.	MAX.	#SAMP	%TILE
0	.5	15	10.9
.5	61	20	25.5
61	170	34	50.4
170	510	34	75.2
510	1220	20	89.8
1220	1800	7	94.9
1800	2420	3	97.1
2420	3170	2	98.5
3170	10400	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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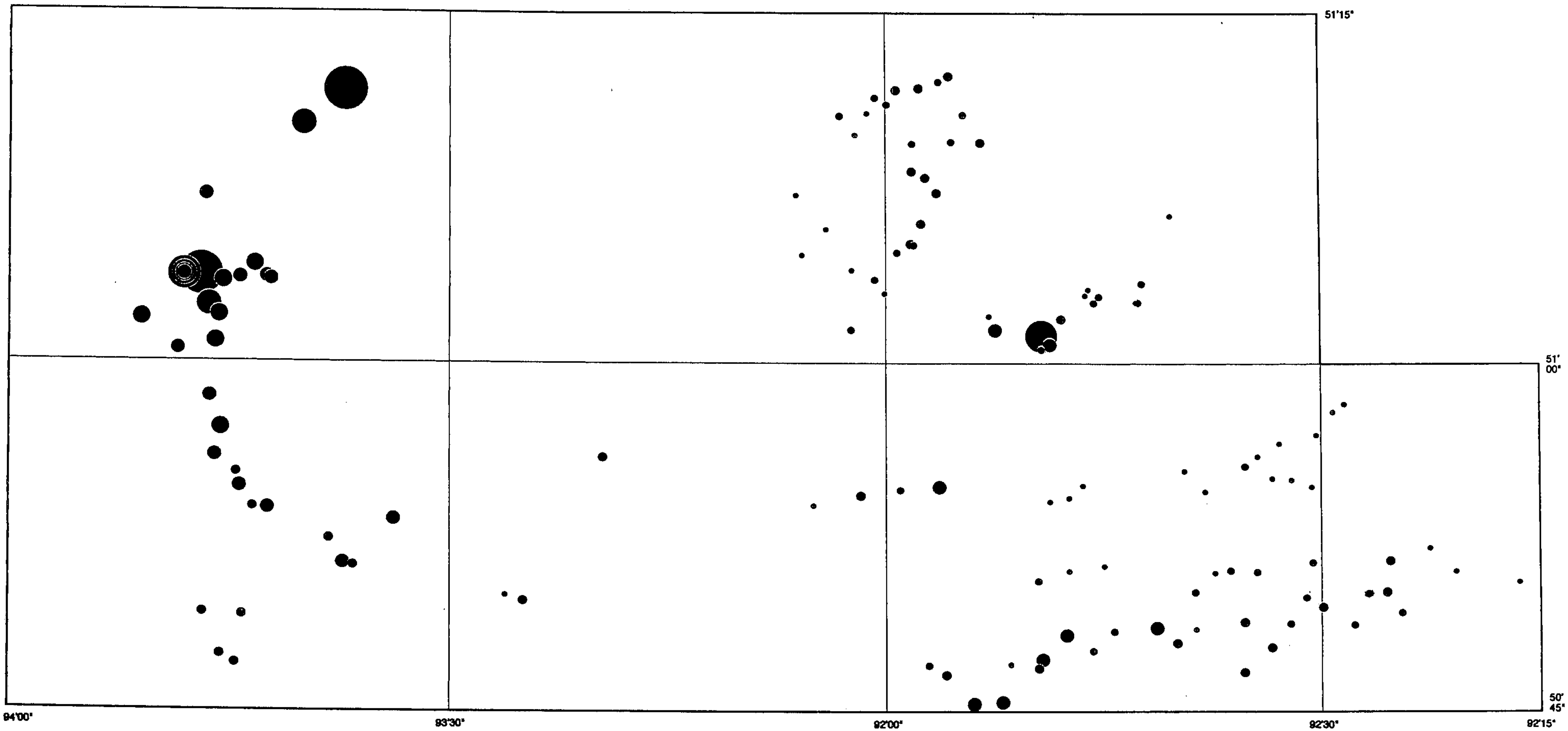

Hafnium (ppm)

MIN.	MAX.	#SAMP	%TILE
137	264	35	25.5
264	369	33	49.6
369	459	35	75.2
459	592	20	89.8
592	662	7	94.9
662	708	3	97.1
708	742	2	98.5
742	761	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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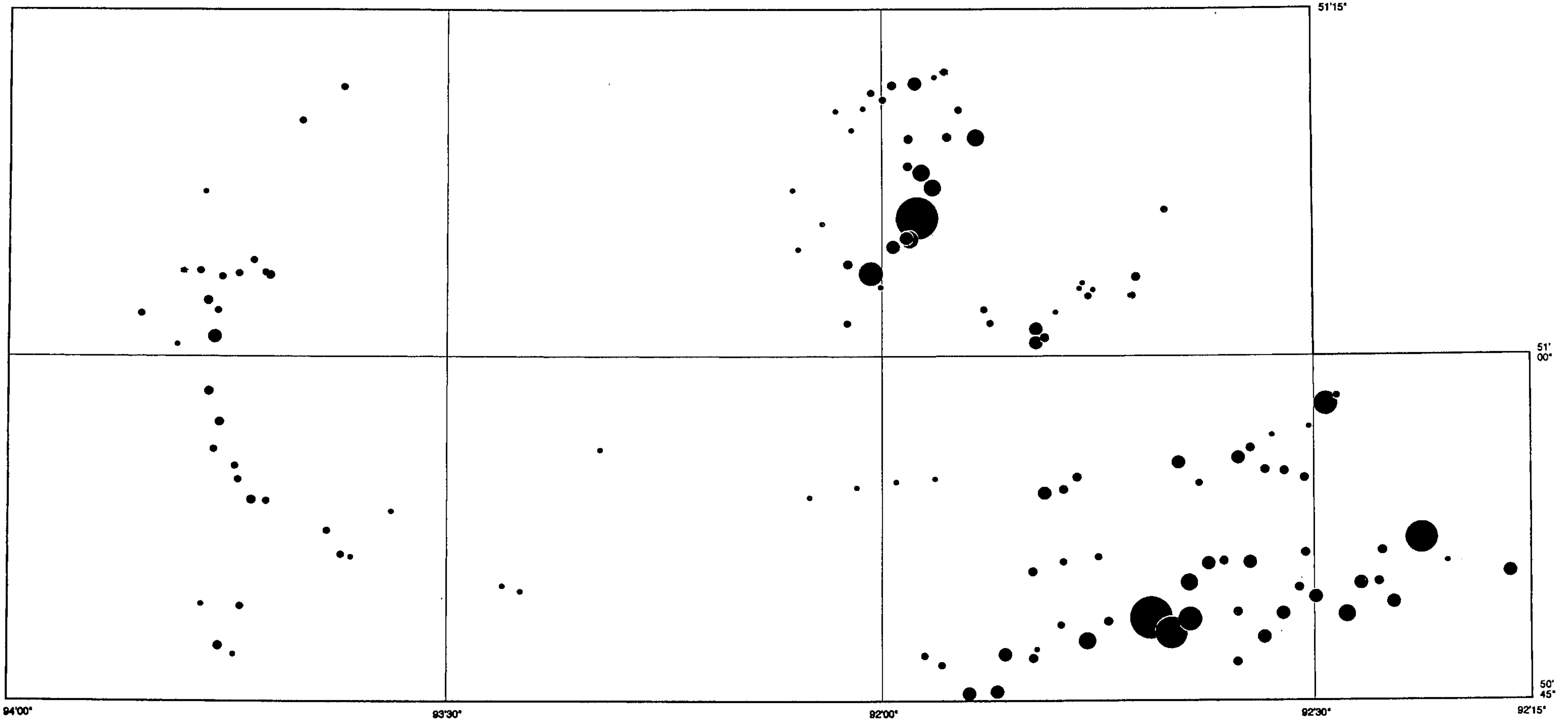

Iron (wt. %)

MIN.	MAX.	#SAMP	%TILE
11	19	32	23.4
19	22.2	36	49.6
22.2	23.8	34	74.5
23.8	26.1	21	89.8
26.1	28.1	7	94.9
28.1	28.9	3	97.1
28.9	29.6	2	98.5
29.6	44.4	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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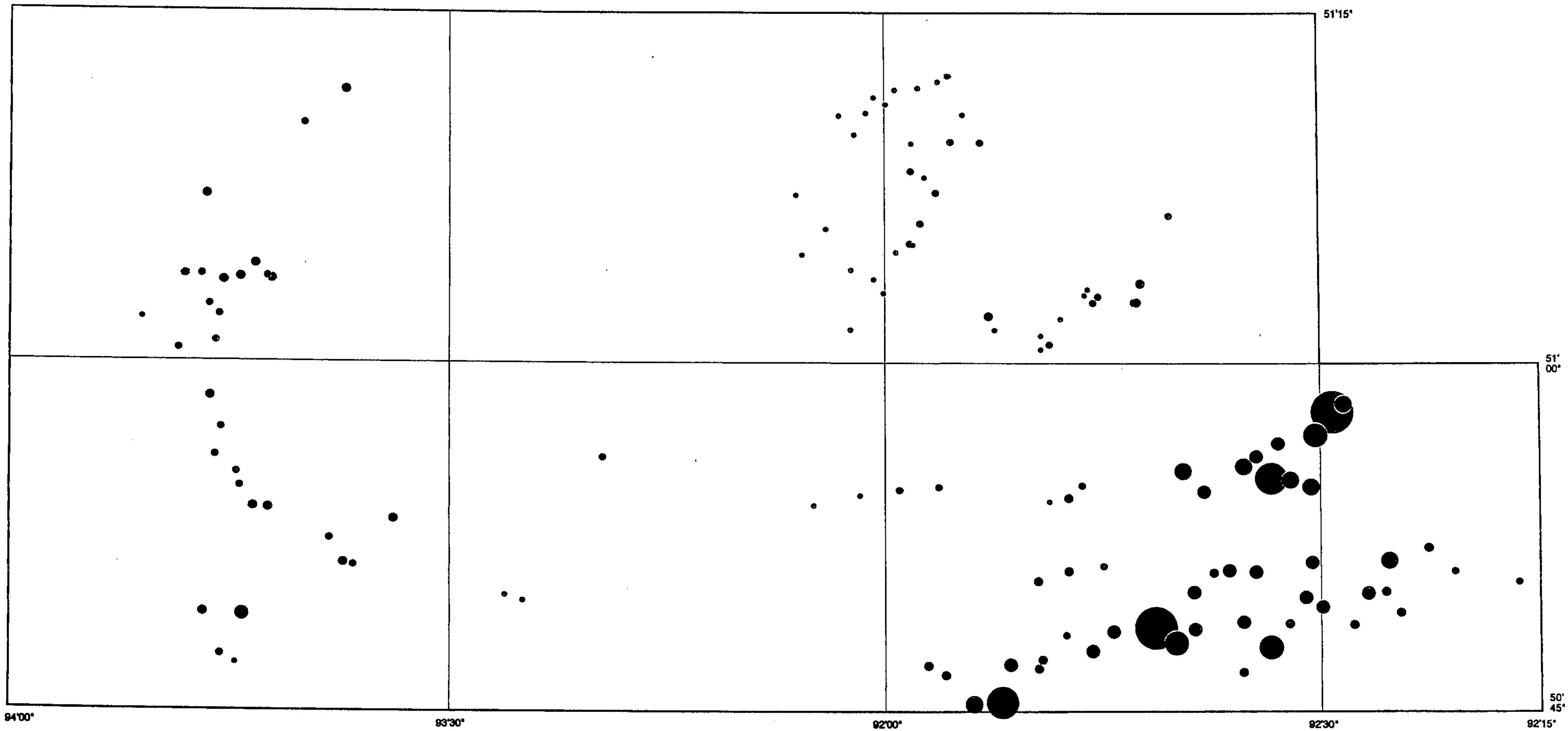

Lanthanum (ppm)

MIN.	MAX.	#SAMP	%TILE
139	316	35	25.5
316	517	34	50.4
517	801	34	75.2
801	1160	20	89.8
1160	1330	7	94.9
1330	1440	3	97.1
1440	1490	2	98.5
1490	2310	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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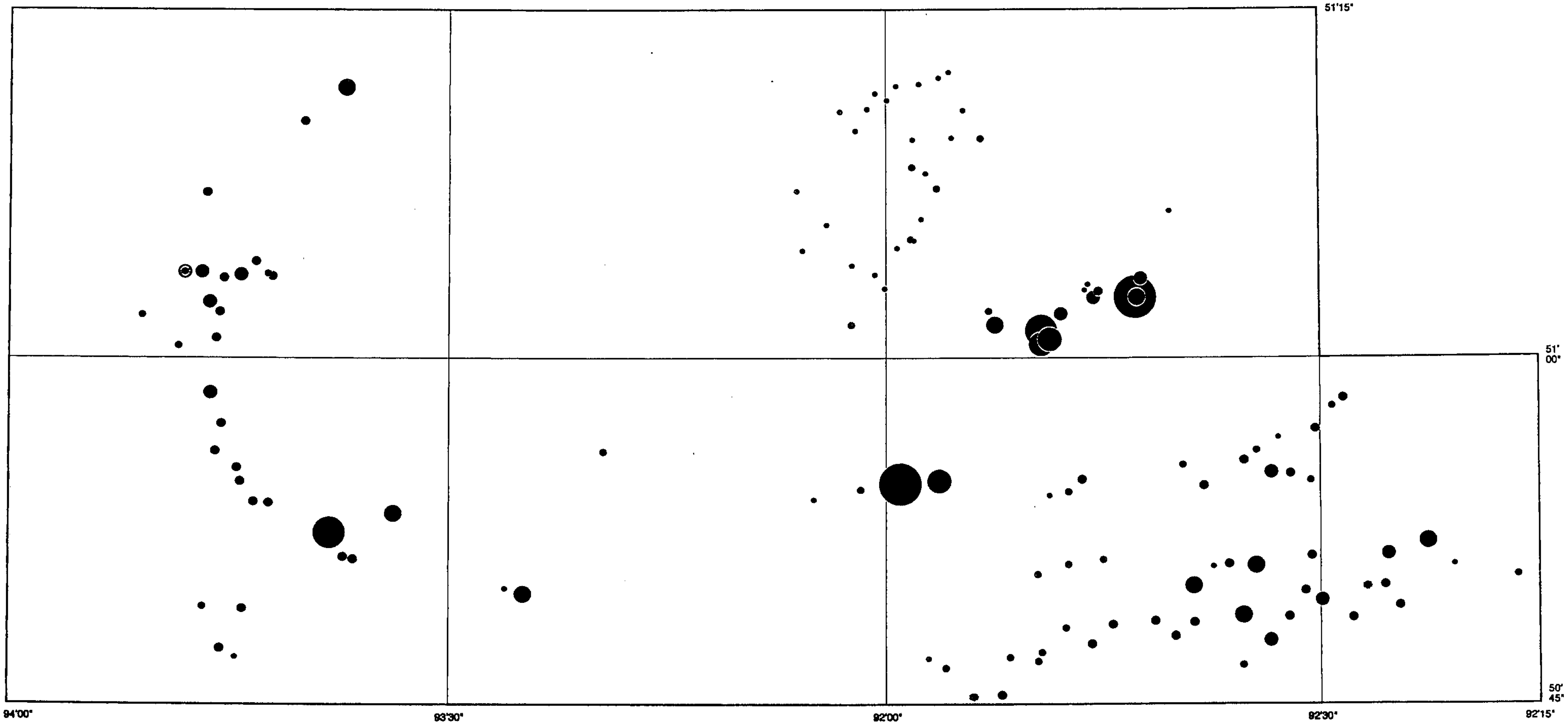

Lutetium (ppm)

	MIN.	MAX.	#SAMP	%TILE
•	5.5	9.4	35	25.5
•	9.4	12	30	47.4
•	12	14	44	79.6
●	14	15	12	88.3
●	15	21.1	9	94.9
●	21.1	28.8	3	97.1
●	28.8	33.4	2	98.5
●	33.4	36.6	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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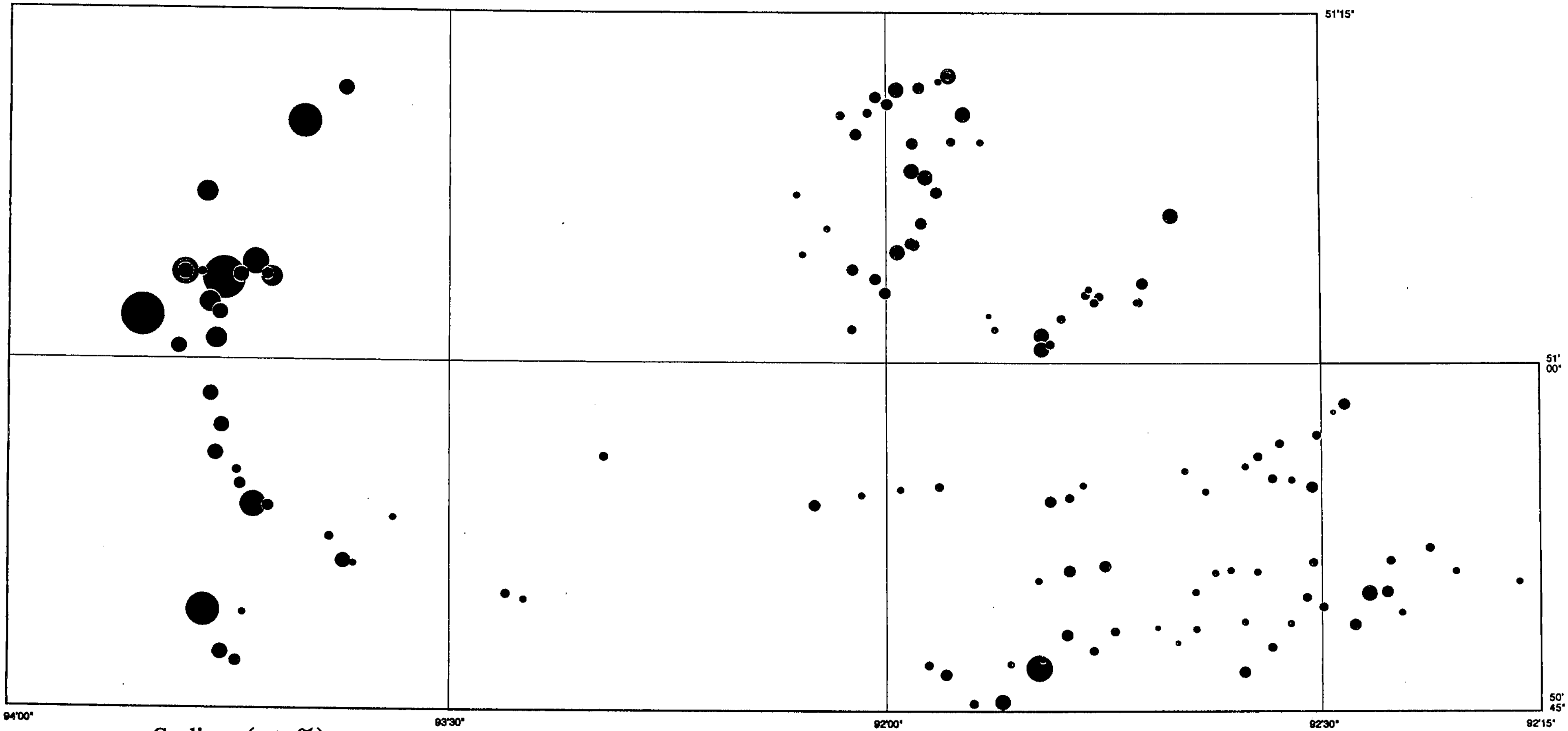

Sodium (wt. %)

MIN.	MAX.	#SAMP	%TILE
0	.05	4	2.9
.05	.24	34	27.7
.24	.3	32	51.1
.3	.39	32	74.5
.39	.47	21	89.8
.47	.57	6	94.2
.57	.59	4	97.1
.59	.62	2	98.5
.62	.65	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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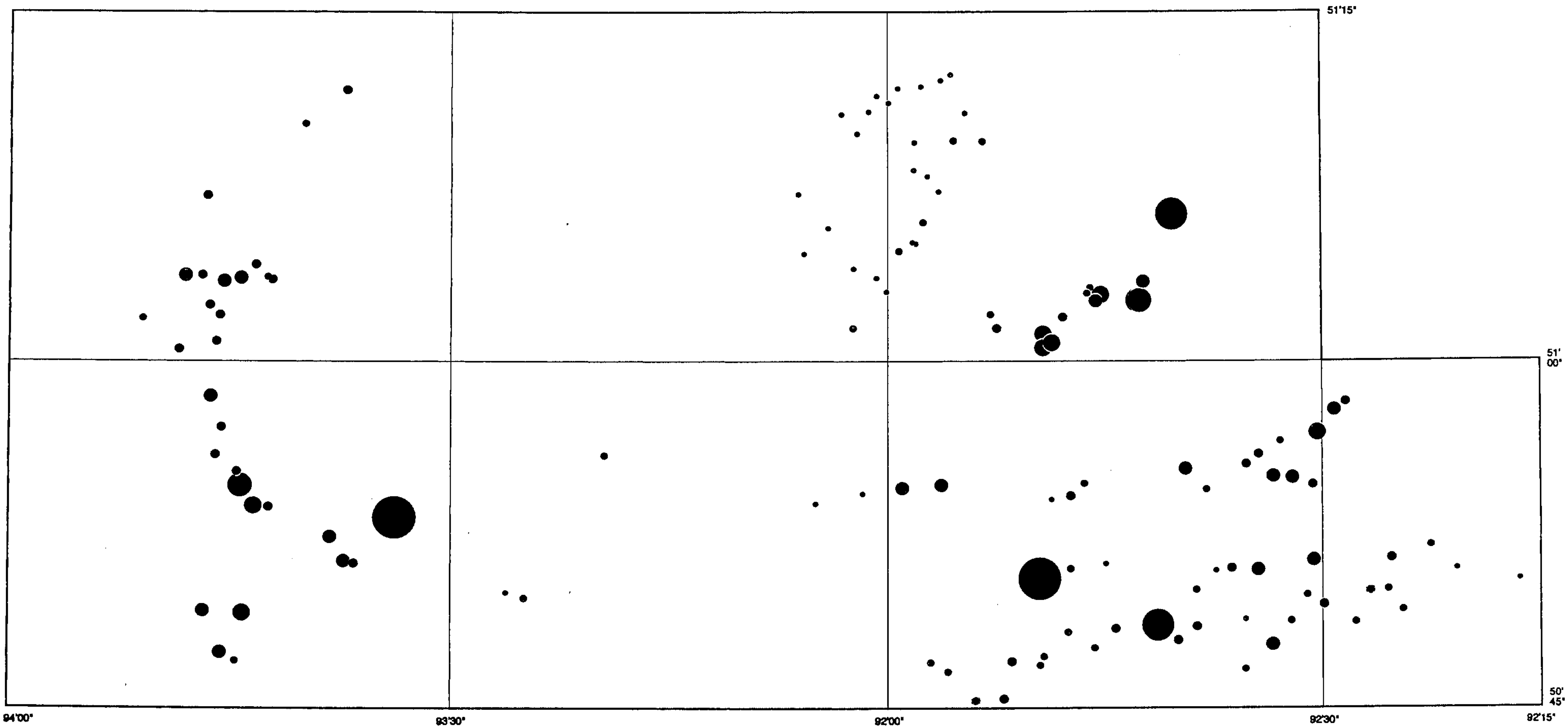
Red Lake Area, Ontario



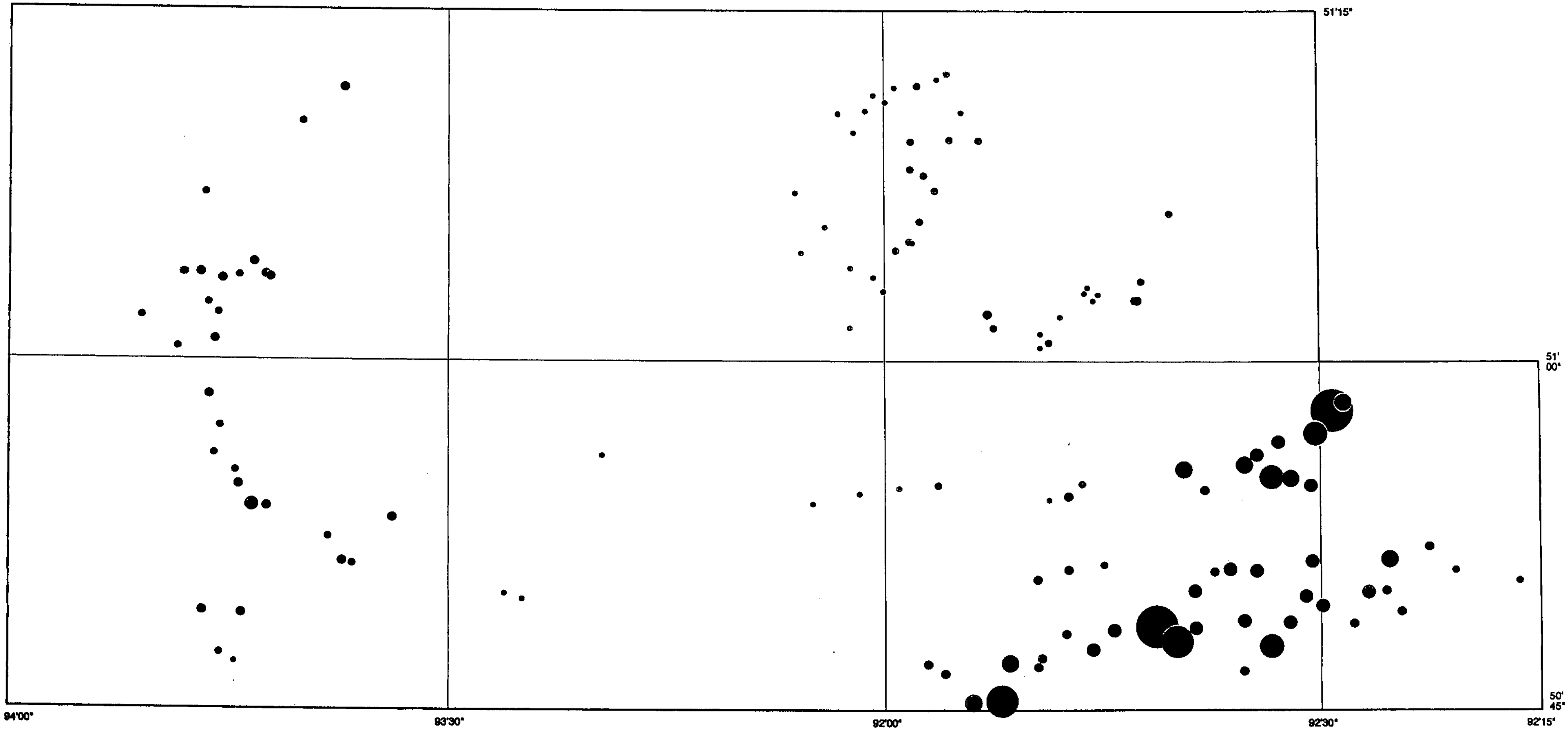
Tantalum (ppm)

MIN.	MAX.	#SAMP	%TILE
8.6	15	33	24.1
15	23	35	49.6
23	31	35	75.2
31	39	20	89.8
39	45	7	94.9
45	50.8	3	97.1
50.8	58.1	2	98.5
58.1	68.5	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

INAA Technique

Red Lake Area, Ontario



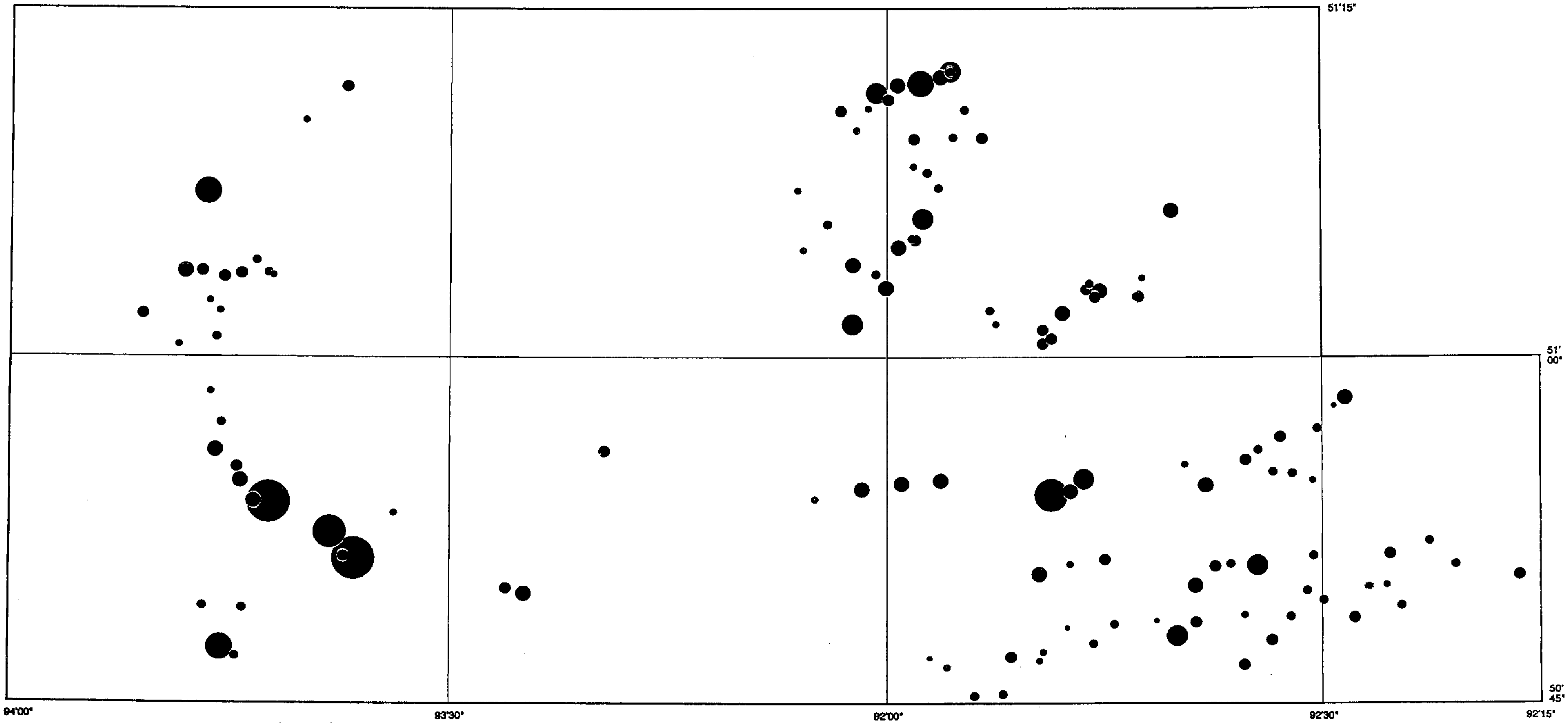
Thorium (ppm)

	MIN.	MAX.	#SAMP	%TILE
	48	137	33	24.1
	137	217	36	50.4
	217	408	34	75.2
	408	613	20	89.8
	613	710	7	94.9
	710	791	3	97.1
	791	811	2	98.5
	811	1370	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

INAA Technique

Red Lake Area, Ontario



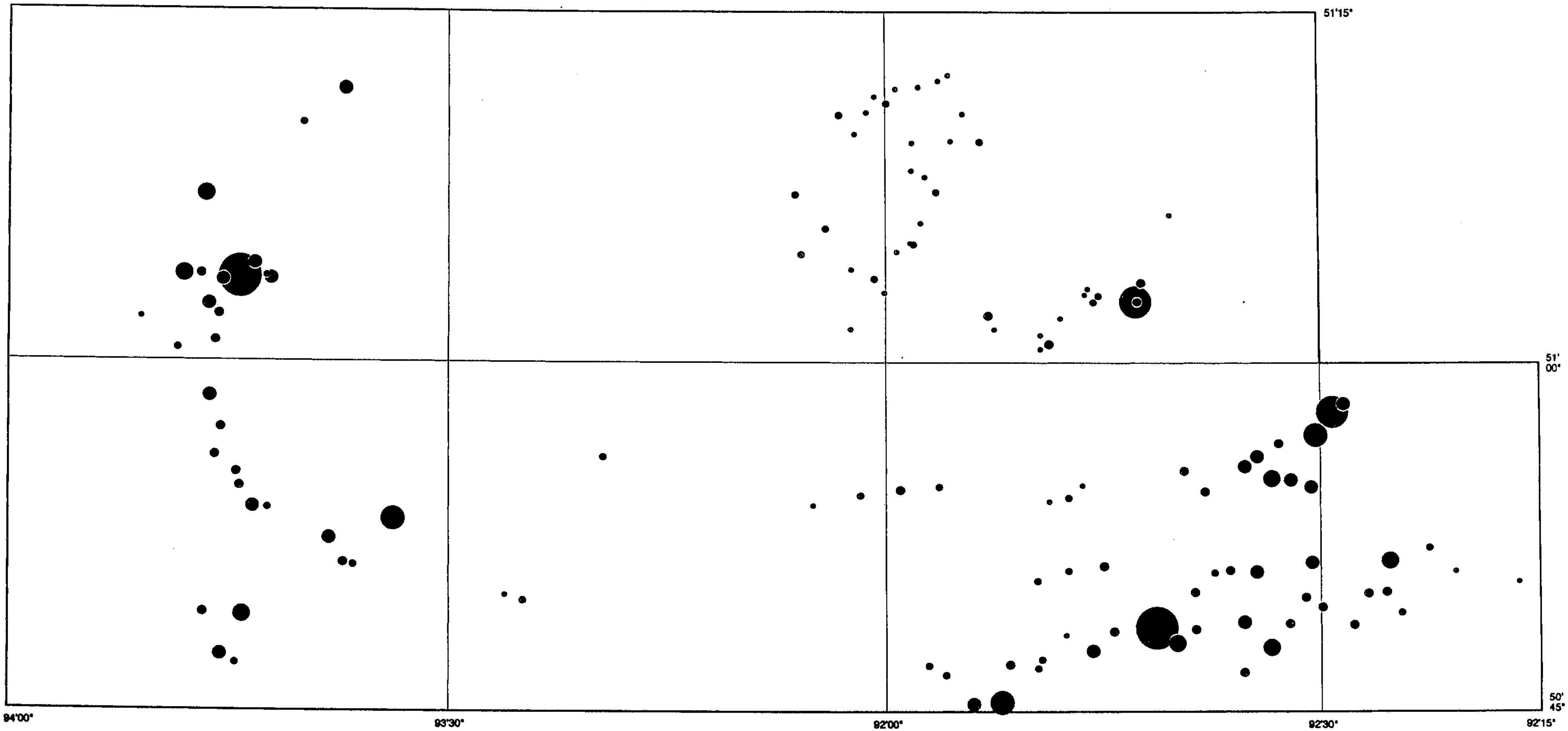
Tungsten (ppm)

MIN.	MAX.	#SAMP	%TILE
0	.5	5	3.6
.5	18	28	24.1
18	27	36	50.4
27	44	33	74.5
44	71	21	89.8
71	95	7	94.9
95	116	3	97.1
116	243	2	98.5
243	2720	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

INAA Technique

Red Lake Area, Ontario



Samarium (ppm)

MIN.	MAX.	#SAMP	%TILE
34	63.9	35	25.5
63.9	97.5	31	48.2
97.5	124	36	74.5
124	140	21	89.8
140	156	7	94.9
156	162	3	97.1
162	178	2	98.5
178	208	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

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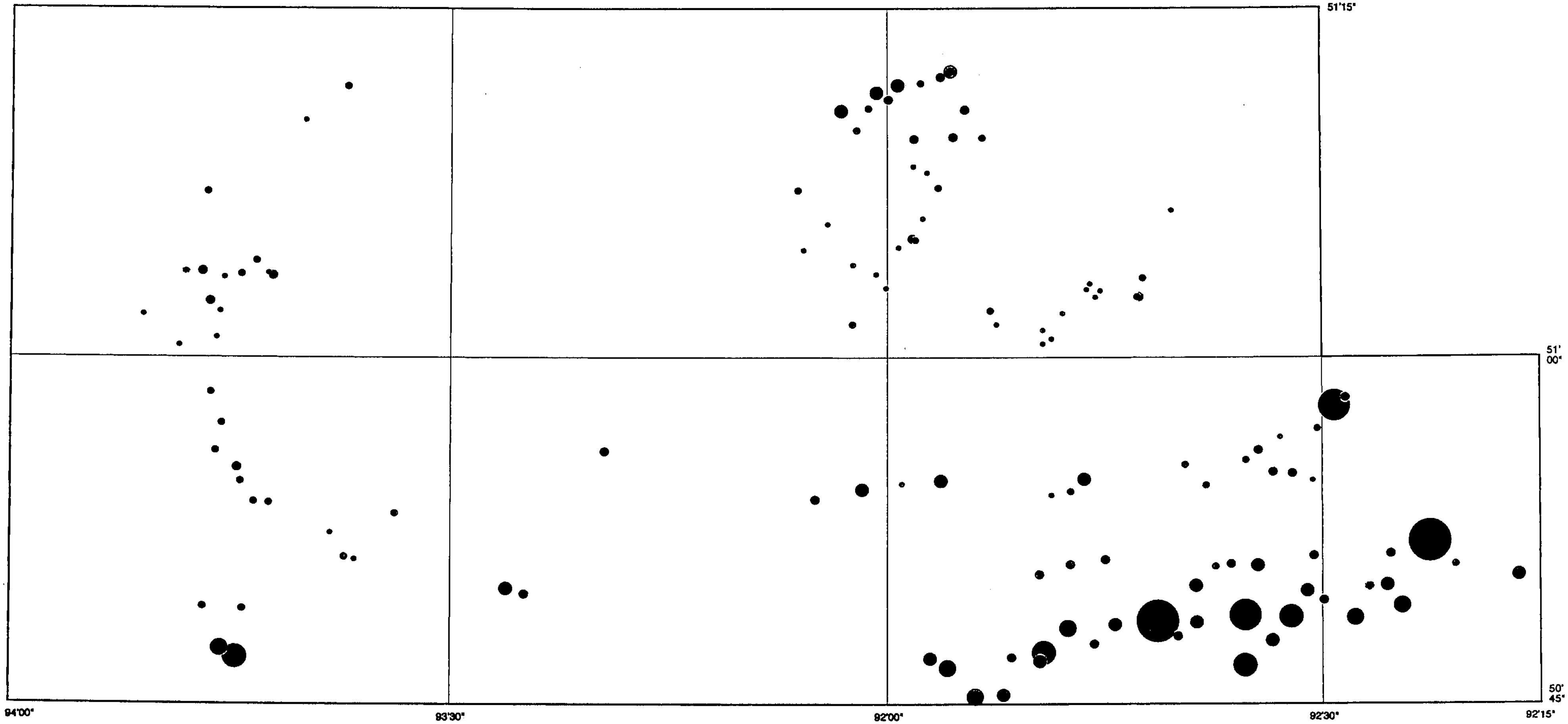
Red Lake Area, Ontario



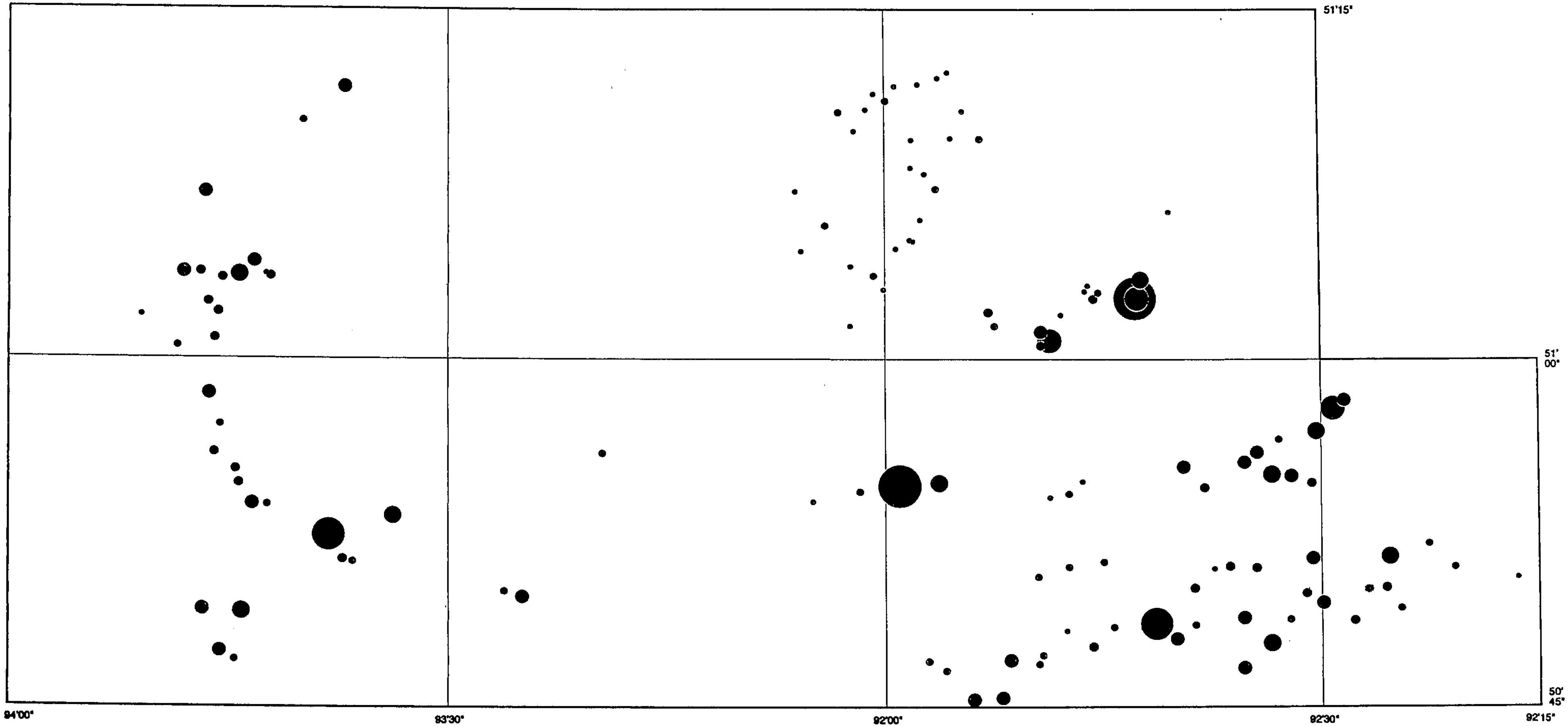
Scandium (ppm)

MIN.	MAX.	#SAMP	%TILE
39	62	35	25.5
62	68.3	34	50.4
68.3	75.2	34	75.2
75.2	84.5	20	89.8
84.5	89.9	6	94.2
89.9	100	4	97.1
100	105	2	98.5
105	135	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

INAA Technique

Red Lake Area, Ontario



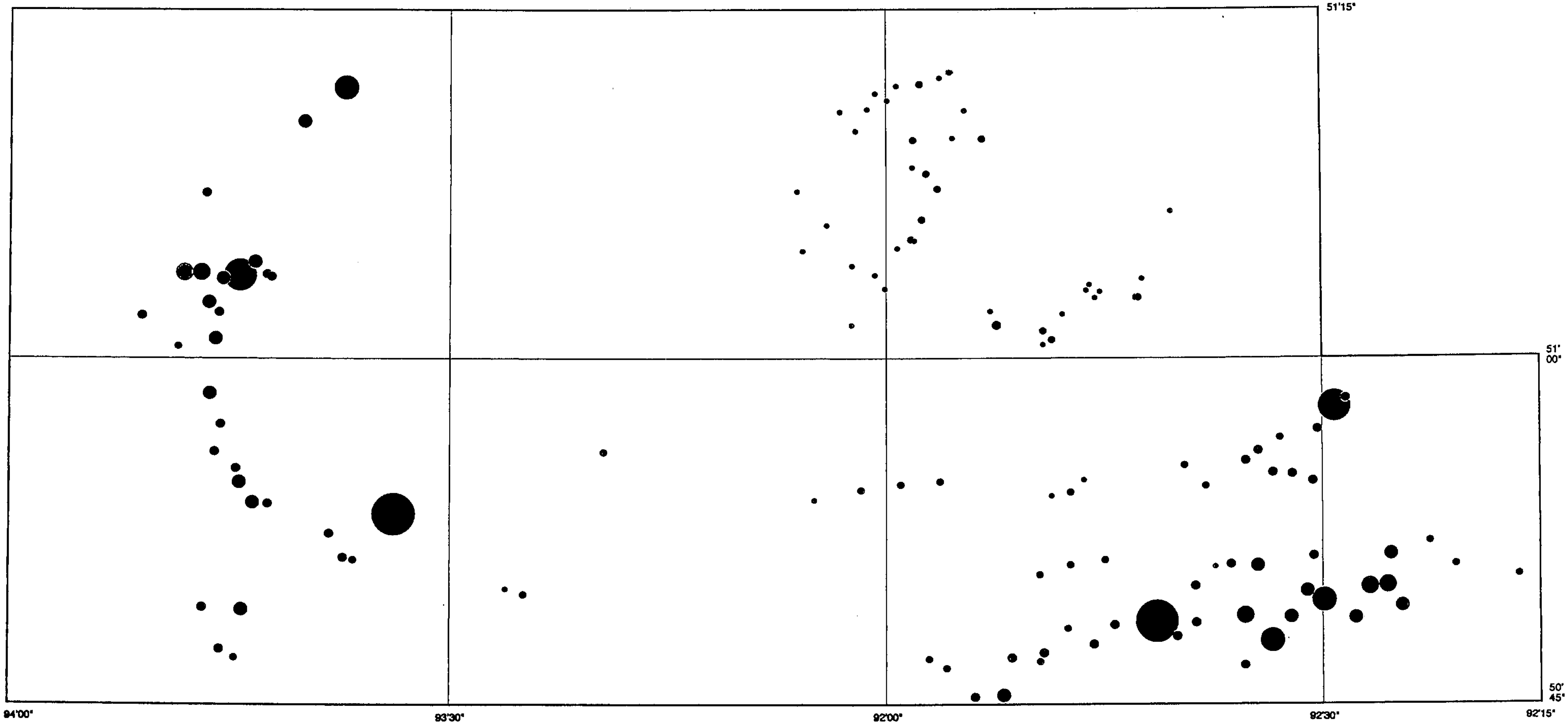
Terbium (ppm)

MIN.	MAX.	#SAMP	%TILE
4	7.5	35	25.5
7.5	11	35	51.1
11	13	26	70.1
13	15	25	88.3
15	18	9	94.9
18	22	3	97.1
22	25	2	98.5
25	41	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

INAA Technique

Red Lake Area, Ontario



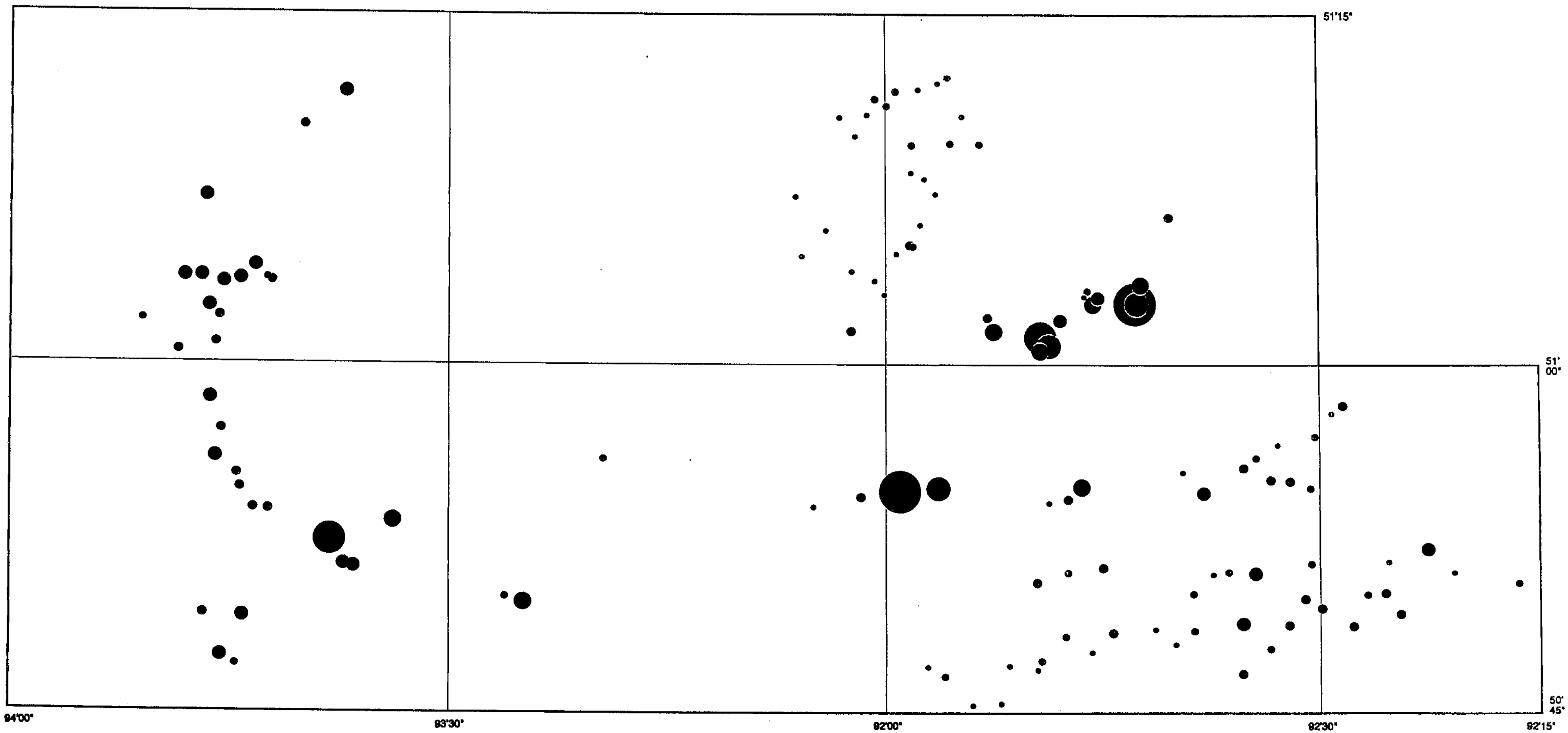
Uranium (ppm)

MIN.	MAX.	#SAMP	%TILE
11	28	35	25.5
28	39.8	34	50.4
39.8	51.9	34	75.2
51.9	58.6	20	89.8
58.6	60.8	7	94.9
60.8	63.1	3	97.1
63.1	66.6	2	98.5
66.6	106	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

INAA Technique

Red Lake Area, Ontario



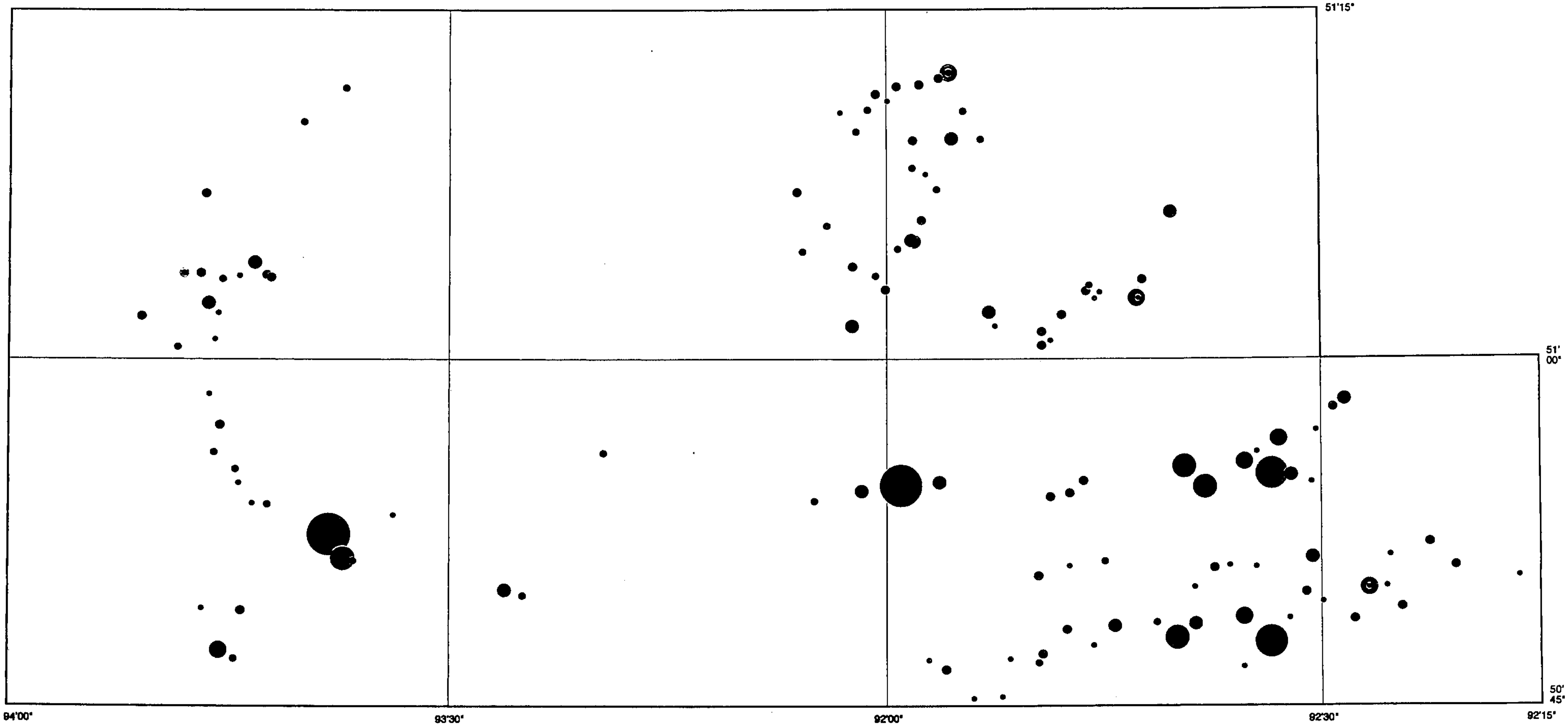
Ytterbium (ppm)

	MIN.	MAX.	#SAMP	%TILE
	17	36	36	26.3
	36	42	33	50.4
	42	52	33	74.5
	52	77	21	89.8
	77	112	7	94.9
	112	157	3	97.1
	157	188	2	98.5
	188	233	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

INAA Technique

Red Lake Area, Ontario



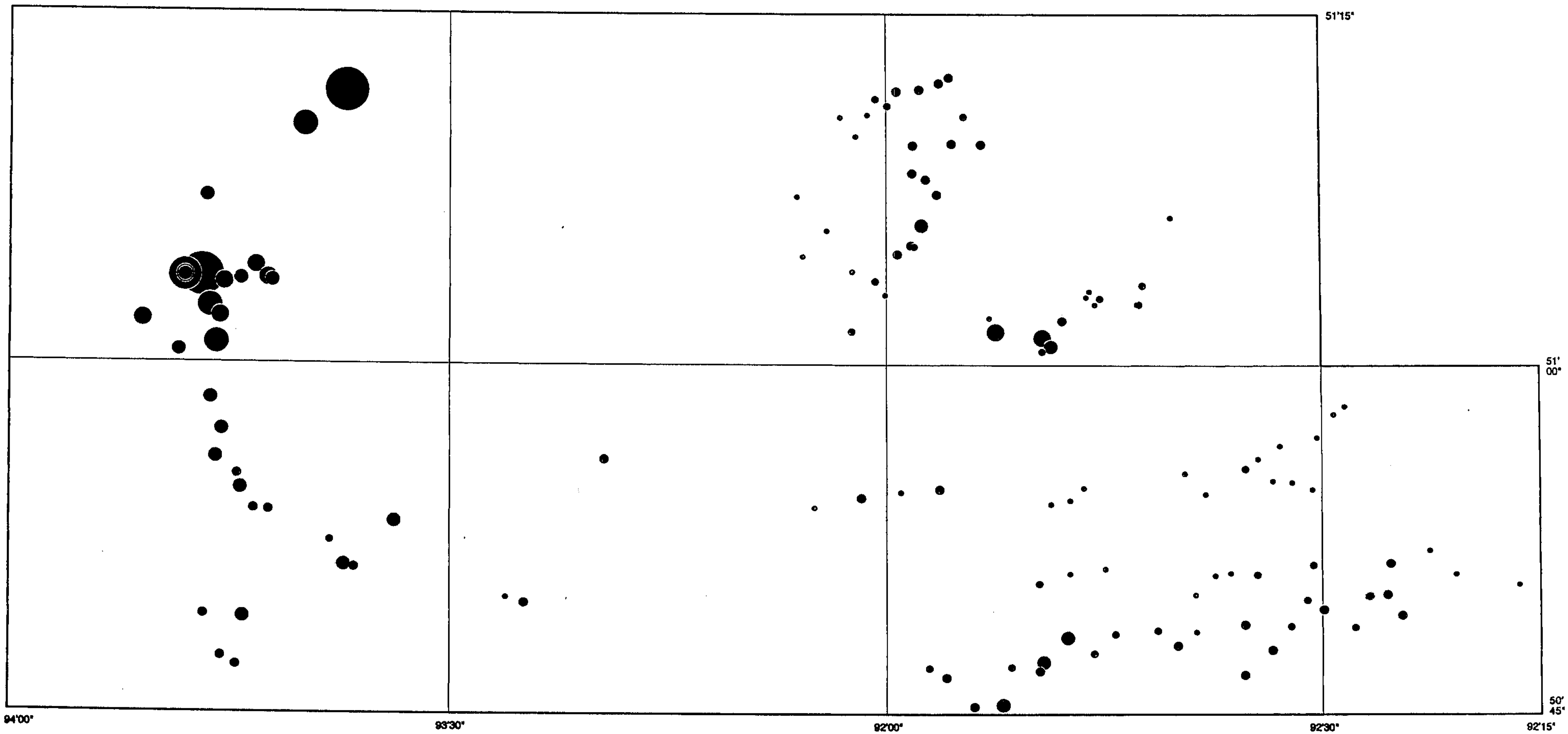
Zinc (ppm)

MIN.	MAX.	#SAMP	%TILE
0	.5	40	29.2
.5	280	29	50.4
280	370	36	76.6
370	460	17	89.1
460	530	7	94.2
530	630	4	97.1
630	950	2	98.5
950	1700	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

INAA Technique

Red Lake Area, Ontario



Zirconium (ppm)

MIN.	MAX.	#SAMP	%TILE
5500	12000	39	28.5
12000	15000	25	46.7
15000	19000	41	76.6
19000	26900	17	89.1
26900	29700	8	94.9
29700	31900	3	97.1
31900	32900	2	98.5
32900	34100	2	100

Geochemistry Of The Heavy Mineral Concentrate From Till

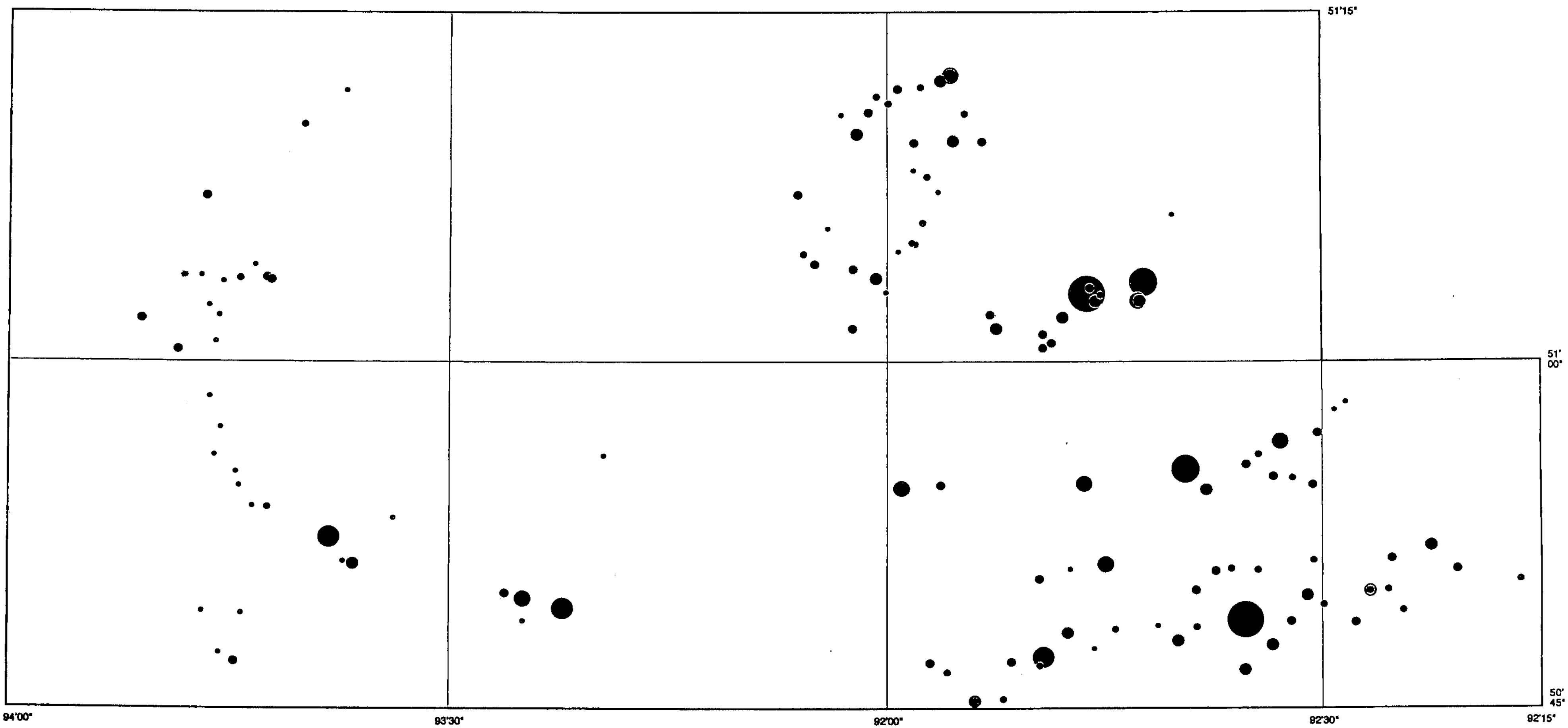
INAA Technique

Red Lake Area, Ontario

APPENDIX 8. Maps of surface sample data

b) <0.063 mm fraction (ICP-AES)

Al, Sb, As, Cu, Cd, Ca, Cr, Co, Cu, Au, Fe, La, Pb, Mg, Mn, Ni, Mo, Pb, K, Ag, Na, Sr, V, Y, Zn

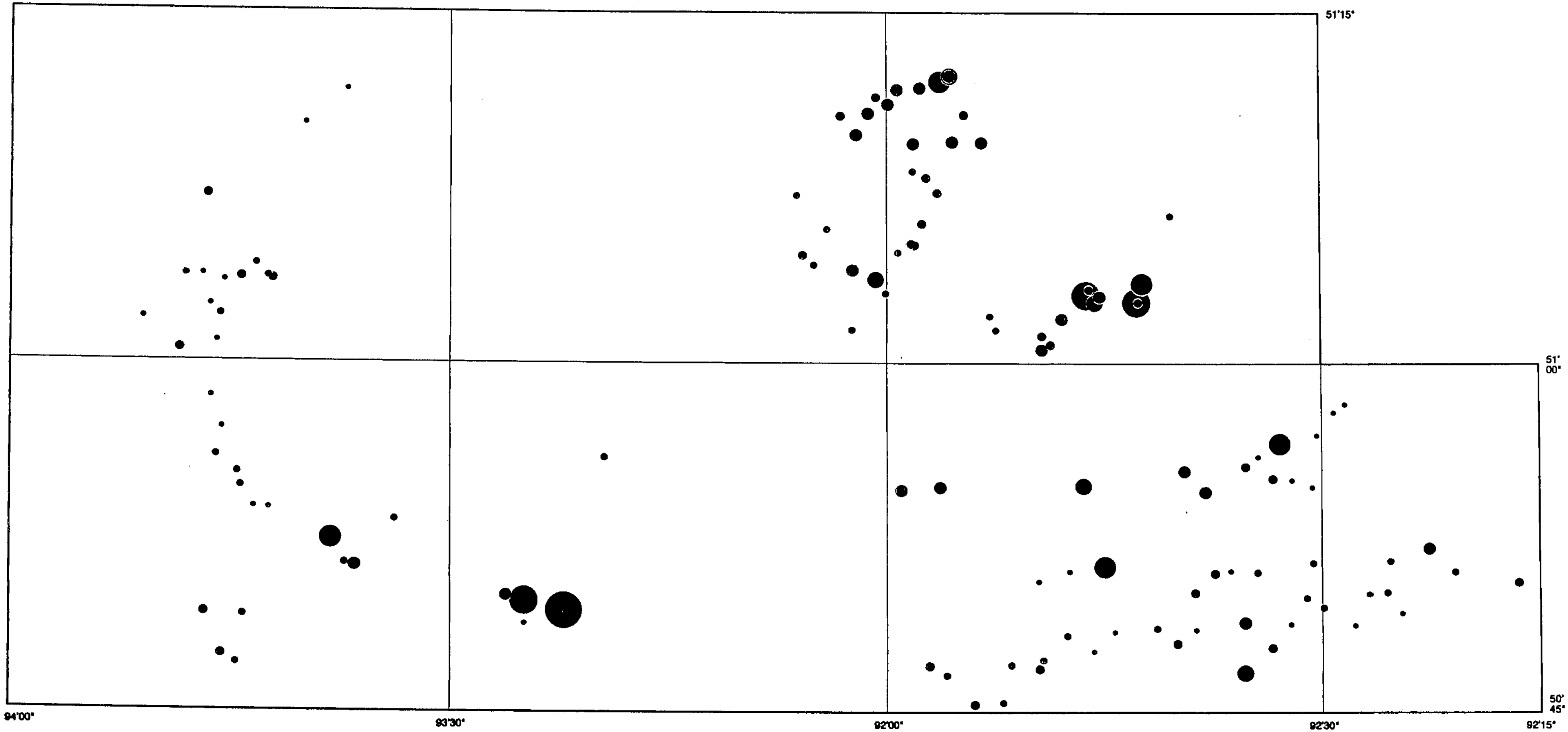


Aluminum (ppm)

MIN.	MAX.	#SAMP	%TILE
.1	.6	35	25.7
.6	.8	31	48.5
.8	1.03	35	74.3
1.03	1.47	21	89.7
1.47	1.62	7	94.9
1.62	1.71	3	97.1
1.71	1.82	2	98.5
1.82	2.16	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

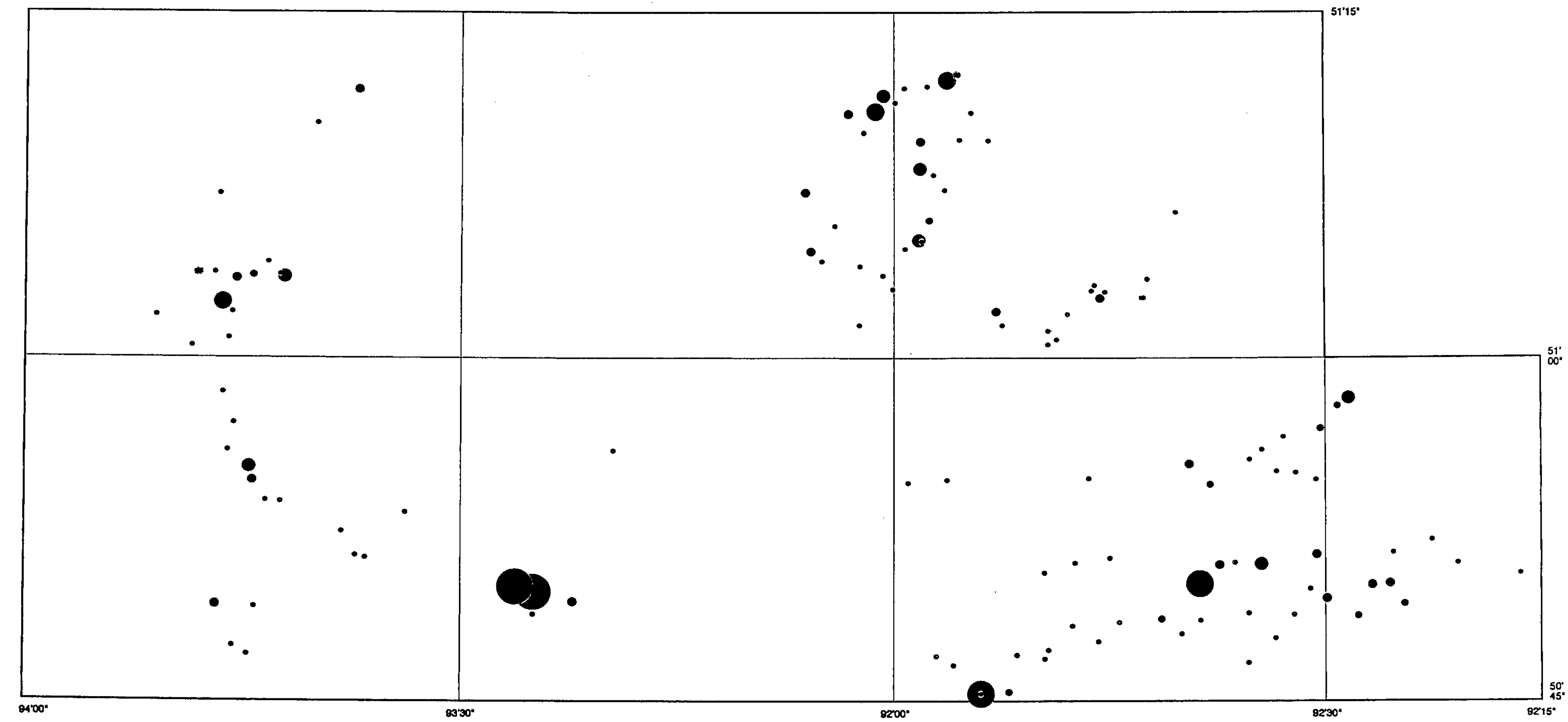


Antimony (ppm)

MIN.	MAX.	#SAMP	%TILE
0	2.5	33	24.3
2.5	6	38	52.2
6	8	29	73.5
8	11	22	89.7
11	13	5	93.4
13	15	5	97.1
15	17	3	99.3
17	18	1	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

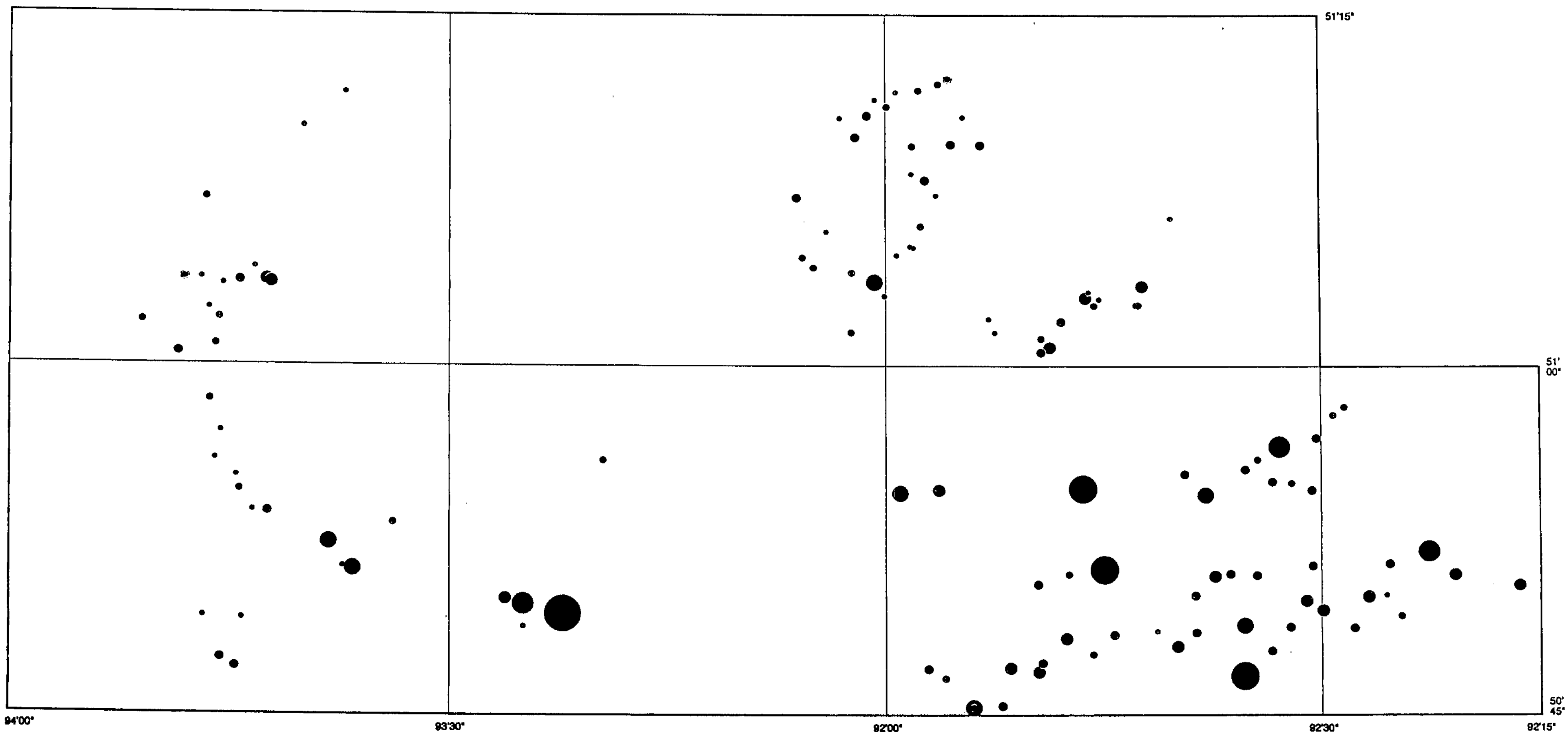


Arsenic (ppm)

MIN.	MAX.	#SAMP	%TILE
0	2.5	93	68.4
2.5	6	11	76.5
6	11	18	89.7
11	14	7	94.9
14	24	3	97.1
24	27	2	98.5
27	106	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

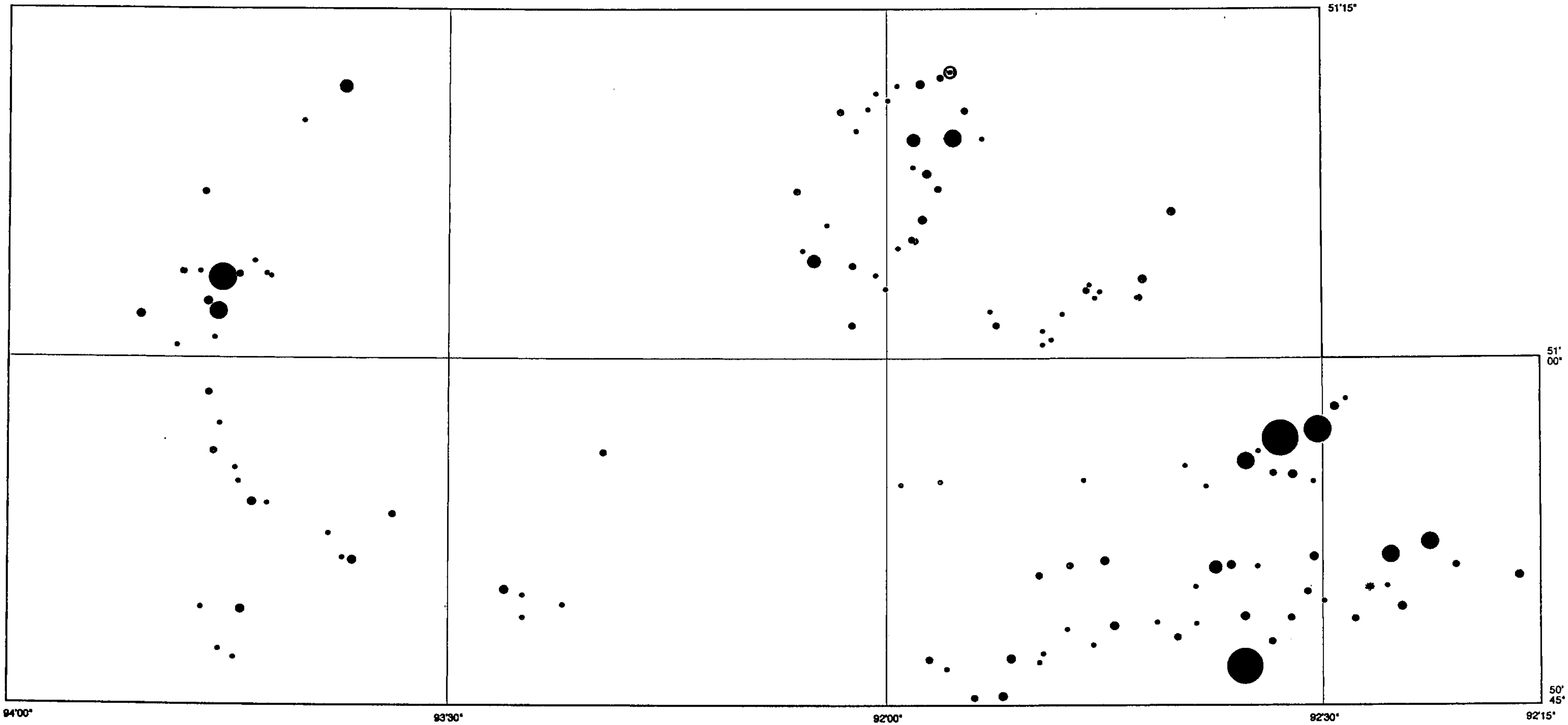


Barium (ppm)

MIN.	MAX.	#SAMP	%TILE
10	23	34	25
23	35	33	49.3
35	52	36	75.7
52	76	19	89.7
76	105	7	94.9
105	123	3	97.1
123	136	3	99.3
136	151	1	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

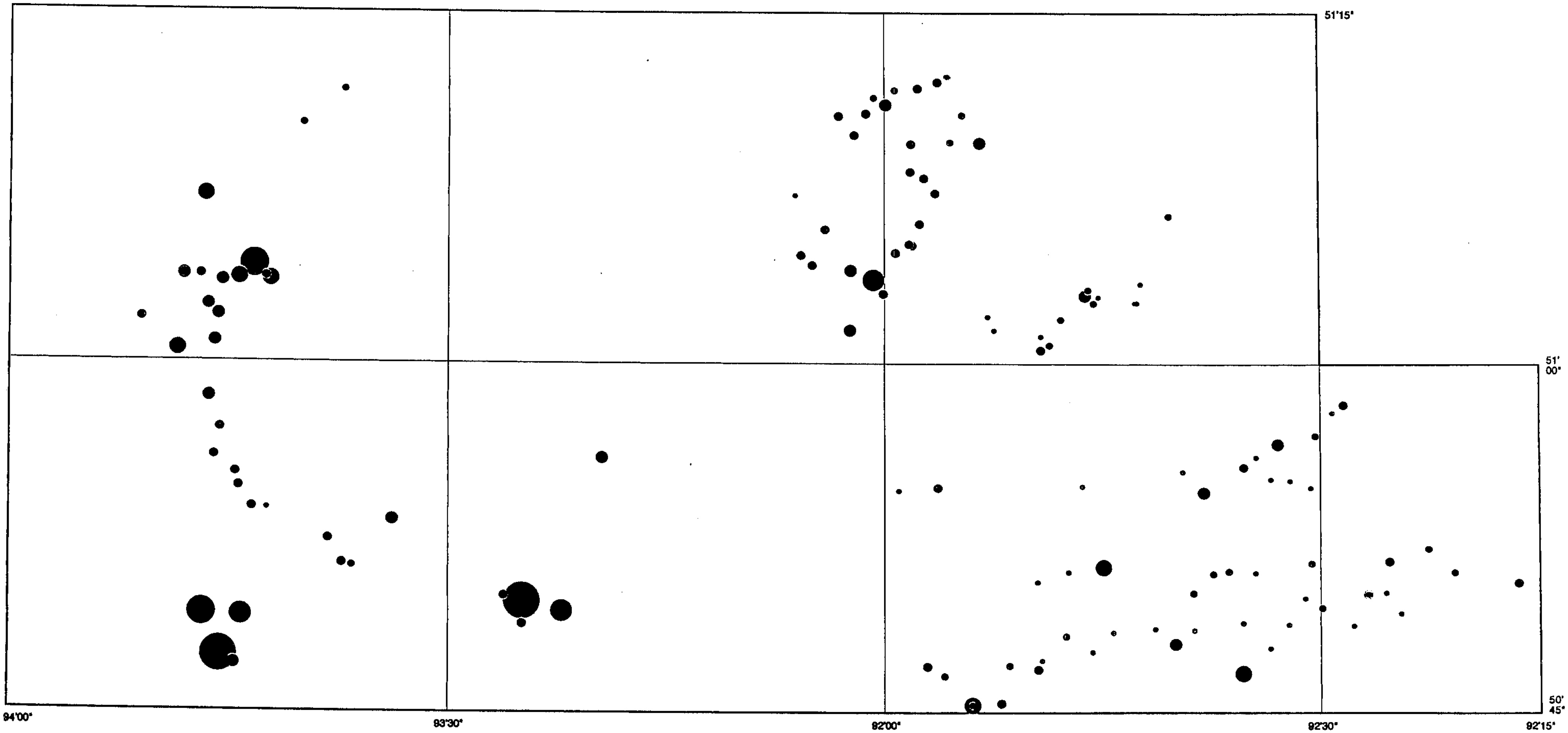


Cadmium (ppm)

MIN.	MAX.	#SAMP	%TILE
0	.1	65	47.8
.1	.4	33	72.1
.4	.8	24	89.7
.8	.9	5	93.4
.9	1.1	5	97.1
1.1	1.2	2	98.5
1.2	2.1	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

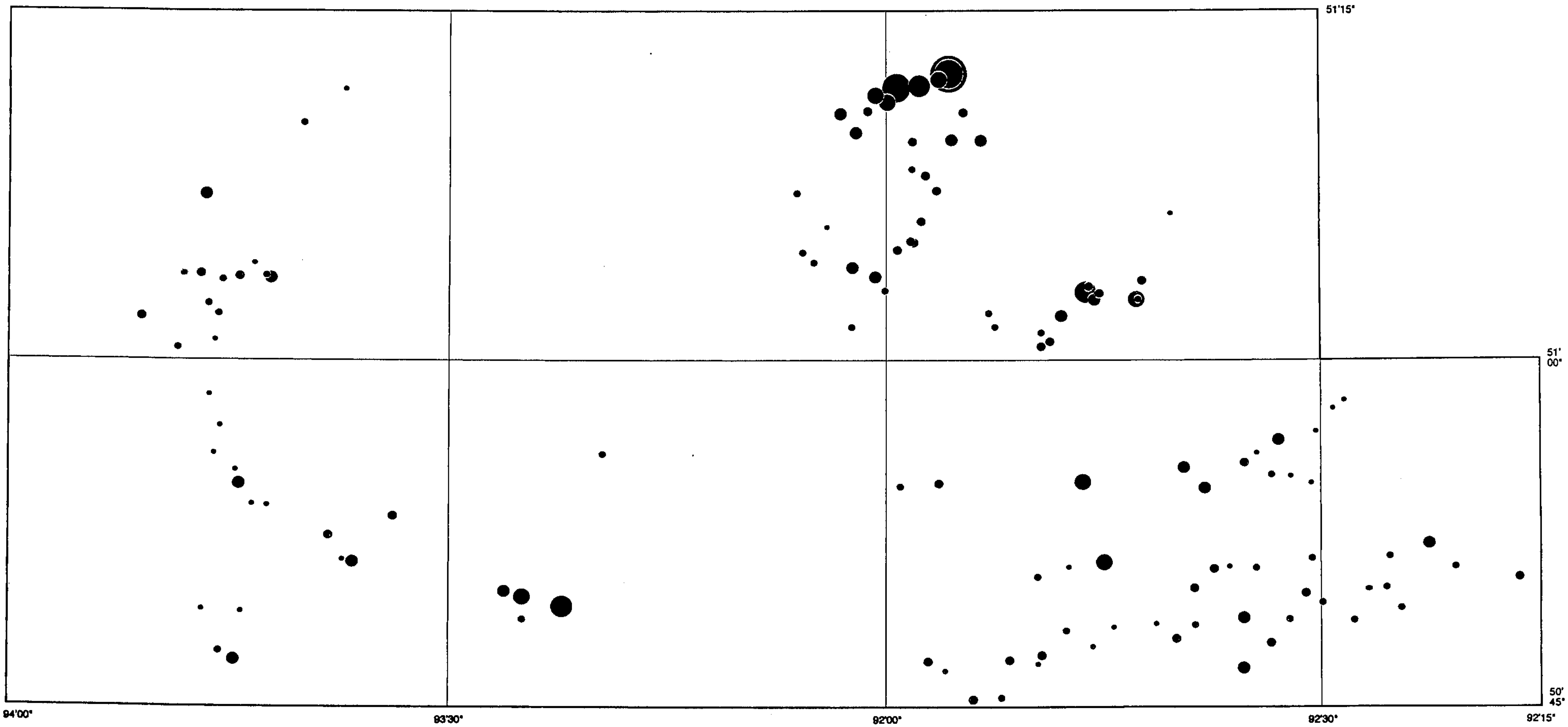


Calcium (wt.%)

MIN.	MAX.	#SAMP	%TILE
.15	.3	35	25.7
.3	.34	28	46.3
.34	.42	40	75.7
.42	.49	19	89.7
.49	.61	7	94.9
.61	.81	3	97.1
.81	.97	2	98.5
.97	1.57	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

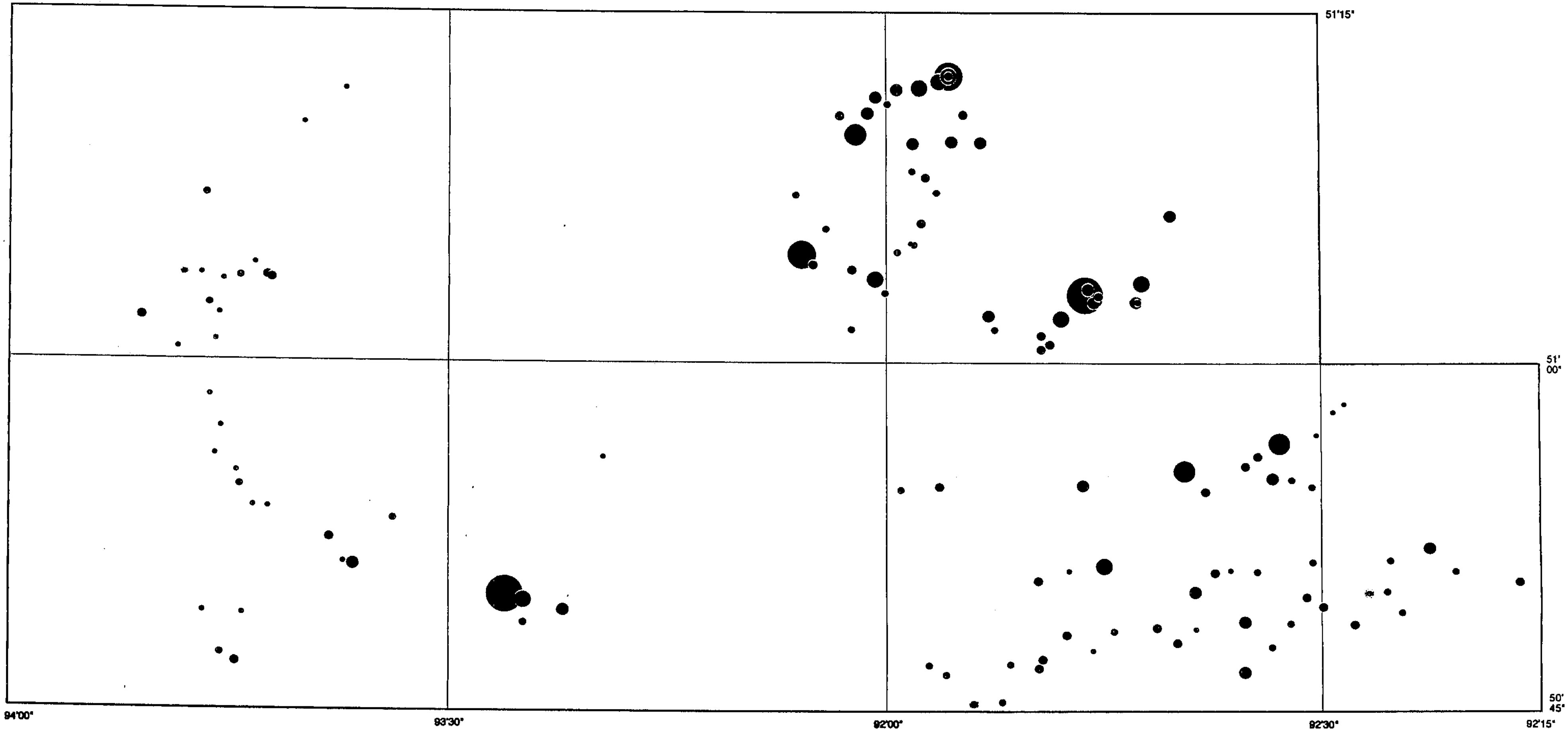


Chromium (ppm)

MIN.	MAX.	#SAMP	%TILE
9	17	31	22.8
17	22	40	52.2
22	32	31	75
32	47	20	89.7
47	70	7	94.9
70	80	3	97.1
80	85	2	98.5
85	107	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

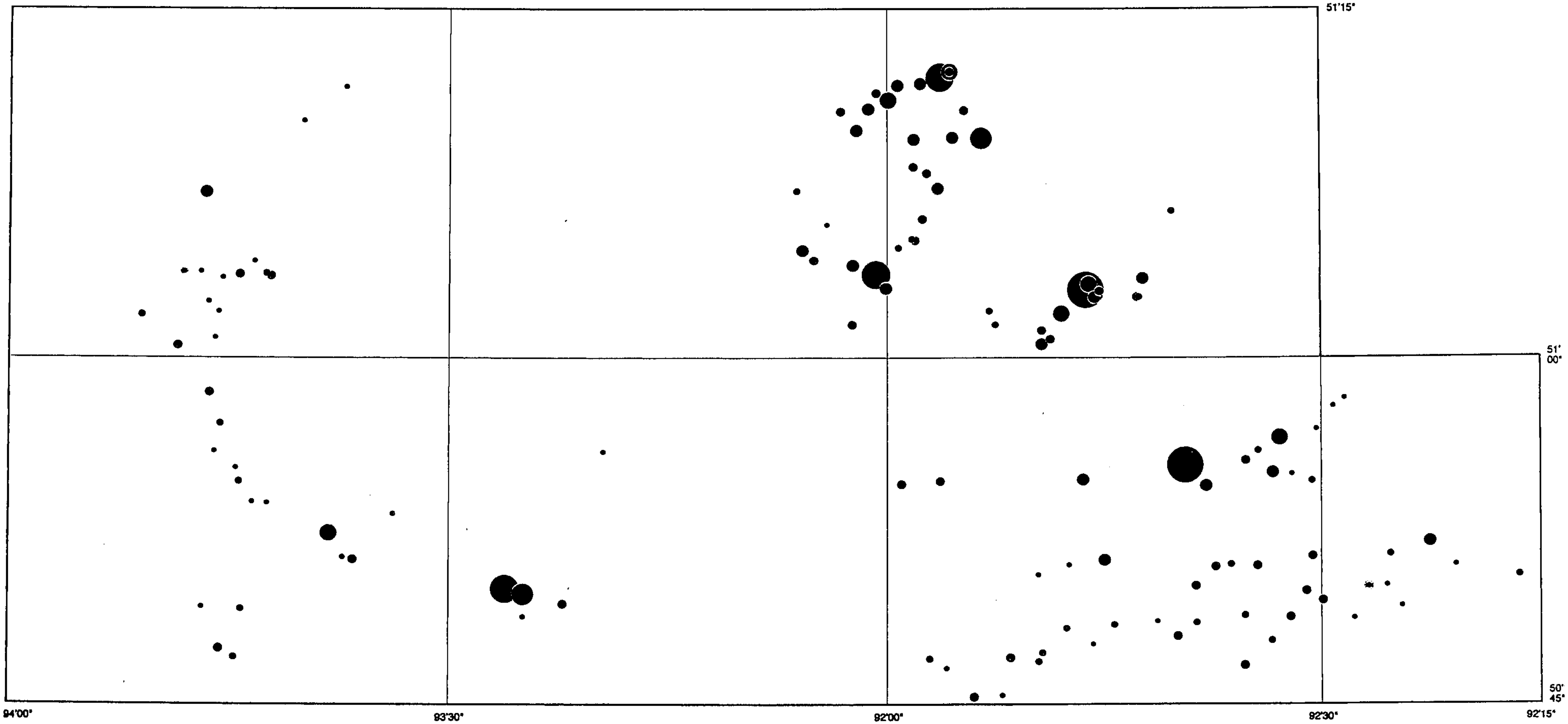


Cobalt (ppm)

MIN.	MAX.	#SAMP	%TILE
0	4	31	22.8
4	6	38	50.7
6	9	33	75
9	12	19	89
12	14	8	94.9
14	16	3	97.1
16	19	2	98.5
19	28	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

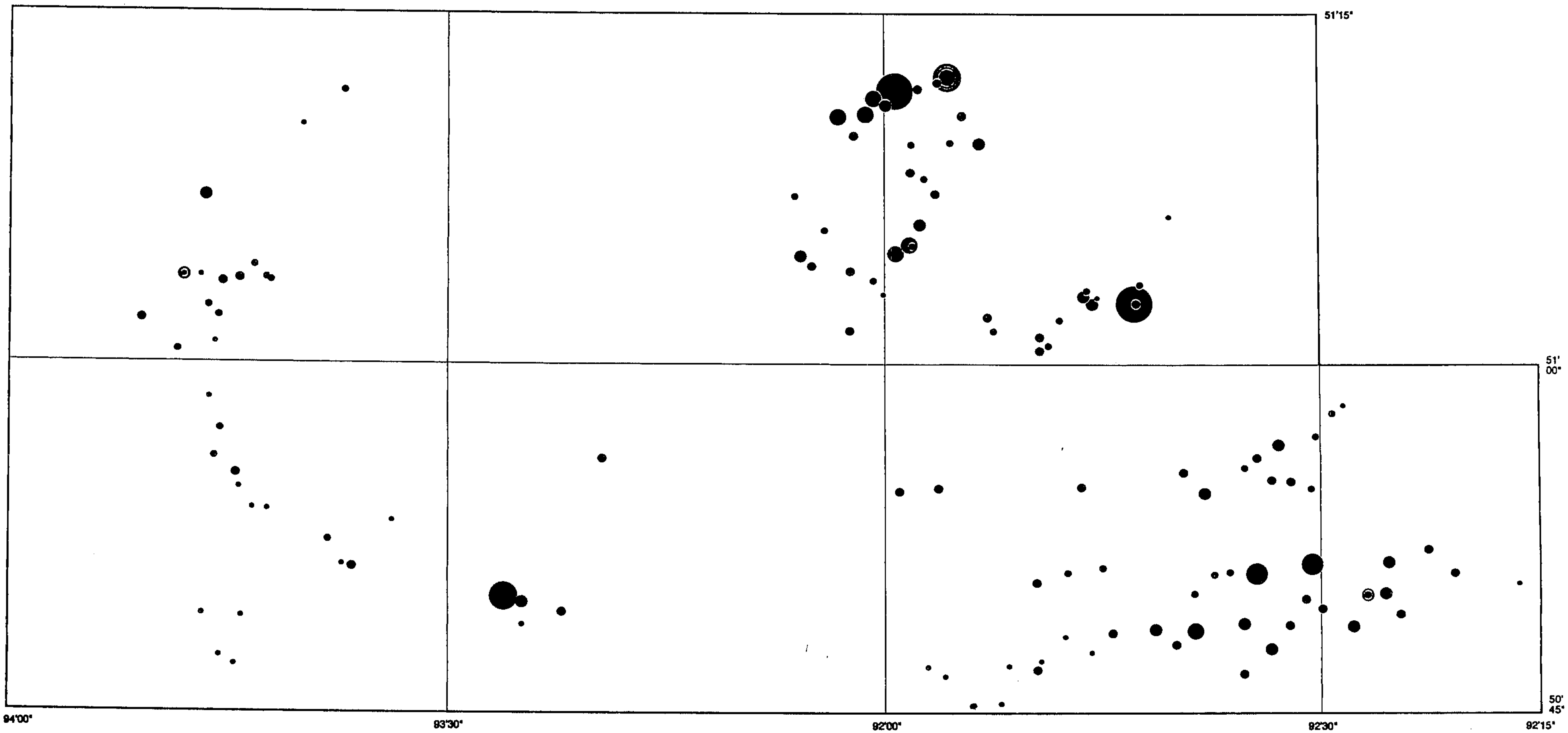


Copper (ppm)

	MIN.	MAX.	#SAMP	%TILE
•	6	15	36	26.5
•	15	23	31	49.3
●	23	37	36	75.7
●	37	53	19	89.7
●	53	60	7	94.9
●	60	66	2	96.3
●	66	83	3	98.5
●	83	114	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

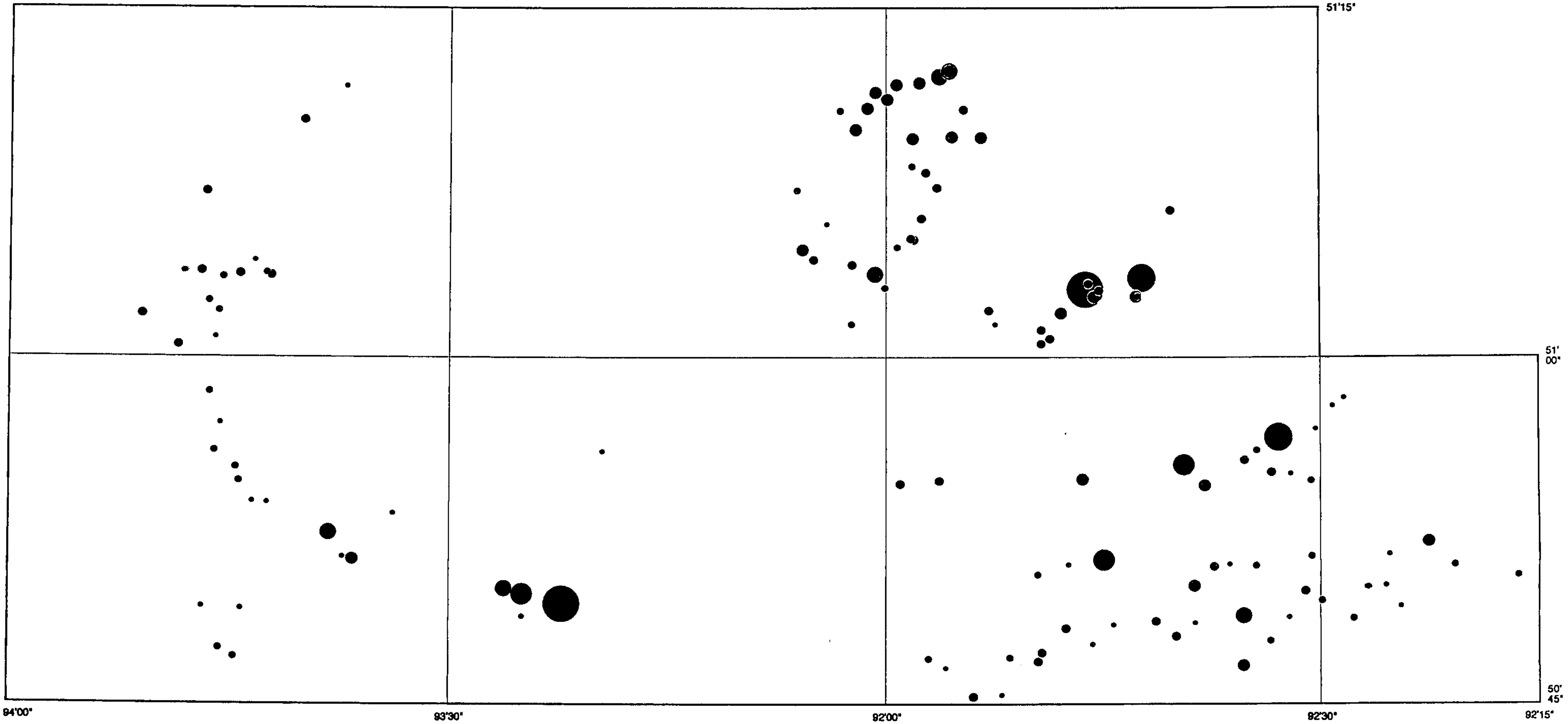


Gold (ppb)

	MIN.	MAX.	#SAMP	%TILE
•	.4	2	29	21.3
•	2	4	34	46.3
●	4	7	41	76.5
●	7	11	18	89.7
●	11	13	7	94.9
●	13	17	3	97.1
●	17	20	2	98.5
●	20	32	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

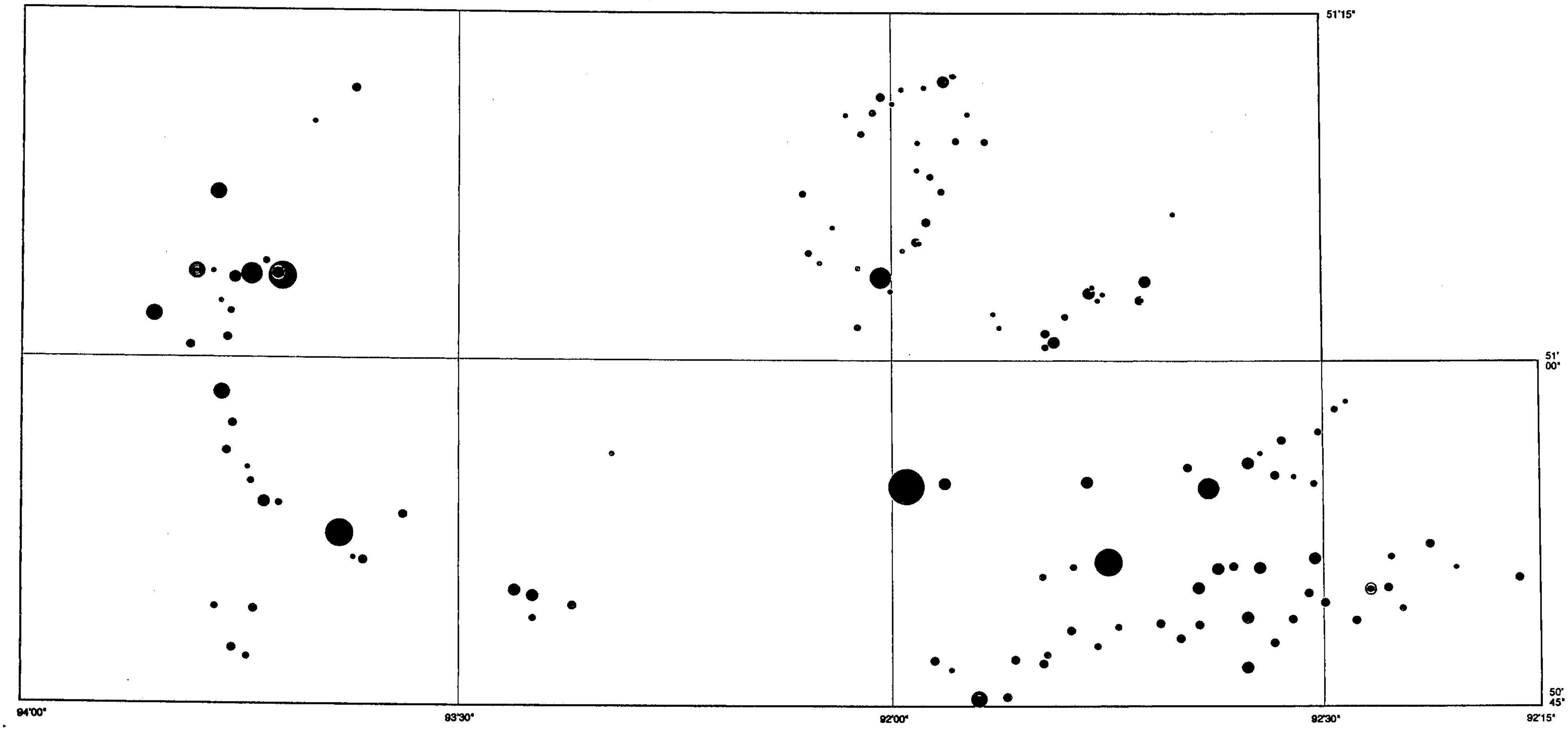


Iron (wt. %)

	MIN.	MAX.	#SAMP	%TILE
•	.82	1.23	35	25.7
•	1.23	1.46	33	50
•	1.46	1.93	34	75
●	1.93	2.3	20	89.7
●	2.3	2.61	7	94.9
●	2.61	2.83	3	97.1
●	2.83	3.1	2	98.5
●	3.1	4.17	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

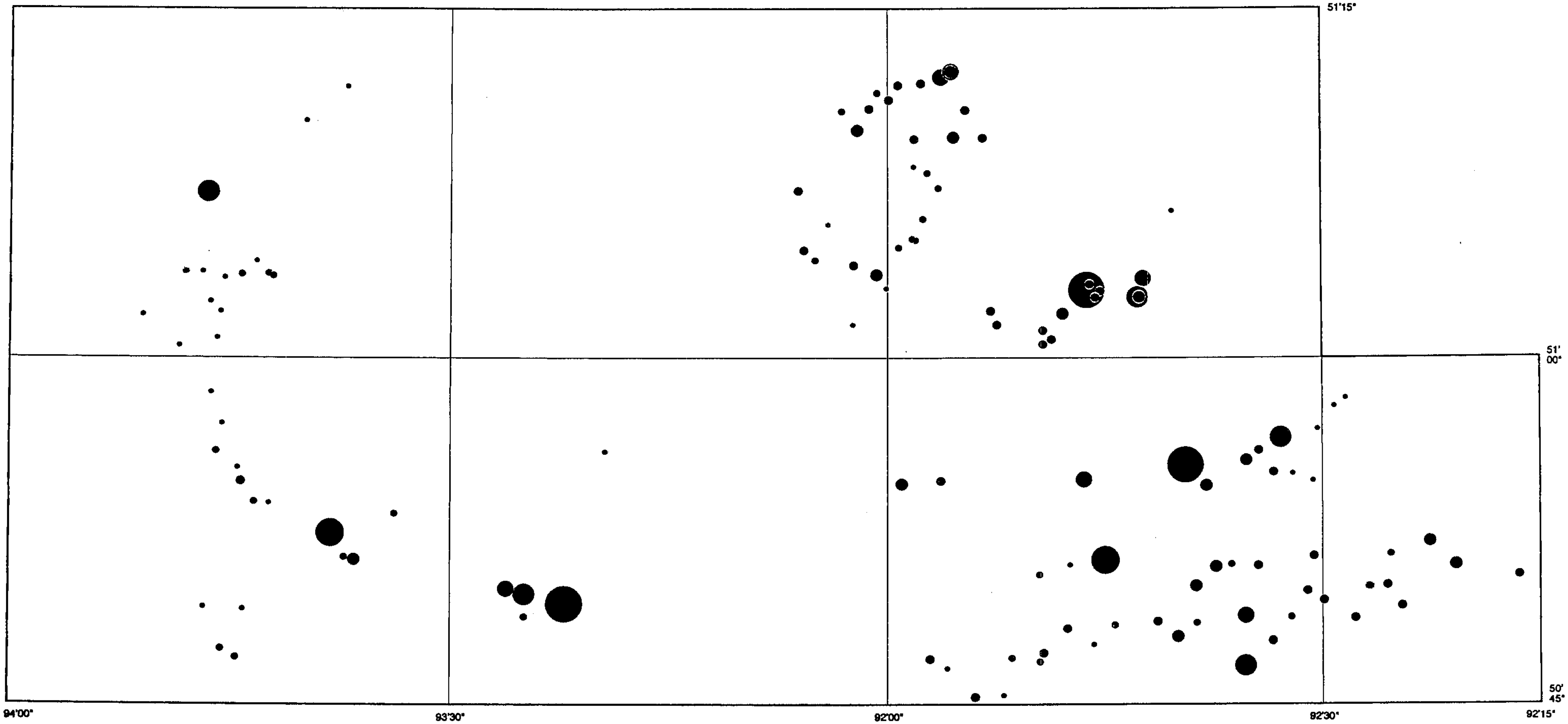


Lanthanum (ppm)

MIN.	MAX.	#SAMP	%TILE
6	15	34	25
15	18	32	48.5
18	24	38	76.5
24	31	19	90.4
31	37	6	94.9
37	44	3	97.1
44	50	3	99.3
50	75	1	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

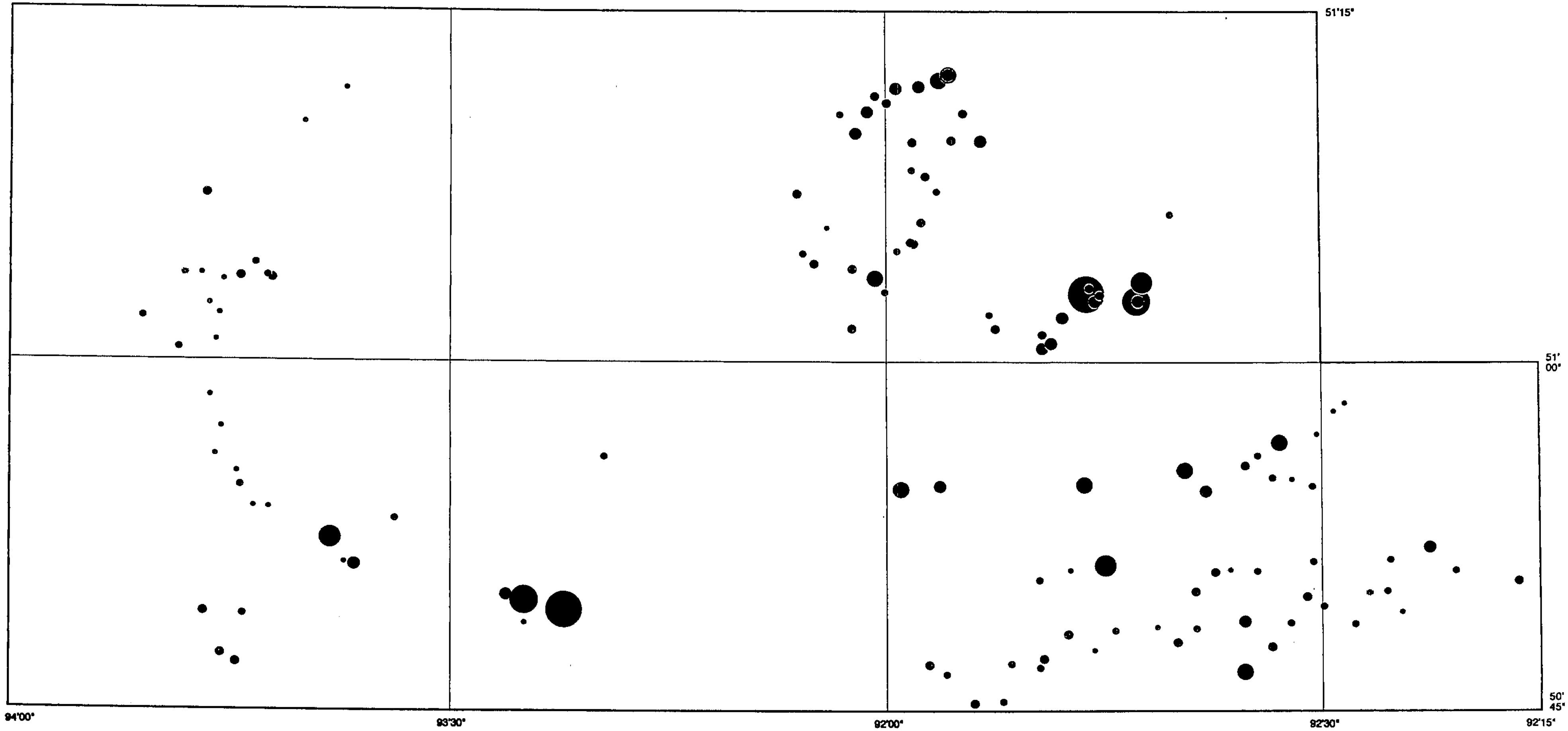


Lead (ppm)

MIN.	MAX.	#SAMP	%TILE
3	9	35	25.7
9	11	31	48.5
11	14	38	76.5
14	18	15	87.5
18	19	7	92.6
19	22	5	96.3
22	23	2	97.8
23	24	3	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

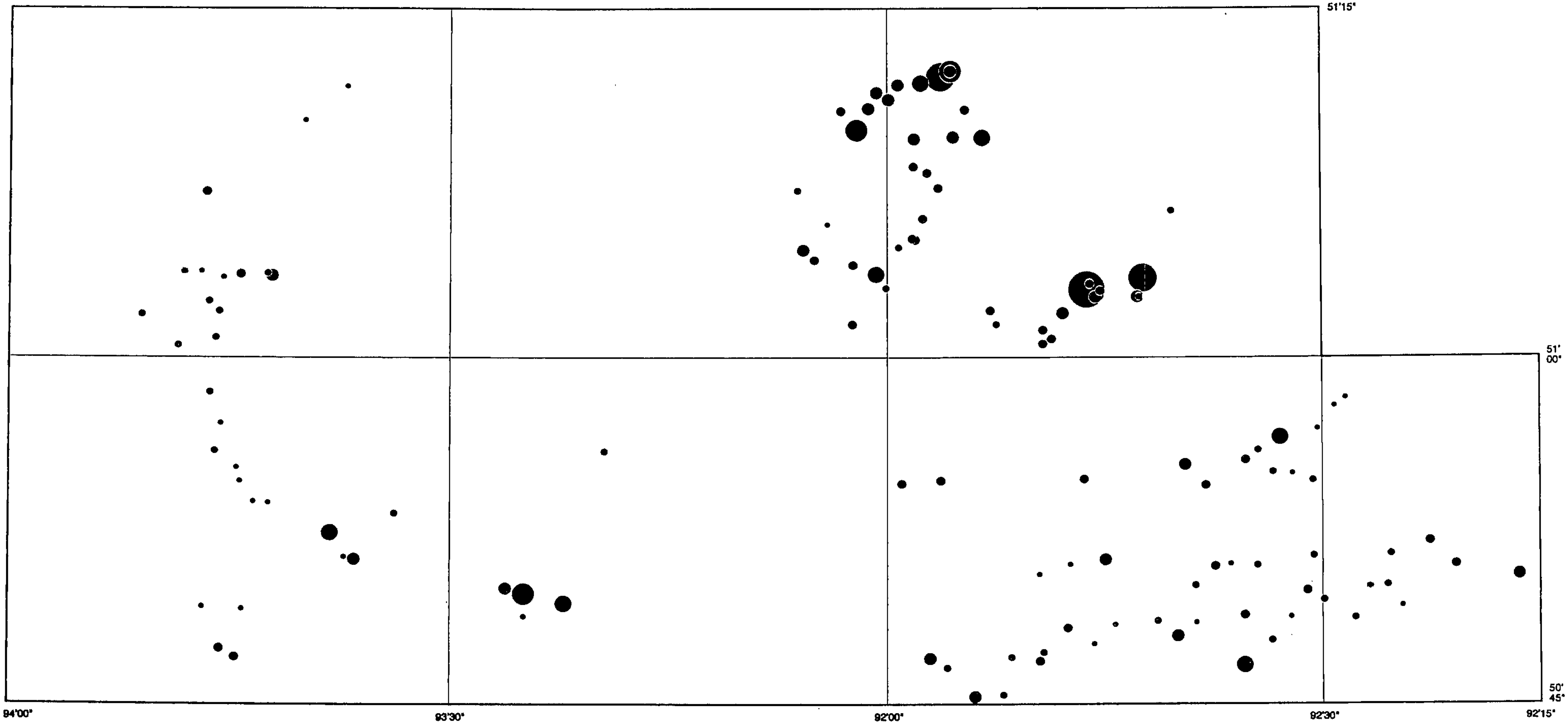


Magnesium (wt. %)

MIN.	MAX.	#SAMP	%TILE
.06	.18	32	23.5
.18	.29	37	50.7
.29	.45	34	75.7
.45	.67	18	89
.67	.84	8	94.9
.84	1.04	3	97.1
1.04	1.2	2	98.5
1.2	1.33	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

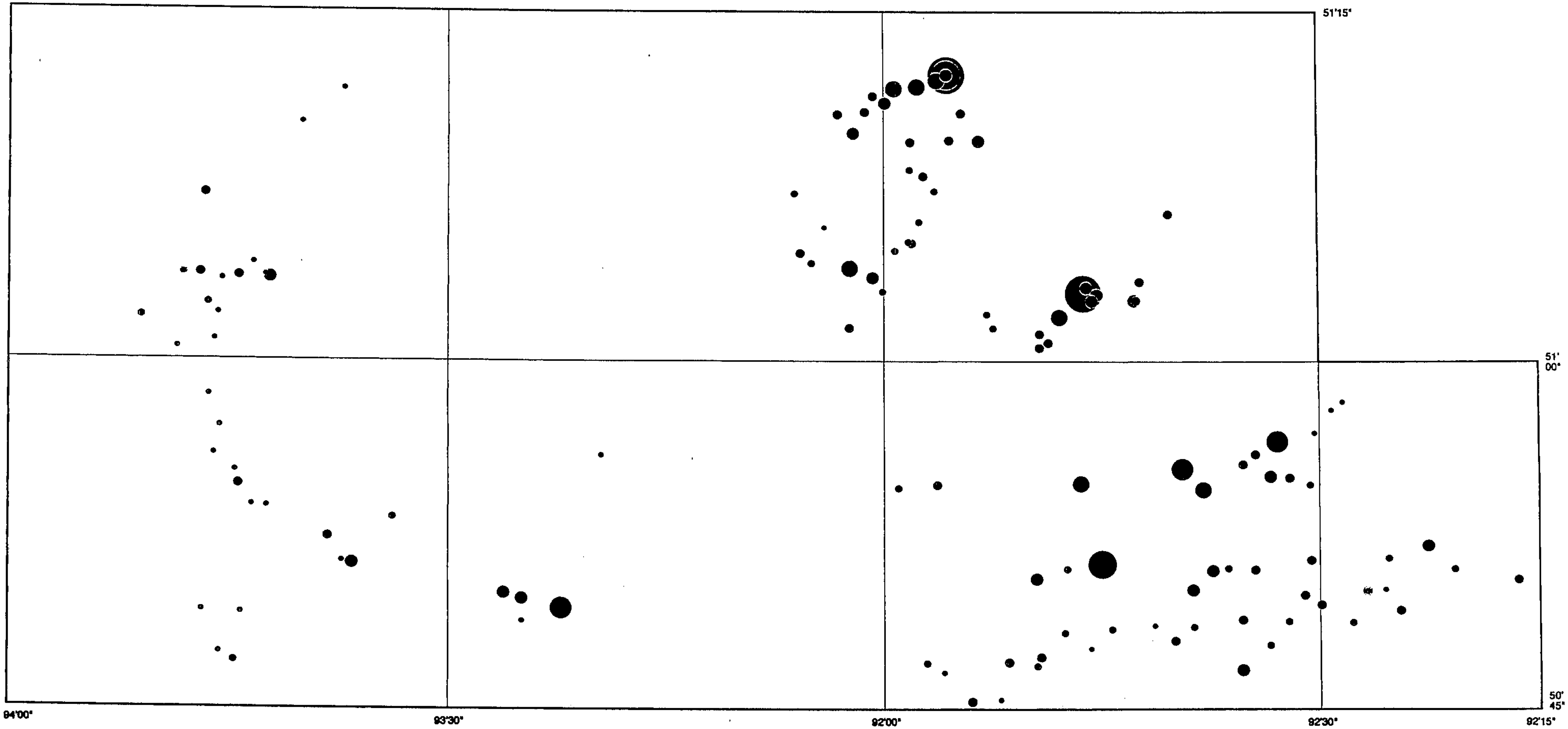


Manganese (ppm)

MIN.	MAX.	#SAMP	%TILE
60	124	33	24.6
124	170	35	50.7
170	245	33	75.4
245	343	20	90.3
343	399	7	95.5
399	443	3	97.8
443	472	2	99.3
472	533	1	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

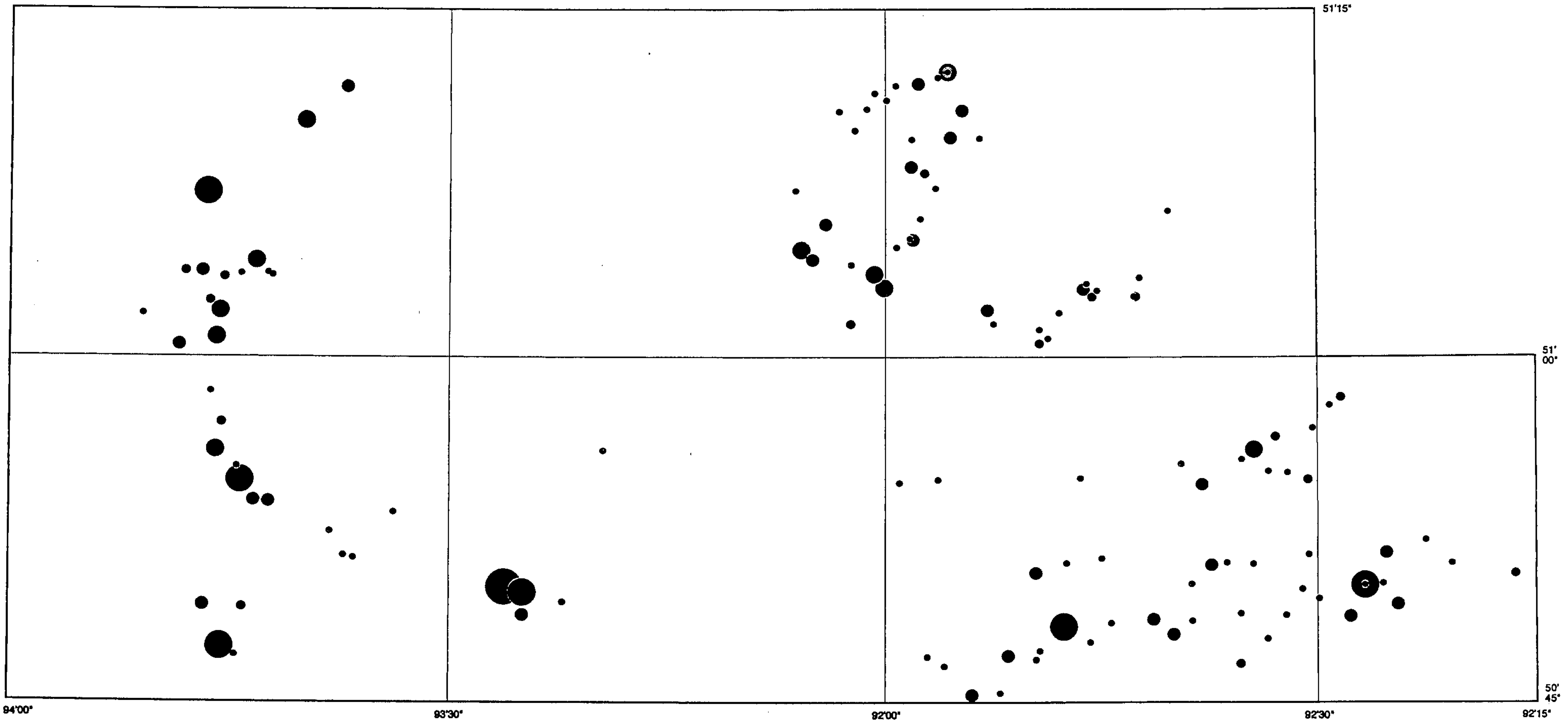


Nickel (ppm)

	MIN.	MAX.	#SAMP	%TILE
•	4	12	34	25
•	12	17	32	48.5
●	17	25	37	75.7
●	25	39	19	89.7
●	39	42	7	94.9
●	42	43	3	97.1
●	43	44	2	98.5
●	44	71	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

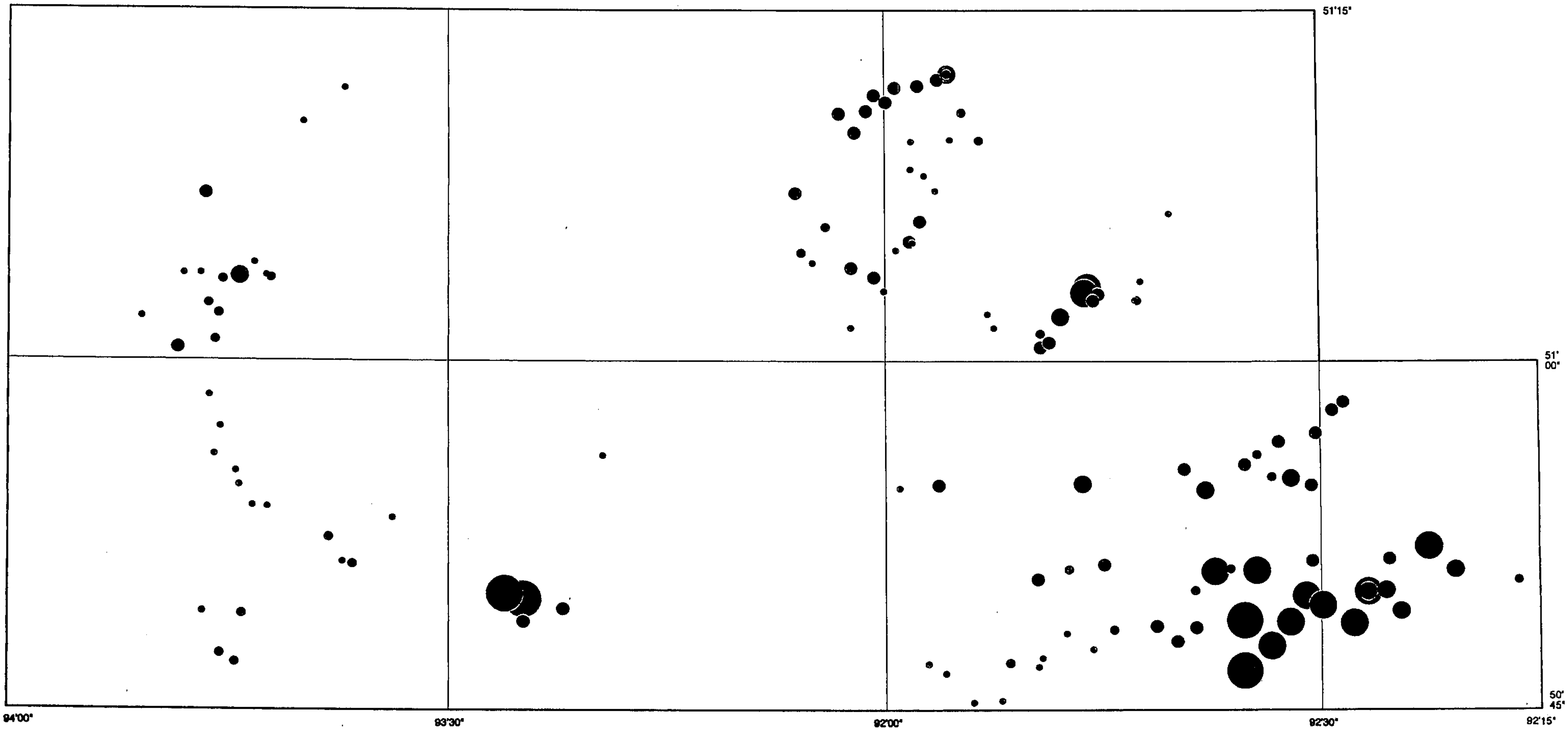


Molybdenum (ppm)

MIN.	MAX.	#SAMP	%TILE
0	.5	75	55.1
.5	1	17	67.6
1	2	27	87.5
2	3	10	94.9
3	4	6	99.3
4	5	1	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

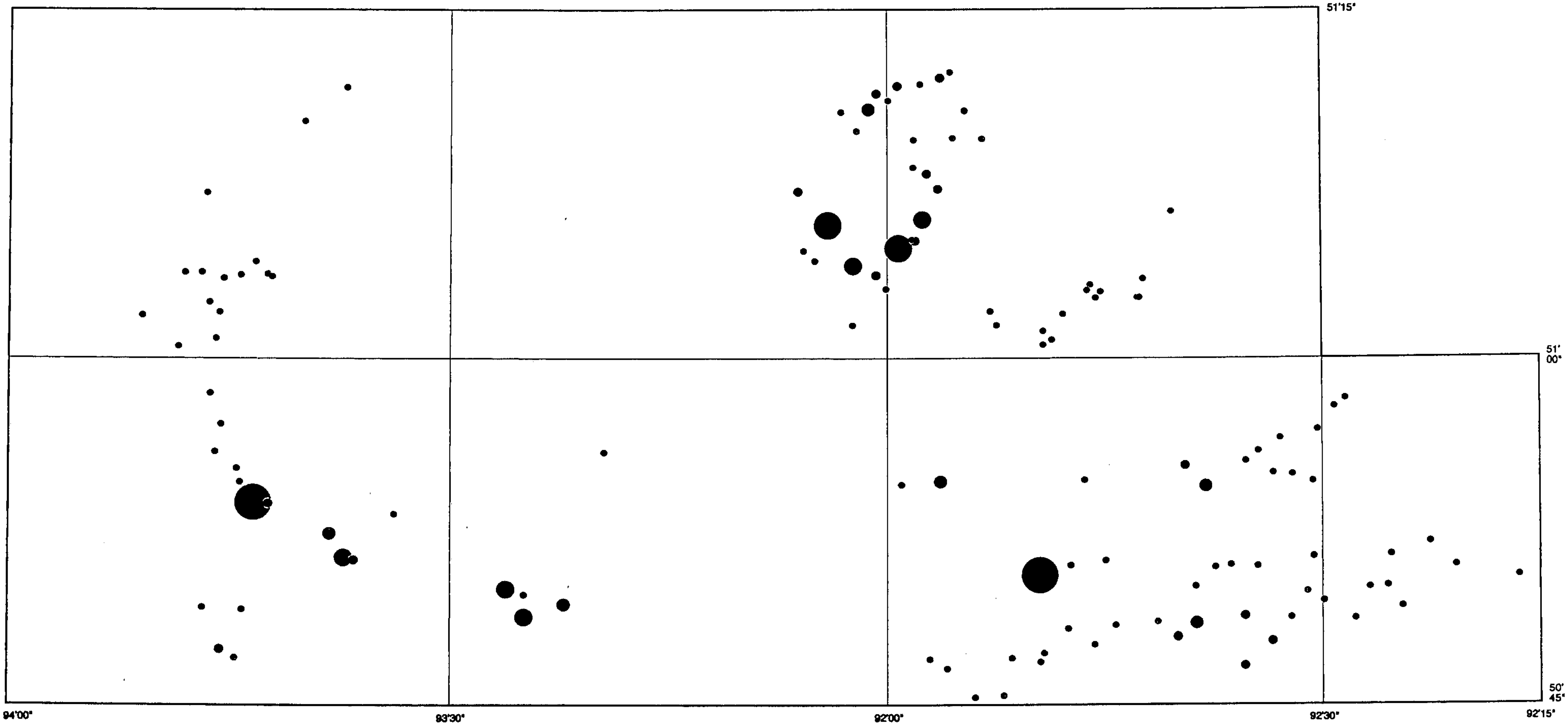


Palladium (ppb)

MIN.	MAX.	#SAMP	%TILE
0	.5	46	33.8
.5	1	25	52.2
1	2	37	79.4
2	3	11	87.5
3	4	13	97.1
4	5	4	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

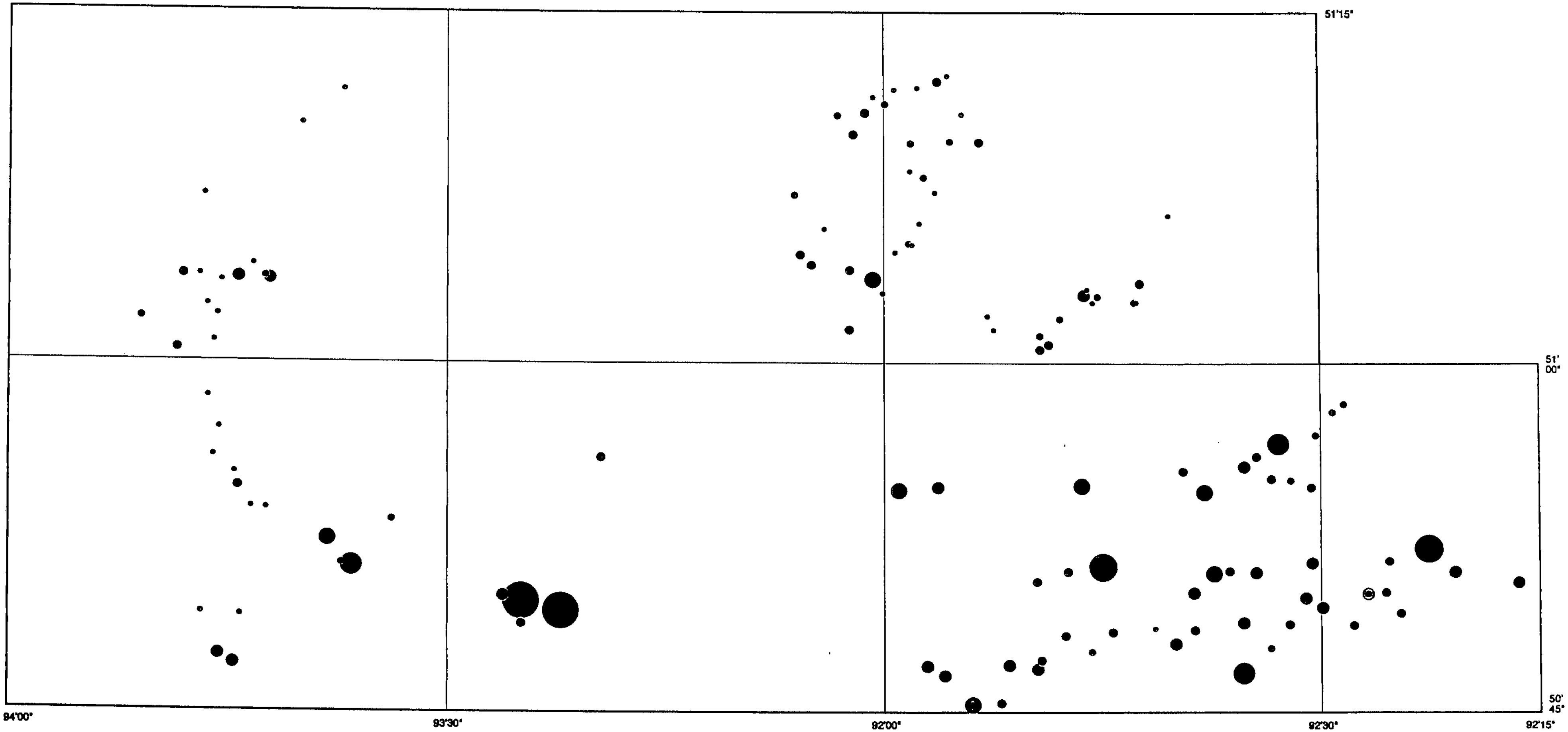


Platinum (ppb)

MIN.	MAX.	#SAMP	%TILE
0	1.5	105	77.2
1.5	4	16	89
4	5	6	93.4
5	6	5	97.1
6	7	2	98.5
7	8	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

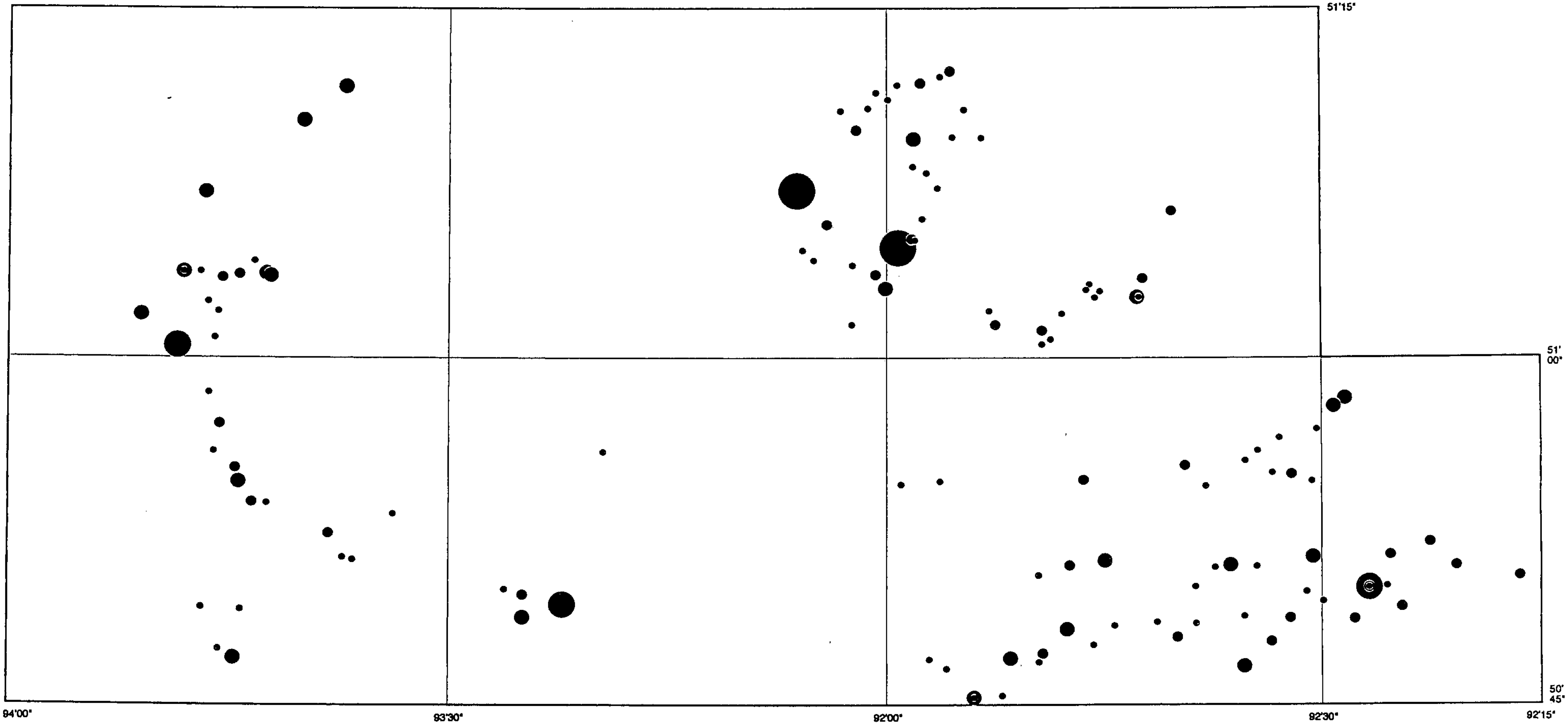


Potassium (wt. %)

MIN.	MAX.	#SAMP	%TILE
.03	.08	40	29.4
.08	.1	24	47.1
.1	.15	36	73.5
.15	.24	22	89.7
.24	.38	7	94.9
.38	.44	3	97.1
.44	.49	2	98.5
.49	.95	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

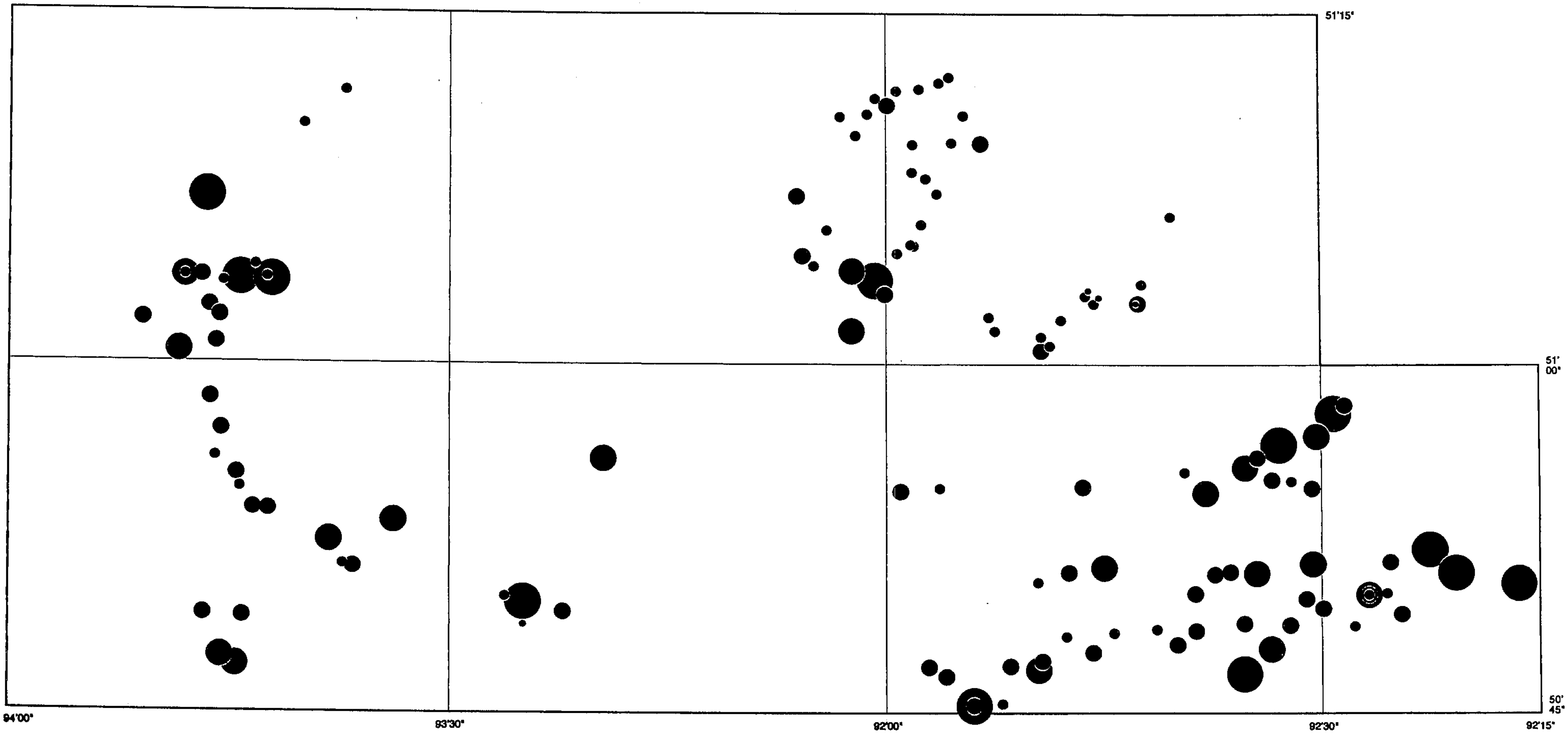


Silver (ppm)

	MIN.	MAX.	#SAMP	%TILE
•	0	.1	75	55.1
•	.1	.2	32	78.7
●	.2	.3	24	96.3
●	.3	.4	3	98.5
●	.4	.5	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

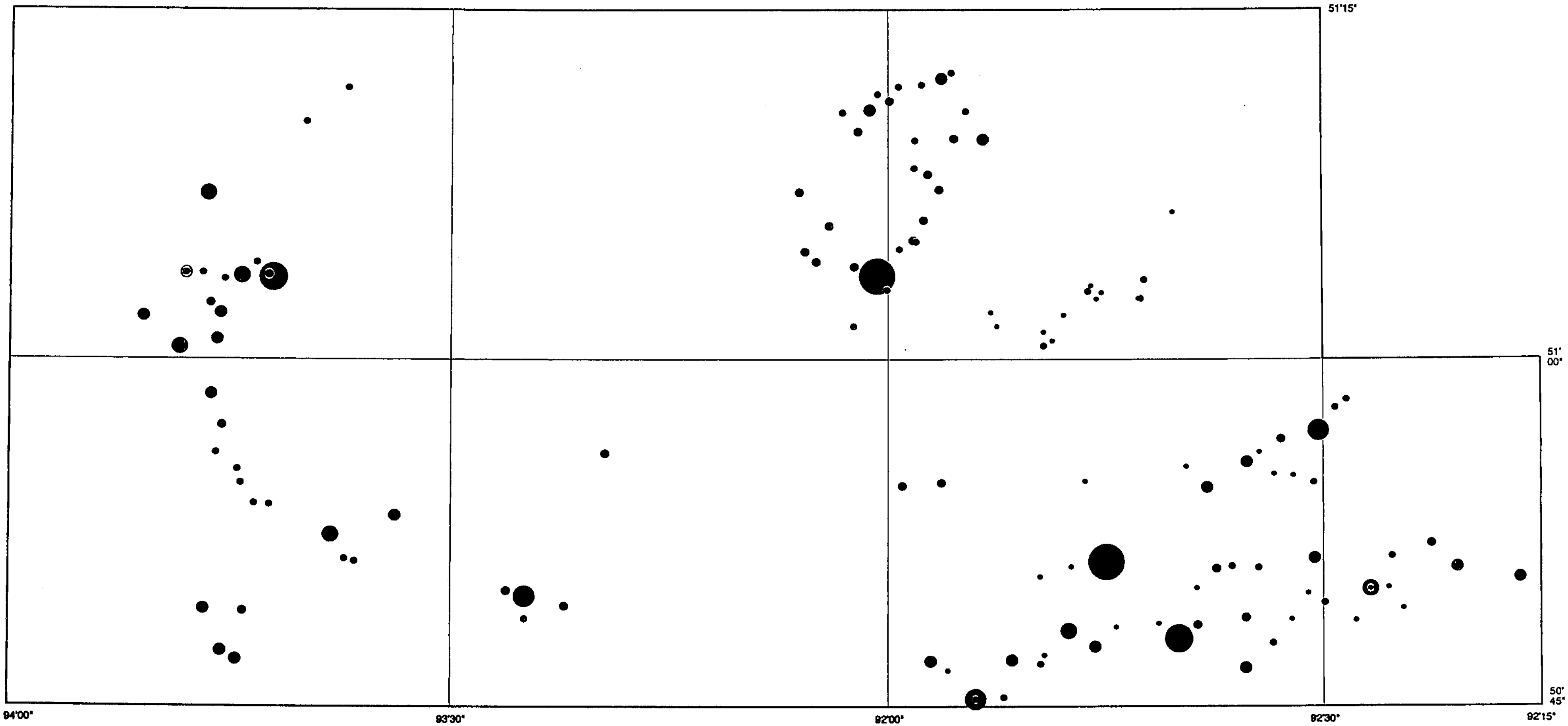


Sodium (wt. %)

MIN.	MAX.	#SAMP	%TILE
.02	.03	4	2.9
.03	.04	53	41.9
.04	.05	47	76.5
.05	.06	20	91.2
.06	.07	12	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

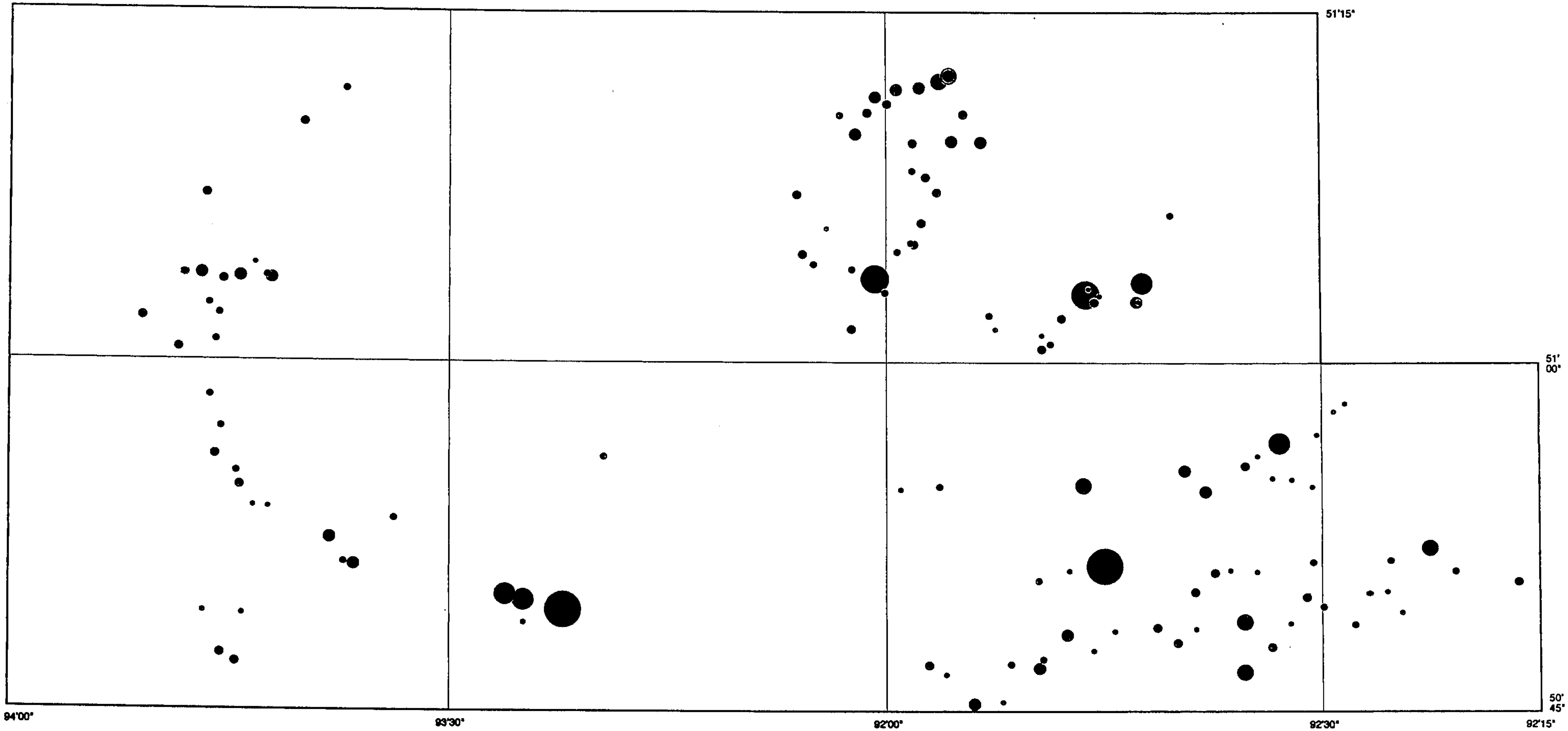


Strontium (ppm)

Symbol	MIN.	MAX.	#SAMP	%TILE
•	5	9	28	20.6
•	9	12	44	52.9
●	12	14	27	72.8
●	14	18	23	89.7
●	18	20	7	94.9
●	20	21	3	97.1
●	21	22	2	98.5
●	22	24	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

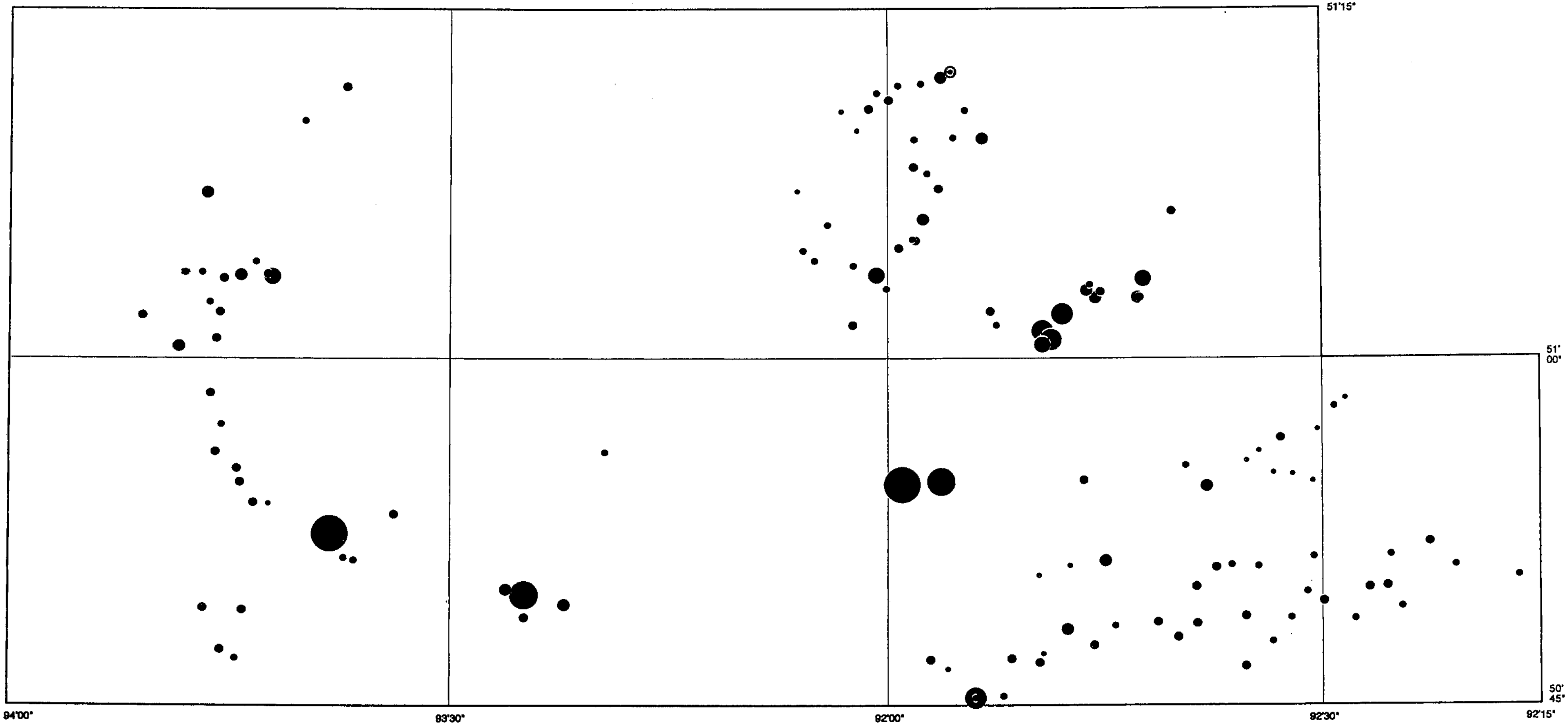


Vanadium (ppm)

MIN.	MAX.	#SAMP	%TILE
14	21	35	25.7
21	24	34	50.7
24	30	34	75.7
30	37	19	89.7
37	40	6	94.1
40	43	4	97.1
43	46	2	98.5
46	49	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario

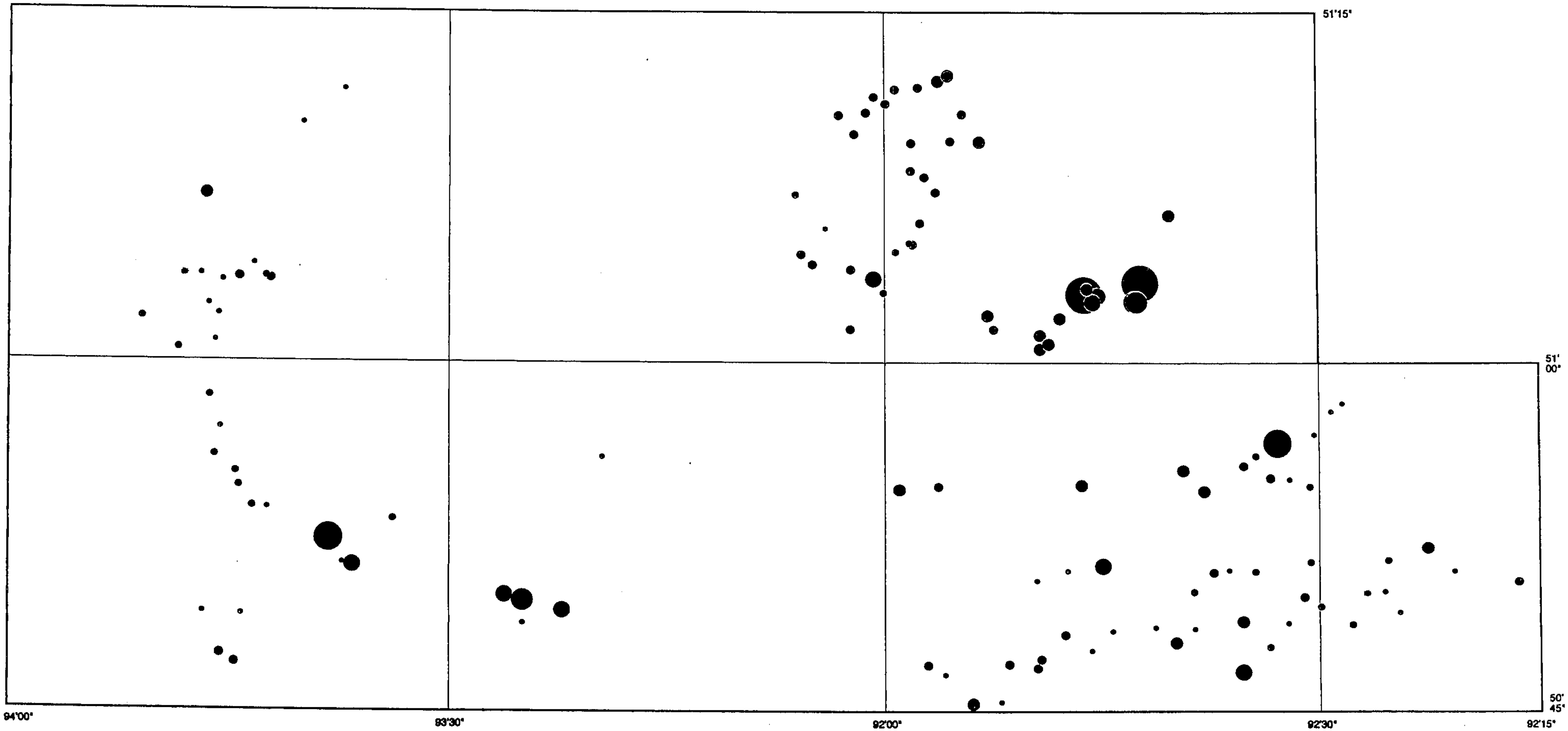


Yttrium (ppm)

MIN.	MAX.	#SAMP	%TILE
0	4	18	13.2
4	5	42	44.1
5	7	49	80.1
7	9	15	91.2
9	10	4	94.1
10	12	4	97.1
12	18	2	98.5
18	28	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

Red Lake Area, Ontario



Zinc (ppm)

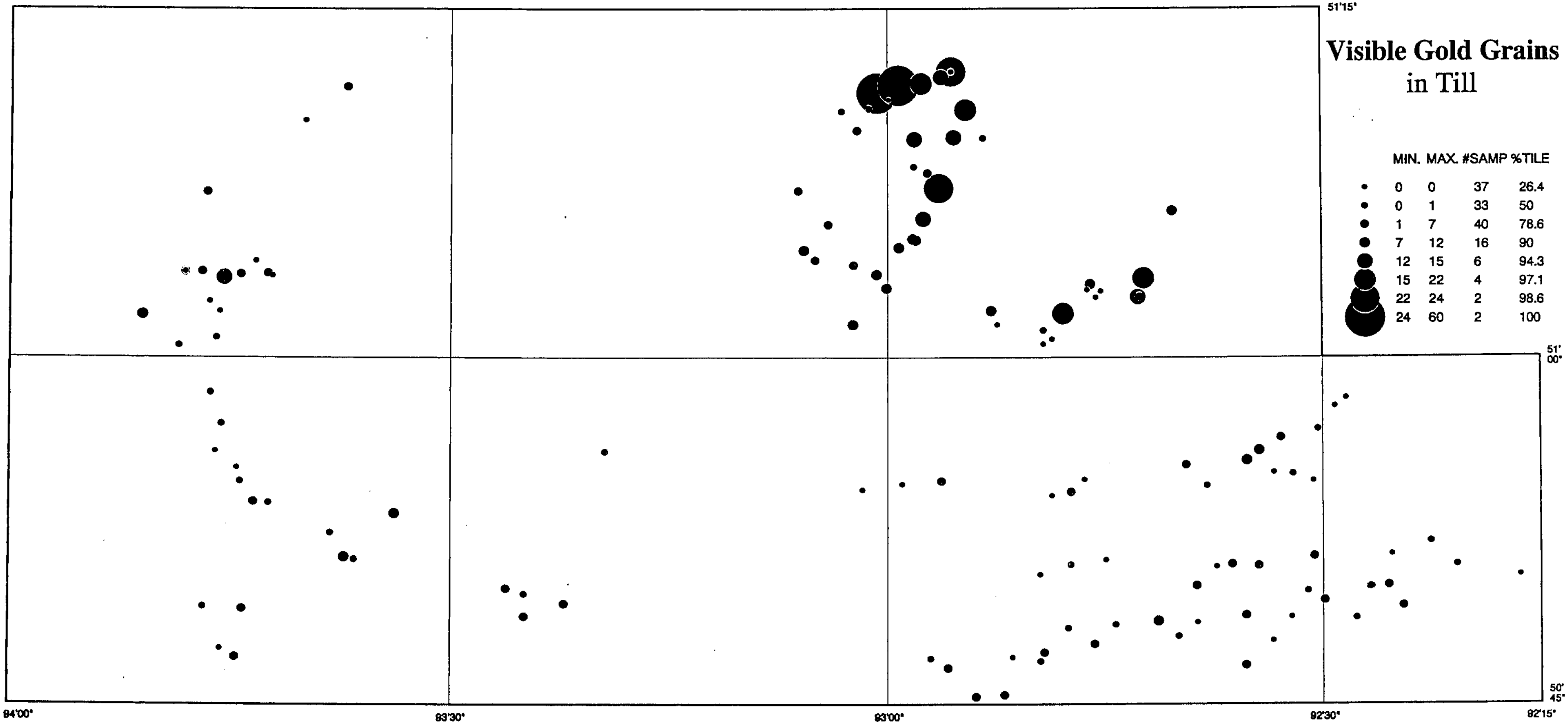
MIN.	MAX.	#SAMP	%TILE
5	14	39	28.7
14	19	26	47.8
19	29	36	74.3
29	43	20	89
43	53	8	94.9
53	62	3	97.1
62	66	2	98.5
66	118	2	100

Geochemistry of <0.063 mm Fraction of Till, ICP Technique

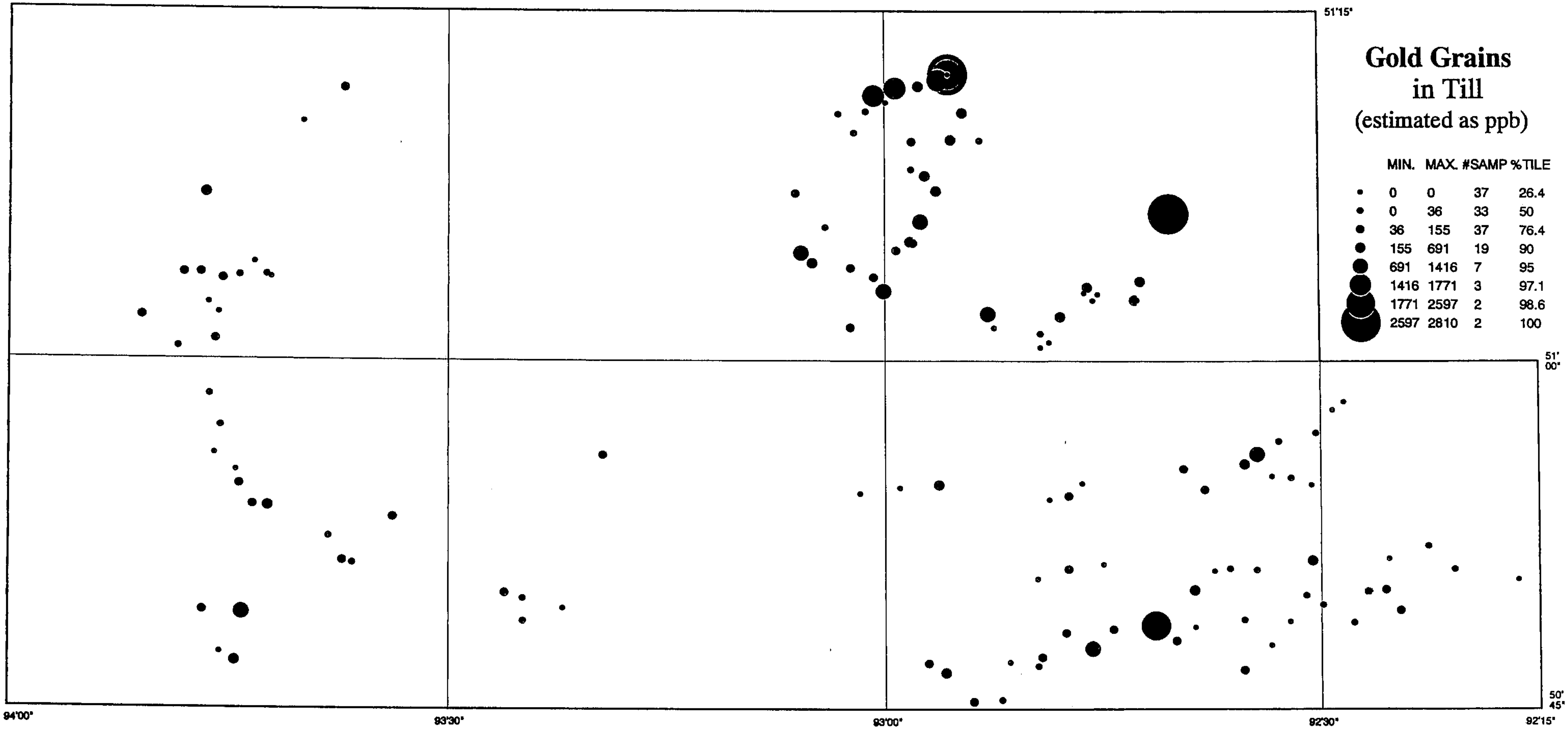
Red Lake Area, Ontario

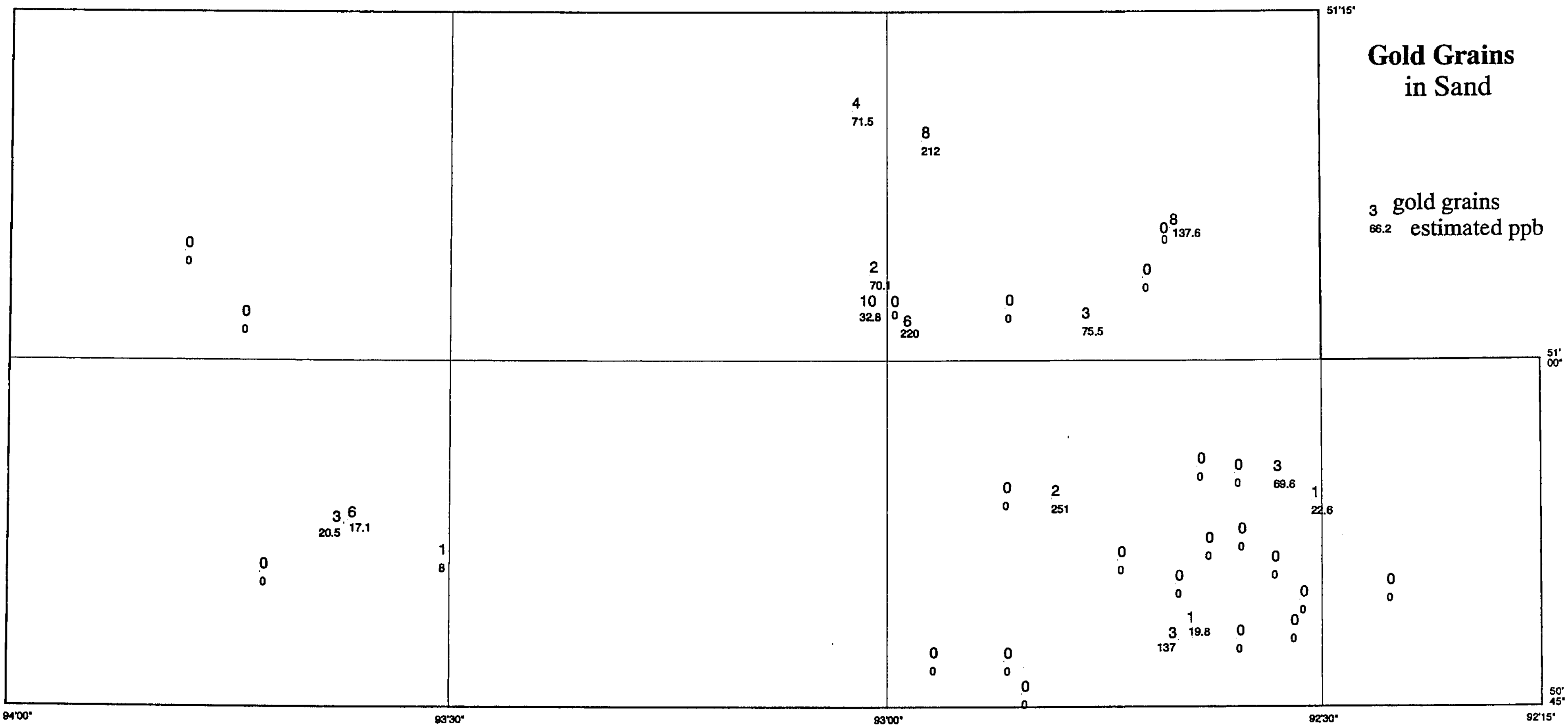
APPENDIX 8. Maps of surface sample data

c) Visible gold grains in till
Gold grains in till (estimated ppb)
Gold grains in sand



51°15'
Visible Gold Grains
in Till
MIN. MAX. #SAMP %TILE
0 0 37 26.4
0 1 33 50
1 7 40 78.6
7 12 16 90
12 15 6 94.3
15 22 4 97.1
22 24 2 98.6
24 60 2 100
51° 00'
50° 45'
94°00'
93°30'
93°00'
92°30'
92°15'

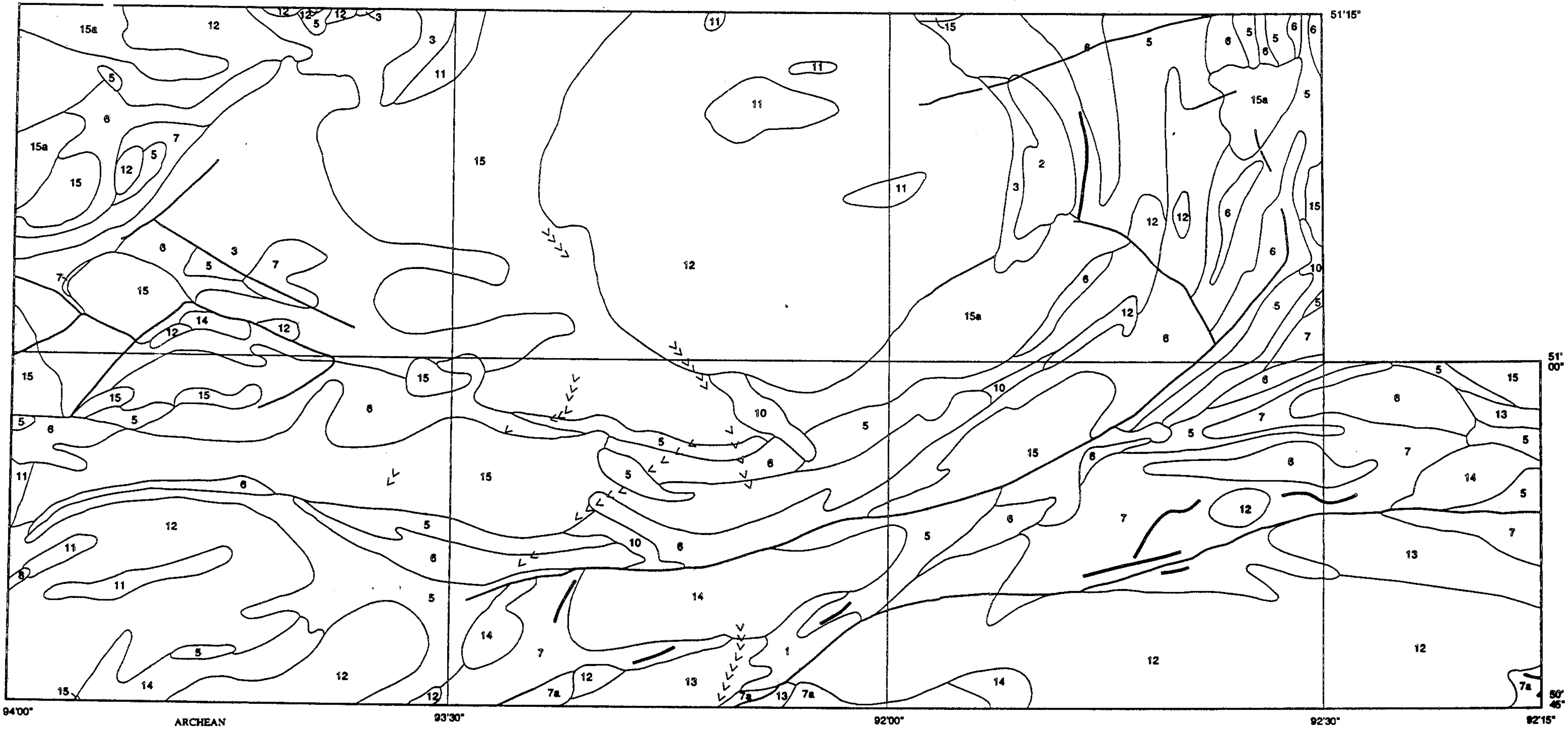

Gold Grains
in Till
(estimated as ppb)
MIN. MAX. #SAMP %TILE
0 0 37 26.4
0 36 33 50
36 155 37 76.4
155 691 19 90
691 1416 7 95
1416 1771 3 97.1
1771 2597 2 98.6
2597 2810 2 100
51°15'
51° 00'
50° 45'
94°00'
93°30'
93°00'
92°30'
92°15'



Gold Grains
in Sand
3 gold grains
66.2 estimated ppb
51°15'
51° 00'
50° 45'
94°00'
93°30'
93°00'
92°30'
92°15'

POCKET

Reproduce this sheet as a transparency



ARCHEAN

NEO- TO MESOARCHEAN (2.5 to 3.4 Ga)

LEGEND

INTRUSIVE ROCKS

15	Massive granodiorite to granite: massive to foliated granodiorite to granite. 15a Potassium feldspar megacrystic units
14	Diorite-monzonite-granodiorite suite: diorite, tonalite, monzonite, granodiorite, syenite, and hypabyssal equivalents (saturated to oversaturated suite)
13	Muscovite-bearing granitic rocks: muscovite-biotite and cordierite-biotite granite, granodiorite-tonalite
12	Foliated tonalite suite: tonalite to granodiorite - foliated to massive
11	Gneissic tonalite suite: tonalite to granodiorite - foliated to gneissic - with minor supracrustal inclusions
10	Mafic and Ultramafic rocks: gabbro, anorthosite, ultramafic rocks

SUPRACRUSTAL ROCKS

8	Migmatized supracrustal rocks: metavolcanic rocks, minor metasedimentary rocks, mafic gneisses of uncertain protolith, granitic gneisses
7	Metasedimentary rocks: wacke, arkose, argillite, slate, marble, chert, iron, formation, minor metavolcanic rocks 7a Paragneisses and migmatites
6	Felsic to intermediate metavolcanic rocks: rhyolitic, rhyodacitic, dacitic and andesitic flows, tuffs and breccias, chert, iron formation, minor metasedimentary and intrusive rocks; related migmatites
5	Mafic to intermediate volcanic rocks: basaltic and andesitic flows, tuffs, and breccias, chert, iron formation, minor metasedimentary and intrusive rocks, related migmatites

MESOARCHEAN (2.9 to 3.4 Ga)

SUPRACRUSTAL ROCKS

3	Mafic metavolcanic and metasedimentary rocks: mafic metavolcanic rocks, minor iron formation
2	Felsic to intermediate metavolcanic rocks: rhyolitic, rhyodacitic, dacitic and andesitic flows, tuffs and breccias
1	Metasedimentary rocks and mafic to ultramafic metavolcanic rocks: coarse clastic metasedimentary rocks, marble, quartz arenite, iron formation, komatiite, mafic metavolcanic rocks, and minor felsic metavolcanic rocks

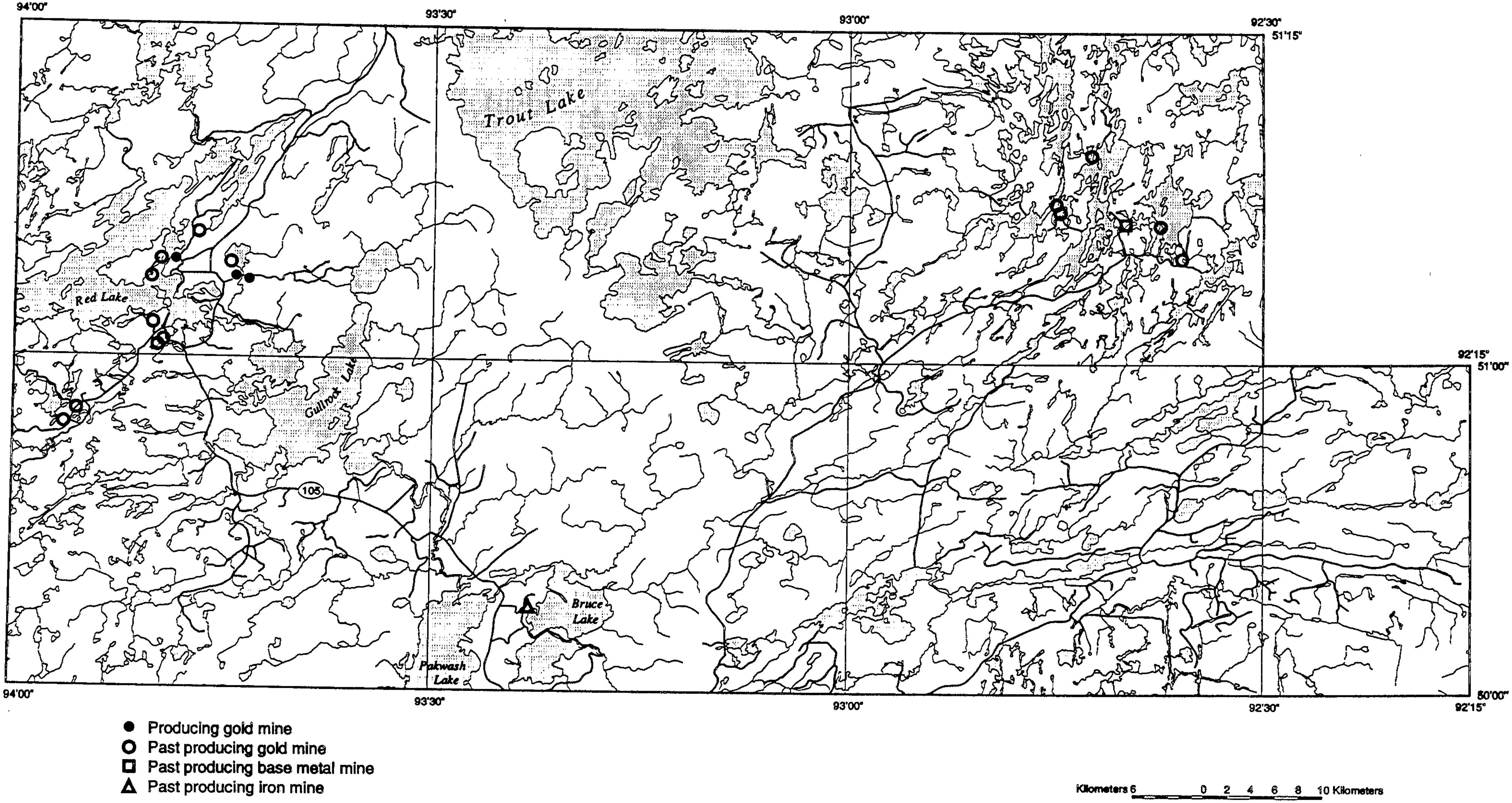
SYMBOLS

- Iron Formation
- Esker (direction known)
- Fault

GEOLOGY OF THE RED LAKE AREA
ONTARIO

Reproduce this sheet as a transparency

Regional Till Geochemistry - Red Lake / Woman Lake Area



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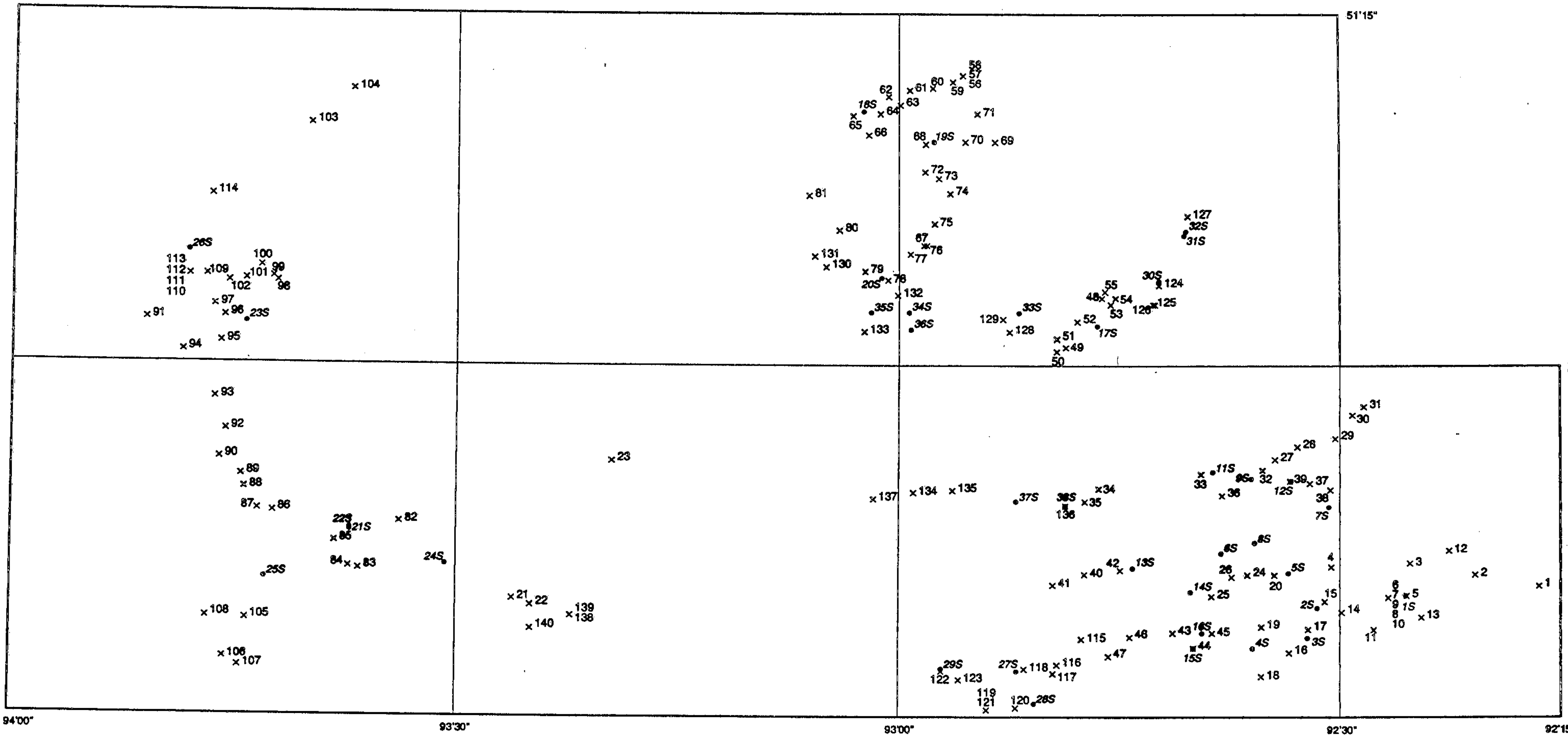

91SSB SAMPLE LOCATIONS

Kilometers 8 0 2 4 6 8 10 Kilometers

×42 Till sample

•13S Sand sample