

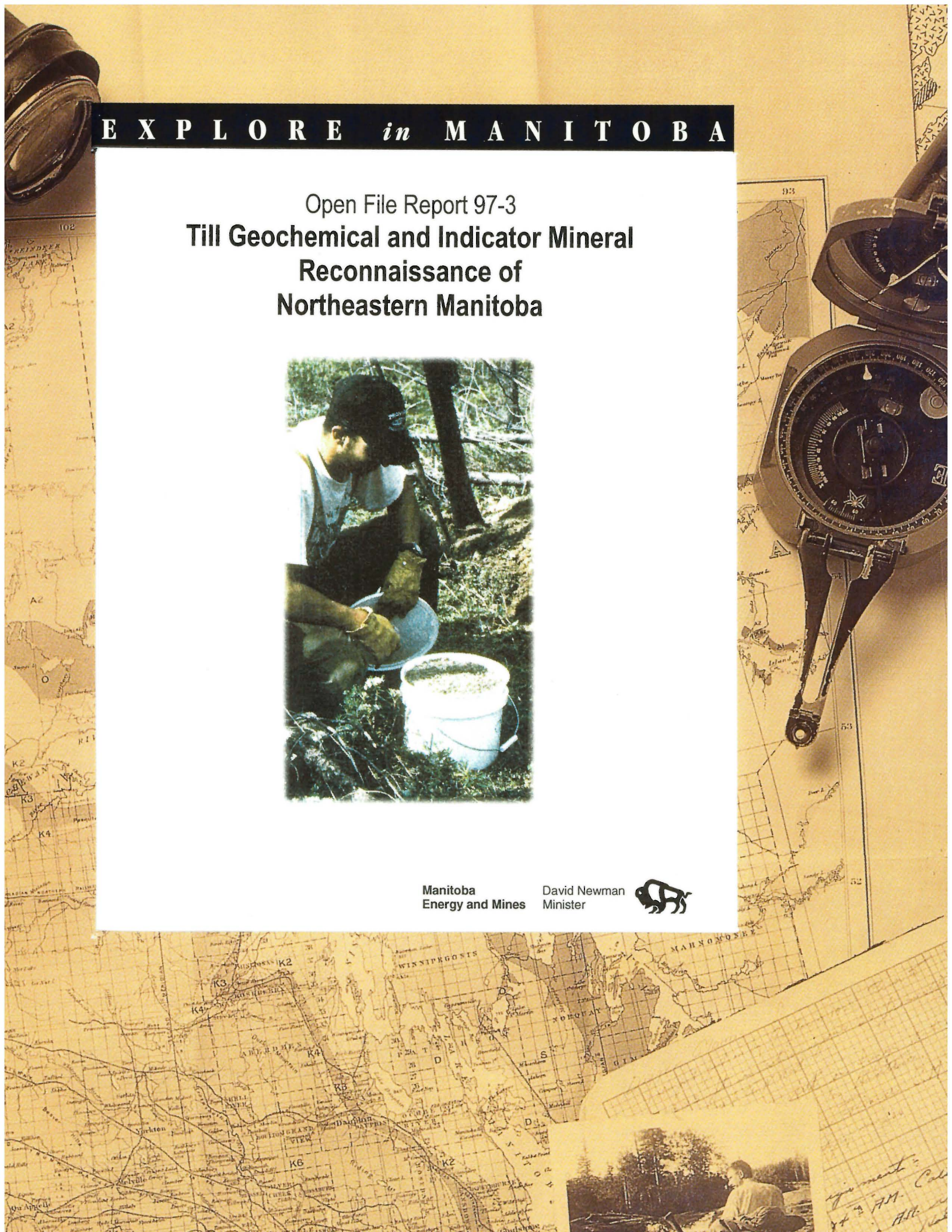
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Open File Report 97-3 Till Geochemical and Indicator Mineral Reconnaissance of Northeastern Manitoba



Manitoba
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David Newman
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Open File OF97-3

Till Geochemical and Indicator Mineral Reconnaissance of Northeastern Manitoba

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Winnipeg, 1997

Energy and Mines

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INTRODUCTION

The Superior Province of the Canadian Shield in northeastern Manitoba is a region with high potential for discoveries of base metal, precious metal, and gemstone deposits. The Manitoba Geological Services Branch (MGSB), therefore, has initiated Operation Superior, a five-year program designed to assist mineral resource assessments in the region. The principal Operation Superior activity is a multimedia geochemical survey based on sampling at 1 km spacing within mapped greenstone belts (Fedikow et al., 1997).

This open file presents data generated by an accompanying project, designed to support the multimedia sampling by providing a reference set of data regarding regional till provenance and geochemistry, as well as indicator mineral frequency and chemistry. The survey was based on low density till sampling, at 40 km spacing, and was conducted on a co-operative basis by MGSB and the Geological Survey of Canada (GSC).

The regional sampling covers the Manitoba portion of an area between 53° and 56° N and 92° and 100° W (Figure 1), an area meant to cover a portion of the northwestern Superior Province with a high frequency of greenstone belts. The area was extended westward into the Churchill Province, and into adjacent Phanerozoic terrane to the southwest and northeast, in order to define regional context and overlap with earlier surveys (Kaszycki, 1989; McMartin et al., 1996; Kaszycki et al., 1996; Thorleifson et al., 1994). For example, the study area extends into an area west of Lake Winnipeg where numerous Cr-diopsides were found by Thorleifson et al. (1994). Data presented here allows confirmation of these observations, and indicates whether this area of Cr-diopside abundance extends onto the shield to the northeast.

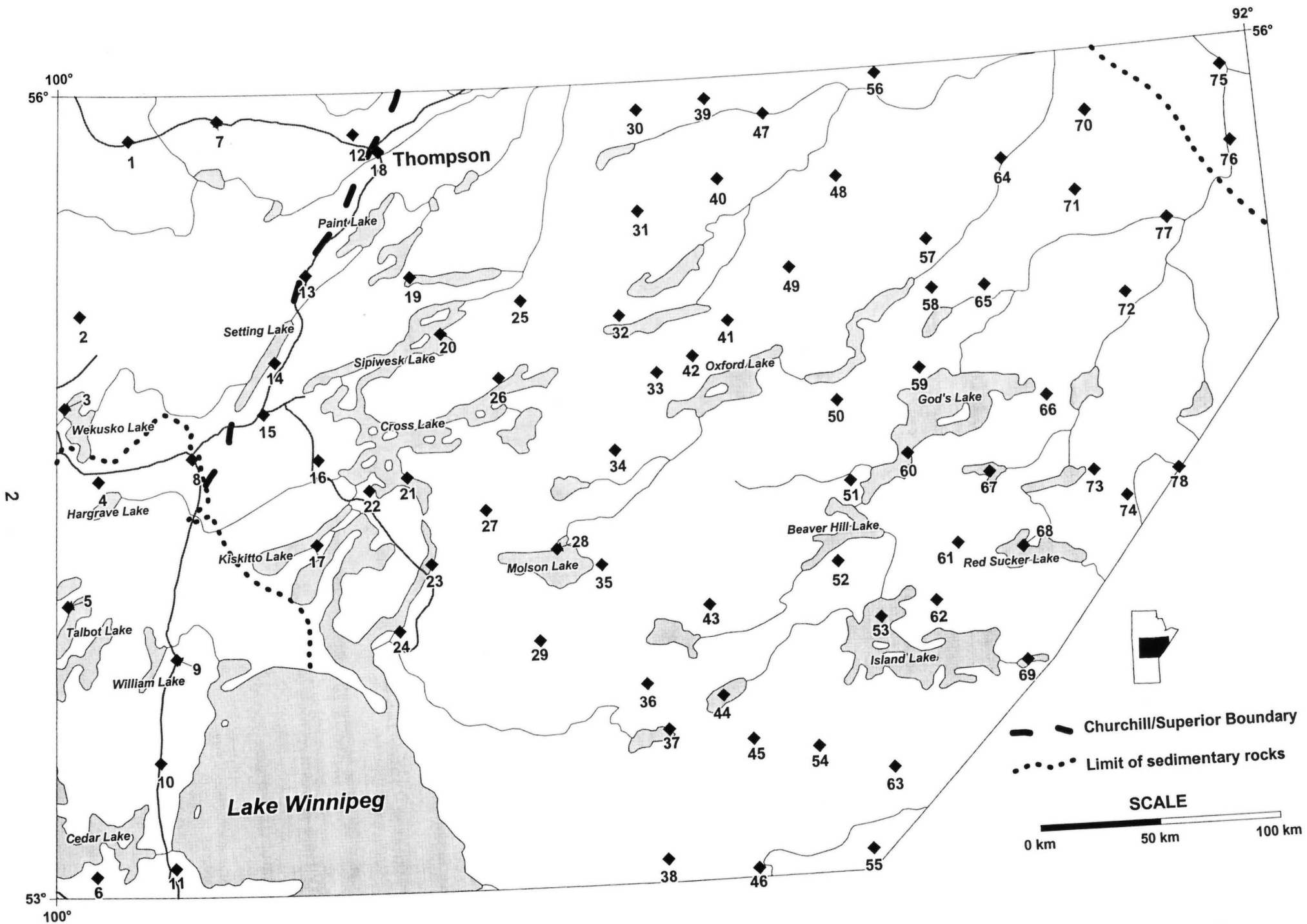


Figure 1: Location of the till sample sites.

REGIONAL GEOLOGY

Precambrian rocks in the region consist largely of granitic and high grade metamorphic rocks with intervening east-west trending greenstone belts including low grade metavolcanic and metasedimentary rocks. The northeastern and southwestern corners of the area are underlain by the margins of the Hudson Bay Lowland and the Western Canada Sedimentary Basin, respectively, where Paleozoic sedimentary rocks dominated by carbonate are present. In the northwest, the area extends into the Churchill Province of the Canadian Shield. The Churchill/Superior Boundary and associated Thompson Nickel Belt are located in the west-central part of the area.

Southwestward ice flow during the late Pleistocene covered the northeastern portion of the area with a continuous sheet of fluted calcareous till derived from carbonates and reworked marine sediments in the Hudson Bay Lowland. Older ice flows that may have affected the region include westward and southeastward flow (Nielsen et al., 1986). The northwestern, and southeastern parts of the area are underlain by noncalcareous, sandy till which may have lacked carbonate at the time of deposition, or which has lost its carbonate content to dissolution. Locally derived, very calcareous till is prevalent in the area west of Lake Winnipeg. Several well-developed eskers trend southwest across much of the area, and moraines in the form of broad, subtle topographic highs trending southeast-northwest are present, including the Hargrave Moraine at the north end of Lake Winnipeg. Silty glaciolacustrine sediments are extensive, particularly in the central and west-central portions of the area. Much of the area is covered by peatlands, and perennially frozen soils are increasingly common to the north.

FIELD METHODS

Till was chosen as the sampling medium for the regional survey due to the role that till plays as the source of other clastic sediments, as well as being a major control of geochemical trends in media such as soil. Furthermore, sampling of till permitted the analysis of indicator minerals and their correlation to the composition of other fractions of the till. Till samples also permit the lithological analysis of the gravel fraction, which may be used to determine the provenance of the sediments to their bedrock sources.

A 40 km spacing was considered adequate to define major features of the drift composition, such as the southwestern limit of carbonate derived from the Hudson Bay Lowland, and regional trends in background for geochemical and indicator mineral variables.

At 78 sites, a 12 litre till sample was collected from below the B horizon at an existing exposure such as a road cut or riverbank, or from a shovel hole. Data regarding location, sampling depth, Munsell colour, reaction to HCl, texture, structure, and moisture content were recorded at each site. This total includes 21 road-accessible sites in the western part of the area which were sampled during a four-day period in late July 1996. At the 57 remaining sites to the east, till was sampled from shovel holes or river cuts accessed by Cessna 206 floatplanes based at Norway House, Thompson, and Gods Lake Narrows. The latter work was completed over 6 days in late July and 7 days in mid-August, with as many as 8 sites sampled per day.

LABORATORY METHODS

At Overburden Drilling Management Ltd., in Nepean, Ontario, three 0.5 litre subsamples were removed from each 12 litre till sample (Figure 2). One split was retained as a reference archive. Another split was weighed before and after air drying at less than 40° C , in order to determine

ANALYSES

Till sample
12 litres

10-11 litre split

Disaggregate in
water & calgon

Wet sieve
@ 2 mm

Disaggregated
<2 mm

Shaker
table

Table
concentrate

Methylene iodide
@ 3.2 SG

Heavy mineral
concentrate

Hand
magnet

Nonferromagnetic
concentrate

Screen @ 0.5 mm,
250 µm, & 63 µm

two 0.5 litre splits

Weigh, dry <40°C
reweigh

Dry sieve @ 63 µm

Centrifuge @ 2 µm

ICP-AES

INAA

Chittick
carbonate

0.5 litre split

Archive

Electron
microprobe

Indicator
minerals

Paramagnetic
separator

Bulk mineralogy,
300 grain count

INAA

Classify lithology,
8 - 16 mm

Dry sieve
@ 4, 8, 16 mm

Table
lights

Visible gold grain
count, size, shape

Pan under
microscope

MI lights

Ferromagnetic
concentrate

0.5 - 2.0 mm

0.25 - 0.5 mm

63 - 250 µm

<63 µm

Figure 2: Sample processing flow sheet.

moisture content, and subsequently was screened using a stainless steel 230 mesh sieve, in order to recover about 50 g of the <63 micron fraction for geochemical and carbonate mineralogical analyses. The third split was processed by centrifugation to recover about 3 g of the <2 micron fraction, for geochemical analysis. The remaining till sample, ~10 litres, was disaggregated and screened at 2 mm. The >2 mm fraction was washed, dried, screened at 4, 8, and 16 mm, weighed, and retained for lithological analysis. The <2 mm fraction was pre-concentrated with respect to density using a shaker table, and a double-tabling protocol designed to enhance recovery of easily-lost coarse silicate heavy minerals. Visible gold grains were recovered at the table and by panning of the table concentrate and subsequently counted and classified with respect to morphology. Final density concentrates were prepared using methylene iodide diluted with acetone to a specific gravity of 3.2, followed by removal of the ferromagnetic fraction. The nonferromagnetic concentrates were then screened, and the 0.25-2.0 mm fraction was visually scanned under a stereoscopic microscope for potential kimberlite and other mineral deposit indicator minerals.

The clay (<2 micron) fraction was analysed geochemically by Bondar-Clegg Ltd., using ICP-AES following nitric-aqua regia partial dissolution. This multi-element analytical package was supplemented by analysis for As by hydride generation-AAS, as well as for Hg by cold vapour-AAS. The fine (<63 micron) fraction was analysed geochemically by INAA at Activation Laboratories Ltd., as well as for an estimate of calcite and dolomite content, using the Chittick gasometric analysis at GSC labs. The <0.25 mm nonferromagnetic heavy mineral concentrates were analysed, by the non-destructive INAA technique, thus permitting future mineralogical analyses, planned for the 63-250 micron fraction, following a cool-down period.

Selected mineral grains were mounted, polished, and analysed for Al_2O_3 , CaO , Cr_2O_3 , FeO , K_2O , MgO , MnO , Na_2O , SiO_2 , TiO_2 , and ZnO at the electron microprobe facilities of the Canada Centre for Mineral and Energy Technology (CANMET), using a JEOL 8900 electron microprobe

operating at 20kV and 40nA. Peak counting times of 10 sec were used for all elements, with the exception of 40 sec for TiO_2 and Cr_2O_3 . Background determinations were made on every 50th grain. Lower detection limits are about 0.1% for all elements, with the exception of about 0.05% for TiO_2 and Cr_2O_3 . One point per grain was analysed, with care to avoid fractures, inclusions, and pits. At the end of each batch, a similar point was analysed on one grain in 30, in order to monitor precision. Zinc-bearing grains generated false values for sodium, due to peak overlaps. Minerals were classified on the basis of visual criteria and evaluation of the weight percent oxide data only.

At least 1 kg of the 8-16 mm fraction was visually classified by Consorminex of Gatineau, Quebec, with respect to lithology, and the classes were weighed in order to obtain weight percentages.

RESULTS

Data obtained from the 78 till samples are presented as tables, as well as maps of selected variables, in Appendices 1 to 6.

In Appendix 1, data regarding location, sampling, description of the sediments, and lithological data are presented. The sites are numbered from 1 to 78, in a series of north to south transects such that site 1 is in the northwest and site 78 is in the southeast. A location name based on a nearby geographic feature is given, and location is specified on the basis of easting and northing in UTM zones 14 and 15. Mean sampling depth is given in metres, and colour of the moist sediment is given in Munsell hue, value, and chroma notation. Reaction to dilute hydrochloric acid (10%), a field indication of carbonate content, is described as strong, moderate, or none. Total weight of the samples, after removal of subsamples, is given in kg, weight of the >2mm gravel fraction in kg, and moisture content in weight %. The total yield of nonferromagnetic, <2 mm, >3.2 specific gravity, heavy mineral concentrate (NFM >3.2SG HMC)

is given in g, as is the total yield of ferromagnetic, <2 mm, >3.2 specific gravity, heavy mineral concentrate. The total number of gold grains recovered also is reported in Appendix 1. Lithology of the 8-16 mm pebbles is presented as weight percent low grade metasedimentary and metavolcanic (LGMM or 'greenstone'), intrusive and high grade metamorphic (including mica schist, labeled IHGM, or 'granitic'), carbonate, and sandstone. Carbonate analysis of the <63 micron fraction is presented as weight % calcite and weight % dolomite. Maps included in Appendix 1 present data for lithological and processing yield variables.

In Appendix 2, data from INAA of the NFM >3.2SG HMC's are presented. The entire concentrate was analysed, and data from concentrates split into multiple vials were combined by weighted average. Detection limits for this procedure are as follows: Ag 5 ppm, As 2 ppm, Au 5 ppb, Ba 200 ppm, Br 5 ppm, Ca 1%, Ce 1 ppm, Co 5 ppm, Cr 10 ppm, Cs 2 ppm, Eu 0.2 ppm, Fe 0.02%, Hf 1 ppm, Hg 5 ppm, Ir 40 ppb, La 1 ppm, Lu 0.1 ppm, Mo 20 ppm, Na 500 ppm, Nd 10 ppm, Ni 200 ppm, Rb 50 ppm, Sb 0.2 ppm, Sc 0.1 ppm, Se 20 ppm, Sm 0.1 ppm, Sr 0.2%, Ta 1 ppm, Tb 2 ppm, Th 0.5 ppm, U 0.5 ppm, W 4 ppm, Yb 0.2 ppm, and Zn 200 ppm. Values below the detection limit were revised in the data files as half the detection limit. Maps included in Appendix 2 present data for several noteworthy elements for which values above the detection limit show a spatial pattern.

In Appendix 3, data from INAA of the <63 micron fraction are presented. About 30 g was analysed. Detection limits for this procedure are as follows, with several elements having lower detection limits than was possible in the case of the heavy mineral concentrates: Ag 5 ppm, As 0.5 ppm, Au 2 ppb, Ba 200 ppm, Br 0.5 ppm, Ca 1%, Ce 1 ppm, Co 1 ppm, Cr 10 ppm, Cs 1 ppm, Eu 0.2 ppm, Fe 0.02%, Hf 1 ppm, Hg 1 ppm, Ir 5 ppb, La 1 ppm, Lu 0.05 ppm, Mo 1 ppm, Na 500 ppm, Nd 5 ppm, Ni 20 ppm, Rb 50 ppm, Sb 0.1 ppm, Sc 0.1 ppm, Se 3 ppm, Sm 0.1 ppm, Sn 0.01%, Sr 0.05%, Ta 0.5 ppm, Tb 0.5 ppm, Th 0.5 ppm, U 0.5 ppm, W 1 ppm, Yb 0.2 ppm, and Zn 50 ppm. Values below the detection limit were revised in the data files as half the

detection limit. Maps included in Appendix 3 present data for several noteworthy elements for which values above the detection limit show a spatial pattern.

Appendix 4 presents geochemical data for the clay (<2 micron) fraction, based on ICP-AES analysis following nitric-aqua regia partial dissolution. Data for As also were obtained by hydride generation-AAS, and for Hg by cold vapour-AAS. Detection limits for these procedures are as follows: Ag 0.2 ppm, Al 0.01%, As by ICP 5 ppm, As by hydride generation/AA 1.0 ppm, Ba 1 ppm, Bi 5 ppm, Ca 0.01%, Cd 0.2 ppm, Co 1 ppm, Cr 1 ppm, Cu 1 ppm, Fe 0.01 %, Ga 2 ppm, Hg 0.005 ppm, K 0.01%, La 1 ppm, Li 1 ppm, Mg 0.01%, Mn 1 ppm, Mo 1 ppm, Na 0.01%, Nb 1 ppm, Ni 1 ppm, Pb 2 ppm, Sb 5 ppm, Sc 5 ppm, Sn 20 ppm, Sr 1 ppm, Ta 10 ppm, Te 10 ppm, Ti 0.01%, V 1 ppm, W 20 ppm, Y 1 ppm, Zn 1 ppm, Zr 1 ppm. In the case of Ca, an upper detection limit of 10% was exceeded in many cases. Maps included in Appendix 5 present data for several noteworthy elements for which values above the detection limit show a spatial pattern.

Part 1 of Appendix 5 includes data from electron microprobe analysis of mineral grains. In Part 2, a tally of minerals judged to be indicator minerals of potential significance with respect to mineral deposits is presented. The tally includes chalcopyrite, corundum, Cr-diopside, Cr-grossularite, Cr-pyroxene, Cr-rutile, Cr-spinel, eclogitic garnet, gahnite, kornorupine, kyanite/sillimanite/ andalusite, loellingite, Mg-ilmenite, Mn-epidote, Mn-spinel, molybdenite, rutile, sapphirine, spinel, tourmaline, and Zn-spinel. Scatterplots for selected data are presented in Part 3. Maps showing the distribution of the minerals tallied in Part 2 are presented in Part 4, and data are listed in Appendix 6.

DISCUSSION

As indicated in Appendix 1, samples from shovel holes were derived typically from depths of 0.8 to 1.2 m. Exceptions where sampling depth was as shallow as 0.2 m are sites where thin

sediments overly rock; where sample depth is less than about 0.3 m sediment may be regarded as B rather than C horizon material. Greater sampling depths of 1.6 to as much as 8.3 m relate to road cuts and river sections. All samples are from oxidized C-horizon sediments, with the exception of two samples from sections on the Gods River, in which sulphide minerals were observed during processing. The majority of the sediments in the area are yellowish to greyish brown (Munsell hue 2.5Y) to olive grey (5Y) in colour.

Following removal of three 0.5 litre splits, the remaining sample, about 10.5 litres, weighed an average of 22 kg and ranged from 16 to 26 kg. Of this, an average of 2.7 kg, between 0.2 and 7.9 kg, consisted of gravel (>2 mm or +10 mesh). As indicated by a map in Appendix 1, Part 2, the most gravel-rich till is also enriched in Precambrian debris, and defines a broad zone extending from the northwestern to the southeastern portions of the area. In this till the weight of the <2 mm fraction averaged 19 kg, ranging from 12 to 24 kg. Water content averaged 10% and ranged from 4 to 25%, so the air dry weight of the <2 mm fraction averaged 17 kg and ranged from 11 to 23 kg. This material yielded nonferromagnetic <2mm, >3.2 specific gravity heavy mineral concentrates averaging 80 g, ranging from 6 to 678 g, plus ferromagnetic concentrates averaging 15 g, ranging from 1 to 110 g. The largest nonferromagnetic concentrates, by far, are almandite-rich samples from the northwestern part of the area. Magnetite, nearly the exclusive constituent of the ferromagnetic concentrates, is most abundant in central and southeastern areas. During wet processing, an average of 3 to 4 gold grains, ranging from 0 to 27 grains per sample were recovered, with the highest counts occurring southwest of Island Lake. Gold grains range from 15 to 450 microns in the long axis dimension and vary in morphology from pristine to reshaped (Appendix 6).

Till Lithology

Lithological composition of the 8-16 mm pebble fraction is characterized by: 1) low grade metasedimentary and metavolcanic rocks (greenstones) averaging of 18% and ranging from 0

to 64%; 2) intrusive and high grade metamorphic rocks (granitic) averaging 48% and ranging from 0 to 100%; 3) carbonate averaging 34% and ranging from 0 to 100%; and 4) sandstone, which in no case exceeds 2% of the pebble fraction. Greenstone pebbles are most abundant in central to eastern areas; granitic clasts are most abundant in the northwest and southeast; carbonate is most highly concentrated in the southwest and northeast, with an anomaly at Cross Lake; and trace levels of sandstone preferentially occur in north-central areas.

Till lacking a visible reaction to HCl contains 1 to 2% calcite according to the Chittick method, although one sample indicates that as much as 7% dolomite may be present without a visible reaction to HCl. Calcite values average 13% and range from 0 to 30%, whereas dolomite averages 17% and ranges from 0 to 65%. Calcite preferentially occurs from the southwest to the centre of the area, whereas dolomite is highest in the southwest and northeast. Very high dolomite values were obtained in sediments derived from Western Canada Sedimentary Basin rocks west of Lake Winnipeg.

Values of less than 5% carbonate in the coarse pebbles correlate in most cases to total Chittick carbonate values of 0 to 20% in the <63 micron matrix. Samples with carbonate pebble values ranging from 10 to 80% correspond to matrix carbonate values of about 40%, with variability between 30 and 50%. Till with close to 100% carbonate in the pebbles contains 60 to 85% Chittick carbonate in the <63 micron matrix. Till with <10% carbonate in the pebbles contains in most cases <12% calcite, whereas samples with 10 to 100% carbonate in the pebbles contain 12 to 30% calcite, with no correlation to the pebbles in this range. Sediments with <5% carbonate in the pebbles contain <10% dolomite. In samples containing between 5 and 80% carbonate in the pebbles, dolomite in the matrix is correlated to the proportion of carbonate pebbles, rising from 25 to 30%. In till with 100% carbonate in the pebbles, dolomite in the matrix is about 60%. High pebble carbonate values occur west of Lake Winnipeg, where the carbonate is not diluted by far-travelled Precambrian debris as is the case in the Hudson Bay Lowland, and

where the carbonate happens to be high in dolomite. It is apparent that calcite values are very variable, with little correlation to the pebbles. This may be related to partial dissolution, or pedogenic precipitation, of calcite at the sampling depths. Precipitation of calcite may be the explanation for anomalous calcite values in the central part of the area. Hence dolomite may be a more reliable indicator of primary carbonate content.

Heavy Mineral Geochemistry

Data presented in Appendix 2 include several trends in heavy mineral geochemistry related to known or potential mineralization and regional geology. Au concentration in the heavy minerals shows some correlation to the elevated gold grain counts already noted for the area southwest of Island Lake (Appendix 1), but slightly elevated values also are present in the Molson Lake region. Elements that show elevated values in the Thompson region include Co, Ni, and Sc. Elevated values for Co and Cr are present within the carbonate terrane of the southwest, although small concentrate size may have been a factor in these determinations. Cr also is elevated south of Island Lake. Rare earths, U, and Th are highest in the eastern half of the area. Elevated Ta values are present southeast of Molson Lake. W values are highest in the Gods Lake/Island Lake region.

Till Matrix Geochemistry

Data presented in Appendix 3 include several trends in the geochemistry of the <63 micron fraction. Arsenic values, as well as Ba, are highest in noncalcareous till in the northwestern to southeastern portions of the study area. Au in this fraction differs from values in the heavy mineral concentrate, with slightly elevated values in the Thompson/Cross Lake region. The lack of correspondence between <63 micron and the concentrates may, in part, be related to dilution by almandine garnet in the Thompson area. Ca values show a pattern similar to carbonate values. The highest Co and Cr values occur from Setting Lake to Thompson. The Ni pattern is less well defined. Na is elevated in the southeast, while La, Th and U values are highest from

the northwest to east central areas.

Data for the geochemistry of the <2 micron fraction are presented in Appendix 4. The highest Ag, As, La, Mn, values occur in the Molson Lake/Island Lake area. Values for Al, Cd, Fe, Hg, Li, Mo, Nb, are highest in the noncalcareous till southwest of Island Lake. Ba, Co, Cr, Cu, K, Ni, Ti, and Zn are highest in the Thompson region. Na and V are highest in the Precambrian-debris-rich till extending from the northwest to the southeast. Pb, Sr, and Y values are highest north of Island Lake.

Indicator Mineral Geochemistry

Data presented in Appendix 5, Part 1, are weight percent oxide values obtained from all mounted grains. Most chalcopyrite grains were not analysed. Included in the data listing, but not in the mineral tallies presented in Appendix 5, Part 2, or in the maps, are data obtained from almandine garnet, amphibole, diopside, epidote, Fe-clinopyroxene, garnet of mixed end-member affinity, hematite, ilmenite, monazite, orthopyroxene, pyrite, spessartine garnet, sphene, and zircon.

Among the 21 garnets analysed, 13 contain elevated Cr_2O_3 concentrations (see Appendix 5, Part 3). Among these Cr-garnets, three are non-magnesian Cr-grossulars, whereas the remaining ten are Cr-pyropes. All of these Cr-pyropes, possibly with one exception, are non-titanian in composition. None are subcalcic, hence a G9 designation in the Dawson and Stephens classification (Fipke et al, 1995) is applied. Among 20 ilmenites, 19 are Mg-ilmenite, all of which contain elevated Cr_2O_3 concentrations. Among 17 Cr-spinels, none exceed the criteria for diamond inclusion composition (60% Cr_2O_3 , 12% MgO).

The Cr-pyropes are scattered at a frequency of one grain per site across the central part of the study area (Appendix 5, Part 4), with one two-grain count at Butterfly Lake, northwest of Molson

Lake. This site also yielded one eclogitic garnet and 5 Mg-ilmenites. Other Mg-ilmenites are scattered in the central to north-central area, with several also occurring in the northeast. Cr-spinels (chromite and magnesiochromite) also show their highest count at Butterfly Lake, although additional occurrences preferentially occur southwest of Thompson.

A total of 546 pyroxenes were analysed (see Appendix 5, Part 3). Those with <3.1% CaO were considered orthopyroxenes. Of the remaining grains, 0.5% Cr₂O₃ was set as the minimum for designation as Cr-diopside (Fipke et al. 1995), although about 0.3% Cr₂O₃ seems to be the break between chrome-bearing and non-chrome-bearing pyroxenes. Several of these grains are subcalcic in composition. Pyroxenes enriched in FeO tend not to be chrome-bearing, but Na₂O shows a positive correlation with Cr₂O₃ up to about 2%.

Cr-diopside counts in the area are very high compared to other regions in Canada. The highest counts, tens of grains per site, occur along the Thompson Nickel Belt. This strongly suggest that the Cr-diopsides are associated with the rocks of the Churchill/Superior Boundary Zone, and also strongly implies that Cr-diopsides reported for the northern Interlake region, west of Lake Winnipeg, by Thorleifson et al. (1994) are derived from the same general source. There is no indication that the Cr-diopsides are derived from kimberlite. Counts of one Cr-diopside per site also occur across the central to northeastern portion of the area, preferentially in calcareous till.

Among 184 spinels (see Appendix 5, Part 3), a total which excludes the Cr-spinels, 13 are gahnites with >25% ZnO. Four which are slightly enriched at >3% ZnO were labelled Zn-spinels. These gahnites and Zn-spinels contain elevated levels of FeO (Figure 3), hence the high-Zn grains may be regarded as Fe-gahnites. The non-zinc-bearing spinels may be divided at 0.7% MnO into Mn-spinels and spinels. An apparent relationship between ZnO and Na₂O is due to false sodium counts due to peak overlap. Rutiles are all very close to 100%TiO₂, and those with >0.8% Cr₂O₃ were labelled Cr-rutiles. Among the 16 analysed epidotes, those with >0.75% MnO

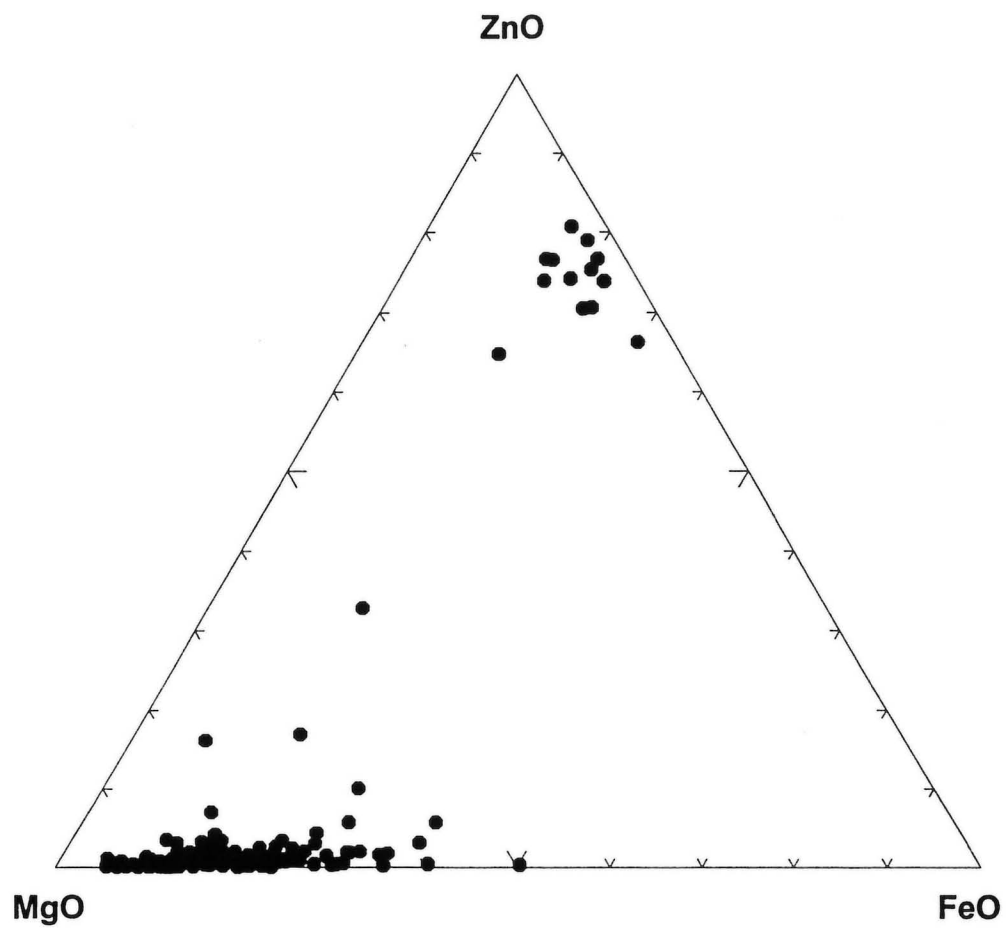


Figure 3: MgO-ZnO-FeO ternary plot for spinels.

were labelled Mn-epidote.

Several minerals judged to be indicators of mineral deposits by Overburden Drilling Management Ltd. occur in the study area (Appendix 5, Part 4). Chalcopyrite, as is the case for all sulphides, weathers rapidly in aerated soils, but a few grains in many circumstances may survive due to factors such as coatings. In northeastern Manitoba, surviving chalcopyrite grains were recovered from the till across the area, but the highest counts were obtained in the Thompson Belt, Wekusko Lake, and Red Sucker Lake areas. Also occurring in the Thompson region are corundum, Cr-grossular, Cr-rutile, kornepupine, loellingite, Mn-epidote, rutile, sapphirine, tourmaline, and Zn-spinel. Fe-gahnite, however, is scattered across the region. Mn-spinel and a molybdenite grain were recovered at the southeastern-most site. Spinel is widely distributed in the Thompson and northern areas.

CONCLUSIONS

- Northeastern Manitoba is a region with much potential for discoveries of mineral deposits. Till over much of the area is an appropriate sampling medium for geochemistry and indicator mineral tracing. Glaciofluvial sediments in deposits such as eskers, as well as modern fluvial sediments in the beds of large rivers, would provide additional, but more variable, opportunities for indicator mineral sampling.
- The area has been influenced primarily by two phases of southwestward radiating ice flow: one that extended beyond the study area; and one that reached the Hargrave Moraine, at the north end of Lake Winnipeg.
- A major factor in till geochemistry and indicator mineral tracing in northeastern Manitoba is the presence of an extensive cover of exotic till derived from the Hudson Bay Lowland. Within the area of nearly continuous cover, northeast of Oxford Lake and Gods Lake,

sampling of the uppermost till deposits is of limited application in mineral exploration, except down-ice from areas of anomalously thin sediments, or in broad, regional assessments.

- A 40 km spacing between till sampling sites is marginally adequate to broadly define major features of sediment provenance and composition in the region, such as the Hudson Bay Lowland carbonate limit and manifestations of the Thompson Nickel Belt.
- The survey provides a useful case study with respect to application of low density till sampling in the search for deposits such as those of the Thompson Nickel Belt. Several geochemical and indicator mineral variables are elevated in this region.
- Cr-diopside is abundant along the Thompson Nickel Belt, and for hundreds of kilometres down-ice from the apparent source or sources. There is no indication that these Cr-diopsides are associated with kimberlite, and their occurrence provides an informative example of the long distance transport of Cr-diopside that is typical of recently glaciated environments.
- Kimberlite indicator minerals are present in the area, with preferential occurrence in the central portion of the region. A multiple-grain, multiple-mineral occurrence was identified at Butterfly Lake, although these minerals may have been derived from some distance up-ice.
- Various other geochemical and indicator mineral patterns, such as gold southwest of Island Lake, may be relevant with respect to mineral exploration.
- The survey provides a useful general reference regarding the glacial history and environmental geochemistry of the region.

ACKNOWLEDGMENTS

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REFERENCES

- Fedikow, M. A. F., Nielsen, E., Conley, G. G., and Matile, G. L. D. 1997. Operation Superior: multimedia geochemical survey results from the Echimamish River, Carrot River, and Munro Lake Greenstone Belts, northern Superior Province, Manitoba (NTS 53L and 63I); Manitoba Energy and Mines Open File 97-2.
- Fipke, C. E., Gurney, J. J., and Moore, R. O. 1995. Diamond exploration techniques emphasising indicator mineral geochemistry and Canadian examples; Geological Survey of Canada Bulletin 423, 86 p.
- Kaszycki, C. A. 1989. Surficial Geology and Till Composition Northwestern Manitoba; Geological Survey of Canada Open File 2118; 48 p.
- Kaszycki, C. A., Nielsen, E. and Gobert, G. 1996. Surficial geochemistry and response to volcanic-hosted massive sulphide mineralization in the Snow Lake region; in EXTECH I: A Multidisciplinary Approach to Massive Sulphide Research in the Rusty Lake-Snow Lake Greenstone Belts, Manitoba; G. F. Bonham-Carter, A. G. Galley, and G. E. M. Hall, eds.; Geological Survey of Canada Bulletin 426, p. 139-154.
- McMartin, I., Henderson, P. J., Nielsen, E., and Campbell, J. E. 1996. Surficial geology, till and humus composition across the Shield margin: geospatial analysis of a glaciated environment; Geological Survey of Canada Open File 3277; 300 p., one diskette.
- Nielsen, E. , Morgan, A. V., Morgan, A., Mott, R. J., Rutter, N. W., and Causse, C. 1986. Stratigraphy, paleoecology, and glacial history of the Gillam area, Manitoba; Canadian Journal of Earth Sciences, v. 23, p. 1641-1661.

Thorleifson, L. H., Garrett, R. G., and Matile, G. L. D. 1994. Prairie kimberlite study – indicator mineral geochemistry; Geological Survey of Canada Open File 2875, one diskette.

Appendix I

Part 1: Location and descriptive data; data listing

Appendix 1: Part 1: Location and descriptive data;data listing

Site	Location	Zone	Easting	Northing	Depth_m	Hue	Value	Chroma	HCIRxn	Wt_kg	+2mm_kg	H2O_%	NFM_g
1	Notigi	14	467311	6187435	1.6	5Y	5	2	strong	18.65	0.90	7.6	127.6
2	WimapediLake	14	446048	6115164	0.8	2.5Y	6	3	none	17.85	2.95	4.7	409.3
3	StallLake	14	439130	6076662	2.8	5Y	5	2	moderate	20.40	1.20	6.0	489.9
4	Wekusko	14	453042	6046297	0.4	2.5Y	6	2	strong	19.75	2.60	6.8	240.1
5	EggLakePortage	14	439537	5994093	0.8	2.5Y	7	2	strong	19.40	1.30	9.8	58.5
6	Easterville	14	450320	5881337	1.2	2.5Y	6	4	strong	19.45	1.80	8.2	14.2
7	FootprintRiver	14	504405	6195355	1.6	5Y	7	2	strong	20.60	3.70	3.8	199.7
8	Ponton	14	492387	6055393	2.5	5Y	5	2	strong	17.30	1.05	11.2	88.3
9	BakerLake	14	484820	5971526	0.9	2.5Y	6	2	strong	19.75	1.60	8.5	42.8
10	SturgeonGillRd.	14	477395	5928166	0.9	2.5Y	7	2	strong	21.50	2.45	8.9	12.6
11	GrandRapids	14	483243	5884499	0.9	2.5Y	6	2	strong	21.05	3.50	7.2	5.7
12	NobelLake	14	561511	6189286	1.7	5Y	6	2	strong	20.15	2.95	6.6	678.1
13	PaintLake	14	540963	6131024	0.6	5Y	6	2	strong	25.40	3.85	9.2	354.6
14	SettingLake	14	527409	6094942	1.9	5Y	6	2	strong	18.90	1.75	8.0	491.0
15	ColinLakeCamp	14	522478	6073323	1.6	5Y	4	3	none	21.05	6.85	7.1	208.2
16	TippettLake	14	545066	6054218	1.1	5Y	6	2	strong	20.70	1.60	9.1	64.7
17	KiskittoDam	14	544066	6018714	0.5	5Y	6	2	strong	23.45	1.45	16.2	35.2
18	Thompson	14	572076	6181872	6.2	5Y	5	2	strong	20.00	7.85	6.1	88.6
19	ThicketPortage	14	584494	6129940	2.1	2.5Y	5	2	strong	25.20	4.15	8.9	307.0
20	SipiwekLake	14	596905	6106227	0.6	2.5Y	5	4	moderate	20.00	3.90	7.7	272.5
21	CrossLakeFerry	14	582351	6046647	2.2	5Y	6	2	strong	20.25	2.15	7.8	47.9
22	Jenpeg	14	566336	6041293	0.6	5Y	5	2	strong	21.55	4.10	7.9	66.4
23	NorwayHouseFerry	14	592010	6009729	1.2	5Y	5	2	strong	17.35	0.50	12.8	14.9
24	NorwayHouse	14	578269	5982008	1.1	5Y	5	2	strong	18.30	0.75	11.1	22.9
25	MutchesonLake	14	630576	6119753	0.8	2.5Y	7	3	strong	21.95	3.35	7.3	73.4
26	CrossLake	14	621068	6087352	1.0	2.5Y	5	3	strong	23.35	1.60	13.3	34.4
27	ButterflyLake	14	614870	6032589	0.6	10YR	4	3	none	19.30	7.65	5.6	50.1
28	MolsonLake	14	644411	6015700	0.7	2.5Y	4	3	none	22.10	7.65	7.6	69.9
29	WashaLake	14	636775	5977407	0.6	2.5Y	5	3	none	22.65	2.60	13.1	71.3
30	AikenRiver	14	680641	6198138	0.8	2.5Y	6	3	strong	25.95	2.05	11.5	44.3
31	BearheadLake	14	680645	6156103	0.6	2.5Y	5	2	strong	25.40	3.00	16.3	84.8
32	WapisewLake	14	672198	6113145	0.4	2.5Y	7	2	strong	23.05	2.00	11.5	25.2
33	KapechLake	14	687703	6088963	0.7	2.5Y	5	2	strong	24.35	3.20	10.9	59.4
34	Porcupine	14	669557	6057027	0.8	2.5Y	6	3	strong	19.70	1.20	14.5	26.8
35	KaweepBay	14	663252	6008878	0.7	2.5Y	6	2	strong	20.20	0.20	21.9	13.3
36	PelicanLake	14	681482	5958995	0.4	2.5Y	5	6	none	20.50	5.80	10.8	37.1
37	GunisaoLake	14	690390	5939780	0.3	10YR	4	3	none	18.55	3.85	25.1	5.9
38	MakatesibiLake	14	689100	5885921	0.4	2.5Y	5	6	none	21.35	3.30	21.7	93.6
39	WarLake	15	709310	6202603	0.6	2.5Y	6	3	strong	26.00	2.00	8.6	32.0
40	HighHillLake	15	714293	6169208	0.9	2.5Y	6	2	strong	18.15	1.30	8.9	41.0
41	CaliforniaLake	15	717769	6110441	0.7	2.5Y	7	2	strong	20.35	2.20	8.7	53.3
42	SempleLake	15	702794	6095704	0.7	2.5Y	7	3	strong	25.55	1.90	7.4	52.6
43	OtataLake	15	708349	5991767	0.4	2.5Y	5	4	none	17.95	2.60	9.7	54.9
44	BigstoneLake	15	713537	5953699	0.5	2.5Y	5	4	none	19.10	1.40	19.0	20.5

Appendix 1: Part 1: Location and descriptive data;data listing

Site	Location	Zone	Easting	Northing	Depth_m	Hue	Value	Chroma	HCIRxn	Wt_kg	+2mm_kg	H2O_%	NFM_g
45	OtterStomachLake	15	725766	5935207	0.4	2.5Y	4	4	strong	24.90	3.40	8.9	49.3
46	WakusLake	15	727254	5881610	0.4	2.5Y	7	3	none	22.45	3.15	7.4	40.8
47	HubleyLake	15	733962	6196090	0.6	2.5Y	5	3	strong	24.20	1.85	14.2	19.8
48	PalmerLake	15	764391	6169913	0.4	2.5Y	5	3	strong	23.95	2.10	8.4	47.2
49	SchwatkaLake	15	744041	6132436	0.7	10YR	6	3	strong	21.10	1.80	7.5	31.9
50	MagillLake	15	763347	6076577	0.7	2.5Y	6	3	strong	25.30	2.55	10.6	34.8
51	TouchwoodLake	15	768533	6043257	0.7	2.5Y	5	3	strong	24.65	2.85	13.6	15.7
52	WestMistuhLake	15	762658	6009224	0.7	2.5Y	6	3	strong	25.55	3.20	9.1	36.5
53	CochraneBay	15	780440	5985675	0.9	2.5Y	5	4	none	22.95	6.50	7.2	39.3
54	CantinLake	15	753387	5931927	0.4	2.5Y	5	4	none	22.20	5.50	11.9	43.0
55	GormanLake	15	775448	5889230	0.8	2.5Y	6	6	none	19.45	6.20	8.2	18.4
56	AtkinsonLake	15	781023	6212688	1.0	2.5Y	5	3	strong	24.65	6.70	7.1	54.3
57	WilsieLake	15	801432	6143408	0.6	2.5Y	5	3	strong	24.05	1.90	9.6	33.4
58	KneeLake	15	803400	6123254	0.7	5Y	4	1	strong	26.05	1.65	10.8	41.1
59	TapperLake	15	797767	6089672	0.8	2.5Y	5	3	strong	23.00	3.30	7.2	47.0
60	GodsLakeNarrows	15	792370	6054407	2.1	2.5Y	7	3	strong	23.60	2.25	11.4	35.8
61	MokomanLake	15	812706	6016168	0.6	2.5Y	7	3	none	18.15	2.10	5.8	30.3
62	ChapinBay	15	803379	5992340	0.5	2.5Y	5	3	none	24.75	2.00	7.2	62.4
63	NielsonLake	15	784930	5923045	0.2	2.5Y	4	4	none	16.75	2.40	7.6	29.9
64	KinoLake	15	833509	6176470	0.5	10YR	4	3	strong	25.45	1.50	8.6	27.7
65	FishLake	15	825518	6124439	0.5	2.5Y	5	3	strong	24.30	1.90	10.5	26.3
66	PiskwaLake	15	850824	6077801	0.6	2.5Y	5	3	strong	24.15	0.60	5.3	40.5
67	WebberLake	15	826505	6046214	0.4	2.5Y	7	3	strong	25.40	2.30	10.3	28.5
68	RedSuckerLake	15	839965	6014522	0.9	2.5Y	5	2	strong	24.80	2.40	8.7	39.2
69	SagawitchewanBay	15	841006	5967087	0.7	2.5Y	5	2	strong	17.90	1.90	13.2	15.7
70	WestMinistikLake	15	868828	6196091	1.1	2.5Y	5	3	strong	25.60	2.20	11.7	22.9
71	PatchLake	15	864326	6163069	1.4	2.5Y	4	3	strong	26.05	1.90	12.3	20.1
72	RedCrossLake	15	884609	6120515	0.5	2.5Y	5	3	strong	15.70	2.20	14.1	8.3
73	SharpeLake	15	870252	6046388	0.7	2.5Y	6	3	strong	23.60	2.30	9.1	31.2
74	RichardsonLake	15	883849	6035511	0.4	5Y	5	2	strong	25.50	1.90	4.6	20.0
75	GodsRiver	15	925546	6214655	4.2	5Y	4	1	strong	21.65	2.40	13.5	16.4
76	GodsRiver	15	929422	6182992	2.2	2.5Y	4	2	strong	18.05	1.90	10.3	16.3
77	GodsRiver	15	902490	6151319	8.3	10YR	5	3	strong	19.60	2.20	8.5	13.3
78	MonumentBay	15	905750	6046852	1.0	2.5Y	5	3	strong	24.10	1.70	11.6	29.7

Appendix 1: Part 1: Location and descriptive data;data listing

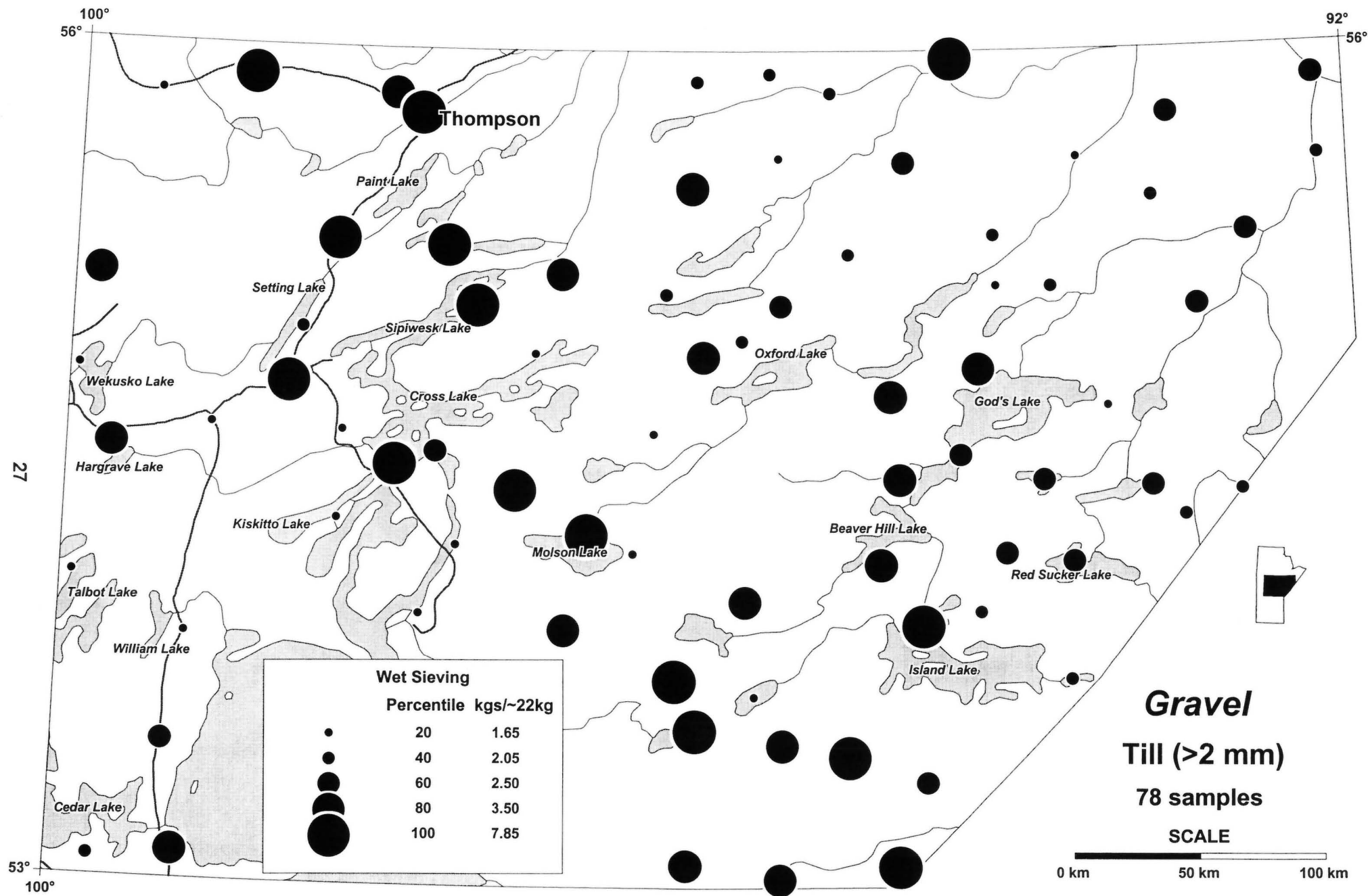
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3	12.7	4	8	92	0	0	1	2
4	3.7	5	3	19	78	0	17	41
5	2.0	2	0	1	99	0	12	52
6	2.4	0	0	1	99	0	21	54
7	25.1	3	7	87	6	0	7	11
8	7.4	0	10	53	37	0	15	13
9	9.5	0	13	14	72	1	24	26
10	2.8	0	1	1	98	0	21	62
11	0.9	0	0	0	100	0	19	65
12	9.2	1	2	97	1	0	4	4
13	35.7	3	11	82	7	0	12	12
14	75.3	5	0	100	0	0	9	12
15	31.1	2	8	92	0	0	1	2
16	20.4	1	21	47	32	0	14	24
17	13.3	0	14	82	4	0	11	30
18	15.1	6	15	84	1	0	8	9
19	53.7	0	28	57	15	0	13	20
20	110.5	6	12	88	0	0	2	1
21	16.2	7	15	37	48	0	12	19
22	18.5	5	20	61	18	1	18	25
23	4.4	2	33	31	36	0	23	17
24	6.0	4	30	57	13	0	19	20
25	23.3	4	26	48	25	1	18	23
26	11.4	4	27	32	40	1	18	22
27	17.7	3	61	38	1	0	0	0
28	22.1	4	64	35	1	0	0	1
29	21.2	7	22	78	0	0	0	0
30	13.2	0	23	40	37	0	18	23
31	21.2	2	17	39	43	1	19	23
32	8.9	2	16	17	66	1	17	28
33	18.9	5	25	26	49	0	13	22
34	10.3	3	30	16	54	0	26	22
35	4.0	2	23	70	7	0	24	17
36	24.0	10	7	93	0	0	1	0
37	4.3	0	1	99	0	0	2	1
38	26.3	11	15	85	0	0	1	0
39	10.7	1	18	34	46	2	18	24
40	13.1	10	13	19	68	0	15	28
41	18.3	7	22	27	50	1	14	24
42	20.9	3	31	13	55	1	18	22
43	18.2	2	13	84	3	0	1	1
44	36.0	3	37	62	1	0	1	1

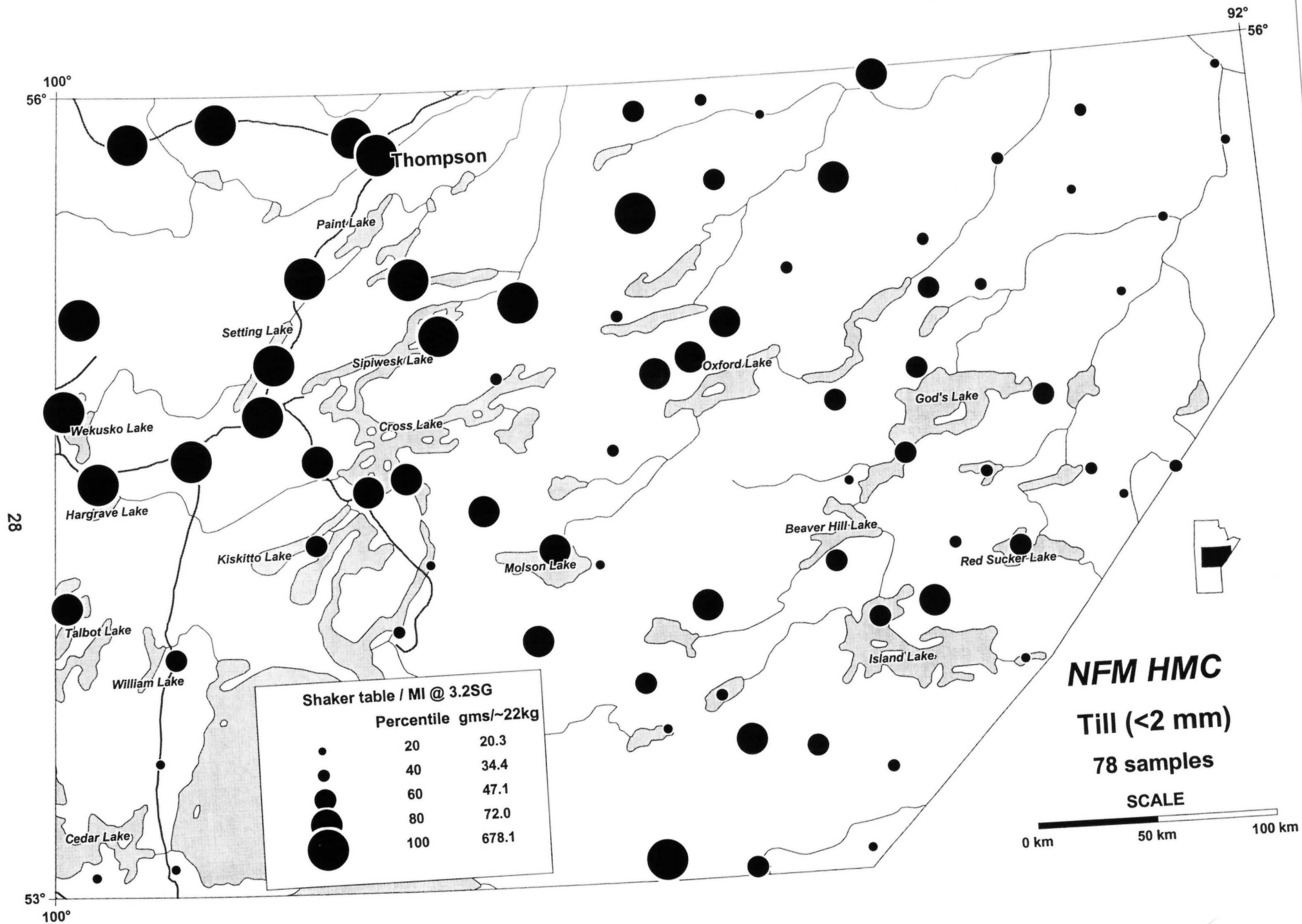
Appendix 1: Part 1: Location and descriptive data;data listing

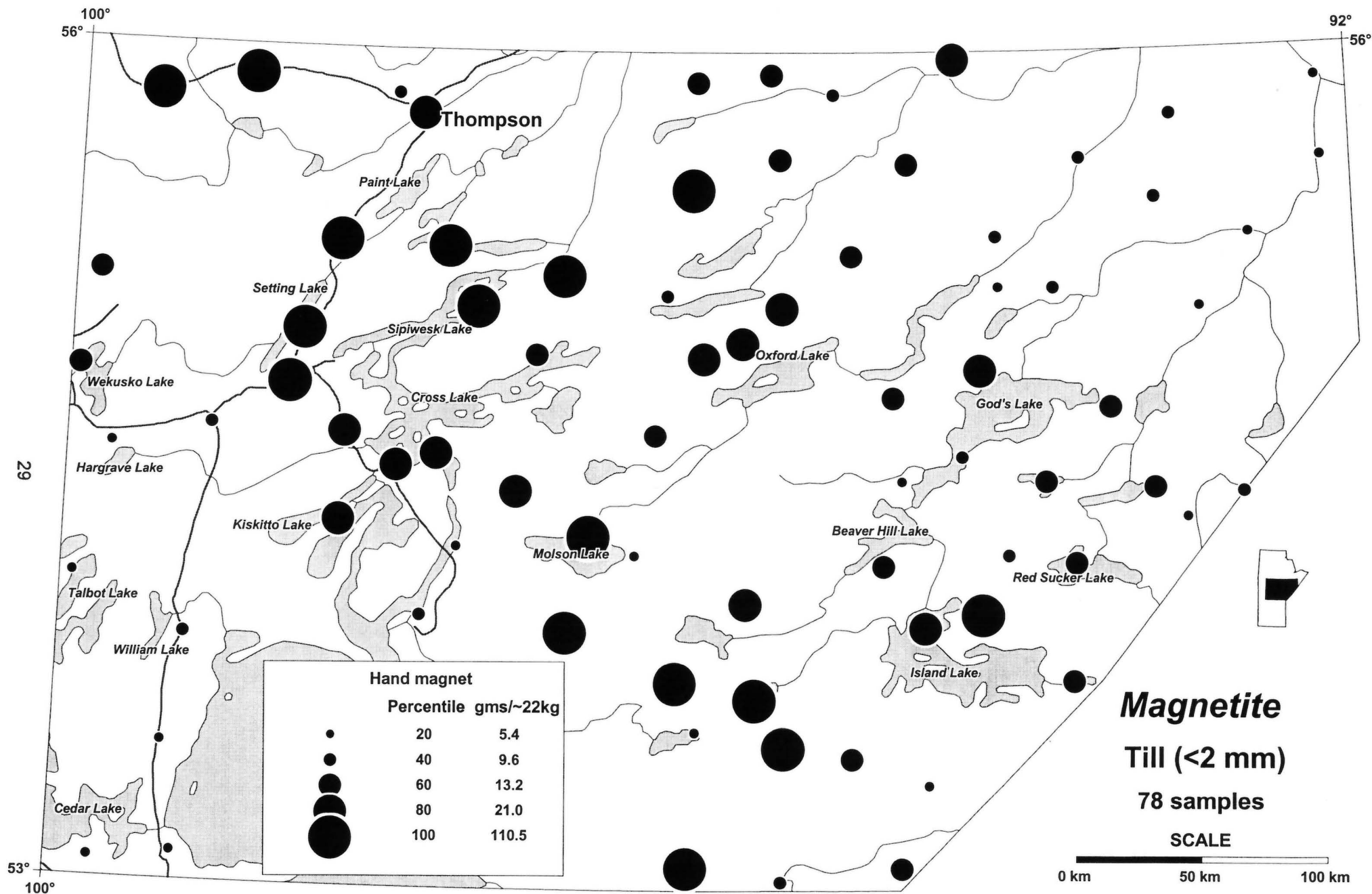
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47	7.5	0	17	26	57	0	15	17
48	13.2	8	13	14	73	0	13	24
49	11.0	3	15	22	63	0	19	23
50	10.5	4	19	22	57	2	18	26
51	4.5	0	10	83	7	0	20	20
52	12.4	3	14	72	14	0	22	16
53	17.3	4	32	68	0	0	1	0
54	12.3	14	4	96	0	0	1	0
55	11.1	1	3	97	0	0	1	0
56	15.1	10	12	17	70	1	19	29
57	7.0	2	17	8	73	2	19	22
58	2.2	1	15	29	55	1	17	24
59	13.5	4	17	25	58	0	16	22
60	7.9	9	26	66	8	0	22	20
61	9.3	1	8	92	0	0	1	0
62	24.0	0	13	84	3	0	2	7
63	1.9	4	23	77	0	0	1	1
64	8.9	6	21	11	68	0	18	25
65	8.3	3	22	10	68	0	20	22
66	13.1	4	25	12	62	1	13	22
67	9.8	4	20	38	42	0	24	22
68	12.5	4	17	70	13	0	15	20
69	9.7	3	55	44	1	0	11	10
70	7.3	1	14	16	70	0	17	20
71	5.6	3	13	10	76	1	17	21
72	2.8	0	9	23	68	0	19	19
73	11.1	1	25	38	36	1	16	19
74	3.4	0	41	22	36	1	22	19
75	2.5	3	9	8	83	0	18	17
76	3.7	0	14	9	77	0	30	27
77	5.2	2	25	4	71	0	20	17
78	7.7	2	38	33	28	1	20	16

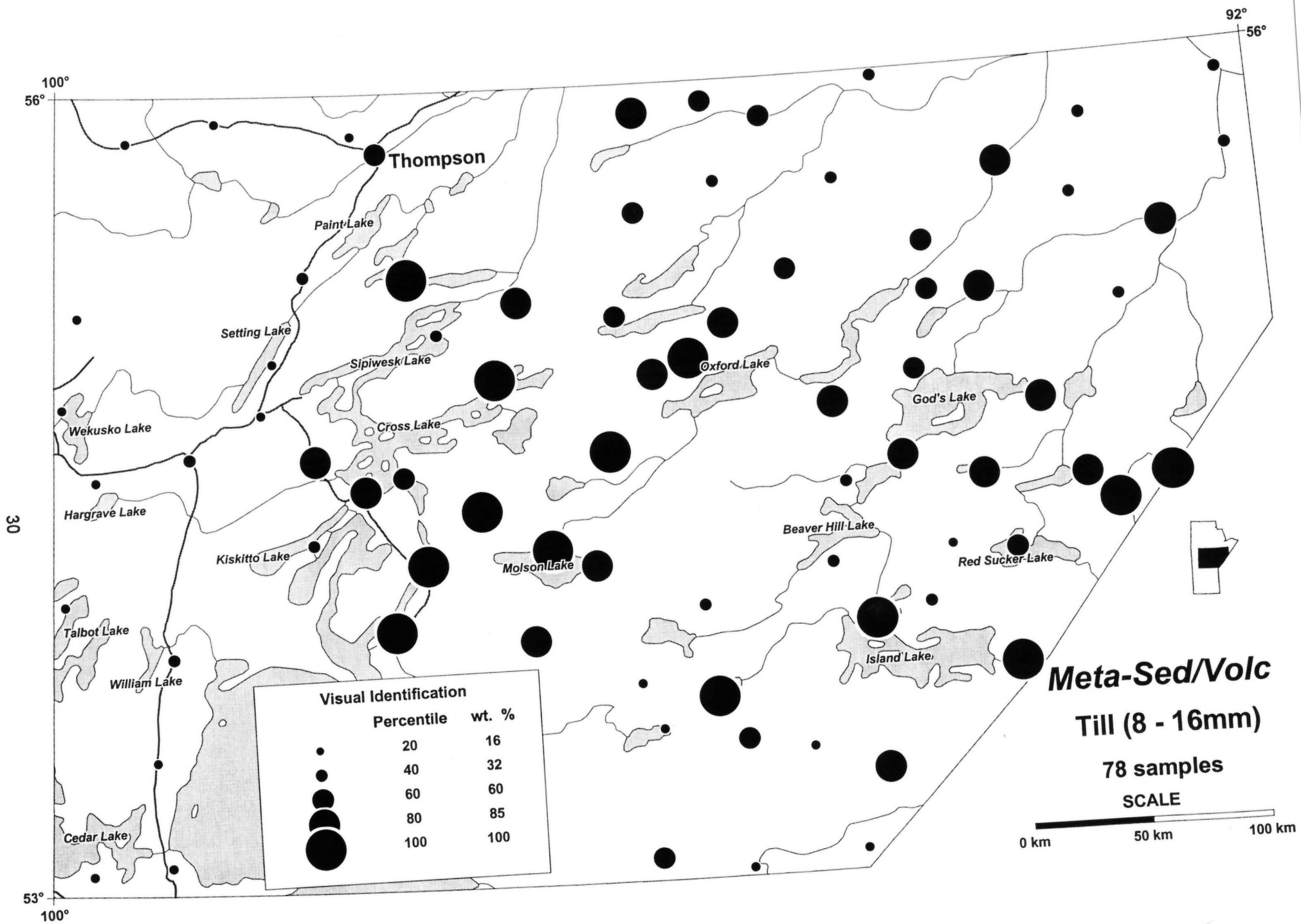
Appendix I

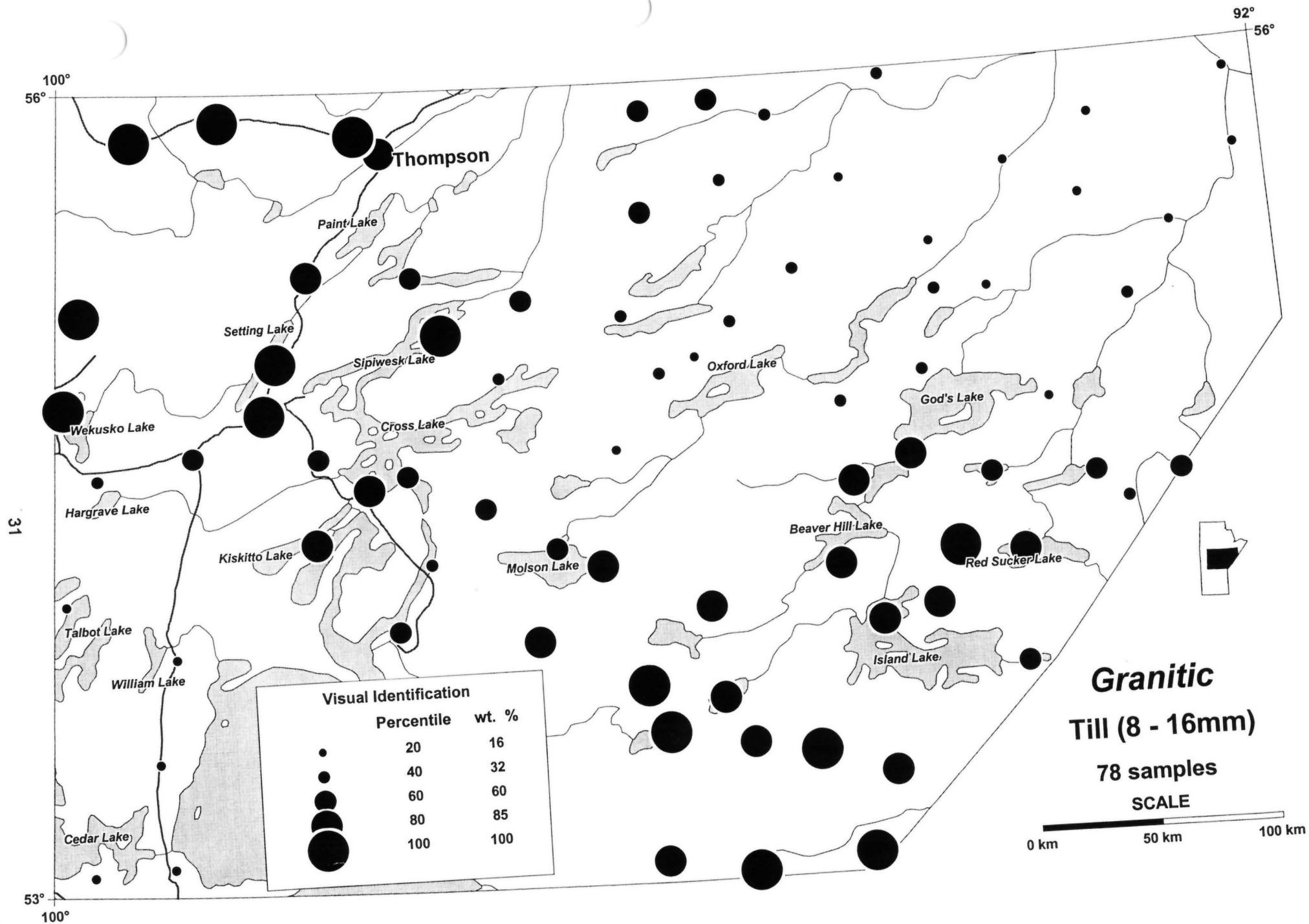
Part 2: Location and descriptive data; maps

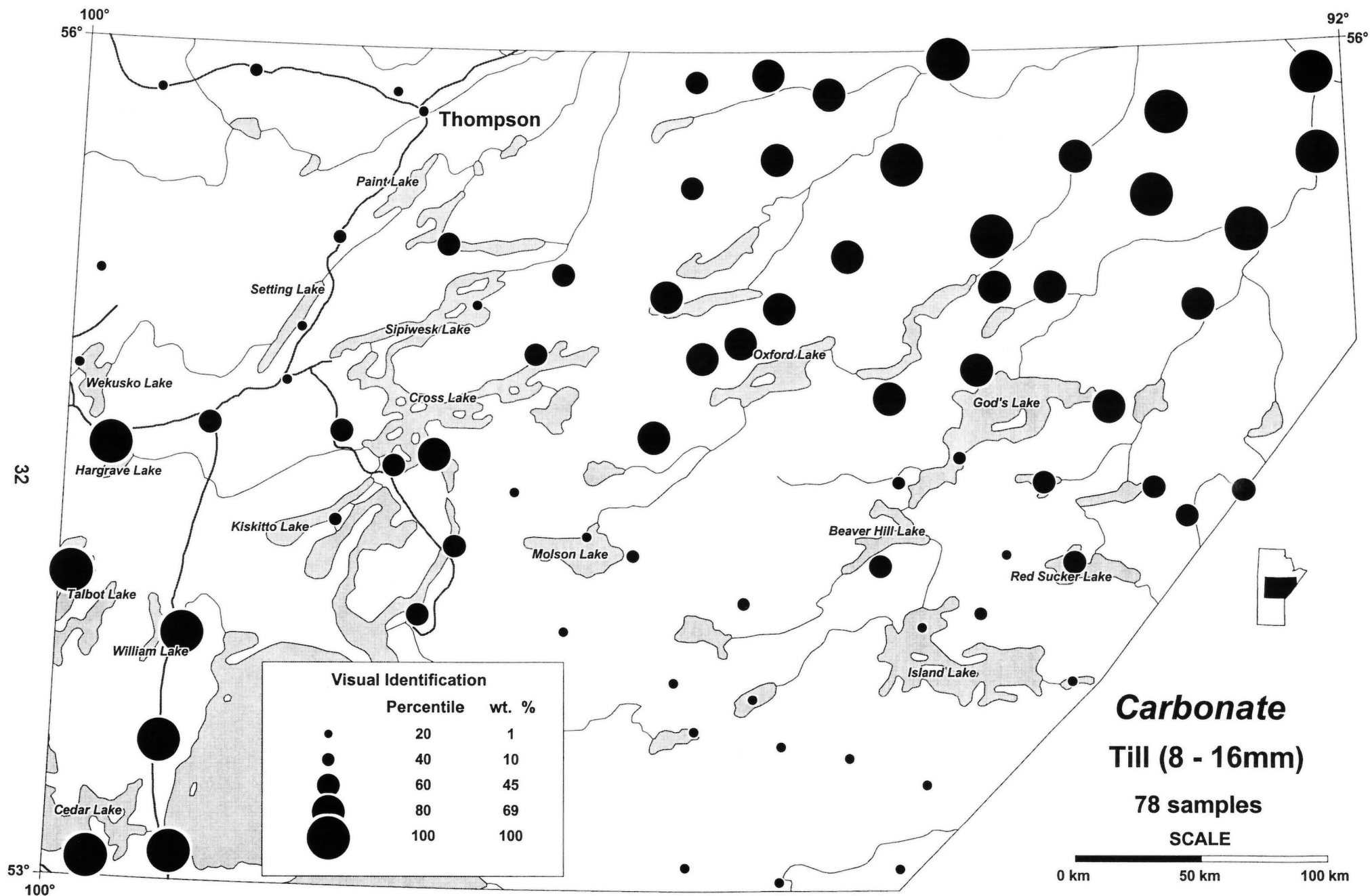


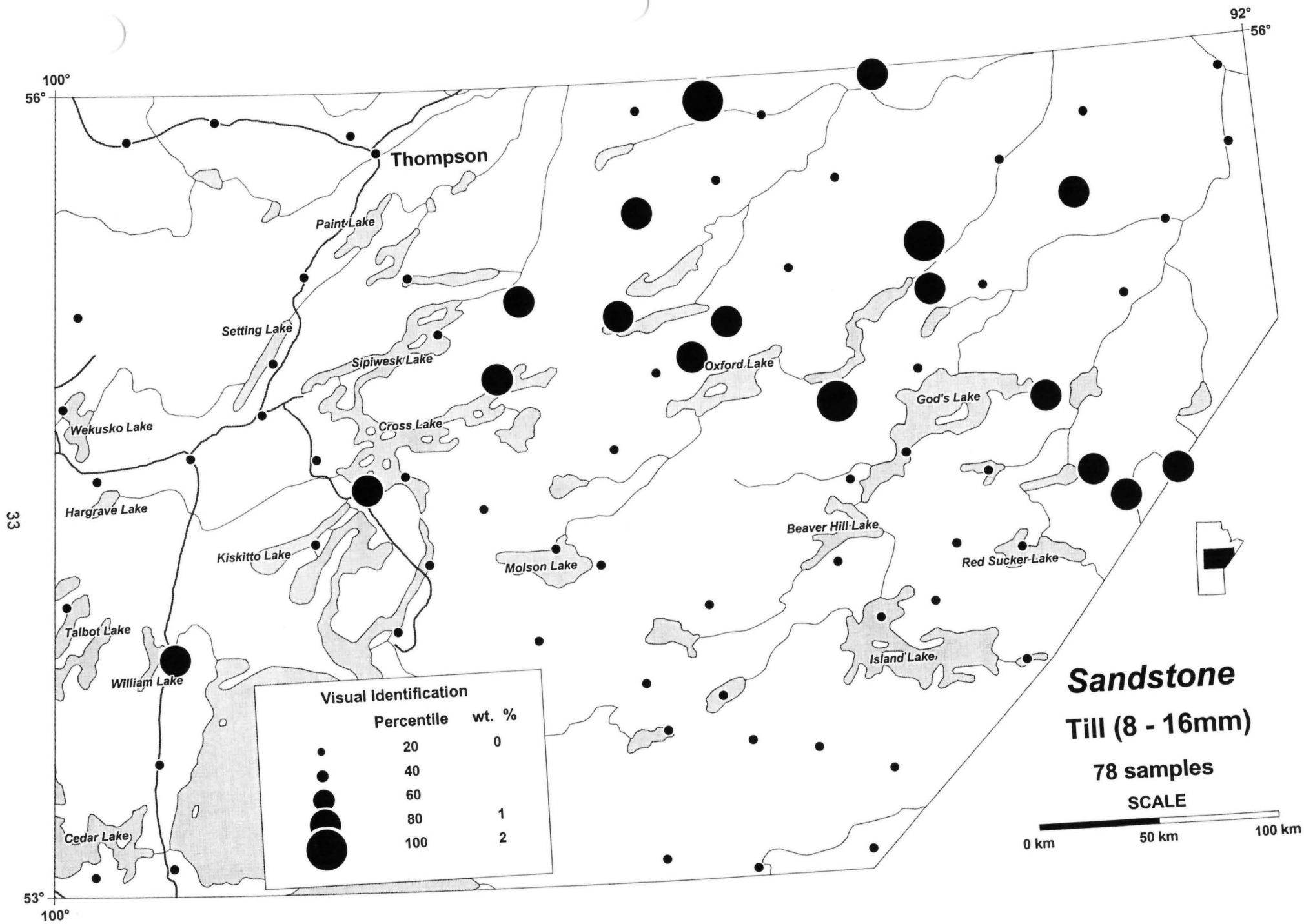


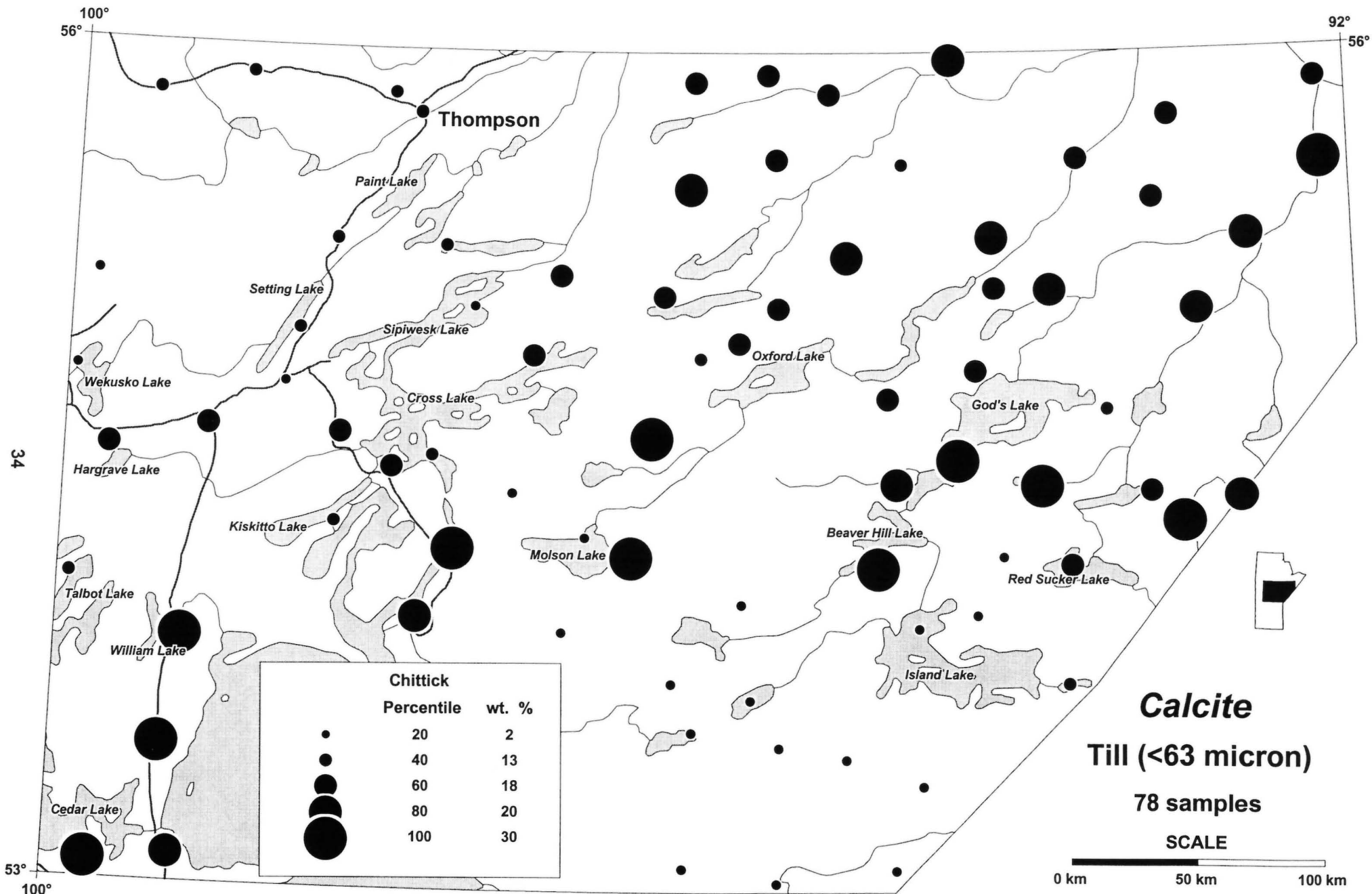


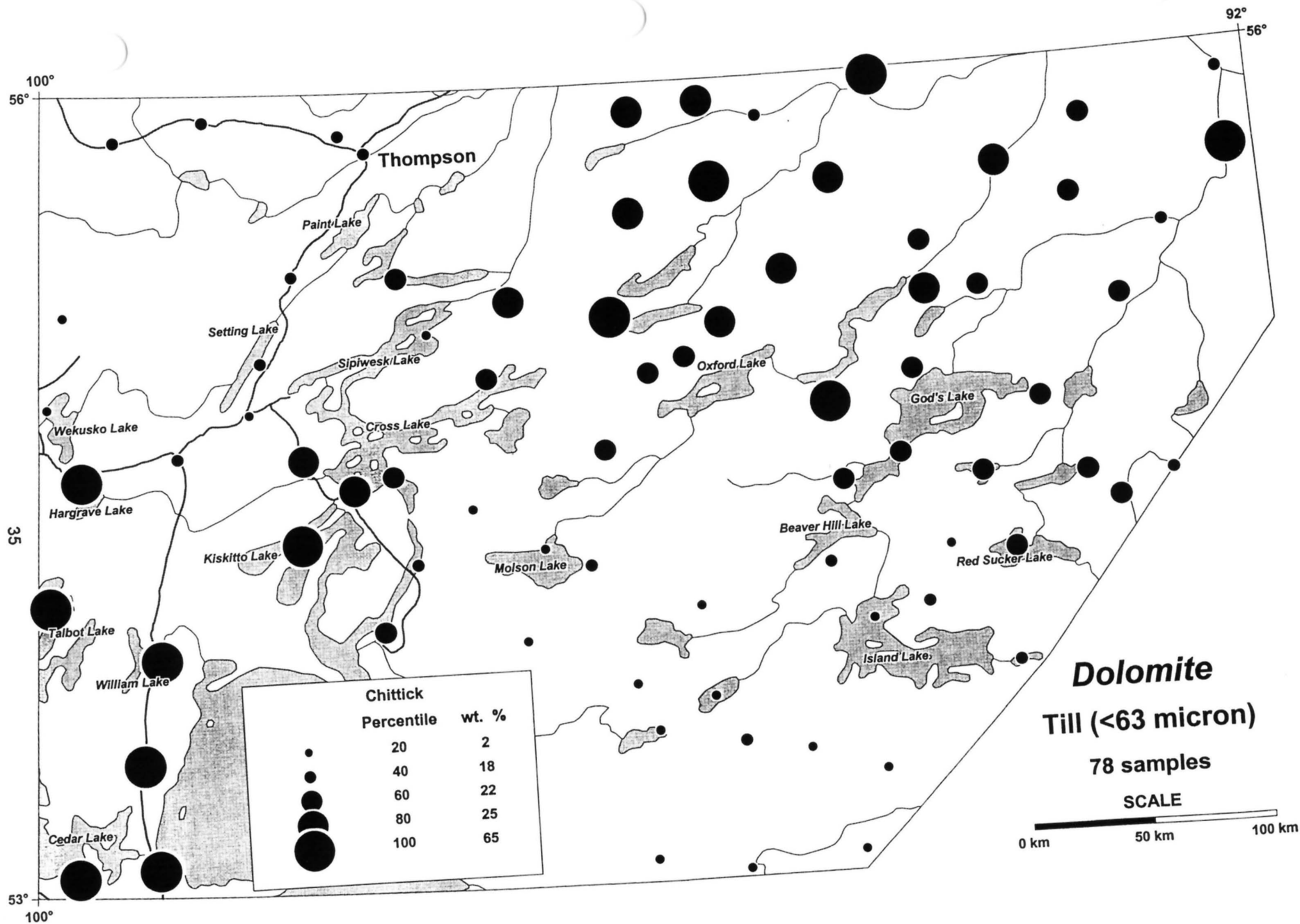


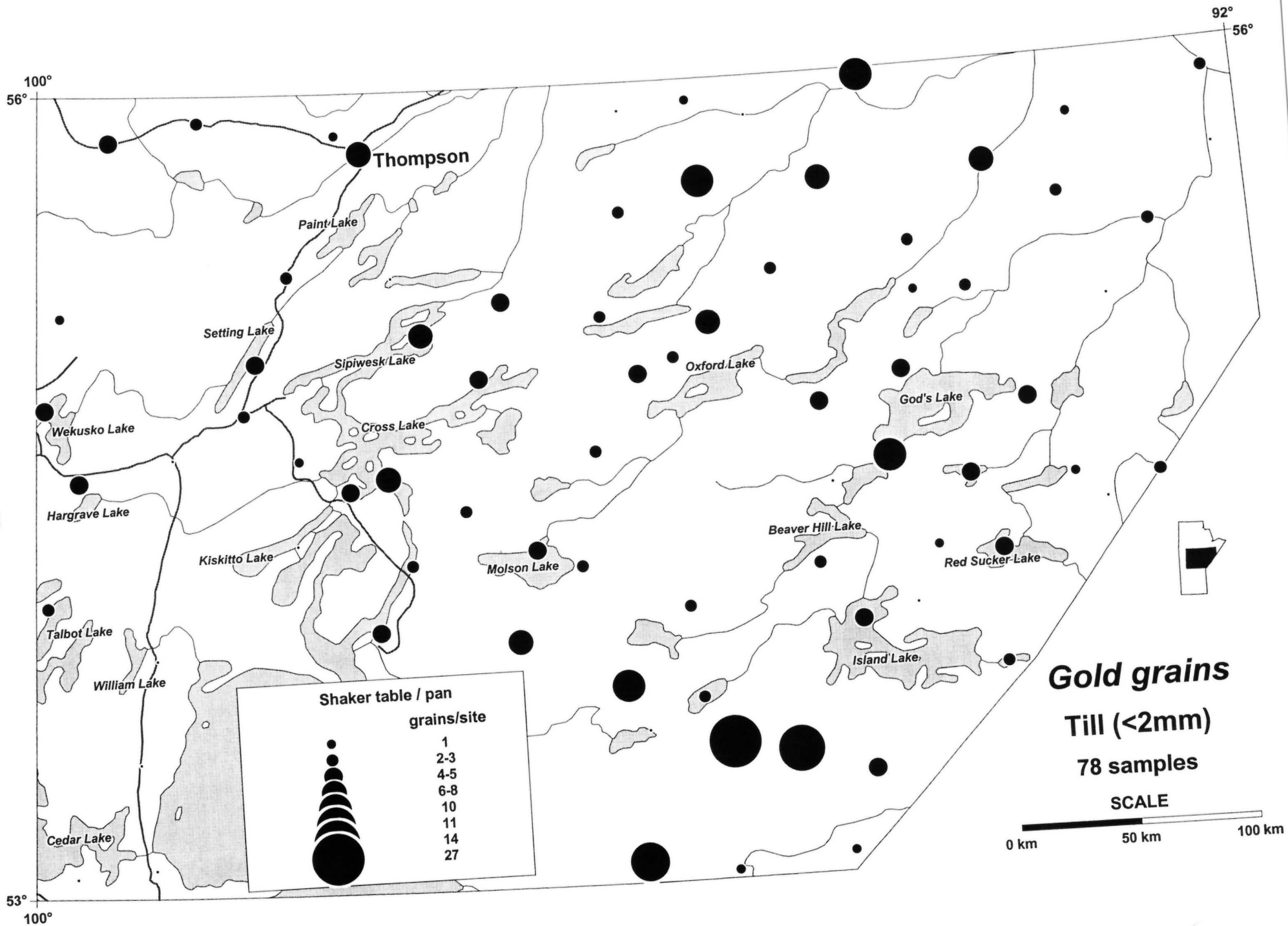












Appendix 2

Part 1: Geochemistry of the heavy mineral fraction; data listing

Appendix 2: Part 1: Geochemisry of the heavy mineral; data listing

Site Unit	Ag ppm	As ppm	Au ppb	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	Hg ppm	Ir ppb	La ppm	Lu ppm	Mo ppm	Na ppm
1	<5	4	<5	<200	<5	1	589	23	525	3	4.6	28.5	55	<5	<40	339	5.3	<20	2617
2	<5	<2	9	<200	<5	2	366	31	234	<2	2.1	19.2	31	<5	<40	214	3.3	<20	1420
3	<5	<2	<5	<200	<5	1	599	30	184	<2	2.5	18.4	34	<5	<40	340	4.1	<20	1252
4	<5	3	91	<200	<5	2	253	25	343	<2	1.3	18.1	16	<5	<40	143	3.6	<20	1551
5	<5	<2	<5	<200	<5	7	190	31	500	<2	2.1	11.4	55	<5	<40	110	1.7	<20	2810
6	<5	17	38	<200	<5	4	330	71	1200	<2	2.5	21.5	120	<5	<40	200	3.0	<20	2380
7	<5	4	21	<200	<5	5	445	22	420	<2	3.0	24.0	42	<5	<40	270	3.9	<20	2019
8	<5	<2	13	<200	<5	1	390	38	570	<2	2.5	13.9	54	<5	<40	250	2.3	<20	2700
9	<5	5	<5	<200	<5	5	370	40	2900	<2	4.4	13.8	130	<5	<40	200	2.6	<20	3520
10	<5	22	57	<200	<5	8	370	62	2000	<2	3.8	17.3	140	<5	<40	230	2.8	<20	3500
11	<5	100	<5	<200	<5	1	560	84	850	<2	4.8	26.8	300	<5	<40	330	5.0	<20	2510
12	<5	<2	10	<200	<5	1	325	29	196	2	1.5	17.6	22	<5	<40	188	3.0	<20	1252
13	<5	<2	<5	<200	<5	4	315	42	886	2	2.9	13.7	75	<5	<40	199	2.6	<20	3589
14	<5	<2	14	<200	<5	6	241	44	620	<2	2.5	13.5	73	<5	<40	147	2.1	<20	3318
15	<5	2	11	<200	<5	5	110	46	430	<2	3.2	13.5	48	<5	<40	62	1.4	<20	5211
16	<5	<2	<5	<200	<5	14	630	34	500	<2	6.2	14.4	220	<5	<40	380	3.8	<20	3420
17	<5	<2	<5	<200	<5	1	1100	35	1000	<2	7.8	16.7	270	<5	<40	650	4.7	<20	3520
18	<5	<2	<5	<200	<5	7	320	49	1200	<2	4.1	14.2	100	<5	<40	200	2.7	<20	3220
19	<5	<2	<5	<200	<5	3	245	44	533	<2	2.0	14.0	50	<5	<40	145	1.5	<20	2258
20	<5	<2	52	<200	<5	4	317	40	297	<2	3.3	14.3	127	<5	<40	180	2.1	<20	3037
21	<5	<2	207	<200	<5	9	730	29	490	<2	9.2	15.0	260	<5	<40	430	4.5	<20	3640
22	<5	<2	<5	<200	<5	1	560	28	580	<2	6.4	13.5	160	<5	<40	340	3.7	23	3720
23	<5	<2	118	<200	<5	12	730	40	530	<2	6.2	15.4	250	<5	<40	460	4.0	<20	4390
24	<5	9	60	820	<5	17	780	38	480	<2	10.9	15.3	250	<5	<40	400	5.3	<20	5580
25	<5	9	124	<200	<5	1	630	24	400	10	7.1	12.2	160	<5	<40	380	3.3	<20	3380
26	<5	16	102	<200	<5	10	910	35	590	5	10.6	16.2	260	<5	<40	500	4.9	<20	4380
27	<5	<2	543	<200	<5	10	430	27	360	<2	6.0	14.0	150	<5	<40	230	3.3	<20	3630
28	<5	<2	<5	<200	<5	11	420	20	240	8	7.4	10.4	160	<5	<40	250	3.7	<20	3600
29	<5	<2	<5	<200	<5	10	390	27	350	<2	6.2	11.3	160	<5	<40	220	3.3	<20	3450
30	<5	<2	<5	<200	<5	1	990	34	510	<2	8.1	16.0	250	<5	<40	570	5.1	<20	3930
31	<5	<2	<5	<200	<5	10	660	23	240	<2	7.4	12.1	170	<5	<40	400	3.5	<20	4360
32	<5	<2	<5	<200	<5	18	1400	35	550	<2	11.7	18.9	320	<5	<40	750	6.3	<20	4250
33	<5	7	50	<200	<5	1	780	30	480	<2	7.8	15.9	240	<5	<40	460	4.6	<20	3500
34	<5	<2	48	<200	<5	1	1100	29	660	<2	10.6	19.6	380	<5	<40	620	5.8	<20	3980
35	<5	<2	455	<200	<5	10	810	36	360	<2	8.2	15.7	310	<5	<40	490	6.1	<20	4320
36	<5	<2	<5	<200	<5	1	1200	24	340	<2	10.0	13.8	300	<5	<40	680	7.2	<20	3050
37	<5	<2	50	<200	<5	1	1900	16	370	<2	10.9	19.4	560	<5	<40	1200	10.9	<20	2300
38	<5	<2	101	<200	<5	6	385	20	775	<2	6.7	9.8	140	<5	<40	205	2.2	<20	4263
39	<5	<2	<5	<200	<5	15	1300	38	580	<2	9.8	19.0	340	<5	<40	760	6.7	<20	3930
40	<5	7	441	<200	<5	1	1000	37	400	<2	7.5	14.4	260	<5	<40	580	5.7	<20	3680
41	<5	9	<5	<200	<5	1	720	28	430	<2	6.5	13.4	210	<5	<40	420	4.4	<20	3620
42	<5	<2	<5	<200	<5	1	900	28	550	<2	8.2	15.0	290	<5	<40	530	4.9	<20	3800
43	<5	8	<5	<200	<5	14	840	29	240	<2	8.4	11.9	210	<5	<40	470	5.7	<20	4490

Appendix 2: Part 1: Geochemistry of the heavy mineral; data listing

Site	Ag	As	Au	Ba	Br	Ca	Ce	Co	Cr	Cs	Eu	Fe	Hf	Hg	Ir	La	Lu	Mo	Na
Unit	ppm	ppm	ppb	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppb	ppm	ppm	ppm	ppm
44	<5	9	<5	<200	<5	1	1100	22	880	<2	10.3	14.6	450	<5	<40	580	8.0	<20	3370
45	<5	6	228	<200	<5	13	770	20	380	<2	9.1	11.1	210	<5	<40	430	4.9	<20	4110
46	<5	<2	1400	<200	<5	1	870	23	330	<2	11.3	10.1	250	<5	<40	480	4.7	<20	4370
47	<5	20	<5	<200	<5	1	1000	37	360	<2	6.0	17.4	220	<5	<40	700	4.6	<20	3000
48	<5	<2	71	<200	8	1	980	29	530	<2	8.3	14.7	280	<5	<40	560	5.5	<20	3780
49	<5	<2	100	<200	<5	1	900	26	560	3	8.8	16.5	250	<5	<40	520	4.9	<20	3960
50	<5	<2	98	<200	<5	1	870	32	540	<2	9.1	16.1	320	<5	<40	480	5.3	<20	3810
51	<5	<2	30	600	<5	15	1700	32	360	<2	10.4	14.2	180	<5	<40	1100	5.7	<20	4440
52	<5	9	<5	<200	<5	1	1200	24	400	<2	10.0	12.8	230	<5	<40	690	5.9	<20	3480
53	<5	<2	64	<200	<5	1	650	23	480	6	10.7	10.8	190	<5	<40	320	5.7	<20	4260
54	<5	<2	300	<200	<5	11	570	15	1400	<2	7.6	11.0	160	<5	<40	320	3.0	<20	2790
55	<5	<2	116	<200	<5	23	1600	17	140	<2	10.5	10.3	480	<5	<40	1100	10.7	<20	1540
56	<5	<2	202	<200	<5	8	950	28	420	<2	8.6	14.8	230	<5	<40	570	4.9	<20	3760
57	<5	<2	143	<200	<5	1	940	30	560	<2	10.1	14.8	370	<5	<40	510	5.9	<20	3820
58	<5	<2	49	<200	<5	18	930	30	450	<2	8.5	12.0	240	<5	<40	530	4.7	<20	4030
59	<5	<2	<5	<200	<5	1	750	28	510	<2	8.6	15.0	270	<5	<40	430	4.8	<20	3810
60	<5	<2	125	<200	<5	8	560	31	410	<2	9.2	12.3	160	<5	<40	270	3.1	<20	4830
61	<5	<2	52	<200	<5	23	1900	29	380	<2	8.7	11.5	170	<5	<40	1100	11.0	<20	3500
62	<5	<2	<5	<200	<5	1	1500	34	270	<2	8.9	11.7	190	<5	<40	940	5.4	<20	4280
63	<5	<2	100	<200	<5	12	440	16	1400	<2	10.5	9.7	190	<5	<40	210	3.1	<20	2980
64	<5	<2	21	<200	<5	11	850	31	530	<2	7.5	15.0	300	<5	<40	470	4.8	<20	3540
65	<5	<2	62	<200	<5	1	930	30	570	<2	9.1	16.6	300	<5	<40	500	5.3	<20	3560
66	<5	11	37	<200	<5	1	880	30	590	<2	8.1	16.3	330	<5	<40	500	5.3	<20	3610
67	<5	<2	67	<200	<5	1	800	32	500	<2	8.8	15.8	260	<5	<40	440	4.7	<20	4080
68	<5	11	80	<200	<5	6	890	27	450	<2	8.2	14.6	230	<5	<40	490	4.9	<20	4030
69	<5	11	405	450	<5	7	650	32	1200	<2	10.0	14.1	270	<5	<40	400	6.1	<20	5300
70	<5	<2	72	<200	<5	1	1100	30	650	<2	10.1	18.8	350	<5	<40	580	6.3	<20	4130
71	<5	9	113	600	<5	10	720	36	460	<2	7.5	16.1	350	<5	<40	470	4.9	<20	3400
72	<5	<2	65	<200	<5	9	1000	38	450	<2	9.4	18.7	350	<5	<40	620	5.8	<20	4540
73	<5	<2	52	<200	<5	15	860	24	500	<2	10.4	15.6	290	<5	<40	440	4.5	<20	3550
74	<5	<2	66	<200	<5	1	820	39	500	<2	9.4	17.1	340	<5	<40	500	4.7	<20	3260
75	<5	11	42	<200	<5	7	790	39	640	<2	6.4	15.9	410	<5	<40	490	6.0	<20	3110
76	<5	16	<5	<200	<5	1	750	42	620	<2	6.8	17.8	370	<5	<40	480	5.3	<20	3540
77	<5	<2	138	<200	<5	1	930	47	650	<2	7.6	19.8	410	<5	<40	580	5.3	<20	2970
78	<5	<2	25	<200	<5	9	620	21	420	<2	8.6	13.6	200	<5	<40	320	3.4	<20	4170

Appendix 2: Part 1: Geochemisry of the heavy mineral; data listing

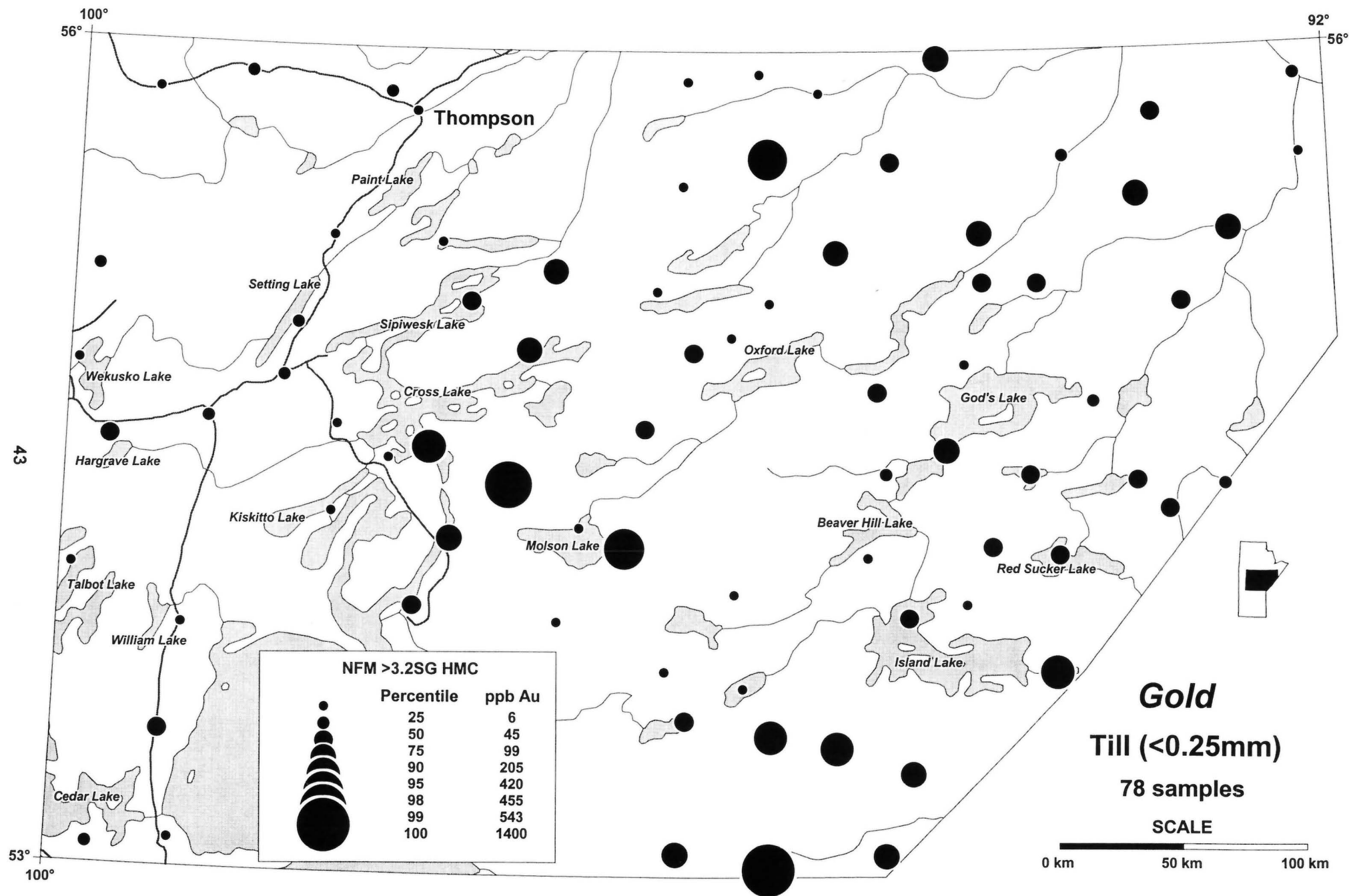
Site Unit	Nd ppm	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr %	Ta ppm	Tb ppm	Th ppm	U ppm	W ppm	Yb ppm	Zn ppm	Mass gms
1	164	<200	<50	<0.2	77.4	<20	37.4	<0.2	3.0	<2	134.6	23.6	<4	28.9	225	110.1
2	109	<200	<50	0.2	92.8	<20	23.2	<0.2	1.0	4	92.5	15.2	<4	18.9	129	298.3
3	210	<200	<50	0.2	104.3	<20	37.9	<0.2	2.2	5	135.3	25.5	<4	24.1	236	416
4	76	<200	<50	<0.2	102.1	<20	15.7	<0.2	<1.0	5	51.9	11.0	<4	21.1	<200	181.9
5	74	<200	<50	<0.2	54.0	<20	12.0	<0.2	<1.0	3	46.0	6.0	<4	9.9	<200	51.3
6	130	<200	<50	1.2	85.0	<20	19.0	<0.2	5.0	4	88.0	11.0	<4	18.0	<200	11.1
7	155	<200	<50	<0.2	78.0	<20	27.5	<0.2	8.0	5	98.0	19.5	<4	22.5	199	129.1
8	97	<200	<50	<0.2	76.0	<20	20.0	<0.2	<1.0	4	120.0	11.0	<4	12.3	<200	63.9
9	100	<200	<50	<0.2	60.0	<20	21.0	<0.2	<1.0	4	89.0	15.0	<4	14.6	221	37.6
10	160	<200	<50	1.0	70.0	<20	22.0	<0.2	5.0	4	100.0	12.0	<4	17.0	<200	10.6
11	190	<200	<50	1.8	85.0	<20	33.0	<0.2	7.0	<2	140.0	20.0	<4	28.9	<200	4.6
12	110	<200	<50	<0.2	106.9	<20	21.8	<0.2	<1.0	5	72.1	14.2	<4	18.1	133	457.5
13	84	165	<50	<0.2	60.6	<20	16.3	<0.2	<1.0	3	82.3	11.0	<4	14.5	125	275.5
14	70	135	<50	<0.2	57.1	<20	13.9	<0.2	2.4	3	61.7	8.5	<4	11.9	147	430.6
15	31	<200	<50	<0.2	51.0	<20	10.2	<0.2	<1.0	3	22.5	4.1	<4	8.2	166	125.4
16	190	<200	<50	<0.2	62.0	<20	34.0	<0.2	8.0	8	170.0	27.0	<4	21.8	<200	52.4
17	370	<200	<50	<0.2	67.0	<20	57.0	<0.2	13.0	<2	350.0	35.0	<4	25.9	<200	30.2
18	94	<200	<50	<0.2	54.0	<20	16.0	<0.2	<1.0	5	80.0	13.0	<4	14.9	<200	49.8
19	77	177	34	0.2	56.0	<20	14.3	<0.2	2.9	2	60.3	6.1	<4	8.5	173	237.1
20	109	<200	<50	0.2	50.7	<20	20.7	<0.2	9.3	4	71.0	12.7	<4	11.8	198	187.3
21	230	<200	<50	<0.2	61.0	<20	43.0	<0.2	14.0	<2	210.0	29.0	<4	26.6	341	40.9
22	170	<200	<50	<0.2	59.0	<20	34.0	<0.2	8.0	<2	160.0	22.0	<4	19.1	<200	58
23	310	<200	<50	<0.2	68.0	<20	42.0	<0.2	6.0	6	150.0	18.0	<4	24.3	260	12.4
24	260	<200	<50	<0.2	74.0	<20	51.0	<0.2	5.0	<2	180.0	30.0	<4	28.2	<200	19.2
25	190	<200	<50	<0.2	52.0	<20	36.0	<0.2	8.0	<2	190.0	28.0	<4	19.3	<200	64.4
26	320	<200	<50	1.1	70.0	<20	53.0	<0.2	16.0	6	260.0	43.0	<4	26.5	<200	29.6
27	130	<200	<50	<0.2	60.0	<20	28.0	<0.2	10.0	6	120.0	19.0	18	18.9	<200	40.8
28	190	<200	<50	<0.2	54.0	<20	32.0	<0.2	11.0	6	120.0	31.0	<4	21.5	<200	55.3
29	110	<200	<50	0.9	55.0	<20	27.0	<0.2	9.0	7	110.0	24.0	<4	18.8	<200	61.6
30	250	<200	<50	1.0	65.0	<20	54.0	<0.2	17.0	11	300.0	34.0	<4	27.8	<200	37.5
31	210	<200	<50	<0.2	51.0	<20	40.0	<0.2	15.0	9	190.0	29.0	<4	19.8	<200	65.4
32	360	<200	<50	<0.2	67.0	<20	79.0	<0.2	<1.0	11	440.0	49.0	<4	34.0	<200	20.8
33	220	<200	<50	<0.2	58.0	<20	44.0	<0.2	18.0	9	240.0	28.0	22	24.0	<200	50.6
34	400	<200	<50	<0.2	70.0	<20	63.0	<0.2	6.0	9	310.0	46.0	<4	32.3	<200	22.3
35	310	<200	<50	<0.2	83.0	<20	48.0	<0.2	12.0	8	190.0	27.0	<4	33.8	<200	10.7
36	330	<200	<50	<0.2	66.0	<20	72.0	<0.2	35.0	10	420.0	61.0	<4	37.3	<200	30.7
37	700	<200	<50	<0.2	79.0	<20	110.0	<0.2	32.0	10	680.0	59.0	<4	57.0	250	4.4
38	110	<200	<50	0.4	54.5	<20	28.0	<0.2	6.5	<2	124.9	23.0	<4	12.6	<200	86.5
39	430	<200	<50	<0.2	71.0	<20	75.0	<0.2	<1.0	<2	410.0	49.0	<4	33.6	451	26.3
40	310	<200	<50	1.0	57.0	<20	59.0	<0.2	11.0	10	330.0	39.0	<4	31.1	226	36.1
41	240	<200	<50	<0.2	55.0	<20	44.0	<0.2	15.0	<2	230.0	24.0	<4	22.7	<200	45.7
42	260	<200	<50	<0.2	61.0	<20	49.0	<0.2	<1.0	9	260.0	39.0	<4	28.6	<200	45.2
43	290	<200	<50	<0.2	76.0	<20	56.0	<0.2	20.0	<2	280.0	40.0	<4	31.1	<200	46.5

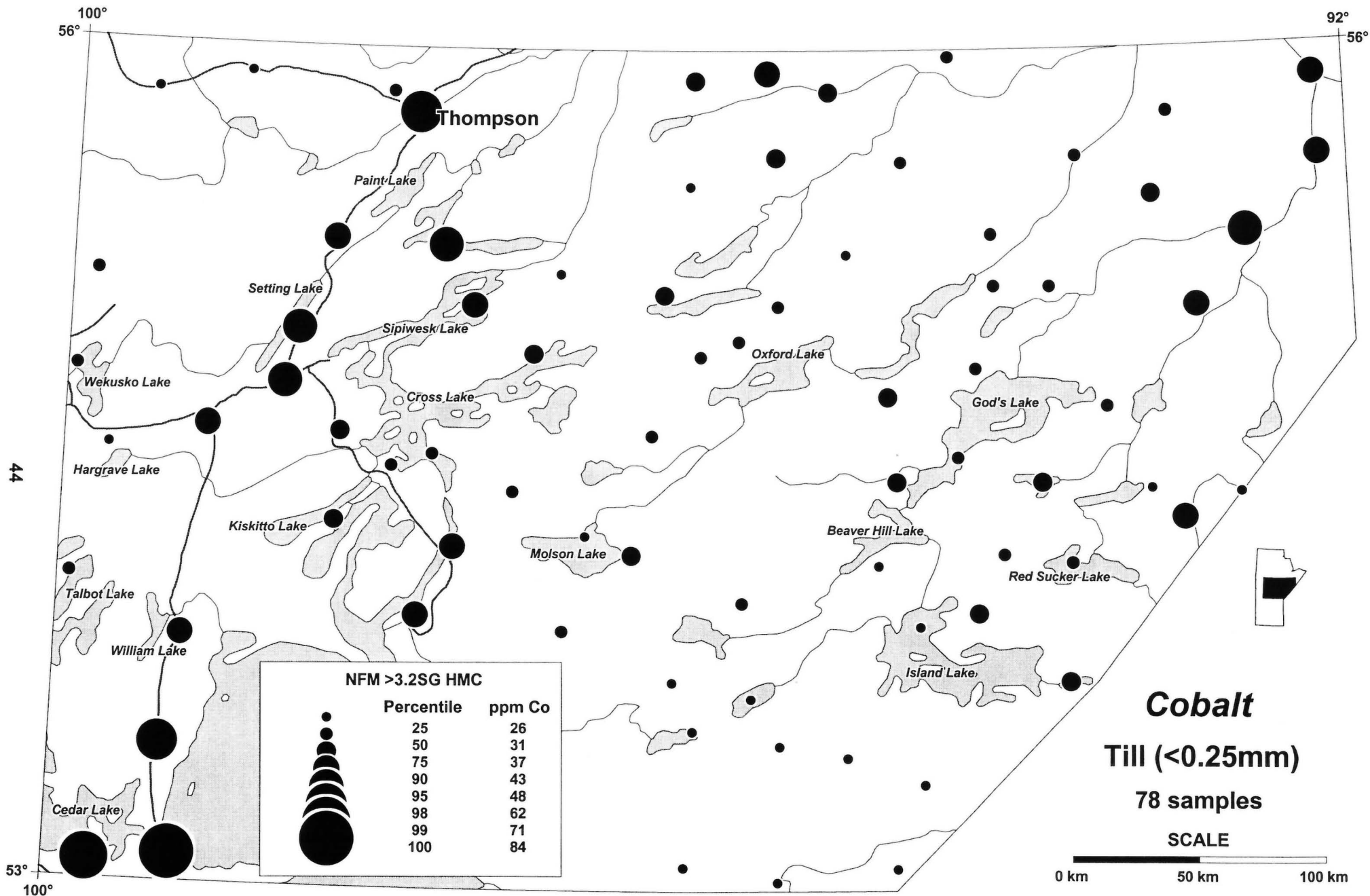
Appendix 2: Part 1: Geochemisry of the heavy mineral; data listing

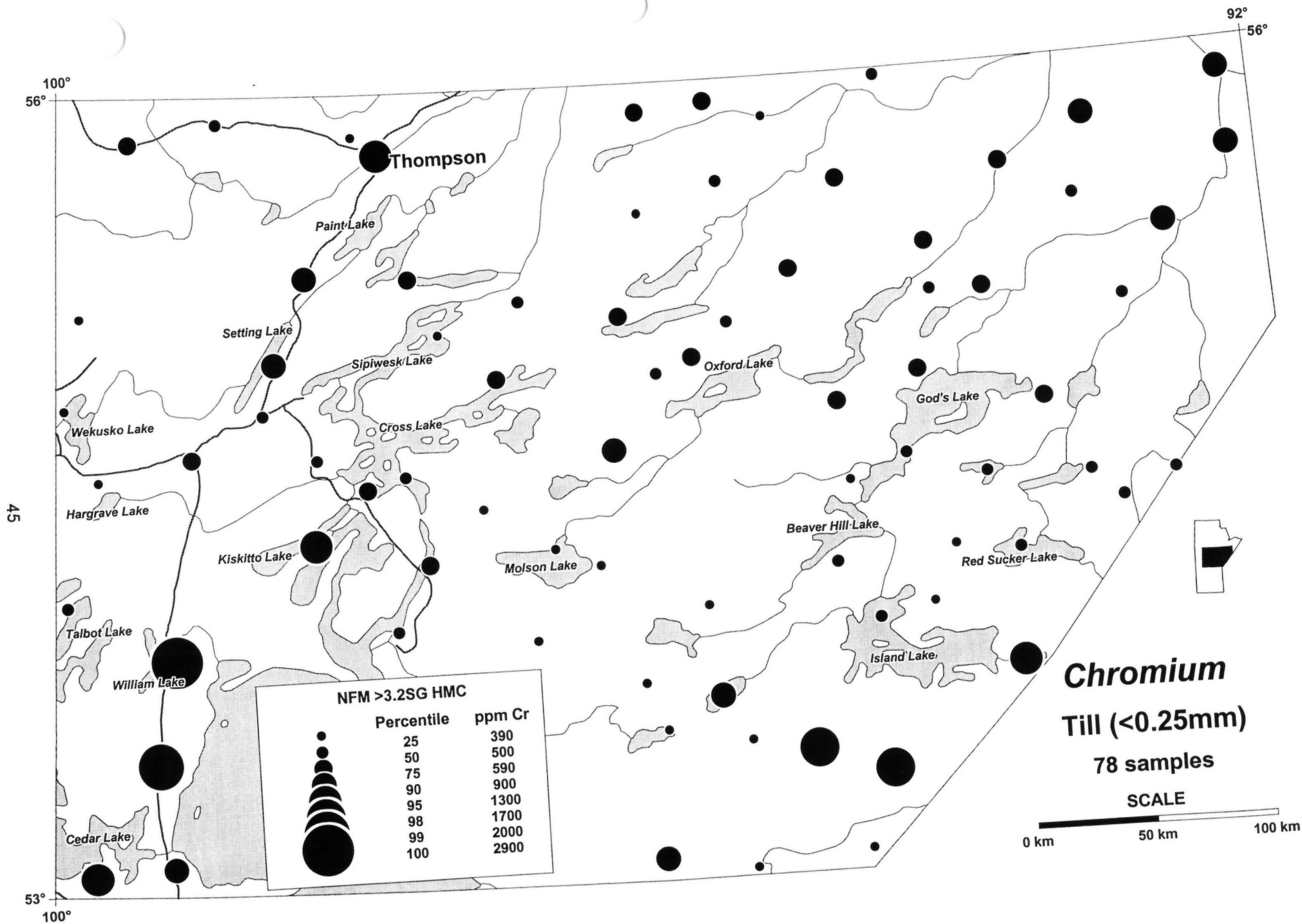
Site	Nd	Ni	Rb	Sb	Sc	Se	Sm	Sr	Ta	Tb	Th	U	W	Yb	Zn	Mass
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	gms
44	340	<200	<50	<0.2	80.0	<20	70.0	<0.2	28.0	11	370.0	62.0	<4	43.9	<200	18.5
45	230	<200	<50	0.9	65.0	<20	51.0	<0.2	18.0	9	220.0	38.0	26	29.6	<200	41.2
46	340	<200	<50	<0.2	68.0	<20	58.0	0.3	22.0	12	340.0	57.0	<4	26.3	<200	34.5
47	410	<200	<50	1.5	63.0	<20	58.0	<0.2	14.0	10	320.0	34.0	<4	28.8	<200	15.6
48	270	<200	<50	<0.2	60.0	<20	55.0	<0.2	19.0	<2	280.0	40.0	<4	28.7	<200	39.8
49	330	<200	<50	1.0	59.0	<20	53.0	<0.2	10.0	5	290.0	35.0	<4	29.0	<200	26.2
50	290	<200	<50	<0.2	67.0	<20	51.0	<0.2	14.0	10	230.0	28.0	<4	28.3	<200	30.3
51	630	<200	<50	<0.2	69.0	<20	89.0	<0.2	14.0	15	540.0	28.0	<4	26.3	<200	12.6
52	320	<200	<50	1.0	71.0	<20	69.0	0.4	19.0	13	390.0	44.0	<4	31.3	<200	29.6
53	240	<200	<50	<0.2	59.0	<20	53.0	<0.2	20.0	10	190.0	32.0	28	32.6	<200	31.5
54	180	<200	<50	<0.2	66.0	<20	34.0	<0.2	8.0	<2	200.0	33.0	18	17.6	<200	40.7
55	620	<200	<50	<0.2	68.0	<20	94.0	<0.2	29.0	16	600.0	60.0	<4	64.0	<200	16.6
56	240	<200	<50	1.9	58.0	<20	53.0	<0.2	19.0	16	300.0	46.0	<4	28.6	<200	47.2
57	300	<200	<50	1.2	64.0	<20	55.0	<0.2	14.0	10	230.0	30.0	<4	32.1	<200	30.5
58	320	<200	<50	<0.2	64.0	<20	52.0	<0.2	15.0	8	290.0	34.0	17	26.3	<200	42
59	230	<200	<50	<0.2	60.0	<20	42.0	<0.2	12.0	8	190.0	26.0	<4	24.5	<200	40.1
60	200	<200	<50	<0.2	57.0	<20	39.0	<0.2	8.0	7	92.0	21.0	<4	17.4	<200	30.9
61	600	<200	<50	<0.2	63.0	<20	110.0	<0.2	28.0	10	810.0	61.0	<4	57.2	<200	26
62	400	<200	<50	<0.2	56.0	<20	74.0	<0.2	17.0	16	580.0	35.0	<4	30.8	<200	49.5
63	160	<200	<50	<0.2	80.0	<20	35.0	<0.2	5.0	6	83.0	20.0	<4	18.7	235	24.2
64	290	<200	<50	<0.2	61.0	<20	48.0	<0.2	11.0	8	230.0	30.0	<4	27.4	<200	23.6
65	300	<200	<50	<0.2	63.0	<20	52.0	<0.2	14.0	<2	250.0	40.0	<4	27.9	<200	21.6
66	260	<200	<50	<0.2	65.0	<20	50.0	<0.2	<1.0	<2	220.0	31.0	<4	28.9	<200	35.6
67	280	<200	<50	1.2	65.0	<20	49.0	<0.2	9.0	8	190.0	20.0	82	25.0	<200	25
68	250	<200	<50	<0.2	66.0	<20	50.0	<0.2	20.0	8	250.0	28.0	1500	29.7	<200	33.1
69	280	<200	<50	0.9	69.0	<20	43.0	<0.2	17.0	7	110.0	23.0	48	35.1	<200	13.3
70	290	<200	<50	<0.2	73.0	<20	64.0	<0.2	13.0	9	280.0	40.0	<4	33.0	344	18.4
71	270	<200	<50	<0.2	67.0	<20	43.0	<0.2	6.0	7	180.0	22.0	<4	29.9	<200	16.9
72	410	<200	<50	<0.2	72.0	<20	61.0	<0.2	7.0	7	270.0	31.0	<4	32.0	<200	7.1
73	340	<200	<50	0.9	64.0	<20	52.0	<0.2	9.0	9	180.0	32.0	<4	24.9	<200	26.8
74	290	<200	<50	<0.2	71.0	<20	48.0	<0.2	<1.0	<2	180.0	23.0	<4	27.3	<200	15.7
75	330	<200	<50	<0.2	67.0	<20	46.0	<0.2	10.0	9	180.0	24.0	<4	31.4	<200	13.8
76	300	<200	<50	0.9	69.0	<20	44.0	<0.2	10.0	7	180.0	24.0	<4	31.3	<200	13.6
77	330	<200	<50	1.4	75.0	<20	50.0	<0.2	13.0	8	210.0	25.0	<4	30.4	<200	10.8
78	220	<200	<50	<0.2	62.0	<20	41.0	<0.2	12.0	5	120.0	24.0	<4	20.1	<200	24.4

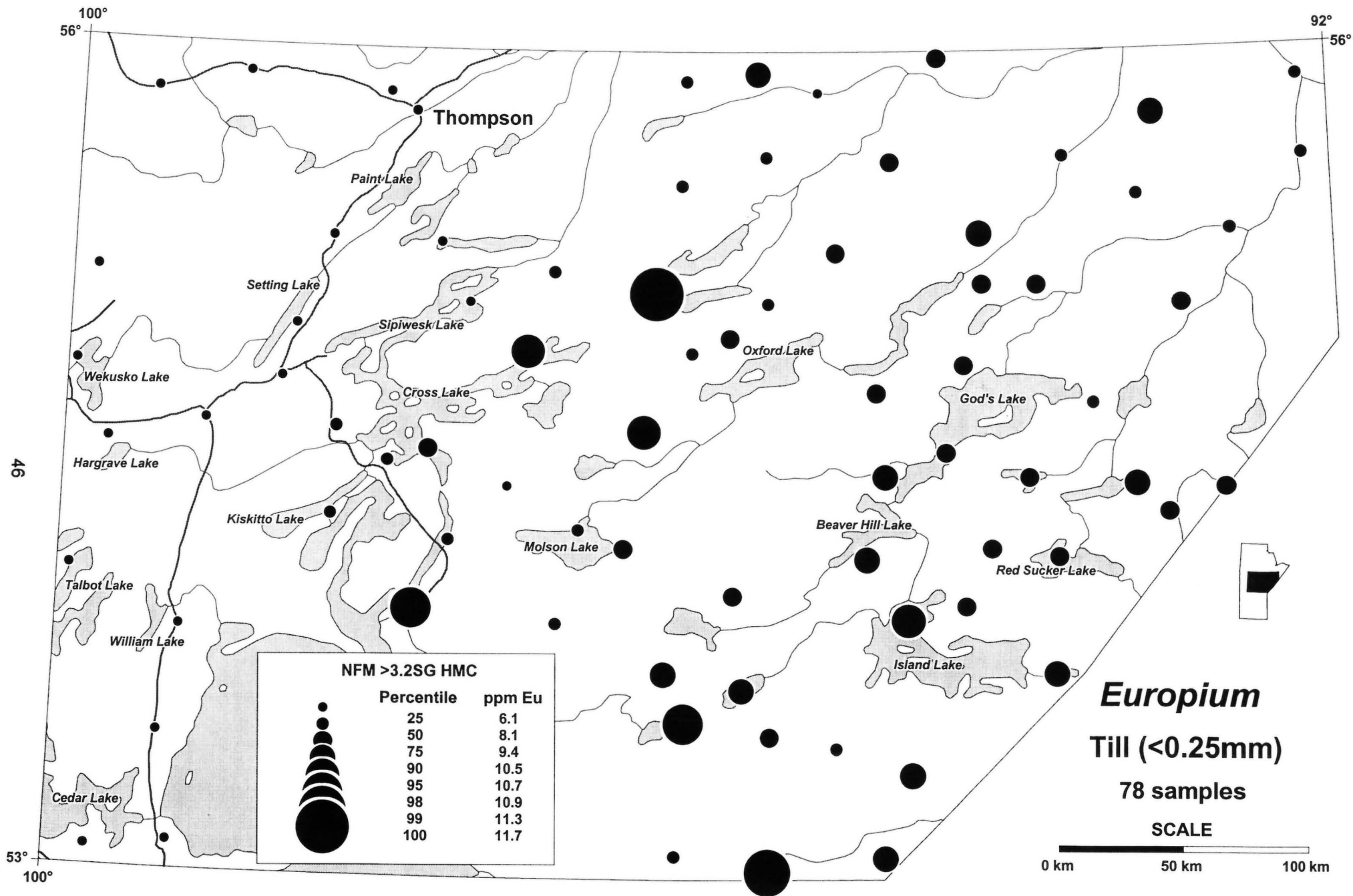
Appendix 2

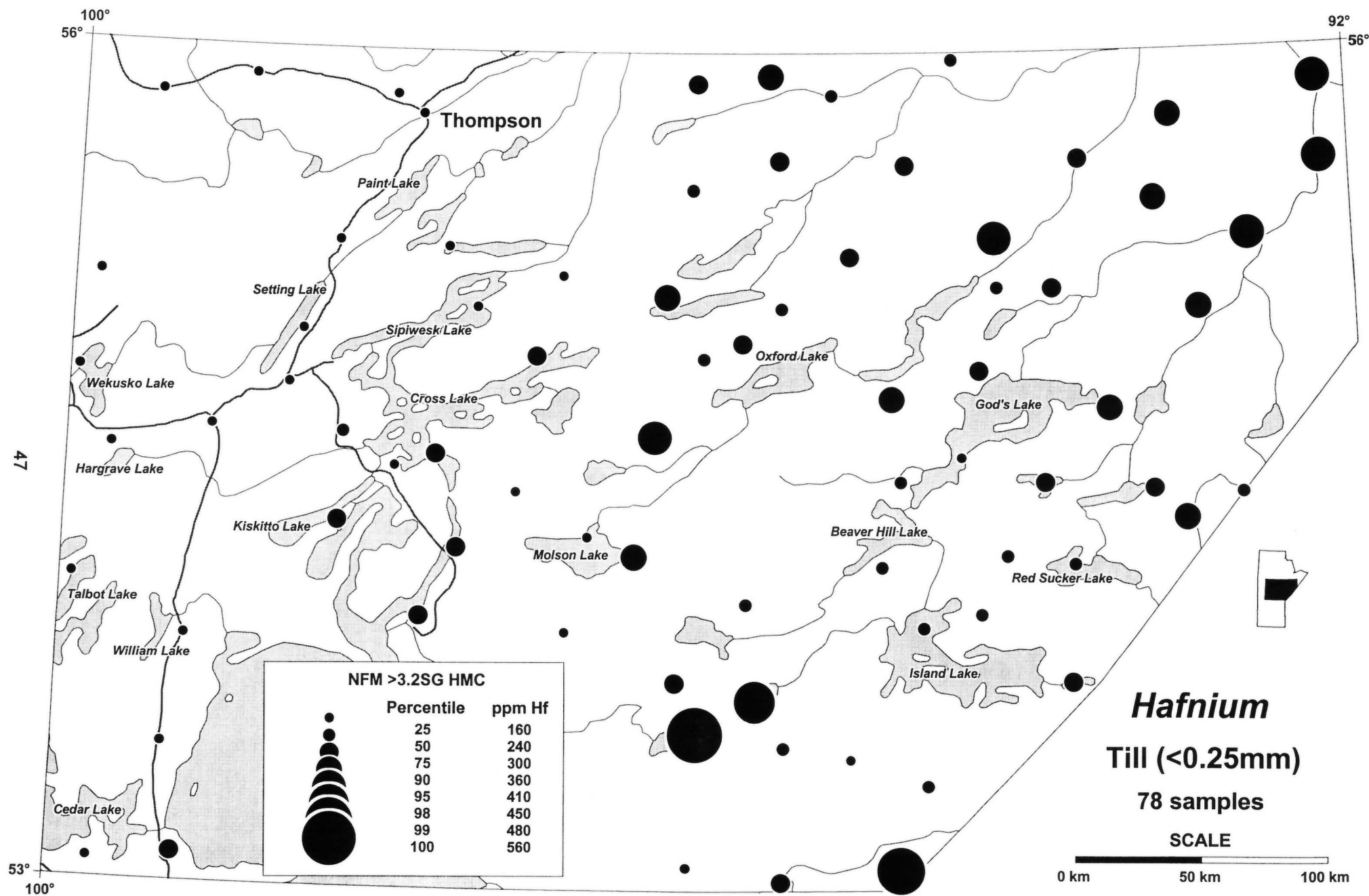
Part 2: Geochemistry of the heavy mineral fraction; maps

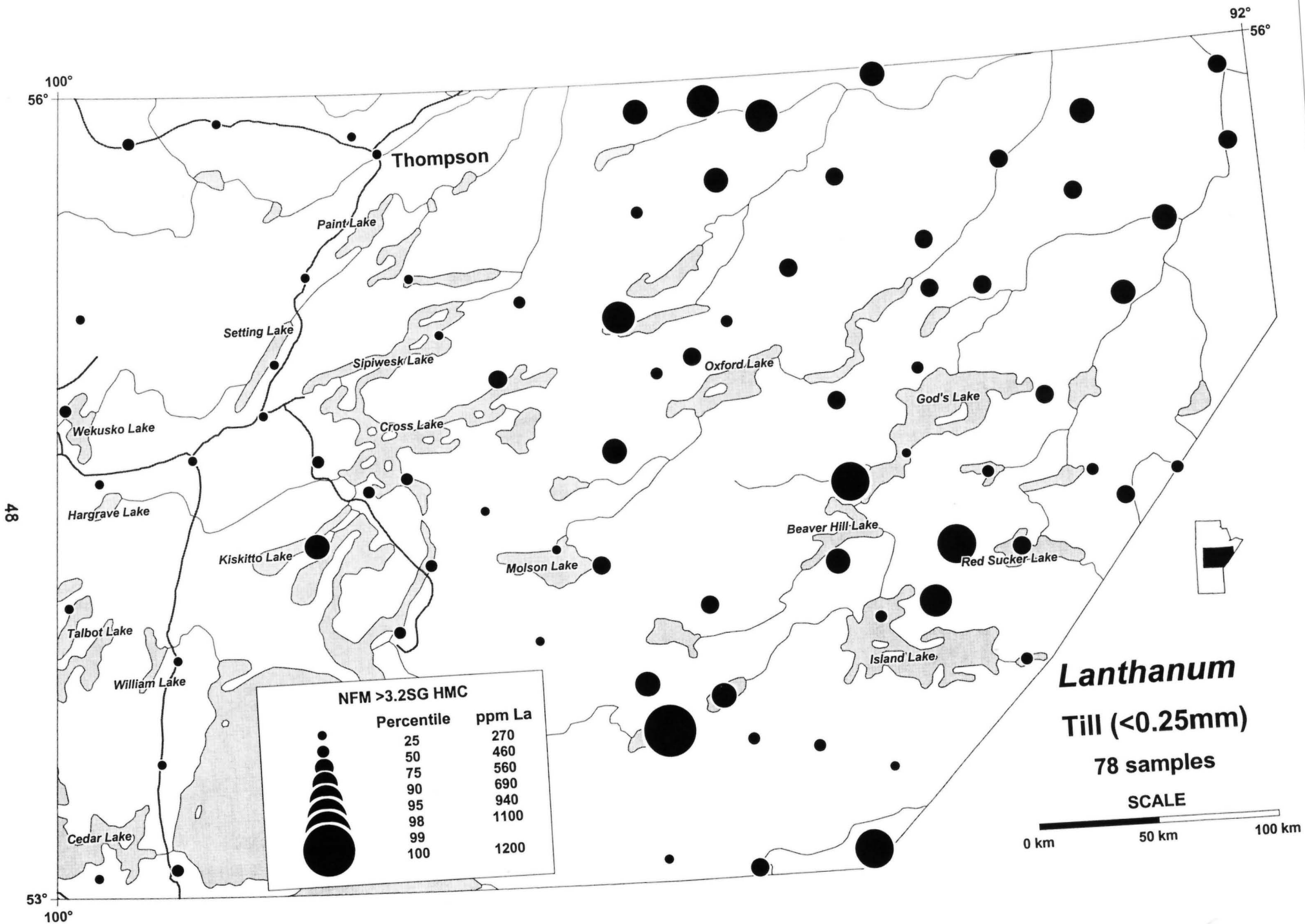


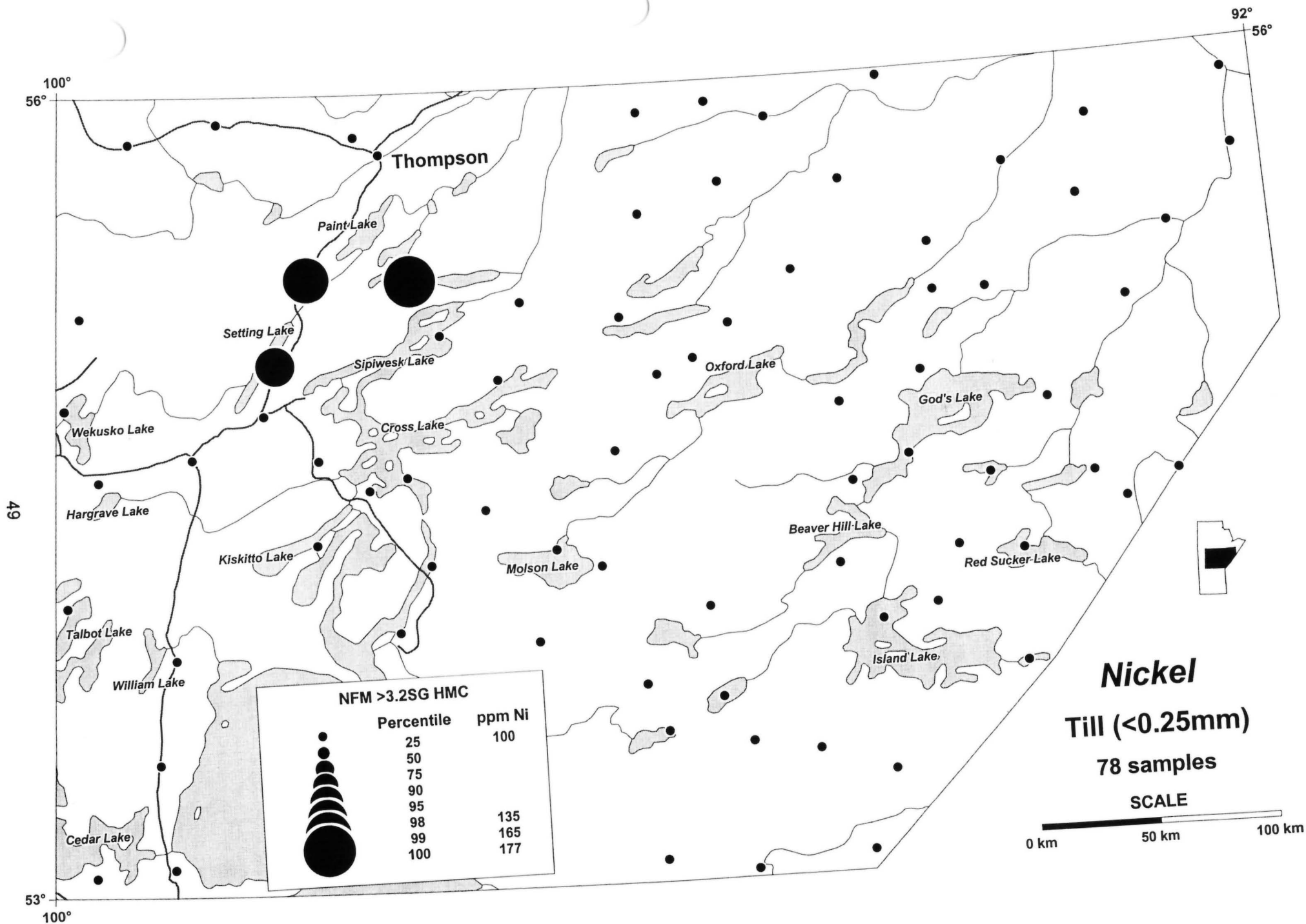


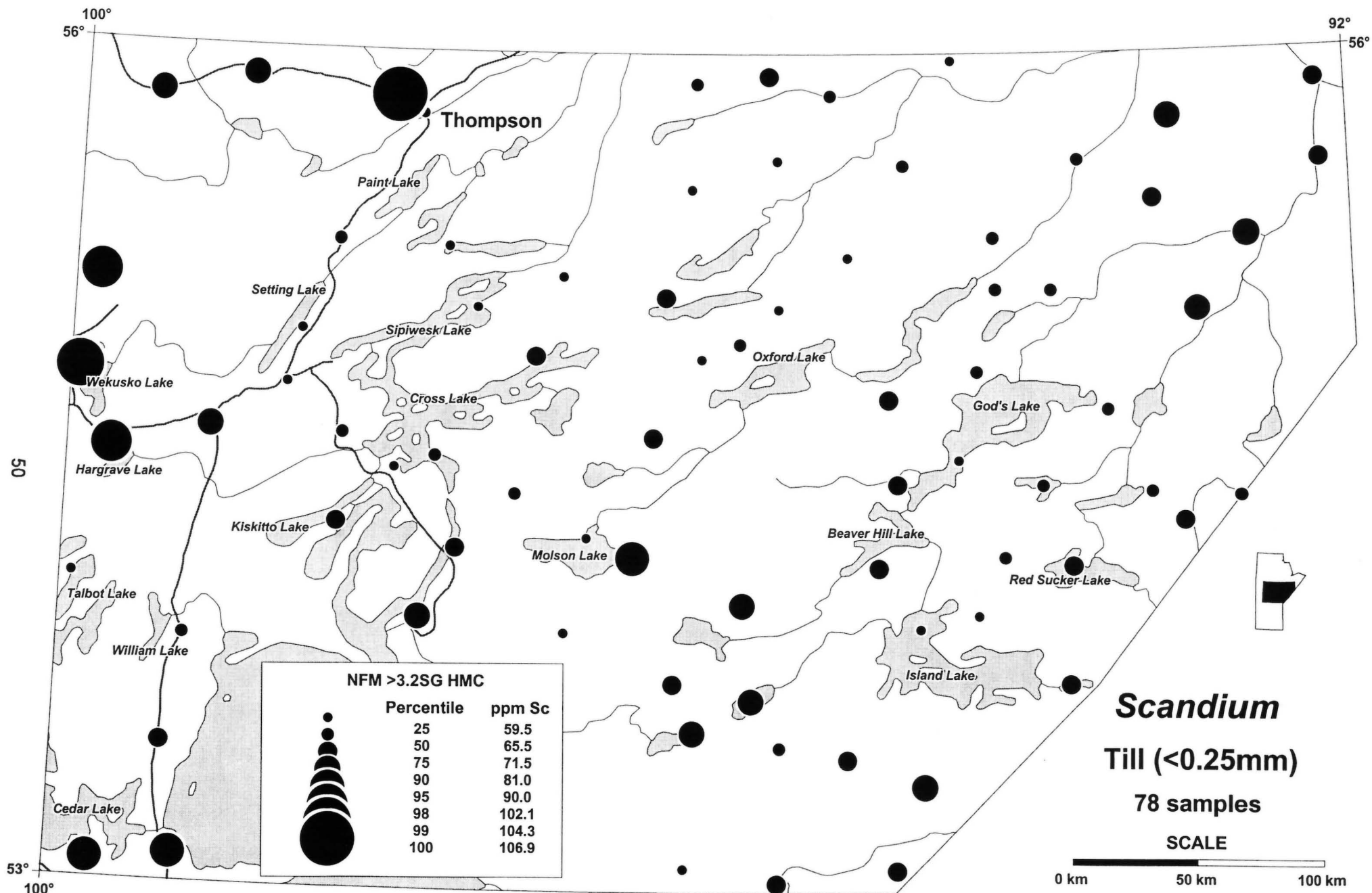


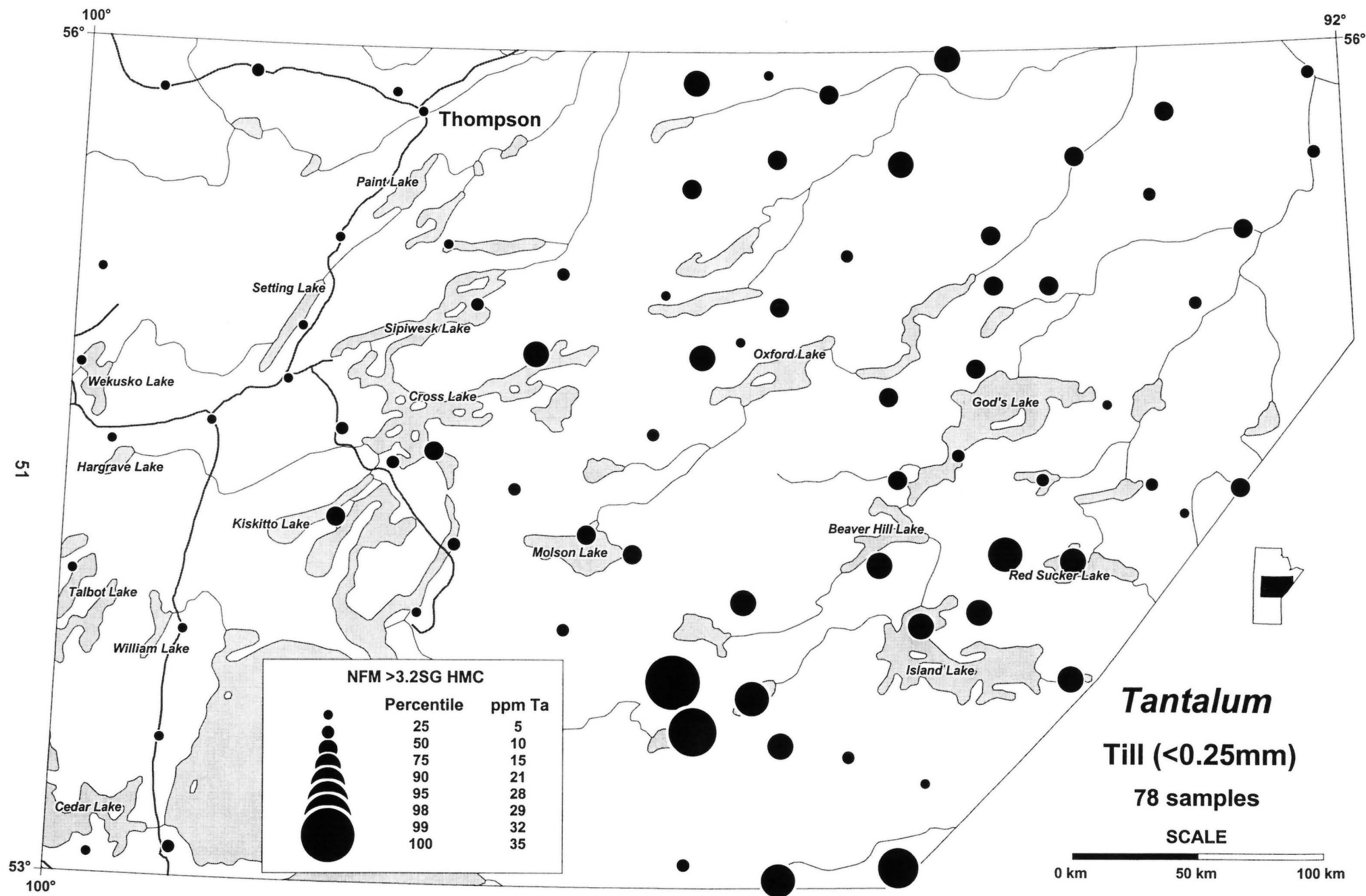


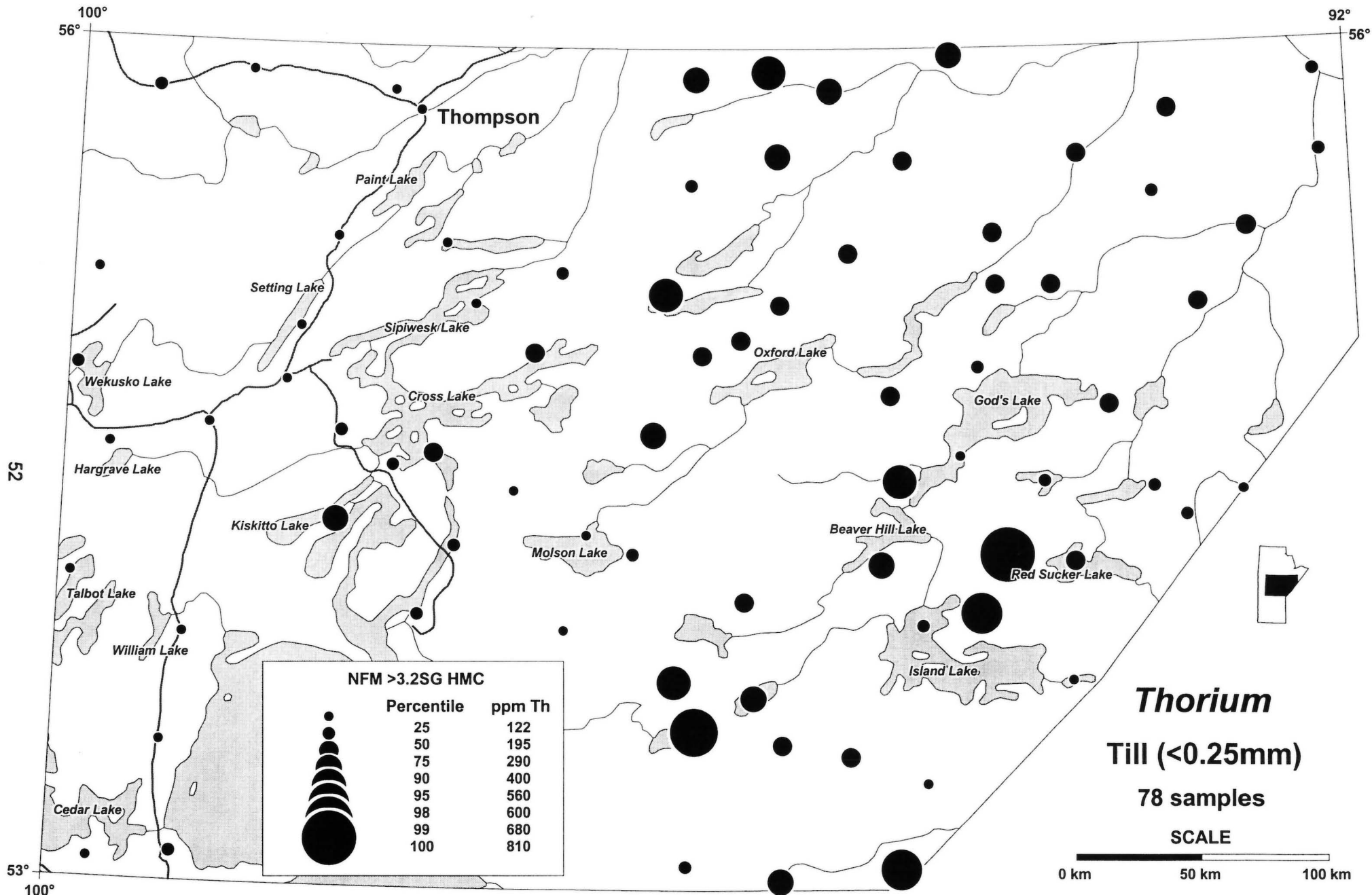


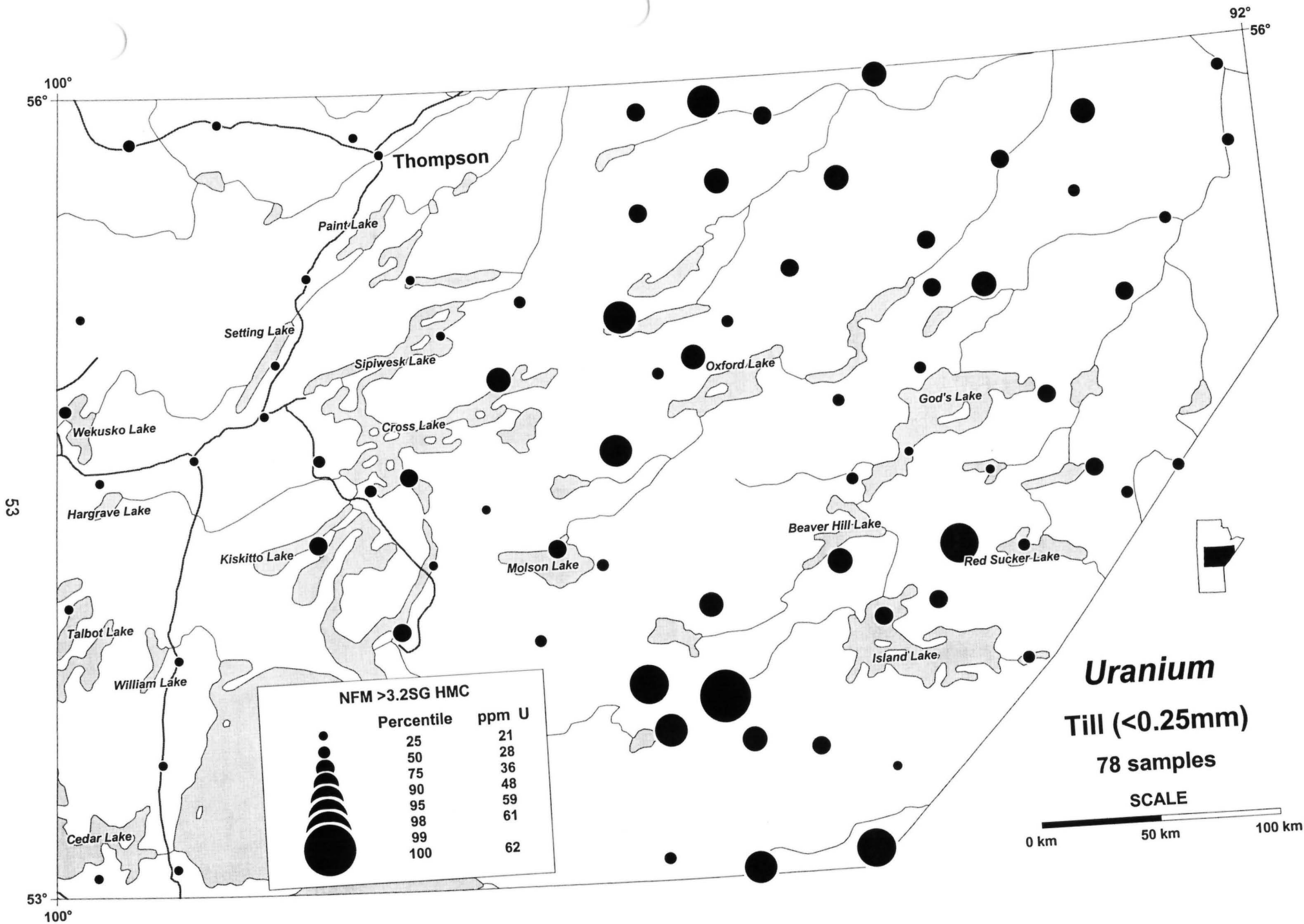


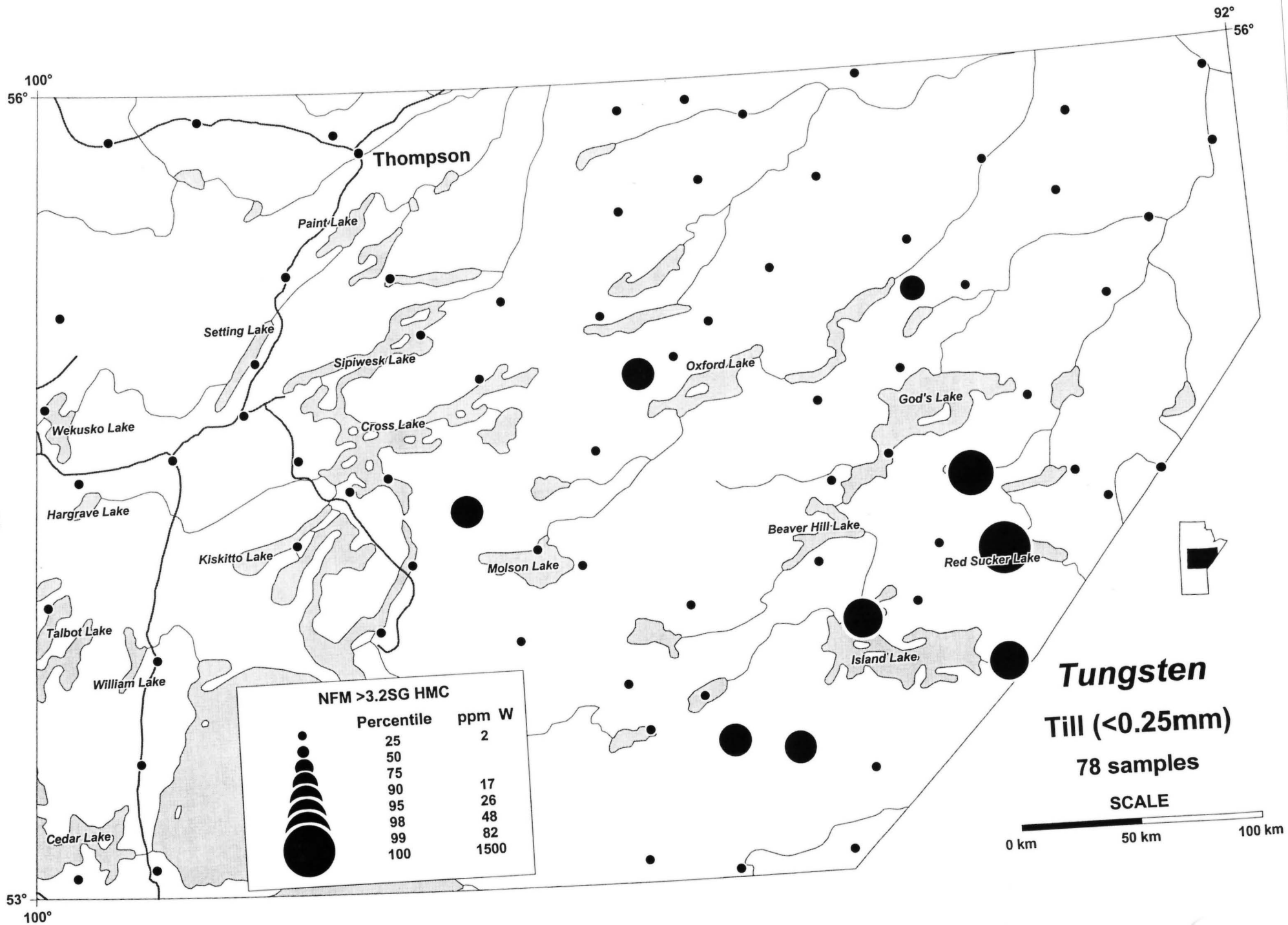












Appendix 3

Part 1: Geochemistry of the <63 micron fraction; data listing

Appendix 3: Part 1: Geochemistry of the <63 micron fraction; data listing

Site Unit	Ag ppm	As ppm	Au ppb	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	Hg ppm	Ir ppb	La ppm	Lu ppm	Mo ppm	Na ppm
1	<5	2.1	<2	710	1.4	4	61	7	53	1	1.0	2.34	6	<1	<5	38	0.47	<1	1.92
2	<5	2.0	9	730	<0.5	2	78	7	39	<1	1.0	2.32	9	<1	<5	46	0.48	<1	2.16
3	<5	2.8	<2	640	<0.5	2	100	7	52	<1	1.1	2.72	9	<1	<5	58	0.54	<1	1.88
4	<5	<0.5	4	260	4.5	14	28	6	44	<1	0.5	1.62	3	<1	<5	17	0.17	<1	0.52
5	<5	<0.5	<2	220	5.1	16	18	5	50	<1	0.4	1.09	2	<1	<5	11	0.12	<1	0.53
6	<5	1.1	4	160	4.3	17	14	4	32	<1	0.2	0.75	1	<1	<5	8	0.09	<1	0.27
7	<5	3.4	<2	630	<0.5	6	52	7	55	<1	0.9	1.85	6	<1	<5	31	0.38	<1	1.67
8	<5	3.4	4	500	2.2	9	54	12	85	2	0.8	2.79	4	<1	<5	34	0.25	<1	0.98
9	<5	<0.5	4	240	3.4	14	26	6	77	<1	0.5	1.11	3	<1	<5	15	0.17	<1	0.75
10	<5	0.9	5	87	4.6	18	9	2	22	<1	0.2	0.51	1	<1	<5	6	0.05	<1	0.20
11	<5	1.3	6	70	5.6	22	7	2	11	<1	0.2	0.40	<1	<1	<5	4	<0.05	2	0.13
12	<5	<0.5	<2	710	<0.5	4	73	12	88	1	1.0	3.07	7	<1	<5	46	0.37	<1	1.60
13	<5	1.1	5	530	2.6	9	47	12	140	<1	0.8	2.37	6	<1	<5	30	0.30	<1	1.44
14	<5	<0.5	12	680	<0.5	9	60	16	170	<1	1.3	3.64	11	<1	<5	39	0.41	<1	1.89
15	<5	<0.5	<2	750	3.0	4	64	31	160	3	1.2	5.51	5	<1	<5	40	0.30	<1	1.97
16	<5	3.8	8	440	4.1	13	40	5	43	<1	0.8	1.49	7	<1	<5	24	0.28	<1	1.30
17	<5	4.1	7	440	4.2	12	30	3	37	<1	0.6	1.05	5	<1	<5	18	0.22	<1	1.17
18	<5	5.7	10	680	3.2	4	110	25	180	2	1.0	4.42	5	<1	<5	68	0.33	<1	1.34
19	<5	4.4	9	470	3.4	10	45	9	74	<1	0.8	2.10	6	<1	<5	28	0.29	<1	1.41
20	<5	1.1	9	770	2.2	2	67	9	56	<1	1.2	2.29	10	<1	<5	41	0.38	2	1.76
21	<5	2.7	9	550	4.2	12	43	7	66	1	0.8	1.94	7	<1	<5	25	0.28	<1	1.20
22	<5	5.1	8	510	3.8	14	39	5	56	<1	0.8	1.52	7	<1	<5	23	0.31	3	1.22
23	<5	3.3	<2	400	3.0	13	47	7	51	2	0.9	1.95	5	<1	<5	28	0.28	<1	0.99
24	<5	2.7	11	470	2.8	14	40	5	41	1	0.8	1.43	6	<1	<5	23	0.26	3	1.19
25	<5	3.7	<2	420	4.6	12	42	5	40	<1	0.9	1.45	7	<1	<5	27	0.28	<1	1.23
26	<5	2.3	5	430	4.0	13	42	5	39	1	0.7	1.49	5	<1	<5	24	0.26	<1	1.05
27	<5	4.2	7	580	3.4	2	30	13	92	2	0.7	3.43	7	<1	<5	17	0.28	<1	1.59
28	<5	7.1	10	600	4.1	2	100	11	53	2	1.6	2.76	11	<1	<5	88	0.43	<1	1.80
29	<5	4.9	6	560	2.6	2	63	9	63	2	0.8	2.63	7	<1	<5	26	0.28	1	1.54
30	<5	3.9	<2	450	4.4	13	42	5	39	1	0.8	1.56	6	<1	<5	25	0.29	<1	1.05
31	<5	3.6	5	490	4.0	12	43	6	34	1	0.8	1.59	5	<1	<5	26	0.25	<1	1.04
32	<5	<0.5	6	340	5.1	14	36	3	27	<1	0.7	1.08	5	<1	<5	22	0.24	<1	0.95
33	<5	1.6	8	480	5.8	9	36	3	26	<1	0.7	1.13	7	<1	<5	21	0.24	<1	1.21
34	<5	3.5	10	430	5.7	14	31	4	31	<1	0.6	1.12	5	<1	<5	18	0.24	<1	0.93
35	<5	1.9	9	400	8.2	15	44	7	44	2	0.7	1.78	4	<1	<5	27	0.27	<1	0.88
36	<5	3.1	<2	650	1.9	1	30	9	110	3	0.7	2.64	8	<1	<5	19	0.28	5	1.87
37	<5	4.0	8	490	6.6	<1	52	7	54	3	0.9	3.85	5	<1	<5	32	0.23	<1	1.08
38	<5	2.4	7	720	3.3	2	34	5	60	<1	0.7	2.07	7	<1	<5	17	0.16	<1	2.27
39	<5	2.1	9	370	4.1	13	37	4	30	1	0.7	1.26	5	<1	<5	22	0.26	<1	0.89
40	<5	<0.5	7	410	4.2	12	30	3	24	<1	0.6	0.88	5	<1	<5	18	0.19	4	1.04
41	<5	2.0	9	410	4.7	11	34	3	31	<1	0.7	1.11	6	<1	<5	22	0.26	<1	1.05
42	<5	1.8	8	370	4.0	12	33	4	30	<1	0.6	1.12	6	<1	<5	20	0.25	<1	0.96
43	<5	2.0	8	650	<0.5	2	110	6	44	2	1.0	1.72	8	<1	<5	50	0.39	<1	1.80

Appendix 3: Part 1: Geochemistry of the <63 micron fraction; data listing

Site	Ag	As	Au	Ba	Br	Ca	Ce	Co	Cr	Cs	Eu	Fe	Hf	Hg	Ir	La	Lu	Mo	Na
Unit	ppm	ppm	ppb	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppb	ppm	ppm	ppm	ppm
44	<5	2.9	6	610	3.2	1	25	7	63	2	0.6	2.00	7	<1	<5	15	0.24	2	1.68
45	<5	5.0	7	730	4.3	2	64	7	75	2	0.8	2.37	6	<1	<5	31	0.28	<1	2.07
46	<5	<0.5	6	670	<0.5	2	47	5	43	<1	0.8	1.39	6	<1	<5	30	0.18	<1	<58
47	<5	2.6	6	390	3.8	10	43	6	42	2	0.8	1.76	4	<1	<5	27	0.27	<1	1.00
48	<5	2.0	<2	400	4.2	12	33	3	28	<1	0.7	1.07	6	<1	<5	20	0.25	<1	0.93
49	<5	2.9	4	430	4.3	13	38	5	37	1	0.7	1.45	5	<1	<5	23	0.25	<1	0.90
50	<5	2.6	7	340	3.2	13	33	4	28	<1	0.6	1.16	5	<1	<5	20	0.23	<1	0.91
51	<5	3.7	<2	430	4.6	12	43	5	41	2	0.8	1.67	5	<1	<5	27	0.28	2	1.03
52	<5	1.8	7	460	3.4	11	50	5	46	2	0.8	1.34	5	<1	<5	32	0.30	<1	1.25
53	<5	5.4	7	640	<0.5	3	140	12	110	2	1.4	2.90	7	<1	<5	95	0.31	4	1.95
54	<5	0.9	9	620	2.1	1	26	6	91	<1	0.6	1.91	6	<1	<5	17	0.21	2	2.08
55	<5	2.8	<2	830	3.4	2	48	4	27	2	0.7	1.49	7	<1	<5	30	0.26	<1	2.21
56	<5	<5	5	370	3.3	12	33	4	25	<1	0.6	1.08	6	<1	<5	20	0.26	<1	0.97
57	<5	1.9	5	290	3.9	11	29	3	27	<1	0.7	0.92	6	<1	<5	19	0.25	<1	0.93
58	<5	1.9	4	440	3.7	11	37	5	32	1	0.7	1.27	5	<1	<5	23	0.23	1	0.97
59	<5	2.2	6	390	4.0	12	32	4	30	<1	0.6	1.11	6	<1	<5	20	0.25	<1	1.00
60	<5	3.8	8	420	<5	13	35	5	37	<1	0.7	1.32	4	<1	<5	21	0.23	1	1.10
61	<5	2.2	<2	560	<0.5	2	55	5	37	1	0.7	1.47	7	<1	<5	29	0.38	<1	1.95
62	<5	<0.5	2	590	3.5	4	61	4	35	1	0.9	1.45	7	<1	<5	41	0.33	<1	1.89
63	<5	3.1	9	600	2.6	1	30	10	98	2	0.7	2.79	5	<1	<5	19	0.23	<1	1.67
64	<5	1.9	3	330	3.6	13	32	4	29	<1	0.7	1.07	5	<1	<5	19	0.26	<1	0.86
65	<5	2.8	<2	410	3.7	13	36	5	31	1	0.6	1.35	5	<1	<5	21	0.25	1	0.84
66	<5	1.9	3	390	3.1	13	34	4	30	<1	0.7	1.15	6	<1	<5	20	0.23	<1	1.00
67	<5	1.8	<2	390	5.7	14	31	4	30	1	0.6	1.11	4	<1	<5	19	0.23	<1	0.99
68	<5	2.9	<2	380	3.1	11	34	4	32	<1	0.6	1.23	5	<1	<5	21	0.25	<1	1.16
69	<5	7.4	5	530	2.8	7	33	7	75	<1	0.7	1.57	5	<1	<5	21	0.23	<1	1.71
70	<5	2.4	<2	430	2.9	13	40	6	38	1	0.7	1.61	4	<1	<5	24	0.27	<1	0.85
71	<5	3.0	<2	480	2.7	12	40	6	41	1	0.7	1.69	4	<1	<5	24	0.23	<1	0.98
72	<5	2.8	<2	450	2.6	10	44	6	41	2	0.7	1.88	4	<1	<5	28	0.25	<1	0.92
73	<5	1.3	<2	350	3.5	11	28	3	27	<1	0.6	1.00	5	<1	<5	18	0.23	<1	0.95
74	<5	1.9	<2	390	3.1	11	34	5	34	<1	0.7	1.18	4	<1	<5	21	0.24	<1	0.98
75	<5	4.2	<2	390	3.5	11	47	7	49	2	0.8	1.94	5	<1	<5	29	0.31	<1	0.68
76	<5	2.7	2	350	3.1	11	42	7	47	2	0.7	1.92	4	<1	<5	26	0.26	<1	0.63
77	<5	2.7	<2	410	2.7	12	42	7	45	2	0.7	1.93	4	<1	<5	25	0.25	1	0.89
78	<5	2.7	4	440	3.0	12	42	6	43	1	0.8	1.66	4	<1	<5	26	0.27	<1	1.02

Appendix 3: Part 1: Geochemistry of the <63 micron fraction; data listing

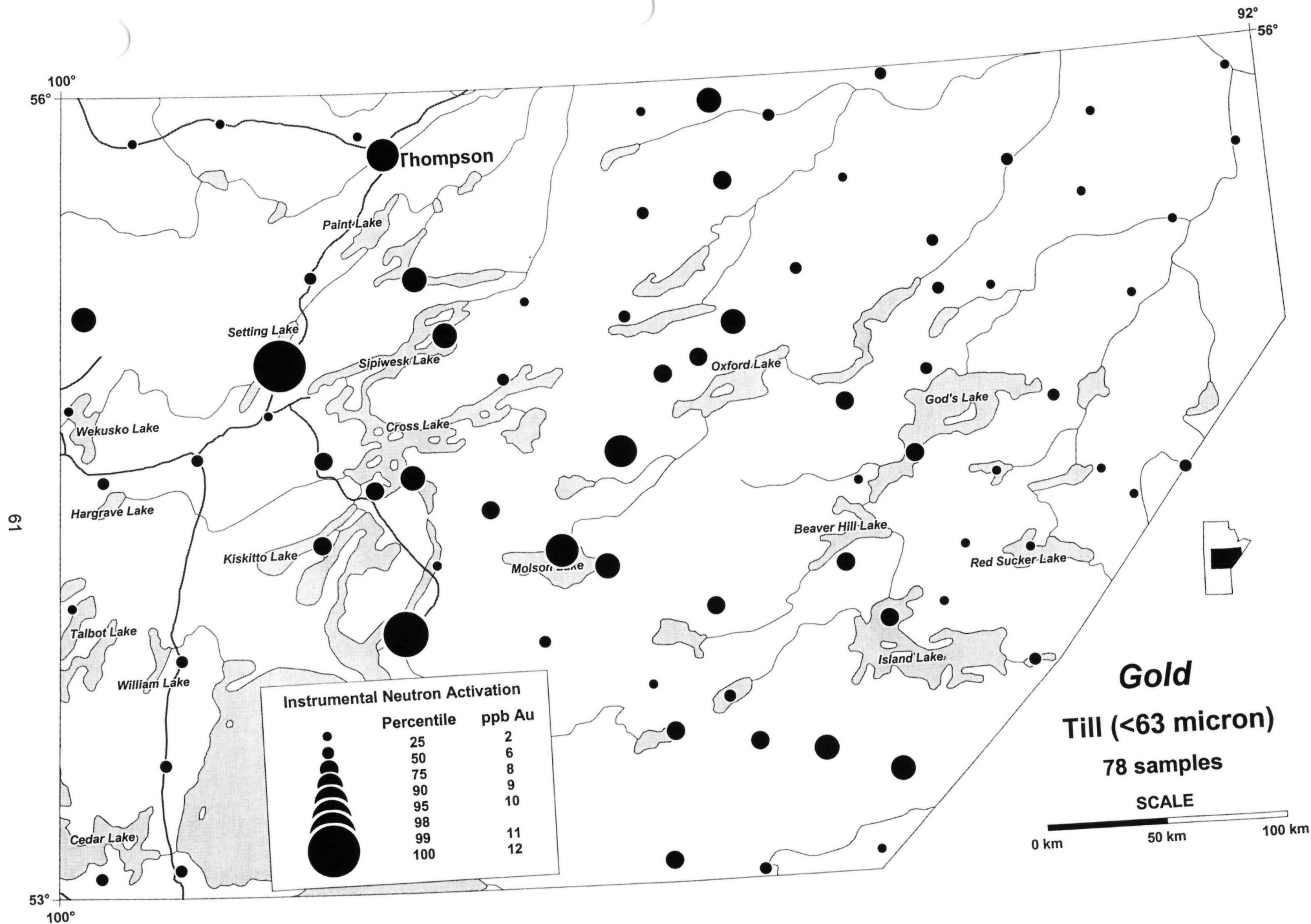
Site Unit	Nd ppm	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sn %	Sr_% %	Ta ppm	Tb ppm	Th ppm	U ppm	W ppm	Yb ppm	Zn ppm	Mass gms
1	23	<20	73	<0.1	7.0	<3	4.8	<0.01	<0.05	0.6	0.7	11	1.9	<1	2.5	50	30.66
2	28	56	65	0.2	8.3	<3	5.9	<0.01	0.05	<0.5	0.9	16	2.7	<1	2.7	54	30.59
3	36	<20	70	<0.1	11.0	<3	8.0	<0.01	<0.05	<0.5	0.8	19	3.0	<1	3.1	64	30.23
4	11	<20	33	<0.1	5.1	<3	2.2	<0.01	<0.05	<0.5	<0.5	5	1.5	<1	0.9	<50	30.82
5	6	<20	22	<0.1	3.5	<3	1.2	<0.01	<0.05	<0.5	<0.5	3	1.0	<1	0.5	<50	30.72
6	<5	<20	20	0.1	2.4	<3	0.9	<0.01	<0.05	<0.5	<0.5	3	<0.5	<1	0.4	<50	30.78
7	18	<20	48	0.2	6.5	<3	4.1	<0.01	<0.05	0.7	0.6	8	2.3	<1	2.2	<50	30.84
8	18	<20	69	0.2	8.4	<3	3.4	<0.01	<0.05	<0.5	<0.5	10	1.2	<1	1.4	60	31.01
9	9	45	31	0.1	3.8	<3	1.9	<0.01	<0.05	<0.5	<0.5	5	0.6	<1	0.8	<50	30.87
10	<5	<20	15	<0.1	1.5	<3	0.6	<0.01	<0.05	<0.5	<0.5	2	0.5	<1	0.3	<50	30.66
11	<5	<20	15	<0.1	1.1	<3	0.5	<0.01	<0.05	<0.5	<0.5	1	<0.5	<1	<0.2	<50	30.72
12	27	<20	55	<0.1	11.0	<3	5.7	<0.01	<0.05	0.6	0.6	14	2.9	<1	2.0	81	30.73
13	17	<20	27	<0.1	8.0	<3	3.2	<0.01	0.05	<0.5	0.5	8	1.7	<1	1.6	<50	30.78
14	24	<20	55	<0.1	11.0	<3	4.3	<0.01	<0.05	<0.5	<0.5	10	2.2	<1	2.1	74	30.73
15	26	130	53	<0.1	15.0	<3	3.9	<0.01	<0.05	1.0	<0.5	9	1.7	<1	1.9	113	30.77
16	16	<20	39	0.3	5.1	<3	2.9	<0.01	<0.05	<0.5	0.6	7	1.9	<1	1.6	<50	30.87
17	11	<20	42	0.2	4.0	<3	2.3	<0.01	<0.05	<0.5	<0.5	5	1.5	<1	1.4	<50	37.66
18	30	120	97	<0.1	12.0	3	4.5	<0.02	<0.05	<0.5	<0.5	13	1.9	<1	1.8	<50	30.81
19	19	<20	31	0.3	6.6	<3	3.2	<0.01	<0.05	<0.5	<0.5	7	1.6	<1	1.5	<50	37.07
20	22	79	45	<0.1	7.8	<3	4.9	<0.01	<0.05	0.8	0.8	10	2.3	<1	2.1	<50	37.85
21	16	<20	63	0.2	5.8	<3	3.1	<0.01	<0.05	<0.5	0.6	8	1.6	<1	1.4	<50	30.82
22	14	<20	35	<0.1	5.2	<3	2.9	<0.01	<0.05	<0.5	<0.5	7	1.6	<1	1.3	<50	30.98
23	18	<20	55	0.2	6.2	<3	3.2	<0.01	<0.05	<0.5	<0.5	9	1.5	<1	1.4	<50	30.61
24	16	<20	58	0.3	5.3	<3	2.9	<0.01	0.06	<0.5	<0.5	7	1.5	<1	1.6	<50	30.79
25	15	<20	48	<0.1	4.8	<3	3.1	<0.01	<0.05	<0.5	<0.5	8	1.8	<1	1.6	<50	30.71
26	14	<20	55	0.2	4.9	<3	2.9	<0.01	<0.05	<0.5	<0.5	8	0.6	<1	1.3	<50	30.67
27	10	<20	72	0.3	8.7	<3	2.2	<0.01	<0.05	<0.5	<0.5	5	2.0	<1	1.5	60	30.99
28	49	<20	63	0.3	8.1	<3	8.2	<0.01	0.06	<0.5	<0.5	17	7.6	<1	2.5	73	30.64
29	12	<20	96	<0.1	7.8	<3	2.9	<0.01	<0.05	<0.5	<0.5	11	1.6	<1	1.6	<50	30.89
30	12	<20	51	0.2	5.3	<3	3.1	<0.01	<0.05	0.6	<0.5	8	1.2	<1	1.4	<50	30.75
31	15	<20	61	0.2	5.1	<3	3.0	<0.01	0.06	0.7	<0.5	8	1.3	<1	1.2	52	30.95
32	16	<20	38	0.2	3.9	<3	2.7	<0.01	<0.05	0.6	<0.5	6	2.1	<1	1.3	<50	30.77
33	8	<20	52	0.2	4.2	<3	<5	<0.01	0.06	0.7	<0.5	6	1.6	<1	1.3	<50	37.18
34	10	<20	37	0.2	3.9	<3	2.3	<0.01	<0.05	<0.5	<0.5	5	<0.5	<1	1.3	<50	30.76
35	15	<20	46	0.2	5.6	<3	3.0	<0.01	<0.05	<0.5	<0.5	9	2.1	<1	1.3	<50	29.93
36	13	<20	75	<0.1	7.1	<3	<5	<0.01	<0.05	0.6	<0.5	9	1.1	<1	1.3	<50	33.59
37	16	<20	51	<0.1	6.5	<3	3.2	<0.01	<0.05	<0.5	<0.5	13	6.3	<1	1.4	<50	29.97
38	14	<20	52	<0.1	5.9	<3	2.4	<0.01	0.09	<0.5	<0.5	9	2.0	<1	0.9	53	32.01
39	12	<20	46	<0.1	4.4	<3	2.7	<0.01	<0.05	0.7	<0.5	6	1.3	<1	1.4	<50	31.53
40	9	<20	33	0.2	3.2	<3	2.2	<0.01	<0.05	<0.5	<0.5	5	0.9	<1	1.1	<50	32.30
41	13	<20	40	<0.1	4.1	<3	2.7	<0.01	<0.05	<0.5	<0.5	7	1.3	<1	1.5	<50	33.70
42	13	<20	41	0.1	4.0	<3	<5	<0.01	<0.05	0.7	<0.5	6	1.1	<1	1.3	<50	32.14
43	28	<20	65	0.2	6.6	<3	5.0	<0.01	<0.05	<0.5	0.6	21	1.9	<1	2.0	<50	32.21

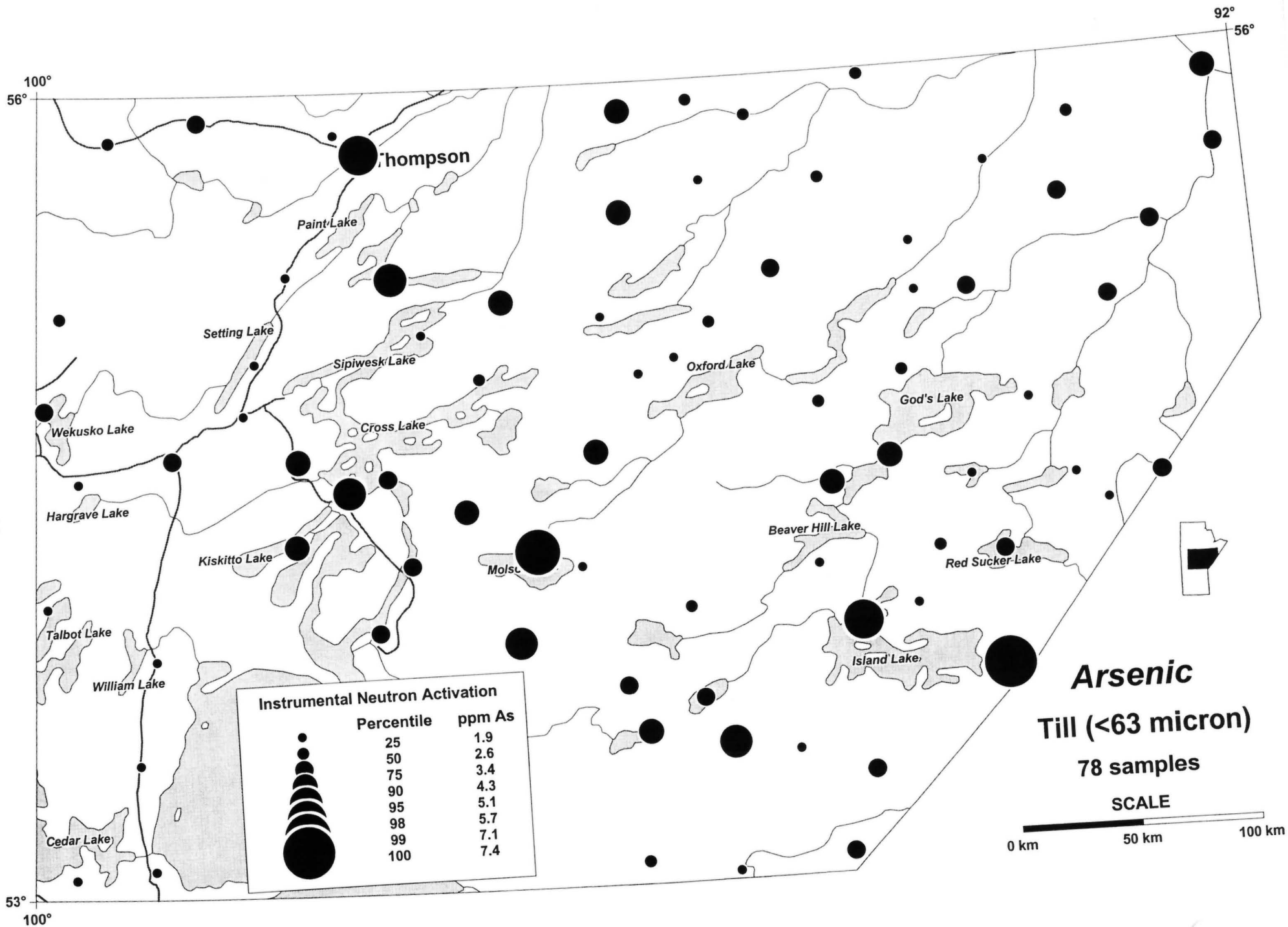
Appendix 3: Part 1: Geochemistry of the <63 micron fraction; data listing

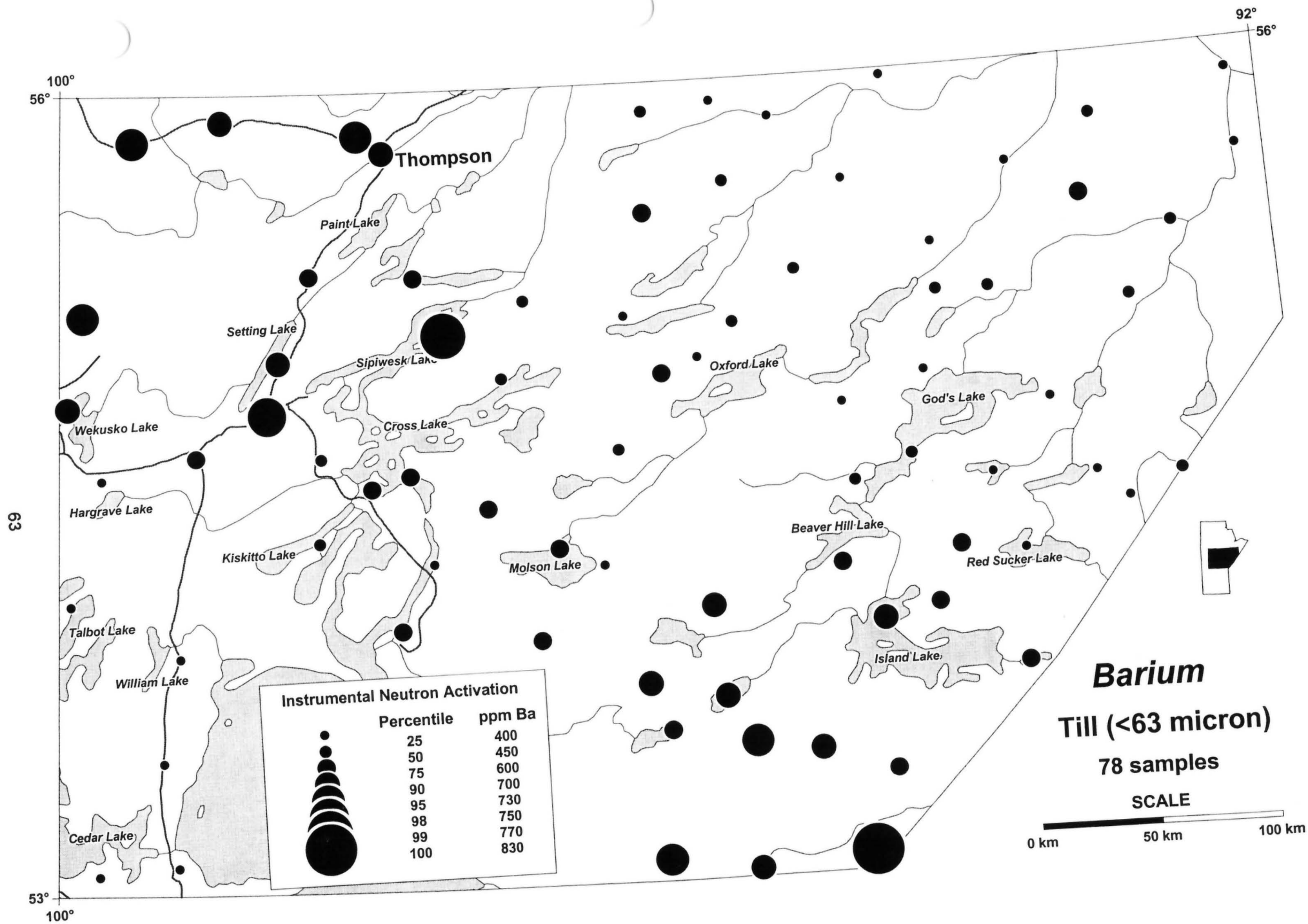
Site	Nd	Ni	Rb	Sb	Sc	Se	Sm	Sn	Sr_%	Ta	Tb	Th	U	W	Yb	Zn	Mass
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	gms
44	9	<20	71	0.2	6.7	<3	2.0	<0.01	<0.05	0.8	<0.5	7	1.4	<1	1.3	<50	31.43
45	17	<20	65	0.4	7.5	<3	3.1	<0.01	<0.05	0.8	<0.5	12	1.7	<1	1.5	61	31.40
46	16	<20	73	<0.1	5.4	<3	2.6	<0.01	<0.05	0.5	<0.5	9	1.9	<1	0.9	<50	3<53
47	15	<20	62	0.3	5.7	<3	3.0	<0.01	<0.05	<0.5	<0.5	9	1.0	<1	1.3	53	31.02
48	12	<20	46	0.1	4.0	<3	<5	<0.01	0.05	<0.5	<0.5	6	1.2	<1	1.3	<50	33.80
49	14	30	46	<0.1	4.7	<3	2.7	<0.01	<0.05	<0.5	<0.5	7	1.2	<1	1.3	<50	30.82
50	12	<20	44	0.1	4.2	<3	<5	<0.01	0.05	0.5	<0.5	6	1.0	<1	1.2	<50	31.96
51	16	<20	68	<0.1	5.6	<3	3.1	<0.01	<0.05	<0.5	0.5	9	1.8	<1	1.4	<50	30.53
52	18	<20	52	<0.1	5.0	<3	3.5	<0.01	0.07	<0.5	<0.5	12	1.4	<1	1.5	<50	30.32
53	46	<20	76	<0.1	8.4	<3	6.6	<0.01	<0.05	0.9	<0.5	16	1.6	<1	1.9	66	31.49
54	8	<20	58	0.2	5.8	<3	1.7	<0.01	0.08	<0.5	<0.5	7	1.1	<1	1.1	<50	35.28
55	14	<20	120	<0.1	4.2	<3	3.0	<0.01	<0.05	0.9	<0.5	14	3.4	<1	1.4	<50	31.27
56	14	<20	42	<0.1	3.7	<3	<5	<0.01	<0.05	<0.5	<0.5	6	0.9	<1	1.4	<50	35.69
57	12	<20	34	0.2	3.8	<3	2.4	<0.01	<0.05	<0.5	<0.5	5	1.1	<1	1.4	<50	36.01
58	14	<20	51	0.2	4.6	<3	2.7	<0.01	<0.05	0.7	<0.5	7	1.2	<1	1.4	<50	31.42
59	12	<20	35	0.1	4.0	<3	<5	<0.01	<0.05	<0.5	<0.5	5	1.6	<1	1.5	<50	36.84
60	13	<20	40	0.1	5.0	<3	2.6	<0.01	0.07	<0.5	<0.5	5	1.2	<1	1.3	<50	32.09
61	15	<20	92	0.2	5.3	<3	3.1	<0.01	<0.05	0.6	0.5	17	3.2	<1	1.9	<50	32.79
62	23	<20	90	<0.1	5.5	<3	4.3	<0.01	<0.05	0.8	0.6	18	2.0	<1	1.7	<50	31.19
63	10	<20	60	0.2	7.8	<3	2.2	<0.01	<0.05	0.7	<0.5	7	1.9	<1	1.1	69	3<56
64	11	<20	39	0.2	4.0	<3	<5	<0.01	0.05	<0.5	<0.5	6	1.1	3	1.4	<50	32.67
65	13	<20	47	0.3	4.5	<3	2.6	<0.01	<0.05	<0.5	<0.5	6	0.9	<1	1.4	<50	30.85
66	13	<20	41	0.2	4.2	<3	<5	<0.01	<0.05	<0.5	<0.5	5	1.6	<1	1.5	<50	33.63
67	13	<20	35	0.2	4.2	<3	2.4	<0.01	<0.05	<0.5	<0.5	5	1.3	<1	1.2	<50	31.36
68	13	<20	45	0.2	4.4	<3	<5	<0.01	<0.05	<0.5	0.6	6	1.0	<1	1.2	<50	33.85
69	11	<20	53	<0.1	5.9	<3	2.4	<0.01	0.06	0.6	<0.5	6	1.2	<1	1.2	<50	34.27
70	16	<20	64	0.2	5.3	<3	2.9	<0.01	<0.05	<0.5	<0.5	7	1.2	<1	1.5	<50	30.87
71	12	<20	52	0.3	5.5	<3	2.9	<0.01	0.06	<0.5	<0.5	7	1.3	<1	1.3	<50	3<58
72	15	<20	65	0.1	5.8	<3	3.0	<0.01	<0.05	<0.5	0.5	10	1.3	<1	1.4	<50	30.16
73	11	31	33	0.2	3.7	<3	2.2	<0.01	<0.05	<0.5	<0.5	4	1.1	<1	1.2	<50	41.01
74	11	<20	39	0.2	4.8	<3	<5	<0.01	0.06	0.6	<0.5	5	1.8	<1	1.3	<50	37.38
75	16	<20	73	0.2	6.3	<3	3.3	<0.01	<0.05	0.6	<0.5	9	1.7	<1	1.6	<50	31.62
76	16	<20	56	0.3	6.0	<3	2.9	<0.01	<0.05	<0.5	<0.5	8	2.0	<1	1.4	<50	31.19
77	15	<20	58	0.2	6.0	<3	2.9	<0.01	<0.05	<0.5	0.5	7	0.9	<1	1.5	<50	30.99
78	16	<20	48	0.3	5.8	<3	3.2	<0.01	<0.05	<0.5	<0.5	7	1.0	<1	1.4	<50	30.30

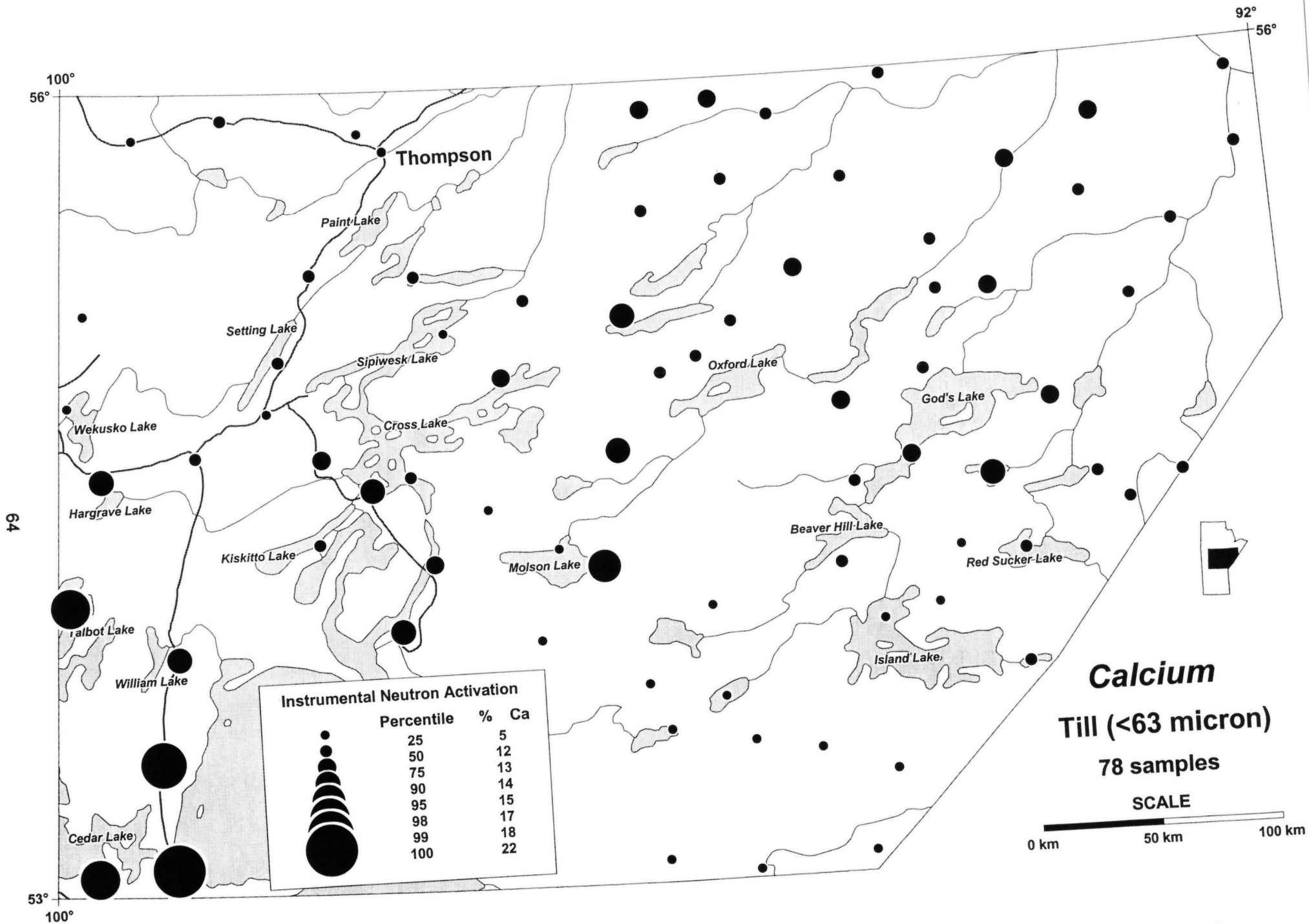
Appendix 3

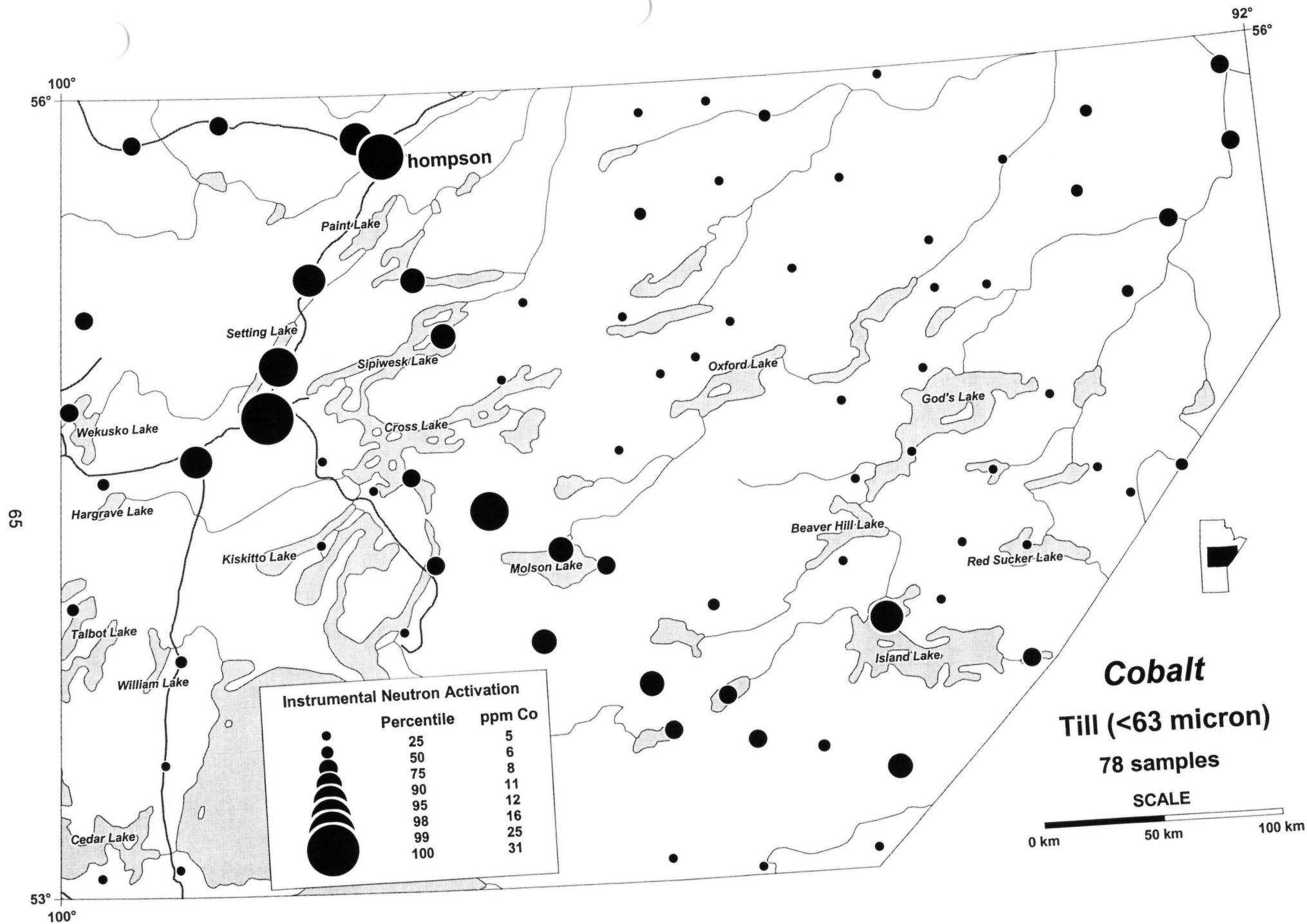
Part 2: Geochemistry of the <63 micron fraction; maps

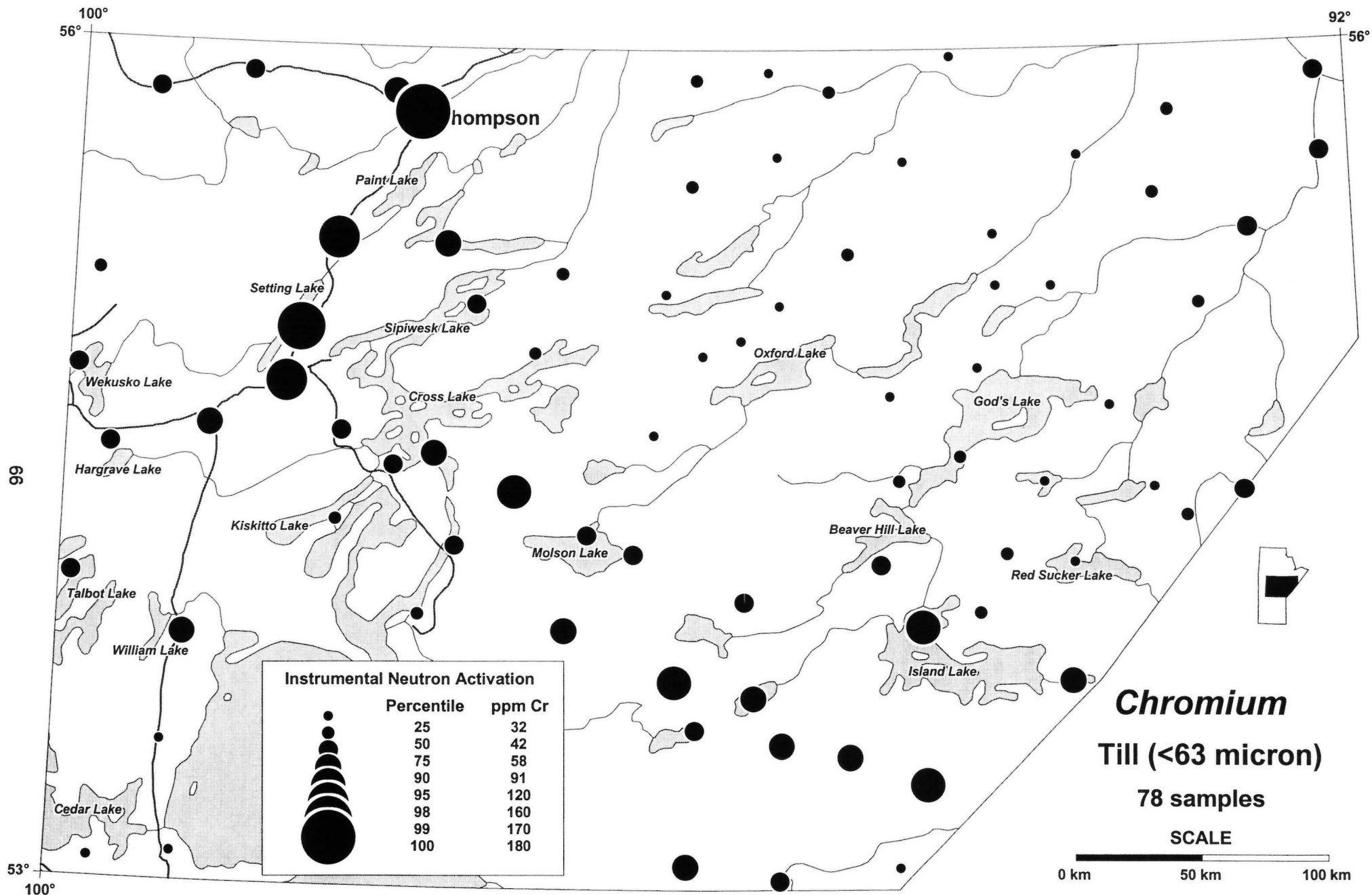


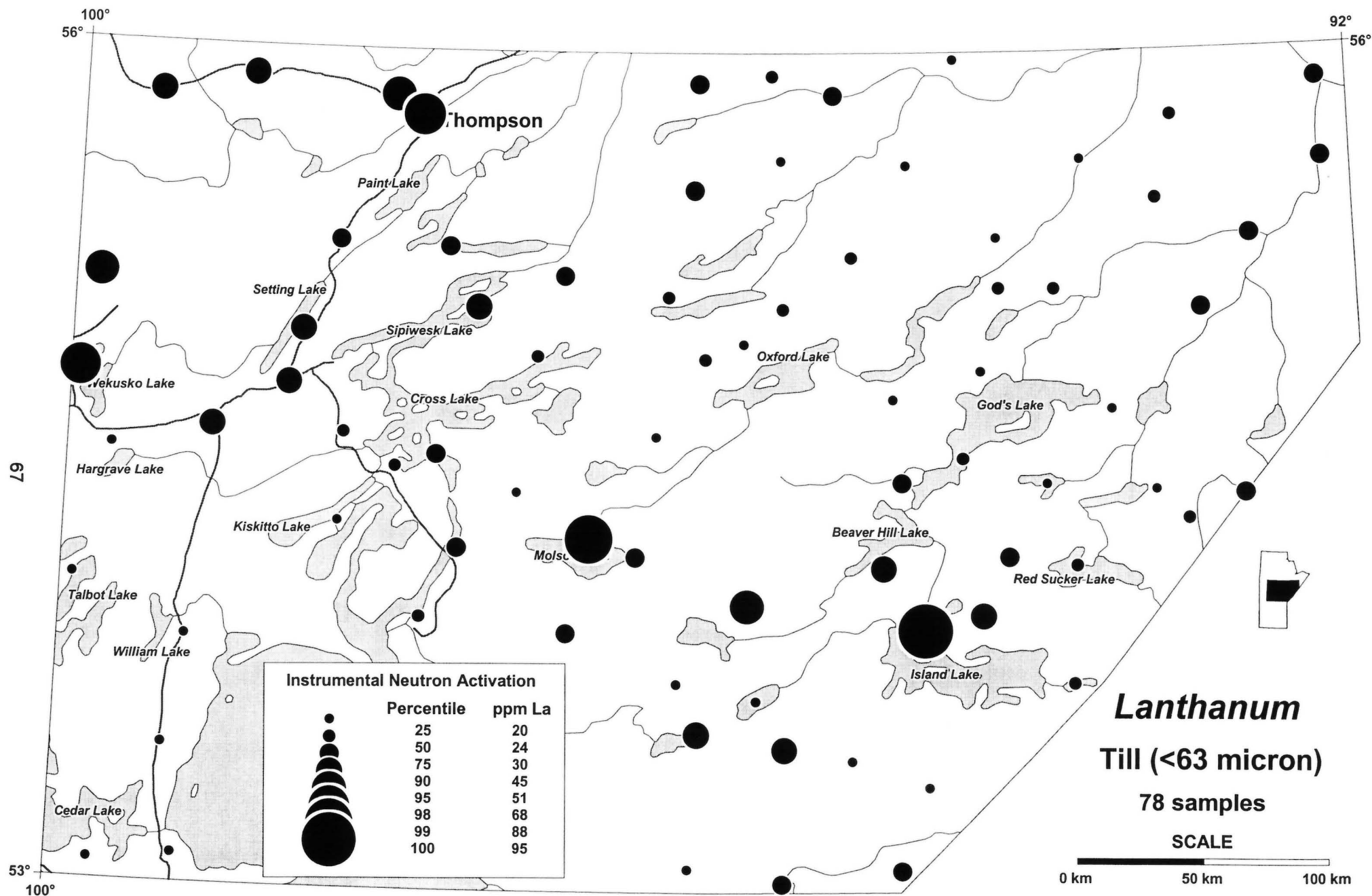


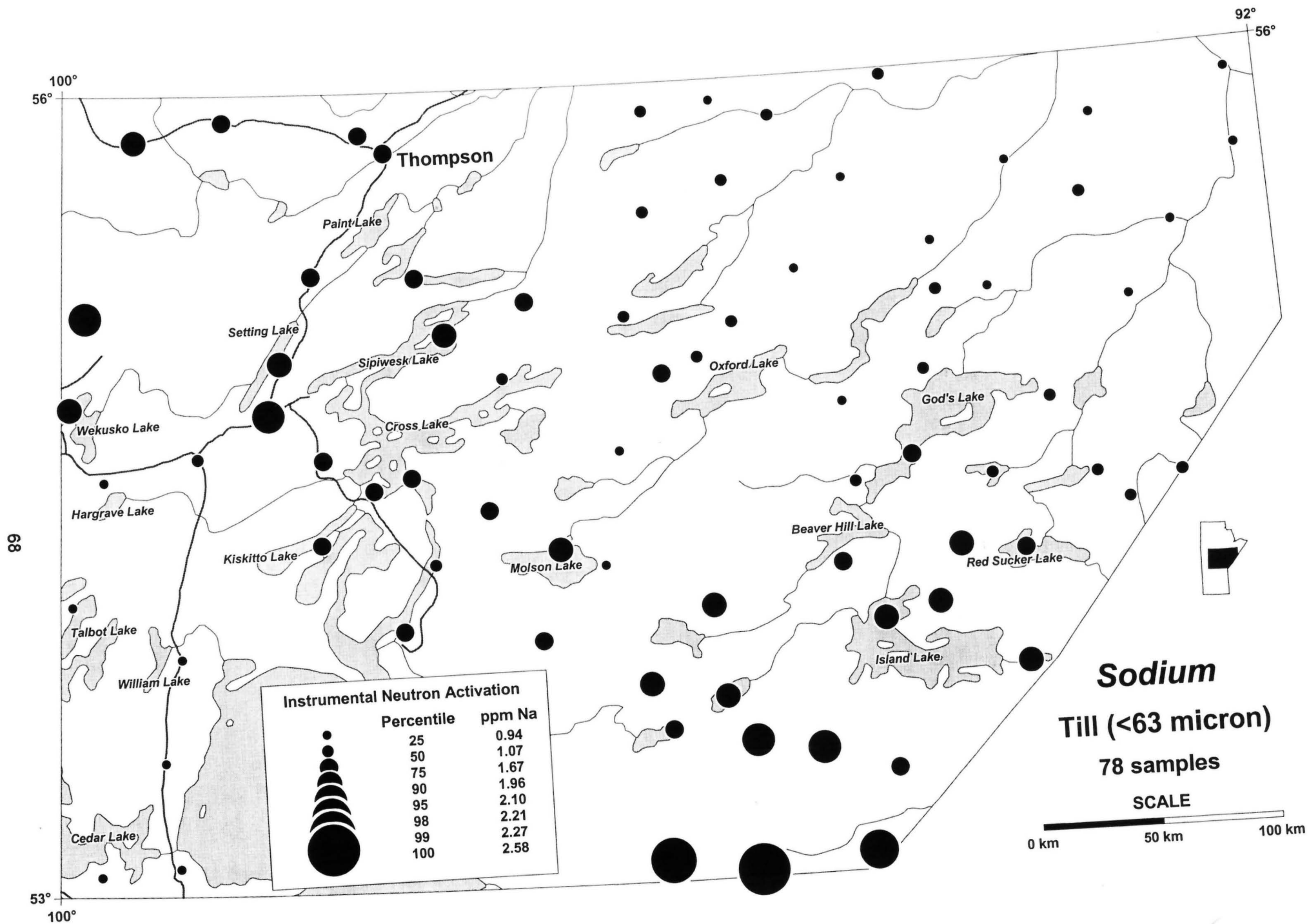


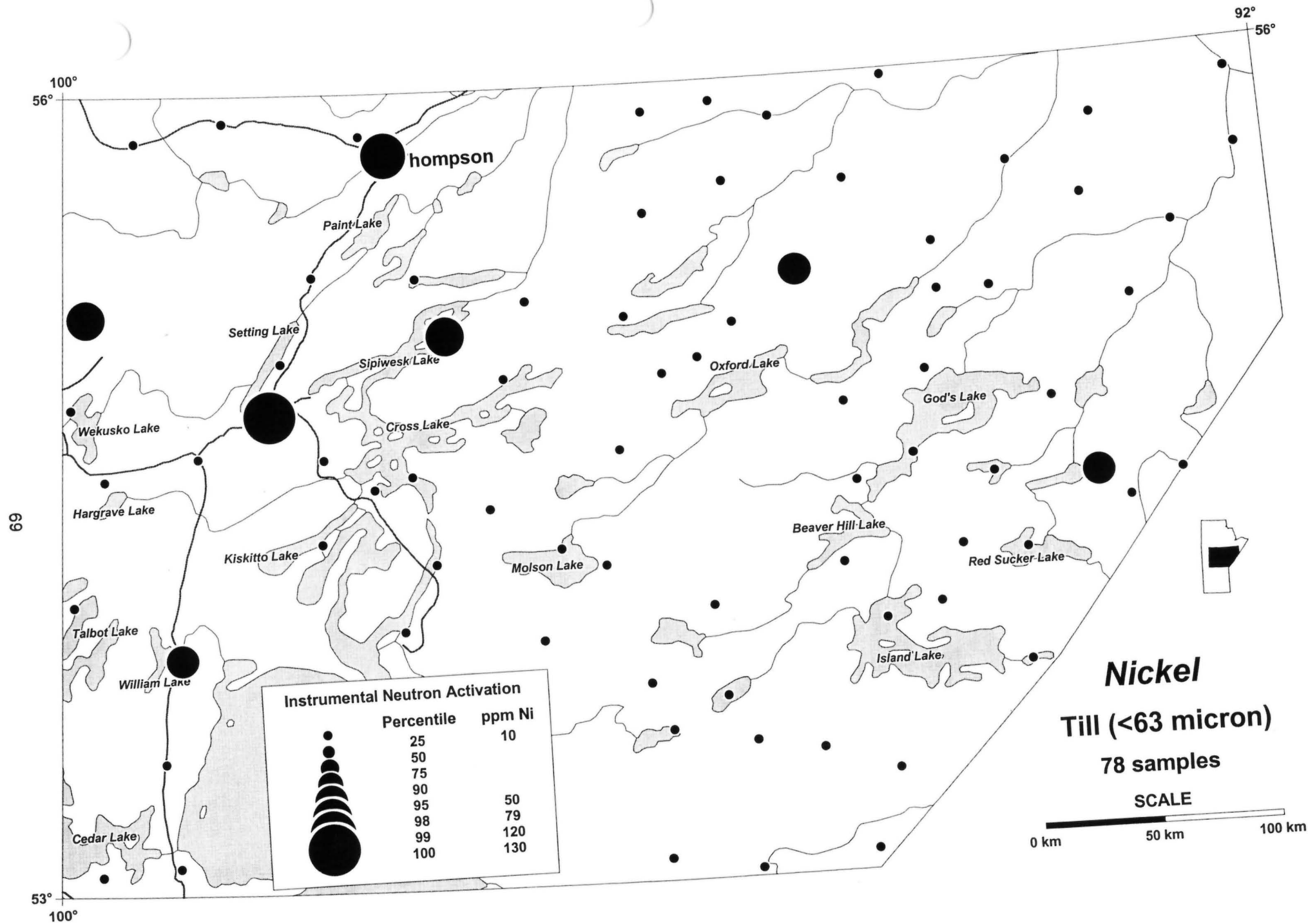


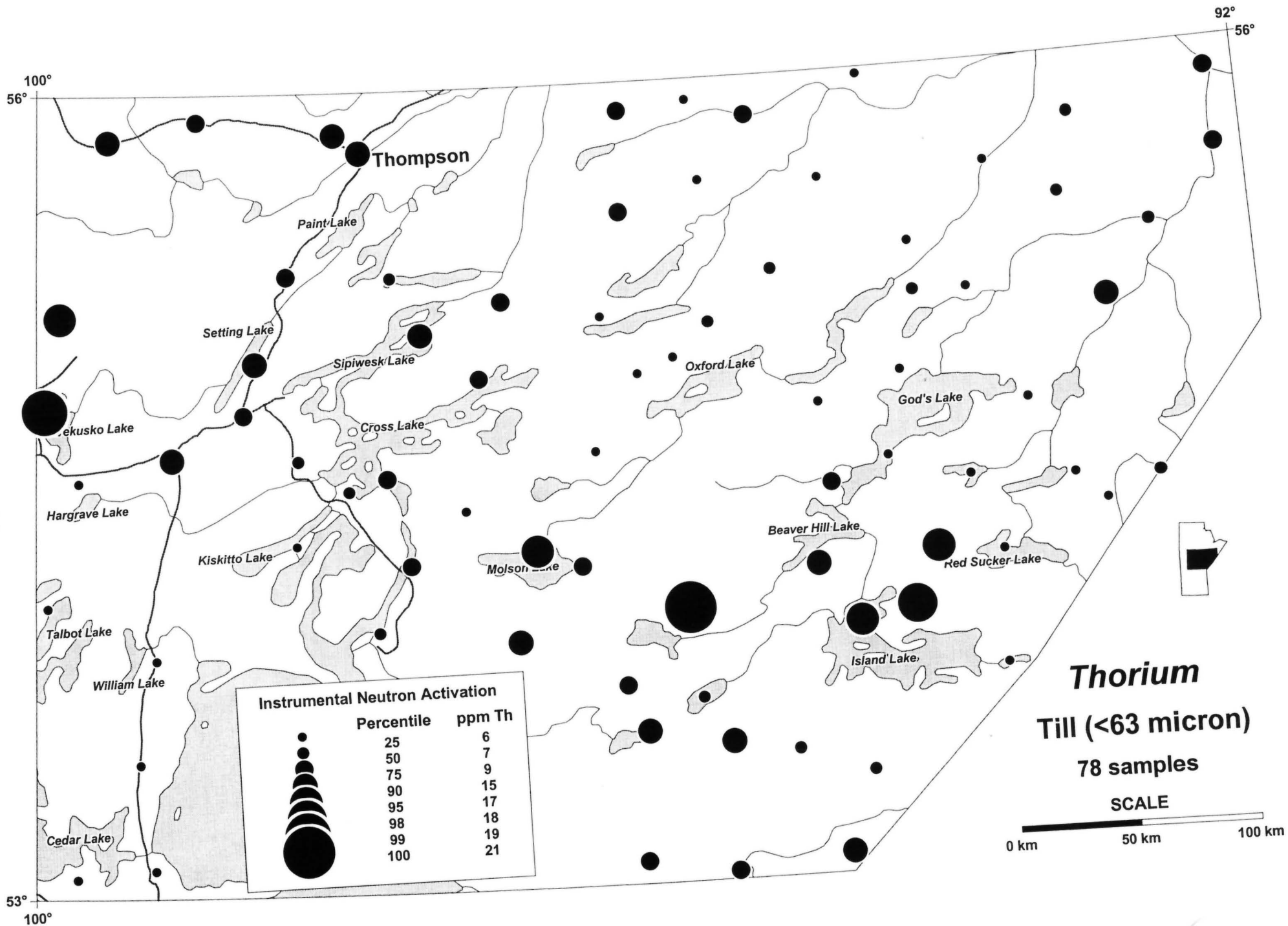


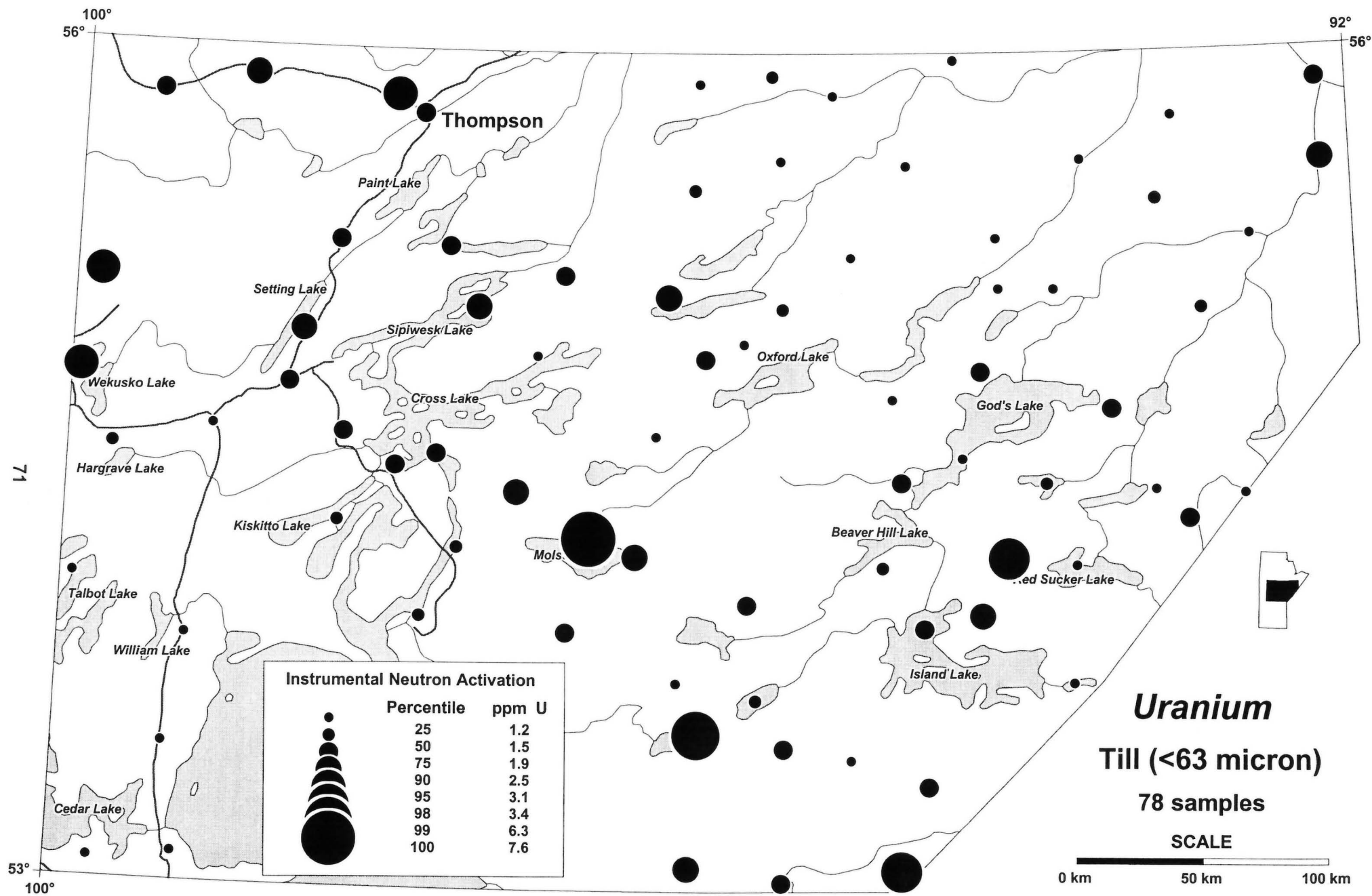












Appendix 4

Part 1: Geochemistry of the <2 micron fraction; data listing

Appendix 4: Part 1: Geochemistry of the <2 micron fraction; data listing

Site	Ag	Al	As(ICP)	As(AA)	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Li	Mg	Mn	Mo
Units	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm
1	0.3	2.96	<5	3.5	225	<5	3.70	<0.2	14	71	58	3.87	12	0.023	1.17	38	68	2.02	577	<1
2	0.5	4.88	8	6.8	212	<5	0.40	0.2	30	95	108	4.70	11	0.044	0.86	27	62	1.73	404	<1
3	0.4	4.08	15	8.1	375	<5	1.14	<0.2	19	127	186	5.26	15	0.019	2.22	30	104	2.32	430	<1
4	<0.2	1.39	8	4.0	100	<5	>10.00	<0.2	7	37	54	1.70	4	0.013	0.53	16	48	2.79	346	<1
5	<0.2	1.07	<5	2.5	102	<5	>10.00	<0.2	6	46	28	1.36	2	0.031	0.21	19	27	2.63	237	<1
6	<0.2	1.11	<5	2.3	71	<5	>10.00	<0.2	5	28	22	1.01	3	0.043	0.25	16	29	2.91	226	<1
7	0.5	2.48	10	8.1	181	<5	6.56	<0.2	17	69	126	3.59	10	0.032	1.06	39	62	2.01	673	<1
8	0.3	2.61	<5	3.8	166	<5	6.54	<0.2	11	68	46	3.25	9	0.020	0.81	38	68	2.17	469	<1
9	<0.2	1.19	<5	1.6	74	<5	>10.00	<0.2	7	46	26	1.28	4	0.018	0.26	24	35	2.49	357	<1
10	<0.2	0.85	<5	1.7	63	<5	>10.00	<0.2	3	17	17	0.72	<2	0.074	0.20	13	25	2.93	171	<1
11	<0.2	0.58	<5	1.7	38	<5	>10.00	<0.2	3	13	11	0.57	<2	0.045	0.18	11	21	2.82	171	<1
12	0.5	3.87	<5	3.3	405	<5	3.15	0.4	25	188	230	4.94	15	0.012	2.41	24	91	2.36	331	<1
13	0.3	2.18	<5	4.4	303	<5	>10.00	<0.2	16	65	87	3.15	8	0.030	0.62	42	49	2.00	542	<1
14	0.3	1.74	8	2.3	159	<5	>10.00	<0.2	18	61	140	2.81	6	0.018	0.48	34	35	2.19	488	<1
15	0.5	4.67	20	5.7	230	<5	0.69	0.3	43	107	200	5.84	15	0.039	0.65	32	82	2.01	769	2
16	0.3	2.17	<5	5.8	136	<5	9.77	<0.2	13	50	50	2.83	7	0.039	0.61	39	56	1.94	572	<1
17	0.2	1.65	8	7.0	127	<5	>10.00	<0.2	11	38	52	2.23	7	0.041	0.52	36	45	1.96	600	<1
18	0.5	3.40	9	6.2	222	<5	2.84	<0.2	26	114	126	4.68	13	0.026	0.80	92	63	2.29	615	<1
19	0.3	2.11	7	5.6	174	<5	9.58	<0.2	14	52	116	3.25	8	0.041	0.61	34	49	1.94	527	<1
20	0.6	5.03	12	11.8	173	<5	0.89	<0.2	45	101	132	6.20	11	0.052	0.47	69	60	1.82	895	<1
21	0.3	2.16	7	5.4	116	<5	>10.00	<0.2	11	71	56	2.61	7	0.028	0.55	39	55	2.04	486	<1
22	<0.2	0.79	<5	4.4	48	<5	>10.00	<0.2	5	26	22	1.03	3	0.018	0.21	22	20	2.15	302	<1
23	<0.2	1.99	<5	3.9	121	<5	>10.00	0.2	9	43	31	2.32	8	0.021	0.52	37	49	1.96	473	<1
24	0.3	1.78	<5	5.3	112	<5	>10.00	<0.2	8	38	32	2.12	5	0.022	0.41	35	43	1.84	463	<1
25	<0.2	1.57	<5	5.3	80	<5	>10.00	<0.2	7	27	30	1.61	4	0.042	0.33	36	31	1.73	389	<1
26	<0.2	1.99	<5	4.5	131	<5	>10.00	0.2	8	39	30	2.29	6	0.026	0.50	37	52	1.88	442	<1
27	0.5	5.47	17	11.3	127	<5	0.83	0.2	23	93	58	5.86	14	0.039	0.39	14	114	1.80	397	1
28	0.8	3.70	31	28.4	120	<5	1.28	0.4	45	87	93	5.83	15	0.100	0.60	296	81	1.81	1735	2
29	0.4	4.33	16	7.4	192	<5	0.68	<0.2	20	82	21	4.89	12	0.042	0.73	33	87	1.88	583	<1
30	0.3	2.32	5	5.1	117	<5	7.26	<0.2	11	49	33	2.98	8	0.036	0.63	37	56	2.02	516	<1
31	0.3	2.57	<5	5.2	144	<5	7.78	<0.2	11	52	37	3.08	10	0.034	0.63	41	64	1.94	417	<1
32	<0.2	2.09	<5	4.6	112	<5	>10.00	<0.2	8	38	27	2.23	6	0.043	0.41	38	47	1.85	342	<1
33	0.2	2.17	<5	3.1	131	<5	>10.00	<0.2	7	36	37	2.21	6	0.077	0.33	35	41	2.14	281	<1
34	<0.2	1.27	<5	3.6	82	<5	>10.00	<0.2	5	24	16	1.27	3	0.035	0.30	25	26	1.60	325	<1
35	0.2	2.04	<5	3.5	116	<5	>10.00	<0.2	8	38	31	2.22	7	0.027	0.51	35	55	1.80	428	<1
36	0.5	5.96	25	13.4	297	<5	0.58	0.4	18	154	50	7.38	15	0.097	0.25	17	96	1.16	315	18
37	0.5	7.80	11	5.2	141	<5	0.16	0.5	7	54	16	7.18	12	0.196	0.15	33	81	0.54	122	3
38	0.6	7.51	10	10.5	95	<5	0.33	0.6	9	59	31	6.91	11	0.079	0.14	34	40	0.98	245	4
39	0.4	2.21	6	6.6	121	<5	9.12	<0.2	11	46	37	2.80	8	0.051	0.49	38	55	1.89	539	<1
40	<0.2	1.09	<5	5.9	66	<5	>10.00	<0.2	8	23	19	1.43	2	0.044	0.20	31	26	1.70	421	<1
41	<0.2	1.69	<5	4.9	79	<5	>10.00	<0.2	8	33	22	1.96	4	0.054	0.37	38	38	1.93	398	<1
42	<0.2	1.47	<5	4.8	99	<5	>10.00	<0.2	8	28	32	1.67	4	0.045	0.36	35	34	1.78	466	<1
43	0.6	5.15	<5	11.1	169	<5	4.39	<0.2	19	60	64	4.26	9	0.139	0.33	108	59	1.27	335	<1

Appendix 4: Part 1: Geochemistry of the <2 micron fraction; data listing

Site	Ag	Al	As(ICP)	As(AA)	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Li	Mg	Mn	Mo
Units	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm
44	0.4	6.42	7	6.7	161	<5	0.29	<0.2	18	88	387	4.55	17	0.081	0.23	17	87	1.63	294	4
45	0.4	3.46	<5	11.0	197	<5	5.94	<0.2	11	65	58	3.47	9	0.056	0.21	68	57	1.22	262	<1
46	0.4	2.97	6	1.4	166	<5	0.74	<0.2	19	88	49	4.42	11	0.023	0.71	106	144	1.96	879	<1
47	0.3	2.96	<5	5.5	148	<5	4.34	<0.2	12	60	38	3.60	10	0.036	0.68	40	66	1.90	475	<1
48	<0.2	2.55	<5	6.5	132	<5	5.35	<0.2	12	52	47	3.21	9	0.079	0.47	34	56	2.07	501	<1
49	0.2	1.90	<5	4.7	103	<5	>10.00	<0.2	8	35	24	2.09	6	0.027	0.46	33	45	1.70	408	<1
50	0.2	1.64	<5	5.2	107	<5	>10.00	<0.2	8	34	28	1.98	6	0.034	0.51	37	44	1.75	490	<1
51	0.3	2.29	8	5.0	116	<5	7.43	<0.2	11	48	32	2.79	9	0.035	0.61	39	55	1.95	432	<1
52	0.3	1.81	<5	3.7	114	<5	>10.00	<0.2	7	34	34	1.96	6	0.046	0.36	64	43	1.73	438	<1
53	0.7	4.62	21	20.3	223	<5	0.71	0.3	33	98	94	6.21	15	0.050	0.90	70	86	1.83	994	<1
54	0.5	5.66	13	10.2	188	<5	0.34	<0.2	18	99	32	5.70	12	0.089	0.33	22	62	1.62	334	2
55	0.4	3.51	10	7.2	131	<5	0.43	0.2	15	51	30	3.98	13	0.045	0.66	38	113	1.62	469	2
56	<0.2	2.05	<5	10.5	128	<5	8.45	0.4	16	46	46	3.16	9	0.073	0.64	34	56	1.94	888	<1
57	0.4	2.82	<5	6.0	117	<5	4.24	<0.2	14	56	32	3.44	10	0.079	0.37	38	61	2.13	498	<1
58	0.3	2.21	<5	1.8	124	<5	6.05	<0.2	15	55	30	3.11	9	0.011	0.58	33	56	2.21	514	<1
59	0.3	2.15	6	6.9	115	<5	>10.00	<0.2	12	47	45	2.80	8	0.051	0.46	37	52	1.94	597	<1
60	0.2	1.82	<5	6.7	100	<5	>10.00	<0.2	10	48	47	2.59	7	0.044	0.48	37	50	1.88	609	<1
61	0.6	4.56	13	10.2	266	<5	0.48	0.4	23	67	63	4.60	11	0.095	0.62	44	98	1.64	855	2
62	0.6	2.75	9	9.9	146	<5	2.45	<0.2	11	54	49	3.36	10	0.068	0.53	102	58	1.91	490	<1
63	0.3	5.63	6	4.8	178	<5	0.32	<0.2	14	99	34	5.10	14	0.071	0.33	19	95	1.58	299	<1
64	0.3	2.16	8	6.8	111	<5	7.46	<0.2	12	48	36	3.07	8	0.048	0.60	36	55	1.89	644	<1
65	<0.2	2.03	<5	5.0	116	<5	>10.00	<0.2	9	42	28	2.46	6	0.027	0.47	33	50	1.80	467	<1
66	<0.2	2.09	<5	6.4	132	<5	>10.00	0.2	14	42	45	2.68	7	0.061	0.51	40	47	1.79	816	<1
67	<0.2	1.43	<5	4.9	121	<5	>10.00	<0.2	6	29	30	1.71	4	0.043	0.36	28	41	1.49	372	<1
68	<0.2	1.69	<5	6.1	118	<5	>10.00	0.4	7	34	48	2.06	7	0.025	0.49	37	46	1.70	492	<1
69	0.2	1.14	13	18.1	69	<5	>10.00	0.3	12	56	115	1.56	3	0.059	0.16	35	23	1.47	348	<1
70	<0.2	2.32	<5	5.2	118	<5	7.42	<0.2	11	50	33	3.00	9	0.030	0.60	37	56	1.91	593	<1
71	0.2	2.37	<5	4.8	119	<5	6.23	<0.2	12	57	33	3.15	8	0.044	0.62	35	58	1.95	523	<1
72	0.3	2.83	<5	4.2	144	<5	4.84	<0.2	12	63	31	3.41	11	0.034	0.67	36	61	2.03	433	<1
73	<0.2	1.65	<5	5.7	135	<5	>10.00	<0.2	12	36	35	2.21	6	0.050	0.39	37	40	1.56	721	<1
74	0.3	2.62	<5	3.8	126	<5	5.99	<0.2	16	66	47	3.28	10	0.072	0.61	34	65	1.90	421	<1
75	0.2	2.45	<5	5.2	100	<5	6.15	0.3	13	50	30	3.05	9	0.019	0.66	40	60	1.82	541	<1
76	0.3	2.15	<5	5.6	98	<5	8.17	<0.2	10	45	27	2.76	8	0.027	0.65	37	59	1.91	450	<1
77	<0.2	2.30	<5	5.2	112	<5	7.84	<0.2	12	55	33	3.10	9	0.025	0.57	35	57	1.93	607	<1
78	0.3	2.81	<5	4.8	141	<5	5.55	<0.2	12	62	42	3.49	10	0.045	0.64	40	66	1.99	495	<1

Appendix 4: Part 1: Geochemistry of the <2 micron fraction; data listing

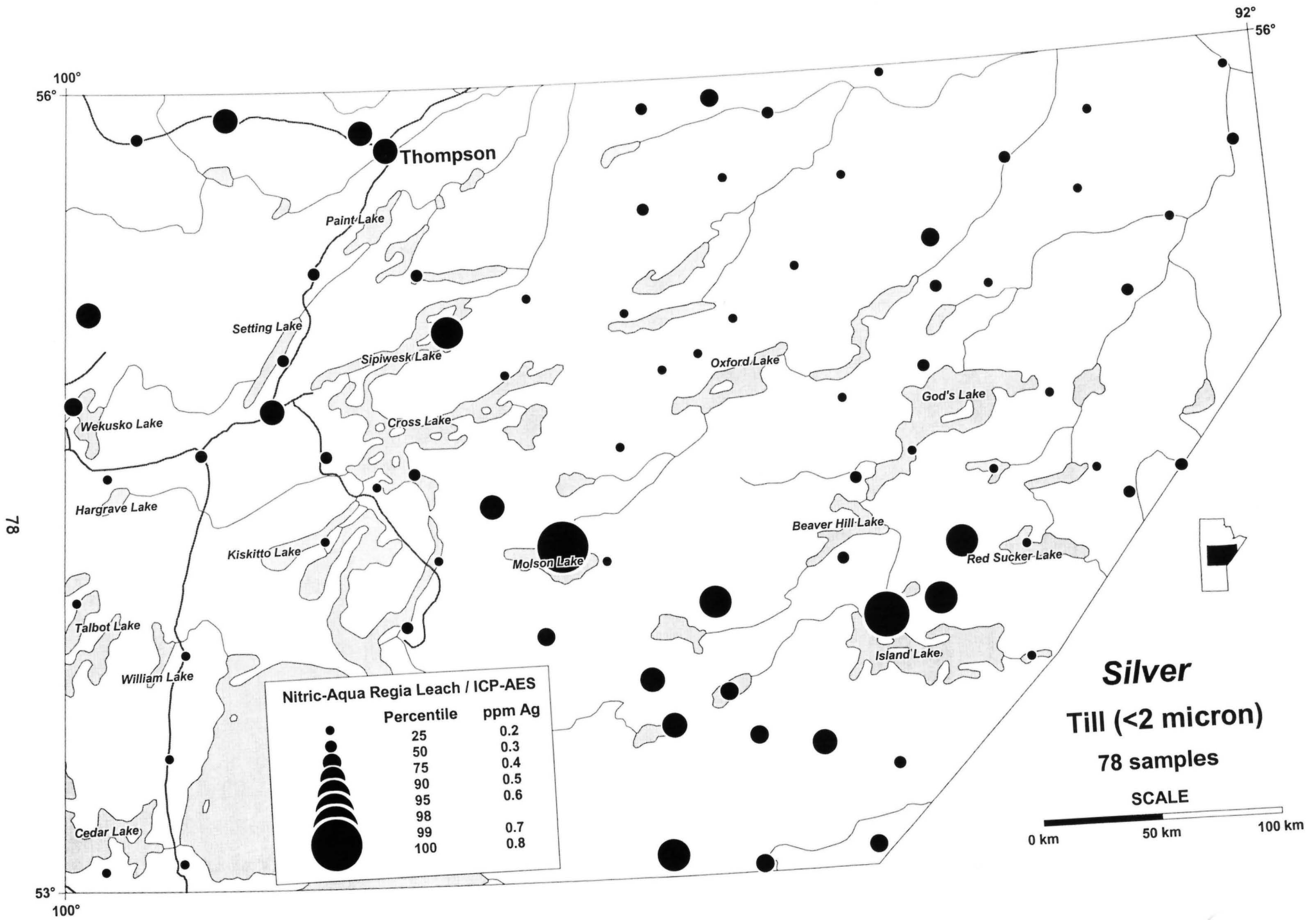
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Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
1	0.24	1	46	3	<5	10	<20	47	<10	<10	0.23	77	<20	12	120	16
2	0.45	3	118	5	<5	8	<20	29	<10	<10	0.20	119	<20	9	96	9
3	0.30	2	76	<2	<5	14	<20	25	<10	<10	0.41	144	<20	10	176	32
4	0.11	<1	30	<2	<5	<5	<20	33	<10	<10	0.09	37	<20	4	37	7
5	0.13	1	38	2	<5	<5	<20	59	<10	<10	0.05	30	<20	5	24	5
6	0.08	<1	25	<2	<5	<5	<20	40	<10	<10	0.05	21	<20	4	24	5
7	0.19	1	61	3	<5	9	<20	62	<10	<10	0.21	75	<20	11	121	9
8	0.16	1	48	3	<5	8	<20	60	<10	<10	0.16	65	<20	11	85	12
9	0.13	<1	56	3	<5	<5	<20	64	<10	<10	0.06	24	<20	6	30	7
10	0.08	<1	17	3	<5	<5	<20	39	<10	<10	0.03	14	<20	3	18	5
11	0.08	<1	11	5	<5	<5	<20	35	<10	<10	0.02	10	<20	2	18	3
12	0.26	2	140	<2	<5	9	<20	35	<10	<10	0.54	177	<20	6	183	17
13	0.19	<1	87	7	<5	8	<20	82	<10	<10	0.14	58	<20	10	72	9
14	0.25	<1	101	2	<5	7	<20	77	<10	<10	0.13	51	<20	8	60	9
15	0.35	3	164	7	<5	9	<20	35	<10	<10	0.20	107	<20	7	97	12
16	0.19	1	41	8	<5	7	<20	85	<10	<10	0.13	50	<20	11	79	7
17	0.20	1	34	8	<5	5	<20	95	<10	<10	0.12	39	<20	9	62	10
18	0.21	2	170	15	<5	10	<20	43	<10	<10	0.20	84	<20	11	92	12
19	0.19	<1	72	6	<5	8	<20	80	<10	<10	0.13	55	<20	10	84	8
20	0.32	3	122	6	<5	18	<20	47	<10	<10	0.14	88	<20	24	90	14
21	0.17	1	49	5	<5	7	<20	83	<10	<10	0.12	48	<20	11	73	7
22	0.07	<1	24	3	<5	<5	<20	83	<10	<10	0.07	20	<20	7	29	9
23	0.12	<1	31	7	<5	6	<20	89	<10	<10	0.12	44	<20	11	62	9
24	0.15	<1	25	6	<5	5	<20	95	<10	<10	0.10	43	<20	10	56	7
25	0.15	1	22	6	<5	<5	<20	90	<10	<10	0.08	28	<20	11	45	5
26	0.15	<1	26	6	<5	6	<20	113	<10	<10	0.11	44	<20	10	61	14
27	0.19	4	85	5	<5	7	<20	35	<10	<10	0.12	124	<20	4	81	7
28	0.30	5	65	32	<5	12	<20	46	<10	<10	0.11	98	<20	56	145	5
29	0.19	2	55	12	<5	10	<20	46	<10	<10	0.17	84	<20	8	95	14
30	0.15	1	36	8	<5	7	<20	84	<10	<10	0.12	53	<20	12	74	11
31	0.17	<1	36	7	<5	7	<20	70	<10	<10	0.13	57	<20	11	73	16
32	0.17	2	25	6	<5	6	<20	84	<10	<10	0.10	41	<20	13	56	8
33	0.22	2	23	2	<5	5	<20	67	<10	<10	0.08	34	<20	11	49	6
34	0.12	1	16	5	<5	<5	<20	95	<10	<10	0.06	22	<20	7	33	5
35	0.15	1	25	7	<5	5	<20	105	<10	<10	0.09	41	<20	10	54	7
36	0.42	2	56	23	<5	8	<20	37	<10	<10	0.04	145	<20	5	64	2
37	0.26	7	19	15	<5	7	<20	15	<10	<10	0.10	90	<20	10	69	13
38	0.39	4	24	<2	<5	8	<20	28	<10	<10	0.04	150	<20	8	52	3
39	0.20	1	31	9	<5	6	<20	73	<10	<10	0.12	50	<20	12	71	6
40	0.19	1	18	8	<5	<5	<20	78	<10	<10	0.06	24	<20	10	43	3
41	0.19	1	22	7	<5	6	<20	80	<10	<10	0.09	33	<20	16	51	5
42	0.15	1	21	8	<5	<5	<20	102	<10	<10	0.08	30	<20	10	46	7
43	0.24	6	47	20	<5	10	<20	48	<10	<10	0.14	60	<20	28	54	18

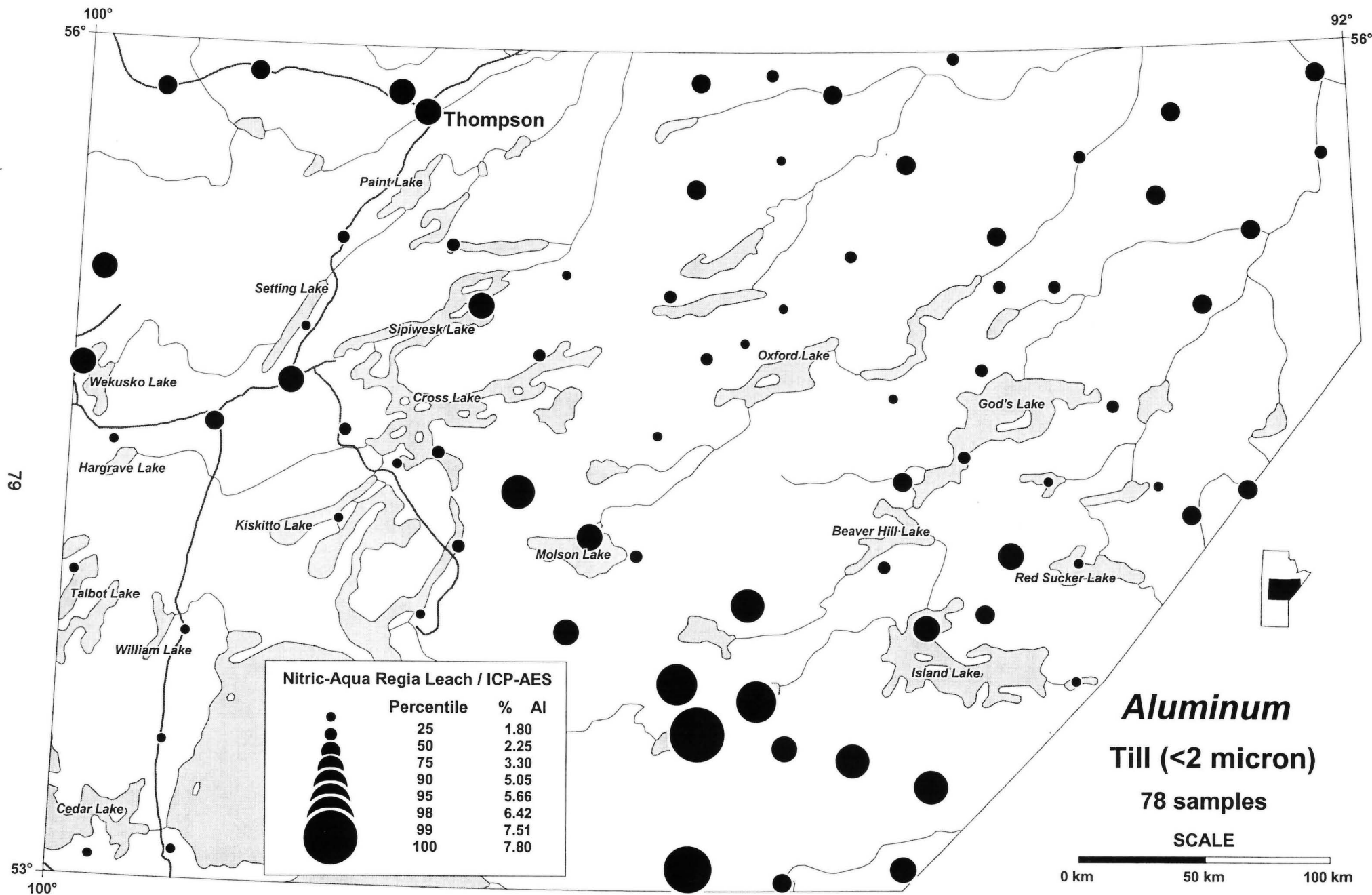
Appendix 4: Part 1: Geochemistry of the <2 micron fraction; data listing

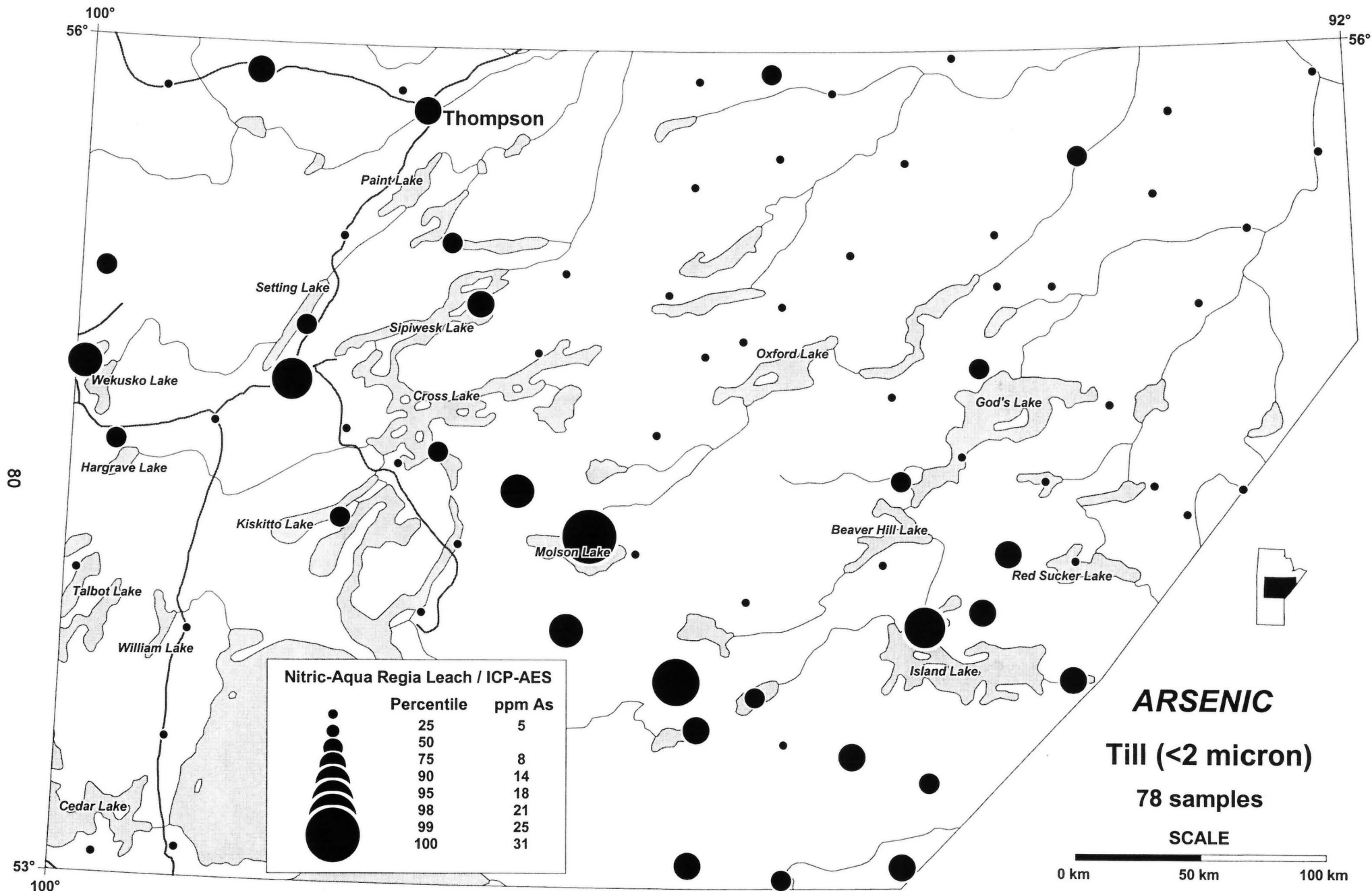
Site	Na	Nb	Ni	Pb	Sb	Sc	Sn	Sr	Ta	Te	Ti	V	W	Y	Zn	Zr
Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
44	0.29	6	59	8	<5	9	<20	23	<10	<10	0.14	84	<20	5	82	12
45	0.17	2	39	9	<5	7	<20	56	<10	<10	0.12	64	<20	17	57	7
46	0.30	3	46	18	<5	6	<20	61	<10	<10	0.24	86	<20	11	97	16
47	0.16	1	43	9	<5	8	<20	62	<10	<10	0.14	64	<20	13	85	18
48	0.25	1	39	8	<5	7	<20	57	<10	<10	0.12	53	<20	13	80	9
49	0.14	<1	25	7	<5	5	<20	86	<10	<10	0.09	38	<20	9	54	10
50	0.11	1	23	8	<5	5	<20	115	<10	<10	0.10	35	<20	11	56	7
51	0.11	<1	33	8	<5	6	<20	72	<10	<10	0.13	52	<20	12	70	12
52	0.12	1	22	10	<5	5	<20	91	<10	<10	0.10	35	<20	15	48	9
53	0.24	3	88	33	<5	14	<20	46	<10	<10	0.18	108	<20	20	123	25
54	0.32	5	61	7	<5	7	<20	29	<10	<10	0.19	93	<20	5	81	17
55	0.26	5	39	16	<5	7	<20	33	<10	<10	0.17	74	<20	7	97	13
56	0.20	1	43	16	<5	6	<20	75	<10	<10	0.13	49	<20	10	88	5
57	0.31	2	45	9	<5	8	<20	52	<10	<10	0.11	58	<20	17	75	5
58	0.16	2	41	8	<5	7	<20	63	<10	<10	0.14	57	<20	10	80	10
59	0.17	1	36	9	<5	6	<20	82	<10	<10	0.12	50	<20	11	77	14
60	0.16	<1	29	7	<5	6	<20	87	<10	<10	0.14	47	<20	11	70	7
61	0.31	5	51	43	<5	10	<20	35	<10	<10	0.21	67	<20	13	94	29
62	0.26	4	41	12	<5	10	<20	46	<10	<10	0.14	59	<20	28	82	13
63	0.26	4	47	3	<5	7	<20	29	<10	<10	0.13	87	<20	5	112	14
64	0.16	1	37	12	<5	7	<20	81	<10	<10	0.14	52	<20	11	81	6
65	0.11	1	29	7	<5	6	<20	82	<10	<10	0.11	45	<20	10	63	12
66	0.08	<1	31	10	<5	7	<20	93	<10	<10	0.12	46	<20	12	71	10
67	0.07	1	19	6	<5	<5	<20	169	<10	<10	0.08	32	<20	8	44	8
68	0.08	<1	22	9	<5	<5	<20	99	<10	<10	0.11	37	<20	10	60	14
69	0.06	1	49	7	<5	<5	<20	113	<10	<10	0.05	27	<20	8	49	3
70	0.08	<1	37	8	<5	7	<20	74	<10	<10	0.14	53	<20	11	79	11
71	0.09	1	40	9	<5	7	<20	69	<10	<10	0.16	58	<20	11	81	21
72	0.09	1	40	8	<5	8	<20	68	<10	<10	0.16	61	<20	11	83	24
73	0.08	1	23	10	<5	5	<20	139	<10	<10	0.10	39	<20	12	48	6
74	0.08	1	43	8	<5	8	<20	67	<10	<10	0.16	62	<20	12	85	17
75	0.06	1	37	10	<5	7	<20	65	<10	<10	0.09	56	<20	12	91	11
76	0.09	<1	34	7	<5	6	<20	80	<10	<10	0.10	51	<20	11	76	7
77	0.08	<1	35	7	<5	7	<20	75	<10	<10	0.14	56	<20	11	84	15
78	0.09	1	43	5	<5	8	<20	65	<10	<10	0.15	61	<20	13	87	17

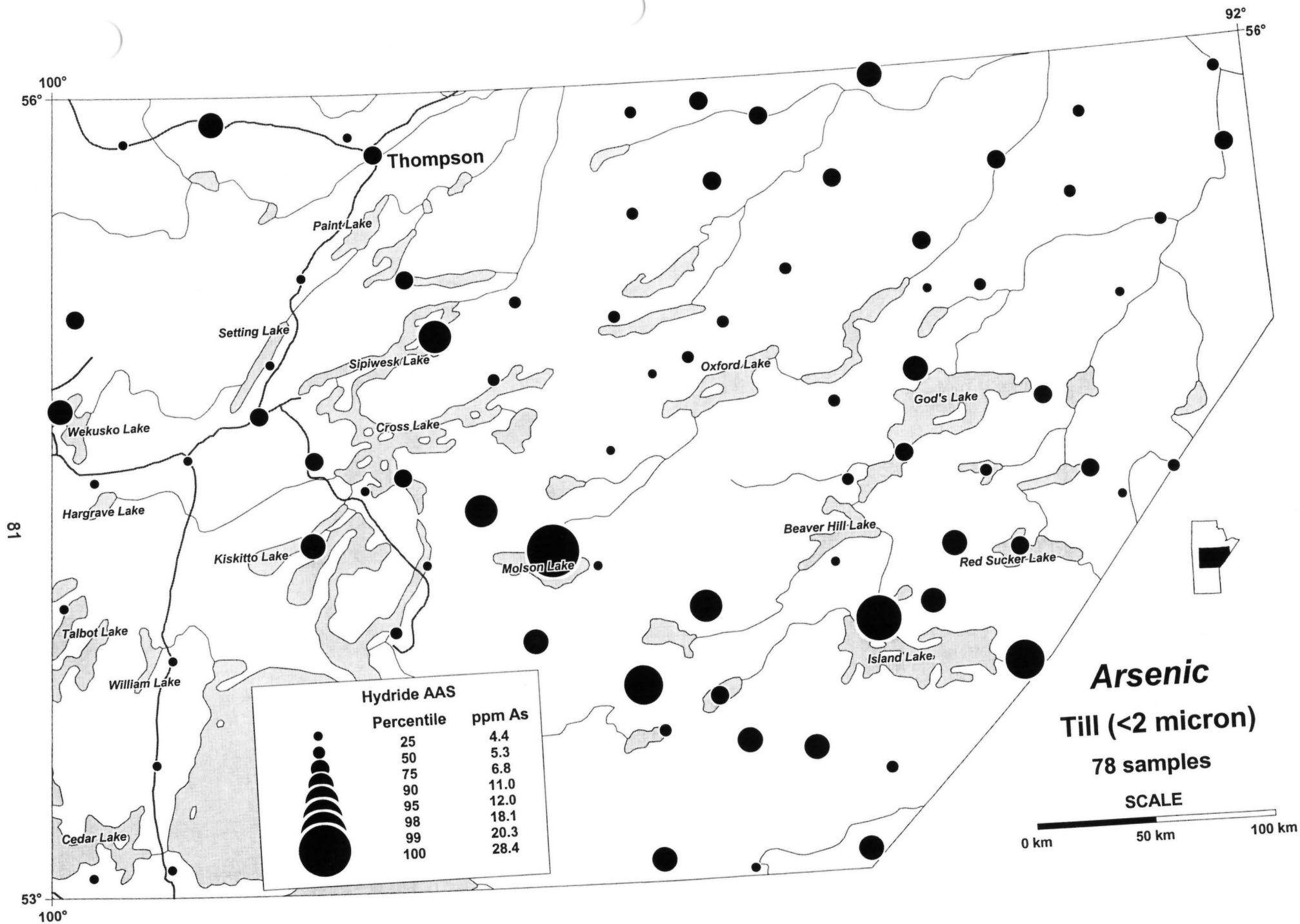
Appendix 4

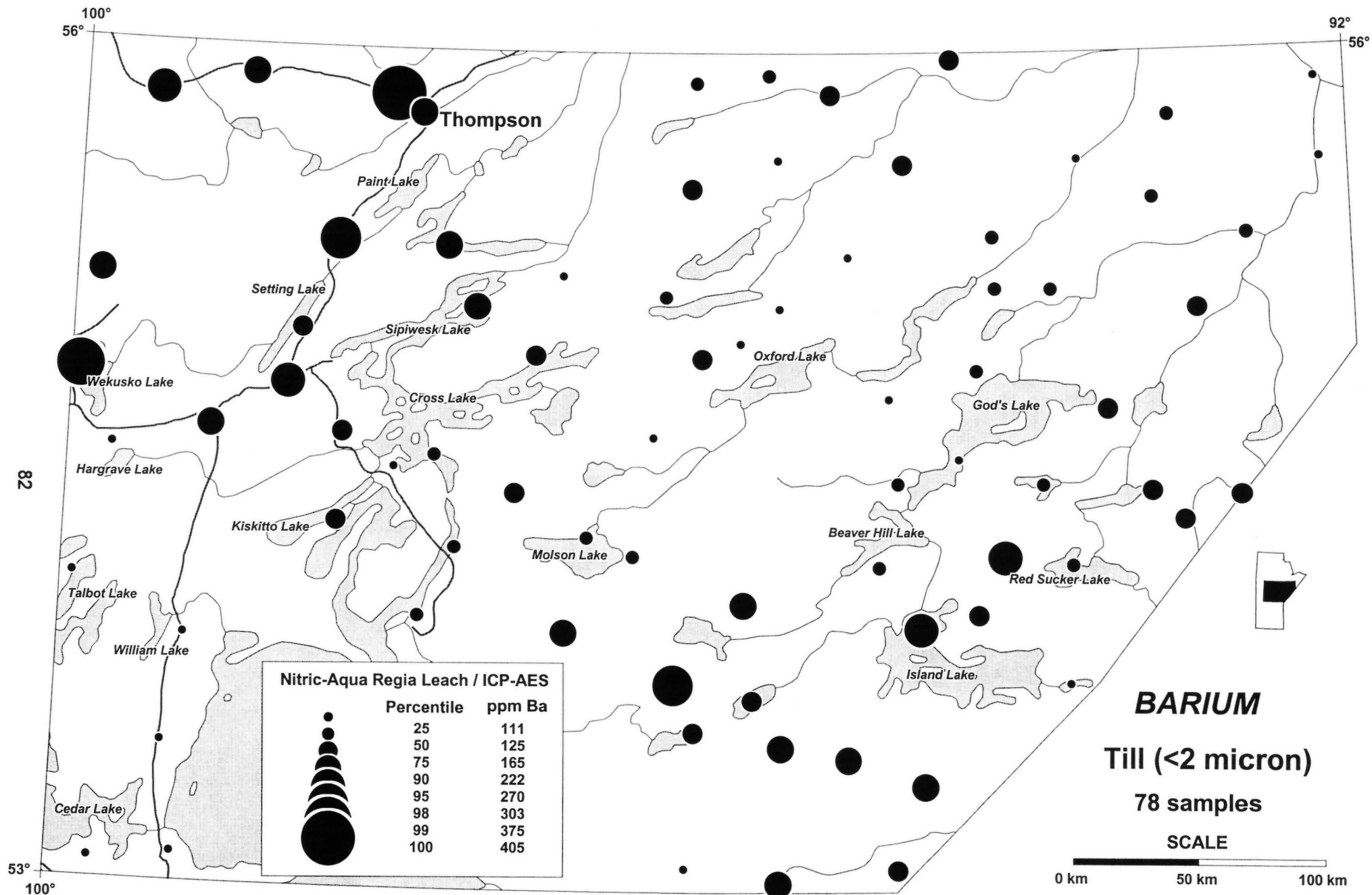
Part 2: Geochemistry of the <2 micron fraction; maps

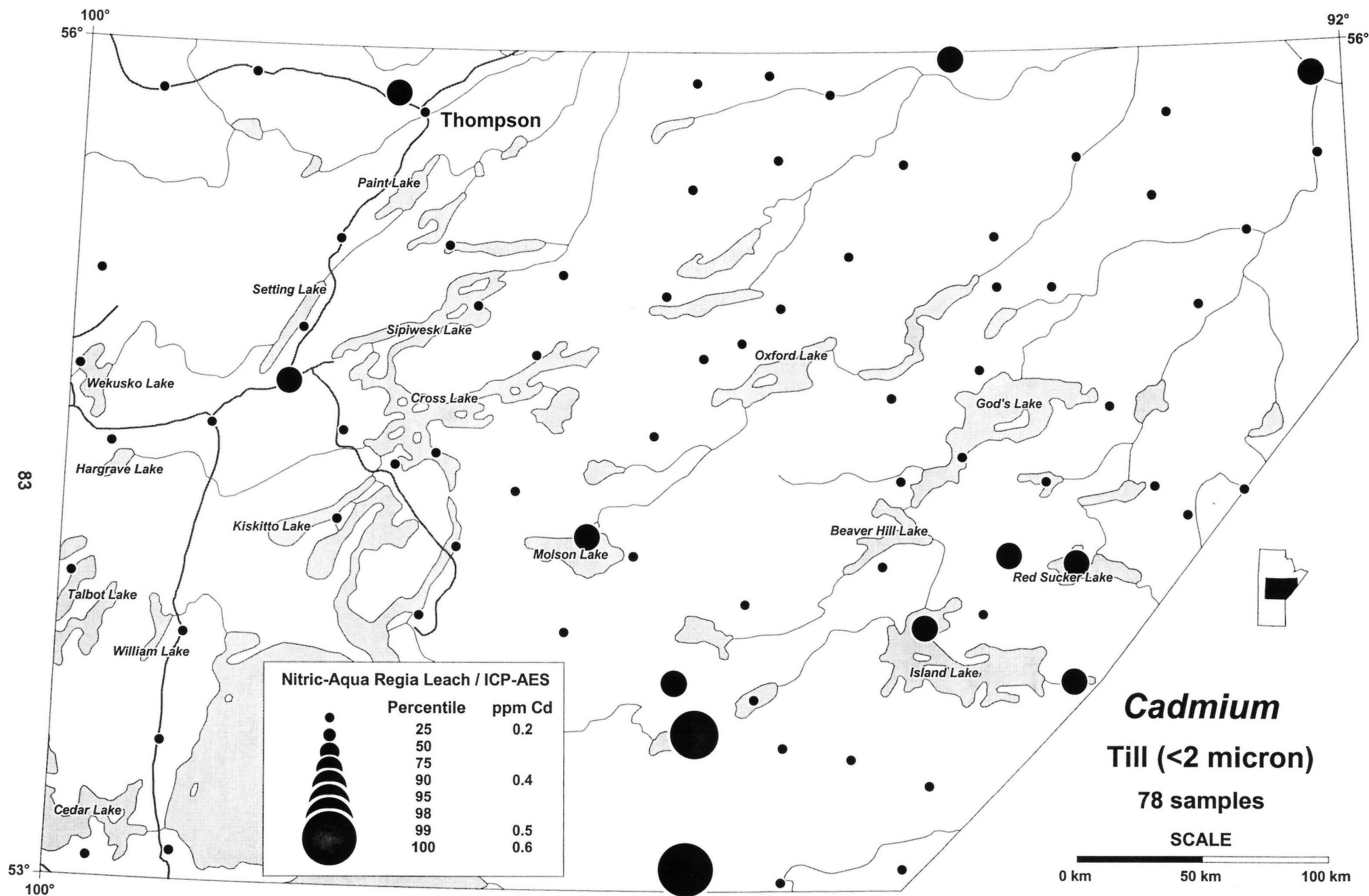


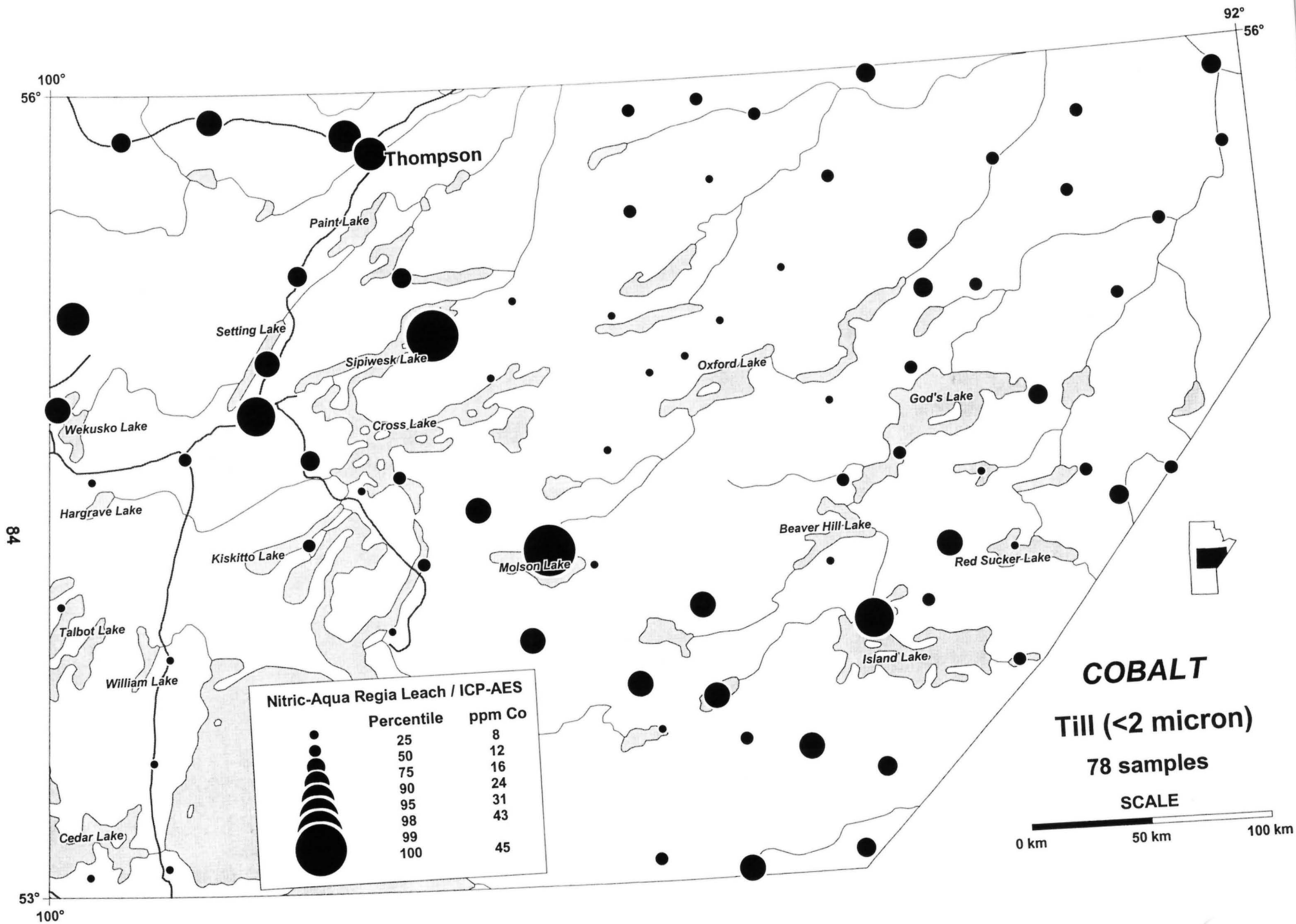


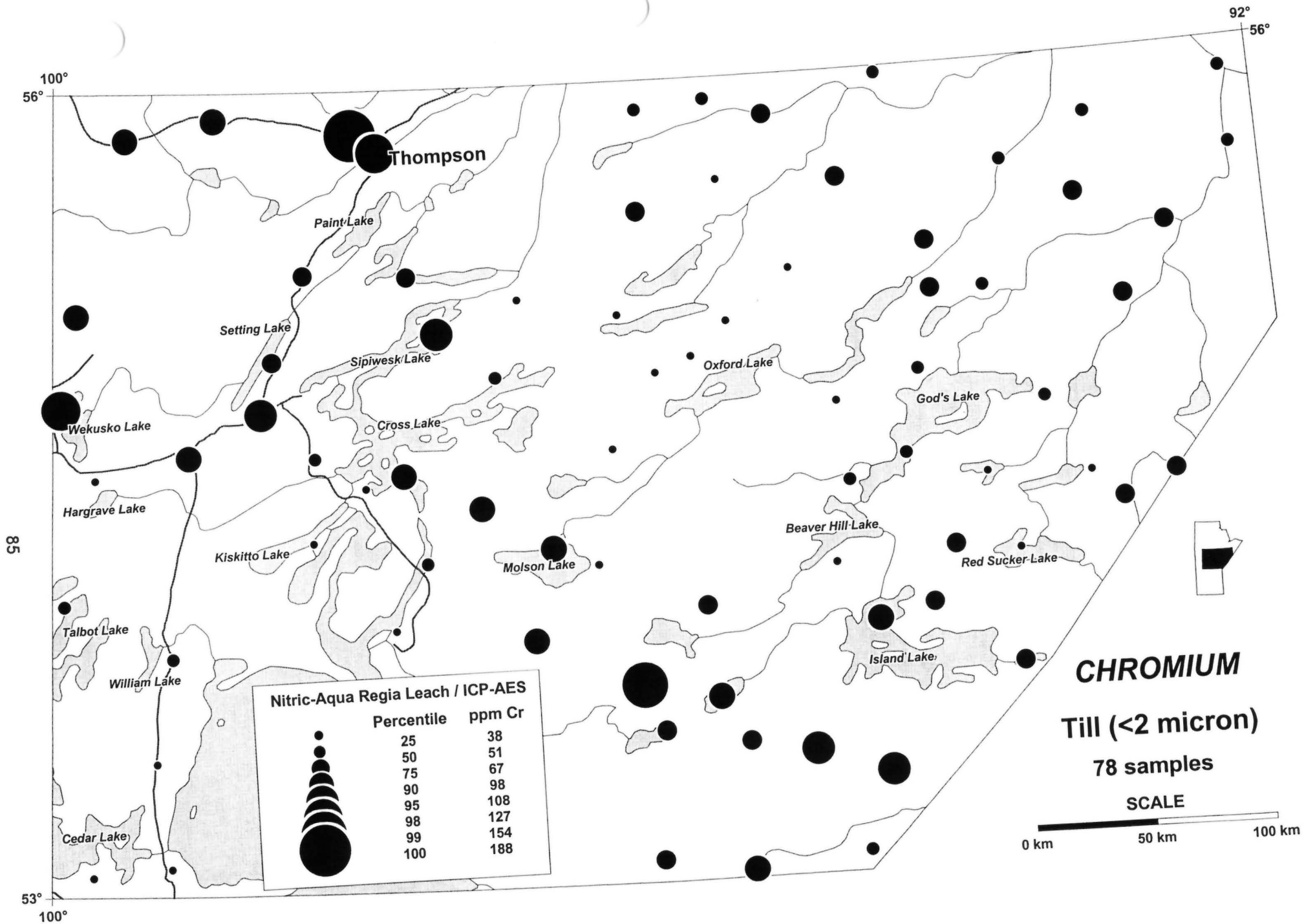


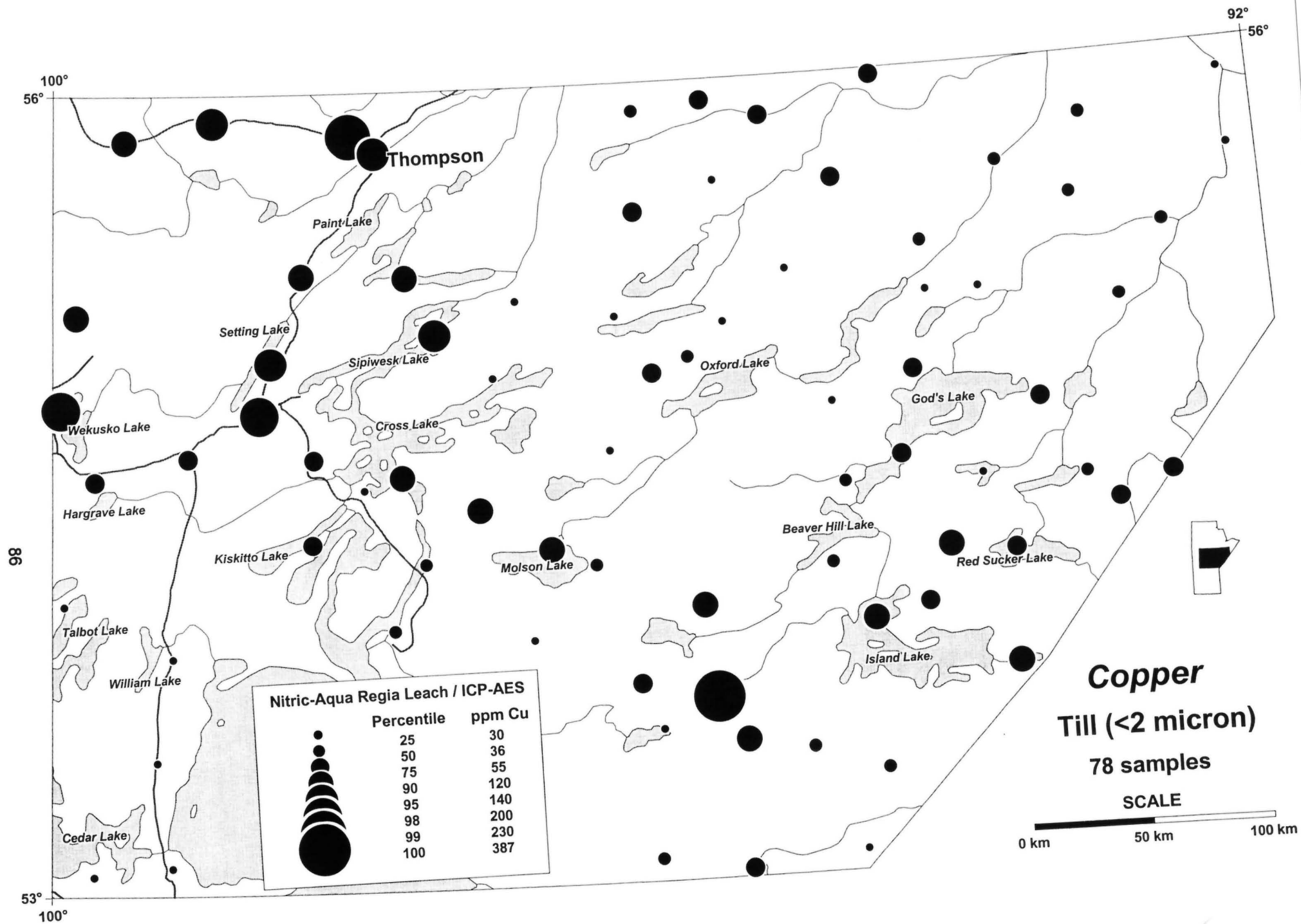


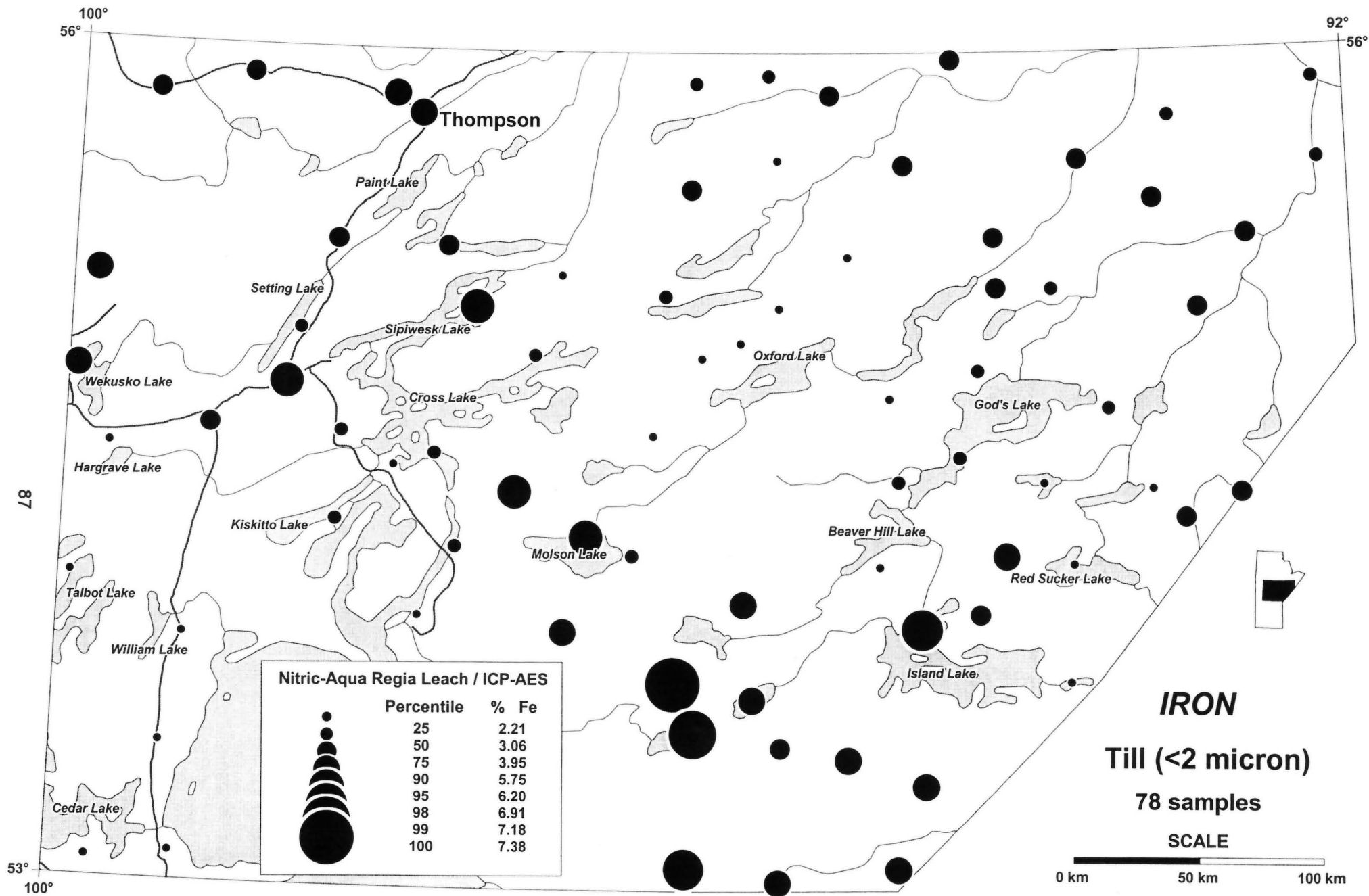


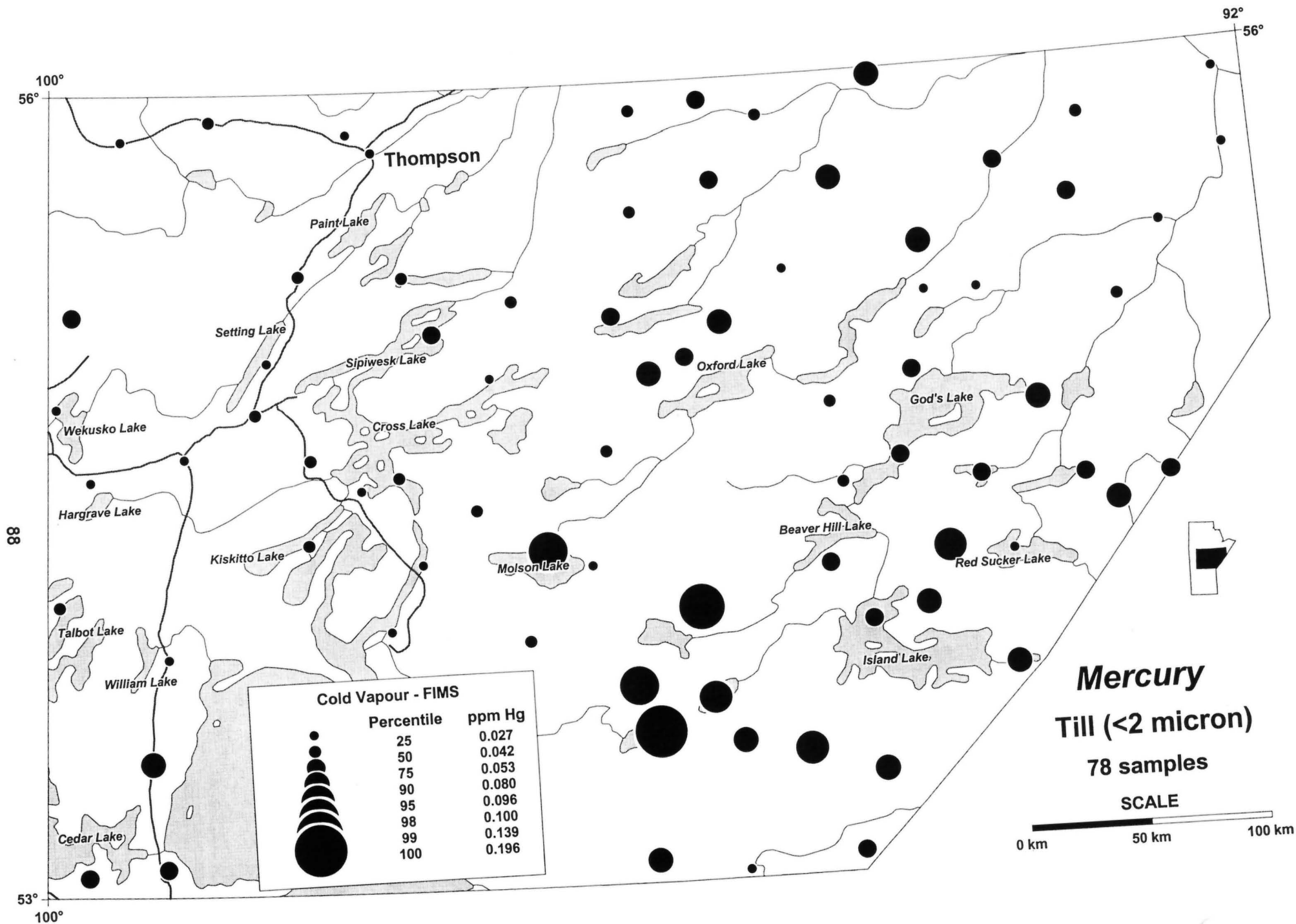


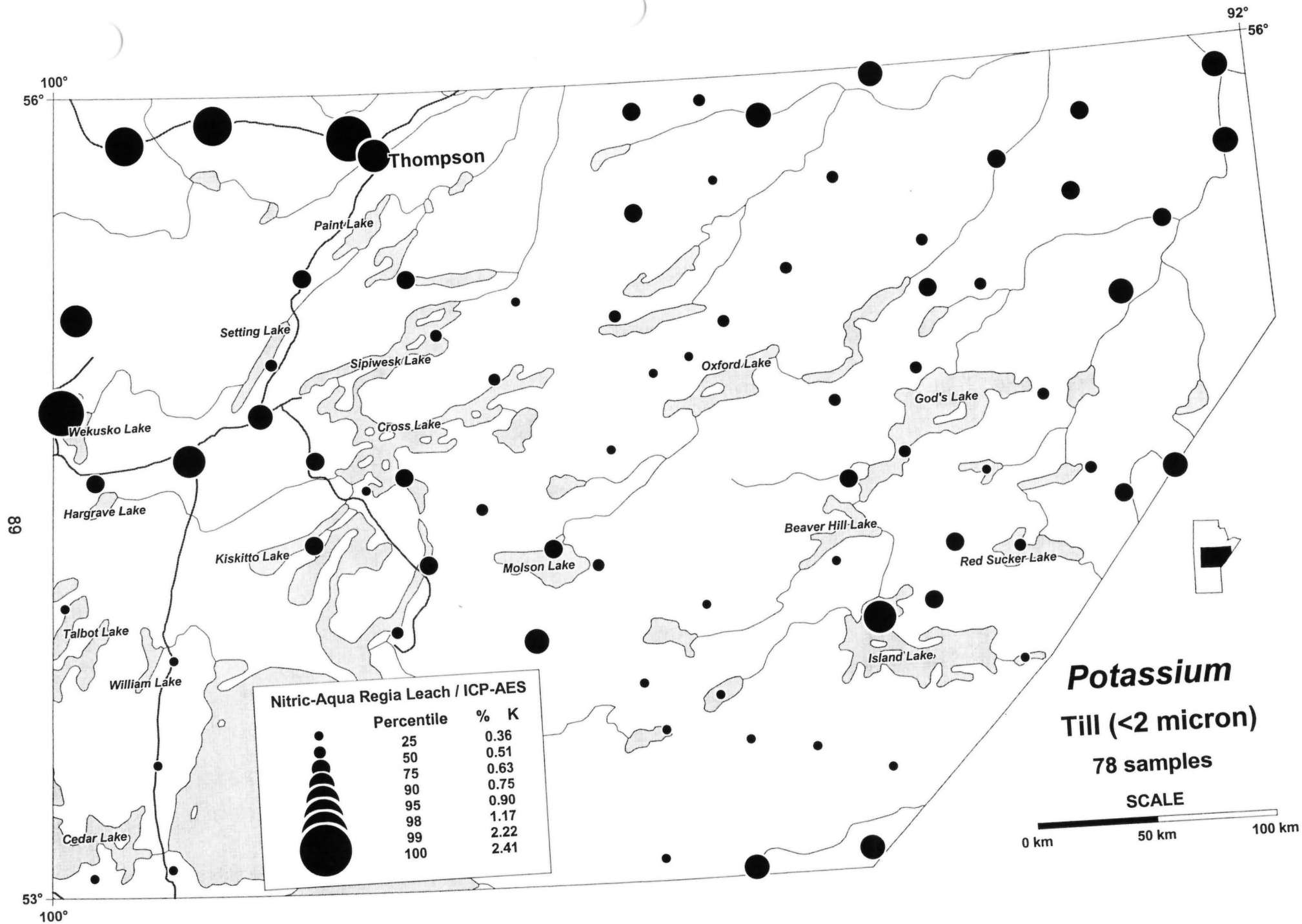


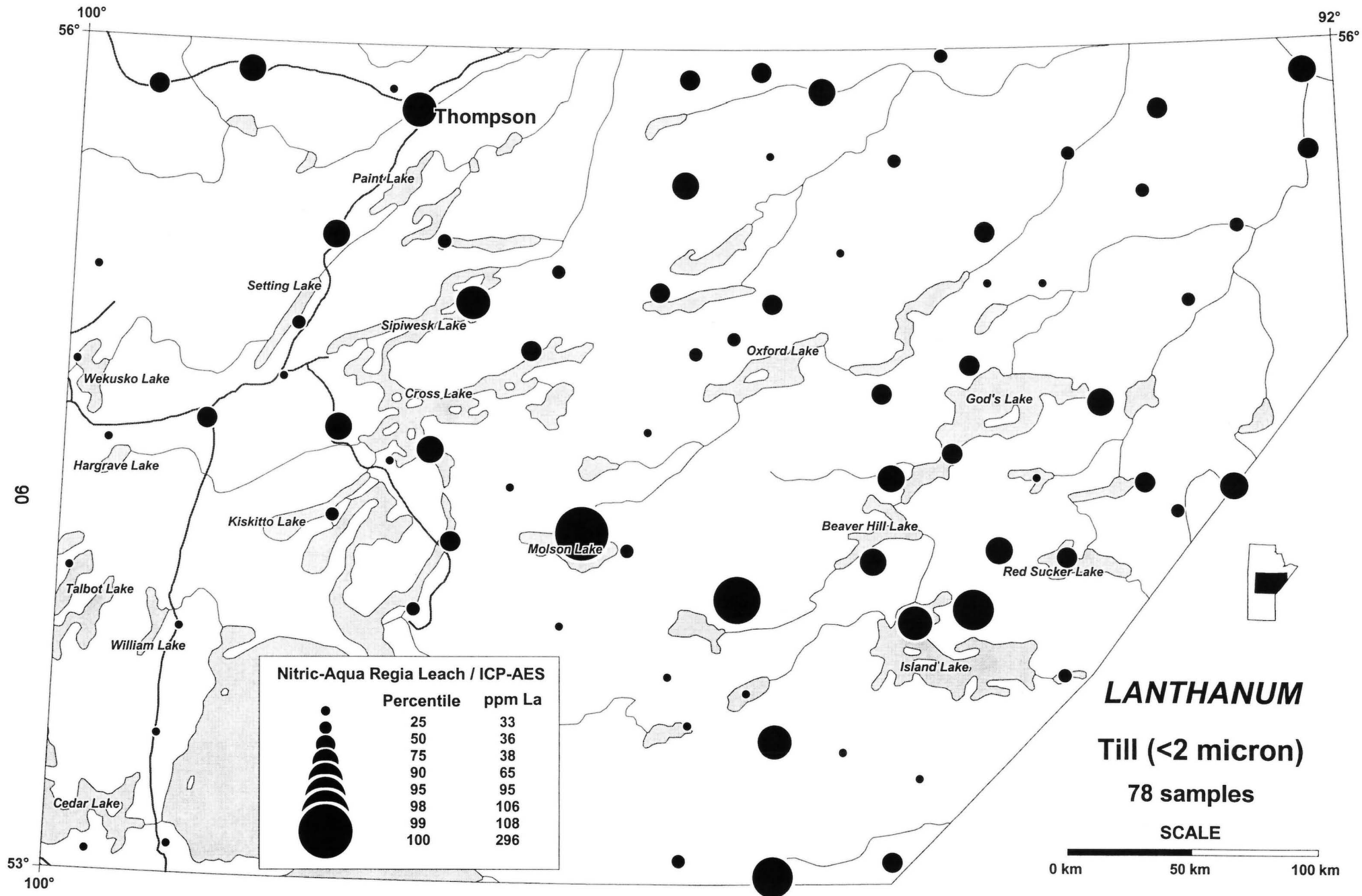


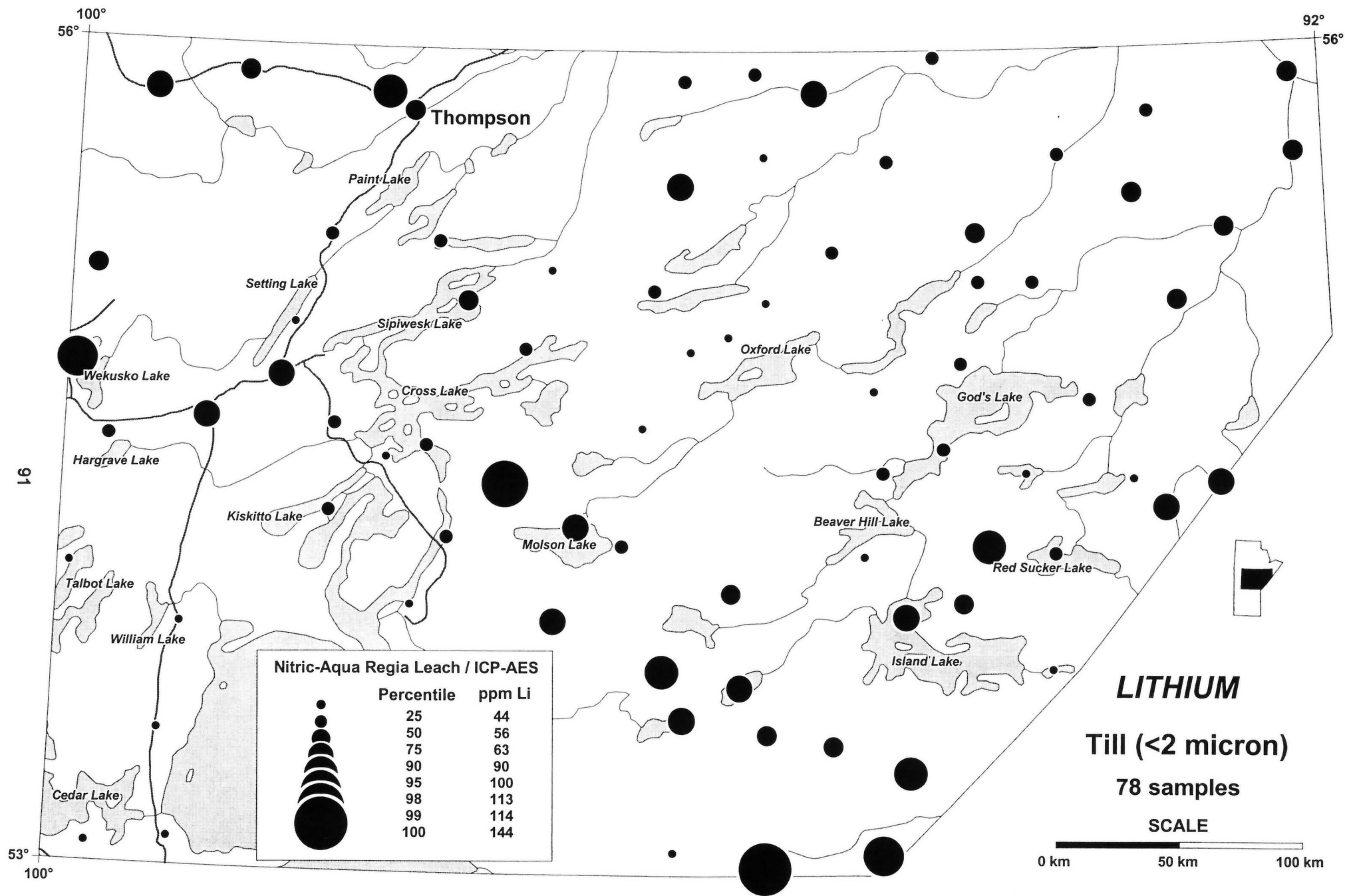


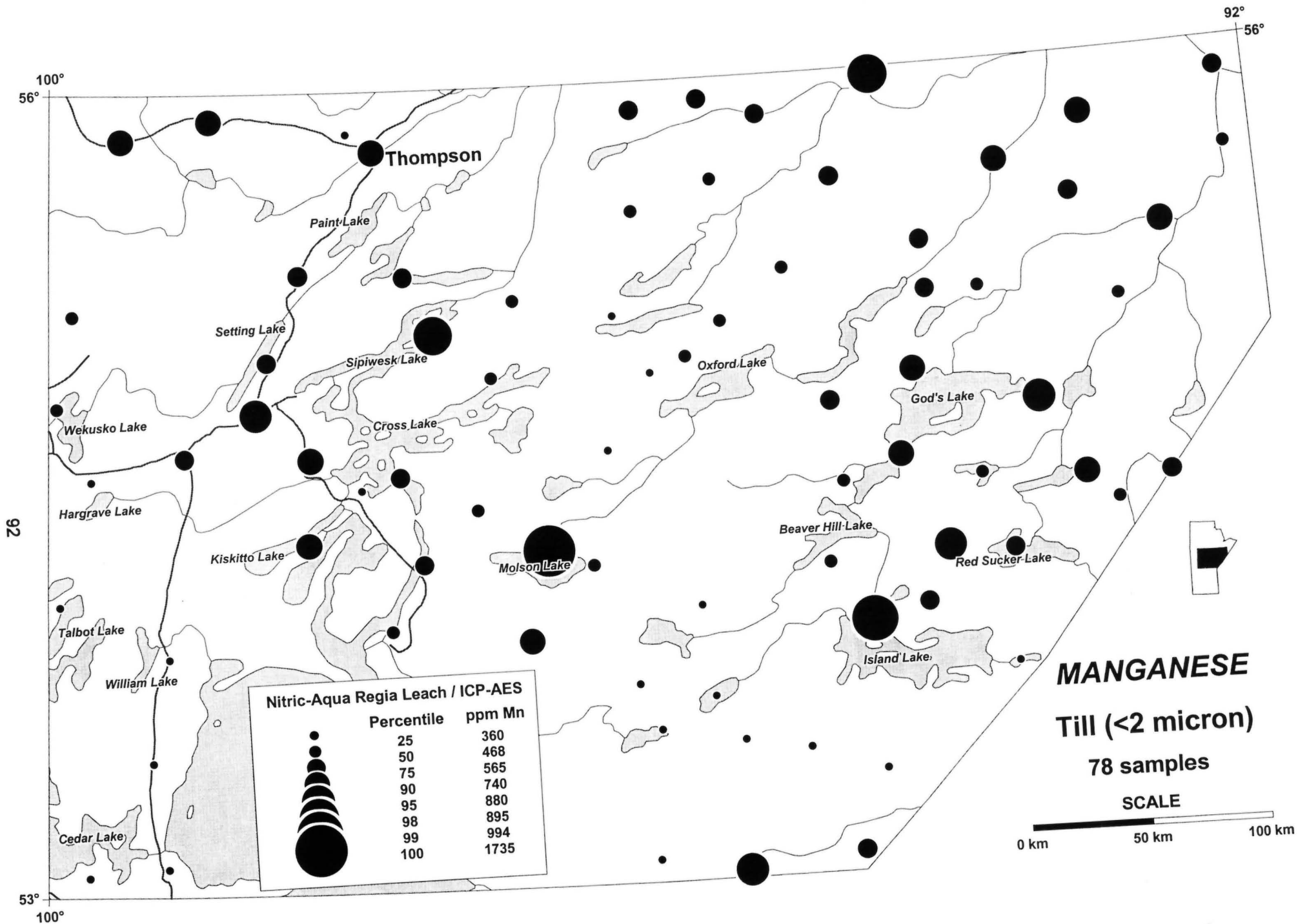


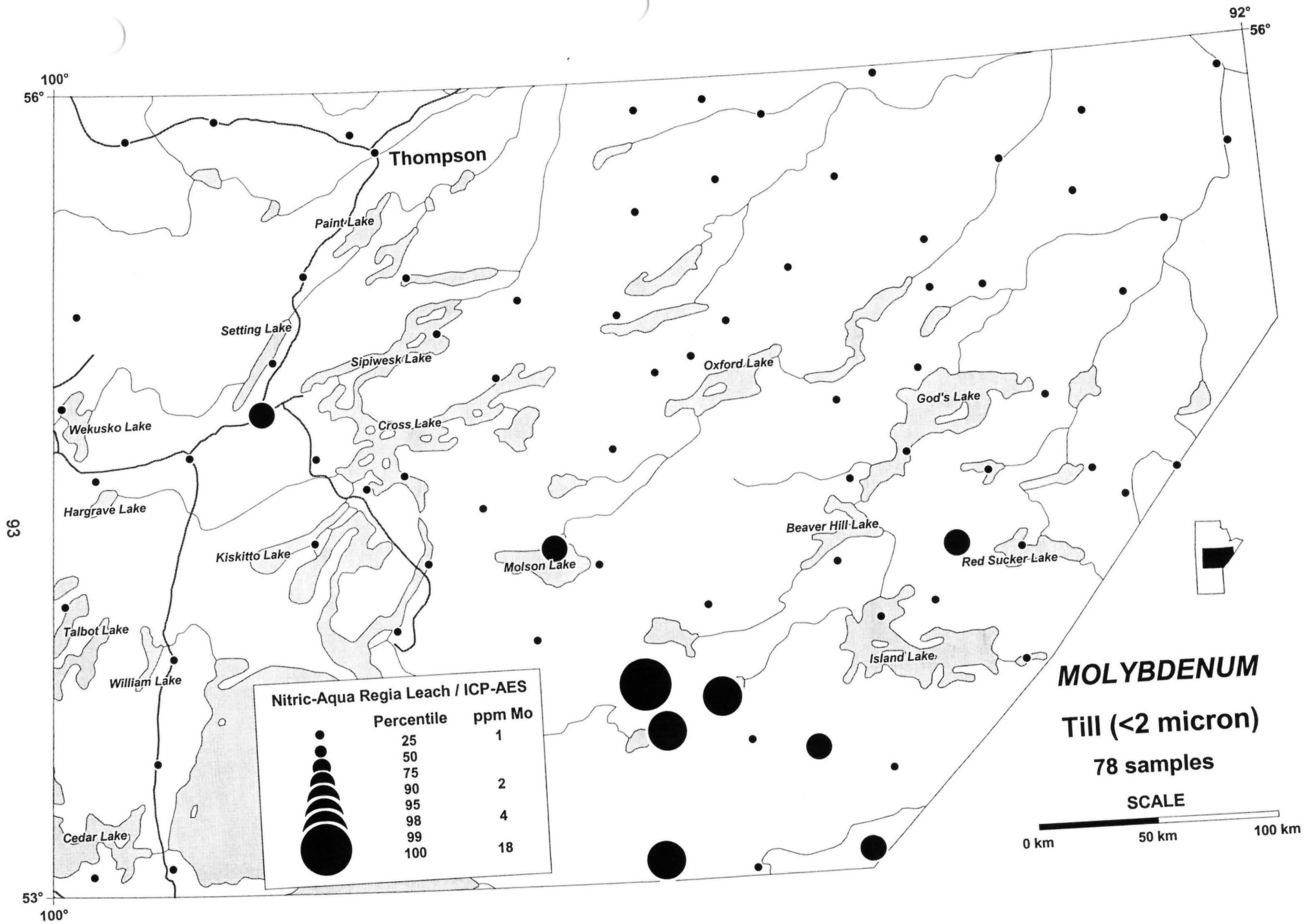


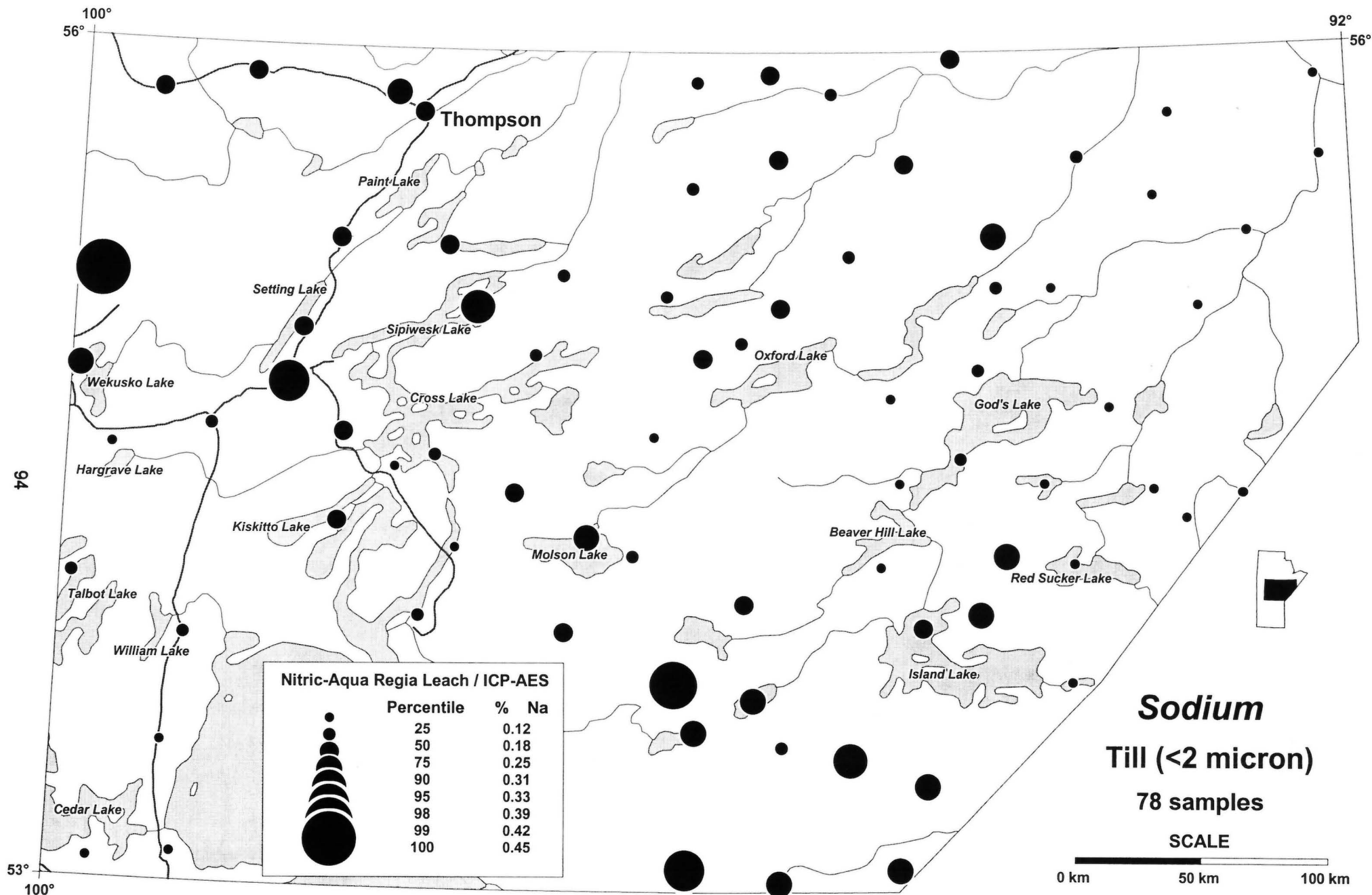


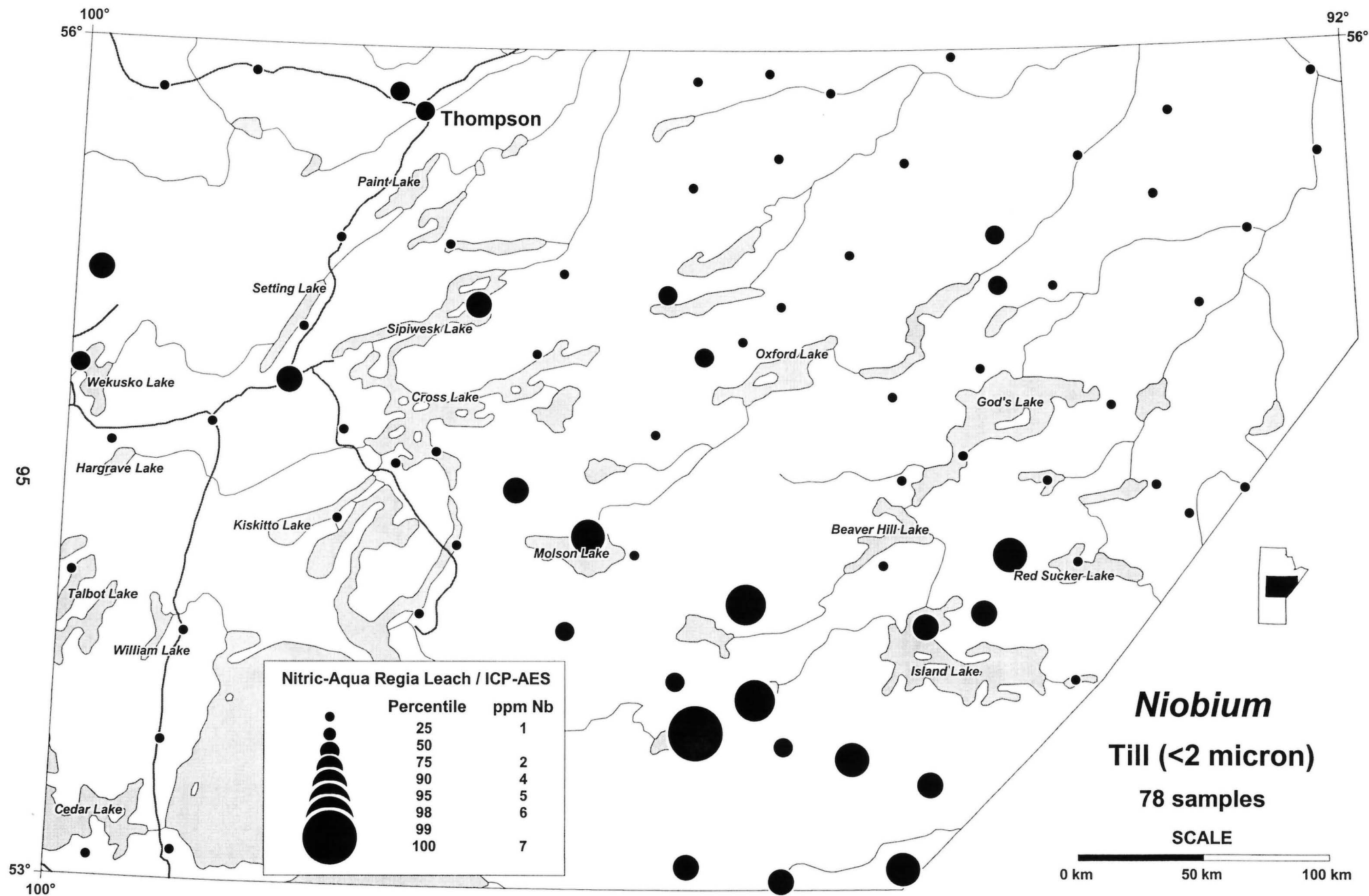


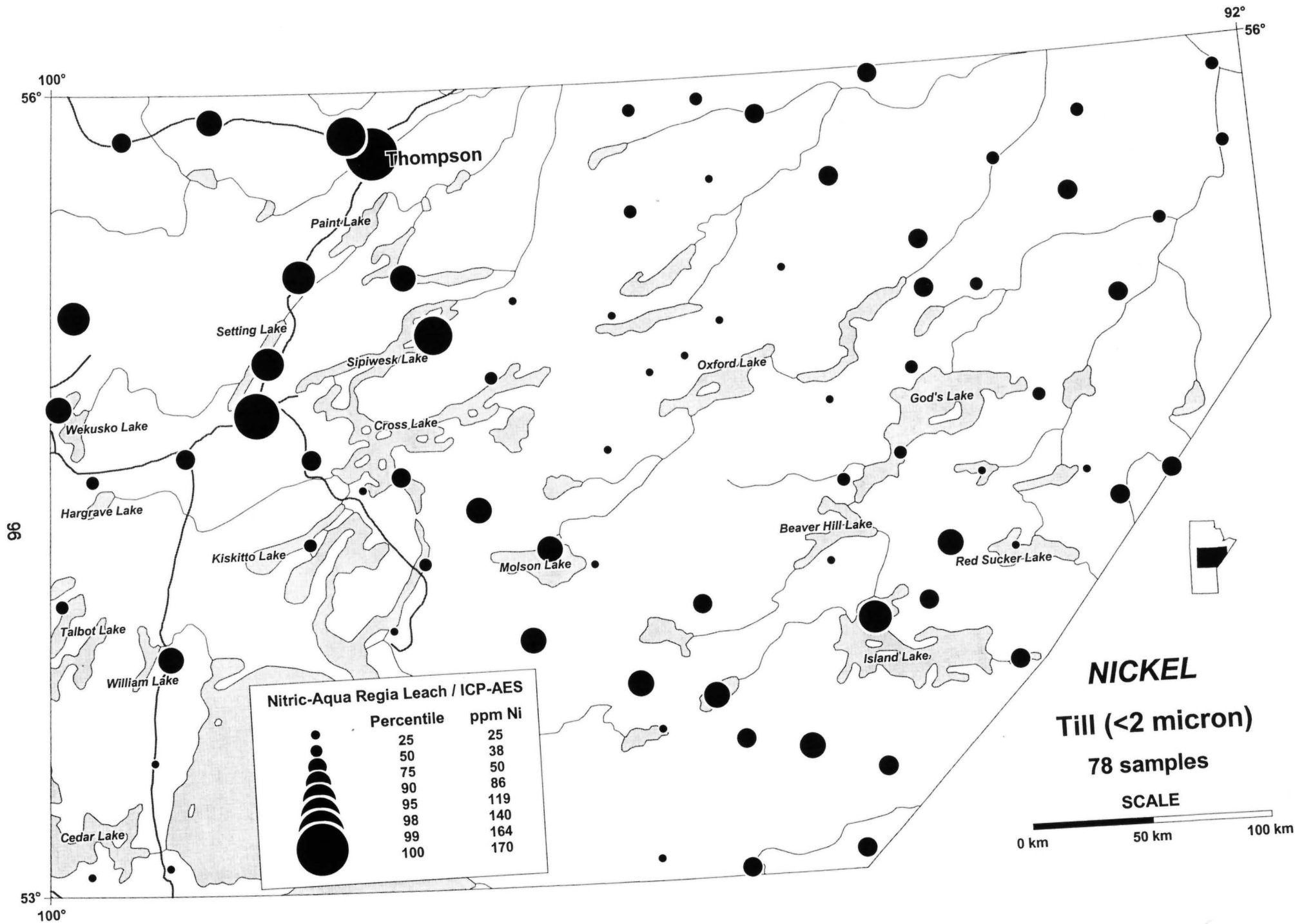


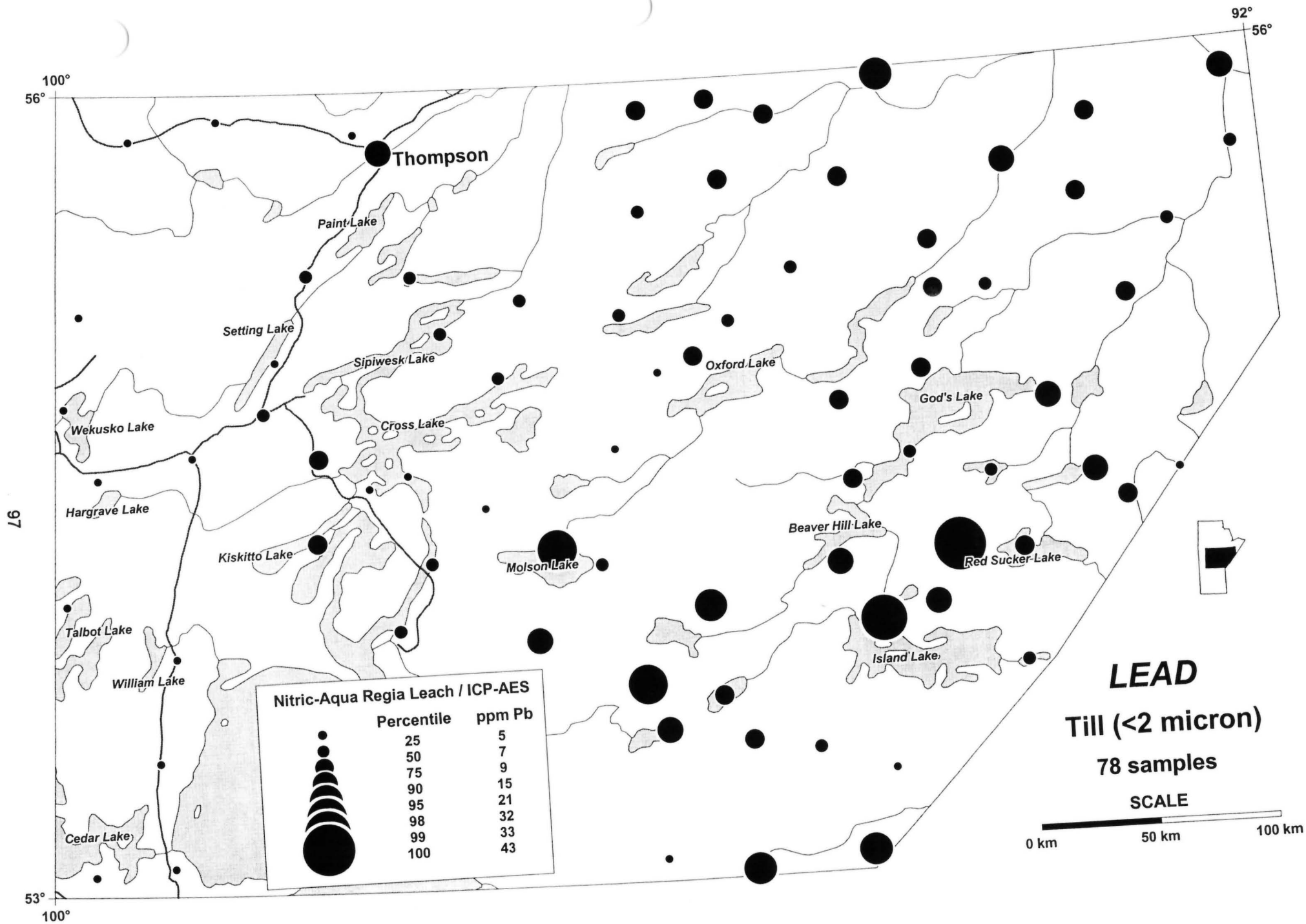


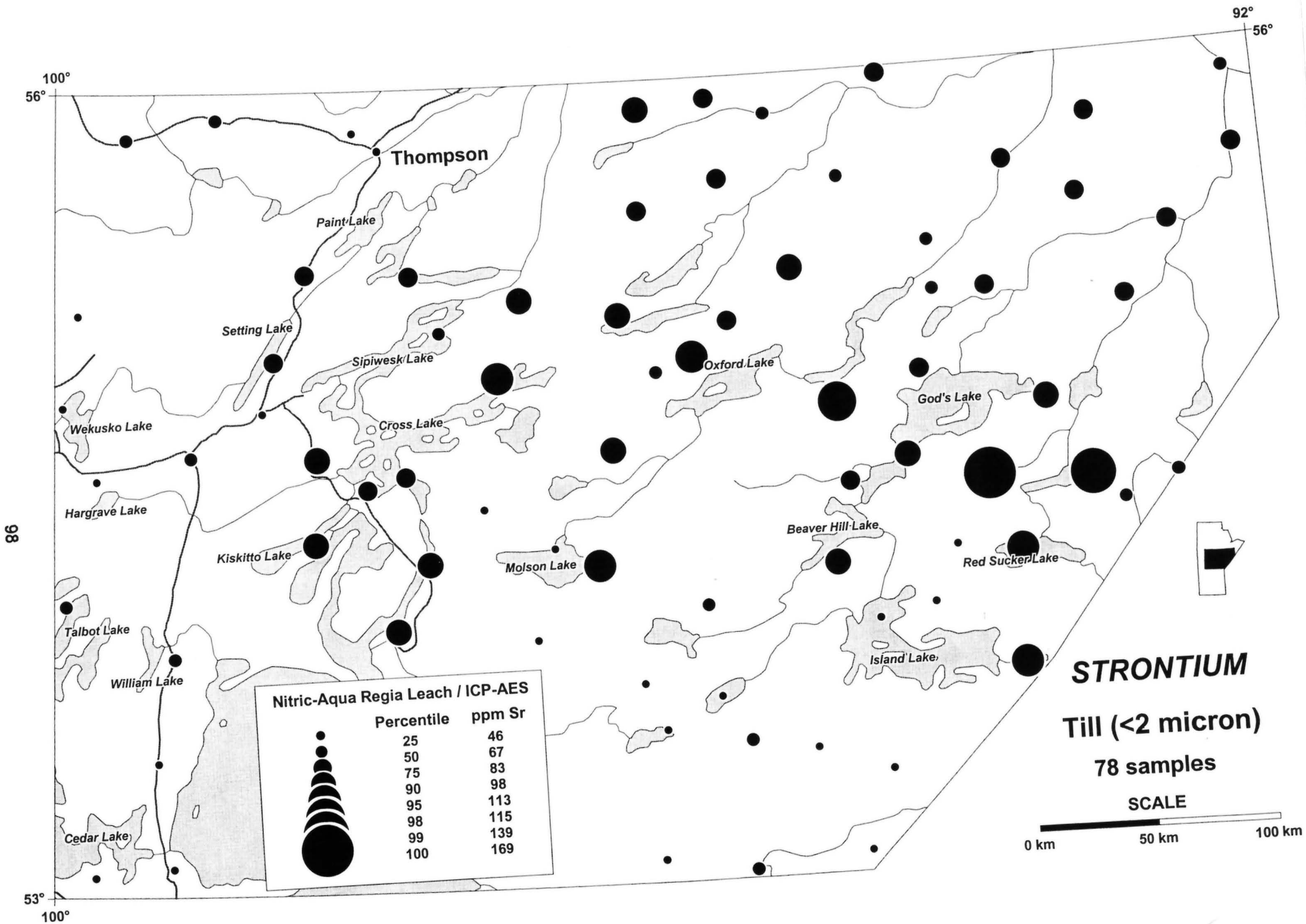


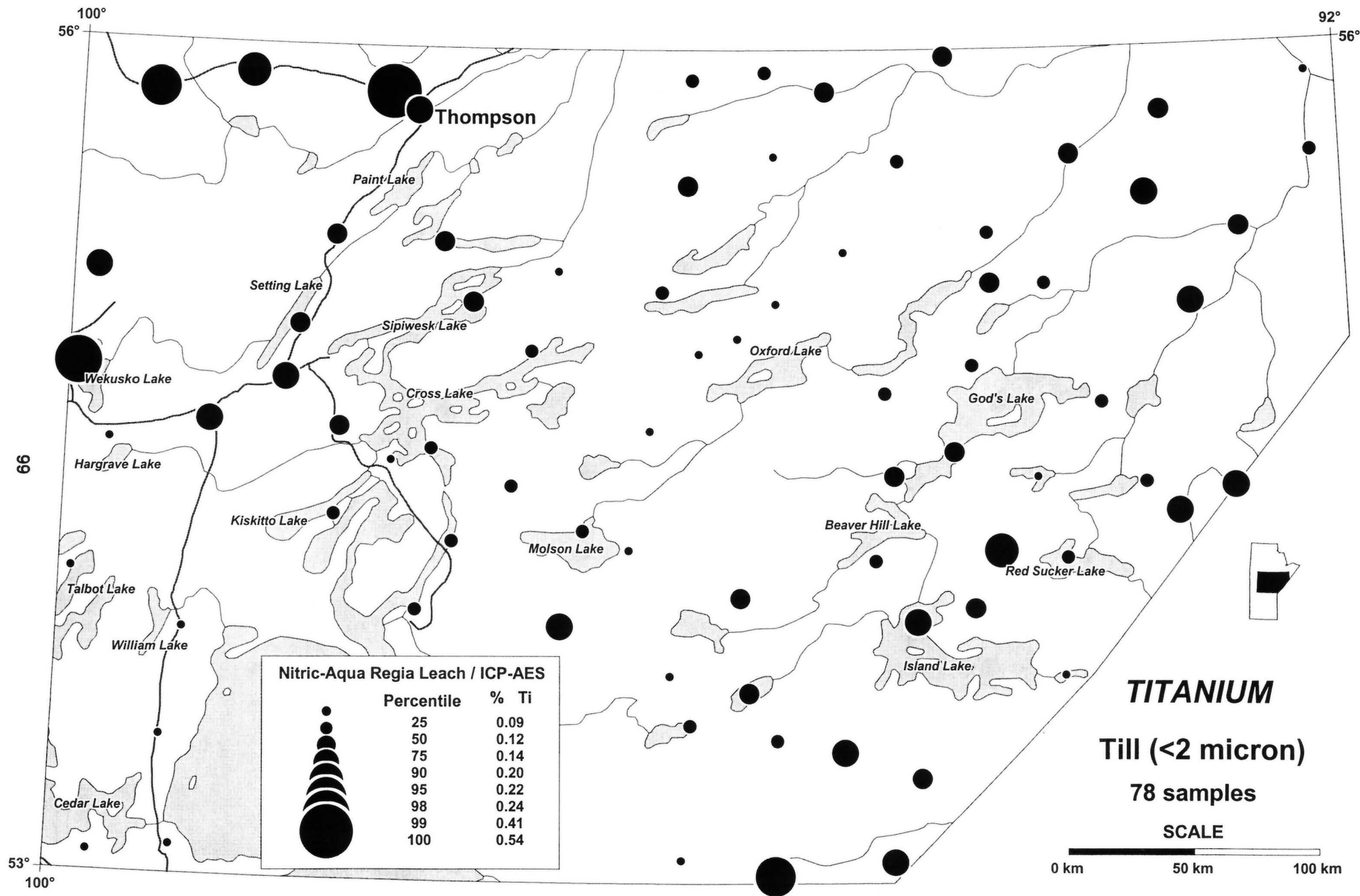


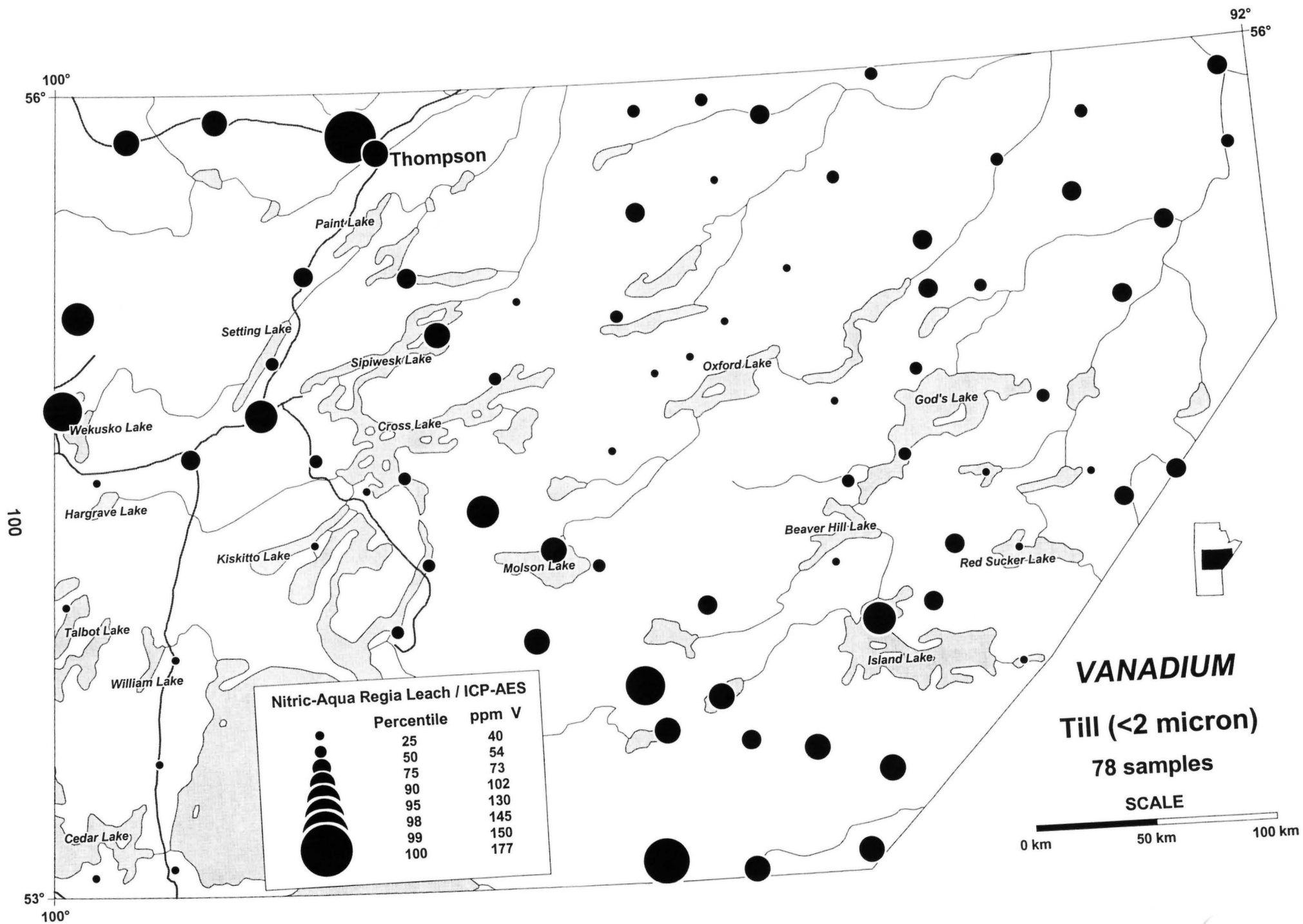


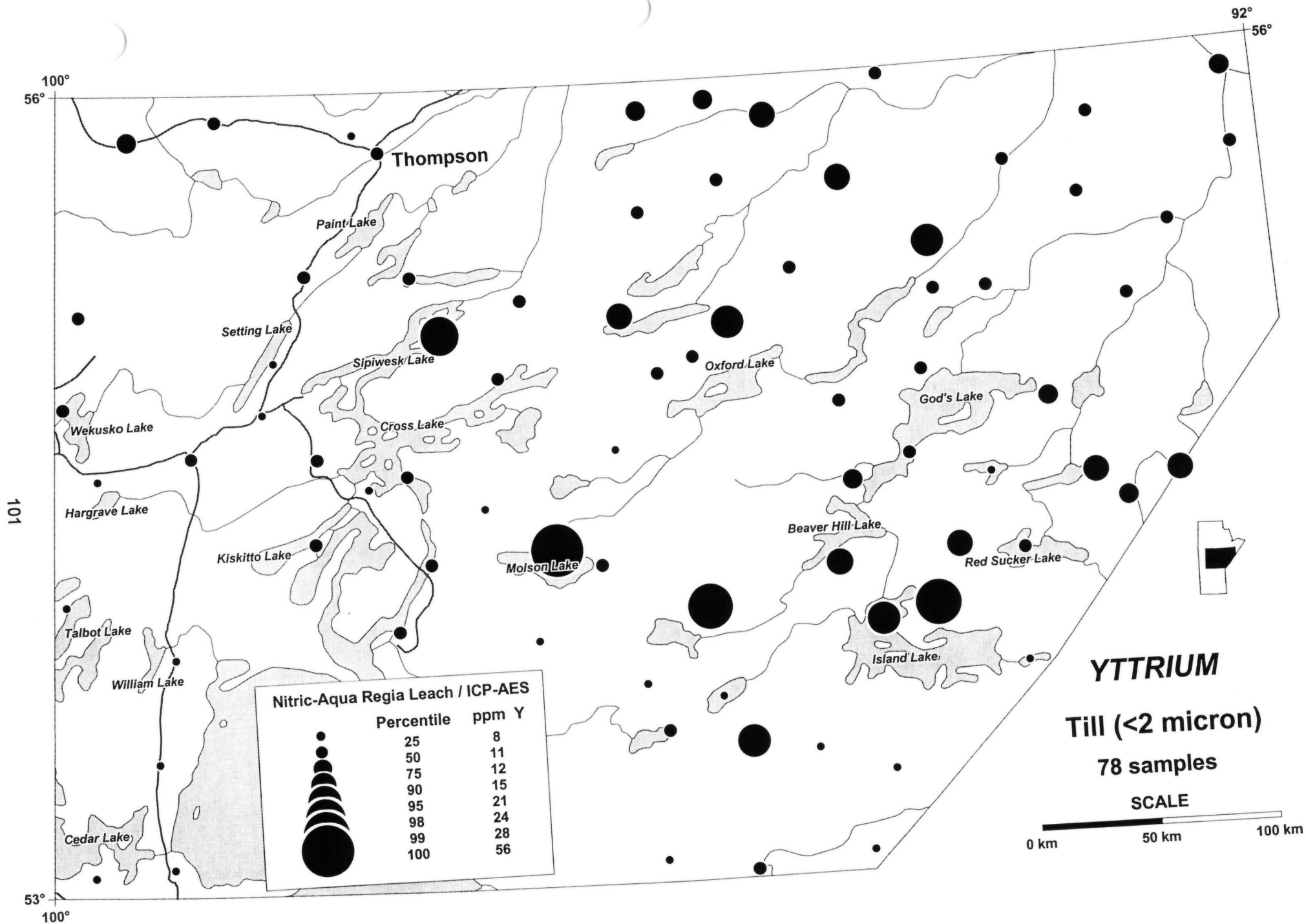


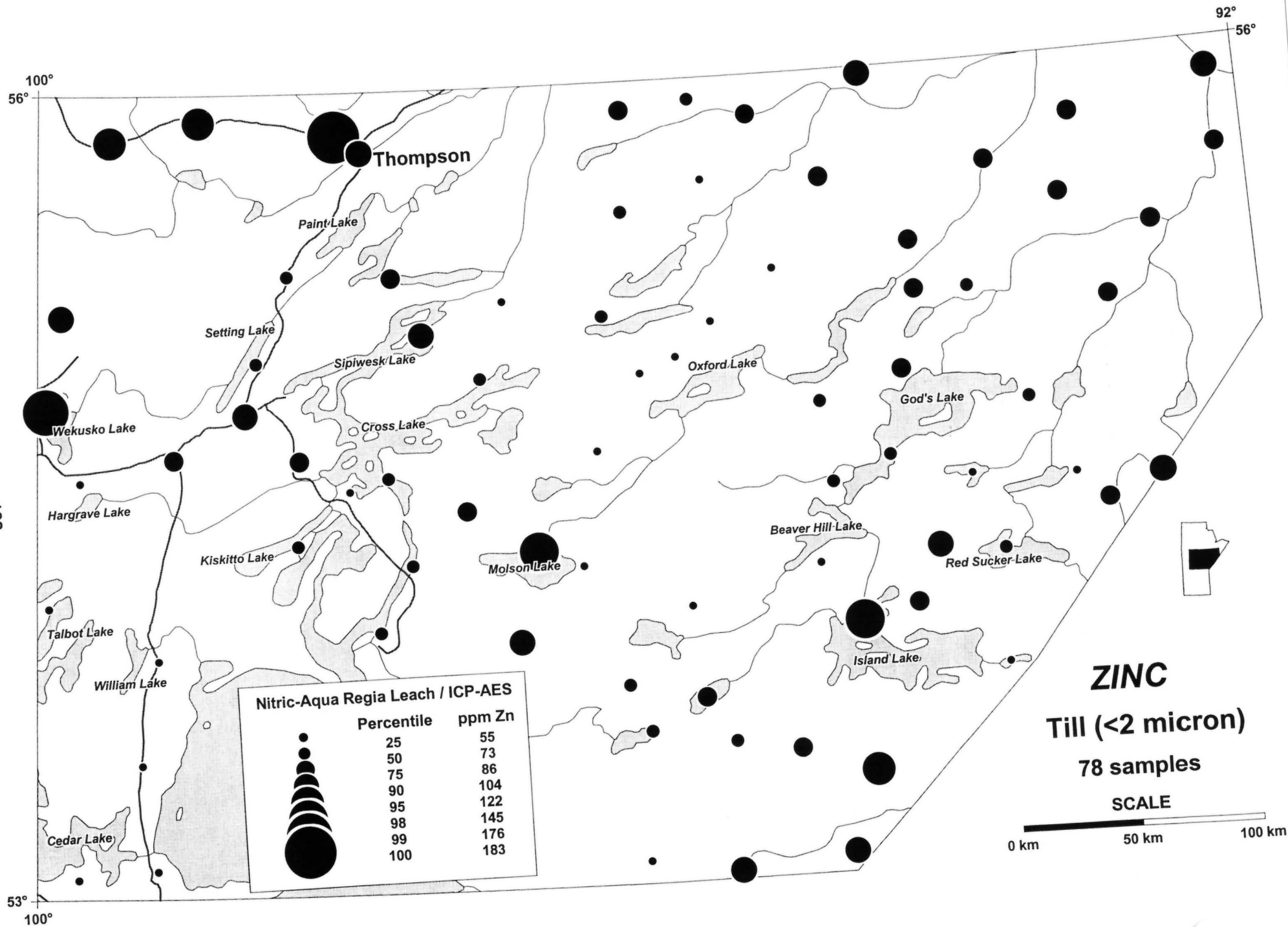












Appendix 5

Part 1: Mineral chemistry; data listing

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
1	588	Amphibole	E2	9.74	11.62	0.00	16.25	1.11	10.54	0.23	1.07	44.38	1.20	0.00	96.12
1	587	Amphibole	E1	9.50	11.67	0.00	18.88	1.42	9.25	0.33	1.27	42.65	1.51	0.00	96.47
1	73	Cr-spinel	B1	18.41	0.00	49.09	18.64	0.00	12.51	0.34	0.00	0.01	0.22	0.00	99.22
1	590	Cr-grossularite	E4	11.65	32.67	10.77	5.03	0.00	0.18	0.24	0.00	38.23	0.26	0.00	99.04
1	1	Cr-spinel	A1	12.94	0.00	46.96	29.78	0.00	7.43	0.54	0.02	0.00	0.40	0.32	98.39
1	525	Almandite	D2	21.44	1.36	0.07	32.85	0.00	5.85	0.54	0.00	38.65	0.04	0.04	100.84
1	589	Tourmaline	E3	27.90	0.17	0.00	14.67	0.04	3.58	0.00	2.22	35.27	1.11	0.00	84.97
1	524	Monazite	D1	0.00	1.42	0.00	0.00	0.00	0.00	0.00	0.00	1.22	0.00	0.05	2.68
2	597	Spinel	E11	67.57	0.00	0.06	6.01	0.00	24.05	0.08	0.00	0.00	0.03	0.19	97.98
2	601	Spinel	E15	67.42	0.00	0.04	4.94	0.00	24.51	0.10	0.02	0.01	0.00	1.04	98.08
2	623	Spinel	E37	68.18	0.00	0.04	3.42	0.00	26.02	0.04	0.01	0.00	0.01	0.16	97.87
2	611	Spinel	E25	67.26	0.00	0.10	6.47	0.00	23.70	0.24	0.01	0.00	0.01	0.63	98.42
2	84	Cr-diopside	B12	0.95	23.39	0.81	3.07	0.01	16.89	0.19	0.46	54.46	0.11	0.00	100.33
2	615	Spinel	E29	67.53	0.00	0.07	5.26	0.00	24.72	0.07	0.00	0.00	0.00	0.29	97.95
2	85	Diopside	B13	1.03	23.62	0.37	3.18	0.00	16.85	0.16	0.26	53.98	0.05	0.00	99.51
2	76	Cr-diopside	B4	1.47	23.49	0.73	3.49	0.00	15.96	0.09	0.33	53.54	0.00	0.00	99.10
2	592	Fe-cpx	E6	1.22	22.18	0.00	7.33	0.00	14.35	0.15	0.25	52.95	0.08	0.00	98.50
2	608	Spinel	E22	67.55	0.00	0.04	5.07	0.00	24.81	0.07	0.01	0.00	0.02	0.45	98.03
2	634	Spinel	E48	67.82	0.00	0.11	4.58	0.00	25.19	0.08	0.01	0.00	0.00	0.25	98.05
2	526	Orthopyroxene	D3	0.50	0.84	0.05	35.61	0.03	12.32	0.68	0.01	50.01	0.13	0.08	100.24
2	83	Diopside	B11	0.98	23.64	0.38	3.48	0.01	16.95	0.20	0.24	53.96	0.03	0.00	99.85
2	629	Spinel	E43	67.95	0.00	0.08	4.59	0.00	25.16	0.07	0.01	0.00	0.02	0.56	98.43
2	607	Zn-spinel	E21	66.37	0.01	0.06	5.89	0.00	21.34	0.09	0.13	0.00	0.00	5.56	99.45
2	78	Cr-diopside	B6	1.85	23.24	0.76	3.42	0.00	15.99	0.03	0.49	53.45	0.00	0.00	99.22
2	77	Diopside	B5	0.96	23.13	0.39	3.52	0.00	16.63	0.11	0.36	54.06	0.00	0.00	99.16
2	610	Spinel	E24	67.88	0.01	0.06	4.77	0.00	25.11	0.06	0.00	0.00	0.02	0.19	98.10
2	98	Diopside	B26	1.25	23.16	0.28	4.00	0.00	16.91	0.20	0.19	53.55	0.11	0.00	99.66
2	603	Spinel	E17	67.26	0.00	0.07	6.46	0.00	23.89	0.11	0.02	0.00	0.02	0.45	98.28
2	97	Diopside	B25	1.01	19.19	0.44	4.23	0.01	19.57	0.15	0.22	55.00	0.04	0.00	99.85
2	617	Spinel	E31	68.04	0.00	0.03	4.31	0.00	25.07	0.11	0.02	0.00	0.00	0.98	98.57
2	620	Spinel	E34	67.43	0.00	0.03	5.27	0.00	24.44	0.37	0.00	0.01	0.02	0.24	97.81
2	612	Spinel	E26	67.14	0.00	0.05	6.96	0.00	23.22	0.23	0.01	0.01	0.00	0.83	98.45
2	94	Diopside	B22	1.13	23.58	0.39	3.61	0.01	16.40	0.31	0.26	53.77	0.10	0.01	99.58
2	622	Spinel	E36	67.70	0.00	0.04	5.12	0.00	24.88	0.11	0.00	0.00	0.03	0.23	98.10
2	91	Diopside	B19	1.08	22.12	0.44	3.75	0.00	17.39	0.17	0.36	54.00	0.11	0.00	99.42
2	621	Spinel	E35	68.10	0.00	0.06	4.27	0.00	25.26	0.22	0.01	0.01	0.00	0.52	98.45
2	87	Diopside	B15	1.17	23.61	0.45	3.25	0.01	16.82	0.16	0.31	53.65	0.03	0.00	99.45
2	92	Cr-diopside	B20	1.13	23.58	0.53	3.24	0.00	16.44	0.21	0.30	53.91	0.03	0.00	99.38
2	593	Orthopyroxene	E7	0.82	0.41	0.16	9.53	0.00	31.96	0.09	0.00	56.73	0.00	0.00	99.69
2	96	Cr-diopside	B24	1.07	23.60	0.69	2.63	0.00	17.08	0.16	0.30	54.09	0.11	0.00	99.73
2	602	Spinel	E16	66.85	0.00	0.08	7.52	0.00	23.03	0.35	0.00	0.01	0.00	0.33	98.17
2	618	Spinel	E32	67.68	0.00	0.05	5.02	0.00	24.77	0.06	0.01	0.03	0.04	0.29	97.94
2	527	Orthopyroxene	D4	0.55	0.61	0.06	25.61	0.01	20.25	0.58	0.00	52.57	0.13	0.06	100.45
2	79	Cr-diopside	B7	1.42	22.94	0.91	3.50	0.00	16.49	0.12	0.37	53.33	0.05	0.00	99.13
2	614	Spinel	E28	67.81	0.01	0.05	5.06	0.00	24.68	0.28	0.01	0.00	0.00	0.32	98.21
2	598	Spinel	E12	67.53	0.00	0.04	4.83	0.01	24.72	0.11	0.01	0.01	0.02	0.43	97.71
2	75	Cr-diopside	B3	1.26	23.22	0.72	3.63	0.00	16.43	0.13	0.27	53.32	0.01	0.00	98.99
2	2	Cr-diopside	A2	1.18	23.08	0.69	2.91	0.00	16.56	0.02	0.39	53.54	0.00	0.00	98.36
2	606	Spinel	E20	67.33	0.00	0.01	7.14	0.00	23.42	0.08	0.01	0.00	0.00	0.15	98.15
2	626	Spinel	E40	67.92	0.00	0.05	3.70	0.00	25.59	0.05	0.00	0.00	0.02	0.40	97.74

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
2	82	Cr-diopside	B10	1.41	22.94	0.53	5.50	0.00	15.29	0.16	0.39	52.86	0.06	0.04	99.17
2	86	Cr-diopside	B14	1.11	22.57	0.61	3.20	0.00	17.19	0.11	0.32	53.93	0.04	0.00	99.08
2	591	Fe-cpx	E5	1.29	19.29	0.00	11.42	0.00	14.35	0.19	0.15	52.98	0.13	0.00	99.81
2	600	Spinel	E14	67.24	0.00	0.09	6.31	0.00	23.96	0.12	0.00	0.00	0.00	0.13	97.85
2	81	Cr-diopside	B9	1.71	22.63	1.19	4.60	0.00	15.41	0.44	0.41	52.90	0.04	0.00	99.32
2	619	Spinel	E33	67.54	0.01	0.05	4.52	0.00	24.12	0.05	0.03	0.00	0.03	1.26	97.61
2	624	Spinel	E38	67.53	0.00	0.15	5.70	0.00	24.29	0.37	0.00	0.00	0.04	0.25	98.32
2	616	Spinel	E30	68.04	0.00	0.07	4.38	0.00	25.47	0.05	0.02	0.01	0.00	0.39	98.44
2	93	Diopside	B21	1.04	22.97	0.36	4.14	0.01	16.62	0.18	0.26	53.85	0.02	0.00	99.44
2	632	Spinel	E46	67.39	0.00	0.01	4.70	0.00	24.79	0.12	0.01	0.00	0.05	0.15	97.22
2	630	Spinel	E44	68.11	0.00	0.07	5.28	0.00	24.73	0.09	0.00	0.00	0.02	0.28	98.58
2	635	Spinel	E49	68.28	0.00	0.04	4.12	0.00	25.53	0.05	0.00	0.01	0.01	0.22	98.26
2	596	Spinel	E10	66.72	0.00	0.06	7.86	0.01	22.90	0.10	0.00	0.00	0.00	0.26	97.92
2	595	Spinel	E9	66.35	0.00	0.04	11.34	0.01	20.50	0.19	0.02	0.00	0.01	0.57	99.03
2	594	Spinel	E8	66.05	0.01	0.23	9.34	0.00	21.21	0.07	0.05	0.00	0.03	1.87	98.85
2	599	Spinel	E13	66.52	0.01	0.08	8.12	0.00	22.59	0.16	0.03	0.00	0.00	0.64	98.15
2	609	Spinel	E23	66.62	0.00	0.09	4.38	0.01	25.19	0.08	0.01	0.00	0.01	0.56	96.94
2	625	Spinel	E39	67.70	0.00	0.11	4.05	0.00	25.32	0.14	0.01	0.01	0.03	0.27	97.63
2	604	Spinel	E18	67.21	0.00	0.05	7.53	0.00	23.17	0.08	0.00	0.00	0.01	0.35	98.40
2	628	Spinel	E42	67.83	0.01	0.05	4.09	0.00	24.47	0.03	0.05	0.00	0.00	2.16	98.68
2	95	Diopside	B23	1.10	23.09	0.35	4.02	0.00	16.62	0.17	0.29	53.71	0.06	0.00	99.41
2	80	Cr-diopside	B8	1.63	21.44	0.99	3.30	0.00	17.61	0.03	0.32	53.30	0.00	0.00	98.61
2	74	Cr-diopside	B2	1.23	22.96	1.22	2.39	0.00	16.77	0.02	0.50	53.91	0.00	0.00	98.98
2	613	Spinel	E27	67.08	0.00	0.10	7.06	0.00	22.95	0.13	0.02	0.00	0.00	1.05	98.38
2	633	Spinel	E47	67.78	0.00	0.11	3.61	0.00	25.49	0.08	0.02	0.00	0.03	0.57	97.70
2	627	Spinel	E41	67.95	0.00	0.01	4.21	0.00	25.30	0.14	0.00	0.00	0.02	0.34	97.97
2	89	Cr-diopside	B17	1.05	23.73	0.60	3.09	0.01	16.80	0.16	0.35	52.50	0.03	0.00	98.32
2	631	Spinel	E45	67.54	0.01	0.07	4.67	0.00	25.20	0.13	0.00	0.00	0.01	0.17	97.79
2	605	Spinel	E19	67.28	0.01	0.04	6.52	0.00	23.46	0.10	0.00	0.00	0.01	0.17	97.58
2	90	Diopside	B18	1.09	23.44	0.25	3.87	0.01	16.52	0.20	0.28	53.51	0.05	0.00	99.21
2	88	Cr-diopside	B16	1.17	22.90	0.76	4.22	0.00	16.25	0.14	0.36	53.15	0.21	0.00	99.16
2	636	Spinel	E50	67.72	0.01	0.07	5.03	0.00	24.70	0.13	0.01	0.00	0.01	0.18	97.84
3	641	Chalcopyrite	E55	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	648	Chalcopyrite	E62	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	649	Chalcopyrite	E63	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	637	Chalcopyrite	E51	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	650	Chalcopyrite	E64	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	638	Chalcopyrite	E52	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	651	Chalcopyrite	E65	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	669	Chalcopyrite	E83	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	652	Chalcopyrite	E66	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	640	Chalcopyrite	E54	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	671	Spinel	E85	68.29	0.00	0.03	2.36	0.00	26.73	0.08	0.00	0.00	0.04	0.11	97.65
3	642	Chalcopyrite	E56	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	653	Chalcopyrite	E67	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	643	Chalcopyrite	E57	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	662	Chalcopyrite	E76	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	645	Chalcopyrite	E59	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	660	Chalcopyrite	E74	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	646	Chalcopyrite	E60	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
3	661	Chalcopyrite	E75	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	647	Chalcopyrite	E61	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	658	Chalcopyrite	E72	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	667	Chalcopyrite	E81	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	663	Chalcopyrite	E77	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	639	Chalcopyrite	E53	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	664	Chalcopyrite	E78	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	528	Chalcopyrite	D5	0.03	0.04	0.11	40.94	0.03	0.00	0.16	0.06	0.03	0.09	0.35	41.84
3	665	Chalcopyrite	E79	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	659	Chalcopyrite	E73	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	654	Chalcopyrite	E68	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	672	Spinel	E86	67.91	0.00	0.01	2.96	0.01	26.36	0.04	0.01	0.01	0.03	0.05	97.38
3	655	Chalcopyrite	E69	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	666	Chalcopyrite	E80	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	656	Chalcopyrite	E70	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	668	Chalcopyrite	E82	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	644	Chalcopyrite	E58	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	670	Gahnite	E84	57.88	0.00	0.19	6.75	0.00	1.62	0.08	1.09	0.00	0.00	34.99	102.59
3	657	Chalcopyrite	E71	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	530	Chalcopyrite	D7	0.03	0.51	0.07	72.57	0.05	0.59	0.11	0.01	2.79	0.06	0.14	76.94
4	101	Cr-diopside	B29	0.37	22.47	0.86	4.48	0.00	16.74	0.17	0.41	53.87	0.00	0.01	99.37
4	99	Diopside	B27	0.32	24.75	0.28	3.10	0.00	16.71	0.13	0.25	54.37	0.00	0.00	99.91
4	100	Diopside	B28	1.09	22.01	0.44	5.95	0.00	16.27	0.23	0.27	53.18	0.01	0.00	99.43
4	4	Cr-spinel	A4	3.05	0.00	66.05	23.54	0.00	6.30	0.55	0.02	0.05	0.02	0.37	99.95
4	529	Chalcopyrite	D6	0.05	0.04	0.10	40.19	0.03	0.00	0.15	0.06	0.05	0.09	0.35	41.10
4	3	Cr-spinel	A3	7.39	0.00	53.52	30.42	0.00	6.70	0.57	0.01	0.01	0.11	0.28	99.00
4	673	Rutile	E87	0.01	0.04	0.37	0.22	0.02	0.00	0.07	0.00	0.05	100.95	0.12	101.84
4	674	Rutile	E88	0.01	0.04	0.44	0.12	0.03	0.00	0.06	0.00	0.06	100.93	0.12	101.79
5	105	Cr-diopside	B33	0.95	23.31	0.60	3.52	0.00	16.18	0.12	0.55	54.10	0.04	0.02	99.38
5	106	Cr-diopside	B34	3.00	23.99	0.70	2.80	0.00	15.56	0.09	0.46	52.46	0.08	0.02	99.15
5	103	Cr-diopside	B31	2.23	23.27	0.88	2.66	0.00	16.00	0.07	0.80	53.41	0.11	0.00	99.42
5	102	Cr-diopside	B30	1.29	22.77	0.53	4.70	0.00	15.75	0.17	0.68	53.51	0.03	0.01	99.44
5	675	Rutile	E89	0.00	0.03	0.35	0.15	0.03	0.00	0.06	0.00	0.05	101.61	0.12	102.40
5	108	Diopside	B36	0.91	23.40	0.34	4.03	0.00	16.16	0.13	0.47	53.91	0.01	0.00	99.36
5	104	Cr-diopside	B32	2.33	23.08	0.91	3.15	0.00	15.64	0.06	0.81	53.44	0.05	0.01	99.47
5	110	Mn-spinel	B38	63.21	0.00	0.24	17.32	0.00	17.09	1.06	0.01	0.00	0.03	0.12	99.09
5	109	Cr-diopside	B37	2.26	20.90	0.53	3.35	0.00	17.83	0.07	0.58	53.43	0.05	0.01	99.03
5	107	Cr-diopside	B35	1.94	22.18	0.89	4.81	0.00	15.17	0.11	0.88	53.18	0.12	0.00	99.27
6	113	Diopside	B41	1.26	23.91	0.34	3.25	0.00	16.55	0.11	0.39	53.96	0.04	0.01	99.82
6	111	Cr-diopside	B39	2.73	20.30	1.23	4.25	0.00	17.87	0.13	0.25	51.74	0.18	0.00	98.67
6	112	Cr-diopside	B40	2.45	18.52	0.83	5.52	0.00	19.23	0.14	0.19	52.65	0.20	0.00	99.74
7	114	Cr-diopside	B42	1.55	23.36	0.62	2.72	0.00	17.59	0.06	0.34	53.51	0.20	0.00	99.94
7	678	Spinel	E92	66.17	0.00	0.01	11.20	0.00	20.47	0.02	0.00	0.00	0.00	0.09	97.95
7	680	Cr-grossularite	E94	12.94	31.73	8.72	5.43	0.01	0.18	1.10	0.00	37.73	0.31	0.06	98.20
7	677	Rutile	E91	0.02	0.04	0.66	0.74	0.03	0.00	0.07	0.00	0.06	98.15	0.11	99.87
7	679	Zn-spinel	E93	67.40	0.01	0.09	2.57	0.00	23.92	0.07	0.13	0.00	0.03	5.11	99.33
7	676	Chalcopyrite	E90	0.02	0.07	0.11	40.86	0.04	0.00	0.17	0.04	0.12	0.12	0.39	41.94
8	683	Chalcopyrite	E97	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
8	124	Cr-diopside	B52	2.12	23.15	0.61	3.68	0.00	15.62	0.11	0.74	52.74	0.06	0.01	98.84
8	118	Cr-diopside	B46	2.29	22.88	0.61	3.50	0.00	15.68	0.08	0.84	53.71	0.09	0.00	99.68

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
8	682	Chalcopyrite	E96	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
8	127	Cr-diopside	B55	3.33	23.02	1.03	3.14	0.00	15.46	0.11	0.75	52.34	0.26	0.01	99.44
8	126	Cr-diopside	B54	2.42	22.80	1.48	2.24	0.00	16.04	0.08	0.81	53.14	0.24	0.01	99.25
8	115	Cr-diopside	B43	2.89	21.24	1.58	2.96	0.00	15.59	0.06	1.46	53.22	0.13	0.00	99.14
8	125	Cr-diopside	B53	2.07	22.63	0.62	3.56	0.00	16.17	0.13	0.61	53.10	0.08	0.00	98.97
8	122	Cr-diopside	B50	1.28	22.78	0.82	3.75	0.00	16.63	0.15	0.49	53.69	0.03	0.01	99.62
8	681	Chalcopyrite	E95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
8	684	Chalcopyrite	E98	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
8	123	Cr-diopside	B51	1.85	23.07	1.10	3.11	0.00	15.70	0.12	0.74	53.44	0.08	0.02	99.23
8	685	Pyrite	E99	0.03	0.05	0.09	56.37	0.03	0.00	0.15	0.04	0.11	0.09	0.26	57.21
8	121	Cr-diopside	B49	3.10	22.36	1.17	4.41	0.00	14.62	0.16	0.94	52.19	0.31	0.04	99.29
8	687	Rutile	E101	0.00	0.03	0.20	0.11	0.03	0.00	0.07	0.00	0.05	101.07	0.11	101.67
8	119	Cr-diopside	B47	1.43	23.57	0.57	3.72	0.00	16.23	0.13	0.54	53.46	0.05	0.01	99.71
8	531	Chalcopyrite	D8	0.03	0.05	0.10	41.24	0.03	0.00	0.14	0.05	0.05	0.09	0.36	42.15
8	120	Cr-diopside	B48	2.65	23.40	1.06	3.09	0.00	15.79	0.10	0.49	52.68	0.16	0.01	99.45
8	117	Cr-diopside	B45	2.59	22.85	0.75	3.71	0.00	15.41	0.11	0.93	53.19	0.06	0.00	99.60
8	116	Cr-diopside	B44	2.34	23.44	0.98	2.61	0.00	16.19	0.09	0.55	52.84	0.12	0.02	99.17
8	686	Rutile	E100	0.01	0.04	0.09	0.38	0.03	0.00	0.06	0.00	0.05	101.32	0.13	102.12
8	532	Chalcopyrite	D9	0.04	0.05	0.10	40.79	0.03	0.00	0.16	0.05	0.05	0.09	0.37	41.73
8	5	Diopside	A5	1.26	23.03	0.45	4.10	0.00	15.90	0.05	0.45	53.77	0.00	0.00	99.01
9	128	Cr-diopside	B56	2.45	20.49	1.23	4.54	0.00	17.91	0.13	0.19	52.20	0.22	0.02	99.37
9	690	Kyanite	E104	57.06	0.00	0.01	0.69	0.00	1.07	0.01	0.01	30.05	0.35	0.01	89.26
9	131	Cr-diopside	B59	2.12	22.75	1.13	3.60	0.01	15.92	0.16	0.57	52.50	0.06	0.01	98.83
9	691	Rutile	E105	0.01	0.03	0.19	0.21	0.03	0.00	0.06	0.00	0.06	101.28	0.12	101.99
9	688	Chalcopyrite	E102	0.03	0.07	0.11	40.75	0.04	0.00	0.18	0.03	0.13	0.11	0.37	41.81
9	689	Chalcopyrite	E103	0.01	0.07	0.12	40.66	0.04	0.00	0.17	0.02	0.12	0.10	0.36	41.67
9	129	Cr-diopside	B57	1.97	20.99	1.15	4.36	0.00	17.36	0.15	0.34	52.65	0.18	0.02	99.16
9	692	Spinel	E106	68.25	0.00	0.08	3.62	0.00	25.88	0.08	0.00	0.00	0.00	0.03	97.94
9	130	Cr-diopside	B58	2.17	17.55	0.94	5.25	0.00	20.13	0.18	0.19	52.91	0.16	0.00	99.47
10	693	Epidote	E107	21.63	21.75	0.02	12.70	0.02	0.00	0.17	0.90	41.63	0.04	0.05	98.89
10	135	Diopside	B63	2.15	22.91	0.50	4.16	0.00	15.75	0.15	0.69	53.53	0.07	0.02	99.92
10	133	Cr-diopside	B61	2.32	19.25	1.19	4.54	0.00	18.97	0.14	0.20	52.66	0.14	0.01	99.41
10	132	Cr-diopside	B60	2.10	18.45	0.87	5.52	0.00	18.88	0.14	0.54	53.55	0.15	0.04	100.24
10	134	Cr-diopside	B62	1.40	20.12	0.72	4.76	0.00	18.64	0.15	0.47	54.38	0.15	0.00	100.79
10	694	Spinel	E108	67.21	0.00	0.03	5.66	0.00	24.81	0.08	0.00	0.00	0.02	0.30	98.10
12	728	Loellingite	E142	0.02	0.09	0.16	40.03	0.06	0.24	0.28	0.12	0.11	0.17	0.58	41.85
12	718	Chalcopyrite	E132	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	734	Kyanite	E148	57.68	0.00	0.00	0.50	0.00	0.80	0.00	0.00	31.41	0.55	0.01	90.95
12	699	Chalcopyrite	E113	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	136	Diopside	B64	0.49	23.33	0.48	3.11	0.00	17.39	0.15	0.35	54.31	0.02	0.00	99.64
12	700	Chalcopyrite	E114	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	729	Cr-rutile	E143	0.01	0.04	0.97	0.13	0.02	0.00	0.07	0.00	0.07	99.90	0.13	101.33
12	704	Chalcopyrite	E118	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	705	Chalcopyrite	E119	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	708	Chalcopyrite	E122	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	701	Chalcopyrite	E115	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	727	Loellingite	E141	0.01	0.11	0.17	40.14	0.06	0.27	0.28	0.11	0.11	0.16	0.60	42.00
12	720	Chalcopyrite	E134	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	745	Kyanite	E159	58.78	0.00	0.00	0.42	0.00	0.49	0.00	0.00	30.54	0.33	0.02	90.57
12	698	Chalcopyrite	E112	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_ %	CaO_ %	Cr2O3_ %	FeO_ %	K2O_ %	MgO_ %	MnO_ %	Na2O_ %	SiO2_ %	TiO2_ %	ZnO_ %	Total_ %
12	741	Kyanite	E155	57.11	0.01	0.02	0.44	0.00	0.90	0.00	0.00	31.15	0.83	0.02	90.48
12	722	Chalcopyrite	E136	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	712	Chalcopyrite	E126	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	730	Gahnite	E144	59.64	0.00	0.01	6.79	0.00	4.24	0.44	0.94	0.00	0.00	31.36	103.42
12	714	Chalcopyrite	E128	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	724	Chalcopyrite	E138	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	733	Spinel	E147	67.96	0.00	0.17	3.46	0.00	26.18	0.02	0.00	0.00	0.04	0.10	97.93
12	740	Corundum	E154	97.76	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.04
12	725	Chalcopyrite	E139	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	744	Spinel	E158	67.57	0.00	0.03	7.03	0.00	23.39	0.06	0.02	0.00	0.01	0.61	98.73
12	721	Chalcopyrite	E135	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	726	Chalcopyrite	E140	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	713	Chalcopyrite	E127	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	735	Spinel	E149	65.92	0.01	0.19	12.41	0.00	19.42	0.06	0.00	0.00	0.01	1.03	99.04
12	697	Chalcopyrite	E111	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	719	Chalcopyrite	E133	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	702	Chalcopyrite	E116	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	711	Chalcopyrite	E125	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	737	Spinel	E151	67.43	0.00	0.06	5.36	0.00	24.72	0.02	0.00	0.00	0.02	0.12	97.73
12	703	Chalcopyrite	E117	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	710	Chalcopyrite	E124	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	732	Spinel	E146	66.71	0.01	0.06	9.75	0.00	21.25	0.08	0.00	0.00	0.00	0.60	98.46
12	736	Kyanite	E150	56.32	0.00	0.00	0.51	0.00	0.83	0.02	0.01	30.13	1.59	0.01	89.41
12	696	Chalcopyrite	E110	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	743	Spinel	E157	67.66	0.00	0.09	3.64	0.00	25.60	0.15	0.00	0.00	0.03	0.29	97.45
12	137	Cr-diopside	B65	0.89	22.72	0.53	4.29	0.00	16.84	0.19	0.25	53.97	0.04	0.03	99.74
12	717	Chalcopyrite	E131	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	738	Spinel	E152	67.15	0.00	0.08	6.44	0.00	23.75	0.08	0.02	0.00	0.02	0.76	98.32
12	695	Chalcopyrite	E109	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	723	Chalcopyrite	E137	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	138	Cr-diopside	B66	0.67	22.72	0.59	4.55	0.00	16.45	0.21	0.45	53.58	0.03	0.04	99.28
12	715	Chalcopyrite	E129	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	739	Kyanite	E153	56.31	0.00	0.01	0.38	0.01	0.65	0.01	0.01	30.18	1.83	0.02	89.39
12	742	Spinel	E156	67.48	0.00	0.16	5.59	0.00	24.31	0.08	0.00	0.00	0.01	0.61	98.25
12	709	Chalcopyrite	E123	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	707	Chalcopyrite	E121	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	746	Kyanite	E160	58.70	0.00	0.00	0.65	0.01	0.29	0.00	0.00	30.82	0.09	0.00	90.55
12	706	Chalcopyrite	E120	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	716	Chalcopyrite	E130	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12	731	Spinel	E145	67.76	0.00	0.12	4.62	0.00	24.92	0.08	0.01	0.00	0.01	0.73	98.25
13	22	Diopside	A22	1.75	22.95	0.34	4.98	0.00	15.74	0.16	0.44	53.61	0.03	0.00	99.99
13	186	Cr-diopside	B114	3.16	22.83	1.19	2.88	0.00	15.70	0.10	0.63	52.07	0.26	0.00	98.80
13	167	Diopside	B95	1.54	22.84	0.43	5.00	0.00	15.54	0.16	0.54	53.43	0.02	0.00	99.51
13	541	Orthopyroxene	D18	1.07	0.36	0.04	34.33	0.00	13.19	0.69	0.00	50.38	0.04	0.11	100.19
13	140	Cr-diopside	B68	2.59	22.59	1.27	2.33	0.00	15.85	0.10	0.90	53.27	0.10	0.01	99.00
13	164	Cr-diopside	B92	2.05	22.99	0.85	3.90	0.00	15.61	0.16	0.59	52.60	0.21	0.00	98.94
13	548	Orthopyroxene	D25	0.67	0.35	0.19	12.26	0.00	30.37	0.24	0.01	55.80	0.00	0.00	99.88
13	754	Chalcopyrite	E168	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
13	141	Cr-diopside	B69	1.40	22.89	0.75	3.94	0.00	16.11	0.10	0.45	53.47	0.01	0.00	99.12
13	19	Fe-cpx	A19	1.38	22.53	0.22	6.66	0.00	14.83	0.12	0.39	53.20	0.00	0.00	99.34

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
13	544	Orthopyroxene	D21	1.28	0.53	0.14	18.00	0.00	25.82	0.40	0.01	54.21	0.02	0.00	100.41
13	752	Chalcopyrite	E166	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
13	14	Diopside	A14	0.96	23.50	0.09	3.72	0.00	16.39	0.06	0.35	54.00	0.00	0.00	99.08
13	12	Diopside	A12	1.03	23.21	0.36	3.55	0.00	16.59	0.13	0.40	53.84	0.00	0.00	99.10
13	540	Orthopyroxene	D17	4.44	0.38	0.19	11.21	0.00	29.80	0.24	0.00	53.36	0.07	0.00	99.69
13	750	Chalcopyrite	E164	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
13	142	Cr-diopside	B70	1.23	23.79	1.35	1.72	0.00	16.87	0.07	0.61	53.65	0.07	0.02	99.38
13	219	Cr-diopside	B147	1.43	22.49	0.72	4.83	0.00	15.52	0.16	0.49	53.32	0.04	0.01	99.01
13	190	Cr-diopside	B118	2.86	23.33	0.99	2.68	0.00	15.77	0.09	0.60	52.66	0.13	0.00	99.10
13	211	Cr-diopside	B139	2.59	23.33	1.17	2.31	0.00	16.07	0.08	0.66	52.61	0.26	0.00	99.07
13	564	Orthopyroxene	D41	1.44	0.74	0.38	7.72	0.00	33.03	0.20	0.02	56.36	0.04	0.00	99.92
13	11	Fe-cpx	A11	1.60	19.42	0.31	7.56	0.00	17.30	0.10	0.41	53.78	0.00	0.00	100.47
13	536	Orthopyroxene	D13	1.16	0.45	0.12	17.61	0.00	26.12	0.35	0.01	54.45	0.01	0.00	100.28
13	197	Diopside	B125	1.30	20.24	0.46	5.03	0.00	17.45	0.13	0.37	54.26	0.01	0.00	99.24
13	143	Cr-diopside	B71	3.43	23.16	1.30	2.30	0.00	15.56	0.08	0.81	52.61	0.24	0.00	99.49
13	753	Chalcopyrite	E167	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
13	563	Orthopyroxene	D40	0.76	0.38	0.24	10.68	0.00	31.44	0.26	0.01	54.85	0.00	0.00	98.61
13	177	Cr-diopside	B105	2.68	23.22	1.26	2.40	0.00	15.88	0.08	0.64	52.24	0.27	0.00	98.68
13	16	Cr-diopside	A16	3.29	21.70	1.47	3.03	0.00	14.80	0.00	1.43	52.70	0.16	0.00	98.57
13	751	Chalcopyrite	E165	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
13	144	Cr-diopside	B72	5.42	11.87	1.38	3.83	0.37	20.35	0.08	0.79	52.20	0.03	0.02	96.33
13	10	Diopside	A10	1.41	22.82	0.33	5.79	0.00	15.32	0.11	0.41	53.42	0.00	0.00	99.60
13	562	Orthopyroxene	D39	0.64	0.28	0.19	10.97	0.00	31.74	0.26	0.01	56.40	0.00	0.00	100.48
13	18	Diopside	A18	1.57	22.93	0.18	5.00	0.00	15.69	0.13	0.49	53.35	0.00	0.00	99.35
13	172	Cr-diopside	B100	2.65	20.27	0.57	3.53	0.00	18.05	0.13	0.59	53.00	0.09	0.00	98.87
13	9	Diopside	A9	1.16	22.89	0.23	4.33	0.00	16.41	0.23	0.37	53.79	0.00	0.00	99.40
13	145	Cr-diopside	B73	3.21	21.34	1.83	2.80	0.00	14.85	0.07	1.61	53.13	0.12	0.00	98.95
13	176	Diopside	B104	1.44	22.62	0.39	5.13	0.00	15.47	0.19	0.44	53.13	0.00	0.00	98.79
13	549	Orthopyroxene	D26	0.71	0.37	0.23	10.60	0.00	31.31	0.28	0.00	56.21	0.00	0.00	99.71
13	759	Corundum	E173	97.38	0.00	0.24	0.50	0.00	0.00	0.00	0.00	0.00	0.05	0.00	98.17
13	146	Cr-diopside	B74	1.45	5.65	0.69	5.95	0.00	30.12	0.10	0.25	56.19	0.03	0.00	100.44
13	772	Sapphirine	E186	63.07	0.01	0.01	3.59	0.00	18.26	0.18	0.00	12.82	0.01	0.00	97.94
13	561	Orthopyroxene	D38	0.84	0.29	0.23	10.53	0.00	31.56	0.26	0.01	56.10	0.00	0.00	99.81
13	25	Cr-spinel	A25	8.24	0.03	60.03	23.90	0.02	6.91	0.61	0.00	0.04	0.11	0.38	100.27
13	756	Corundum	E170	97.72	0.00	0.30	0.27	0.00	0.00	0.00	0.00	0.00	0.02	0.00	98.31
13	149	Cr-diopside	B77	3.15	21.39	1.67	3.79	0.00	14.72	0.08	1.48	52.37	0.30	0.00	98.95
13	547	Orthopyroxene	D24	0.70	0.27	0.22	10.76	0.00	31.58	0.27	0.00	56.46	0.00	0.00	100.26
13	771	Sapphirine	E185	61.38	0.00	0.00	4.73	0.00	18.67	0.14	0.00	13.38	0.02	0.00	98.31
13	560	Orthopyroxene	D37	0.79	0.34	0.22	10.57	0.00	31.58	0.26	0.01	56.16	0.00	0.00	99.93
13	770	Sapphirine	E184	62.07	0.00	0.00	5.69	0.00	17.17	0.13	0.00	12.88	0.01	0.04	98.00
13	545	Orthopyroxene	D22	0.64	0.26	0.19	10.59	0.00	31.72	0.27	0.00	56.09	0.00	0.00	99.76
13	755	Corundum	E169	98.38	0.00	0.29	0.19	0.00	0.00	0.00	0.00	0.00	0.01	0.00	98.86
13	147	Cr-diopside	B75	3.24	21.96	1.76	2.37	0.00	15.36	0.06	1.22	52.79	0.27	0.00	99.01
13	218	Cr-diopside	B146	2.01	23.94	0.76	2.64	0.00	16.49	0.09	0.32	52.86	0.12	0.00	99.24
13	559	Orthopyroxene	D36	0.77	0.35	0.20	10.56	0.00	31.22	0.26	0.01	56.12	0.00	0.00	99.49
13	212	Cr-diopside	B140	3.76	22.83	0.94	3.56	0.00	14.95	0.11	0.83	51.86	0.22	0.00	99.06
13	199	Cr-diopside	B127	4.92	11.87	1.20	3.85	0.37	20.56	0.09	0.78	52.83	0.04	0.00	96.51
13	17	Cr-diopside	A17	2.85	23.71	0.63	2.72	0.00	15.92	0.09	0.54	52.76	0.16	0.05	99.43
13	543	Orthopyroxene	D20	1.20	0.43	0.15	17.65	0.00	26.01	0.37	0.00	54.23	0.03	0.01	100.09
13	765	Cr-rutile	E179	0.00	0.04	1.06	0.24	0.02	0.00	0.06	0.00	0.06	99.15	0.14	100.76

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_ %	CaO_ %	Cr2O3_ %	FeO_ %	K2O_ %	MgO_ %	MnO_ %	Na2O_ %	SiO2_ %	TiO2_ %	ZnO_ %	Total_ %
13	148	Cr-diopside	B76	4.87	11.94	1.33	3.71	0.28	20.74	0.09	0.75	52.95	0.03	0.00	96.68
13	208	Cr-diopside	B136	1.55	22.69	0.59	5.02	0.00	15.74	0.16	0.52	53.27	0.01	0.00	99.55
13	558	Orthopyroxene	D35	0.31	0.16	0.11	10.73	0.00	31.53	0.28	0.00	56.61	0.00	0.00	99.72
13	161	Diopside	B89	1.63	22.42	0.45	5.86	0.00	15.10	0.17	0.55	52.90	0.05	0.00	99.13
13	15	Diopside	A15	1.19	22.92	0.09	5.28	0.00	15.69	0.08	0.36	53.46	0.00	0.00	99.08
13	196	Cr-diopside	B124	2.59	23.49	0.91	2.72	0.00	15.94	0.09	0.56	52.87	0.11	0.00	99.26
13	760	Corundum	E174	97.95	0.00	0.14	0.29	0.00	0.00	0.00	0.00	0.00	0.02	0.00	98.40
13	566	Diopside	D43	1.46	23.37	0.32	3.24	0.01	16.06	0.13	0.51	54.05	0.02	0.01	99.16
13	557	Orthopyroxene	D34	0.80	0.34	0.26	10.54	0.00	31.56	0.27	0.00	56.16	0.00	0.00	99.94
13	565	Cr-diopside	D42	3.24	23.75	0.77	3.22	0.01	15.71	0.10	0.32	52.45	0.10	0.01	99.66
13	539	Orthopyroxene	D16	1.44	0.43	0.11	18.09	0.00	25.07	0.38	0.01	54.05	0.06	0.03	99.66
13	13	Cr-diopside	A13	1.42	20.73	0.53	6.00	0.00	16.87	0.08	0.43	53.82	0.00	0.00	99.88
13	758	Corundum	E172	98.33	0.00	0.24	0.22	0.00	0.00	0.00	0.00	0.00	0.02	0.00	98.81
13	202	Cr-diopside	B130	1.26	21.44	0.58	5.14	0.00	16.96	0.17	0.39	53.46	0.01	0.00	99.41
13	556	Orthopyroxene	D33	0.58	0.25	0.19	10.90	0.00	31.82	0.27	0.00	56.14	0.00	0.00	100.14
13	185	Cr-diopside	B113	2.18	23.60	0.94	2.76	0.00	16.22	0.11	0.62	53.40	0.08	0.00	99.90
13	181	Diopside	B109	1.38	23.10	0.50	4.51	0.00	15.92	0.14	0.41	53.50	0.00	0.00	99.46
13	183	Cr-diopside	B111	2.24	22.72	1.37	3.56	0.00	15.43	0.14	0.75	52.68	0.11	0.00	99.01
13	537	Orthopyroxene	D14	2.20	2.38	0.69	8.78	0.00	29.90	0.20	0.03	55.05	0.08	0.00	99.31
13	7	Cr-diopside	A7	1.38	21.63	0.61	4.66	0.00	16.35	0.05	0.46	53.60	0.00	0.00	98.73
13	175	Cr-diopside	B103	2.06	23.29	0.71	3.69	0.00	15.78	0.12	0.57	52.92	0.14	0.00	99.27
13	193	Diopside	B121	1.26	22.89	0.33	5.04	0.00	15.94	0.19	0.38	53.81	0.01	0.00	99.85
13	554	Orthopyroxene	D31	0.65	0.27	0.25	10.68	0.00	31.79	0.27	0.01	55.93	0.00	0.00	99.86
13	139	Cr-diopside	B67	5.45	11.94	1.59	3.88	0.35	20.25	0.08	0.86	52.40	0.03	0.00	96.82
13	21	Cr-diopside	A21	2.58	22.84	0.86	3.52	0.01	15.75	0.12	0.61	52.75	0.19	0.00	99.22
13	215	Cr-diopside	B143	1.38	22.55	0.67	5.35	0.00	15.61	0.14	0.43	53.08	0.03	0.00	99.23
13	535	Orthopyroxene	D12	0.59	0.28	0.10	17.35	0.00	26.56	0.46	0.01	55.31	0.01	0.01	100.66
13	767	Rutile	E181	0.01	0.03	0.24	0.66	0.02	0.00	0.05	0.00	0.06	99.66	0.15	100.88
13	201	Cr-diopside	B129	2.12	23.37	0.99	2.72	0.00	16.03	0.11	0.64	52.88	0.23	0.01	99.09
13	24	Fe-cpx	A24	1.52	22.71	0.42	6.38	0.01	14.90	0.19	0.45	53.55	0.07	0.02	100.21
13	553	Orthopyroxene	D30	0.73	0.41	0.25	10.69	0.00	31.41	0.28	0.01	56.37	0.00	0.00	100.15
13	763	Rutile	E177	0.00	0.03	0.18	0.10	0.03	0.00	0.06	0.00	0.07	101.00	0.15	101.61
13	205	Cr-diopside	B133	1.99	23.17	0.80	3.14	0.00	15.90	0.11	0.68	53.30	0.15	0.00	99.24
13	768	Rutile	E182	0.01	0.24	0.21	0.13	0.02	0.00	0.05	0.00	0.06	100.83	0.14	101.70
13	170	Cr-diopside	B98	5.93	11.85	1.40	3.99	0.40	20.19	0.09	0.89	51.98	0.04	0.00	96.76
13	173	Diopside	B101	1.09	22.94	0.47	5.90	0.00	14.96	0.18	0.39	52.92	0.02	0.01	98.86
13	23	Cr-diopside	A23	2.61	23.13	0.63	4.32	0.00	15.51	0.11	0.51	52.43	0.15	0.00	99.39
13	195	Diopside	B123	1.97	23.85	0.49	3.19	0.00	16.55	0.10	0.40	53.30	0.08	0.00	99.93
13	552	Orthopyroxene	D29	0.78	0.25	0.24	10.77	0.00	31.53	0.26	0.01	56.30	0.00	0.00	100.14
13	20	Diopside	A20	0.99	22.37	0.48	5.43	0.00	15.53	0.15	0.69	53.68	0.00	0.00	99.30
13	213	Cr-diopside	B141	4.73	11.84	1.15	3.94	0.29	20.73	0.09	0.73	53.42	0.02	0.00	96.92
13	747	Chalcopyrite	E161	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
13	551	Orthopyroxene	D28	0.77	0.19	0.20	10.71	0.00	31.87	0.26	0.00	56.34	0.00	0.00	100.34
13	534	Chalcopyrite	D11	0.04	0.05	0.09	40.99	0.04	0.00	0.15	0.04	0.03	0.09	0.34	41.86
13	217	Cr-diopside	B145	1.32	23.62	0.54	3.32	0.01	16.45	0.09	0.30	53.30	0.10	0.00	99.04
13	757	Corundum	E171	97.49	0.00	0.39	0.18	0.00	0.00	0.00	0.00	0.00	0.03	0.00	98.09
13	550	Orthopyroxene	D27	0.76	0.26	0.25	10.83	0.00	31.55	0.26	0.00	56.33	0.00	0.00	100.25
13	224	Cr-diopside	B152	1.25	22.65	0.77	4.18	0.00	16.18	0.10	0.51	53.20	0.03	0.02	98.91
13	221	Cr-diopside	B149	3.24	21.55	1.37	3.78	0.00	14.61	0.10	1.46	52.77	0.32	0.03	99.24
13	220	Cr-diopside	B148	4.98	11.78	1.27	3.87	0.32	20.71	0.09	0.74	52.67	0.02	0.02	96.46

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
13	152	Cr-diopside	B80	3.29	23.35	1.00	2.88	0.00	15.67	0.08	0.59	52.30	0.15	0.00	99.32
13	216	Cr-diopside	B144	2.99	11.88	0.99	3.45	0.14	21.61	0.10	0.53	55.23	0.00	0.00	96.92
13	151	Cr-diopside	B79	2.23	23.64	0.78	2.58	0.00	16.31	0.08	0.38	53.14	0.04	0.00	99.17
13	769	Rutile	E183	0.00	0.02	0.53	0.13	0.02	0.00	0.05	0.00	0.06	100.15	0.17	101.14
13	154	Cr-diopside	B82	5.69	11.89	1.37	4.03	0.43	20.27	0.09	0.85	51.82	0.04	0.01	96.47
13	764	Rutile	E178	0.01	0.03	0.15	0.32	0.02	0.00	0.04	0.00	0.05	99.86	0.15	100.63
13	153	Cr-diopside	B81	2.64	11.59	1.57	3.35	0.18	22.18	0.10	0.50	55.70	0.00	0.00	97.80
13	206	Cr-diopside	B134	2.56	23.02	1.23	2.59	0.00	16.05	0.11	0.59	52.94	0.26	0.00	99.34
13	156	Cr-diopside	B84	2.92	23.41	1.13	2.45	0.00	15.86	0.06	0.64	52.81	0.20	0.00	99.47
13	204	Cr-diopside	B132	1.72	22.77	1.13	3.25	0.00	16.42	0.13	0.57	53.22	0.04	0.00	99.24
13	155	Cr-diopside	B83	1.34	22.76	0.53	5.06	0.00	15.50	0.18	0.44	53.14	0.02	0.00	98.97
13	546	Orthopyroxene	D23	1.00	0.33	0.17	14.13	0.00	29.11	0.30	0.00	55.29	0.01	0.00	100.34
13	158	Cr-diopside	B86	3.51	22.69	1.20	3.24	0.00	15.15	0.09	0.78	52.09	0.17	0.00	98.91
13	198	Cr-diopside	B126	1.46	22.83	0.54	5.39	0.00	15.48	0.20	0.41	53.26	0.03	0.00	99.60
13	157	Cr-diopside	B85	1.42	22.88	0.86	4.13	0.00	15.99	0.13	0.50	53.49	0.03	0.00	99.42
13	542	Orthopyroxene	D19	2.37	0.87	0.03	20.62	0.00	22.87	0.67	0.04	52.22	0.11	0.01	99.80
13	160	Cr-diopside	B88	5.35	11.93	1.20	4.00	0.48	20.28	0.09	0.82	52.60	0.04	0.00	96.80
13	192	Cr-diopside	B120	4.93	11.89	1.31	3.88	0.32	20.47	0.08	0.76	52.19	0.04	0.01	95.88
13	159	Cr-diopside	B87	1.35	23.18	0.57	3.72	0.00	16.24	0.19	0.47	53.73	0.00	0.00	99.45
13	222	Diopside	B150	1.55	22.93	0.47	4.78	0.00	15.64	0.15	0.45	53.42	0.03	0.02	99.43
13	184	Cr-diopside	B112	1.38	23.31	0.53	4.55	0.00	15.75	0.13	0.44	53.63	0.01	0.00	99.74
13	209	Diopside	B137	1.25	21.88	0.38	5.66	0.00	16.11	0.16	0.42	53.63	0.02	0.00	99.50
13	163	Cr-diopside	B91	2.72	23.14	0.81	3.00	0.00	16.02	0.11	0.59	52.54	0.12	0.01	99.05
13	188	Diopside	B116	1.38	23.16	0.42	4.31	0.00	16.00	0.14	0.35	53.65	0.03	0.00	99.43
13	555	Orthopyroxene	D32	0.77	0.26	0.24	10.73	0.00	31.81	0.27	0.00	56.11	0.00	0.00	100.19
13	533	Chalcopyrite	D10	0.04	0.04	0.10	40.73	0.03	0.00	0.14	0.06	0.06	0.08	0.36	41.65
13	150	Cr-diopside	B78	2.47	22.94	1.57	2.69	0.00	15.55	0.07	0.88	53.09	0.21	0.00	99.47
13	214	Diopside	B142	1.50	22.94	0.34	4.96	0.00	15.25	0.19	0.44	53.39	0.01	0.03	99.06
13	168	Cr-diopside	B96	3.19	21.53	1.27	3.43	0.00	15.00	0.08	1.45	52.71	0.25	0.00	98.91
13	761	Diopside	E175	1.21	25.13	0.01	5.04	0.01	13.93	1.63	0.21	54.12	0.07	0.11	101.48
13	207	Cr-diopside	B135	1.14	22.94	0.72	4.96	0.00	15.72	0.16	0.48	52.74	0.00	0.00	98.86
13	766	Rutile	E180	0.00	0.03	0.06	0.66	0.02	0.00	0.04	0.00	0.07	100.71	0.15	101.74
13	165	Cr-diopside	B93	1.32	23.08	0.64	4.98	0.00	15.66	0.15	0.40	53.28	0.03	0.01	99.55
13	189	Cr-diopside	B117	2.43	23.10	0.76	3.04	0.00	16.14	0.09	0.61	53.29	0.23	0.00	99.69
13	8	Fe-cpx	A8	1.58	21.21	0.32	6.31	0.00	15.33	0.09	0.59	53.24	0.00	0.00	98.66
13	200	Cr-diopside	B128	2.88	23.02	0.93	3.85	0.00	15.25	0.11	0.57	52.13	0.12	0.00	98.86
13	223	Cr-diopside	B151	1.48	23.21	0.52	4.96	0.00	15.58	0.13	0.42	53.48	0.03	0.02	99.82
13	191	Cr-diopside	B119	1.15	23.28	0.83	2.97	0.01	16.29	0.11	0.54	53.59	0.01	0.00	98.77
13	169	Cr-diopside	B97	2.52	22.14	1.05	3.36	0.00	16.24	0.10	0.67	52.77	0.24	0.00	99.08
13	748	Chalcopyrite	E162	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
13	174	Cr-diopside	B102	1.46	23.03	0.52	4.29	0.00	15.97	0.16	0.57	53.55	0.02	0.01	99.59
13	749	Chalcopyrite	E163	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
13	6	Cr-diopside	A6	2.95	20.65	1.91	2.89	0.00	14.72	0.00	1.82	53.19	0.14	0.00	98.26
13	187	Fe-cpx	B115	1.35	21.06	0.33	6.62	0.00	16.00	0.23	0.51	53.98	0.01	0.00	100.07
13	762	Loellingite	E176	0.01	0.11	0.16	38.74	0.07	0.25	0.27	0.13	0.12	0.17	0.62	40.64
13	171	Diopside	B99	1.16	23.16	0.37	4.54	0.00	15.85	0.20	0.48	53.15	0.03	0.00	98.92
13	162	Cr-diopside	B90	1.62	22.80	0.63	4.90	0.00	15.44	0.13	0.54	52.68	0.02	0.01	98.76
13	179	Cr-diopside	B107	3.34	21.75	1.56	3.47	0.00	14.62	0.09	1.36	52.32	0.31	0.00	98.83
13	182	Cr-diopside	B110	1.95	23.00	1.31	2.83	0.00	15.64	0.11	0.86	53.22	0.11	0.00	99.03
13	203	Cr-diopside	B131	1.38	22.67	0.54	4.62	0.00	16.01	0.15	0.43	53.57	0.05	0.01	99.43

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
13	166	Cr-diopside	B94	2.37	23.40	1.07	2.40	0.00	16.50	0.08	0.55	53.33	0.18	0.03	99.91
13	210	Cr-diopside	B138	1.62	24.12	0.68	2.46	0.00	16.82	0.08	0.31	53.53	0.07	0.00	99.69
13	180	Cr-diopside	B108	1.49	21.87	0.53	5.83	0.00	15.63	0.19	0.46	53.25	0.00	0.00	99.26
13	194	Diopside	B122	1.24	22.59	0.49	5.59	0.00	15.45	0.17	0.45	53.65	0.03	0.00	99.66
13	538	Orthopyroxene	D15	2.37	0.30	0.19	10.99	0.00	30.97	0.24	0.00	55.14	0.08	0.00	100.27
13	773	Spinel	E187	66.93	0.00	0.08	6.16	0.00	24.17	0.09	0.01	0.01	0.02	0.48	97.93
13	178	Cr-diopside	B106	2.58	22.65	0.60	4.20	0.00	16.18	0.13	0.40	52.72	0.11	0.02	99.59
14	781	Rutile	E195	0.02	0.04	0.62	0.11	0.02	0.00	0.06	0.00	0.06	99.88	0.14	100.95
14	271	Cr-spinel	B199	18.04	0.02	48.57	22.10	0.02	10.04	0.48	0.00	0.02	0.11	0.19	99.59
14	226	Cr-diopside	B154	3.07	23.49	1.12	3.08	0.00	15.57	0.10	0.57	51.95	0.30	0.02	99.27
14	269	Cr-diopside	B197	1.63	24.05	0.71	2.27	0.00	16.94	0.09	0.32	53.43	0.09	0.00	99.53
14	228	Cr-diopside	B156	1.67	23.12	0.87	3.13	0.00	16.11	0.08	0.75	53.51	0.11	0.02	99.35
14	265	Cr-diopside	B193	3.34	22.50	1.38	3.09	0.00	14.82	0.10	1.21	52.59	0.18	0.00	99.20
14	230	Cr-diopside	B158	3.16	21.54	1.69	2.85	0.00	15.08	0.07	1.45	52.43	0.17	0.03	98.47
14	263	Diopside	B191	1.57	23.06	0.45	3.29	0.00	16.37	0.10	0.61	53.78	0.06	0.00	99.29
14	775	Corundum	E189	94.92	0.00	0.41	0.13	0.00	0.00	0.00	0.00	0.00	0.02	0.00	95.48
14	780	Mn-epidote	E194	23.02	22.97	0.00	4.69	0.00	0.05	7.03	0.00	37.96	0.12	0.01	95.85
14	232	Cr-diopside	B160	3.10	20.31	1.46	4.09	0.00	15.55	0.09	1.42	51.86	0.22	0.03	98.12
14	261	Cr-diopside	B189	2.31	23.16	0.85	4.12	0.00	15.50	0.13	0.43	52.52	0.10	0.01	99.13
14	784	Spinel	E198	68.39	0.00	0.06	2.19	0.00	26.84	0.04	0.00	0.00	0.06	0.08	97.67
14	28	Diopside	A28	1.42	23.65	0.43	2.66	0.01	16.66	0.17	0.52	54.27	0.01	0.00	99.80
14	262	Diopside	B190	1.73	23.30	0.37	3.83	0.00	15.93	0.12	0.44	53.34	0.07	0.01	99.12
14	776	Mn-epidote	E190	23.08	23.55	0.00	9.95	0.00	0.01	1.76	0.00	38.38	0.00	0.01	96.74
14	234	Cr-diopside	B162	2.44	23.40	1.18	2.28	0.00	16.24	0.07	0.50	52.96	0.16	0.01	99.25
14	249	Cr-diopside	B177	1.32	21.80	0.76	3.90	0.00	17.21	0.13	0.40	53.71	0.05	0.00	99.27
14	779	Rutile	E193	0.01	0.04	0.33	0.18	0.02	0.00	0.06	0.00	0.06	100.46	0.15	101.31
14	241	Cr-diopside	B169	2.62	23.29	1.20	3.10	0.00	15.59	0.10	0.63	52.33	0.15	0.00	98.99
14	268	Cr-diopside	B196	1.58	23.36	0.81	2.98	0.00	16.52	0.10	0.54	53.38	0.10	0.00	99.37
14	233	Cr-diopside	B161	2.98	23.56	0.87	2.38	0.00	16.03	0.06	0.55	52.86	0.15	0.05	99.48
14	266	Cr-diopside	B194	3.19	23.02	0.93	2.62	0.00	15.72	0.11	0.76	52.67	0.19	0.00	99.21
14	225	Cr-diopside	B153	3.57	21.81	1.17	3.25	0.00	14.88	0.08	1.41	52.56	0.15	0.03	98.90
14	264	Cr-diopside	B192	2.60	23.52	1.08	2.40	0.00	16.12	0.07	0.55	53.11	0.20	0.00	99.64
14	774	Corundum	E188	97.13	0.00	0.46	0.19	0.00	0.00	0.00	0.00	0.00	0.02	0.00	97.79
14	236	Cr-diopside	B164	2.20	23.05	0.68	3.17	0.00	16.13	0.09	0.68	53.19	0.11	0.02	99.32
14	244	Cr-diopside	B172	2.32	23.36	0.91	2.98	0.00	15.98	0.08	0.60	52.97	0.11	0.00	99.31
14	260	Cr-diopside	B188	1.62	23.20	0.72	3.35	0.00	16.50	0.11	0.47	53.29	0.19	0.00	99.44
14	231	Cr-diopside	B159	2.07	22.68	1.12	3.31	0.00	16.29	0.09	0.72	53.21	0.11	0.01	99.62
14	258	Cr-diopside	B186	1.31	23.14	0.86	3.38	0.01	16.56	0.13	0.53	53.86	0.04	0.00	99.81
14	783	Sapphirine	E197	60.67	0.01	0.01	5.95	0.01	17.82	0.11	0.00	13.29	0.01	0.02	97.89
14	568	Unknown	D45	0.00	53.16	0.00	0.57	0.01	0.00	0.03	0.01	0.06	0.00	0.00	53.84
14	777	Epidote	E191	21.85	23.32	0.00	13.03	0.00	0.00	0.14	0.01	38.19	0.02	0.00	96.56
14	256	Cr-diopside	B184	1.86	21.16	0.92	5.08	0.00	16.90	0.13	0.52	52.77	0.23	0.00	99.56
14	567	Epidote	D44	26.87	23.75	0.02	7.48	0.00	0.04	0.11	0.01	39.58	0.06	0.02	97.92
14	238	Cr-diopside	B166	1.72	21.27	0.51	5.87	0.00	16.80	0.17	0.39	52.90	0.08	0.02	99.75
14	229	Diopside	B157	1.20	20.82	0.49	6.05	0.00	16.68	0.18	0.45	53.23	0.05	0.03	99.17
14	227	Cr-diopside	B155	1.87	22.57	1.33	3.66	0.00	15.33	0.10	0.90	53.07	0.19	0.03	99.04
14	257	Cr-diopside	B185	1.72	22.89	0.64	4.74	0.00	15.75	0.16	0.51	53.12	0.03	0.00	99.57
14	254	Cr-diopside	B182	1.68	23.29	0.51	4.49	0.00	15.73	0.20	0.35	53.33	0.04	0.02	99.63
14	245	Cr-diopside	B173	1.50	23.11	0.86	3.59	0.00	16.00	0.11	0.58	53.19	0.16	0.00	99.11
14	235	Cr-diopside	B163	2.47	23.28	1.26	2.37	0.00	16.20	0.08	0.53	52.94	0.12	0.02	99.29

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_ %	CaO_ %	Cr2O3_ %	FeO_ %	K2O_ %	MgO_ %	MnO_ %	Na2O_ %	SiO2_ %	TiO2_ %	ZnO_ %	Total_ %
14	27	Cr-diopside	A27	2.22	23.13	0.90	3.46	0.01	16.04	0.12	0.50	52.83	0.12	0.03	99.35
14	252	Cr-diopside	B180	1.45	23.46	0.98	3.06	0.00	15.97	0.11	0.52	52.88	0.19	0.00	98.59
14	270	Diopside	B198	1.29	23.17	0.42	4.43	0.00	15.65	0.14	0.37	53.60	0.03	0.00	99.08
14	243	Cr-diopside	B171	2.60	22.86	0.67	3.93	0.00	15.58	0.14	0.69	52.34	0.15	0.00	98.96
14	247	Cr-diopside	B175	3.60	23.22	1.05	3.52	0.00	15.28	0.12	0.65	51.90	0.17	0.00	99.51
14	250	Cr-diopside	B178	2.70	23.10	0.78	3.48	0.00	15.58	0.08	0.64	52.52	0.15	0.00	99.03
14	255	Cr-diopside	B183	1.90	23.00	1.33	3.27	0.00	15.80	0.11	0.74	53.16	0.22	0.01	99.54
14	251	Cr-diopside	B179	1.36	23.28	0.73	3.19	0.00	16.41	0.15	0.56	53.56	0.06	0.01	99.30
14	778	Mn-epidote	E192	21.80	22.61	0.02	9.43	0.02	0.35	2.77	0.00	37.09	0.03	0.01	94.13
14	240	Cr-diopside	B168	2.19	22.86	1.54	3.13	0.00	15.60	0.14	0.79	52.86	0.13	0.06	99.29
14	237	Cr-diopside	B165	2.01	23.03	1.36	2.66	0.00	16.26	0.08	0.63	52.99	0.06	0.03	99.09
14	259	Cr-diopside	B187	1.68	22.73	0.69	5.05	0.00	15.32	0.16	0.56	53.18	0.07	0.01	99.45
14	242	Cr-diopside	B170	1.76	23.64	1.05	2.55	0.00	16.41	0.10	0.55	53.17	0.17	0.00	99.39
14	248	Cr-diopside	B176	1.76	23.50	0.72	3.08	0.00	16.37	0.11	0.53	53.42	0.07	0.01	99.57
14	239	Cr-diopside	B167	2.98	23.39	0.95	3.04	0.00	15.79	0.10	0.55	52.33	0.18	0.04	99.36
14	267	Cr-diopside	B195	3.00	23.31	0.91	2.14	0.00	15.99	0.09	0.67	52.79	0.27	0.00	99.16
14	782	Spinel	E196	64.14	0.01	1.25	13.14	0.00	19.52	0.12	0.00	0.00	0.03	0.15	98.36
14	253	Cr-diopside	B181	1.83	22.42	1.14	2.98	0.00	15.87	0.09	0.95	53.49	0.18	0.00	98.93
14	26	Cr-diopside	A26	1.32	23.37	0.70	3.41	0.01	16.29	0.21	0.51	53.74	0.02	0.01	99.58
14	246	Cr-diopside	B174	2.01	23.10	0.90	3.06	0.00	16.19	0.10	0.71	53.12	0.15	0.00	99.32
15	300	Cr-diopside	B228	1.91	23.01	1.07	3.11	0.00	15.89	0.10	0.75	53.35	0.04	0.00	99.22
15	318	Cr-diopside	B246	2.00	23.06	0.87	3.27	0.00	16.01	0.12	0.69	52.91	0.05	0.00	98.98
15	316	Cr-diopside	B244	2.29	22.63	1.13	3.81	0.00	15.16	0.10	0.89	52.66	0.28	0.00	98.95
15	283	Cr-diopside	B211	1.88	23.39	0.65	2.46	0.00	16.26	0.08	0.65	53.10	0.07	0.00	98.52
15	317	Diopside	B245	1.71	23.22	0.48	3.44	0.00	16.10	0.11	0.68	53.09	0.05	0.00	98.88
15	291	Cr-diopside	B219	2.47	22.31	1.24	2.90	0.00	16.43	0.10	0.79	53.35	0.33	0.00	99.91
15	314	Cr-diopside	B242	1.63	22.96	0.99	2.70	0.00	16.24	0.07	0.83	53.16	0.10	0.00	98.66
15	299	Cr-diopside	B227	1.18	22.55	0.78	3.17	0.00	17.11	0.09	0.51	53.40	0.15	0.00	98.94
15	363	Diopside	C3	1.10	23.47	0.45	3.40	0.00	16.54	0.11	0.45	53.58	0.07	0.01	99.17
15	307	Cr-diopside	B235	2.47	23.48	0.80	3.38	0.01	15.60	0.12	0.67	52.75	0.12	0.00	99.42
15	312	Cr-diopside	B240	1.40	22.63	0.57	3.48	0.00	17.05	0.14	0.63	54.07	0.06	0.00	100.03
15	315	Cr-diopside	B243	2.57	22.18	0.87	3.88	0.00	15.60	0.11	0.84	52.94	0.11	0.00	99.10
15	35	Diopside	A35	1.48	23.48	0.47	3.02	0.00	16.44	0.13	0.62	53.84	0.07	0.00	99.56
15	323	Cr-diopside	B251	2.27	23.97	0.56	2.34	0.00	16.45	0.07	0.58	53.57	0.10	0.00	99.91
15	310	Cr-diopside	B238	1.77	22.01	1.00	3.80	0.00	16.61	0.11	0.72	52.94	0.10	0.00	99.06
15	331	Cr-diopside	B259	1.95	22.61	0.96	4.05	0.00	15.83	0.14	0.66	53.08	0.12	0.01	99.40
15	306	Cr-diopside	B234	2.57	21.98	0.87	3.32	0.00	16.63	0.10	0.75	53.32	0.13	0.00	99.65
15	339	Cr-diopside	B267	3.78	18.88	1.09	5.10	0.00	18.14	0.15	0.27	51.89	0.27	0.03	99.59
15	304	Cr-diopside	B232	1.93	23.03	0.77	2.77	0.00	16.34	0.09	0.67	53.06	0.14	0.00	98.79
15	347	Cr-diopside	B275	1.61	23.41	0.52	3.29	0.00	16.10	0.10	0.62	53.49	0.11	0.01	99.26
15	302	Cr-diopside	B230	2.65	22.81	0.99	4.15	0.00	14.98	0.15	0.80	52.33	0.10	0.00	98.96
15	355	Cr-diopside	B283	1.63	23.07	0.85	3.77	0.01	15.57	0.11	0.70	53.21	0.16	0.00	99.08
15	327	Diopside	B255	1.93	23.67	0.44	2.42	0.00	16.58	0.07	0.52	53.57	0.11	0.02	99.33
15	321	Cr-diopside	B249	1.78	23.48	0.61	2.49	0.00	16.26	0.06	0.76	53.61	0.19	0.00	99.23
15	803	Cr-rutile	E217	0.02	0.00	0.85	0.86	0.00	0.00	0.02	0.00	0.00	97.36	0.02	99.14
15	309	Cr-diopside	B237	1.98	23.49	1.29	2.59	0.00	16.16	0.10	0.49	52.51	0.16	0.00	98.76
15	298	Cr-diopside	B226	0.66	24.18	0.51	2.29	0.00	17.44	0.10	0.42	54.67	0.04	0.00	100.32
15	301	Cr-diopside	B229	1.40	23.22	0.81	2.66	0.00	16.41	0.09	0.67	53.68	0.05	0.00	99.00
15	348	Diopside	B276	1.50	23.63	0.39	3.27	0.00	16.38	0.11	0.49	53.49	0.07	0.03	99.36
15	293	Cr-diopside	B221	1.83	22.90	0.70	3.38	0.00	15.87	0.12	0.86	53.59	0.12	0.00	99.35

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_ %	CaO_ %	Cr2O3_ %	FeO_ %	K2O_ %	MgO_ %	MnO_ %	Na2O_ %	SiO2_ %	TiO2_ %	ZnO_ %	Total_ %
15	294	Cr-diopside	B222	1.93	23.09	0.91	2.64	0.00	16.17	0.09	0.81	53.67	0.06	0.00	99.37
15	285	Cr-diopside	B213	1.62	22.10	0.81	4.23	0.00	16.54	0.15	0.61	53.12	0.08	0.00	99.26
15	805	Rutile	E219	0.06	0.01	0.24	0.12	0.00	0.00	0.02	0.02	0.00	100.18	0.00	100.64
15	787	Kyanite	E201	60.55	0.01	1.11	0.20	0.00	0.00	0.01	0.00	36.75	0.01	0.01	98.65
15	292	Cr-diopside	B220	1.78	23.21	0.71	2.99	0.00	16.49	0.08	0.63	53.76	0.02	0.00	99.66
15	34	Cr-diopside	A34	1.81	23.47	0.59	2.41	0.01	16.43	0.10	0.64	53.87	0.13	0.01	99.46
15	791	Rutile	E205	0.03	0.04	0.07	0.38	0.02	0.00	0.06	0.00	0.06	100.73	0.15	101.54
15	303	Cr-diopside	B231	1.87	21.66	1.13	3.65	0.00	16.07	0.12	1.03	53.58	0.09	0.00	99.19
15	290	Cr-diopside	B218	2.94	23.26	0.56	3.23	0.00	15.62	0.08	0.71	53.26	0.09	0.00	99.76
15	319	Cr-diopside	B247	3.11	23.42	0.65	2.90	0.00	15.71	0.11	0.72	52.77	0.19	0.00	99.58
15	792	Rutile	E206	0.01	0.00	0.28	0.04	0.00	0.01	0.01	0.01	0.00	100.44	0.03	100.84
15	335	Cr-diopside	B263	2.24	23.05	0.56	3.48	0.00	15.31	0.13	0.78	53.39	0.14	0.02	99.09
15	38	Cr-spinel	A38	5.88	0.03	46.64	39.90	0.03	4.80	0.67	0.01	0.02	0.51	0.39	98.88
15	351	Cr-diopside	B279	1.99	22.59	1.36	3.04	0.01	15.63	0.09	0.94	53.12	0.20	0.03	99.01
15	288	Cr-diopside	B216	2.06	23.26	0.84	2.67	0.00	16.12	0.10	0.83	53.78	0.13	0.00	99.80
15	352	Cr-diopside	B280	2.46	23.11	0.98	2.96	0.00	15.70	0.10	0.85	53.40	0.12	0.02	99.71
15	37	Cr-spinel	A37	8.59	0.03	48.57	33.77	0.03	7.06	0.62	0.00	0.01	0.43	0.32	99.43
15	346	Cr-diopside	B274	1.79	22.57	0.87	3.84	0.01	15.79	0.13	0.84	53.37	0.10	0.04	99.33
15	286	Cr-diopside	B214	2.43	23.13	0.94	2.46	0.00	16.22	0.07	0.74	52.99	0.14	0.00	99.11
15	30	Cr-diopside	A30	1.80	23.08	0.51	3.88	0.00	15.98	0.11	0.63	53.18	0.04	0.00	99.22
15	36	Cr-spinel	A36	5.93	0.03	48.75	37.52	0.03	5.14	0.69	0.00	0.02	0.43	0.39	98.92
15	295	Cr-diopside	B223	1.58	22.62	0.78	2.40	0.01	16.30	0.05	0.75	53.50	0.17	0.00	98.15
15	793	Rutile	E207	0.02	0.00	0.17	0.13	0.00	0.00	0.00	0.01	0.00	100.71	0.02	101.06
15	338	Cr-diopside	B266	1.56	23.07	0.61	3.31	0.00	16.32	0.11	0.68	53.75	0.10	0.05	99.56
15	33	Cr-diopside	A33	1.58	24.08	0.89	2.31	0.01	16.57	0.08	0.55	53.78	0.04	0.01	99.87
15	359	Cr-diopside	B287	2.51	22.59	1.06	3.36	0.00	15.56	0.09	0.85	52.23	0.10	0.00	98.33
15	794	Rutile	E208	0.03	0.01	0.31	0.18	0.00	0.02	0.01	0.01	0.08	100.71	0.02	101.38
15	330	Cr-diopside	B258	2.33	21.41	1.50	4.02	0.01	15.89	0.09	0.93	52.93	0.08	0.01	99.20
15	282	Cr-diopside	B210	1.82	23.33	0.89	2.98	0.00	16.24	0.10	0.65	53.42	0.07	0.00	99.50
15	311	Cr-diopside	B239	1.67	21.20	0.99	4.01	0.00	16.78	0.09	0.83	53.44	0.12	0.00	99.12
15	795	Rutile	E209	0.04	0.00	0.18	0.15	0.00	0.00	0.02	0.01	0.00	100.42	0.03	100.85
15	324	Cr-diopside	B252	0.99	23.26	0.76	3.18	0.01	16.44	0.10	0.78	53.69	0.02	0.01	99.23
15	280	Cr-diopside	B208	2.01	22.61	1.14	3.47	0.00	15.69	0.11	0.95	53.24	0.26	0.00	99.48
15	32	Cr-diopside	A32	1.83	22.80	0.64	4.01	0.01	15.81	0.16	0.73	52.93	0.04	0.00	98.96
15	796	Rutile	E210	0.02	0.00	0.15	0.18	0.00	0.01	0.01	0.02	0.00	100.68	0.03	101.08
15	320	Cr-diopside	B248	1.49	23.04	0.51	3.17	0.01	16.72	0.12	0.67	53.63	0.08	0.00	99.43
15	278	Cr-diopside	B206	2.11	22.31	1.41	3.37	0.00	15.34	0.11	1.04	53.49	0.11	0.00	99.29
15	334	Diopside	B262	1.69	23.44	0.49	2.75	0.00	16.43	0.07	0.66	54.02	0.03	0.01	99.59
15	276	Cr-diopside	B204	1.85	23.52	0.88	2.01	0.00	16.64	0.06	0.55	53.66	0.08	0.00	99.24
15	357	Cr-diopside	B285	2.47	23.00	0.87	3.19	0.01	15.48	0.12	0.81	53.17	0.11	0.00	99.23
15	797	Rutile	E211	0.01	0.01	0.14	0.10	0.00	0.00	0.02	0.02	0.00	100.95	0.00	101.25
15	349	Cr-diopside	B277	1.60	23.07	0.91	3.10	0.00	16.11	0.08	0.76	53.64	0.03	0.02	99.31
15	274	Cr-diopside	B202	1.65	22.77	1.33	2.91	0.00	15.33	0.10	0.96	53.08	0.12	0.00	98.24
15	341	Cr-diopside	B269	1.86	22.45	1.21	3.40	0.00	15.54	0.10	0.98	53.49	0.13	0.02	99.18
15	272	Cr-diopside	B200	1.81	21.56	1.21	4.04	0.00	16.21	0.11	0.86	53.54	0.08	0.00	99.41
15	329	Cr-diopside	B257	2.60	22.31	1.14	4.25	0.01	14.60	0.18	0.93	52.56	0.11	0.01	98.70
15	31	Cr-diopside	A31	1.74	23.10	1.03	3.06	0.01	16.01	0.11	0.78	53.60	0.20	0.00	99.65
15	313	Cr-diopside	B241	1.94	23.18	0.95	2.48	0.00	16.23	0.08	0.78	53.59	0.13	0.00	99.37
15	798	Rutile	E212	0.01	0.00	0.16	0.16	0.00	0.01	0.02	0.01	0.00	100.08	0.00	100.44
15	297	Cr-diopside	B225	1.80	21.97	0.68	3.98	0.01	16.31	0.09	0.74	53.62	0.04	0.00	99.22

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
15	789	Rutile	E203	0.00	0.04	0.34	0.50	0.02	0.00	0.06	0.00	0.06	100.21	0.13	101.35
15	281	Cr-diopside	B209	2.39	22.01	1.44	4.40	0.00	14.56	0.12	1.19	52.99	0.18	0.00	99.28
15	799	Rutile	E213	0.02	0.00	0.09	0.34	0.00	0.00	0.02	0.02	0.00	100.23	0.01	100.72
15	273	Cr-diopside	B201	2.40	23.25	0.85	2.60	0.00	15.99	0.09	0.80	53.49	0.19	0.00	99.65
15	800	Rutile	E214	0.01	0.00	0.24	0.08	0.00	0.00	0.01	0.02	0.00	100.63	0.04	101.03
15	360	Cr-diopside	B288	1.25	23.42	0.69	2.93	0.00	16.34	0.12	0.67	53.66	0.04	0.00	99.11
15	29	Cr-diopside	A29	2.28	22.94	1.14	3.07	0.01	15.84	0.11	0.76	53.13	0.11	0.00	99.39
15	354	Cr-diopside	B282	2.27	22.82	1.21	2.66	0.00	15.94	0.07	0.84	53.31	0.03	0.01	99.17
15	801	Rutile	E215	0.01	0.00	0.28	0.06	0.00	0.01	0.02	0.00	0.00	100.42	0.00	100.79
15	344	Cr-diopside	B272	1.67	23.55	0.62	2.35	0.01	16.57	0.05	0.66	54.24	0.10	0.02	99.82
15	802	Rutile	E216	0.01	0.00	0.18	0.28	0.00	0.00	0.01	0.01	0.00	100.92	0.02	101.42
15	284	Orthopyroxene	B212	0.64	0.36	0.32	7.22	0.00	34.10	0.29	0.00	56.40	0.01	0.00	99.34
15	806	Rutile	E220	0.01	0.00	0.68	0.30	0.00	0.01	0.01	0.00	0.00	99.96	0.00	100.98
15	332	Cr-diopside	B260	2.43	23.18	1.12	2.37	0.00	15.57	0.06	0.83	53.11	0.11	0.02	98.81
15	804	Rutile	E218	0.02	0.00	0.43	0.01	0.00	0.02	0.02	0.02	0.00	100.29	0.01	100.82
15	326	Cr-diopside	B254	1.60	22.67	1.05	2.92	0.00	16.47	0.09	0.77	53.75	0.11	0.03	99.46
15	788	Rutile	E202	0.03	0.04	0.39	0.78	0.02	0.00	0.06	0.00	0.06	99.69	0.16	101.23
15	322	Cr-diopside	B250	2.33	23.38	0.75	2.71	0.01	16.12	0.07	0.63	53.07	0.19	0.00	99.26
15	337	Diopside	B265	2.48	21.84	0.50	3.38	0.00	16.79	0.10	0.72	53.46	0.08	0.02	99.36
15	361	Cr-diopside	C1	2.58	22.44	1.05	4.26	0.00	14.75	0.16	0.98	52.82	0.14	0.00	99.18
15	358	Diopside	B286	1.57	23.55	0.46	2.76	0.00	16.40	0.12	0.62	53.65	0.16	0.00	99.30
15	345	Cr-diopside	B273	2.77	23.18	1.06	3.21	0.00	15.31	0.09	0.85	52.74	0.10	0.02	99.32
15	790	Rutile	E204	0.03	0.04	0.06	0.33	0.02	0.00	0.06	0.00	0.06	99.94	0.12	100.65
15	325	Cr-diopside	B253	1.90	22.79	1.12	4.03	0.00	15.49	0.11	0.74	52.68	0.21	0.02	99.09
15	808	Sapphirine	E222	59.82	0.00	0.00	6.43	0.00	18.09	0.04	0.02	13.77	0.00	0.00	98.16
15	289	Cr-diopside	B217	2.09	23.20	0.91	2.93	0.00	15.84	0.11	0.75	53.55	0.08	0.00	99.44
15	807	Sapphirine	E221	63.16	0.00	0.00	5.91	0.00	17.02	0.08	0.01	11.69	0.00	0.00	97.87
15	362	Cr-diopside	C2	1.67	22.94	0.53	3.96	0.00	15.91	0.15	0.67	53.01	0.11	0.00	98.93
15	365	Cr-diopside	C5	1.63	22.56	0.52	4.36	0.00	15.34	0.13	0.83	53.26	0.10	0.00	98.74
15	350	Cr-diopside	B278	1.75	23.57	0.60	3.26	0.00	16.26	0.11	0.65	53.29	0.09	0.02	99.62
15	364	Cr-diopside	C4	1.87	23.77	0.51	2.43	0.00	16.39	0.07	0.57	54.03	0.07	0.00	99.70
15	336	Cr-diopside	B264	1.17	22.95	0.69	3.71	0.00	16.05	0.14	0.67	53.69	0.06	0.02	99.14
15	279	Diopside	B207	1.34	23.07	0.36	3.68	0.00	16.70	0.14	0.46	53.52	0.07	0.00	99.33
15	343	Cr-diopside	B271	1.28	23.17	0.61	3.34	0.00	15.96	0.12	0.90	54.03	0.03	0.01	99.44
15	809	Spinel	E223	67.54	0.00	0.01	5.41	0.00	24.43	0.19	0.01	0.00	0.00	0.15	97.74
15	353	Cr-diopside	B281	1.68	22.94	0.88	3.05	0.00	16.29	0.10	0.69	53.42	0.16	0.01	99.23
15	287	Diopside	B215	1.36	23.33	0.41	3.11	0.00	16.50	0.10	0.61	53.95	0.06	0.00	99.45
15	305	Cr-diopside	B233	2.25	23.19	0.78	3.02	0.00	16.02	0.09	0.70	53.21	0.12	0.00	99.39
15	340	Diopside	B268	1.34	23.13	0.37	3.61	0.01	16.30	0.12	0.71	53.77	0.03	0.03	99.42
15	356	Cr-diopside	B284	1.94	23.04	0.84	3.64	0.01	16.14	0.12	0.57	52.90	0.14	0.00	99.34
15	296	Diopside	B224	1.93	23.30	0.44	3.00	0.01	16.06	0.09	0.71	53.59	0.08	0.00	99.21
15	328	Cr-diopside	B256	2.33	23.05	0.55	3.39	0.00	16.01	0.11	0.67	52.84	0.07	0.03	99.05
15	785	Corundum	E199	97.28	0.00	0.64	0.10	0.00	0.00	0.00	0.00	0.00	0.02	0.00	98.05
15	333	Cr-diopside	B261	2.27	23.20	0.63	3.10	0.00	15.96	0.11	0.74	53.53	0.07	0.01	99.62
15	308	Diopside	B236	0.90	23.96	0.34	2.92	0.01	16.86	0.11	0.40	53.88	0.06	0.00	99.44
15	342	Cr-diopside	B270	1.62	22.48	0.85	3.40	0.00	16.46	0.11	0.68	53.42	0.07	0.03	99.13
15	277	Cr-diopside	B205	1.78	23.18	0.79	3.05	0.00	16.24	0.10	0.64	53.57	0.13	0.00	99.50
15	275	Cr-diopside	B203	1.68	23.22	0.68	3.24	0.00	16.23	0.13	0.66	53.21	0.11	0.00	99.15
15	786	Corundum	E200	97.60	0.00	0.31	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.09
16	814	Rutile	E228	0.00	0.00	0.21	0.35	0.00	0.00	0.00	0.00	0.03	99.75	0.00	100.34

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
16	815	Rutile	E229	0.04	0.00	0.08	0.15	0.00	0.00	0.00	0.00	0.04	100.52	0.00	100.83
16	811	Fe-cpx	E225	2.62	22.71	0.04	14.26	0.00	8.88	0.70	0.51	50.32	0.28	0.03	100.34
16	812	Gahnite	E226	59.01	0.01	0.01	9.73	0.01	2.81	0.53	0.92	0.00	0.02	30.19	103.23
16	810	Fe-cpx	E224	2.55	23.43	0.03	9.02	0.01	12.59	0.34	0.47	51.80	0.13	0.01	100.36
16	813	Spinel	E227	68.53	0.00	0.00	2.05	0.00	26.97	0.00	0.00	0.00	0.00	0.00	97.55
17	39	Cr-spinel	A39	20.73	0.02	33.33	35.20	0.02	8.09	0.51	0.00	0.01	0.64	0.39	98.94
17	819	Spinel	E233	67.56	0.00	0.00	5.44	0.00	25.11	0.05	0.00	0.00	0.00	0.00	98.17
17	821	Spinel	E235	68.48	0.00	0.04	2.52	0.00	26.74	0.06	0.01	0.00	0.03	0.08	97.96
17	569	Amphibole	D46	14.71	11.72	0.02	7.19	0.20	16.02	0.09	1.67	44.35	0.07	0.00	96.03
17	822	Spinel	E236	67.86	0.00	0.16	4.37	0.00	25.20	0.10	0.00	0.01	0.03	0.05	97.76
17	820	Spinel	E234	67.25	0.00	0.01	5.85	0.00	24.32	0.04	0.00	0.00	0.00	0.17	97.65
17	818	Spinel	E232	67.60	0.00	0.13	6.15	0.00	24.27	0.00	0.00	0.00	0.00	0.00	98.15
17	816	Rutile	E230	0.01	0.00	0.11	0.04	0.00	0.00	0.00	0.00	0.03	101.52	0.00	101.71
17	817	Rutile	E231	0.00	0.00	0.06	0.54	0.00	0.00	0.00	0.00	0.04	100.84	0.00	101.47
18	401	Cr-diopside	C41	2.91	23.16	0.80	3.01	0.00	15.84	0.09	0.67	52.84	0.11	0.02	99.46
18	833	Rutile	E247	0.02	0.00	0.50	0.18	0.00	0.00	0.00	0.00	0.00	99.93	0.00	100.63
18	826	Gahnite	E240	59.60	0.00	0.01	9.34	0.00	3.23	0.01	0.85	0.01	0.03	30.04	103.13
18	394	Cr-diopside	C34	3.24	23.16	1.39	2.67	0.00	15.49	0.11	0.75	52.31	0.26	0.00	99.40
18	824	Unknown	E238	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	2.13	0.00	0.04	3.63
18	395	Cr-diopside	C35	2.31	23.48	1.15	2.62	0.00	16.07	0.10	0.57	53.17	0.27	0.02	99.73
18	384	Diopside	C24	2.39	22.10	0.45	5.58	0.00	15.43	0.19	0.24	52.49	0.04	0.01	98.93
18	396	Cr-diopside	C36	1.71	23.49	0.59	3.34	0.00	16.15	0.12	0.56	53.56	0.12	0.00	99.64
18	829	Spinel	E243	67.25	0.01	0.05	6.06	0.00	24.77	0.06	0.00	0.00	0.01	0.05	98.24
18	397	Cr-diopside	C37	1.52	23.48	0.74	3.40	0.01	16.03	0.15	0.53	53.84	0.12	0.00	99.82
18	383	Cr-diopside	C23	1.58	22.62	0.69	3.36	0.02	16.97	0.13	0.29	54.53	0.01	0.02	100.20
18	398	Cr-diopside	C38	2.00	24.02	0.68	2.46	0.00	16.23	0.08	0.37	53.40	0.14	0.00	99.39
18	367	Cr-diopside	C7	1.48	23.26	1.23	3.17	0.00	15.97	0.13	0.61	53.45	0.20	0.00	99.49
18	399	Cr-diopside	C39	2.26	23.59	0.79	3.23	0.00	15.87	0.11	0.50	53.32	0.11	0.00	99.78
18	369	Cr-diopside	C9	2.76	23.08	0.93	3.41	0.00	15.27	0.11	0.73	52.91	0.22	0.00	99.41
18	400	Cr-diopside	C40	1.27	22.90	0.54	3.83	0.01	16.28	0.14	0.28	53.88	0.09	0.01	99.21
18	371	Cr-diopside	C11	3.66	23.13	0.93	3.03	0.00	15.55	0.07	0.68	52.12	0.16	0.00	99.34
18	413	Diopside	C53	2.05	23.83	0.45	3.21	0.00	16.19	0.10	0.44	53.49	0.05	0.00	99.80
18	373	Cr-diopside	C13	1.75	23.34	1.19	2.74	0.00	16.09	0.09	0.64	53.40	0.25	0.00	99.50
18	402	Cr-diopside	C42	2.00	20.22	0.88	5.20	0.00	16.45	0.18	0.59	53.47	0.13	0.00	99.12
18	375	Cr-diopside	C15	1.47	23.37	0.84	3.15	0.00	16.04	0.09	0.56	53.87	0.11	0.00	99.50
18	403	Cr-diopside	C43	1.59	20.00	0.66	4.90	0.00	18.47	0.14	0.43	53.89	0.15	0.01	100.23
18	377	Cr-diopside	C17	3.00	23.27	1.19	2.74	0.00	15.78	0.08	0.64	52.56	0.18	0.00	99.44
18	404	Cr-diopside	C44	2.60	23.38	0.79	2.93	0.00	15.88	0.10	0.59	53.19	0.27	0.00	99.72
18	379	Cr-diopside	C19	3.30	23.44	0.83	3.25	0.00	15.59	0.10	0.54	52.22	0.25	0.00	99.53
18	405	Cr-diopside	C45	1.97	23.21	1.15	2.98	0.00	16.00	0.10	0.56	53.04	0.15	0.00	99.15
18	381	Cr-diopside	C21	3.59	19.12	1.18	5.00	0.00	17.82	0.13	0.25	52.01	0.23	0.00	99.33
18	406	Cr-diopside	C46	1.75	23.71	0.86	2.98	0.00	16.35	0.10	0.47	53.77	0.06	0.00	100.05
18	385	Cr-diopside	C25	3.64	22.02	0.76	3.02	0.00	15.15	0.10	1.10	53.18	0.08	0.01	99.05
18	407	Cr-diopside	C47	3.52	23.47	1.28	2.56	0.00	15.47	0.10	0.59	52.24	0.22	0.00	99.46
18	387	Cr-diopside	C27	2.74	18.73	1.29	4.74	0.00	17.81	0.15	0.46	52.58	0.17	0.01	98.68
18	408	Cr-diopside	C48	1.40	23.57	1.03	2.99	0.00	16.07	0.09	0.51	53.52	0.06	0.01	99.25
18	388	Cr-diopside	C28	1.86	21.44	0.99	4.89	0.00	16.47	0.15	0.60	53.53	0.08	0.00	100.00
18	844	Rutile	E258	0.03	0.00	0.70	0.27	0.00	0.02	0.01	0.00	0.00	99.07	0.00	100.08
18	390	Cr-diopside	C30	1.32	23.67	0.60	3.56	0.00	15.97	0.12	0.41	53.40	0.05	0.01	99.11
18	409	Cr-diopside	C49	3.27	23.14	1.12	2.96	0.00	15.35	0.08	0.69	52.31	0.23	0.01	99.14

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
18	835	Rutile	E249	0.02	0.00	0.48	0.13	0.00	0.01	0.00	0.00	0.00	100.09	0.00	100.74
18	842	Rutile	E256	0.01	0.00	0.20	0.02	0.00	0.00	0.00	0.00	0.00	101.56	0.00	101.80
18	392	Cr-diopside	C32	1.87	23.29	1.14	3.01	0.00	16.03	0.11	0.64	53.47	0.05	0.01	99.62
18	410	Cr-diopside	C50	2.34	23.48	0.89	3.47	0.00	15.72	0.11	0.52	52.76	0.16	0.00	99.44
18	841	Rutile	E255	0.01	0.00	0.49	0.02	0.00	0.01	0.00	0.00	0.00	101.08	0.00	101.62
18	840	Rutile	E254	0.03	0.00	0.41	0.16	0.00	0.00	0.00	0.00	0.48	99.21	0.00	100.30
18	412	Diopside	C52	0.41	24.51	0.28	4.74	0.00	15.52	0.28	0.24	54.14	0.06	0.01	100.16
18	411	Cr-diopside	C51	2.26	22.66	0.96	4.53	0.00	15.24	0.12	0.60	52.59	0.19	0.01	99.16
18	828	Spinel	E242	67.74	0.01	0.09	3.20	0.00	26.13	0.05	0.00	0.01	0.04	0.12	97.38
18	838	Rutile	E252	0.03	0.00	0.07	0.14	0.00	0.00	0.00	0.00	0.01	100.26	0.00	100.51
18	366	Cr-diopside	C6	3.13	22.16	0.84	4.01	0.00	14.96	0.09	1.04	52.42	0.20	0.00	98.84
18	836	Rutile	E250	0.01	0.00	0.43	0.11	0.00	0.00	0.00	0.00	0.00	99.00	0.00	99.56
18	370	Cr-diopside	C10	1.33	20.07	0.69	5.29	0.00	17.01	0.17	0.54	53.43	0.06	0.00	98.61
18	414	Cr-diopside	C54	3.08	23.30	0.95	3.03	0.00	15.42	0.10	0.63	52.95	0.15	0.00	99.60
18	374	Cr-diopside	C14	2.97	23.25	0.68	2.92	0.00	15.86	0.08	0.64	53.06	0.13	0.00	99.59
18	834	Rutile	E248	0.04	0.00	0.31	0.28	0.00	0.01	0.00	0.00	0.00	99.68	0.00	100.31
18	378	Cr-diopside	C18	1.96	23.36	1.05	3.30	0.00	16.06	0.09	0.57	53.26	0.07	0.00	99.73
18	832	Rutile	E246	0.03	0.00	0.56	0.06	0.00	0.01	0.00	0.00	0.01	100.49	0.00	101.16
18	382	Cr-diopside	C22	2.34	23.56	0.54	3.93	0.00	15.45	0.11	0.52	52.87	0.10	0.00	99.41
18	415	Cr-diopside	C55	3.30	19.46	0.81	4.99	0.00	16.66	0.13	0.84	52.96	0.22	0.01	99.38
18	839	Rutile	E253	0.03	0.00	0.14	0.20	0.00	0.01	0.00	0.00	0.00	100.81	0.00	101.19
18	416	Cr-diopside	C56	2.06	23.71	0.68	3.01	0.00	16.01	0.12	0.42	53.31	0.19	0.00	99.51
18	843	Rutile	E257	0.02	0.00	0.28	0.23	0.00	0.01	0.00	0.00	0.00	100.68	0.00	101.22
18	417	Cr-diopside	C57	2.24	23.28	0.77	3.00	0.00	15.94	0.10	0.64	53.36	0.25	0.00	99.57
18	393	Cr-diopside	C33	3.00	20.42	1.18	4.79	0.00	17.42	0.16	0.26	52.10	0.17	0.00	99.50
18	418	Cr-diopside	C58	2.21	23.58	0.72	3.87	0.00	15.73	0.14	0.41	53.20	0.04	0.01	99.91
18	827	Spinel	E241	68.37	0.00	0.01	1.64	0.00	27.21	0.03	0.01	0.00	0.01	0.10	97.37
18	419	Cr-diopside	C59	2.00	23.22	1.31	3.13	0.00	15.66	0.11	0.69	53.31	0.10	0.00	99.53
18	368	Cr-diopside	C8	3.24	23.20	1.14	2.76	0.00	15.65	0.07	0.74	52.66	0.13	0.00	99.60
18	420	Cr-diopside	C60	1.57	23.98	0.61	2.95	0.00	16.28	0.11	0.52	54.13	0.07	0.00	100.22
18	376	Cr-diopside	C16	1.90	23.37	1.25	2.94	0.00	15.62	0.11	0.56	52.92	0.28	0.00	98.95
18	421	Cr-diopside	C61	2.89	22.73	0.77	3.33	0.00	16.02	0.12	0.66	53.06	0.08	0.00	99.65
18	386	Cr-diopside	C26	1.92	23.01	1.25	3.16	0.00	15.97	0.14	0.58	53.09	0.23	0.00	99.35
18	40	Cr-diopside	A40	3.51	16.18	1.22	5.54	0.00	20.47	0.18	0.27	52.29	0.21	0.00	99.87
18	391	Cr-diopside	C31	2.74	23.29	1.01	2.62	0.00	15.64	0.09	0.70	53.20	0.24	0.00	99.54
18	825	Orthopyroxene	E239	1.18	0.00	0.15	10.08	0.00	32.18	0.19	0.00	56.18	0.04	0.00	99.98
18	823	Chalcopyrite	E237	0.00	0.00	0.07	40.95	0.00	0.03	0.08	0.00	0.09	0.08	0.23	41.54
18	830	Komarovite	E244	16.39	11.85	0.02	7.65	0.25	15.89	0.09	2.22	41.45	0.08	0.07	95.96
18	380	Cr-diopside	C20	2.16	23.53	0.91	2.27	0.00	16.23	0.07	0.59	53.17	0.05	0.00	98.97
18	831	Komarovite	E245	61.02	0.00	0.00	4.30	0.00	19.31	0.00	0.00	13.51	0.00	0.00	98.14
18	837	Rutile	E251	0.01	0.00	0.23	0.19	0.00	0.01	0.00	0.00	0.00	100.53	0.00	100.98
18	389	Cr-diopside	C29	3.23	23.26	1.08	3.14	0.00	15.45	0.11	0.63	52.27	0.31	0.00	99.46
18	372	Cr-diopside	C12	2.12	23.28	0.77	3.31	0.00	15.91	0.08	0.60	53.02	0.18	0.00	99.25
18	41	Ilmenite	A41	0.00	0.01	0.00	47.82	0.00	0.19	1.11	0.00	0.02	51.45	0.00	100.61
19	862	Rutile	E276	0.00	0.00	0.20	0.16	0.00	0.00	0.04	0.00	0.06	100.58	0.12	101.17
19	465	Cr-diopside	C105	1.82	22.75	0.94	4.44	0.00	15.52	0.12	0.48	53.21	0.09	0.01	99.38
19	464	Cr-diopside	C104	2.47	23.37	1.04	3.22	0.00	15.54	0.09	0.54	53.11	0.08	0.00	99.44
19	859	Rutile	E273	0.00	0.00	0.29	0.10	0.00	0.00	0.04	0.00	0.07	100.68	0.14	101.32
19	463	Diopside	C103	1.17	23.04	0.48	4.58	0.00	15.46	0.27	0.48	53.68	0.02	0.01	99.19
19	861	Rutile	E275	0.00	0.00	0.28	0.11	0.00	0.00	0.04	0.00	0.06	100.49	0.14	101.12

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
19	877	Sapphirine	F3	62.34	0.00	0.00	6.33	0.00	16.91	0.16	0.00	11.84	0.00	0.00	97.58
19	429	Cr-diopside	C69	2.58	22.03	0.77	3.78	0.00	16.42	0.08	0.58	53.36	0.09	0.00	99.70
19	422	Cr-pyrope	C62	18.03	5.66	6.54	7.33	0.00	20.11	0.42	0.01	41.30	0.14	0.00	99.54
19	426	Diopside	C66	1.18	23.51	0.50	3.40	0.00	16.39	0.14	0.38	53.98	0.07	0.00	99.54
19	863	Rutile	E277	0.00	0.00	0.17	0.09	0.00	0.00	0.05	0.00	0.07	100.63	0.15	101.16
19	860	Rutile	E274	0.00	0.00	0.41	0.16	0.00	0.00	0.04	0.00	0.07	100.85	0.14	101.66
19	468	Cr-diopside	C108	1.34	23.52	0.64	3.09	0.00	16.48	0.10	0.45	53.91	0.07	0.00	99.59
19	867	Rutile	E281	0.01	0.00	0.17	0.05	0.00	0.01	0.01	0.01	0.02	100.69	0.00	100.98
19	435	Diopside	C75	1.34	22.70	0.43	4.23	0.00	15.97	0.12	0.54	54.11	0.06	0.00	99.48
19	574	Fe-cpx	D51	1.59	22.43	0.29	6.73	0.01	14.73	0.20	0.54	53.46	0.07	0.00	100.05
19	467	Cr-diopside	C107	2.29	23.04	0.65	4.61	0.00	15.32	0.17	0.57	52.96	0.08	0.00	99.67
19	858	Rutile	E272	0.00	0.00	0.56	0.09	0.00	0.00	0.05	0.00	0.07	100.84	0.14	101.75
19	425	Cr-diopside	C65	0.99	23.56	0.52	3.59	0.00	16.33	0.09	0.35	54.07	0.08	0.00	99.56
19	866	Rutile	E280	0.00	0.00	0.20	0.17	0.00	0.00	0.05	0.00	0.06	101.14	0.14	101.76
19	42	Cr-diopside	A42	1.23	20.93	0.75	4.30	0.00	17.10	0.20	0.52	53.14	0.00	0.00	98.15
19	855	Hematite	E269	0.08	0.00	0.16	86.60	0.00	0.01	0.27	0.00	0.15	0.15	0.24	87.65
19	876	Rutile	F2	0.02	0.00	0.07	0.30	0.00	0.00	0.00	0.00	0.00	100.50	0.00	100.88
19	850	Corundum	E264	97.30	0.00	0.30	0.11	0.00	0.02	0.00	0.00	0.00	0.00	0.00	97.73
19	466	Cr-diopside	C106	2.05	23.39	0.66	3.32	0.00	16.07	0.10	0.53	53.48	0.13	0.01	99.72
19	865	Rutile	E279	0.00	0.00	0.35	0.13	0.00	0.00	0.05	0.00	0.06	100.08	0.13	100.80
19	857	Rutile	E271	0.00	0.00	0.45	0.11	0.00	0.00	0.04	0.00	0.06	100.14	0.15	100.95
19	864	Rutile	E278	0.00	0.00	0.18	0.18	0.00	0.00	0.04	0.00	0.06	100.53	0.15	101.14
19	871	Rutile	E285	0.00	0.00	0.21	0.12	0.00	0.00	0.04	0.00	0.07	100.61	0.14	101.18
19	854	Hematite	E268	0.07	0.00	0.16	86.35	0.00	0.00	0.39	0.00	0.21	0.31	0.25	87.73
19	849	Corundum	E263	97.51	0.00	0.34	0.11	0.00	0.02	0.00	0.00	0.00	0.00	0.00	97.99
19	870	Rutile	E284	0.00	0.00	0.20	0.18	0.00	0.00	0.06	0.00	0.06	101.12	0.15	101.76
19	848	Corundum	E262	97.27	0.00	0.24	0.12	0.00	0.01	0.00	0.00	0.00	0.00	0.00	97.64
19	431	Cr-diopside	C71	1.07	23.12	0.71	3.73	0.00	16.26	0.13	0.53	53.64	0.04	0.00	99.22
19	433	Cr-diopside	C73	1.38	23.43	0.57	3.38	0.00	16.27	0.10	0.45	53.52	0.09	0.00	99.19
19	432	Cr-diopside	C72	1.45	23.59	0.55	3.39	0.00	16.77	0.09	0.35	53.68	0.13	0.00	99.99
19	570	Orthopyroxene	D47	0.74	0.43	0.17	17.28	0.01	26.59	0.29	0.01	54.46	0.07	0.00	100.05
19	470	Cr-diopside	C110	1.56	23.12	0.83	2.78	0.00	16.42	0.09	0.54	53.88	0.14	0.00	99.37
19	875	Rutile	F1	0.02	0.00	0.23	0.06	0.00	0.00	0.00	0.00	0.00	100.62	0.00	100.93
19	872	Rutile	E286	0.01	0.00	0.16	0.06	0.00	0.00	0.00	0.00	0.00	100.57	0.00	100.80
19	47	Orthopyroxene	A47	1.59	0.20	0.29	8.02	0.00	33.16	0.15	0.01	55.50	0.00	0.00	98.92
19	847	Corundum	E261	97.03	0.00	0.39	0.05	0.00	0.02	0.00	0.00	0.00	0.00	0.00	97.50
19	457	Cr-diopside	C97	2.57	22.70	0.89	3.26	0.00	15.79	0.10	0.62	52.74	0.18	0.00	98.85
19	846	Corundum	E260	97.75	0.00	0.18	0.14	0.00	0.02	0.00	0.00	0.00	0.00	0.00	98.08
19	427	Cr-diopside	C67	2.07	23.40	0.85	2.99	0.00	16.11	0.07	0.60	53.61	0.17	0.00	99.87
19	851	Corundum	E265	97.14	0.00	0.52	0.11	0.00	0.02	0.00	0.00	0.00	0.00	0.00	97.78
19	456	Cr-diopside	C96	1.43	22.05	0.75	5.47	0.00	15.87	0.14	0.57	53.93	0.03	0.02	100.26
19	458	Cr-diopside	C98	1.50	21.40	1.06	3.82	0.00	16.91	0.11	0.56	54.01	0.14	0.00	99.51
19	48	Orthopyroxene	A48	1.43	0.24	0.18	12.89	0.00	29.58	0.14	0.01	54.64	0.00	0.00	99.11
19	460	Cr-diopside	C100	1.76	23.40	0.98	2.89	0.00	15.84	0.09	0.58	53.27	0.08	0.00	98.89
19	455	Cr-diopside	C95	2.58	22.93	0.66	3.42	0.00	15.84	0.11	0.62	53.32	0.17	0.00	99.64
19	571	Orthopyroxene	D48	0.79	0.43	0.18	17.45	0.01	26.50	0.31	0.00	54.66	0.05	0.01	100.38
19	454	Cr-diopside	C94	1.35	22.73	0.83	4.93	0.00	15.26	0.16	0.62	53.43	0.15	0.01	99.47
19	423	Cr-diopside	C63	2.28	22.68	1.01	4.13	0.00	15.31	0.13	0.59	52.64	0.34	0.00	99.09
19	453	Cr-diopside	C93	2.53	23.38	0.96	2.86	0.00	15.82	0.09	0.70	53.33	0.16	0.00	99.81
19	424	Cr-diopside	C64	2.42	23.20	1.11	2.51	0.00	15.95	0.07	0.67	53.37	0.19	0.00	99.48

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
19	452	Cr-diopside	C92	1.68	17.54	1.05	3.61	0.00	19.64	0.10	0.79	54.15	0.10	0.00	98.65
19	878	Tourmaline	F4	33.22	0.00	0.00	13.93	0.00	0.53	0.16	1.66	34.27	0.66	0.00	84.42
19	451	Cr-diopside	C91	1.51	23.60	0.94	2.42	0.00	16.49	0.07	0.61	53.54	0.06	0.01	99.25
19	439	Diopside	C79	1.39	23.79	0.49	3.42	0.00	16.23	0.10	0.39	53.57	0.11	0.00	99.50
19	450	Cr-diopside	C90	1.05	23.47	0.64	3.58	0.00	16.18	0.11	0.42	54.04	0.02	0.02	99.53
19	873	Rutile	E287	0.01	0.00	0.40	0.03	0.00	0.00	0.00	0.00	0.00	100.54	0.02	101.01
19	449	Cr-diopside	C89	0.99	21.52	1.13	3.16	0.02	16.23	0.07	1.34	54.84	0.22	0.02	99.53
19	856	Rutile	E270	0.00	0.00	0.17	0.11	0.00	0.00	0.04	0.00	0.06	100.61	0.13	101.12
19	448	Cr-diopside	C88	1.38	23.30	0.87	3.61	0.00	15.91	0.12	0.57	53.54	0.15	0.00	99.45
19	573	Orthopyroxene	D50	1.13	0.28	0.24	9.12	0.00	32.78	0.24	0.01	56.29	0.03	0.00	100.13
19	45	Cr-diopside	A45	1.39	23.36	0.74	2.97	0.00	16.47	0.06	0.48	53.30	0.00	0.00	98.77
19	471	Cr-diopside	C111	1.57	21.87	0.89	5.50	0.00	15.46	0.15	0.58	53.65	0.16	0.00	99.83
19	447	Cr-diopside	C87	1.06	23.31	0.69	3.75	0.00	16.04	0.10	0.49	53.93	0.07	0.02	99.45
19	869	Rutile	E283	0.00	0.00	0.25	0.21	0.00	0.00	0.04	0.00	0.07	100.58	0.15	101.31
19	446	Cr-diopside	C86	1.40	23.80	0.61	3.11	0.00	16.68	0.10	0.35	53.77	0.08	0.00	99.90
19	845	Corundum	E259	97.37	0.00	0.41	0.13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	97.91
19	445	Cr-diopside	C85	1.53	23.26	1.08	4.02	0.00	15.57	0.14	0.48	53.54	0.03	0.00	99.66
19	459	Cr-diopside	C99	2.30	23.21	0.79	3.41	0.00	15.74	0.11	0.59	53.15	0.12	0.01	99.42
19	444	Cr-diopside	C84	2.36	23.42	0.95	2.68	0.00	16.08	0.09	0.60	53.00	0.08	0.00	99.25
19	462	Cr-diopside	C102	1.36	23.39	0.99	2.83	0.00	16.32	0.15	0.58	53.90	0.18	0.01	99.69
19	443	Cr-diopside	C83	1.66	23.62	0.65	2.67	0.00	16.20	0.12	0.47	53.86	0.15	0.00	99.38
19	430	Diopside	C70	1.11	23.42	0.33	4.29	0.00	15.82	0.17	0.38	53.87	0.05	0.00	99.44
19	44	Cr-diopside	A44	2.91	9.24	0.97	8.18	0.00	24.18	0.09	0.16	53.56	0.00	0.00	99.29
19	874	Rutile	E288	0.02	0.00	0.24	0.04	0.00	0.00	0.00	0.00	0.00	101.06	0.00	101.36
19	442	Cr-diopside	C82	0.89	23.43	0.56	2.99	0.00	16.81	0.07	0.36	53.93	0.07	0.00	99.12
19	434	Cr-diopside	C74	1.07	22.28	0.81	4.37	0.00	16.39	0.15	0.49	53.65	0.06	0.00	99.27
19	441	Cr-diopside	C81	1.32	23.36	0.81	2.97	0.00	16.32	0.07	0.59	53.73	0.15	0.00	99.31
19	469	Cr-diopside	C109	1.94	22.89	1.14	3.61	0.00	15.56	0.15	0.69	53.28	0.19	0.00	99.43
19	440	Cr-diopside	C80	0.99	23.20	0.73	3.63	0.01	16.59	0.27	0.52	54.16	0.02	0.00	100.13
19	853	Corundum	E267	95.15	0.00	0.37	0.21	0.00	0.01	0.00	0.00	0.02	0.04	0.00	95.80
19	43	Cr-diopside	A43	2.20	19.77	0.88	4.53	0.00	18.35	0.03	0.19	52.31	0.09	0.00	98.34
19	46	Cr-diopside	A46	1.98	22.95	0.73	3.70	0.01	16.03	0.11	0.55	53.05	0.14	0.05	99.29
19	438	Cr-diopside	C78	2.46	23.15	0.89	3.03	0.00	15.89	0.09	0.59	53.11	0.18	0.00	99.38
19	428	Diopside	C68	1.06	23.61	0.49	3.47	0.00	16.48	0.10	0.41	54.25	0.04	0.00	99.90
19	437	Cr-diopside	C77	1.77	23.52	0.86	2.52	0.00	16.16	0.09	0.56	53.96	0.05	0.00	99.48
19	852	Corundum	E266	97.38	0.00	0.35	0.22	0.00	0.01	0.00	0.00	0.00	0.02	0.00	97.97
19	436	Cr-diopside	C76	1.92	22.86	1.09	4.60	0.00	14.83	0.08	0.68	53.54	0.07	0.00	99.67
19	868	Rutile	E282	0.00	0.00	0.25	0.16	0.00	0.00	0.05	0.00	0.07	100.63	0.14	101.30
19	461	Cr-diopside	C101	1.28	22.58	0.77	3.61	0.00	16.30	0.12	0.57	53.53	0.09	0.00	98.83
19	572	Orthopyroxene	D49	1.08	0.41	0.14	19.50	0.00	24.74	0.46	0.01	54.11	0.02	0.03	100.49
19	575	Rutile	D52	0.04	0.04	0.05	0.57	0.02	0.00	0.03	0.01	0.03	100.87	0.08	101.73
20	478	Cr-diopside	C118	1.08	23.80	0.65	2.75	0.00	16.34	0.09	0.49	54.34	0.02	0.01	99.56
20	473	Cr-diopside	C113	1.37	22.65	0.77	4.10	0.00	16.12	0.10	0.57	54.09	0.07	0.00	99.85
20	476	Cr-diopside	C116	1.27	20.44	0.87	4.25	0.00	17.24	0.09	0.58	53.98	0.05	0.00	98.76
20	474	Cr-diopside	C114	1.35	22.62	0.73	3.09	0.00	17.17	0.08	0.45	54.33	0.06	0.00	99.86
20	477	Diopside	C117	1.68	23.54	0.43	3.06	0.00	16.46	0.09	0.46	53.56	0.04	0.00	99.33
20	479	Cr-diopside	C119	1.32	21.87	1.10	4.35	0.00	16.40	0.10	0.64	53.96	0.14	0.01	99.88
20	472	Cr-diopside	C112	1.59	22.95	0.99	3.86	0.00	15.75	0.10	0.63	53.39	0.04	0.00	99.30
20	475	Cr-diopside	C115	1.58	23.02	1.08	3.43	0.00	15.98	0.10	0.70	53.44	0.06	0.00	99.38
21	480	Tourmaline	C120	26.25	0.66	0.00	14.63	0.08	5.21	0.10	2.10	35.70	1.09	0.00	85.82

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_ %	CaO_ %	Cr2O3_ %	FeO_ %	K2O_ %	MgO_ %	MnO_ %	Na2O_ %	SiO2_ %	TiO2_ %	ZnO_ %	Total_ %
21	880	Spinel	F6	66.69	0.00	0.04	8.22	0.00	21.99	0.28	0.03	0.00	0.00	1.38	98.63
21	481	Tourmaline	C121	31.89	0.34	0.00	13.18	0.05	2.25	0.16	1.68	35.22	0.58	0.05	85.40
21	879	Spinel	F5	67.44	0.00	0.18	2.98	0.00	25.21	0.06	0.02	0.00	0.00	1.02	96.92
22	483	Cr-diopside	C123	1.15	23.68	0.62	3.52	0.00	15.56	0.15	0.66	54.29	0.03	0.00	99.64
22	482	Cr-pyroxene	C122	17.74	5.79	6.95	7.40	0.00	19.20	0.45	0.02	41.11	0.24	0.00	98.89
22	884	Spinel	F10	68.68	0.00	0.01	1.57	0.00	27.09	0.09	0.00	0.00	0.05	0.14	97.63
22	882	Spinel	F8	66.11	0.00	0.00	9.11	0.00	22.34	0.22	0.01	0.00	0.00	0.49	98.28
22	886	Rutile	F12	0.04	0.00	0.23	0.08	0.00	0.00	0.01	0.00	0.00	100.14	0.00	100.51
22	49	Mg-ilmenite	A49	0.10	0.02	5.30	28.19	0.02	13.30	0.41	0.03	0.01	53.08	0.20	100.65
22	881	Chalcopyrite	F7	0.02	0.00	0.07	41.31	0.00	0.01	0.13	0.03	0.05	0.00	0.26	41.89
22	885	Rutile	F11	0.03	0.00	0.14	0.15	0.00	0.00	0.00	0.00	0.00	100.06	0.00	100.39
22	883	Gahnite	F9	58.02	0.00	0.00	13.03	0.01	1.71	0.37	0.81	0.01	0.00	28.90	102.87
23	887	Chalcopyrite	F13	0.03	0.00	0.10	40.88	0.00	0.02	0.12	0.02	0.02	0.00	0.26	41.45
24	50	Garnet	A50	22.21	6.16	0.02	20.11	0.00	10.91	0.38	0.01	39.63	0.07	0.00	99.50
24	484	Cr-diopside	C124	2.52	21.50	1.09	6.54	0.00	14.66	0.20	0.65	52.59	0.03	0.00	99.77
24	888	Rutile	F14	0.02	0.00	0.13	0.24	0.00	0.00	0.00	0.00	0.00	99.63	0.01	100.02
25	895	Unknown	F21	10.69	0.00	8.85	6.60	0.00	0.11	0.26	0.00	39.40	0.04	0.00	65.95
25	893	Spinel	F19	67.56	0.00	0.05	3.39	0.00	25.12	0.05	0.02	0.02	0.04	0.90	97.14
25	894	Spinel	F20	67.43	0.00	0.00	4.58	0.00	24.45	0.09	0.03	0.00	0.00	1.24	97.82
25	891	Rutile	F17	0.07	0.00	0.03	0.58	0.00	0.00	0.00	0.00	0.00	100.01	0.00	100.69
25	890	Rutile	F16	0.01	0.00	0.18	0.16	0.00	0.00	0.00	0.00	0.00	101.06	0.00	101.41
25	892	Rutile	F18	0.03	0.00	0.07	0.24	0.00	0.00	0.00	0.00	0.01	100.70	0.02	101.07
25	889	Corundum	F15	96.87	0.00	0.37	0.59	0.00	0.02	0.00	0.00	0.00	0.00	0.00	97.85
26	898	Loellingite	F24	0.04	0.00	0.14	40.78	0.00	0.35	0.23	0.12	0.05	0.06	0.46	42.25
26	896	Chalcopyrite	F22	0.03	0.00	0.07	41.65	0.00	0.01	0.12	0.05	0.06	0.00	0.32	42.30
26	900	Rutile	F26	0.06	0.00	0.04	0.63	0.00	0.00	0.00	0.00	0.01	100.25	0.01	100.99
26	897	Spinel	F23	66.47	0.00	0.03	6.53	0.00	24.19	0.05	0.00	0.00	0.00	0.00	97.26
26	899	Rutile	F25	0.02	0.00	0.08	0.55	0.00	0.00	0.00	0.00	0.02	100.85	0.01	101.53
26	485	Cr-diopside	C125	1.51	23.04	0.62	3.64	0.00	16.19	0.13	0.60	53.90	0.08	0.00	99.71
27	487	Cr-pyroxene	C127	21.74	4.95	2.11	8.47	0.00	20.21	0.45	0.00	41.80	0.02	0.00	99.75
27	903	Cr-rutile	F29	0.02	0.00	0.91	0.04	0.00	0.00	0.00	0.00	0.00	99.16	0.01	100.14
27	56	Mg-ilmenite	A56	0.31	0.00	2.84	27.62	0.00	14.50	0.25	0.02	0.00	55.36	0.00	100.90
27	490	Cr-diopside	C130	1.50	23.18	0.55	3.78	0.00	16.02	0.13	0.54	53.75	0.04	0.00	99.48
27	55	Mg-ilmenite	A55	0.06	0.00	2.73	36.60	0.00	9.50	0.35	0.01	0.00	49.97	0.00	99.22
27	905	Spinel	F31	67.45	0.00	0.00	6.40	0.00	24.22	0.04	0.00	0.00	0.00	0.00	98.11
27	486	Cr-pyroxene	C126	20.14	4.89	4.01	7.11	0.00	21.15	0.38	0.03	41.89	0.18	0.00	99.78
27	906	Kyanite	F32	57.69	0.00	0.00	0.52	0.00	0.96	0.00	0.00	30.51	0.09	0.00	89.77
27	51	Garnet	A51	22.06	6.18	0.00	19.75	0.00	11.75	0.12	0.02	39.74	0.08	0.00	99.70
27	901	Rutile	F27	0.05	0.00	0.07	0.61	0.00	0.00	0.00	0.01	0.00	99.23	0.00	99.97
27	52	Mg-ilmenite	A52	0.35	0.00	2.55	30.22	0.00	12.59	0.24	0.04	0.00	54.20	0.00	100.19
27	493	Cr-spinel	C133	15.31	0.01	51.66	19.89	0.02	12.24	0.41	0.00	0.08	0.31	0.20	100.13
27	491	Cr-spinel	C131	8.12	0.03	37.89	36.07	0.03	11.34	0.47	0.00	0.05	4.69	0.17	98.86
27	53	Mg-ilmenite	A53	0.10	0.01	2.33	32.64	0.00	11.47	0.31	0.01	0.00	52.76	0.00	99.63
27	489	E-garnet	C129	22.05	8.21	0.06	18.57	0.00	10.53	0.44	0.00	40.14	0.18	0.00	100.19
27	492	Cr-spinel	C132	13.85	0.04	42.47	34.67	0.02	5.97	0.54	0.00	0.00	0.24	0.93	98.73
27	904	Rutile	F30	0.06	0.00	0.04	0.30	0.00	0.00	0.00	0.00	0.00	100.65	0.03	101.07
27	57	Cr-spinel	A57	7.20	0.02	52.85	21.86	0.03	13.09	0.37	0.02	0.10	2.39	0.20	98.13
27	54	Mg-ilmenite	A54	0.04	0.00	2.67	35.52	0.00	9.92	0.36	0.02	0.00	50.54	0.00	99.08
27	488	Almandite	C128	21.06	6.36	0.04	26.85	0.01	6.30	0.75	0.00	38.69	0.08	0.04	100.17
27	902	Rutile	F28	0.02	0.00	0.52	0.38	0.00	0.00	0.01	0.00	0.01	99.95	0.02	100.90

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
28	909	Rutile	F35	0.02	0.00	0.04	0.42	0.00	0.00	0.00	0.00	0.01	100.79	0.02	101.30
28	907	Epidote	F33	22.70	23.27	0.01	11.83	0.00	0.03	0.13	0.00	38.28	0.01	0.03	96.28
28	908	Rutile	F34	0.03	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.01	100.58	0.01	100.82
28	494	Cr-diopside	C134	1.24	22.69	0.65	4.15	0.00	15.43	0.11	0.53	53.98	0.02	0.00	98.82
29	916	Spinel	F42	67.76	0.00	0.02	4.12	0.00	25.25	0.24	0.00	0.00	0.00	0.00	97.39
29	915	Rutile	F41	0.02	0.00	0.16	0.14	0.00	0.00	0.00	0.00	0.00	100.79	0.01	101.12
29	912	Rutile	F38	0.01	0.00	0.05	0.32	0.00	0.00	0.00	0.00	0.00	100.91	0.00	101.28
29	917	Spinel	F43	68.01	0.00	0.02	3.25	0.00	25.89	0.03	0.00	0.00	0.00	0.00	97.19
29	913	Rutile	F39	0.01	0.00	0.26	0.62	0.00	0.00	0.00	0.01	0.00	99.47	0.00	100.37
29	910	Mn-epidote	F36	25.82	22.62	0.02	7.71	0.00	0.02	1.36	0.00	39.58	0.08	0.00	97.23
29	914	Rutile	F40	0.02	0.00	0.11	0.37	0.00	0.00	0.00	0.00	0.00	100.75	0.01	101.26
29	911	Mn-epidote	F37	25.03	23.68	0.01	7.99	0.00	0.07	1.75	0.00	39.47	0.01	0.00	98.02
30	59	Mg-ilmenite	A59	0.19	0.00	2.52	32.20	0.00	11.79	0.31	0.03	0.00	53.46	0.00	100.50
30	919	Spinel	F45	68.26	0.00	0.00	3.52	0.00	25.77	0.04	0.00	0.00	0.00	0.00	97.59
30	918	Rutile	F44	0.02	0.00	0.17	0.03	0.00	0.00	0.01	0.01	0.00	101.23	0.00	101.46
30	495	Cr-diopside	C135	1.00	23.27	0.73	3.67	0.00	16.30	0.17	0.52	54.11	0.02	0.00	99.78
30	58	Mg-ilmenite	A58	0.17	0.00	2.94	32.27	0.00	11.57	0.30	0.04	0.00	53.04	0.00	100.33
31	925	Spinel	F51	67.86	0.00	0.00	3.46	0.00	25.73	0.06	0.00	0.00	0.00	0.00	97.11
31	920	Chalcopyrite	F46	0.02	0.00	0.09	40.72	0.00	0.02	0.12	0.03	0.04	0.00	0.27	41.31
31	924	Spinel	F50	66.53	0.00	0.05	6.24	0.00	23.68	0.33	0.00	0.00	0.00	0.06	96.89
31	497	Cr-diopside	C137	0.89	23.27	0.79	3.63	0.00	15.81	0.11	0.49	53.59	0.09	0.00	98.67
31	922	Chalcopyrite	F48	0.03	0.00	0.09	41.64	0.00	0.03	0.11	0.03	0.03	0.00	0.29	42.25
31	496	Cr-pyroxene	C136	17.70	5.84	6.80	7.25	0.00	19.99	0.44	0.02	41.14	0.19	0.00	99.37
31	923	Spinel	F49	66.53	0.00	0.06	6.87	0.00	23.49	0.14	0.01	0.00	0.00	0.17	97.27
31	921	Chalcopyrite	F47	0.04	0.00	0.05	57.03	0.00	0.03	0.08	0.03	0.05	0.00	0.11	57.41
32	929	Spinel	F55	67.75	0.00	0.00	3.71	0.00	25.50	0.09	0.01	0.00	0.00	0.04	97.10
32	61	Mg-ilmenite	A61	0.18	0.00	2.98	32.44	0.01	11.58	0.34	0.01	0.02	53.04	0.00	100.60
32	928	Spinel	F54	67.72	0.00	0.00	4.33	0.00	25.21	0.02	0.00	0.00	0.00	0.00	97.28
32	927	Spinel	F53	65.90	0.00	0.02	9.69	0.00	21.49	0.45	0.01	0.00	0.00	0.00	97.56
32	926	Diopside	F52	3.01	25.04	0.00	5.49	0.00	14.35	0.44	0.01	52.21	0.04	0.06	100.64
32	498	Cr-pyroxene	C138	21.74	5.02	2.00	9.92	0.00	19.21	0.49	0.00	41.62	0.10	0.00	100.08
32	60	Mg-ilmenite	A60	0.01	0.00	3.49	31.33	0.00	12.22	0.42	0.02	0.00	52.94	0.00	100.43
33	499	Cr-diopside	C139	1.07	23.64	0.89	2.91	0.01	16.62	0.11	0.42	53.90	0.10	0.00	99.66
33	930	Chalcopyrite	F56	0.03	0.00	0.09	41.17	0.00	0.03	0.12	0.03	0.04	0.00	0.28	41.80
33	932	Spinel	F58	68.34	0.00	0.04	4.39	0.00	25.22	0.33	0.00	0.00	0.00	0.13	98.45
33	931	Spinel	F57	67.96	0.00	0.00	3.79	0.00	25.86	0.02	0.01	0.00	0.00	0.00	97.63
34	934	Chalcopyrite	F60	0.04	0.00	0.08	40.54	0.00	0.00	0.16	0.00	0.14	0.09	0.44	41.49
34	933	Chalcopyrite	F59	0.03	0.01	0.10	40.86	0.00	0.00	0.17	0.00	0.13	0.11	0.44	41.84
36	500	Cr-pyroxene	C140	21.85	5.64	2.03	8.34	0.00	19.48	0.58	0.01	41.97	0.01	0.00	99.90
36	937	Rutile	F63	0.03	0.00	0.08	0.37	0.00	0.00	0.05	0.00	0.07	101.18	0.16	101.92
36	936	Spinel	F62	67.60	0.00	0.01	4.89	0.00	25.65	0.08	0.00	0.00	0.00	0.11	98.33
36	935	Gahnite	F61	59.02	0.00	0.08	6.29	0.00	3.58	0.61	0.99	0.01	0.00	32.36	102.94
37	939	Sphene	F65	1.43	27.60	0.00	1.58	0.00	0.02	0.11	0.01	29.83	36.26	0.00	96.83
37	938	Spinel	F64	68.44	0.00	0.09	5.32	0.00	25.76	0.08	0.00	0.00	0.03	0.73	100.46
39	942	Rutile	F68	0.04	0.00	0.20	0.34	0.00	0.00	0.04	0.00	0.06	100.28	0.14	101.11
39	940	Chalcopyrite	F66	0.03	0.00	0.10	41.09	0.00	0.00	0.15	0.00	0.15	0.09	0.44	42.06
39	941	Rutile	F67	0.04	0.00	0.13	0.27	0.00	0.00	0.04	0.00	0.06	100.56	0.15	101.24
40	944	Chalcopyrite	F70	0.03	0.00	0.11	41.04	0.00	0.00	0.16	0.00	0.12	0.09	0.51	42.06
40	501	Cr-diopside	C141	0.94	22.01	2.53	2.71	0.00	15.49	0.05	1.22	53.92	0.06	0.00	98.93
40	502	Cr-diopside	C142	1.21	23.12	0.64	3.78	0.00	16.21	0.13	0.50	54.03	0.12	0.00	99.73

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_ %	CaO_ %	Cr2O3_ %	FeO_ %	K2O_ %	MgO_ %	MnO_ %	Na2O_ %	SiO2_ %	TiO2_ %	ZnO_ %	Total_ %
40	943	Chalcopyrite	F69	0.03	0.00	0.11	40.67	0.00	0.00	0.15	0.00	0.12	0.10	0.41	41.59
40	946	Spinel	F72	68.26	0.00	0.03	4.69	0.00	25.11	0.34	0.00	0.00	0.01	0.17	98.60
40	945	Rutile	F71	0.06	0.00	0.09	0.39	0.00	0.00	0.00	0.00	0.01	101.37	0.03	101.95
41	951	Spinel	F77	67.76	0.00	0.03	5.64	0.00	24.48	0.16	0.00	0.01	0.01	0.38	98.47
41	952	Rutile	F78	0.00	0.00	0.37	0.20	0.00	0.00	0.00	0.00	0.00	100.20	0.00	100.77
41	62	Mg-ilmenite	A62	0.04	0.00	3.01	36.10	0.00	9.65	0.46	0.01	0.02	50.22	0.00	99.52
41	950	Spinel	F76	68.16	0.00	0.04	4.32	0.00	25.36	0.20	0.00	0.00	0.01	0.21	98.31
41	63	Mg-ilmenite	A63	0.07	0.00	4.06	35.39	0.01	9.18	0.38	0.01	0.01	49.25	0.00	98.37
41	953	Rutile	F79	0.01	0.00	0.05	0.20	0.00	0.00	0.00	0.00	0.00	101.23	0.00	101.50
41	949	Spinel	F75	67.08	0.00	0.02	6.48	0.00	24.63	0.19	0.00	0.00	0.05	0.06	98.50
41	948	Gahnite	F74	58.32	0.00	0.00	9.64	0.00	1.57	0.34	0.98	0.00	0.00	31.79	102.65
41	947	Chalcopyrite	F73	0.03	0.00	0.09	40.80	0.00	0.00	0.14	0.00	0.12	0.09	0.46	41.72
42	961	Sapphirine	F87	63.69	0.00	0.01	3.41	0.00	18.55	0.10	0.00	12.49	0.02	0.05	98.32
42	955	Rutile	F81	0.02	0.00	0.08	0.24	0.00	0.00	0.00	0.00	0.00	101.03	0.00	101.37
42	963	Spinel	F89	68.63	0.00	0.06	1.45	0.00	27.20	0.03	0.01	0.02	0.02	0.32	97.74
42	954	Rutile	F80	0.01	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	101.30	0.00	101.41
42	64	Mg-ilmenite	A64	0.11	0.00	4.80	28.03	0.00	13.11	0.37	0.01	0.01	53.58	0.00	100.02
42	962	Spinel	F88	67.01	0.00	0.07	5.85	0.00	23.78	0.33	0.00	0.01	0.03	0.30	97.36
42	960	Spinel	F86	67.78	0.00	0.03	5.11	0.00	24.86	0.08	0.01	0.00	0.02	0.29	98.17
42	959	Fe-cpx	F85	2.58	24.76	0.02	7.15	0.00	13.12	0.27	0.18	52.23	0.07	0.05	100.42
42	957	Rutile	F83	0.03	0.00	0.07	0.16	0.00	0.00	0.00	0.00	0.00	100.86	0.00	101.12
42	956	Rutile	F82	0.03	0.00	0.34	0.89	0.00	0.00	0.00	0.00	0.00	98.35	0.02	99.62
42	958	Spinel	F84	67.12	0.00	0.03	5.46	0.01	24.97	0.42	0.00	0.00	0.02	0.09	98.12
43	965	Spinel	F91	67.50	0.00	0.05	4.16	0.00	26.05	0.10	0.02	0.01	0.04	0.59	98.52
43	964	Rutile	F90	0.01	0.00	0.01	0.39	0.00	0.00	0.00	0.00	0.01	100.54	0.00	100.96
44	966	Spinel	F92	70.61	0.00	0.01	4.13	0.00	26.37	0.00	0.00	0.00	0.00	0.00	101.11
44	503	Diopside	C143	1.81	23.27	0.48	4.15	0.00	15.83	0.15	0.42	53.49	0.06	0.00	99.68
45	967	Chalcopyrite	F93	0.02	0.00	0.07	41.10	0.00	0.01	0.11	0.02	0.04	0.00	0.30	41.67
45	504	Diopside	C144	0.93	23.70	0.49	4.37	0.00	15.20	0.17	0.80	54.50	0.03	0.00	100.19
45	968	Chalcopyrite	F94	0.03	0.00	0.07	41.08	0.00	0.01	0.11	0.02	0.03	0.00	0.26	41.61
45	969	Spinel	F95	67.89	0.00	0.05	3.81	0.00	25.84	0.15	0.01	0.00	0.00	0.11	97.87
47	971	Spinel	F97	66.67	0.00	0.01	7.56	0.00	23.23	0.16	0.01	0.00	0.00	0.24	97.88
47	970	Mn-epidote	F96	24.18	23.62	0.00	10.16	0.00	0.03	0.76	0.01	39.09	0.02	0.00	97.87
47	974	Spinel	F100	68.65	0.00	0.04	1.87	0.00	27.01	0.04	0.00	0.00	0.01	0.12	97.73
47	972	Spinel	F98	67.37	0.00	0.02	5.86	0.00	24.26	0.23	0.00	0.00	0.02	0.22	97.98
47	973	Spinel	F99	67.78	0.00	0.05	4.75	0.00	24.65	0.32	0.01	0.00	0.04	0.85	98.45
48	980	Spinel	F106	67.87	0.00	0.07	2.94	0.00	26.31	0.08	0.00	0.00	0.00	0.11	97.38
48	576	Spessartite	D53	20.78	2.89	0.06	16.33	0.02	0.54	22.28	0.02	37.26	0.10	0.07	100.34
48	976	Spinel	F102	65.78	0.00	0.07	6.60	0.00	24.66	0.12	0.00	0.00	0.03	0.29	97.54
48	983	Rutile	F109	0.01	0.00	0.08	0.56	0.00	0.00	0.05	0.00	0.05	100.39	0.15	101.29
48	977	Gahnite	F103	57.93	0.01	0.01	7.94	0.01	1.28	0.30	1.07	0.01	0.00	34.57	103.11
48	982	Spinel	F108	68.21	0.01	0.05	2.35	0.00	26.42	0.04	0.00	0.01	0.00	0.10	97.19
48	975	Chalcopyrite	F101	0.03	0.00	0.11	40.72	0.00	0.00	0.16	0.02	0.12	0.11	0.41	41.67
48	978	Sapphirine	F104	62.07	0.00	0.03	4.53	0.00	18.76	0.01	0.00	13.40	0.04	0.01	98.84
48	979	Spinel	F105	68.01	0.00	0.05	2.67	0.00	26.33	0.05	0.00	0.00	0.00	0.39	97.51
48	505	Cr-pyrope	C145	17.02	6.45	7.72	7.65	0.00	19.19	0.43	0.03	41.08	0.13	0.00	99.70
48	506	Cr-spinel	C146	15.89	0.02	53.03	15.23	0.02	14.33	0.44	0.00	0.00	0.30	0.16	99.42
48	981	Spinel	F107	67.80	0.00	0.01	3.68	0.01	25.95	0.04	0.00	0.00	0.02	0.24	97.75
49	989	Spinel	F115	67.78	0.00	0.03	4.77	0.00	24.67	0.18	0.01	0.00	0.02	1.02	98.49
49	986	Rutile	F112	0.03	0.00	0.09	0.42	0.00	0.00	0.00	0.01	0.00	101.30	0.02	101.87

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
49	508	Diopside	C148	1.03	24.19	0.21	3.84	0.00	15.77	0.14	0.51	54.38	0.04	0.00	100.10
49	987	Rutile	F113	0.03	0.00	0.15	0.20	0.00	0.00	0.06	0.00	0.05	101.39	0.12	102.01
49	985	Rutile	F111	0.02	0.00	0.43	0.43	0.00	0.00	0.06	0.00	0.05	100.10	0.11	101.19
49	988	Cr-rutile	F114	0.00	0.00	1.19	0.19	0.00	0.00	0.06	0.00	0.06	100.57	0.11	102.19
49	984	Rutile	F110	0.03	0.00	0.07	0.40	0.00	0.00	0.05	0.00	0.04	100.06	0.12	100.77
49	992	Spinel	F118	68.39	0.00	0.08	1.57	0.00	27.00	0.03	0.00	0.00	0.02	0.00	97.08
49	990	Spinel	F116	68.48	0.00	0.04	2.69	0.00	26.51	0.04	0.01	0.00	0.02	0.35	98.13
49	991	Spinel	F117	67.68	0.00	0.04	4.23	0.00	25.50	0.09	0.00	0.00	0.01	0.01	97.55
49	507	Diopside	C147	0.65	23.64	0.16	3.44	0.00	16.90	0.11	0.38	54.72	0.04	0.00	100.02
50	65	Cr-diopside	A65	1.64	23.35	0.64	2.96	0.00	16.37	0.04	0.53	53.54	0.00	0.00	99.07
51	509	Cr-pyroxene	C149	19.32	4.97	5.18	7.19	0.00	20.89	0.39	0.04	41.72	0.21	0.00	99.89
51	510	Diopside	C150	1.30	22.98	0.21	5.27	0.00	15.63	0.20	0.47	53.93	0.02	0.03	100.05
51	993	Rutile	F119	0.01	0.00	0.06	0.68	0.00	0.00	0.08	0.00	0.09	99.90	0.11	100.91
52	994	Chalcopyrite	F120	0.01	0.00	0.12	40.71	0.00	0.00	0.18	0.04	0.14	0.10	0.38	41.68
52	995	Spinel	F121	67.51	0.00	0.05	3.57	0.00	25.93	0.07	0.01	0.01	0.02	0.33	97.49
52	511	Cr-diopside	C151	1.16	24.31	0.65	4.56	0.00	14.77	0.20	0.50	53.81	0.03	0.00	100.00
53	996	Mn-epidote	F122	23.77	23.21	0.05	8.49	0.01	0.09	1.98	0.01	38.17	0.04	0.00	95.82
55	1047	Mn-spinel	F174	66.38	0.00	0.15	8.09	0.00	21.49	1.34	0.01	0.00	0.00	0.92	98.39
55	1005	Fe-cpx	F131	4.49	25.28	0.01	7.04	0.00	12.86	0.20	0.08	50.21	0.16	0.16	100.47
55	998	Fe-cpx	F124	5.88	24.89	0.00	8.32	0.00	11.80	0.39	0.09	48.59	0.26	0.06	100.29
55	1021	Fe-cpx	F147	3.12	24.55	0.09	8.09	0.00	12.18	0.62	0.19	50.93	0.25	0.03	100.06
55	1031	Mn-spinel	F158	67.05	0.00	0.03	6.67	0.00	23.22	1.05	0.01	0.00	0.01	0.08	98.12
55	578	Molybdenite	D55	0.21	0.07	0.18	0.37	0.04	0.09	0.22	0.10	0.20	0.12	0.52	2.12
55	1042	Fe-cpx	F169	0.88	24.10	0.00	11.82	0.00	9.49	1.77	0.14	51.99	0.03	0.15	100.36
55	1036	Mn-spinel	F163	67.18	0.00	0.01	8.62	0.00	22.35	0.88	0.00	0.00	0.00	0.13	99.16
55	1027	Mn-spinel	F153	66.38	0.00	0.00	9.40	0.00	21.71	0.83	0.00	0.00	0.00	0.14	98.47
55	1044	Mn-spinel	F171	65.59	0.00	0.11	9.45	0.00	20.98	1.38	0.00	0.00	0.00	0.17	97.68
55	1019	Fe-cpx	F145	1.22	24.29	0.01	6.77	0.01	14.08	0.60	0.19	53.30	0.03	0.08	100.58
55	1024	Fe-cpx	F150	1.23	22.78	0.10	13.41	0.01	9.46	1.46	0.41	51.74	0.09	0.08	100.74
55	579	Mn-spinel	D56	65.26	0.00	0.00	8.92	0.00	21.90	1.17	0.00	0.00	0.02	0.43	97.69
55	1013	Mn-spinel	F139	66.66	0.00	0.04	6.71	0.00	23.07	1.46	0.01	0.00	0.00	0.11	98.06
55	1001	Mn-spinel	F127	65.99	0.00	0.09	9.56	0.00	21.13	1.22	0.01	0.02	0.03	0.61	98.65
55	1034	Mn-spinel	F161	65.28	0.00	0.12	12.49	0.00	18.26	1.55	0.04	0.00	0.00	1.88	99.63
55	1016	Fe-cpx	F142	1.14	24.29	0.01	11.26	0.00	10.66	0.45	0.22	51.98	0.07	0.11	100.20
55	997	Fe-cpx	F123	1.80	24.13	0.01	11.90	0.00	10.11	0.49	0.25	51.32	0.11	0.09	100.22
55	1020	Fe-cpx	F146	3.04	24.68	0.02	6.65	0.00	13.07	0.67	0.27	51.69	0.25	0.08	100.42
55	1010	Mn-spinel	F136	66.11	0.00	0.38	4.88	0.00	24.39	1.56	0.01	0.02	0.01	0.39	97.75
55	1033	Zn-spinel	F160	65.73	0.00	0.50	8.76	0.00	19.66	1.47	0.06	0.00	0.00	3.19	99.37
55	999	Fe-cpx	F125	0.85	24.46	0.00	9.92	0.00	11.36	0.97	0.13	52.76	0.03	0.13	100.62
55	1043	Zn-spinel	F170	65.30	0.00	0.01	5.90	0.00	17.75	0.86	0.30	0.00	0.00	11.58	101.69
55	1022	Diopside	F148	5.63	25.10	0.03	5.79	0.00	12.91	0.63	0.04	49.20	0.19	0.07	99.61
55	1039	Fe-cpx	F166	2.54	24.70	0.02	8.18	0.00	12.38	0.74	0.12	51.40	0.06	0.05	100.17
55	1018	Fe-cpx	F144	2.22	24.46	0.01	8.22	0.00	12.49	0.90	0.09	51.37	0.09	0.08	99.93
55	1009	Fe-cpx	F135	1.07	24.61	0.02	8.77	0.00	12.48	0.78	0.07	52.55	0.00	0.03	100.37
55	1007	Fe-cpx	F133	0.96	24.29	0.00	11.75	0.00	10.22	1.08	0.13	52.15	0.02	0.07	100.66
55	1041	Mn-spinel	F168	65.93	0.00	0.02	10.18	0.00	21.11	1.29	0.01	0.00	0.01	0.64	99.18
55	1026	Diopside	F152	3.76	25.12	0.02	5.25	0.00	14.15	0.43	0.05	51.02	0.14	0.07	100.00
55	1035	Mn-spinel	F162	67.33	0.00	0.11	5.91	0.00	23.76	1.11	0.00	0.00	0.00	0.06	98.27
55	1011	Fe-cpx	F137	2.90	24.37	0.01	11.23	0.00	10.37	0.49	0.20	50.37	0.19	0.05	100.17
55	1003	Fe-cpx	F129	1.16	24.52	0.00	10.10	0.00	11.65	0.52	0.20	52.65	0.03	0.13	100.96

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
55	1014	Fe-cpx	F140	2.43	24.57	0.03	8.97	0.01	11.69	0.98	0.15	51.42	0.21	0.07	100.53
55	1046	Mn-spinel	F173	67.17	0.00	0.13	7.14	0.00	22.89	1.22	0.01	0.00	0.00	0.23	98.78
55	1004	Fe-cpx	F130	6.56	24.45	0.02	7.26	0.00	11.91	0.96	0.12	48.10	0.56	0.01	99.96
55	1030	Mn-spinel	F157	66.54	0.00	0.27	7.50	0.00	22.51	1.08	0.03	0.00	0.00	0.75	98.67
55	1038	Mn-spinel	F165	65.70	0.00	0.55	10.75	0.00	20.16	1.69	0.00	0.00	0.00	0.50	99.36
55	1029	Mn-spinel	F156	67.23	0.00	0.01	5.73	0.00	23.44	1.29	0.01	0.00	0.00	0.03	97.73
55	1023	Fe-cpx	F149	2.04	24.69	0.01	7.54	0.00	12.97	1.15	0.10	51.45	0.04	0.00	99.98
55	1006	Fe-cpx	F132	0.87	24.40	0.02	10.38	0.01	11.21	0.83	0.16	52.27	0.05	0.07	100.25
55	1017	Fe-cpx	F143	2.62	24.50	0.00	6.75	0.00	12.62	1.52	0.19	51.62	0.23	0.06	100.11
55	1008	Mn-spinel	F134	66.59	0.00	0.10	6.92	0.00	23.46	1.34	0.02	0.02	0.01	0.44	98.90
55	1025	Diopside	F151	2.16	25.10	0.00	5.31	0.00	14.20	0.86	0.09	52.69	0.09	0.04	100.54
55	1028	Mn-spinel	F155	67.72	0.00	0.26	3.26	0.00	25.53	1.16	0.00	0.00	0.00	0.00	97.92
55	577	Mn-epidote	D54	16.21	34.06	0.10	7.98	0.01	0.10	1.77	0.01	38.42	0.18	0.03	98.87
55	1015	Mn-spinel	F141	67.71	0.00	0.10	4.29	0.00	25.15	1.02	0.01	0.00	0.02	0.16	98.46
55	1045	Fe-cpx	F172	5.36	24.63	0.02	8.84	0.00	11.54	0.46	0.11	48.63	0.19	0.03	99.80
55	1012	Fe-cpx	F138	1.05	24.27	0.01	11.00	0.00	10.92	0.54	0.22	52.40	0.04	0.07	100.52
55	1002	Fe-cpx	F128	2.32	23.81	0.01	8.61	0.00	11.98	1.33	0.16	51.47	0.22	0.03	99.93
55	1000	Diopside	F126	1.27	24.29	0.02	6.03	0.00	14.43	0.65	0.26	53.46	0.04	0.05	100.50
55	1040	Mn-spinel	F167	66.68	0.00	0.11	6.64	0.00	23.25	1.15	0.00	0.00	0.02	0.08	97.91
55	1032	Diopside	F159	1.98	25.21	0.01	4.99	0.00	14.31	0.91	0.08	52.81	0.10	0.06	100.45
55	1037	Fe-cpx	F164	1.91	24.62	0.04	7.91	0.00	12.52	0.91	0.12	52.16	0.13	0.06	100.37
56	1050	Spinel	F177	66.75	0.00	0.04	6.05	0.00	24.93	0.09	0.00	0.00	0.00	0.14	97.98
56	514	Cr-spinel	C154	14.16	0.03	51.14	25.07	0.02	7.48	0.59	0.01	0.02	0.23	0.71	99.45
56	1049	Spinel	F176	66.19	0.00	0.24	9.49	0.00	22.36	0.01	0.00	0.00	0.00	0.11	98.41
56	513	Diopside	C153	0.55	24.69	0.35	3.20	0.00	16.31	0.11	0.41	54.81	0.02	0.00	100.45
56	512	Diopside	C152	0.59	24.00	0.34	4.16	0.00	16.03	0.16	0.40	54.33	0.05	0.00	100.07
56	1051	Spinel	F178	67.92	0.00	0.08	3.83	0.00	25.90	0.02	0.00	0.00	0.01	0.06	97.82
56	1048	Chalcopyrite	F175	0.03	0.00	0.10	41.16	0.00	0.02	0.13	0.01	0.05	0.08	0.41	41.99
57	1052	Spinel	F179	68.61	0.00	0.09	1.55	0.00	27.30	0.01	0.00	0.00	0.02	0.05	97.63
57	66	Mg-ilmenite	A66	0.37	0.00	4.81	28.87	0.01	13.16	0.29	0.02	0.04	52.48	0.00	100.05
58	515	Cr-pyrope	C155	20.23	4.67	3.72	7.62	0.00	21.14	0.42	0.05	41.78	0.32	0.00	99.94
58	1054	Spinel	F181	67.97	0.00	0.10	3.80	0.00	25.36	0.20	0.01	0.00	0.04	0.51	97.99
58	1055	Spinel	F182	68.67	0.00	0.06	2.88	0.00	26.36	0.06	0.00	0.00	0.01	0.14	98.18
58	1053	Kyanite	F180	57.61	0.01	0.00	0.38	0.00	1.07	0.00	0.01	31.29	0.06	0.03	90.45
59	1058	Spinel	F185	67.96	0.00	0.05	2.89	0.00	26.56	0.05	0.00	0.00	0.05	0.31	97.88
59	1059	Spinel	F186	66.74	0.00	0.05	7.28	0.00	24.03	0.02	0.00	0.00	0.04	0.03	98.19
59	1057	Epidote	F184	23.61	23.40	0.00	10.67	0.04	0.16	0.20	0.01	39.60	0.08	0.01	97.78
59	1060	Cr-grossularite	F187	17.55	36.54	5.54	0.25	0.00	0.21	0.39	0.01	39.41	0.25	0.03	100.16
59	1056	Chalcopyrite	F183	0.00	0.00	0.12	41.14	0.00	0.00	0.17	0.03	0.12	0.12	0.43	42.12
60	1061	Epidote	F188	26.78	22.01	0.00	7.58	0.01	0.01	0.13	0.00	39.13	0.03	0.03	95.73
61	1062	Chalcopyrite	F189	0.00	0.00	0.11	40.63	0.00	0.00	0.17	0.01	0.13	0.10	0.42	41.57
61	1063	Spinel	F190	68.05	0.00	0.04	3.45	0.00	26.32	0.05	0.00	0.00	0.01	0.02	97.94
62	516	Cr-diopside	C156	5.26	14.07	0.75	4.66	0.01	14.82	0.12	3.58	55.12	0.22	0.00	98.59
62	1065	Gahnite	F192	58.91	0.00	0.01	8.71	0.00	1.85	0.20	1.01	0.02	0.00	32.24	102.94
62	1064	Chalcopyrite	F191	0.01	0.00	0.11	41.33	0.00	0.00	0.17	0.03	0.12	0.10	0.44	42.31
62	1066	Spinel	F193	68.03	0.00	0.05	3.95	0.00	25.89	0.07	0.00	0.00	0.00	0.05	98.03
63	1067	Spinel	F194	67.61	0.00	0.06	3.88	0.00	26.04	0.07	0.00	0.00	0.03	0.18	97.86
64	582	Spinel	D59	68.30	0.00	0.05	1.91	0.00	26.74	0.02	0.00	0.01	0.00	0.24	97.29
64	1070	Spinel	F197	68.11	0.00	0.04	2.91	0.00	26.41	0.02	0.00	0.00	0.01	0.05	97.56
64	581	Spinel	D58	68.37	0.00	0.06	3.50	0.00	25.90	0.07	0.00	0.01	0.00	0.04	97.96

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_%	CaO_%	Cr2O3_%	FeO_%	K2O_%	MgO_%	MnO_%	Na2O_%	SiO2_%	TiO2_%	ZnO_%	Total_%
64	580	Chalcopyrite	D57	0.11	0.07	0.11	41.11	0.05	0.06	0.17	0.03	0.54	0.08	0.35	42.69
64	1069	Spinel	F196	68.60	0.00	0.06	2.86	0.00	26.65	0.04	0.00	0.00	0.02	0.24	98.47
64	1068	Spinel	F195	67.16	0.00	0.04	6.14	0.00	24.28	0.42	0.00	0.00	0.03	0.11	98.17
65	1071	Lost	F198	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
65	1072	Spinel	F199	70.09	0.00	0.09	3.95	0.00	26.97	0.06	0.00	0.00	0.02	0.08	101.25
65	584	Spinel	D61	68.50	0.00	0.02	1.82	0.00	27.17	0.03	0.00	0.00	0.04	0.14	97.72
65	583	Chalcopyrite	D60	0.00	0.00	0.01	40.80	0.00	0.00	0.00	0.01	0.00	0.00	0.00	40.82
65	1073	Spinel	F200	68.30	0.00	0.02	2.55	0.00	26.44	0.07	0.00	0.00	0.03	0.02	97.44
66	1078	Rutile	F205	0.01	0.00	0.08	0.42	0.01	0.00	0.00	0.01	0.00	100.07	0.03	100.63
66	1075	Spinel	F202	66.49	0.00	0.08	8.10	0.00	22.84	0.42	0.00	0.00	0.02	0.29	98.23
66	1076	Spinel	F203	67.65	0.00	0.06	5.20	0.00	24.31	0.14	0.01	0.00	0.02	0.50	97.89
66	1077	Spinel	F204	68.29	0.00	0.02	1.90	0.00	27.09	0.02	0.00	0.00	0.03	0.02	97.36
66	1074	Gahnite	F201	58.36	0.00	0.13	8.77	0.00	1.27	0.29	1.02	0.13	0.00	32.92	102.89
67	518	Cr-diopside	C158	0.24	22.84	2.04	1.85	0.00	16.48	0.07	1.14	55.12	0.12	0.00	99.89
67	1080	Rutile	F207	0.00	0.00	0.09	0.24	0.00	0.00	0.00	0.01	0.00	100.18	0.00	100.52
67	1079	Chalcopyrite	F206	0.00	0.00	0.01	40.81	0.01	0.00	0.00	0.00	0.00	0.00	0.00	40.84
67	1081	Spinel	F208	68.15	0.01	0.04	3.86	0.00	25.69	0.07	0.00	0.00	0.00	0.09	97.91
67	517	Zircon	C157	0.04	0.04	0.13	0.17	0.02	0.03	0.14	0.03	33.79	0.12	0.30	34.82
68	1082	Chalcopyrite	F209	0.01	0.00	0.00	40.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.91
68	1083	Chalcopyrite	F210	0.00	0.00	0.01	40.77	0.00	0.02	0.01	0.00	0.00	0.00	0.00	40.80
68	1088	Corundum	F215	96.58	0.00	0.11	0.78	0.00	0.03	0.01	0.00	0.00	0.05	0.00	97.56
68	1086	Gahnite	F213	59.52	0.01	0.00	6.63	0.01	3.30	0.23	0.95	0.00	0.01	32.40	103.04
68	1084	Chalcopyrite	F211	0.00	0.01	0.00	40.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.82
68	1085	Chalcopyrite	F212	0.00	0.00	0.00	40.15	0.00	0.00	0.00	0.01	0.01	0.00	0.00	40.17
68	1087	Spinel	F214	67.58	0.00	0.00	3.85	0.00	25.85	0.07	0.00	0.00	0.00	0.09	97.43
69	1091	Epidote	F218	25.00	23.74	0.01	8.61	0.00	0.12	0.14	0.00	38.44	0.20	0.00	96.25
69	1089	Chalcopyrite	F216	0.00	0.00	0.00	40.59	0.01	0.01	0.00	0.00	0.00	0.00	0.00	40.60
69	67	Cr-spinel	A67	12.72	0.00	54.13	17.70	0.00	14.09	0.31	0.00	0.07	0.32	0.00	99.33
69	1090	Chalcopyrite	F217	0.00	0.00	0.01	41.14	0.00	0.02	0.00	0.00	0.02	0.01	0.00	41.20
70	1092	Spinel	F219	68.49	0.01	0.06	2.15	0.00	26.54	0.10	0.00	0.00	0.02	0.05	97.43
70	68	Mg-ilmenite	A68	0.28	0.00	1.90	30.81	0.00	12.55	0.31	0.01	0.01	55.04	0.00	100.91
71	1094	Spinel	F221	67.75	0.00	0.02	3.43	0.00	26.18	0.04	0.00	0.00	0.03	0.11	97.55
71	1093	Gahnite	F220	61.38	0.00	0.05	6.27	0.00	7.83	0.19	0.78	0.01	0.00	25.91	102.40
71	519	Cr-diopside	C159	0.87	17.56	0.59	6.85	0.00	19.27	0.30	0.39	54.91	0.02	0.00	100.77
72	1095	Spinel	F222	68.29	0.00	0.02	2.81	0.01	26.27	0.07	0.00	0.00	0.02	0.22	97.72
73	1097	Spinel	F224	67.47	0.00	0.03	5.00	0.00	25.21	0.06	0.00	0.00	0.00	0.10	97.88
73	69	Mg-ilmenite	A69	0.12	0.00	2.33	31.64	0.00	11.80	0.38	0.00	0.01	53.40	0.00	99.68
73	1096	Chalcopyrite	F223	0.00	0.00	0.01	40.78	0.00	0.01	0.00	0.00	0.00	0.00	0.00	40.80
74	585	Chalcopyrite	D62	0.00	0.00	0.02	40.04	0.01	0.00	0.00	0.01	0.00	0.00	0.00	40.08
74	1098	Epidote	F225	22.44	22.86	0.00	12.02	0.00	0.02	0.19	0.00	38.27	0.02	0.01	95.83
74	70	Mg-ilmenite	A70	0.17	0.01	2.46	32.30	0.01	11.66	0.34	0.01	0.01	53.34	0.00	100.29
75	586	Almandite	D63	20.80	1.94	0.00	27.41	0.00	1.39	10.91	0.00	37.53	0.00	0.00	99.99
75	1103	Spinel	F230	67.14	0.00	0.03	5.25	0.00	24.64	0.12	0.00	0.00	0.01	0.20	97.39
75	1099	Rutile	F226	0.02	0.00	0.08	0.26	0.00	0.01	0.01	0.01	0.00	100.32	0.01	100.70
75	1101	Rutile	F228	0.02	0.00	0.10	0.00	0.00	0.00	0.01	0.00	0.00	98.25	0.04	98.42
75	1100	Rutile	F227	0.17	0.00	0.12	0.26	0.00	0.01	0.00	0.00	0.00	98.46	0.01	99.03
75	1102	Sapphirine	F229	61.39	0.00	0.01	6.27	0.00	17.19	0.17	0.01	12.66	0.01	0.06	97.76
76	521	Diopside	C161	0.80	22.87	0.37	4.61	0.00	16.22	0.19	0.46	53.82	0.04	0.00	99.39
76	1104	Gahnite	F231	58.99	0.01	0.01	7.97	0.00	3.02	0.28	0.95	0.00	0.00	31.64	102.87
76	1105	Spinel	F232	67.81	0.00	0.03	3.13	0.01	25.64	0.12	0.00	0.00	0.06	0.24	97.04

Appendix 5: Part 1: Mineral chemistry; data listing

Site	Grain	ID	Mount	Al2O3_ %	CaO_ %	Cr2O3_ %	FeO_ %	K2O_ %	MgO_ %	MnO_ %	Na2O_ %	SiO2_ %	TiO2_ %	ZnO_ %	Total_ %
76	520	Cr-diopside	C160	1.57	22.83	0.87	4.10	0.00	15.55	0.16	0.67	53.35	0.12	0.00	99.21
77	71	Mg-ilmenite	A71	0.09	0.00	2.68	32.66	0.01	11.62	0.38	0.00	0.02	52.44	0.00	99.90
77	522	Cr-diopside	C162	3.74	16.65	0.97	4.28	0.01	15.05	0.11	2.83	54.98	0.27	0.00	98.86
77	1107	Rutile	F234	0.03	0.00	0.04	0.29	0.00	0.00	0.01	0.01	0.00	99.62	0.00	100.01
77	1106	Chalcopyrite	F233	0.00	0.00	0.00	40.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.20
78	72	Mg-ilmenite	A72	0.07	0.00	4.04	35.12	0.00	9.88	0.38	0.01	0.00	49.89	0.00	99.40
78	523	Cr-diopside	C163	1.67	22.74	0.72	4.30	0.00	15.56	0.13	0.68	53.52	0.07	0.00	99.39
78	1108	Spinel	F235	67.80	0.00	0.05	3.26	0.00	26.08	0.04	0.00	0.00	0.03	0.05	97.31
78	1109	Garnet	F236	20.98	1.99	0.02	18.92	0.00	2.70	17.83	0.02	37.61	0.03	0.00	100.09

Appendix 5

Part 2: Indicator mineral counts; data listing

Appendix 5: Part 2: Indicator mineral counts; data listing

Site	Chalco	Corund	Cr-dio	Cr-gro	Cr-pyr	Cr-rut	Cr-spi	E-garn	Gahnit	Korner	Kyanit	Loelli	Mg-ilm	Mn-epi	Mn-spi	Molybd	Rutile	Sapphi	Spinel	Tourma	Zn-spi
1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0
2	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	1
3	34	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0
4	2	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0
5	0	0	7	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
6	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1
8	6	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
9	2	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0
10	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	32	1	2	0	0	1	0	0	1	0	6	2	0	0	0	0	0	0	9	0	0
13	10	6	79	0	0	1	1	0	0	0	0	1	0	0	0	0	6	3	1	0	0
14	0	2	44	0	0	0	1	0	0	0	0	0	0	3	0	0	2	1	2	0	0
15	0	2	87	0	0	1	3	0	0	0	1	0	0	0	0	0	18	2	1	0	0
16	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	1	0	0
17	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	5	0	0
18	1	0	54	0	0	0	0	0	1	2	0	0	0	0	0	0	13	0	3	0	0
19	0	9	48	0	1	0	0	0	0	0	0	0	0	0	0	0	22	1	0	1	0
20	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
22	1	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	2	0	0
23	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
25	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0
26	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	1	0	0
27	0	0	1	0	2	1	4	1	0	0	1	0	5	0	0	0	3	0	1	0	0
28	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4	0	2	0	0
30	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	1	0	0
31	3	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
32	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	3	0	0
33	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
34	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
40	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
41	1	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	2	0	3	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	1	4	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
45	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	0	0
48	1	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	1	1	5	0	0
49	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0
50	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

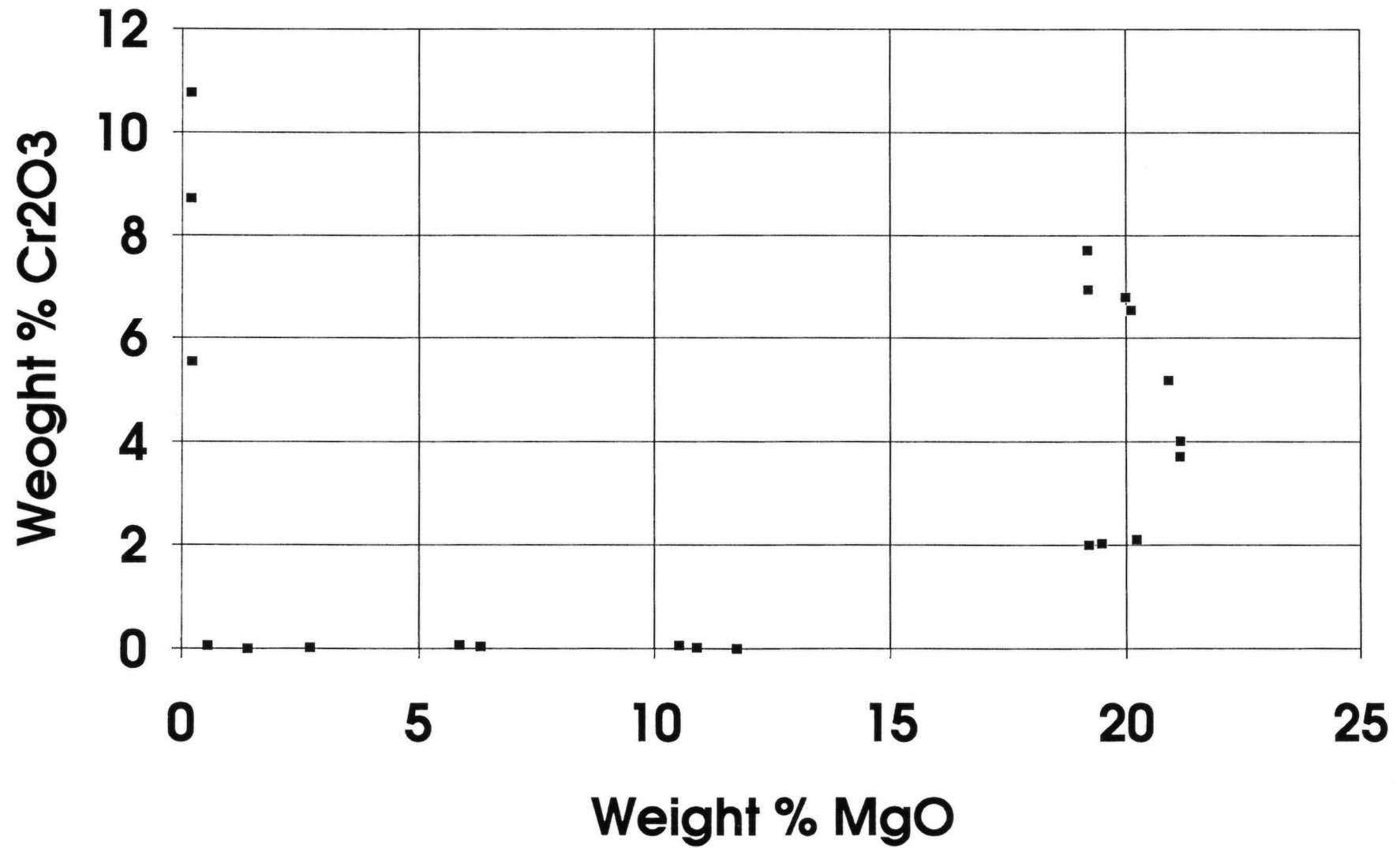
Appendix 5: Part 2: Indicator mineral counts; data listing

Site	Chalco	Corund	Cr-dio	Cr-gro	Cr-pyr	Cr-rut	Cr-spi	E-garn	Gahnit	Korner	Kyanit	Loelli	Mg-ilm	Mn-epi	Mn-spi	Molybd	Rutile	Sapphi	Spinel	Tourma	Zn-spi
51	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
52	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0	1	20	1	0	0	0	0	2
56	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
58	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
59	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
62	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
64	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
65	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
66	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	3	0	0
67	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
68	4	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
69	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
71	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
73	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
74	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	0	0
76	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
77	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
78	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0

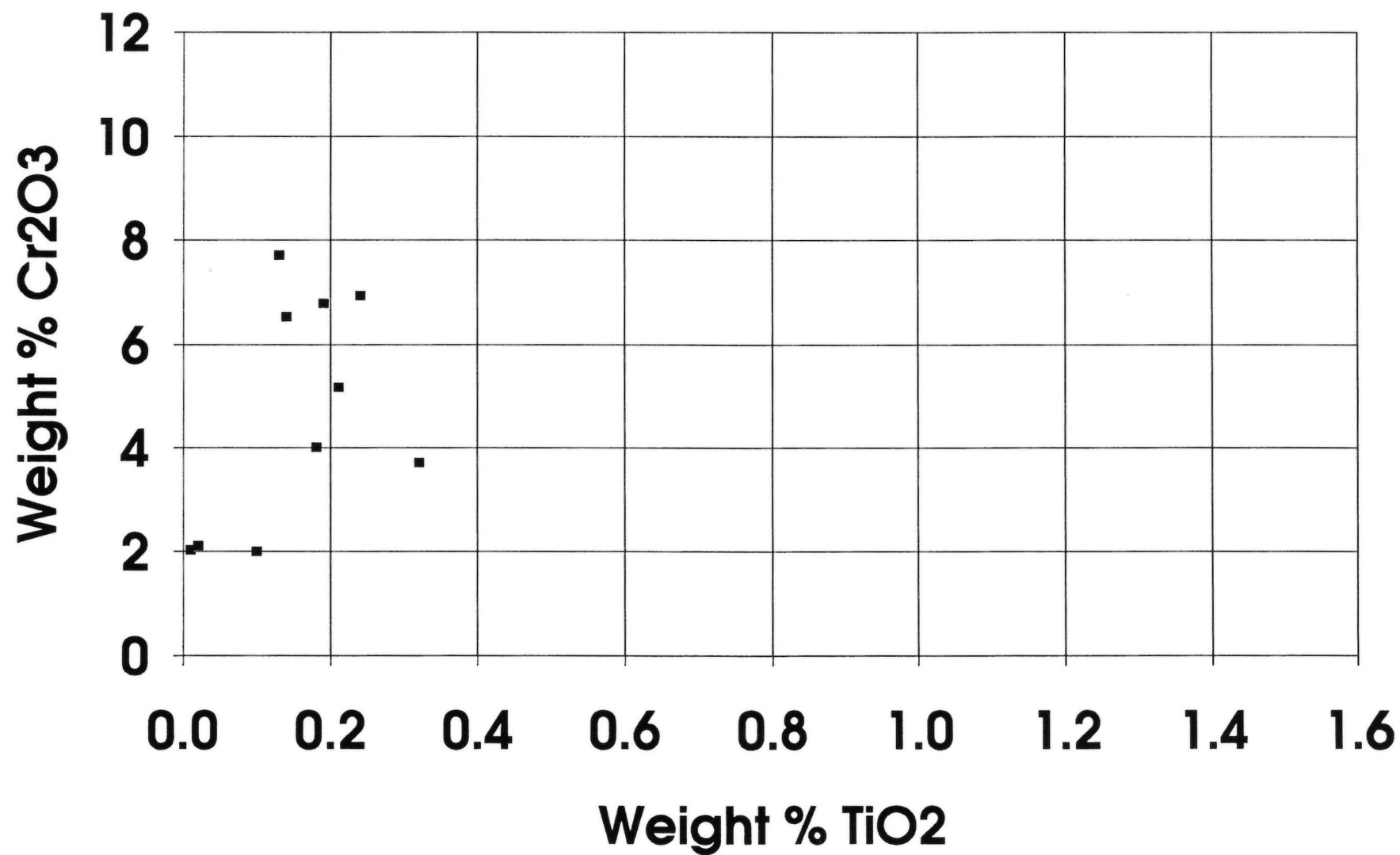
Appendix 5

Part 3: Scatterplots for selected mineral chemistry data

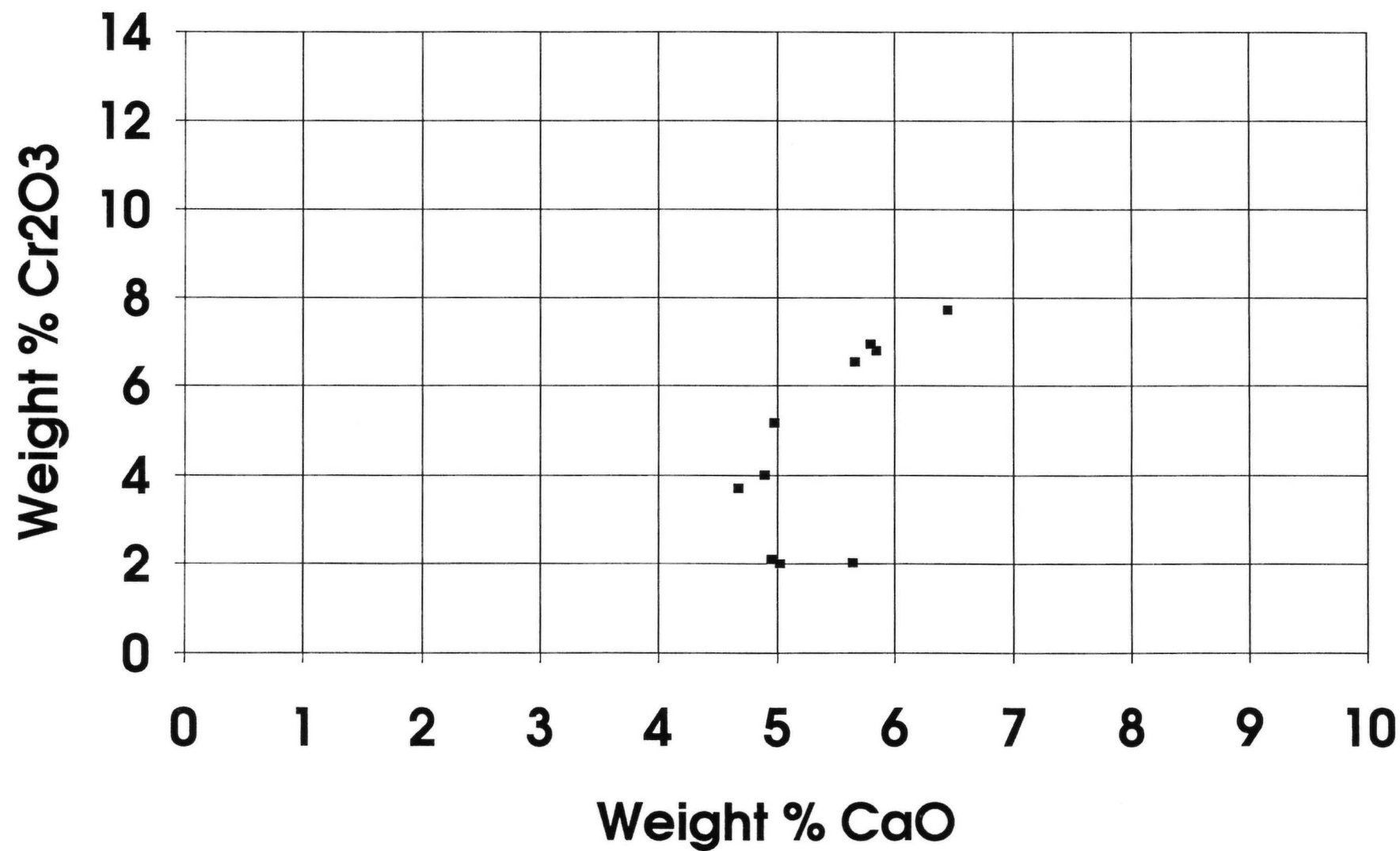
NE Manitoba; Garnet; n = 21



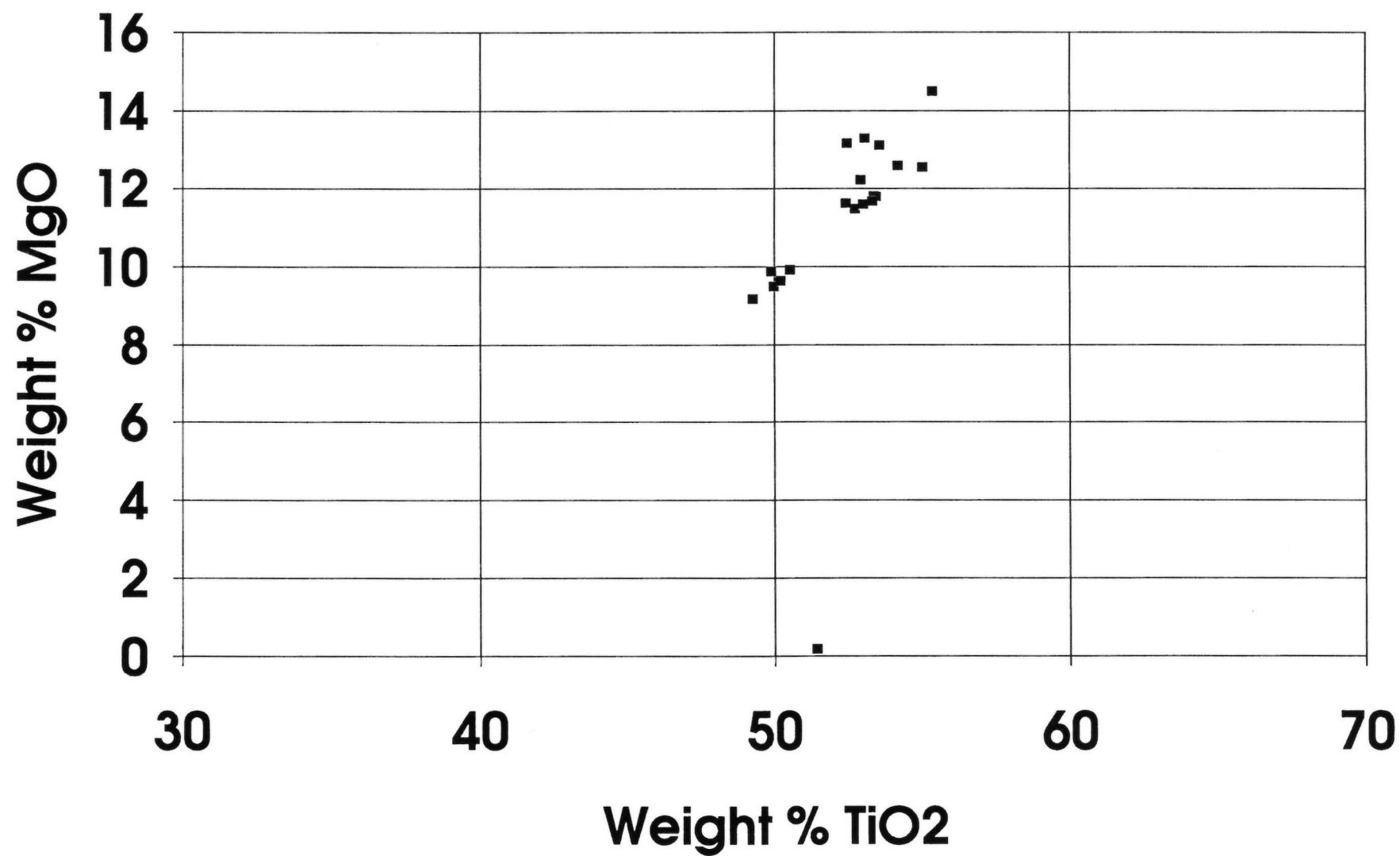
NE Manitoba; Cr-pyrope; n = 10



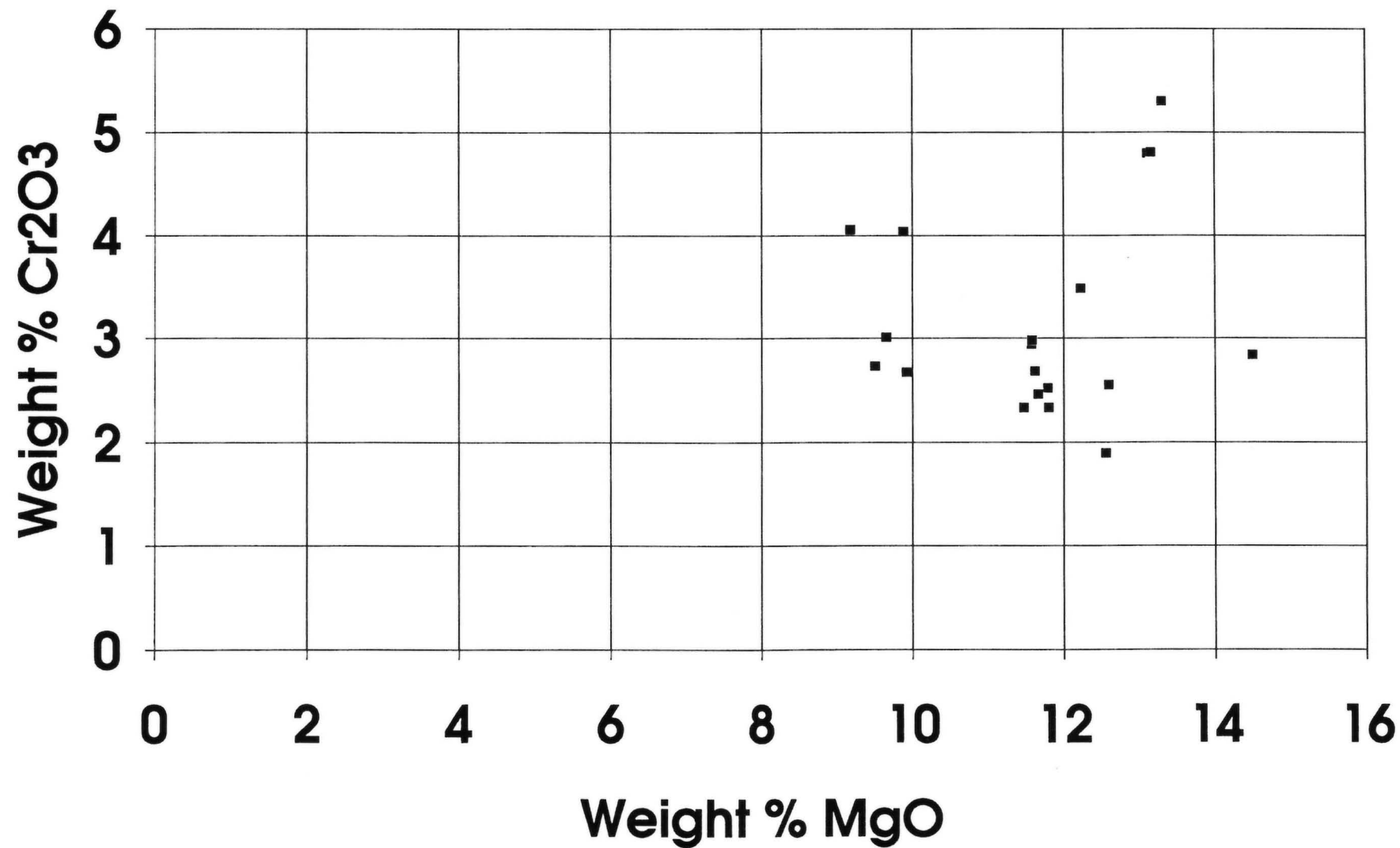
NE Manitoba; Cr-pyrope; n = 10



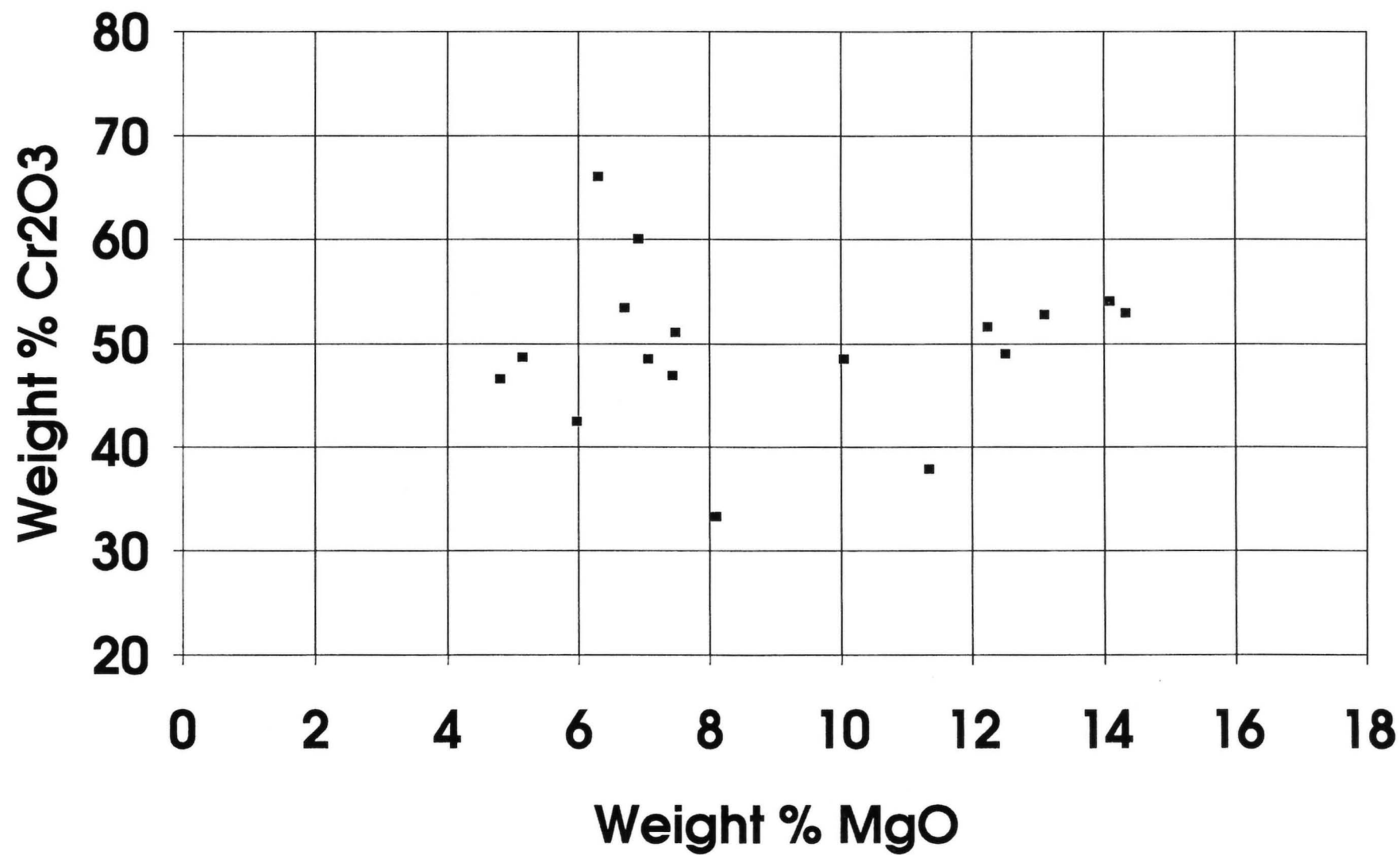
NE Manitoba; Ilmenite; n = 20



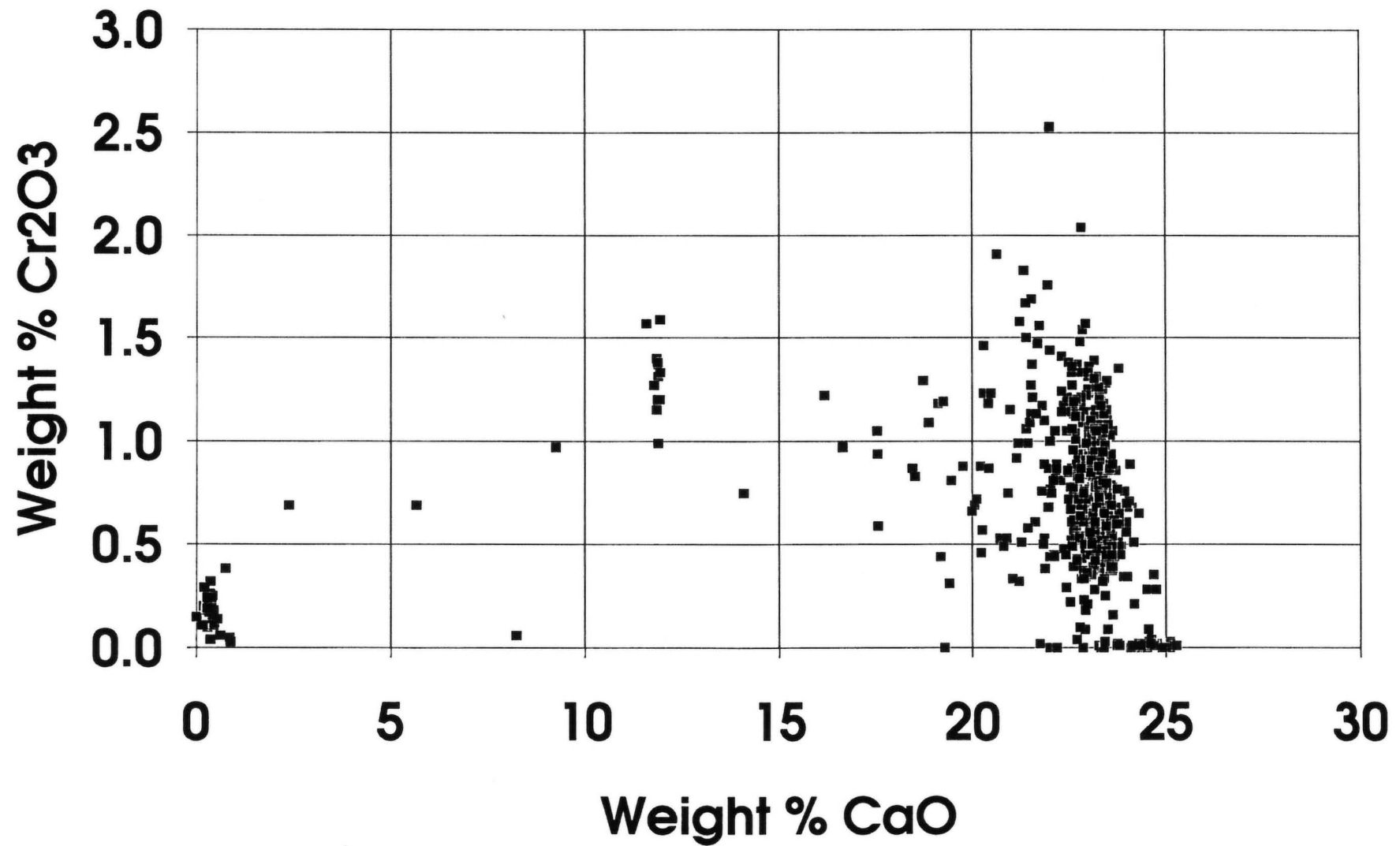
NE Manitoba; Mg-ilmenite; n = 19



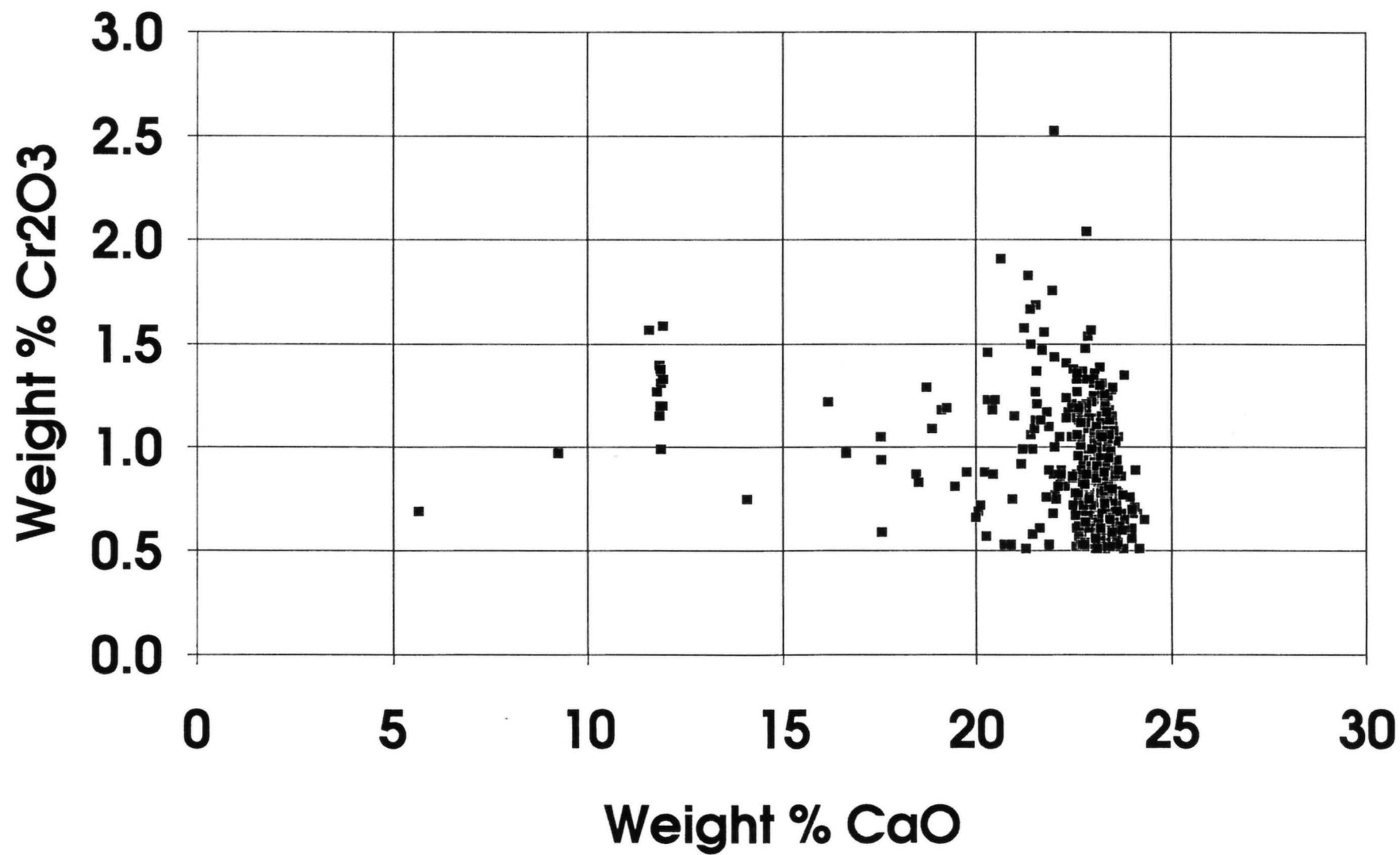
NE Manitoba; Cr-spinel; n = 17



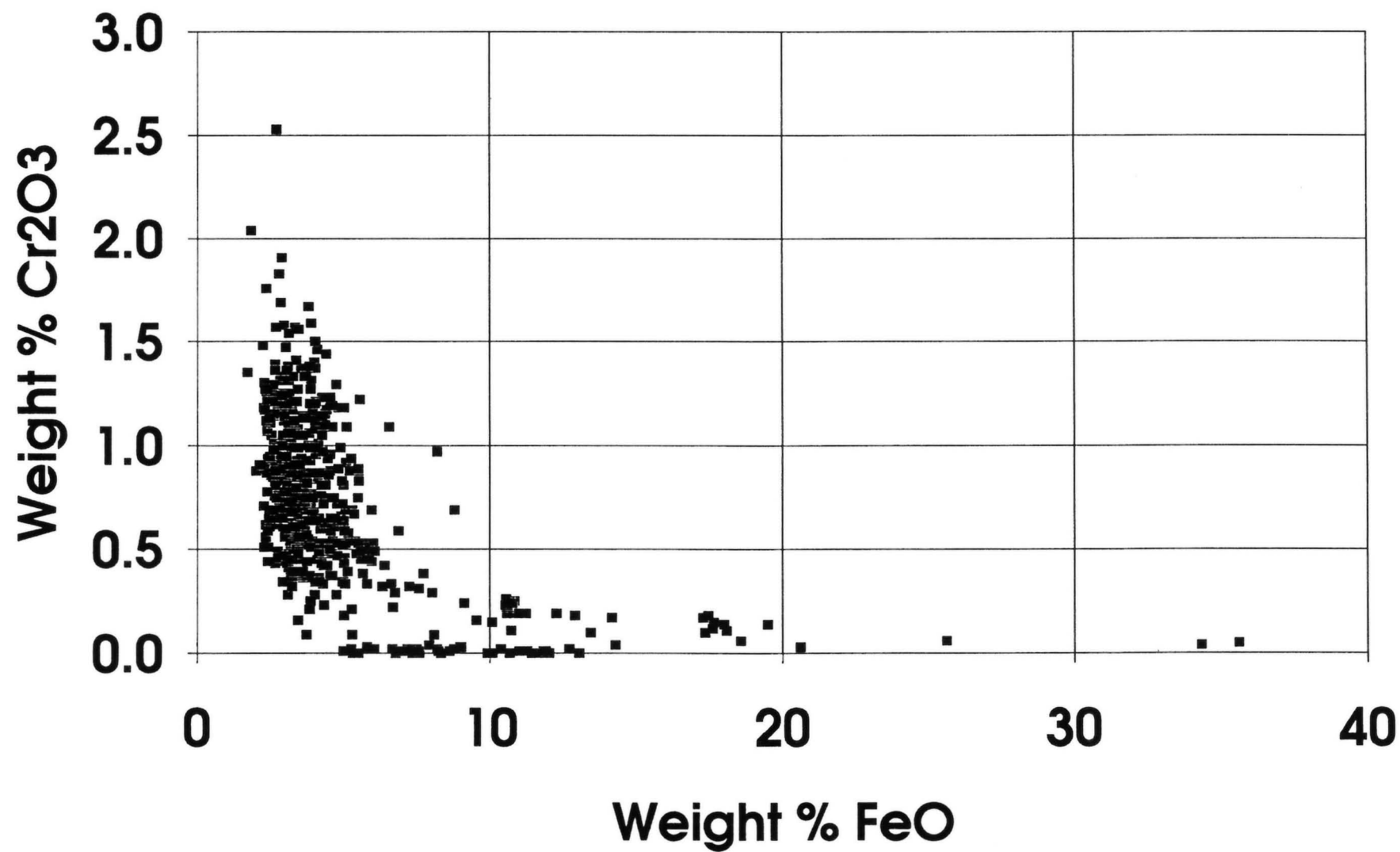
NE Manitoba; Pyroxene; n = 546



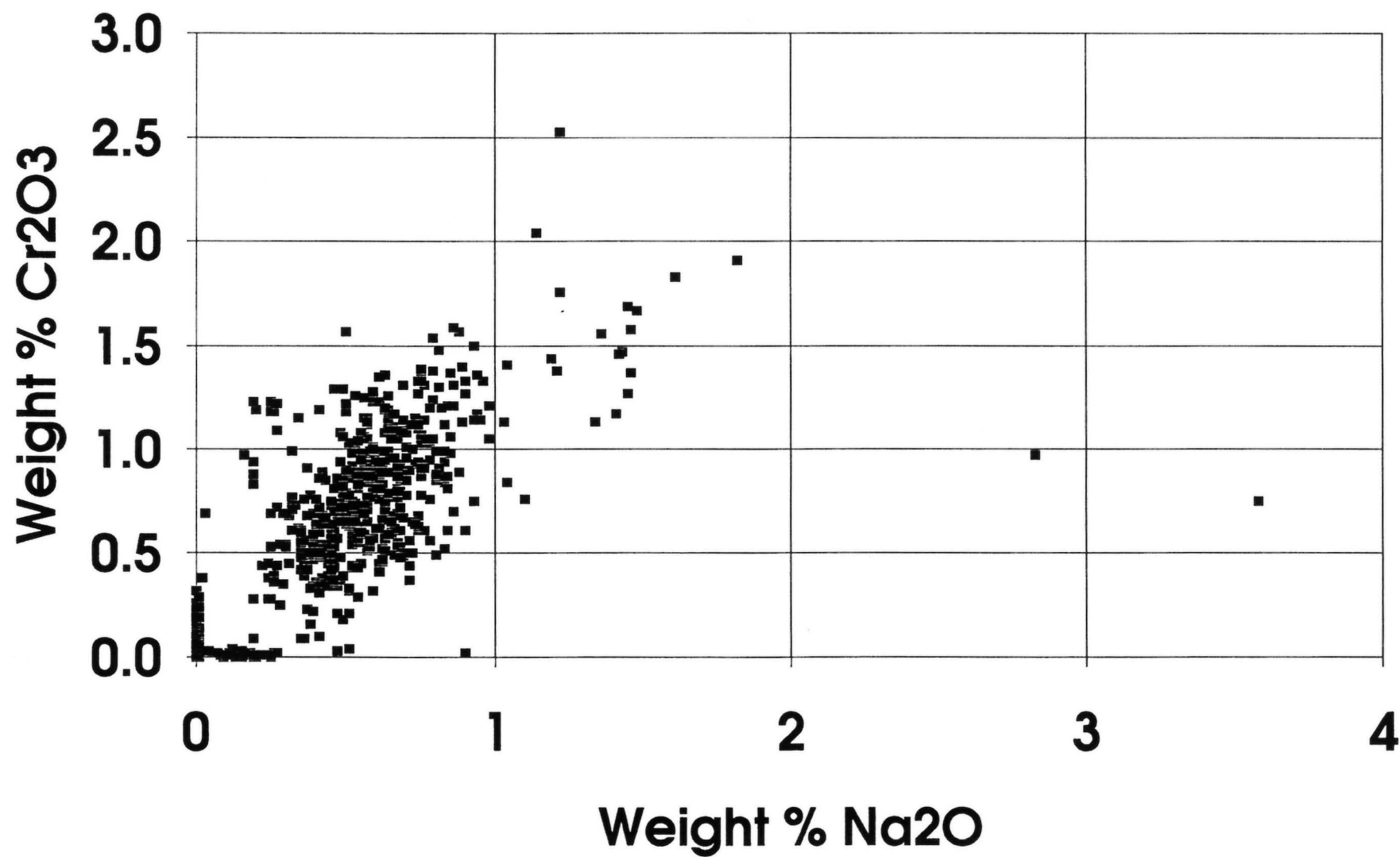
NE Manitoba; Cr-diopside; n = 385



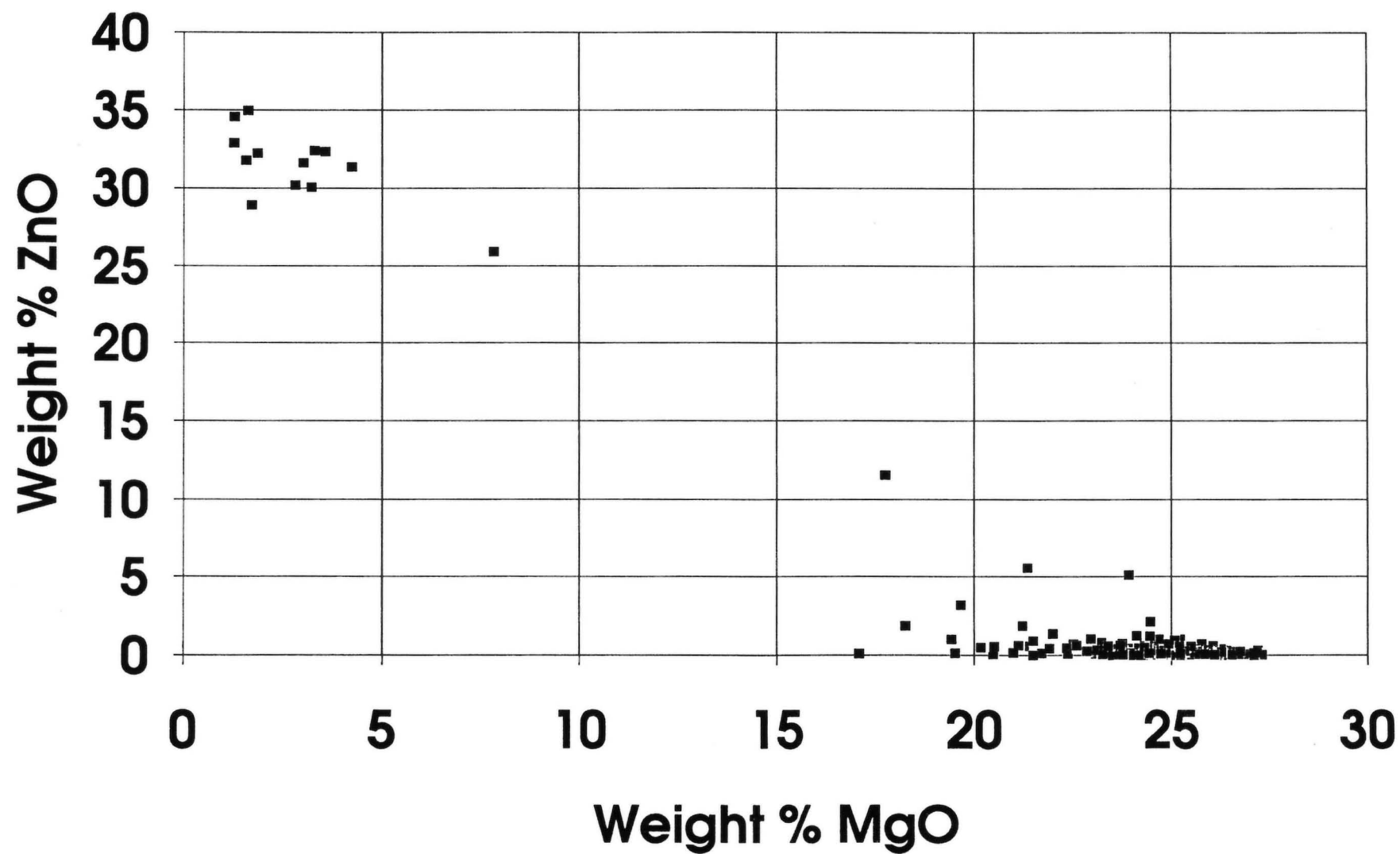
NE Manitoba; Pyroxene; n = 546



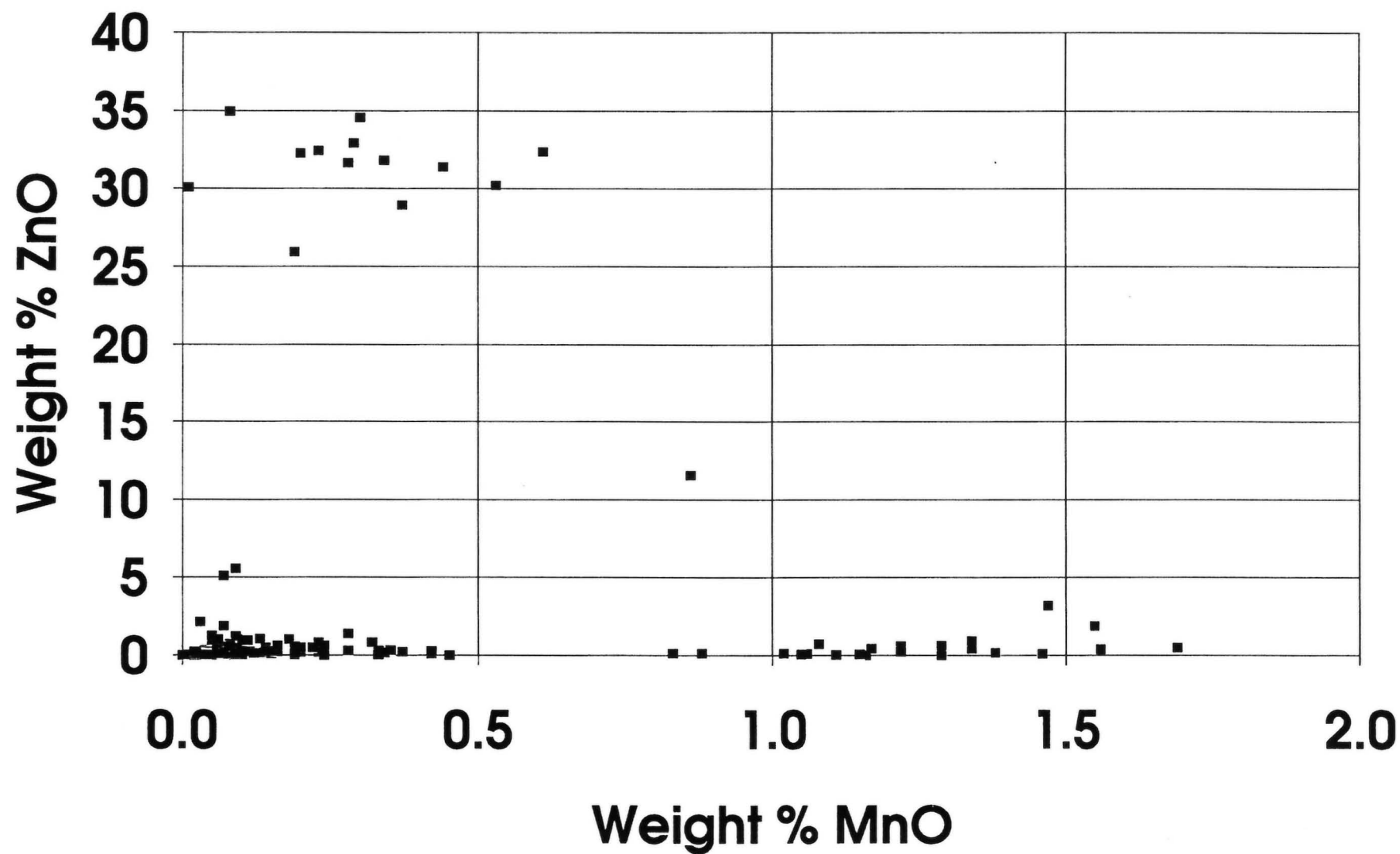
NE Manitoba; Pyroxene; n = 546



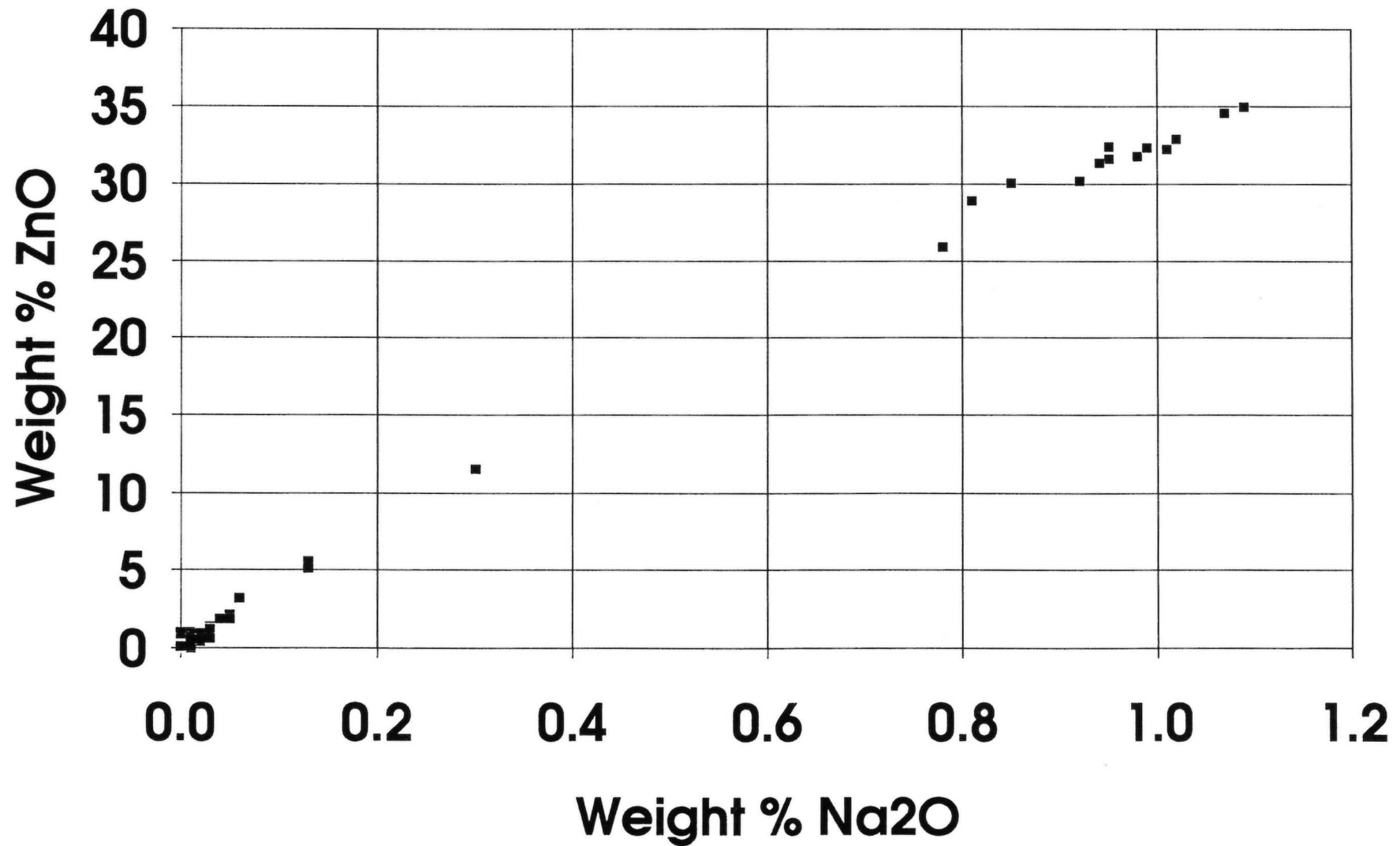
NE Manitoba; Spinel <-> Gahnite; n = 184



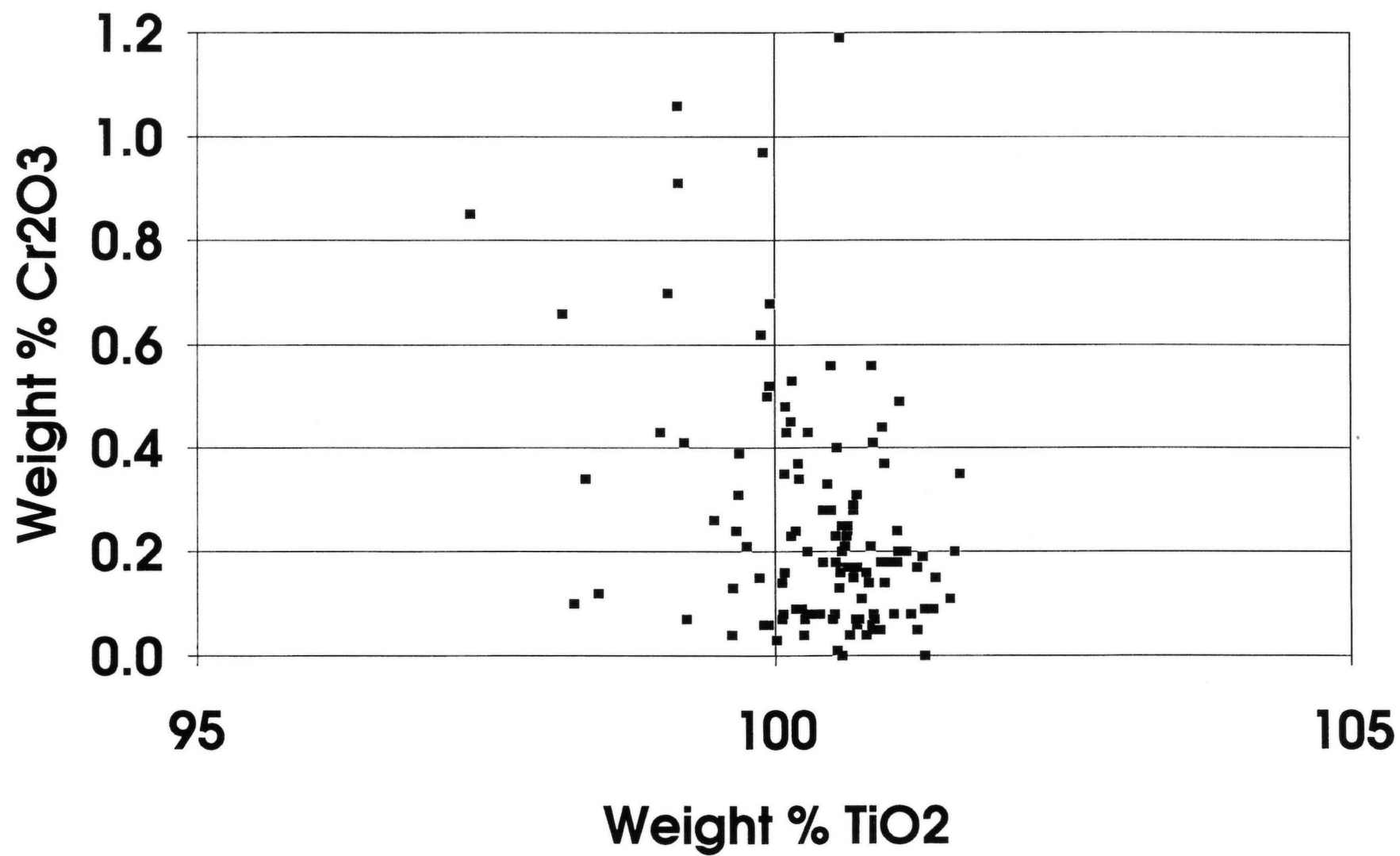
NE Manitoba; Spinel <-> Gahnite; n = 184



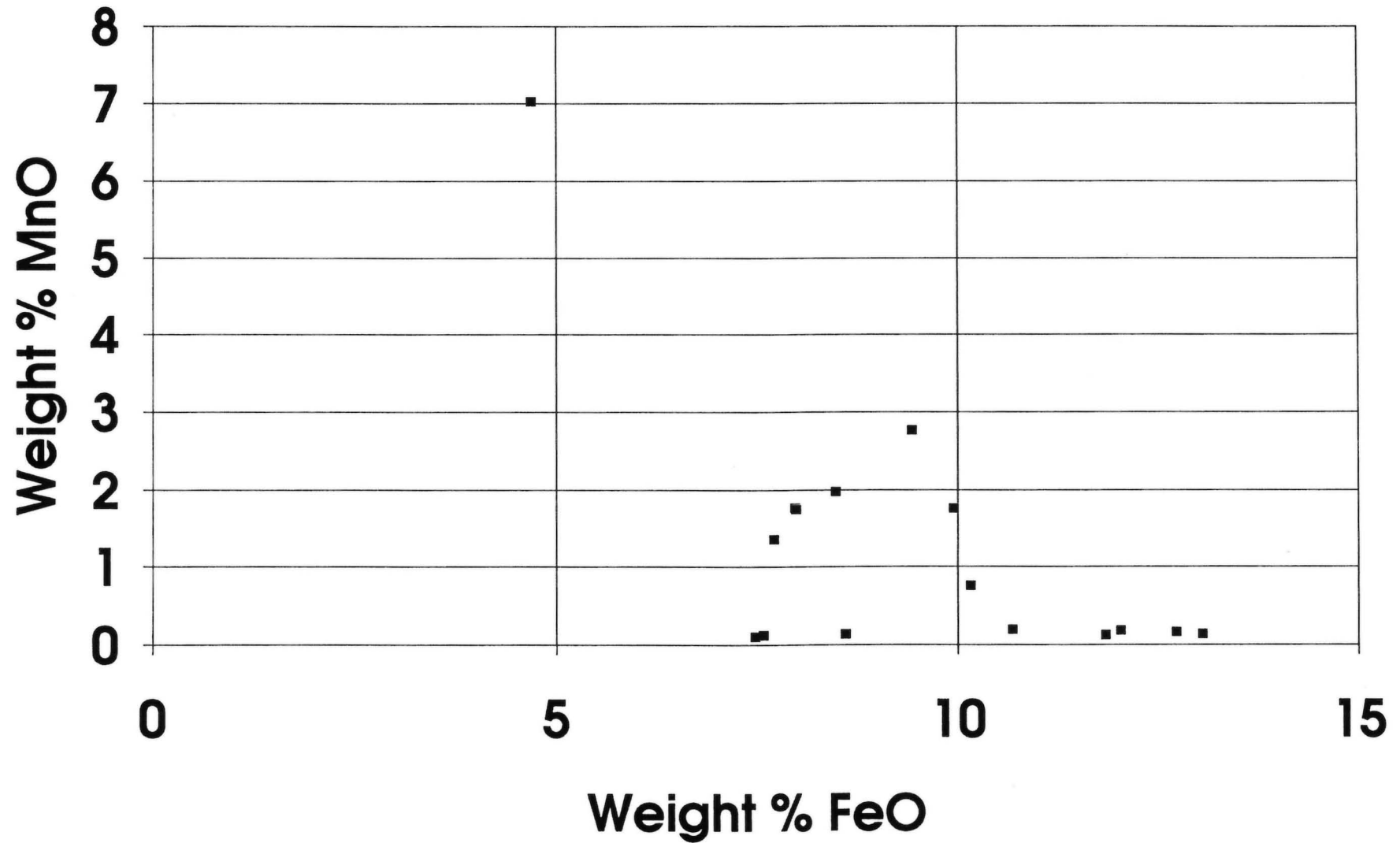
NE Manitoba; Spinel \leftrightarrow Gahnite; n = 184



NE Manitoba; Rutile; n = 118

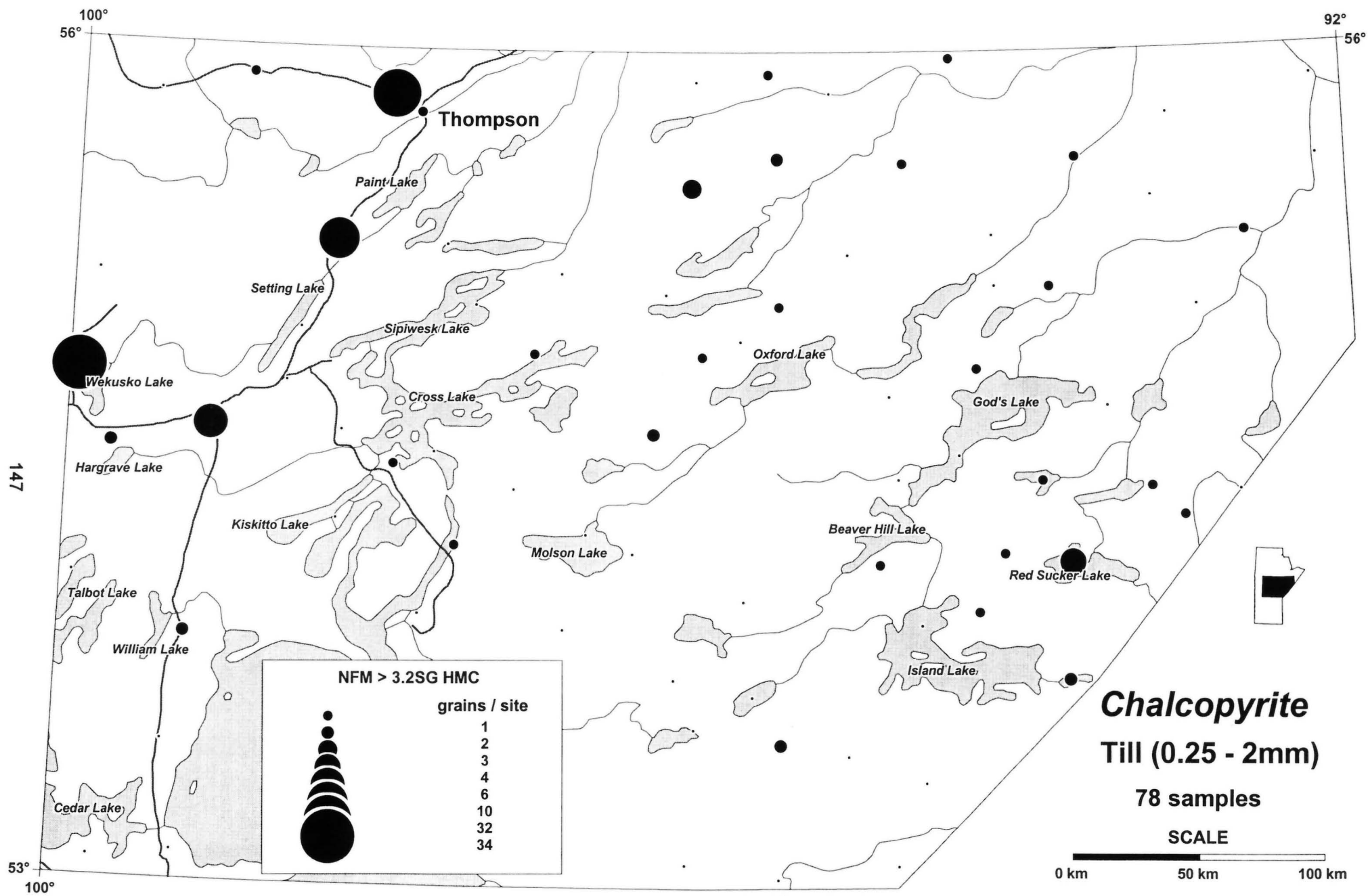


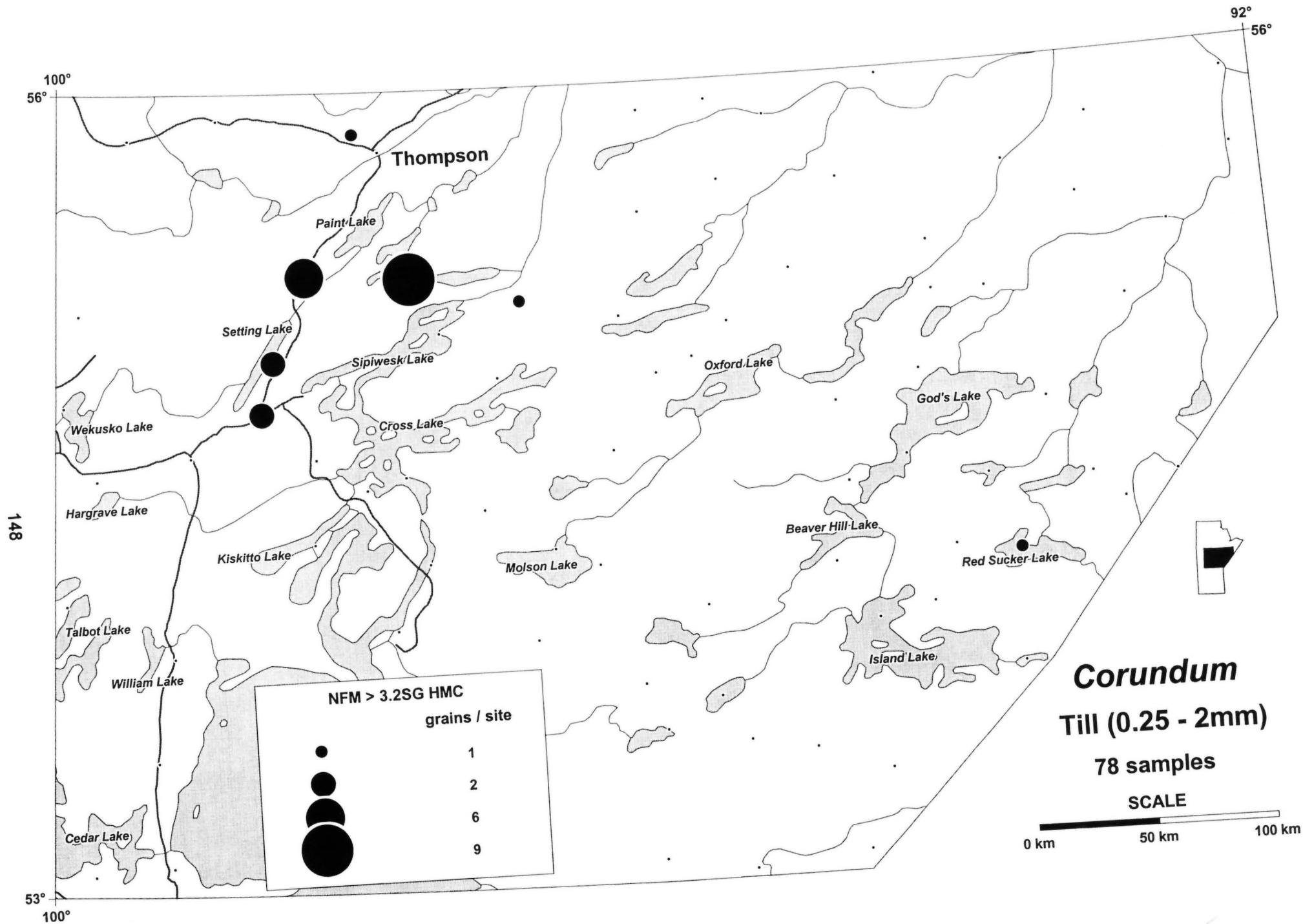
NE Manitoba; Epidote; n = 16

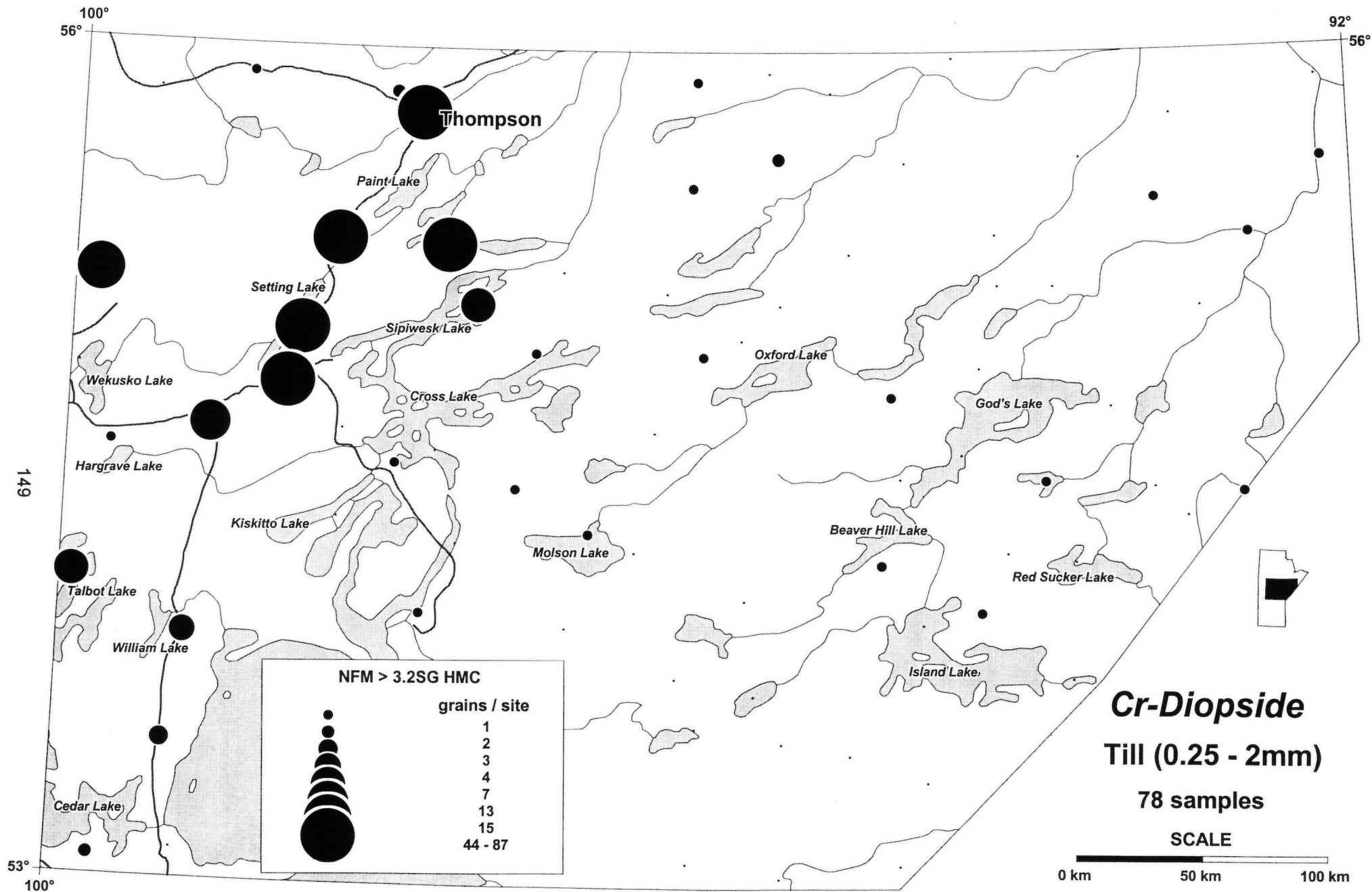


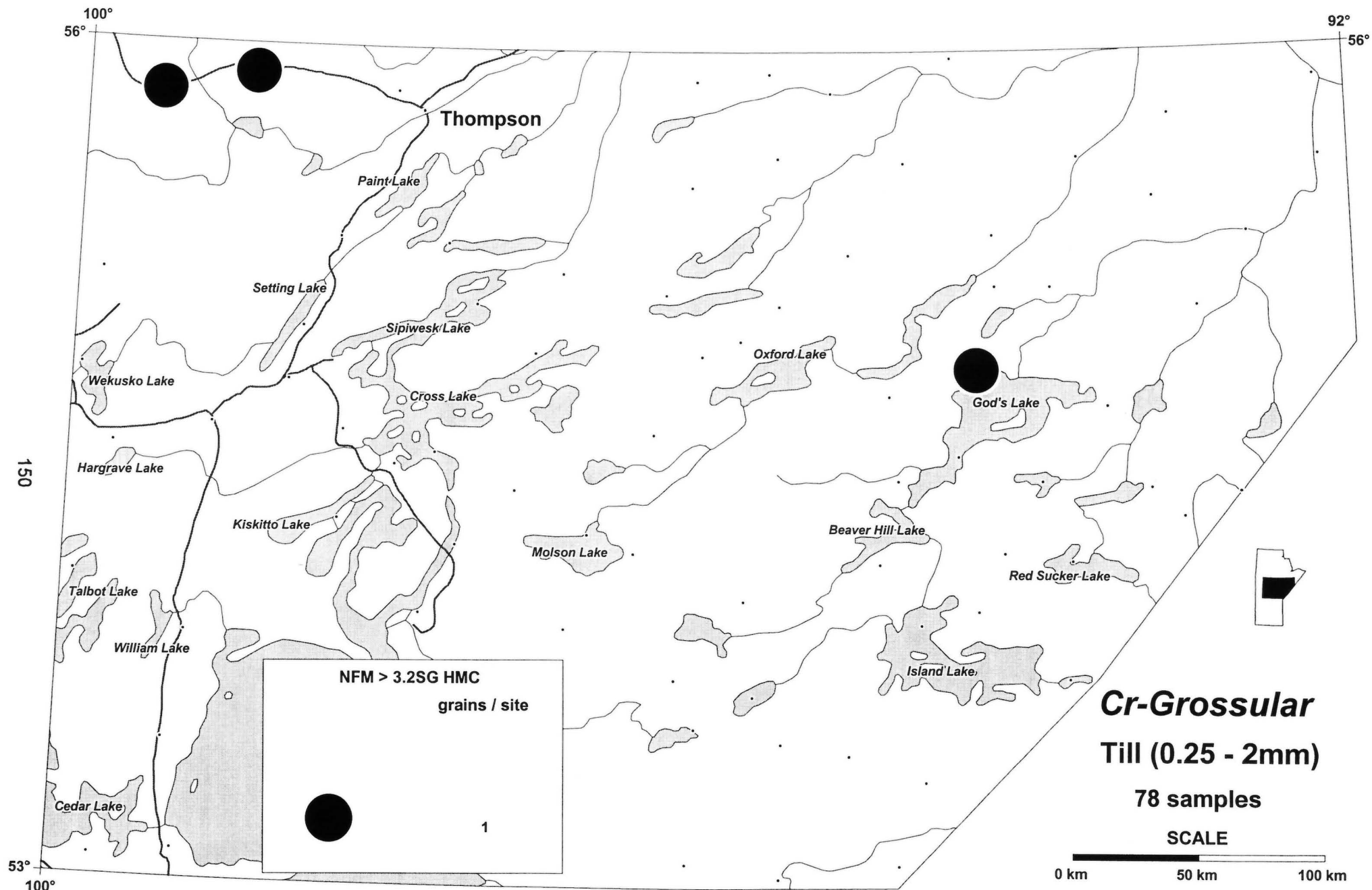
Appendix 5

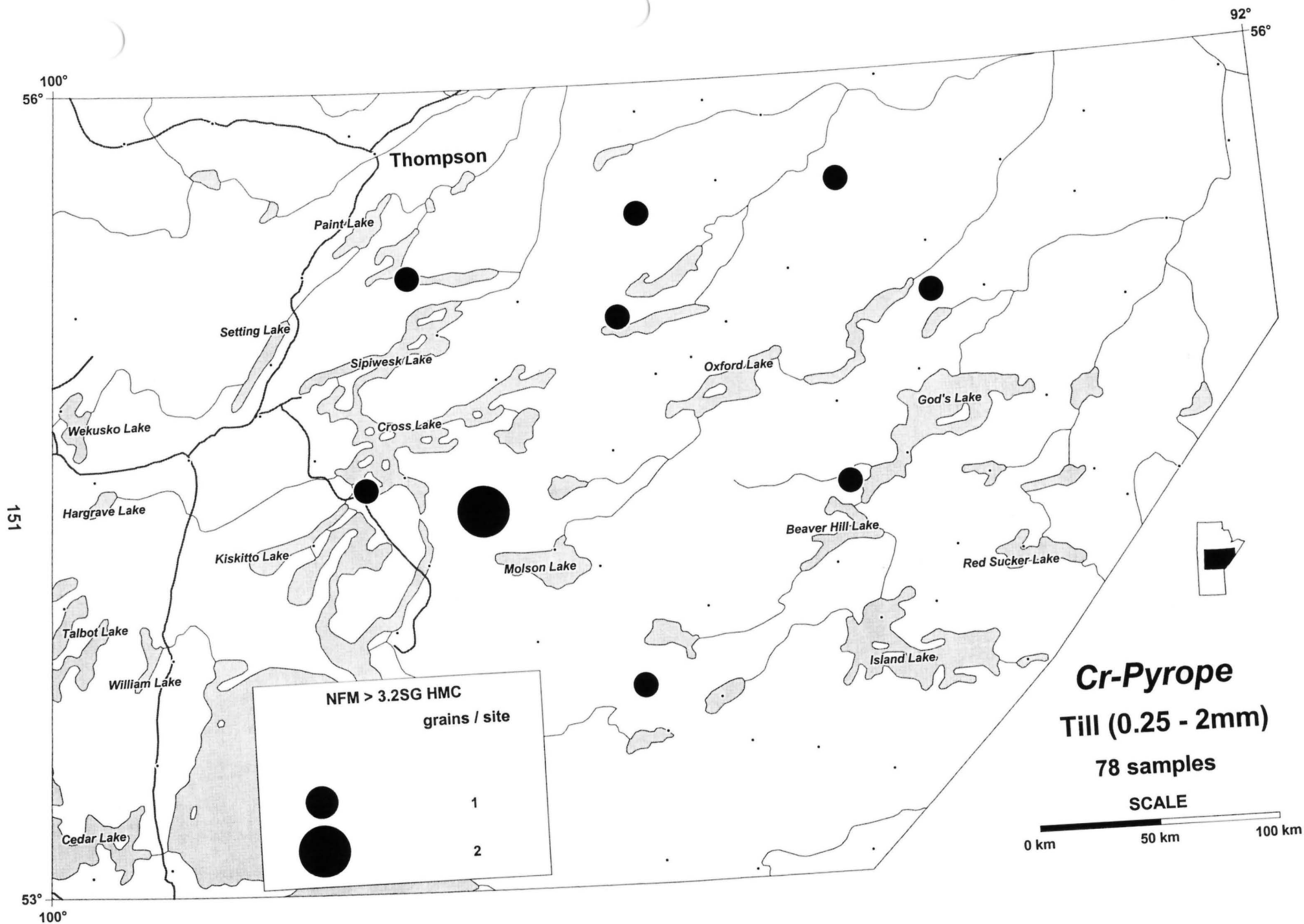
Part 4: Indicator mineral counts; maps

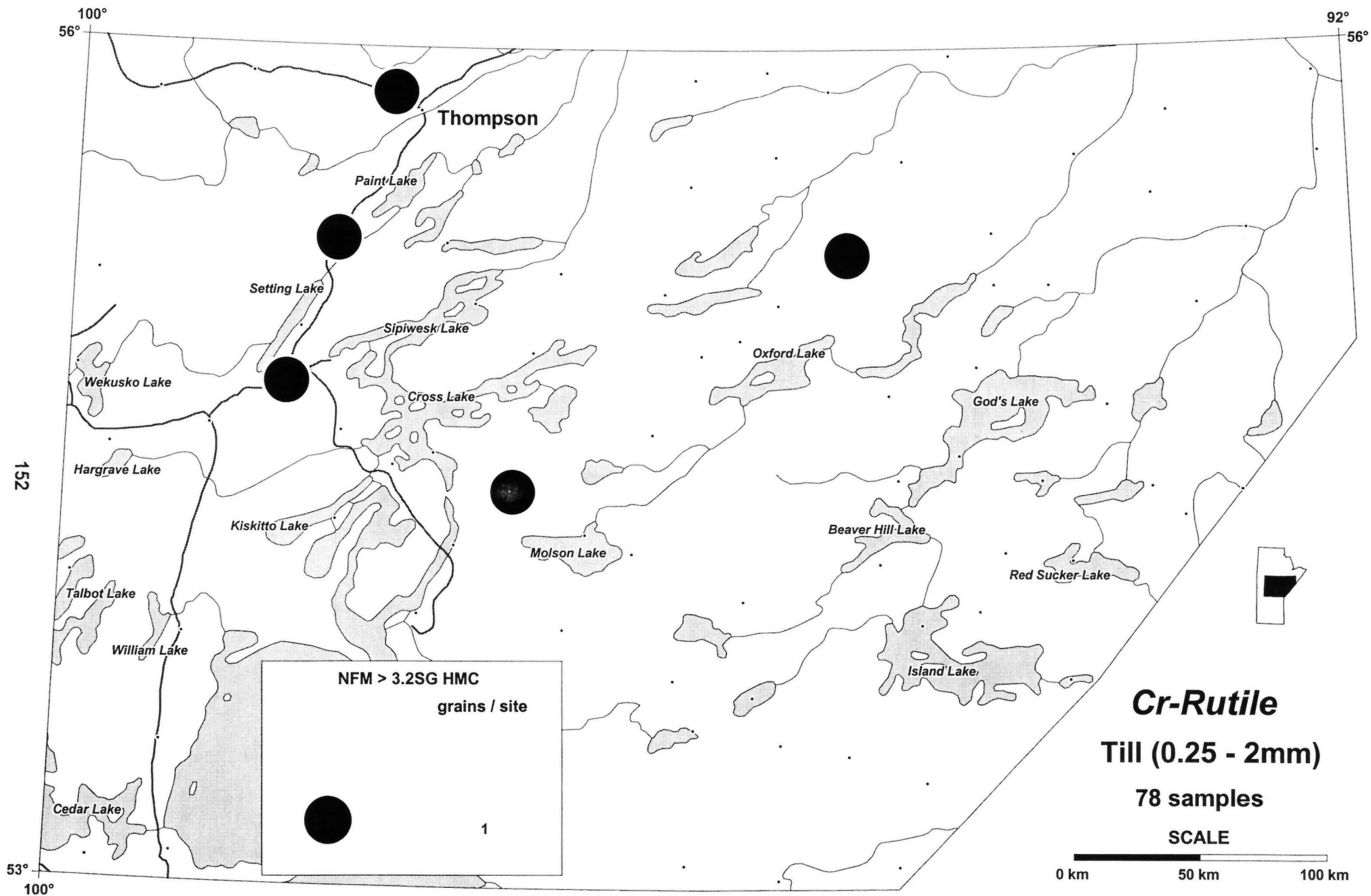


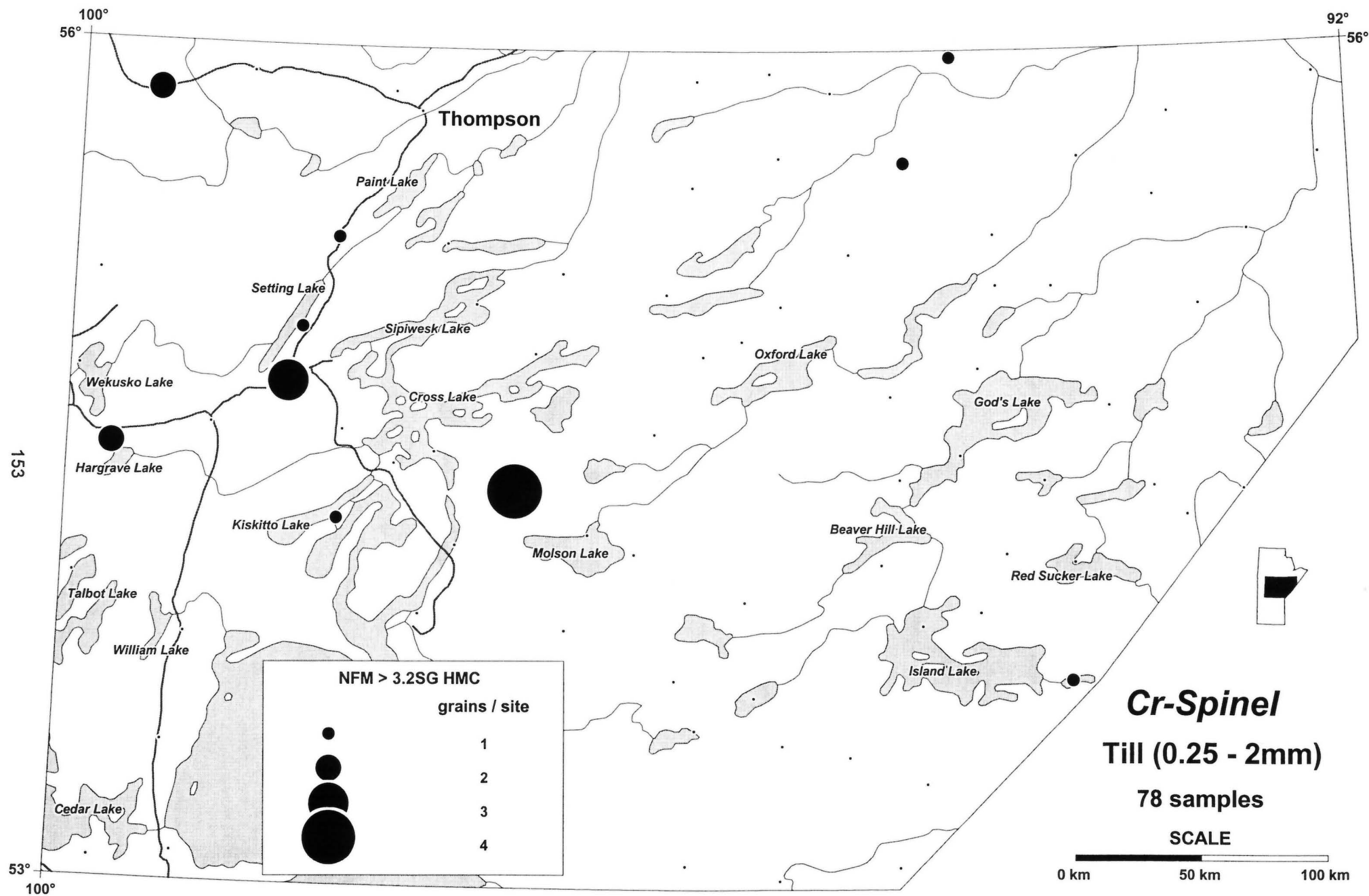


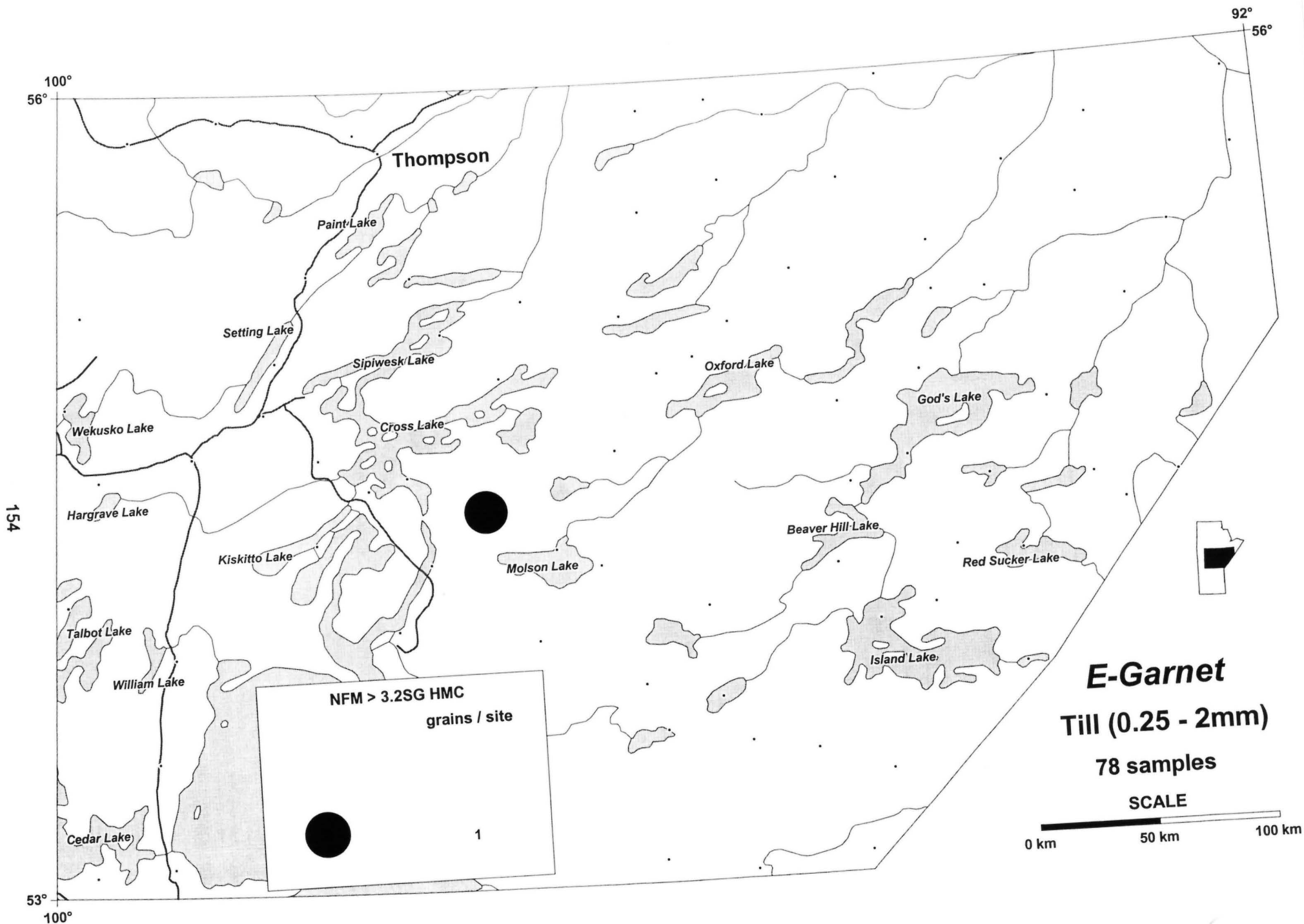


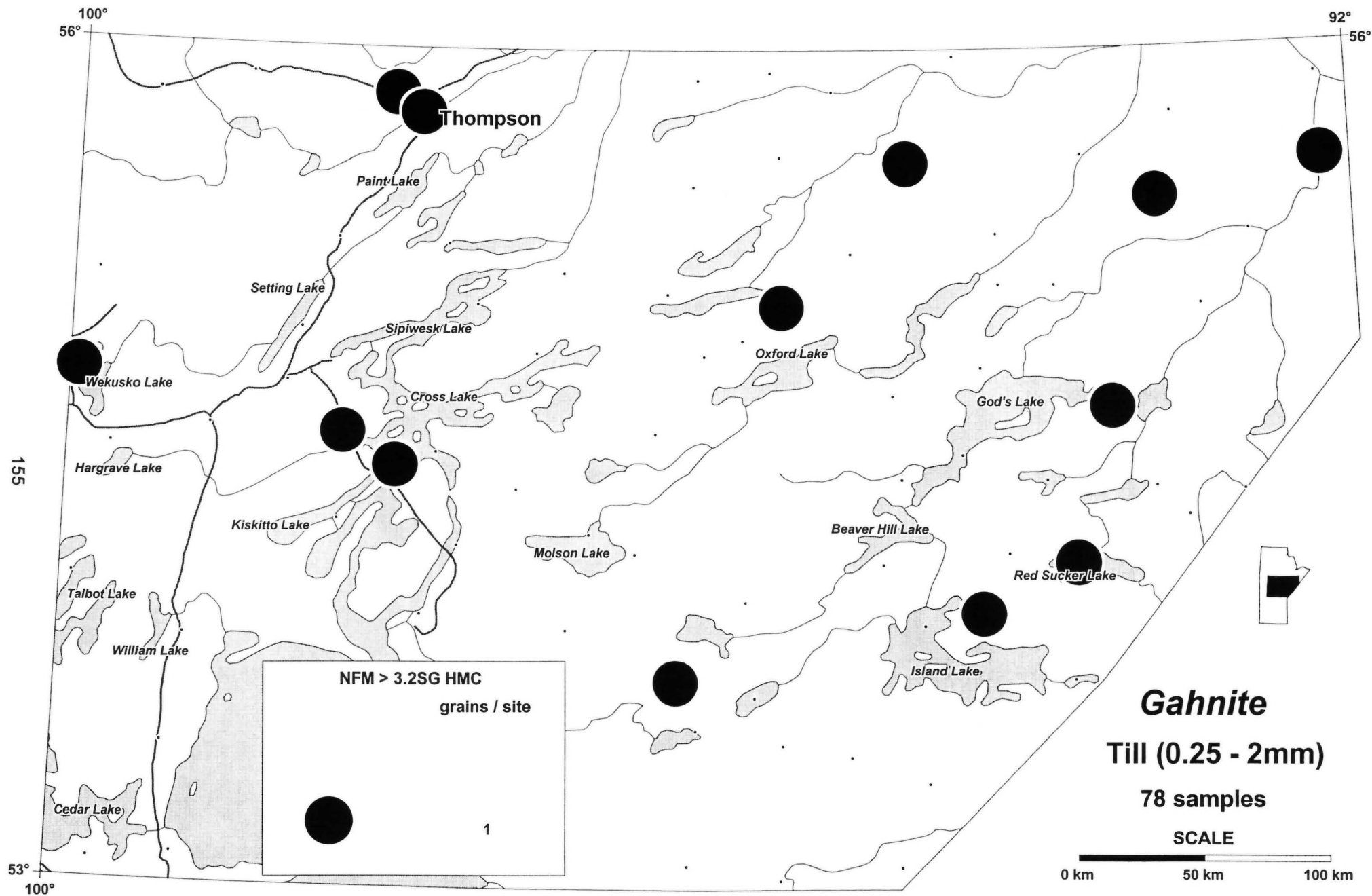


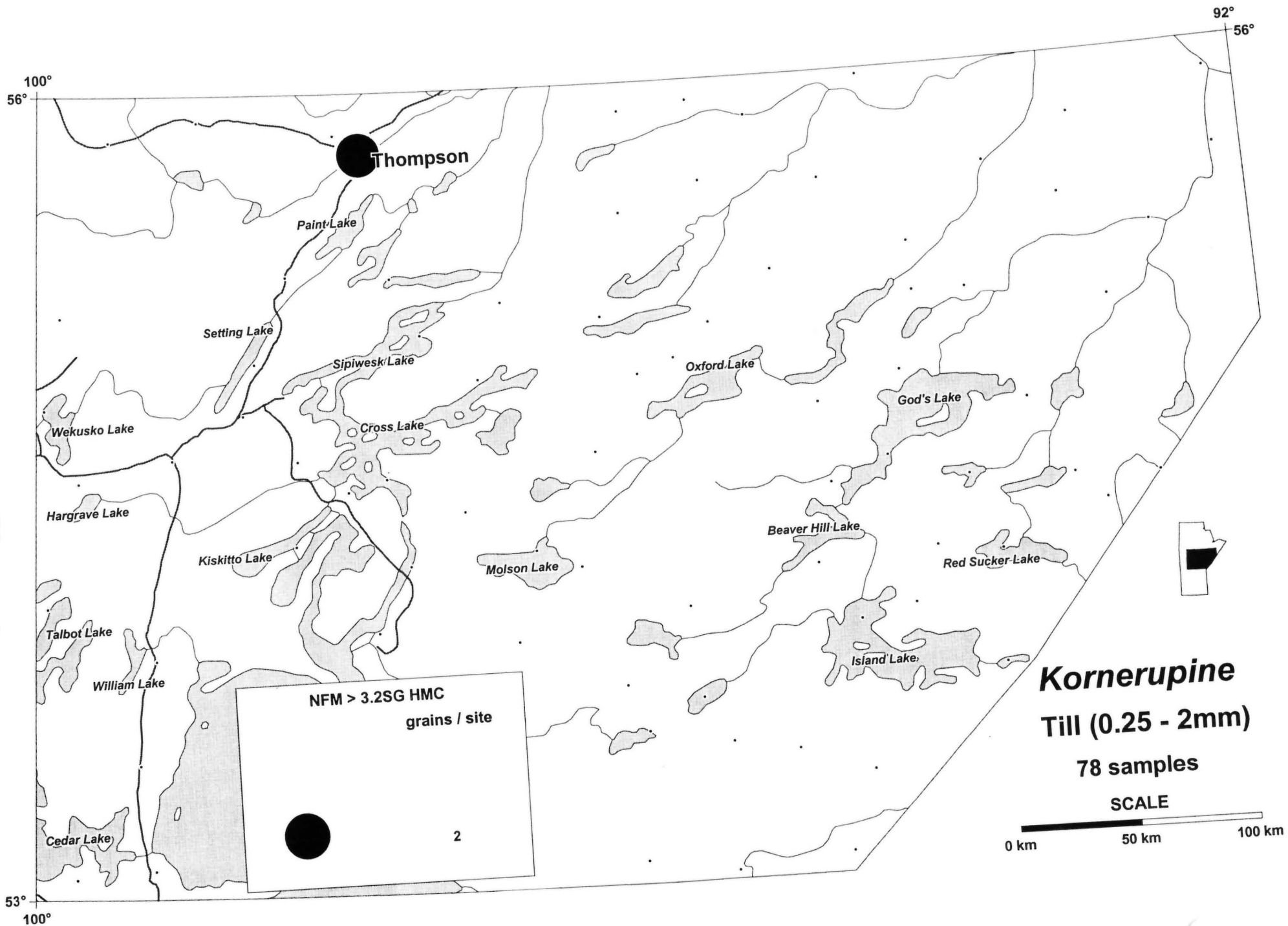


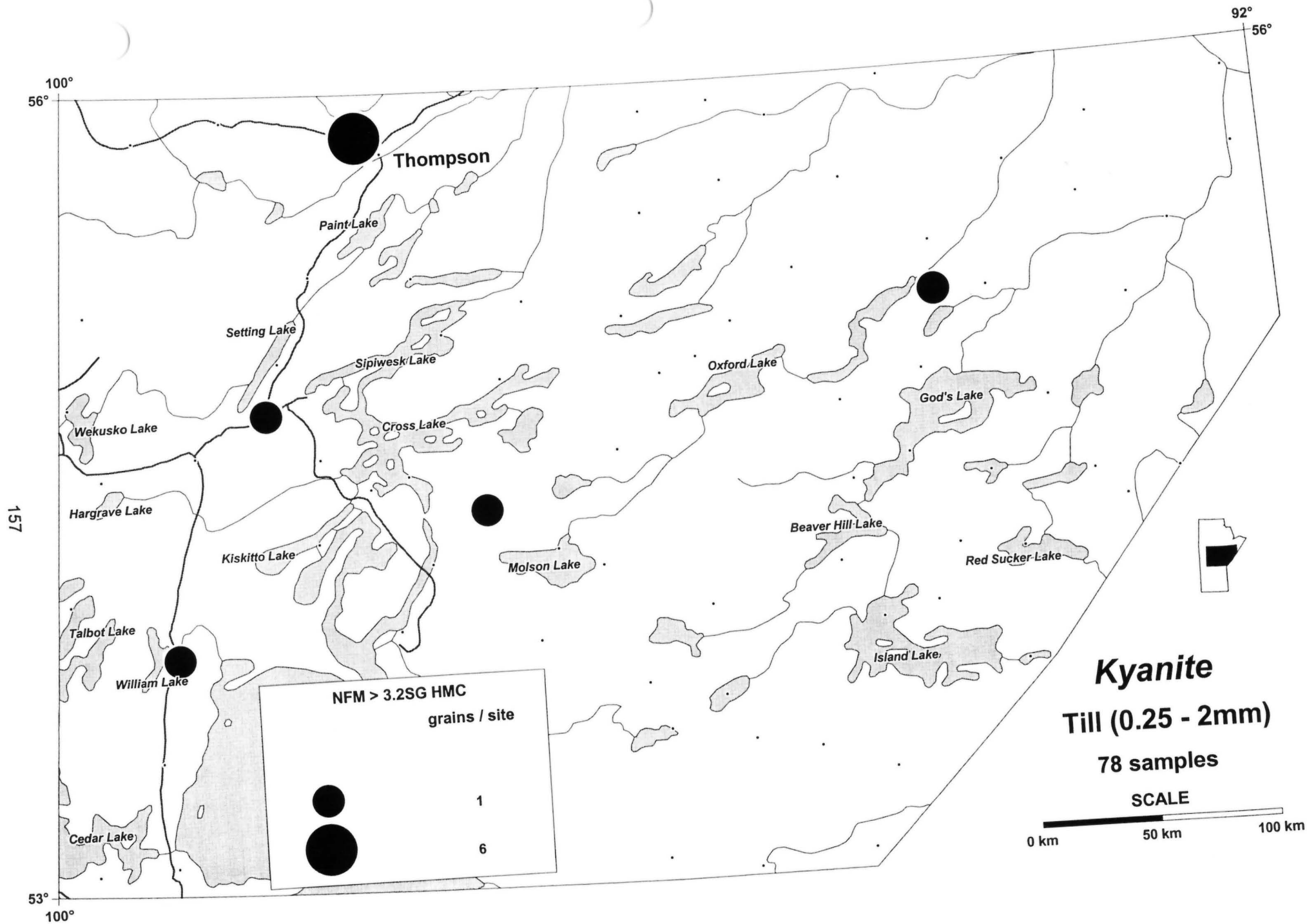


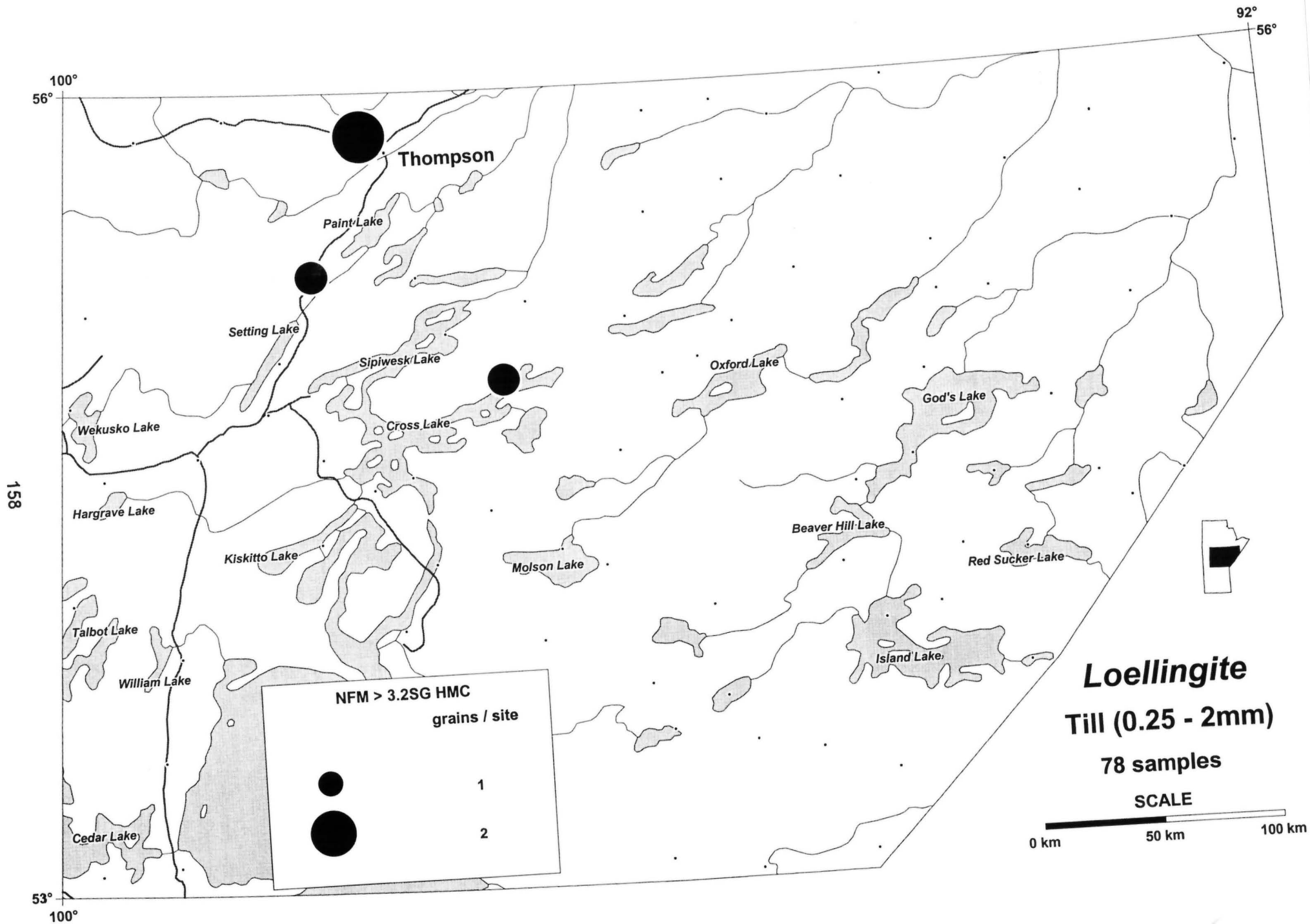


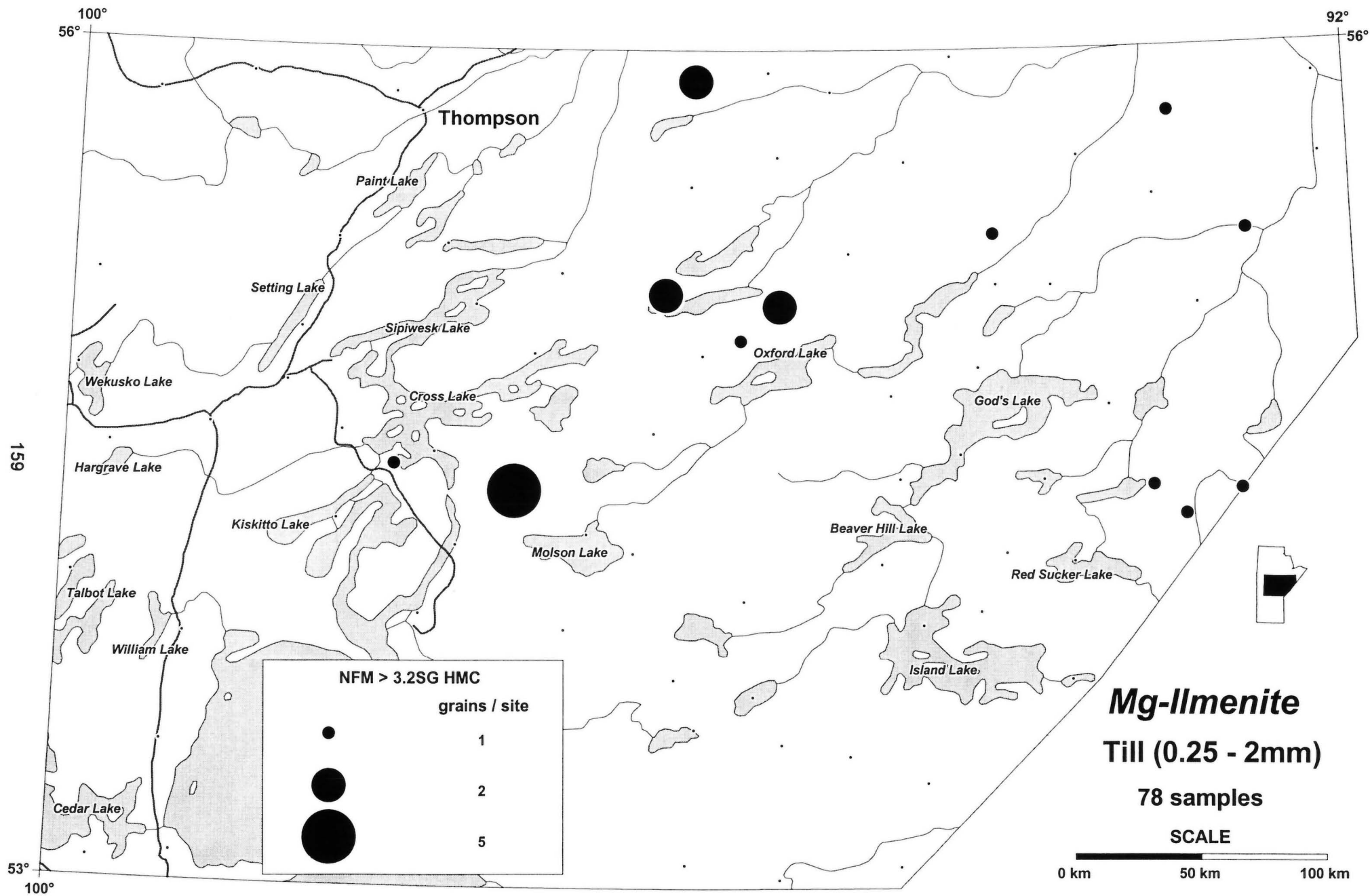


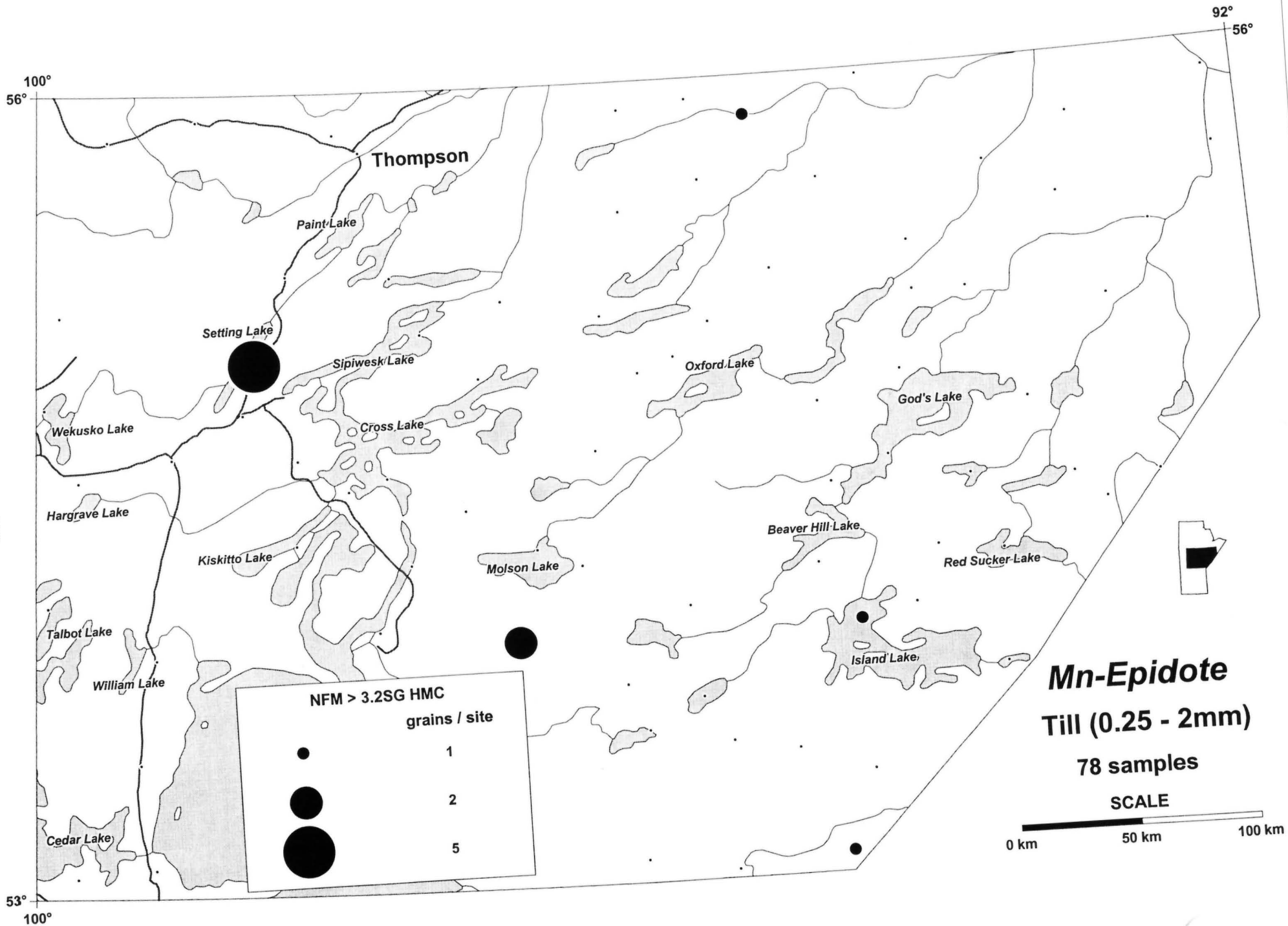


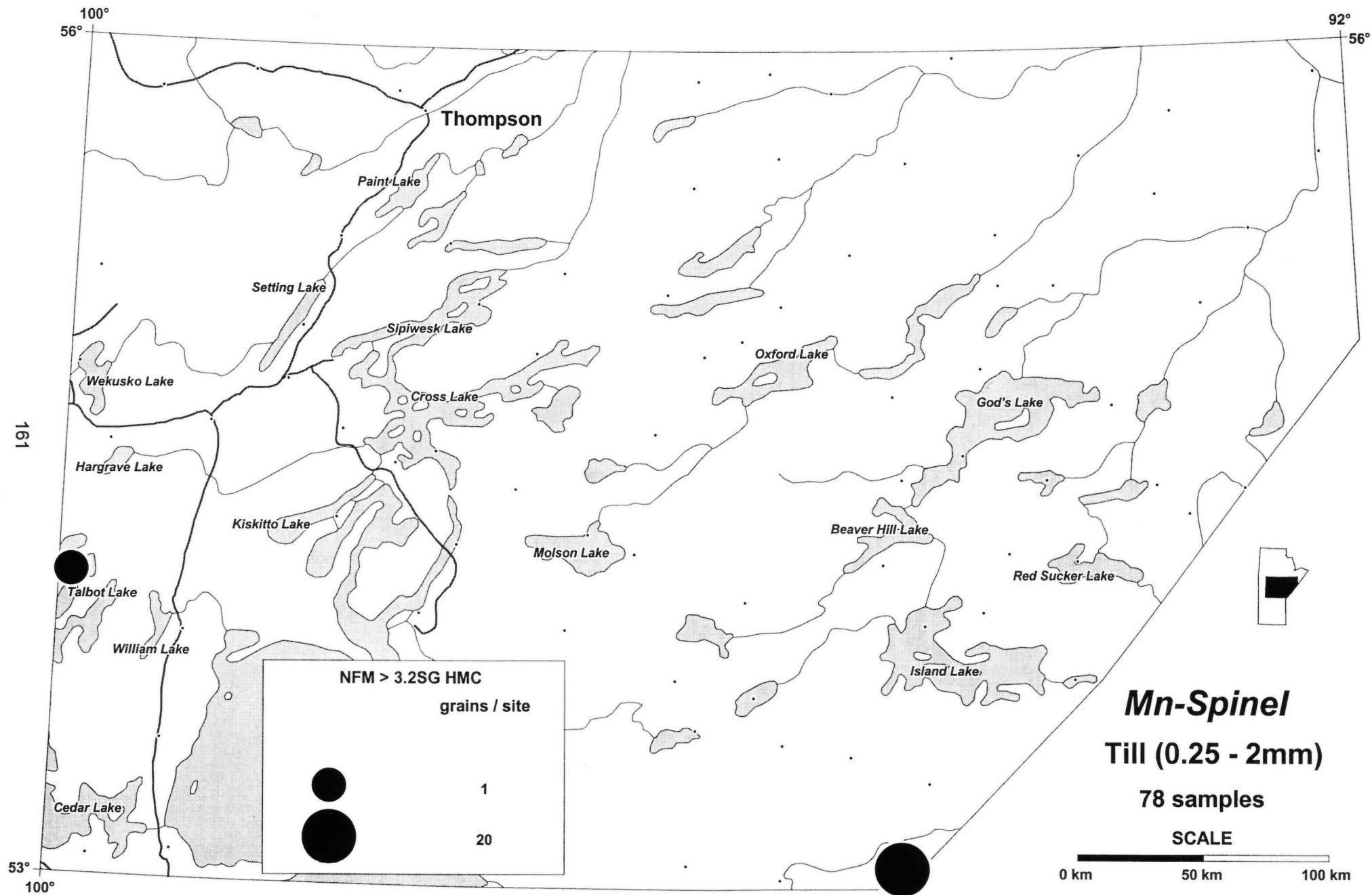


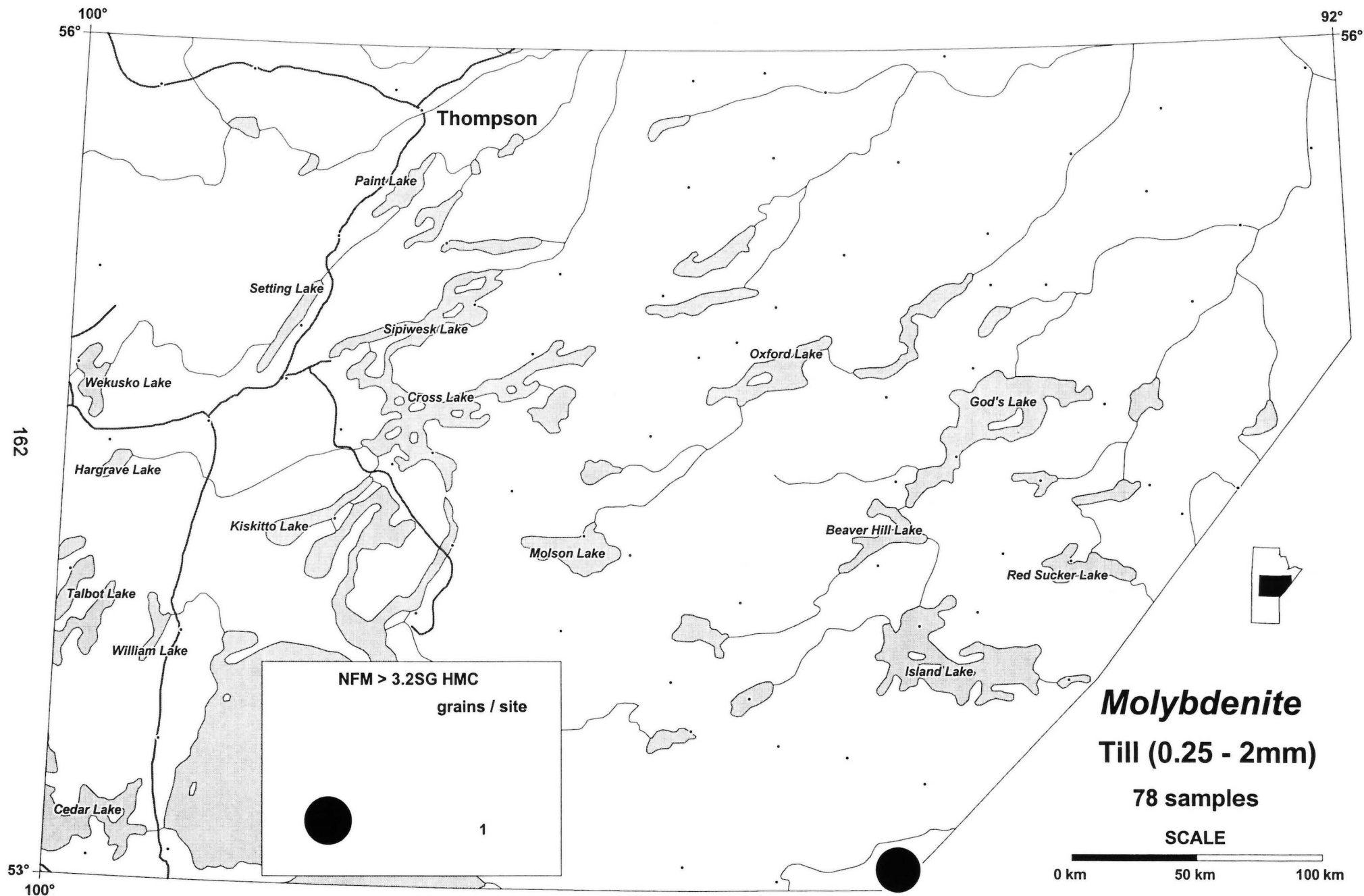


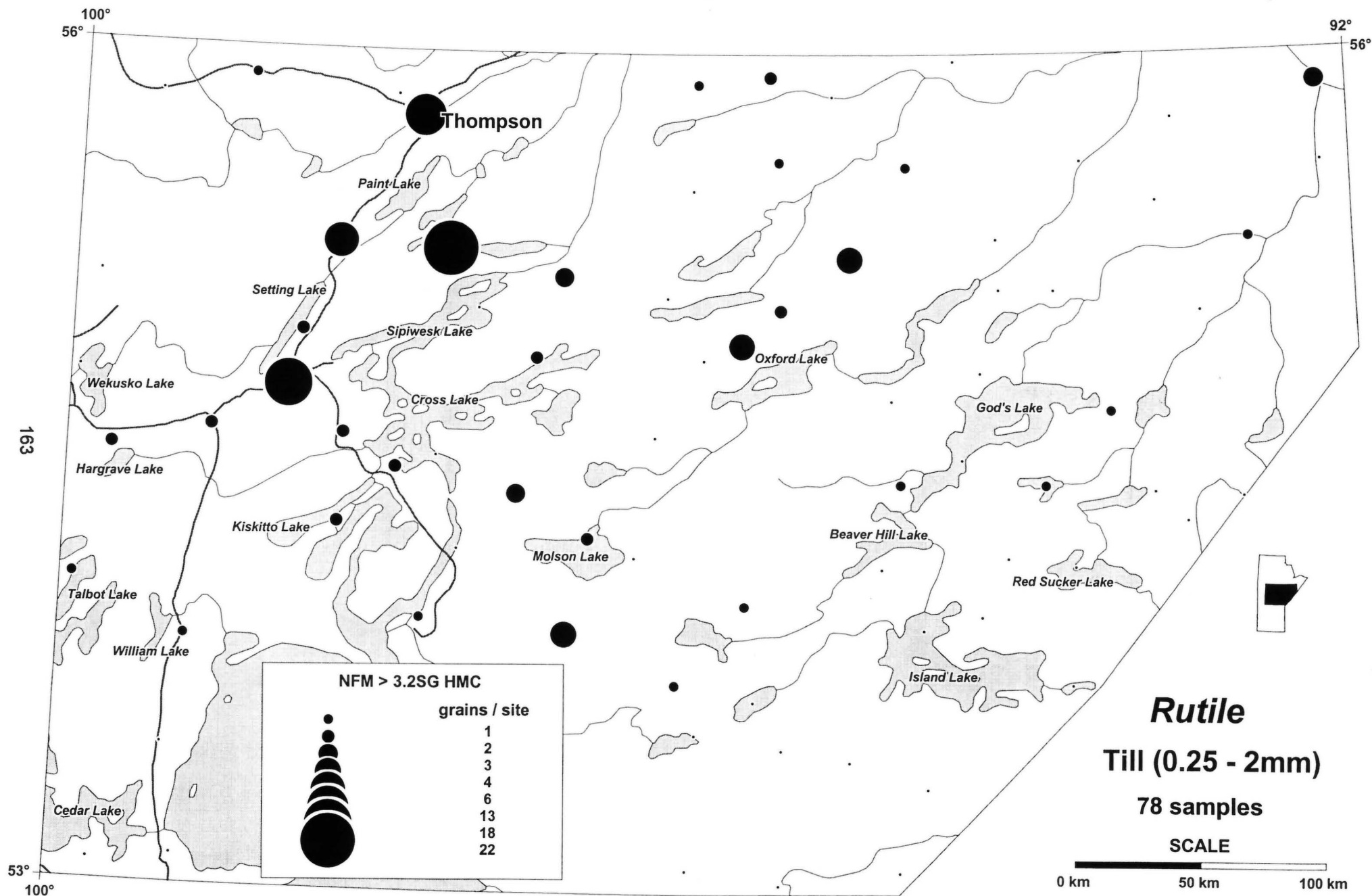


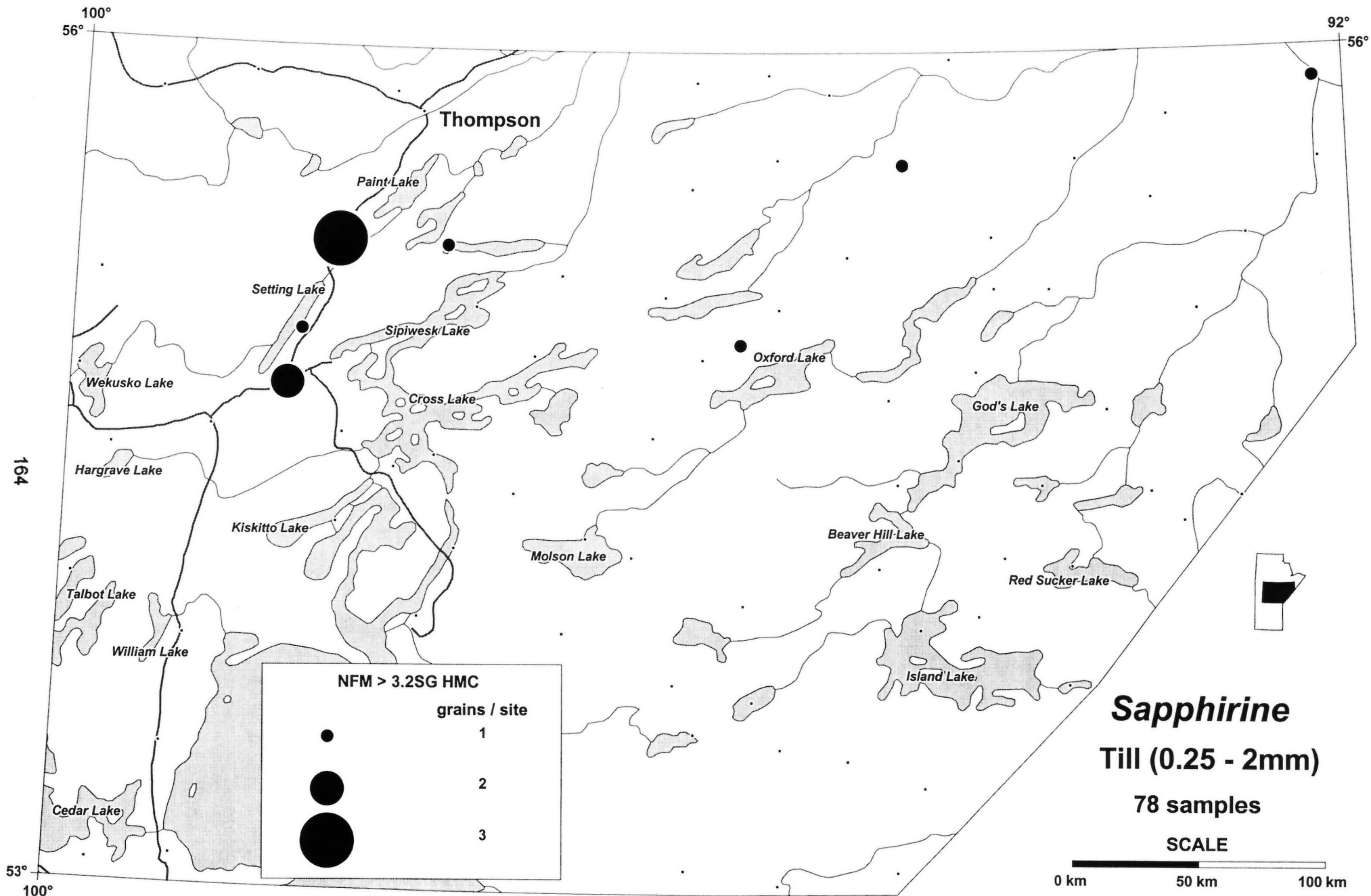


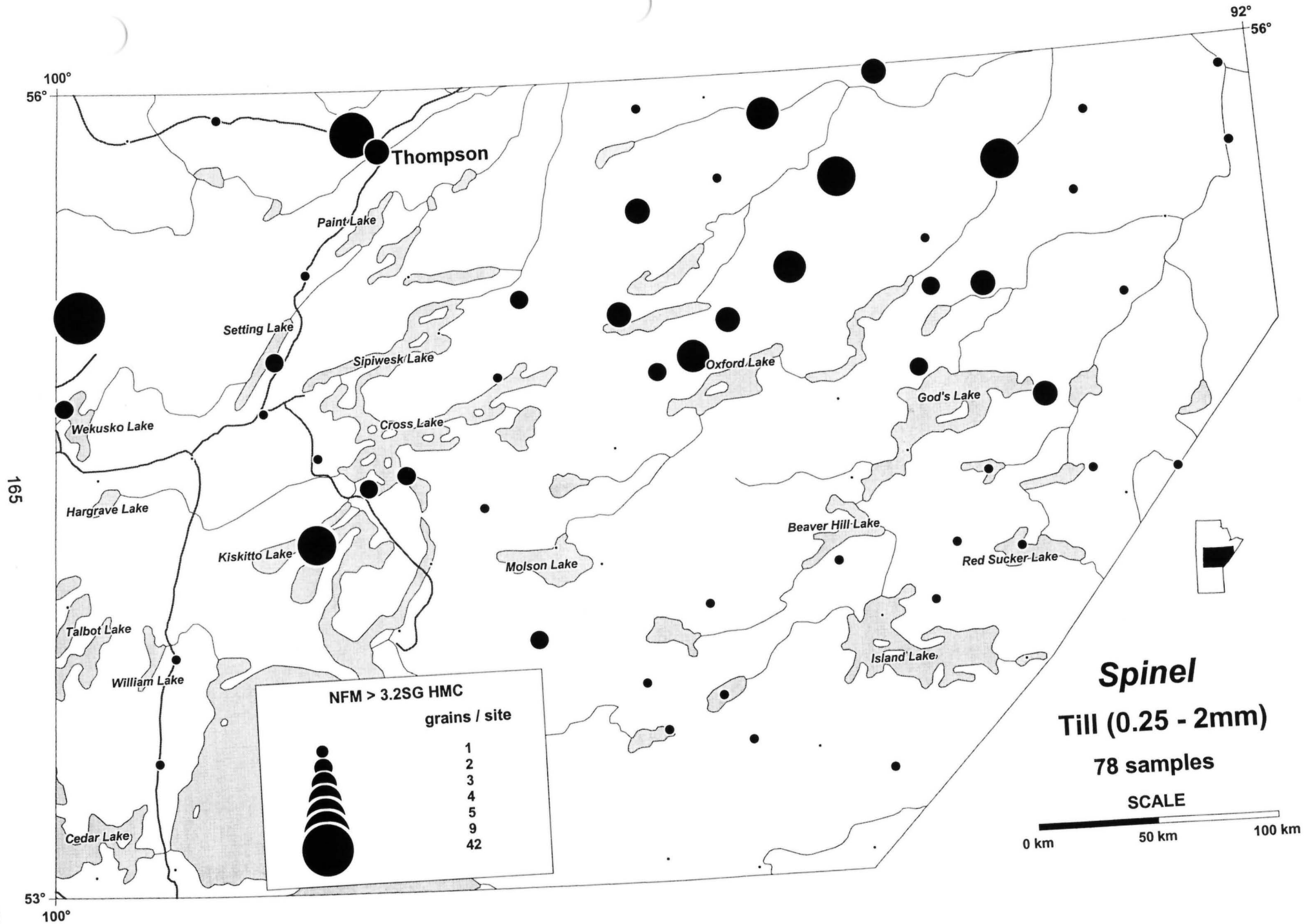


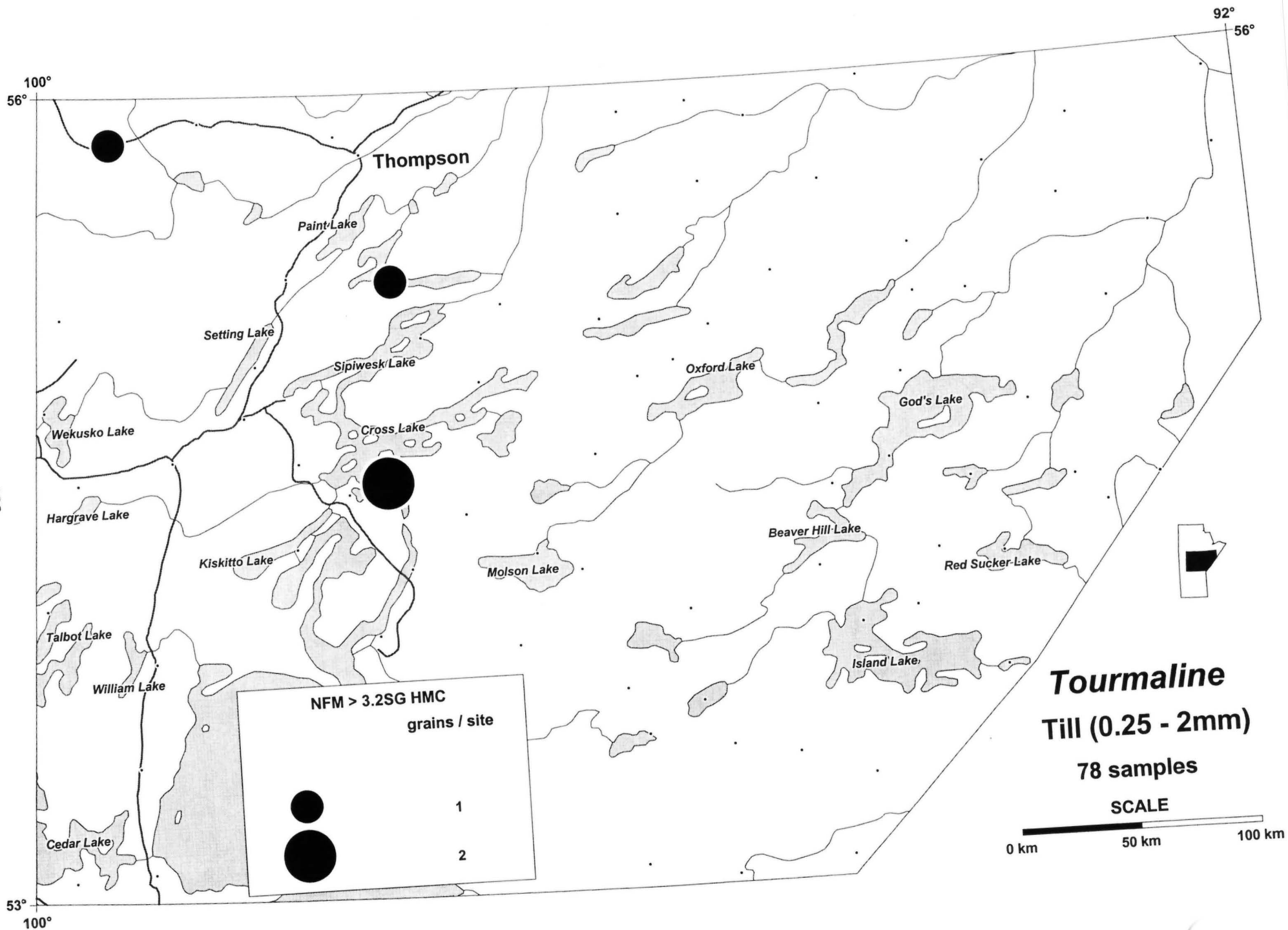


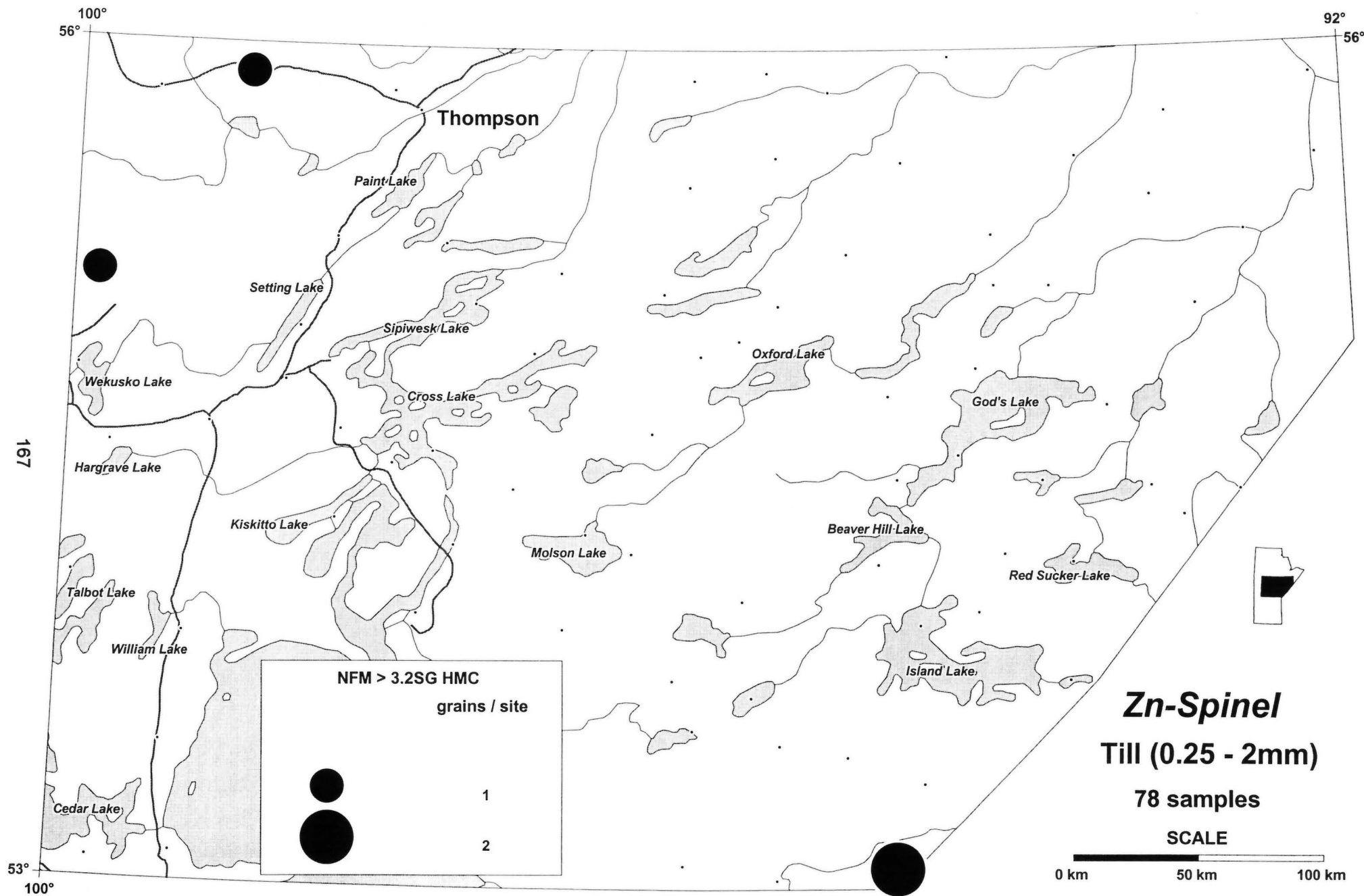












Zn-Spinel
Till (0.25 - 2mm)
78 samples

SCALE

Appendix 6

Visible gold grain morphology and count

C: Calculated thickness of grain (in microns)

M: Actual measured thickness of grain (in microns)

Py.: pyrite

Cpy.: chalcopyrite

Aspy: arsenopyrite

Marc: marcasite

L/G: limonite/goethite

Sid.: siderite

NUMBER OF GRAINS

SAMPLE NUMBER	PANNED Y/N	MEASUREMENT (MICRONS)		RESHAPED		MODIFIED		PRISTINE		TOTAL	NON	CALC	V.G.	REMARKS
		DIAMETER	THICKNESS	T	P	T	P	T	P		MAG	ASSAY		
											GMS	PPB		
96TCA														
01	Y	25 X 50	8 C	1		1				2				No sulphides.
		25 X 75	10 C	1						1				
		125 X 125	25 C		1					1				
										4	127.6		25	
02	Y	25 X 50	8 C	1						1				No sulphides.
										1	409.3		0	
03	Y	25 X 50	8 C	1						1				No sulphides.
		25 X 75	10 C			1				1				
		50 X 75	13 C			1				1				
		50 X 125	18 C					1		1				
										4	489.9		3	
04	Y	25 X 25	5 C			1				1				No sulphides.
		50 X 50	10 C	2						2				
		100 X 125	22 C	1						1				
		150 X 150	29 C	1						1				
										5	240.1		31	
05	Y	15 X 25	4 C			1				1				No sulphides.
		25 X 25	5 C			1				1				
										2	58.5		1	
06	Y	NO VISIBLE GOLD												No sulphides.
07	Y	25 X 25	5 C	1						1				No sulphides.
		50 X 75	13 C	1						1				
		50 X 100	15 C	1						1				
										3	199.7		5	
08	Y	NO VISIBLE GOLD												No sulphides.
09	Y	NO VISIBLE GOLD												No sulphides.
10	Y	NO VISIBLE GOLD												No sulphides.
11	Y	NO VISIBLE GOLD												No sulphides.
12	Y	50 X 75	13 C	1						1				No sulphides.
										1	678.1		1	
13	Y	25 X 25	5 C	3						3				No sulphides.
										3	354.6		0	
14	Y	25 X 25	5 C	2						2				No sulphides.
		25 X 50	8 C						1	1				
		50 X 50	10 C		1					1				
		50 X 125	18 C		1					1				
										5	491.0		3	
15	Y	25 X 50	25 M	2						2				No sulphides.
										2	208.2		3	
16	Y	25 X 25	5 C	1						1				No sulphides.
										1	64.7		0	

NUMBER OF GRAINS														
SAMPLE NUMBER	PANNED Y/N	MEASUREMENT (MICRONS)		RESHAPED		MODIFIED		PRISTINE		TOTAL	NON	CALC	V.G.	REMARKS
		DIAMETER	THICKNESS	T	P	T	P	T	P		MAG	ASSAY		
											GMS	PPB		
17	Y	NO VISIBLE GOLD												No sulphides.
18	Y	10 X 10	2 C					1		1				No sulphides.
		25 X 25	5 C	2		1				3				
		25 X 50	8 C	2						2				
										6	88.6	3		
19	Y	E GOLD												No sulphides.
20	Y	25 X 25	5 C	3						3				TR pyrite (~100 grains)
		25 X 50	8 C					2		2				
		125 X 125	25 C	1						1				
										6	272.5	11		
21	Y	15 X 25	4 C	1						1				No sulphides.
		25 X 25	5 C	2						2				
		25 X 50	8 C	1						1				
		50 X 50	10 C	1						1				
		50 X 75	13 C		1					1				
		75 X 125	20 C		1					1				
										7	47.9	46		
22	Y	15 X 25	4 C	1						1				No sulphides.
		25 X 25	5 C	2						2				
		50 X 75	13 C	2						2				
										5	66.4	12		
23	Y	15 X 25	4 C			1				1				No sulphides.
		50 X 125	18 C	1						1				
										2	14.9	69		
24	Y	25 X 25	5 C	2						2				No sulphides.
		25 X 50	8 C	1		1				2				
										4	22.9	9		
25	Y	25 X 50	8 C		1					1				No sulphides.
		50 X 50	10 C		1					1				
		75 X 125	20 C	1						1				
		125 X 125	25 C	1						1				
										4	73.4	64		
26	Y	15 X 15	3 C			1				1				No sulphides.
		50 X 50	10 C		1					1				
		50 X 75	13 C		1	1				2				
										4	34.4	27		
27	Y	25 X 50	8 C		1					1				No sulphides.
		75 X 225	29 C	1						1				
		100 X 200	29 C	1						1				
										3	50.1	199		
28	Y	25 X 25	5 C	1						1				No sulphides.
		25 X 50	8 C	1		1				2				
		25 X 75	10 C	1						1				
										4	69.9	5		

NUMBER OF GRAINS

SAMPLE NUMBER	PANNED Y/N	MEASUREMENT (MICRONS)		RESHAPED		MODIFIED		PRISTINE		TOTAL	NON MAG	CALC PPB	V.G. ASSAY	REMARKS
		DIAMETER	THICKNESS	T	P	T	P	T	P		GMS			
29	Y	25 X 25	5 C	4						4			No sulphides.	
		25 X 50	8 C					1		1				
		75 X 75	15 C	1						1				
		75 X 100	18 C	1						1				
											7	71.3	26	
30	Y	NO VISIBLE GOLD											No sulphides.	
31	Y	15 X 15	3 C	1						1			No sulphides.	
		50 X 75	13 C	1						1				
											2	84.8	4	
32	Y	25 X 25	5 C			1				1			No sulphides.	
		25 X 50	8 C	1						1				
											2	25.2	4	
33	Y	15 X 15	3 C	1						1			No sulphides.	
		25 X 25	5 C	1						1				
		25 X 50	8 C	1						1				
		50 X 75	13 C	1						1				
		50 X 100	15 C	1						1				
											5	59.4	19	
34	Y	25 X 50	8 C	1						1			No sulphides.	
		50 X 50	10 C	1						1				
		50 X 100	15 C	1						1				
											3	26.8	34	
35	Y	50 X 75	13 C	1						1			No sulphides.	
		100 X 125	22 C		1					1				
											2	13.3	188	
36	Y	25 X 25	5 C	1		1		4		6			No sulphides.	
		25 X 50	8 C	1		1				2				
		50 X 50	10 C	1						1				
		75 X 75	15 C	1						1				
											10	37.1	31	
37	Y	NO VISIBLE GOLD											No sulphides.	
38	Y	10 X 20	3 C	1						1			No sulphides.	
		25 X 25	5 C	4						4				
		25 X 50	8 C	1						1				
		25 X 75	10 C	3	1					4				
		50 X 75	13 C	1						1				
											11	93.6	14	
39	Y	50 X 50	10 C	1						1			No sulphides.	
											1	32.0	6	
40	Y	25 X 25	5 C	4						4			No sulphides.	
		25 X 50	8 C	4						4				
		50 X 50	10 C	1						1				
		50 X 75	13 C	1						1				
											10	41.0	24	
41	Y	25 X 25	5 C	4						4			No sulphides.	
		25 X 50	8 C	2						2				
		50 X 75	13 C	1						1				
											7	53.3	12	

NUMBER OF GRAINS																	
SAMPLE NUMBER	PANNED Y/N	MEASUREMENT (MICRONS)		RESHAPED		MODIFIED		PRISTINE		TOTAL	NON MAG	CALC V.G. ASSAY	REMARKS				
		DIAMETER	THICKNESS	T	P	T	P	T	P					GMS	PPB		
42	Y	15 X 50	7 C		1					1			No sulphides.				
		25 X 50	8 C	1						1							
		75 X 75	15 C		1					1							
											3	52.6	15				
43	Y	25 X 25	5 C	1						1			No sulphides.				
		50 X 75	13 C	1						1							
														2	54.9	7	
44	Y	25 X 50	8 C	1						1			No sulphides.				
		50 X 75	13 C	1	1					2							
														3	20.5	40	
45	Y	15 X 15	3 C	1		2		2		5			No sulphides.				
		15 X 25	4 C			6				6							
		25 X 25	5 C			1				1							
		25 X 50	8 C		1			1		2							
		25 X 75	10 C		1	2				3							
		25 X 100	13 C	1						1							
		50 X 50	10 C	2				1		3							
		50 X 75	13 C	1		2		1		4							
		50 X 125	18 C	1		1				2							
														27	49.3	108	
		46	Y	350 X 350	25 M		1					1				No sulphides.	
											1	40.8	563				
47	Y	NO VISIBLE GOLD											No sulphides.				
48	Y	25 X 25	5 C	1						1			No sulphides.				
		25 X 50	8 C	3						3							
		25 X 75	10 C	2						2							
		50 X 75	13 C	1						1							
		150 X 175	25 M	1						1							
											8	47.2	127				
49	Y	50 X 50	10 C	1						1			No sulphides.				
		50 X 75	13 C	1						1							
		100 X 125	22 C	1						1							
											3	31.9	84				
50	Y	25 X 25	5 C	1						1			No sulphides.				
		25 X 100	13 C	1						1							
		75 X 75	15 C	1						1							
		75 X 125	20 C	1						1							
											4	34.8	73				
51	Y	NO VISIBLE GOLD											No sulphides.				
52	Y	25 X 25	5 C	1						1			No sulphides.				
		25 X 50	8 C	1						1							
		50 X 75	13 C	1						1							
											3	36.5	13				
53	Y	50 X 50	10 C	2						2			No sulphides.				
		50 X 75	13 C	1						1							
		75 X 100	18 C	1						1							
											4	39.3	45				

NUMBER OF GRAINS

SAMPLE NUMBER	PANNED Y/N	MEASUREMENT (MICRONS)		RESHAPED		MODIFIED		PRISTINE		TOTAL	NON CALC V.G.		REMARKS
		DIAMETER	THICKNESS	T	P	T	P	T	P		MAG	ASSAY	
54	Y	25 X 25	5 C	1						1			No sulphides.
		25 X 50	8 C	4	1					5			
		25 X 100	13 C				1			1			
		50 X 50	10 C	1						1			
		50 X 75	13 C	2						2			
		50 X 100	15 C	2						2			
		100 X 175	27 C		1					1			
		150 X 450	50 M	1						1			
										14	43.0	944	
55	Y	50 X 100	15 C			1				1			No sulphides.
										1	18.4	35	
56	Y	15 X 25	4 C	1						1			No sulphides.
		25 X 25	5 C	1						1			
		25 X 50	8 C	2				1		3			
		25 X 75	10 C	2						2			
		50 X 50	10 C					1		1			
		50 X 75	13 C		2					2			
										10	54.3	30	
57	Y	50 X 50	10 C	1						1			No sulphides.
		75 X 100	18 C	1						1			
										2	33.4	36	
58	Y	50 X 100	15 C	1						1			No sulphides.
											1	41.1	
59	Y	25 X 50	8 C	1						1			No sulphides.
		50 X 50	10 C	2						2			
		50 X 175	22 C		1					1			
										4	47.0	55	
60	Y	15 X 15	3 C	1						1			No sulphides.
		25 X 25	5 C	2				1		3			
		25 X 50	8 C					2		2			
		50 X 50	10 C						1	1			
		50 X 75	13 C					1		1			
		75 X 125	20 C						1	1			
										9	35.8	64	
61	Y	25 X 50	8 C	1						1			No sulphides.
											1	30.3	
62	Y	NO VISIBLE GOLD											No sulphides.
63	Y	50 X 50	10 C	1						1			No sulphides.
		50 X 75	13 C	1						1			
		50 X 100	15 C	1						1			
		100 X 150	25 C	1						1			
										4	29.9	137	
64	Y	15 X 15	3 C	3						3			No sulphides.
		25 X 75	10 C	1						1			
		25 X 125	15 C	1						1			
		50 X 75	13 C					1		1			
										6	27.7	44	

NUMBER OF GRAINS															
SAMPLE NUMBER	PANNED Y/N	MEASUREMENT (MICRONS)		RESHAPED		MODIFIED		PRISTINE		TOTAL	NON MAG	CALC V.G. ASSAY	REMARKS		
		DIAMETER	THICKNESS	T	P	T	P	T	P						
65	Y	25 X 50	8 C	1						1			No sulphides.		
		50 X 50	10 C	1						1					
		50 X 75	13 C		1					1					
											3	26.3	25		
66	Y	25 X 25	5 C	1						1			No sulphides.		
		25 X 50	8 C	1						1					
		50 X 50	10 C	1						1					
		50 X 75	13 C	1						1					
											4	40.5	17		
67	Y	25 X 25	5 C					1		1			No sulphides.		
		25 X 50	8 C	1						1					
		50 X 50	10 C					1		1					
		50 X 125	18 C	1						1					
											4	28.5	46		
68	Y	25 X 50	8 C	3						3			No sulphides.		
		25 X 75	10 C	1						1					
											4	39.2	11		
69	Y	25 X 50	8 C	1						1			No sulphides.		
		25 X 75	10 C		1					1					
		50 X 50	10 C	1						1					
											3	15.7	30		
70	Y	15 X 50	7 C		1					1			No sulphides.		
											1	22.9	2		
71	Y	25 X 50	8 C	1	1					2			No sulphides.		
		75 X 75	15 C	1						1					
											3	20.1	40		
72	Y	NO VISIBLE GOLD													No sulphides.
73	Y	50 X 50	10 C		1					1			No sulphides.		
											1	31.2	6		
74	Y	NO VISIBLE GOLD													No sulphides.
75	Y	25 X 25	5 C	1						1			No sulphides.		
		25 X 50	8 C	1						1					
		50 X 50	10 C	1						1					
											3	16.4	18		
76	Y	NO VISIBLE GOLD													No sulphides.
77	Y	25 X 50	8 C		1					1			No sulphides.		
		50 X 100	15 C	1						1					
											2	13.3	54		
78	Y	25 X 25	5 C	1						1			No sulphides.		
		25 X 50	8 C	1						1					
											2	29.7	4		

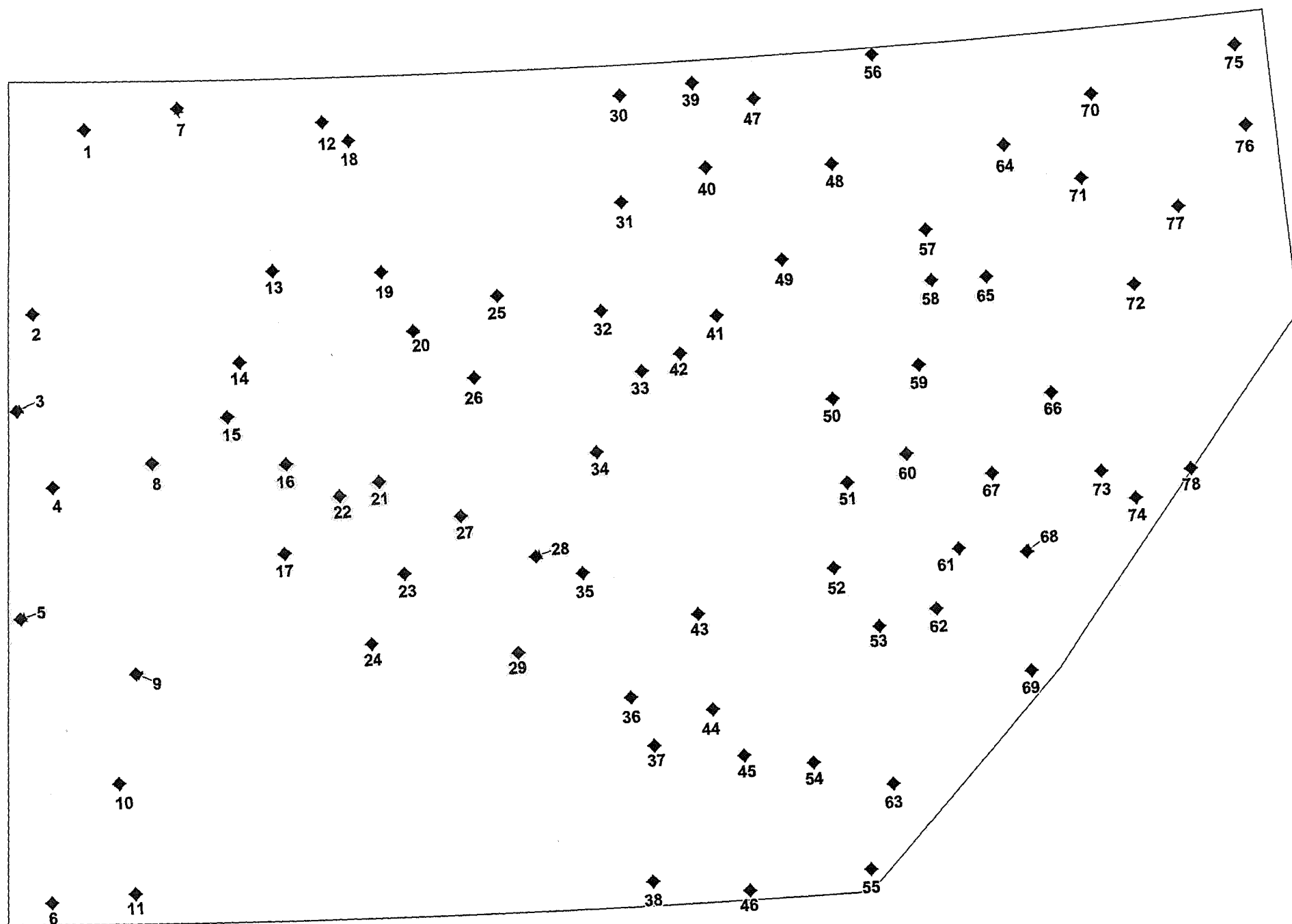


Figure 4: Transparent sample number overlay map.