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TILL SAMPLING PROGRAM AND PRESENTATION OF PHYSICAL AND GEOCHEMICAL DATA FROM WESTERN VICTORIA ISLAND, NORTHWEST TERRITORIES

F.M. Nixon

GEOSCIENCE INFORMATION DIVISION
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Critical Reader

A.S. Dyke
R.N.W. DiLabio

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TILL SAMPLING AND PRESENTATION OF PHYSICAL AND GEOCHEMICAL DATA FROM WESTERN VICTORIA ISLAND, NORTHWEST TERRITORIES

Abstract

A co-ordinated till sampling program was one component of a large mapping project on western Victoria Island, Northwest Territories. The program was designed to allow evaluation of the reproducibility of results and of the spatial distribution of variance through analysis of variance techniques. Sample characteristics measured include granulometry, carbonate content, and trace element geochemistry. Data from site observations and laboratory analyses are appended in a table and on maps. Analysis of variance indicates that certain variables strongly represent regional variation in till whereas others show considerable variability below the scale of sampling density. This information will be valuable when using the data and has contributed to a subsequent sampling design in an adjacent area.

Résumé

Un programme coordonné d'échantillonnage des tills a été réalisé dans le cadre d'un grand projet de cartographie dans l'ouest de l'île Victoria (Territoires du Nord-Ouest). Le programme a été conçu dans le but de permettre l'évaluation de la reproductibilité des données obtenues et de la répartition spatiale de la variance à l'aide de techniques d'analyse de la variance. On compte parmi les caractéristiques des échantillons retenues la granulométrie, la teneur en carbonate et la géochimie des éléments en traces. Les données d'observation sur le terrain et d'analyse en laboratoire sont présentées en annexe dans un tableau et sur des cartes. L'analyse de la variance indique que certaines variables correspondent fortement à une variation régionale du till tandis que d'autres montrent une variabilité considérable en deça de l'échelle d'échantillonnage. Ces renseignements s'avéreront utiles lorsqu'il s'agira d'utiliser les données; ils ont aussi servi à l'élaboration du plan d'échantillonnage utilisé dans une région voisine.

SUMMARY

A project to study the surficial geology and Quaternary history of western Victoria Island included a co-ordinated till sampling program as one component. This program began with creation of a rational sampling design and progressed through field sampling and laboratory analyses to data processing and presentation as a unified procedure resulting in comparable data for each of three map subdivisions.

An unbalanced, inverted, nested (multilevel) sampling design was chosen to allow evaluation of sampling and to provide information on distribution of variation through analysis of variance. Surface samples were collected at grid sites as well as at other points on mapping traverses. Standard site observations were taken for geomorphic setting, surface features, and pit characteristics. Soil horizon and depth profile were sampled at selected sites to evaluate the significance of variability resulting from depth of sampling.

SOMMAIRE

Un projet d'étude de la géologie des formations en surface et de l'histoire quaternaire de l'ouest de l'île Victoria a, entre autres, comporté un programme coordonné d'échantillonnage des tills. La première étape du programme comportait l'élaboration d'un plan d'échantillonnage rationnel suivie de l'échantillonnage sur le terrain et des analyses en laboratoire puis du traitement et de la présentation des données selon une méthode unifiée afin que les données de chacune des trois sous-divisions cartographiques soient comparables.

Pour permettre l'évaluation de l'échantillonnage et pour obtenir des informations sur la répartition de la variation par l'analyse de la variance, on a choisi un plan d'échantillonnage non équilibré, inversé et à plusieurs degrés. Les échantillons superficiels ont été prélevés à des endroits choisis sur la grille ainsi qu'à d'autres points sur les cheminements cartographiques. Les observations sur le terrain visaient, en général, a recueillir des informations sur les formes de relief, les éléments de surface et les caractéristiques des cavités excavées. Des échantillons représentatifs des horizons du sol et de son profil en profondeur ont été prélevés à des endroits choisis dans le but d'évaluer la variabilité en fonction de la profondeur d'échantillonnage.

In the laboratory, gravel content and sand:silt: clay ratio were measured, carbonate content was determined, and clays were analyzed for 13 trace elements: copper, lead, zinc, cobalt, nickel, silver, chromium, molybdenum, manganese, iron, cadmium, uranium, and arsenic.

Data files were created from laboratory results and site observations. Analysis of variance of laboratory data identified those characteristics with strong regional variability at a reconnaissance scale. Shaded isarithmic plots were produced for these distributions whereas point values were plotted for the rest. These plots and a table of laboratory values and site observations selected from data files are presented as appendices.

Analysis of detailed soil and depth profile sampling indicates leaching of carbonates and enrichment of most trace elements in the upper or more oxidized material. None of these variations was sufficiently large to alter distribution plots or to suggest changes in reconnaissance sampling technique.

The distribution of trace elements showing strong regional variance primarily reflects underlying bedrock composition. Superimposed on this pattern are the effects of glacial transport as well as other less obvious factors; which may include the relative age of surface or texture of a particular facies of glacial sedimentation.

The data table and maps of variable distributions will be used in conjunction with other information for geological interpretation. The use of both forms of data presentation will be guided by information on the distribution of variance at each sampling level.

Des mesures en laboratoire ont établi la teneur en gravier et le rapport sable-silt-argile, il en a été de même de la teneur en carbonate et de la présence, dans les argiles, de 13 éléments en traces (cuivre, plomb, zinc, cobalt, nickel, argent, chrome, molybdène, manganèse, fer, cadmium, uranium et arsenic).

Des fichiers de données ont été établis à partir des résultats de laboratoire et des observations sur le terrain. L'analyse de la variance des données de laboratoire a permis d'identifier les caractéristiques de forte variabilité régionale à une échelle de reconnaissance. On a tracé des lignes isométriques estompées pour représenter ces répartitions tandis que les autres répartitions correspondent à des valeurs ponctuelles. Ces cartes et un tableau contenant des données d'analyse en laboratoire et d'observation sur le terrain, extraites des fichiers de données, sont présentés en annexe.

L'analyse d'échantillons de sol prélevés dans certains horizons et à des profondeurs systématiques indique un lessivage des carbonates et une augmentation de la teneur de la plupart des éléments en traces dans les matériaux supérieurs, soit les matériaux plus oxydés. Aucune de ces variations, cependant, n'a été suffisamment importante pour modifier les cartes de répartition ou pour entraîner des changements au niveau de à la technique d'échantillonnage de reconnaissance.

La répartition des éléments en traces caractérisés par une importante variance régionale reflète essentiellement la composition de la roche sous-jacente. Sur cette répartition ont été tracés les effets du transport glaciaire ainsi que d'autres facteurs moins évidents comme, notamment, l'âge relatif de la surface ou la texture d'un faciès particulier de sédimentation glaciaire.

Le tableau de données et les cartes de répartition variable seront utilisés avec d'autres informations à des fins d'interprétation géologique. Le choix de ces deux formes de présentation dépendra des informations recueillies sur la répartition de la variance à chaque niveau d'échantillonnage.

INTRODUCTION

During 1981 and 1982, mapping of the Quaternary geology of Victoria Island west of 110°W was pursued by Terrain Sciences Division of the Geological Survey of Canada. The aim of the project, co-ordinated by J-S. Vincent, is to produce surficial geology maps and reports describing the Quaternary sediments and history of the area.

The bulk of fieldwork was completed in 1982 when three parties mapped equivalent size portions of western Victoria Island (Fig. 1). This work included the execution of a systematic till sampling program to provide uniform sample coverage for all parts of the map area and a standard data set from subsequent laboratory analyses. Till was chosen for the sampling target as a primary glacial sediment resulting directly from the presence of glacial ice. Characterization of tills can assist in interpreting their stratigraphic relationships, environments of deposition, geographic extent, and provenance and thus can contribute to an understanding of glacial events as an important part of Quaternary geology in the study area.

The more technical goals of the program were to maximize sampling density and to assure objectivity using available resources. As the amount of helicopter support would not permit a sampling density near that considered normal for reconnaissance sampling, it was most important that the sampling design allow testing sample reliability. In this report the till sampling program, including its design, execution, analysis, and other data processing, is described and the results are presented in the form of maps and table.

Acknowledgments

R.G. Garrett of Mineral Resources Division provided assistance and encouragement during the design of the sampling program and the ANOVA (analysis of variance) phase of data processing. Computer programs used for analysis of variance were provided by Garrett. The principal investigators of the Quaternary Geology Inventory Program, J-S. Vincent (northwestern Victoria), D.A. Hodgson (north-central Victoria), and D.R. Sharpe (Wollaston Peninsula) collected most of the samples and have given invaluable support through-

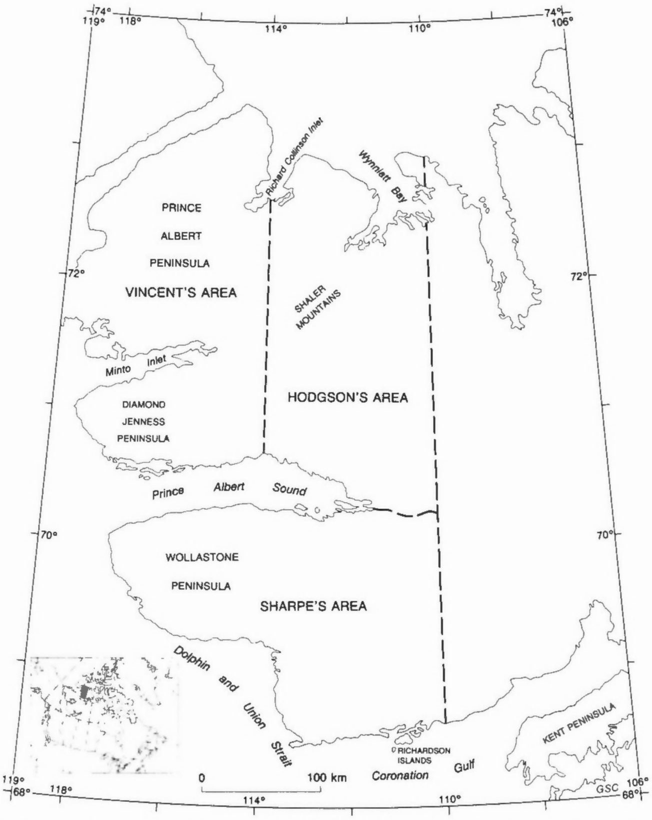

Figure 1. Location and study area on Western Victoria Island showing mapping subdivisions.

out. During data processing, particularly plotting, J.R. Bélanger provided not only pertinent programs and procedures but much patient advice. The report was reviewed by A.S. Dyke and R.N.W. DiLabio.

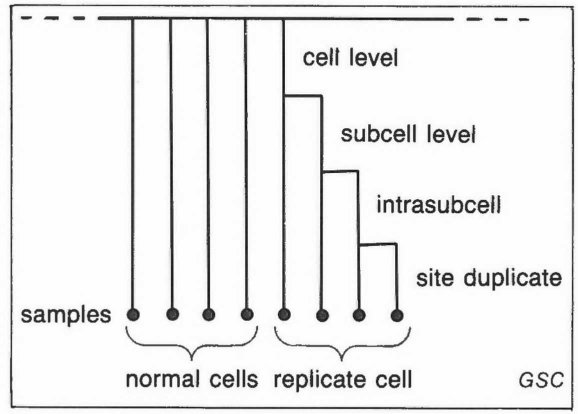

Figure 2. Four-level, inverted, unbalanced sampling design (after Garrett, 1979).

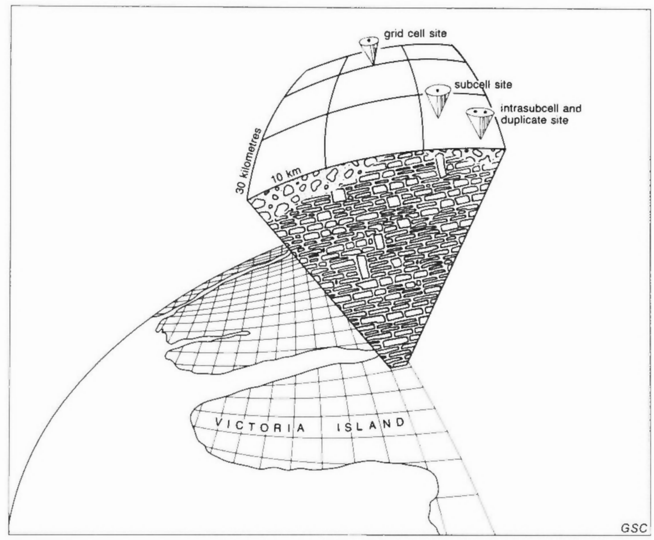

Figure 3. Schematic diagram of replicate cell relationship to sampling grid (about 20% of all cells).

METHOD

Program design

An unbalanced, inverted, nested (multilevel) sampling design, as described by Garrett (1979), was adopted. It allows evaluation of the effectiveness of sampling through analysis of variance with a minimum of replicate sampling and laboratory analyses. Hierarchical sampling levels include variation between grid cells, between subcells, within subcells, and variation at a site (Fig. 2). The Universal Transverse Mercator grid was modified to create equivalent area cells of land, each 900 km^2. Contained within each grid cell were nine subcells in which replicate sampling was done (Fig. 3). Sampling sites were chosen at random within cells and subcells and, after examination of airphotos, were moved to the nearest till outcrop. These sites were plotted on 1:250 000 scale topographic map sheets which were used in the field to integrate till sampling with geological traverses.

As stated, one goal of the till sampling program was to provide baseline till characteristics, the variability of which could be tested as a reliable representation of nature. To achieve this goal, statistically sound sampling procedures and a set of assumptions were adopted. Despite random site selection and fixed grid size, known geological information was not ignored. Within the structured sampling, replicate cells were chosen to represent geological complexity as well as to provide uniform distribution. Each geologist, besides collecting samples for the base program, added those sampling sites deemed necessary to meet general geological goals. Thus, in complex areas, more sampling was done.

Execution

Sampling at grid sites was done as rapidly as possible to complete the design successfully without compromising other aspects of the project. Thus, no attempt was made to dig to the frost table (as much as 1 m below the surface). From each shallow pit (normally 20-30 cm deep) as fresh a sample as possible was collected avoiding obvious organic accumulations, oxidation, and unrepresentative sorting.

There was concern that soil processes in the active layer might affect sample characteristics to the extent of masking primary variations unpredictably. Deeper pits, some well below the frost table, were dug at selected sites where soils were described and detailed profile sampling was carried out to provide information about the magnitude and nature of this potential problem (for similar work see Dyke, 1983, p. 18). In addition, soil zones were described and sampled in several shallower pits (Klassen, 1984).

At each sampling site, observations recorded on standard forms included local morphology; surface features, such as vegetation and stone cover; distinctive lithologies and frost forms; and various characteristics of the near-surface soil, such as drainage, stone content, presence of oxidation, and organic accumulation.

Laboratory analyses

All samples from the program were treated using the same series of tests, which included colour, granulometry, and geochemistry.

During sample preparation, the dry Munsell colour of the matrix and the percentage of the total sample remaining on the 2 mm sieve (the gravel value) were recorded. Sieve and pipette analyses for each sample, from which sand:silt:clay ratios were computed, completed the physical testing.

Total carbon and organic carbon contents were determined on the silt-plus-clay fraction using an electric induction furnace-combustion gas carbon analyser (LECO) and acid digestion techniques, the difference being taken as percent nonorganic carbon. The value produced is equivalent to a calcium carbonate content that would be required to give the measured result (and is expressed as a percentage by weight).

Trace element geochemistry of the clay fraction (< 2 micron) consisted of analyses for copper, lead, zinc, cobalt, nickel, silver, chromium, molybdenum, manganese, iron, cadmium, uranium, and arsenic. For determination of most elements, this fraction was leached with hot nitric and hydrochloric acids and the extract analyzed by atomic absorption spectroscopy. For uranium, the clay was leached with nitric acid and was analyzed by fluorimetry. In the case of arsenic, nitric perchloric acid leach was followed by colorimetric determination. Units of concentration are in ppm, except for iron which is expressed as a percentage.

Data processing

Files. Both laboratory results and site observations, along with identification and location information, were entered into a relational data base. Trace elements data for silver, molybdenum, and cadmium were not included because variation was insignificant, and levels were near detection limits. Laboratory data were selected and processed to produce the analyses of variance, data tables, and maps for this report. The data base provides ready access and easy information processing to mappers during compilation and interpretation of the Quaternary geology of western Victoria Island.

Analyses of variance. Only those records from the structured sample design were selected for statistical testing because criteria essential to the analysis are satisfied only within the design. Prior to analysis of variance, the data were tested for normality and homogeneity of variance and a transformation was applied to approximate these assumptions (Alder and Roessler, 1968, p. 276-278). Analysis of variance at the different levels of sampling indicate how much of the total variance occurs at the main (between-cell) level, thereby measuring the validity of the imposed sample density. Values for the proportion of variance at lower levels indicate the distribution of the variance and may suggest the degree to which sampling density must be increased to produce meaningful results. UANOVA, a program developed by Garrett and Goss (1980), was used to evaluate the sampling design.

Plotting. Records used for plotting include all those from the structured sampling design plus all other compatible records from till samples collected outside the design. Compatible records are those from samples representing the surface till at a site (i.e., not a buried till in section) and most nearly approximating the postdepositional environment of grab-type samples from the design (i.e., from near-surface rather than completely unaltered parent material). For example, where more than one sample was collected at a site, that most comparable to the bulk of other samples used was selected for plotting.

Geographic distributions for each variable were plotted as discrete point plots and as isarithmic maps. Plotting was accomplished through the URBIS5 package developed by Bélanger (1978) with subsequent modifications allowing raster scan ink jet plotting.

RESULTS

Data table

Laboratory results from all till samples analyzed are provided in Appendix 1. Each row in the table includes sample number, site number (plotted in Fig. 4), latitude and longitude, per cent gravel, sand:silt:clay ratio, carbonate content, concentration of the trace elements, Munsell colour, and symbols indicating whether the record was used for plotting and if it is part of the structured design. Also in this appendix are site observations, including coded surface conditions, shallow subsurface observations, and uncoded comments on site and situation. The data are sorted by ascending site number, and blanks in the table indicate missing data.

Analysis of variance

For most of the variables, from 60-80% of the variance occurs between 30 km grid cells. An empirical variance ratio indicating contour map stability or reproducibility (Garrett, 1979, p. 203) shows about one-third of the variable distributions will produce stable small-scale maps (i.e., if an equivalent sample were taken from the same area, a similar map would result). Another one-sixth are marginal for stable maps and the remaining half of the variables will produce maps with poor reproducibility.

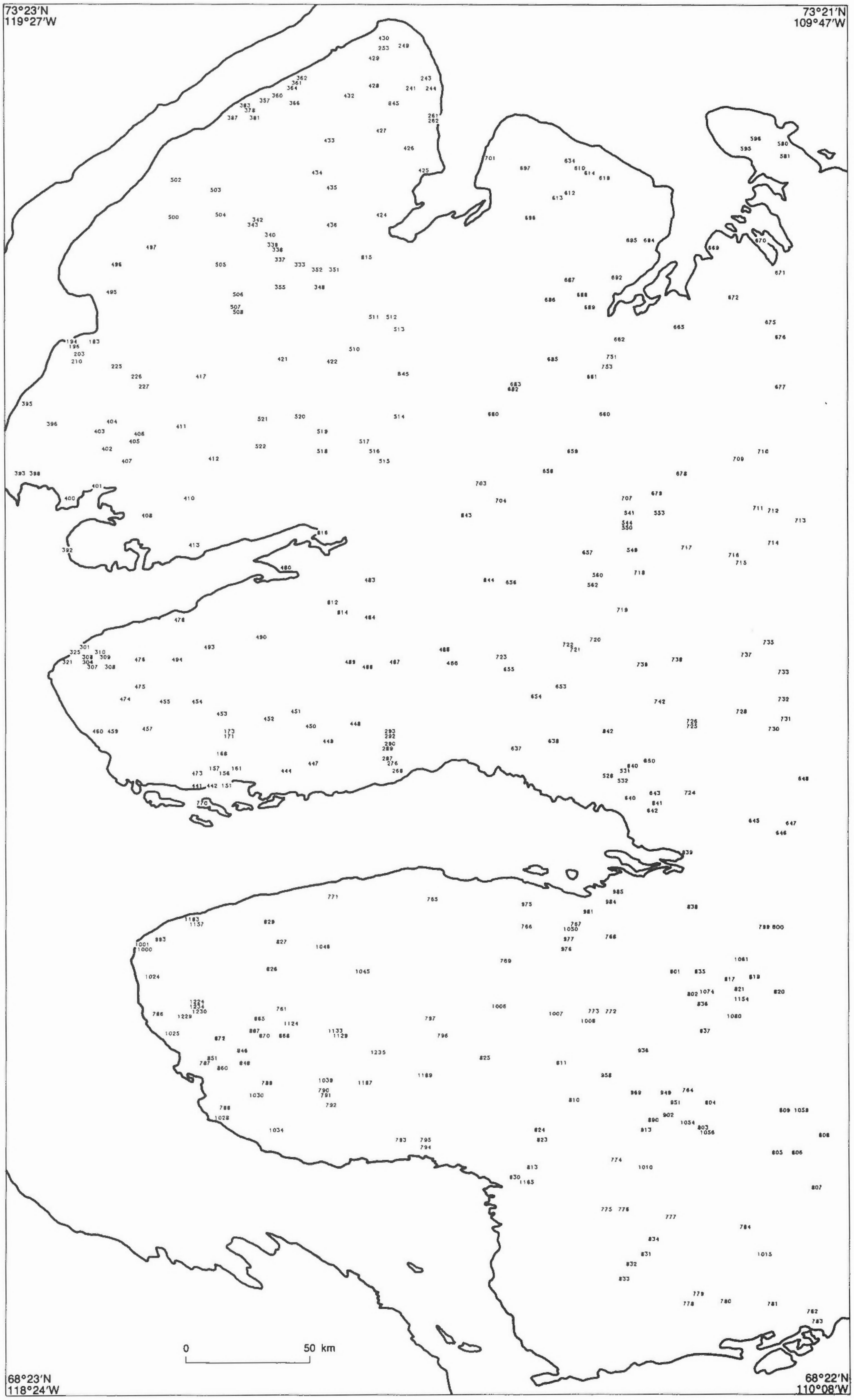

Figure 4. Location of till sampling sites on Western Victoria Island.

Table 1. Distribution of variance on regional and local scale

Variance	Variables											
	sand	$CaCO_3$	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe
% total variance between cells	51	83	64	79	76	59	65	77	59	43	59	53
% total variance within subcells	28	13	16	12	8	11	8	10	25	41	14	15
variance ratio*	1.0	4.8	1.8	3.8	3.2	1.4	1.9	3.3	1.4	0.8	1.5	1.1

*Empirical variance ratio is between cell variance divided by the sum of between-subcell, within-subcell, and on-site variance.

The distribution of variability between regional and local scales is summarized in Table 1. Grain size and uranium and iron concentration all show around 50% of variance at the main level and significant variance within 10 km subcells and at the site. This result indicates that sampling density would have to be increased greatly to describe adequately the regional variation. These variables also have low variance ratios which reduces confidence in the maps. Cobalt, manganese, and arsenic show 60% variance between grid cells but produce values of the variance ratio suggesting, according to Garrett's (1979) criterion, caution in using the derived maps. Sampling density for these elements should also be increased to at least a 10 km grid. Speculation about the causes of these differing variance distributions is beyond the scope of this report.

Plots

Fewer than half the maps plotted are based on data with good reproducibility in which considerable confidence can be placed. These data are presented in Appendix 2 as shaded isarithmic maps. Shading for each interval was chosen so that the distinct break between darker and lighter tone occurs at about the value of the mean plus two standard deviations.

Plots of those variables for which a lesser level of confidence is appropriate are presented in Appendix 3 as point-value maps. Line contours of the data are retained to aid initial inspection of the geographic distribution. Weaknesses in the sampling for each variable (as already described) should be considered when using these maps.

The interpolation algorithm and contour generation are identical for each type of map. The fact that some values fall the wrong side of the contour on the maps

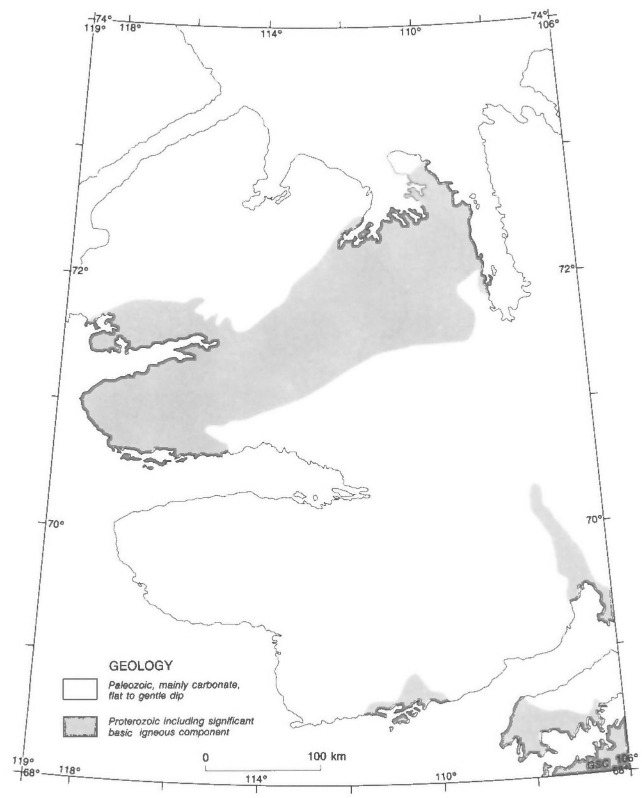

Figure 5. Generalized Proterozoic and Paleozoic geology of Western Victoria Island (after Thorsteinson and Tozer, 1962; Christie, 1964; and Douglas, 1969).

results from contouring of an interpolated grid rather than the actual sample site and values. The algorithm corrects for spotty and clustered data distribution and produces a "conservative" surface (Bélanger, 1978, p. 1-3).

It must be stressed that an interesting feature on the maps must always be related to the quantity and location of samples contributing to it as the distribution of sample sites is not uniform. For example, the striking peak and hollow in the sand and silt surfaces immediately south of Prince Albert Sound result from a single anomalous sample (Appendix 3).

Profile sampling

Analysis of detailed soil and depth-profile sampling indicates leaching of carbonates and enrichment of most trace elements in the upper or more oxidized material. None of these variations with depth or soil development was sufficiently large to change distribution plots significantly.

DISCUSSION

The plots are simply a presentation of the data in its geographic context. A detailed interpretation of distribution patterns is beyond the scope of this report. Some general observations and hypotheses may serve to illustrate the utility of initial data presentation of this type.

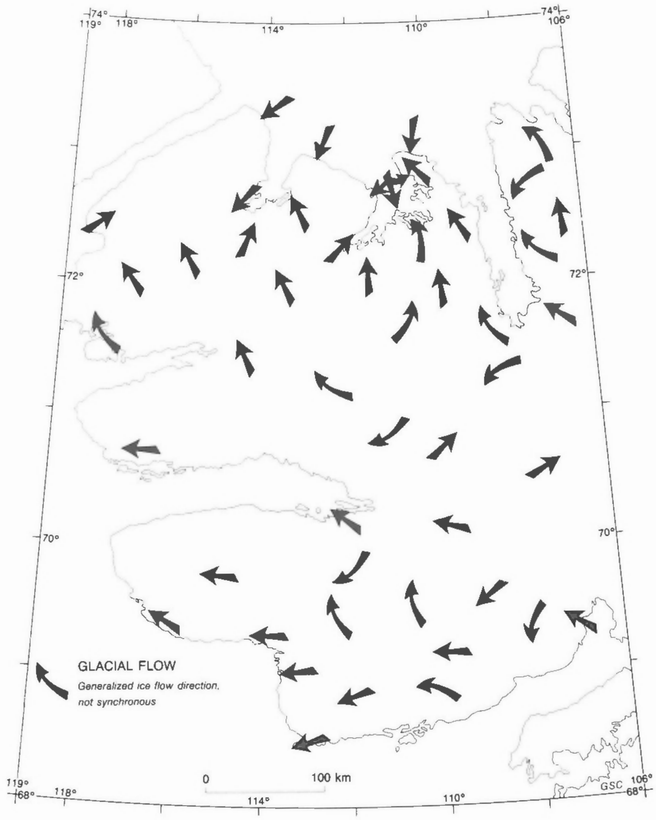

Figure 6. Generalized ice flow (modified from Fyles, 1963).

Using only those plots considered stable (Appendix 2), one can see the close association between till geochemistry and underlying bedrock (Fig. 5). Carbonate content is low over Shaler Group rocks with a low ridge between Minto Inlet and the northeast Shaler Mountains corresponding to a gap in the extrusive outcrop. Carbonate content is also low near the Richardson Islands where basic sills are exposed, contrasting with high values over much of the Paleozoic carbonate terrane. Copper, zinc, nickel, and chromium show similar, though reverse patterns linking these elements to the Proterozoic mafic rocks of Victoria Island. Lead is the exception, showing locally elevated levels over Paleozoic sediments surrounding the Shaler Group (arsenic trends correspond).

Superimposed on the substrate-controlled distribution are features resulting, no doubt, from various processes. Glacial transport (Fig. 6) is most likely responsible for high carbonate contents south of Wynniatt Bay and in eastern Diamond Jenness Peninsula. Low carbonate content and elevated copper, nickel, and chromium values east of Dolphin and Union Strait are within the ice stream curving from Kent Peninsula over Richardson Islands north of Coronation Gulf. Other dispersion by glacial transport can be seen north of Minto Inlet and between Richard Collinson Inlet and Wynniatt Bay in nickel-chromium, copper, and zinc levels (though the Minto Inlet zinc anomaly is based on few samples). Could elevated copper as well as other elements on Prince Albert Peninsula result from long-distance transport from mafic sources and deposition of englacial and supraglacial material near an ice limit?

Bedrock source and glacial transport are not the only processes causing variability in the geochemistry of tills. For example, low carbonate values in north-central Prince Albert Peninsula could result from dilution by glacial transport of mafic material, but may also reflect leaching on an older terrain (Vincent, 1984). A similar, low carbonate area in eastern Wollaston Peninsula could simply indicate a coarser facies of glacial sediment (Sharpe, 1984) from which more finely comminuted carbonate fragments have been partially removed during deposition.

Data tables and maps of variable distributions will be used in conjunction with other information for geological interpretation. The use of both forms of data presentation should be guided by information on the distribution of variance at each sampling level.

REFERENCES

Alder, H.L. and Roessler, E.B.
1968: Introduction to Probability and Statistics; Fourth Edition; W.H. Freeman and Company, San Francisco, 333 p.

Bélanger, J.R.
1978: URBIS5 user's reference manual; Geological Survey of Canada, Paper 78-21, 27 p.

Christie, R.L.
1964: Diabase - grabbro sills and related rocks of Banks and Victoria islands, Arctic Archipelago; Geological Survey of Canada, Bulletin 105, 13 p.

Douglas, R.J.W., ed.
1969: Geological map of Canada; *in* Geology and Economic Minerals of Canada, Maps and Charts; Geological Survey of Canada, Map 1250A.

Dyke, A.S.
1983: Quaternary geology of Somerset Island, District of Franklin; Geological Survey of Canada, Memoir 404, 32 p.

Fyles, J.G.
1963: Surficial geology of Victoria and Stefansson islands, District of Franklin; Geological Survey of Canada, Bulletin 101, 38 p.

Garrett, R.G.
1979: Sampling considerations for regional geochemical surveys; *in* Current Research, Part A; Geological Survey of Canada, Paper 79-1A, p. 197-205.

Garrett, R.G. and Goss, T.I.
1980: UANOVA: a FORTRAN IV program for unbalanced nested analysis of variance; Computers and Geosciences, v. 6, p. 35-60.

Klassen, R.A.
1984: A preliminary report on drift prospecting studies in Labrador: part II; *in* Current Research, Part A, Geological Survey of Canada, Paper 84-1A, p. 247-254.

Sharpe, D.R.
1984: Late Wisconsinan glaciation and deglaciation of Wollaston Peninsula, Victoria Island, Northwest Territories; *in* Current Research, Part A, Geological Survey of Canada, Paper 84-1A, p. 259-269.

Thorsteinsson, R. and Tozer, E.T.
1962: Banks, Victoria and Stefansson islands, Arctic Archipelago; Geological Survey of Canada, Memoir 330, 85 p.

Vincent, J-S.
1984: Quaternary stratigraphy of the western Canadian Arctic Archipelago; *in* Quaternary Stratigraphy of Canada - A Canadian Contribution to IGCP Project 24, ed. R.J. Fulton; Geological Survey of Canada, Paper 84-10, p. 87-100.

APPENDIX 1
Data table

-Identification-			-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample		site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
81VH 001	*	151	70°40'	116°23'	20.6	43.3	38.7	18.0	58.8	35	20	56	10	23	27	385	0.7	9	2.4	5 Y 6/2									
81VH 018		151	70°40'	116°23'	18.7	34.8	45.3	19.9	65.8	34	19	56	9	22	28	295	1.5	13	2.6	10 YR6/3									
81VH 005	*	156	70°40'	116°26'	38.0	42.9	41.1	16.0	59.1	29	18	60	9	22	30	355	0.6	12	3.0	10 YR5/4									
81VH 006	*	157	70°41'	116°32'	28.7	54.6	35.3	10.1	59.7	54	22	80	10	25	36	330	0.6	16	3.7	5 YR5/3									
81VH 008	*	157	70°41'	116°32'	65.6	73.6	22.3	4.1	58.3	52	16	84	17	37	38	360	1.2	14	3.5	10 YR5/3									
81VH 007		157	70°41'	116°32'	70.1	81.5	11.7	6.8	47.0	42	16	76	14	36	40	360	1.1	6	3.3	10 YR5/3									
81VH 011	*	161	70°41'	116°18'	48.8	48.2	43.7	8.1	58.2	66	19	86	12	31	37	355	2.9	19	4.0	5 Y 5/3									
81VH 013	*	168	70°44'	116°28'	21.1	35.9	43.2	20.8	52.5	54	15	78	14	32	40	380	0.6	10	3.8	10 YR5/3									
81VH 014	*	171	70°48'	116°23'	44.6	46.3	39.6	14.0	54.2	72	19	74	17	37	40	500	0.7	14	3.7	5 Y 5/3									
81VH 015	*	173	70°49'	116°22'	25.4	38.7	45.4	16.0	56.6	76	18	68	14	29	32	400	1.0	12	3.4	5 Y 5/3									
81VH 019	*	183	72°12'	118°12'	17.2	24.6	42.9	32.5	56.3	33	18	64	10	26	34	380	1.2	8	2.8	5 Y 6/2									
81VH 026	*	194	72°12'	118°20'	8.0	31.3	45.0	23.6	51.2	56	17	84	13	37	44	425	1.2	13	3.7	5 YR5/3									
81VH 029	*	196	72°11'	118°18'	21.9	35.8	46.1	18.1	54.5	46	18	80	10	31	39	380	0.9	13	3.4	5 YR5/3									
81VH 034		203	72°11'	118°15'	14.4	32.2	50.8	16.9	50.4	42	19	80	16	41	41	620	0.9	11	3.2	5 YR5/2									
81VH 036	*	203	72°11'	118°15'	5.0	45.4	38.7	15.8	53.2	46	19	84	15	41	40	580	1.0	12	3.3	5 YR4/3									
81VH 037		203	72°11'	118°15'	13.9	28.9	48.8	22.2	48.2	42	16	68	14	38	42	530	1.2	8	3.1	5 YR4/2									
81VH 040	*	210	72°08'	118°15'	20.7	45.1	43.8	11.0	54.5	88	16	94	14	40	48	380	0.8	20	4.6	10 YR5/2									
81VH 043	*	225	72°07'	117°47'	29.1	45.1	37.5	17.4	55.5	59	20	85	14	27	44	400	0.3	18	4.0	10 YR6/3									
81VH 044	*	226	72°05'	117°33'	62.5	79.3	14.8	6.0	52.1	130	31	110	22	43	48	2350	0.9	26	6.2	10 YR7/3									
81VH 045	*	227	72°05'	117°28'	54.6	61.8	28.4	9.8	41.6	130	24	118	20	49	50	1600	0.8	27	6.2	5 YR4/4									
81VH 048	*	241	73°09'	114°16	14.7	26.2	52.2	21.7	58.2	54	15	66	12	31	34	400	0.9	11	3.0	10 YR4/3									
81VH 049	*	243	73°09'	114°05'	33.7	36.6	42.0	21.4	56.6	52	17	82	13	34	40	390	0.6	16	3.5	5 YR5/4									
81VH 050	*	244	73°09'	114°02	4.9	16.3	41.0	42.7	45.8	44	18	80	12	34	38	465	0.9	15	3.3	5 YR5/3									
81VH 054	*@	249	73°18'	114°22	4.3	21.5	59.3	19.2	58.2	50	17	66	12	34	36	500	0.9	11	3.0	5 YR5/3									
81VH 055	*	253	73°18'	114°36	30.6	20.4	53.8	25.8	55.5	52	16	74	14	32	36	460	1.0	15	3.2	5 YR5/3									
81VH 059	*	261	73°03'	114°01'	4.8	15.1	51.6	33.3	50.2	44	19	72	14	34	38	520	1.9	11	2.9	5 YR5/3									
81VH 060		262	73°02'	114°01'	10.1	33.7	48.1	18.2	62.7	58	18	74	16	32	36	490	1.0	17	3.3	5 YR5/4									
81VH 062	*	262	73°02	114°01'	2.8	16.4	36.2	47.4	46.4	42	4	78	12	33	36	500	1.0	16	3.4	10 YR5/3									
82VH 001	*	268	70°41'	114°31'	48.4	48.0	38.5	13.5	65.7	24	20	35	7	13	24	300	0.1	9	1.7	7.5YR8/2									
82VH 004	*@	276	70°42'	114°34'	24.5	29.6	47.7	22.7	67.9	22	22	36	7	13	23	330	0.7	9	1.7	7.5YR8/2	40	10	< 5	1	I	M			hill
82VH 008	*	287	70°44'	114°39	20.3	40.3	43.2	16.5	68.7	22	23	47	11	18	23	290	0.2	15	1.8	10 YR7/1	10	50	< 3	1	I	M			hill
82VH 009	*	289	70°46'	114°38'	31.0	42.3	42.0	15.8	65.7	29	20	54	10	20	27	330	0.7	13	2.1	7.5YR7/2	10	60	< 3	1	I	M			hill
82VH 010	*	290	70°47	114°36	44.3	39.8	38.8	21.4	54.4	24	14	63	10	22	32	325	0.8	8	2.4	7.5YR7/2	10	50	< 1	1		M			ridge
82VH 011	*	292	70°49'	114°36'	44.9	42.1	43.6	14.3	57.0	38	23	79	15	29	41	420	1.0	11	3.6	7.5YR7/4	5	50	< 1	1	I	M			flat, hill top
82VH 012	*@	293	70°50	114°36'	42.2	38.9	37.7	23.4	47.3	18	13	54	11	20	33	300	0.8	6	2.4	5 YR7/4	5	60	< 1	1	I	M			hill
82VH 015	*@	301	71°06'	118°00'	31.3	40.9	40.0	19.0	59.1	76	22	90	17	30	38	440	0.4	14	3.2	10 YR7/2	20	60	R	10	W	N			hill
82VH 018	*	303	71°04	117°59	20.2	30.4	47.6	22.0	60.5	33	12	65	10	22	40	290	0.8	8	2.7	7.5YR7/2									
82VH 019	*	304	71°04'	117°58'	19.5	32.2	44.6	23.2	46.8	47	19	80	12	24	42	345	0.6	12	3.5	10 YR7/2	10	70	R	10	I	M			hill
82VH 020	*	307	71°02'	117°54	30.6	31.2	45.5	23.4	40.0	64	22	100	13	30	52	400	0.3	11	4.4	10 YR7/2	40	20	R	10	I	M			hill
82VH 021	*	308	71°02	117°49	20.6	24.3	44.6	31.1	31.2	62	19	110	17	34	46	520	0.2	14	4.9	10 YR7/3	10	70	R	10	I	M			hill top
82VH 022	*	309	71°04	117°52	27.6	32.2	46.2	21.5	42.3	54	21	98	15	28	48	440	0.0	12	4.6	10 YR7/3	40	20	R	10	I	M			hill top
sample		site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO_3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation
- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

-Identification-			-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample		site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
82VH 023	*	310	71°05'	117°50'	48.7	43.0	39.0	18.1	49.5	82	20	117	16	27	45	450	0.3	12	4.2	10 YR7/2	10	70	1	10	W	M			crest of ridge
82VH 030	*	321	71°04'	118°12'	24.4	47.1	37.3	15.7	53.2	44	18	73	11	26	37	420	0.8	8	3.3	10 YR6/1									
82VH 032	*	325	71°05'	118°07'	22.1	39.6	40.7	19.8	52.4	71	21	94	16	26	38	410	0.6	11	3.6	10 YR7/1	10	70	R	10	W	M			hill top
82VH 034	*	333	72°31'	115°38'	50.6	29.8	52.9	17.3	57.1	58	18	89	15	31	47	500	0.3	15	4.0	10 YR7/3	10	60	VR	10	W	M			top of ridge
82VH 035	*	337	72°32'	115°52'	37.0	37.2	39.0	23.8	53.7	44	19	76	12	26	44	415	0.6	15	3.6	10 YR6/3	30	50	VR	2	I	M			flat,high surface
82VH 036	*	338	72°34'	115°55'	36.9	38.4	48.5	13.1	64.2	49	22	100	14	33	47	480	0.3	19	3.8	10 YR6/3	50	25	VR	2	W	M			flat, low surface
82VH 037	*	339	72°35'	115°58'	57.2	68.9	23.6	7.4	57.5	99	34	118	21	40	50	760	0.4	27	5.3	10 YR7/3	60	20	R	3	W	M			flat area between De Geer moraine
82VH 038	*	339	72°35'	115°58'	31.8	58.8	32.5	8.7	60.0	73	28	100	19	34	52	664	0.3	23	4.8	10 YR6/3	20	60	R	2	W	M			crest of De Geer moraine
82VH 039	*	340	72°37'	116°01'	40.3	57.2	33.4	9.4	60.5	84	29	98	18	35	46	856	0.0	24	4.6	10 YR7/3	30	60	0	2	W	M			
82VH 040	*	342	72°40'	116°10'	18.4	56.0	34.4	9.6	55.3	75	22	110	13	24	43	300	0.8	14	4.3	10 YR6/3	50	20	0	5	W	M			flat, summit of small hill
82VH 041	*	343	72°39'	116°13'	53.1	40.1	43.3	16.6	48.8	72	23	94	16	32	46	580	0.8	23	4.2	10 YR6/4	50	20	0	2	I	M			flat, summit of small hill
82VH 042	*	348	72°26'	115°24'	26.0	43.6	39.8	16.6	59.9	43	23	78	13	24	40	350	0.3	18	3.4	10 YR6/3	40	35	R	2	W	M			flat, summit of small hill
82VH 043	*@	351	72°30'	115°14'	29.1	45.1	37.5	17.4	55.5	59	20	85	14	27	44	400	0.3	18	4.0	10 YR6/3	10	70	R	2	W	M			flat, summit of small hill
82VH 044	*	352	72°30'	115°26'	34.1	40.2	43.4	16.4	62.2	49	20	69	12	22	37	400	0.8	18	3.2	10 YR7/3	10	70	R	2	W	M			flat, summit of small hill
82VH 045	*	355	72°26'	115°53'	20.4	31.2	43.6	25.2	55.3	47	21	80	10	26	46	370	0.0	18	3.6	10 YR6/3	40	40	0	2	W	M			flat, summit of small hill
82VH 046	*	357	73°06'	116°05'	9.0	26.4	47.4	26.2	44.8	46	16	115	12	38	38	330	0.8	14	3.6	10 YR6/2	40	20	R	2	W	N			flat, top of hill
82VH 048	*	360	73°07'	115°57'	0.3	8.4	47.7	43.9	38.1	37	17	95	12	38	36	455	1.0	11	3.0	10 YR5/2									
82VH 049	*	361	73°10'	115°42'	1.0	8.3	42.1	49.6	37.7	39	19	108	10	38	38	320	1.2	13	3.5	10 YR5/2	10	40	MR	5	W	N			flat, top of hill
82VH 050	*	362	73°11'	115°39'	12.1	31.4	46.7	21.9	46.7	56	21	132	15	45	40	500	0.6	23	4.2	10 YR6/3	10	40	MR	2	W	M			flat, top of hill
82VH 051	*	364	73°09'	115°45'	1.7	9.4	56.8	33.8	49.1	42	19	93	12	37	37	395	1.0	13	3.4	10 YR6/2	5	50	1	5	W	N			flat, top of hill
82VH 052	*@	366	73°06'	115°43'	32.5	32.5	45.2	22.3	52.0	54	17	84	12	37	41	520	0.3	15	3.4	10 YR6/3	15	35	MR	2	W	M			flat, top of hill
82VH 054	*	378	73°04'	116°16'	16.9	29.2	42.3	28.5	44.3	47	18	112	13	39	42	370	1.1	16	3.9	10 YR6/2	20	30	MR	5	W	N			flat, top of hill
82VH 055	*@	381	73°02'	116°12'	47.7	66.0	24.1	9.8	55.2	61	20	128	16	51	40	540	1.3	17	3.6	10 YR6/3	20	50	R	2	W	M			flat surface
82VH 056	*	383	73°05'	116°20'	14.1	41.2	37.1	21.7	50.8	52	20	118	12	40	44	370	0.8	18	3.8	10 YR6/3	15	45	MR	5	W	M			top of flat hill
82VH 057	*	387	73°02'	116°30'	17.2	41.0	44.0	14.9	59.3	37	17	110	12	45	30	520	0.7	10	3.8	10 YR6/3	10	20	MR	2	W	M			top ot flat hill
82VH 058	*	392	71°27'	118°16'	36.8	43.7	37.5	18.8	47.5	39	21	77	13	40	50	540	0.2	10	3.3	5 YR6/3									
82VH 059	*	393	71°43'	118°50'	14.2	22.1	50.4	27.5	51.8	40	18	77	13	31	43	380	0.0	12	3.2	10 YR6/3									
82VH 060	*@	395	71°58'	118°48'	15.2	41.7	39.8	18.5	52.9	43	15	88	12	34	44	370	0.3	13	3.4	10 YR6/4									
82VH 061	*	396	71°54'	118°31'	26.9	38.8	39.8	21.4	51.7	60	21	80	13	38	55	380	0.0	14	4.0	10 YR6/4									
82VH 062	*@	398	71°43'	118°40'	3.8	15.8	45.7	38.6	48.6	40	19	75	12	30	46	365	0.0	11	3.3	7.5YR6/2									
82VH 063	*@	400	71°38'	118°15'	29.5	35.0	40.4	24.6	53.6	55	18	60	12	35	48	430	0.3	11	3.1	7.5YR6/2									
82VH 064	*	401	71°41'	117°58'	5.6	21.4	31.5	47.0	43.4	39	21	77	13	31	51	520	0.0	9	3.6	5 YR6/2									
82VH 065	*@	402	71°49'	117°51'	29.2	36.0	44.3	19.6	55.3	46	25	89	13	38	44	360	0.5	11	3.3	10 YR6/3									
82VH 066	*@	403	71°53'	117°58'	39.7	45.9	35.7	18.4	58.5	46	26	88	12	34	40	380	0.7	17	3.0	10 YR6/2									
82VH 067	*@	403	71°53'	117°58'	22.7	46.2	36.5	17.3	62.9	52	28	87	14	37	45	420	0.6	19	3.4	10 YR6/3									
82VH 068	*@	404	71°55'	117°49'	32.6	40.5	42.4	17.2	53.8	55	24	95	14	38	55	400	0.3	14	3.7	10 YR6/3									
82VH 069	*	405	71°51'	117°32'	78.8	68.8	25.4	5.8	52.0	123	84	2950	21	41	48	1300	0.2	12	3.4	10 YR5/2									
82VH 070	*	406	71°53'	117°29'	34.5	42.7	39.2	18.1	46.4	94	31	130	16	55	72	500	0.3	11	4.4	10 YR6/3									
82VH 071	*	407	71°47'	117°38'	29.7	47.5	40.9	11.6	52.1	90	29	108	17	56	66	540	0.6	13	4.5	10 YR5/2									
82VH 072	*	408	71°35'	117°22'	32.1	41.0	38.7	20.3	49.2	97	31	97	15	53	64	712	0.3	10	4.8	10 YR6/3									
82VH 073	*@	410	71°39'	116°53'	51.2	36.5	44.2	19.2	30.4	50	55	2200	19	70	75	560	0.0	7	7.0	5 Y 4/2									
82VH 074	*@	411	71°55'	117°00'	21.7	45.0	35.3	19.7	38.0	87	22	80	19	68	86	580	0.3	11	4.4	5 YR6/4									
82VH 075	*	412	71°48'	116°38'	27.8	28.0	42.4	29.5	38.5	80	17	75	18	71	104	440	0.3	9	3.8	7.5YR6/4									
82VH 076	*	413	71°29'	116°49'	38.9	39.9	42.9	17.3	46.3	86	27	70	22	64	74	520	0.0	10	4.0	10 YR6/3									
82VH 078	*@	417	72°06'	116°48'	60.8	55.3	32.0	12.7	44.3	86	28	117	19	48	57	935	0.4	18	5.3	10 YR6/4	10	90	VR	15	W	M			level, sorted polygon
82VH 079	*@	421	72°10'	115°50'	31.7	46.0	43.4	10.6	70.9	65	51	71	15	44	38	1100	0.3	27	4.0	10 YR6/3	20	40		10	W	M			2 deg. slope, sorted nets and stripes
sample		site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO_3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation
- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

-Identification-			-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample		site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
82VH 080	*	422	72°10'	115°15'	34.4	55.9	35.8	8.2	73.2	82	56	125	21	58	47	500	1.3	60	5.0	2.5Y 7/4	5	45	VR	1		V			1 deg. slope, sorted nets
82VH 081	*	424	72°42'	114°39'	17.6	59.0	28.5	12.4	64.5	50	24	72	12	32	46	345	0.3	21	3.0	10 YR6/3	25	25	VR	15	W	M			3 deg slope
82VH 082	*	425	72°51'	114°08'	9.9	21.8	43.6	34.5	58.2	33	17	55	9	28	34	410	0.6	12	2.1	10 YR6/2	15	20	1	15	I	M			1 deg. slope, nonsorted stripes(veg), no boulders
82VH 083	*@	426	72°56'	114°18'	2.3	8.2	41.3	50.6	49.1	46	17	76	14	28	38	440	0.7	13	2.8	10 YR6/2	1	50	R	20	W	N			level, slight desiccation cracks, otherwise featureless
82VH 084	*@	427	73°00'	114°38'	52.7	38.6	49.2	12.2	60.4	130	31	118	23	49	55	1000	0.6	27	5.7	10 YR6/6	20	60	R	25	W	V			level, sorted nets
82VH 085	*	428	73°10'	114°44'	47.4	55.0	32.7	12.3	51.6	118	31	136	20	56	49	860	0.9	37	9.2	10 YR5/4	10	80		20	W	V			low hummock on ridgetop, sorted nets
82VH 086	*@	429	73°16'	114°44'	21.2	49.2	37.6	13.1	54.3	94	21	100	14	37	50	350	0.9	23	4.7	10 YR6/3	25	50		15	I	V			5 deg. slope, sorted stripes
82VH 087	*@	429	73°16'	114°44'	29.9	35.8	41.7	22.5	50.7	70	18	91	14	36	47	350	0.9	14	3.8	10 YR6/2									
82VH 088	*@	430	73°20'	114°36'	5.4	18.0	46.3	35.7	39.6	40	14	106	14	42	35	310	0.9	12	3.0	10 YR5/2	1	50	1	15	W	V			ridge top
82VH 089	*	432	73°08'	115°03'	36.2	39.5	46.1	14.4	48.9	70	20	132	14	42	42	560	0.9	19	4.9	10 YR5/3	25	45		15	I	V			level, sorted nets
82VH 090	*@	433	72°58'	115°18'	70.9	40.2	40.6	19.2	45.1	113	20	108	18	39	49	530	0.6	15	4.0	10 YR5/3	20	70	0	25	W	M			level, ridge top
82VH 091	*@	434	72°51'	115°26'	22.5	37.3	43.2	19.5	49.8	111	19	90	17	39	47	430	0.6	16	3.5	10 YR5/2	25	50	0	20	W	M			level, ridge top
82VH 092	*@	434	72°51'	115°26'	29.0	42.9	43.2	13.8	47.8	94	19	109	12	31	40	420	0.5	17	4.4	10 YR5/3	20	70	VR	20	W	V			level, ridge top
82VH 093	*@	435	72°48'	115°15'	10.1	40.4	33.2	26.4	37.0	62	17	97	13	23	32	275	1.5	19	3.0	2.5YR4/2	25	50		20	W	M			level, ridge top
82VH 094	*	436	72°40'	115°15'	20.2	29.2	44.8	26.0	56.5	63	16	79	16	30	42	420	0.5	15	3.1	10 YR6/3	50	20	VR	15	I	M			3 deg slope, veg stripes, sorted nets, boils
82VH 095	*	441	70°39'	116°40'	18.8	41.2	43.6	15.2	62.5	60	20	78	13	27	36	410	0.4	12	2.9	7.5YR6/4	25	70	1	5	W	M			slope, small hill
82VH 096	*	442	70°39'	116°34'	35.8	55.6	32.2	12.2	65.8	55	25	79	15	28	36	410	0.7	17	3.1	7.5YR6/4	10	70	1	5	W	M			ridge top
82VH 097	*	444	70°41'	115°44'	30.7	42.0	41.8	16.2	66.2	24	23	71	12	17	26	310	0.9	13	1.9	7.5YR6/4	25	55	1	2	W	M			rolling knoll top
82VH 098	*	447	70°43'	115°27'	36.2	47.2	38.9	13.9	67.4	86	28	117	19	48	57	935	0.4	18	5.3	7.5YR6/4	30	50	1	3	W	M			flat, top of hill
82VH 099	*@	448	70°52'	115°00'	36.1	36.6	49.3	14.1	70.8	30	24	55	11	22	28	270	0.7	14	2.0	10 YR7/3	10	70	1	1	W	V			flat
82VH 100	*@	449	70°48'	115°17'	55.6	49.0	39.7	11.3	65.7	48	24	96	15	29	40	400	0.4	18	3.2	5 YR6/4	15	70	1	3	W	V			flat crest of hill
82VH 101	*	450	70°51'	115°29'	24.0	33.8	46.8	19.4	53.0	49	20	98	15	28	42	360	0.7	13	3.4	7.5YR6/4	15	75	2	2	I	V			3 deg slope
82VH 102	*	451	70°54'	115°38'	68.6	38.2	45.2	16.6	56.6	104	26	94	15	36	53	520	0.5	18	4.0	5 YR6/4	10	70	R	2	W	V			gentle slope
82VH 103	*@	452	70°52'	115°57'	22.5	38.2	38.5	23.4	58.4	51	17	61	12	23	36	380	0.5	10	2.5	5 YR6/3	15	75	1	3	I	M			flat knoll
82VH 104	*@	453	70°53'	116°28'	46.9	42.7	42.3	15.0	56.0	82	24	90	18	37	55	620	0.3	13	4.3	7.5YR6/4	10	75	1	5	I	V			sorted circle, flat top
82VH 105	*	454	70°55'	116°44'	26.2	52.1	40.1	7.8	65.8	108	39	169	24	47	55	1375	0.3	22	5.6	10 YR6/3	10	50	0	2	I				fines from sorted circles on ridge top
82VH 106	*	455	70°55'	117°06'	10.1	13.0	53.6	33.3	53.0	41	18	72	13	24	37	320	0.5	9	2.7	7.5YR6/4	25	20	1	10	W	N			flat
82VH 107	*	457	70°49'	117°16'	43.4	27.4	46.0	26.5	28.9	92	15	112	11	30	55	270	0.4	9	3.8	10 YR6/3	40	40	R	20	W	V			gentle slope, 1 deg.
82VH 108	*@	459	70°48'	117°40'	28.1	35.0	35.5	29.5	29.2	63	21	120'	15	29	46	370	0.0	7	3.7	10 YR6/2	25	50	R	5	W	V			flat
82VH 109	*@	460	70°48'	117°49'	12.5	30.3	42.8	26.9	44.7	85	19	95	13	27	42	330	0.2	8	3.3	10 YR6/2	40	20	R	10	W	V			veg stripes on gentle slope
82VH 110	*@	460	70°48'	117°49'	18.8	30.2	43.7	26.2	43.8	70	17	91	14	26	42	300	0.2	10	3.1	10 YR5/2									
82VH 126		473	70°40'	116°29'	45.8	41.9	44.1	13.9	66.7	65	16	71	12	26	35	240	0.5	14	2.8	10 YR6/3									
82VH 133		473	70°40'	116°29'	13.4	37.6	44.7	17.7	69.0	27	18	49	11	20	26	245	0.9	4	2.6	7.5YR6/4									
82VH 135	*@	474	70°55'	117°33'	8.0	16.9	48.1	35.0	20.2	68	21	120	16	34	52	380	0.2	8	4.0	10 YR6/2	25	50	VR	10	I	N			flat hill top
82VH 136	*@	475	70°58'	117°23'	9.7	14.4	46.2	39.4	11.2	88	26	112	18	53	75	535	0.6	10	3.6	10 YR6/3	50	40	VR	10	I	N			flat, low ridge
82VH 137	*	476	71°04'	117°24'	39.8	31.5	42.0	26.5	36.7	102	22	110	18	38	44	560	0.3	13	4.4	10 YR6/3	20	60	VR	25	W	M			flat crest
82VH 138	*@	478	71°13'	116°58'	15.6	39.6	43.0	17.5	43.9	186	22	106	22	43	47	570	0.0	10	4.7	2.5Y 6/2	30	60	VR	50	P	M			slight slope
82VH 139	*@	480	71°25'	115°46'	32.3	42.1	37.7	20.2	44.2	79	21	117	15	35	47	350	0.5	14	4.4	7.5YR6/2	30	60	0	30	I	M			flat, crest of hill
82VH 140	*@	483	71°23'	114°49'	22.8	39.7	34.9	25.4	52.2	45	14	129	8	19	38	270	0.3	4	2.6	10 YR7/1	5	75	0	5	I	V			slight slope
82VH 141	*@	484	71°15'	114°49'	37.6	35.0	39.6	25.2	36.7	59	14	73	11	27	55	280	0.5	6	3.0	2.5Y 6/4	10	60	VR	10	I	M			flat, crest of hill
82VH 142	*@	485	71°07'	113°59'	44.2	41.5	46.2	11.3	75.3	61	30	74	12	29	34	315	0.7	27	3.3	10 YR7/4	10	70	1	5	W	V			slight slope, near crest of hill
82VH 143	*@	486	71°04'	114°01'	15.1	41.8	50.0	8.2	74.3	59	33	104	15	37	42	360	0.7	27	4.5	10 YR6/4									
82VH 144	*@	487	71°05'	114°32'	31.6	48.2	42.6	9.2	67.8	58	26	111	16	37	52	520	0.5	15	4.2	10 YR6/4	10	50	1	5	W	M			slight slope near crest
82VH 145	*@	488	71°04'	114°51'	30.0	46.3	44.4	9.3	74.5	45	27	87	13	29	30	350	0.7	17	3.2	10 YR7/3	5	70	2	2	W	M			flat, crest of hill
82VH 146	*@	489	71°05'	115°02'	36.8	43.2	45.6	11.2	64.3	88	33	122	16	41	48	620	0.9	20	5.5	10 YR6/3	5	65	R	5	W	M			flat
82VH 147	*@	489	71°05'	115°02'	22.5	58.9	33.7	7.4	68.9	84	33	116	17	38	44	500	0.7	37	4.9	10 YR6/4									
sample		site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO_3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluorescent light, colour in comments is field observation

- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

-Identification-		-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
82VH 148 *@	490	71°10'	116°02'	55.9	64.7	26.6	8.7	35.6	355	19	122	30	46	59	880	0.5	15	8.1	2.5Y 6/2	10	65	0	80	P	V			flat, slight slope
82VH 149 *	493	71°07'	116°38'	20.5	22.5	54.1	23.4	54.8	84	13	166	12	26	30	360	0.5	8	2.7	7.5YR6/2	15	60	1	20	I	M			flat
82VH 150 *	494	71°04'	116°58'	20.3	42.4	39.1	18.5	51.2	90	17	90	14	31	37	470	0.5	9	3.8	10 YR6/2	5	75	VR	20	I	V			flat
82VH 151 *@	495	72°23'	117°54'	42.9	35.5	41.3	23.2	53.8	52	16	80	12	28	37	340	0.7	13	2.6	7.5YR6/2	25	40	1	10	I	M			flat
82VH 152 *@	496	72°29'	117°50'	7.4	26.7	43.4	29.9	52.7	52	15	73	11	28	35	340	0.7	9	2.5	7.5YR6/2	25	25	1	15	I	M			flat, hill top
82VH 153 *	497	72°33'	117°26'	20.2	41.1	46.8	12.0	57.1	77	19	95	13	34	38	410	0.7	13	3.8	10 YR6/3	20	30	1	10	I	M			flat, polygonized surface
82VH 154 *	500	72°40'	117°10'	32.8	51.1	27.8	21.1	42.8	46	17	108	13	34	32	300	1.0	16	2.9	10 YR5/2	40	30	R	5	I	M			flat, polygonized surface
82VH 155 *	502	72°48'	117°10'	25.7	32.9	41.9	25.2	49.0	55	18	116	12	47	34	320	1.3	15	2.7	10 YR5/2	25	35	MR	10	P	M			flat surface, shallow polygons
82VH 156 *	502	72°48'	117°10'	28.8	35.7	41.1	23.2	47.7	60	18	137	13	58	37	300	1.0	15	3.3	10 YR5/2									
82VH 157 *@	503	72°46'	116°40'	13.1	41.4	30.4	28.2	33.4	45	16	108	14	30	35	310	0.9	18	3.4	2.5Y 4/2	15	50	R	10	I	N			flat
82VH 158 *	504	72°41'	116°37'	31.8	47.0	24.6	28.4	30.4	45	16	98	15	30	35	390	0.9	18	3.7	2.5Y 5/2	25	60	R	5	I	V			gentle slope
82VH 159 *@	505	72°30'	116°36'	18.3	64.0	15.7	20.3	23.0	74	16	79	8	16	26	220	0.9	18	2.2	2.5Y 4/2	20	40	0	15	I	M			flat knoll, some sorting and high centre polygons
82VH 160 *@	506	72°24'	116°23'	38.5	51.8	33.9	14.3	47.0	77	19	93	14	30	45	340	0.7	20	4.0	10 YR5/2	35	40	0	15	I	M			slope, veg stripes
82VH 161 *@	507	72°21'	116°24'	13.4	41.6	38.7	19.6	61.3	61	22	83	14	28	37	390	0.8	18	3.2	10 YR6/3	20	40	0	5	I	M			flat, hill top
82VH 162 *@	507	72°21'	116°24'	35.0	42.7	38.3	19.0	49.1	76	19	95	14	28	43	320	1.1	24	3.4	10 YR6/2									
82VH 163 *@	508	72°20'	116°22'	37.7	64.8	26.7	8.4	55.8	98	22	107	19	39	44	640	0.9	23	5.0	10 YR6/3	15	40	R	5	I	M			flat, hill top
82VH 164 *	510	72°13'	115°00'	64.3	52.4	34.6	13.0	52.8	75	20	66	18	38	42	460	0.7	23	4.4	10 YR6/2	15	60	R	3	I	M			crest of ridge, polygons
82VH 165 *@	511	72°20'	114°45'	30.7	47.5	40.5	12.0	62.6	79	19	65	14	28	34	540	0.5	22	3.0	10 YR6/3	50	25	R	5	I	M			slope, below washing limits?
82VH 166 *@	512	72°20'	114°33'	34.1	53.4	33.6	12.9	64.1	87	16	86	13	31	39	440	0.5	15	3.3	10 YR6/2	60	30	R	5	I	M			crest of drumlin
82VH 167 *@	513	72°17'	114°28'	23.9	39.6	45.7	14.7	69.0	54	18	57	11	24	28	460	0.4	29	2.8	10 YR7/2	40	20	R	5	I	M			very gentle slope
82VH 168 *@	513	72°17'	114°28'	24.0	37.7	47.9	14.5	69.4	53	17	63	12	22	28	370	0.7	26	2.0	10 YR7/3									
82VH 169 *@	514	71°58'	114°28'	23.6	41.1	39.0	19.9	46.3	64	15	81	14	28	32	450	0.5	11	2.6	10 YR6/2	30	30	0	10	I	M			crest of knoll
82VH 170 *@	515	71°50'	114°38'	29.3	40.4	39.1	20.5	44.7	52	16	79	11	30	32	420	0.5	9	2.5	10 YR6/2	25	30	R	15	I	M			slope, veg stripes
82VH 171 *@	516	71°51'	114°46'	19.9	35.6	40.5	23.9	45.7	65	16	67	14	32	34	670	0.6	9	3.2	7.5YR6/2	25	45	R	5	I	M			gentle slope, pink colour
82VH 172 *@	516	71°51'	114°46'	28.1	34.7	42.1	23.2	45.2	70	15	86	14	30	42	450	0.6	10	3.3	10 YR6/3									
82VH 173 *@	517	71°53'	114°53'	23.4	31.7	47.9	20.4	57.3	52	23	55	14	30	33	430	0.6	27	3.0	10 YR7/3	25	40	R	5	I	M			crest of ridge, veg in nets
82VH 174 *@	518	71°51'	115°21'	26.8	24.6	44.7	30.7	41.2	44	17	81	17	33	40	550	0.3	18	3.7	10 YR5/3	30	55	0	1	W	V			flat, bouldery, somewhat sorted
82VH 175 *	519	71°55'	115°21'	38.8	45.8	36.2	18.0	53.4	43	19	57	17	30	38	410	0.7	31	4.6	10 YR5/4	30	55	0	1	I	M			high centre polygons
82VH 176 *@	520	71°58'	115°37'	40.7	39.2	35.5	25.3	41.1	44	23	58	21	37	40	390	0.9	27	4.0	5 YR5/3	20	50	R	1	I	V			flat, ridge top, shallow polygons
82VH 177 *@	521	71°57'	116°04'	26.3	41.0	41.0	18.0	48.2	68	25	76	20	36	43	500	0.9	23	4.2	2.5Y 6/2	25	60	R	1	I	M			gentle slope, veg stripes,
82VH 178 *@	522	71°51'	116°04'	20.2	47.9	28.6	23.5	31.7	37	41	91	19	51	26	745	0.9	43	3.6	10 YR6/4	60	15	R	1	I	M			flat, peculiar rock knobs
82HCA19/6- 5 *	528	70°38'	112°14'	20.2	42.4	45.0	12.6	80.0	20	35	32	10	15	18	440	0.5	16	1.7	10 YR7/3	<10	90	< 1	< 1	I	V			flat summit
82HCA20/6- 3 *	531	70°39'	112°02'	27.3	43.2	45.4	11.4	76.2	24	38	46	11	19	24	435	0.6	15	2.2	10 YR7/4	<10	90	< 1	< 1	I	V			flat summit, frost fissure troughs
82HCA20/6- 4 *	532	70°37'	112°04'	27.5	53.9	37.8	8.3	78.7	24	36	36	10	16	19	370	0.7	22	2.0	10 YR7/3	<10	90	< 1	< 1	I	V			flat summit, sorted nets
82HCA26/6- 1 *	541	71°33'	111°50'	25.7	44.3	48.0	7.8	63.7	57	27	117	17	37	57	805	0.2	13	4.0	10 YR6/3	20	50	0	20	I	M			3 deg. slope, sorted nets, 10YR 6/4
82HCA26/6- 4 *	544	71°33'	111°52'	52.1	46.4	44.9	8.7	63.2	124	29	116	20	41	54	835	0.2	13	4.0	10 YR6/4	20	40	< 1	>25	I	M			flat summit, 10YR 5/4
82HCA27/6- 4A*@	549	71°27'	111°50'	17.4	47.8	43.9	8.3	58.8	113	32	115	23	44	49	700	0.4	21	4.2	10 YR6/3	1	50	< 1	>25	I	M			summit of low hill, 10YR 4/3
82HCA27/6- 4B*@	549	71°27'	111°50'	10.2	48.5	41.8	9.7	64.8	66	31	82	17	32	40	495	0.3	18	3.1	10 YR7/3									10YR 5/4
82HCA27/6- 5 *	550	71°32'	111°52'	24.4	44.0	46.4	9.5	67.0	54	32	105	19	37	57	600	0.2	16	4.2	10 YR6/4	10	60	< 1	15	I	M			flat, sorted nets, 10YR 5/4
82HCA28/6- 3A*@	553	71°35'	111°30'	15.8	55.9	36.3	7.8	70.9	49	39	89	15	38	44	585	0.6	20	3.8	10 YR6/4		50	< 1	5	I	N			2 deg. slope, likely washed by lake, frost fissure troughs, 10YR5/4
82HCA28/6- 3B*@	553	71°35'	111°30'	17.7	41.0	46.5	12.5	72.0	39	33	64	13	28	35	335	0.3	21	2.8	10 YR6/4									7.5YR6/6
82HCA30/6- 2 *@	560	71°22'	112°14'	26.8	43.9	45.3	10.7	66.5	78	34	76	16	35	44	640	0.5	23	3.8	10 YR6/4		50	< 1	25	I	M			3 deg. slope, sorted stripes, 10YR 5/4
82HCA30/6- 4 *	562	71°22'	112°18'	29.6	48.0	33.8	18.2	70.7	50	41	81	16	32	48	410	0.6	33	3.8	10 YR6/4	10	60	<<1	?	W	V			flat, possibly washed, 10YR 5/5
82HCA 4/7- 9 *	580	72°51'	109°43'	20.6	48.5	45.0	6.5	54.0	64	29	95	16	26	38	560	0.7	16	3.8	10 YR6/3	5	40	<<1	>50	I	M			flat, sorted nets, 10YR 4/3
82HCA 4/7-10 *	581	72°51'	109°42'	8.4	5.3	42.2	52.4	46.7	20	18	60	9	18	26	330	0.7	8	2.9	10 YR6/2	20	40	< 1	10	I	N			flat, no sorting, 7.5YR 4/2
82HCA 5/7-11 *@	595	72°53'	110°10'	23.5	36.0	41.0	23.0	61.6	64	18	53	13	29	38	405	0.6	12	3.1	10 YR6/3	1	75	< 1	25	I	V			drumlin crest, little sorting, 10YR 5/2
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO_3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation

- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
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- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

-Identification-		-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
82HCA 5/7-12 *	596	72°55'	110°02'	35.7	38.5	38.4	23.0	60.9	42	23	69	10	23	32	390	0.3	14	3.1	10 YR6/3	10	50	< 1	10	I	M			1 deg. slope, 10YR 5/3
82HCA 9/7- 5 *	610	72°50'	112°14'	18.2	23.1	44.8	32.0	54.7	51	13	55	12	24	35	405	0.5	10	3.0	10 YR6/2	5	60	0	25	I	M			flat, 10YR 4/2
82HCA 9/7- 7 *	612	72°45'	112°22'	19.2	64.6	28.6	6.8	70.9	113	34	88	16	39	58	665	0.3	29	5.1	10 YR6/4	1	90	0	20	W	V			sorted nets, 10YR 5/4
82HCA 9/7- 8 *	613	72°44'	112°30'	33.3	41.5	41.2	17.3	66.8	66	17	64	16	30	41	480	0.7	13	3.2	10 YR6/3	5	75	0	15	I	M			2 deg. slope, sorted cells, 10YR 4/3
82HCA 9/7- 9 *	614	72°49'	112°07'	15.8	24.5	45.3	30.2	54.2	56	18	54	13	25	34	445	0.5	10	2.7	10 YR6/2	5	50	0	15	I	M			< 1 deg. slope, sorted nets, 10YR 4/3
82HCA10/7- 4 *@	619	72°48'	111°56'	23.6	23.5	39.6	37.0	56.8	44	22	54	11	23	27	380	0.6	12	2.1	10 YR6/2	10	45	< 1	15	I	N			flat, no sorting, 10YR 4/3
82HCA13/7- 3 *	634	72°52'	112°20'	10.0	21.5	38.7	39.9	54.8	34	14	48	11	23	29	410	0.7	4	2.3	10 YR6/2	5	45	0	10	I	M			flat, no sorting, 10YR 4/3
82HCA17/7- 1 *@	637	70°45'	113°13'	17.8	41.5	48.8	9.7	78.9	27	36	43	7	19	23	315	0.3	18	2.3	10 YR8/3	10	50	< 1	1	I	M			10YR 6/4
82HCA17/7- 2 *@	638	70°46'	112°49'	21.9	46.8	43.0	10.3	81.0	20	27	41	8	16	21	290	0.5	14	2.0	10 YR7/3	20	40	< 1	1	I	M			2 deg. slope, sorted polygons
82HCA17/7- 4 *	640	70°33'	111°59'	18.7	43.6	43.6	12.8	66.8	15	19	35	8	18	25	360	0.6	10	2.0	10 YR6/3		60	1	5	W	V			10YR 6/3
82HCA17/7- 6 *@	642	70°30'	111°45'	16.5	52.0	38.9	9.2	67.7	19	22	52	6	18	25	275	0.4	11	2.1	10 YR6/3	5	60	< 5	< 1					2 deg. slope, sorted nets, 10YR 5/4
82HCA17/7- 7 *@	643	70°34'	111°44'	14.8	47.6	43.5	8.9	60.8	27	27	46	9	22	30	320	0.4	15	2.4	10 YR6/3	60	30	1	< 1	I	M			sorted polygons, 10YR 5/3
82HCA17/7- 9 *	645	70°27'	110°41'	34.6	52.0	36.8	11.2	60.2	19	25	34	7	15	24	395	0.5	10	2.0	10 YR7/3		25	5	1	I	M			sorted ploygons, 10YR 5/4
82HCA17/7-10A*@	646	70°24'	110°24'	25.4	45.2	44.6	10.2	77.7	26	37	38	9	16	25	245	1.1	11	2.5	10 YR7/4	25	70	< 1	?	W	V			sorted polygons, 10YR 5/4
82HCA17/7-10B*@	646	70°24'	110°24'	27.9	44.2	45.4	10.3	75.3	24	37	43	8	20	24	235	1.3	25	2.3	10 YR7/4									
82HCA17/7-11 *@	647	70°26'	110°17'	9.7	46.4	43.7	9.9	62.1	25	26	46	8	18	28	275	0.4	9	2.1	10 YR6/3	20	25	<< 1	1	I	M			1 deg. slope, sorted nets, 10YR 5/4
82HCA17/7-12 *@	648	70°36'	110°06'	19.5	42.0	47.0	11.0	63.8	21	29	64	8	19	28	310	0.8	12	2.2	10 YR6/3	50	30	< 1	1	I	M			1 deg. slope, sorted nets, 10YR 5/4
82HCA17/7-14 *@	650	70°41'	111°20'	18.9	47.2	38.8	14.0	55.8	27	21	30	8	16	25	370	0.7	11	2.0	10 YR7/4		50	1	5	I	M			1 deg. slope, sorted nets, 10YR 5/4
82HCA17/7-17 *	653	70°58'	112°43'	25.3	48.7	44.4	6.8	68.2	28	38	84	14	31	47	370	0.7	20	3.5	10 YR6/4	50	40	< 1	5	I	M			flat, sorted nets, 10YR 5/4
82HCA17/7-18 *@	654	70°56'	112°59'	14.5	45.1	44.0	10.9	73.5	30	41	49	10	24	27	375	0.5	19	2.4	10 YR7/4			< 1	?	I				flat, sorted nets, 10YR 5/4
82HCA17/7-19A*@	655	71°02'	113°16'	14.2	43.0	48.6	8.4	71.9	33	27	73	9	22	33	265	0.6	18	2.3	10 YR7/3	10	50	1	?	I	M			1 deg. slope, sorted nets, 10YR 5/4
82HCA17/7-19B*@	655	71°02'	113°16'	21.7	41.9	50.1	8.0	73.8	34	37	78	12	25	43	350	0.7	24	3.4	10 YR7/4									
82HCA22/7- 1 *	656	71°21'	113°13'	32.0	31.3	47.7	21.0	53.6	36	15	62	10	22	35	390	0.3	7	2.4	10 YR7/2	10	80	<< 1	10	I	V			flat, 10YR 5/3
82HCA22/7- 2 *	657	71°27'	112°20'	15.4	61.9	29.8	8.3	61.9	35	19	70	10	22	39	340	0.5	10	2.3	10 YR6/3	25	40	<< 1	10	I	M			1 deg. slope, 10YR 5/4
82HCA22/7- 3A*@	658	71°45'	112°45'	73.8	65.0	27.8	7.2	1.9	319	13	105	43	76	98	2515	0.0	4	6.8	10 YR4/3	30	60		>90	I	V			sorted nets, 7.5YR 3/2
82HCA22/7- 3B*@	658	71°45'	112°45'	51.7	65.9	19.9	14.3	5.5	428	10	105	40	81	120	1815	0.0	3	6.6	10 YR4/3									
82HCA22/7- 4 *@	659	71°49'	112°28'	55.0	45.4	33.1	21.5	2.0	404	15	113	34	65	127	1125	0.0	6	7.0	10 YR4/4	15	80		>90	I	V			sorted nets, 7.5YR 4/2
82HCA22/7- 5 *@	660	71°57'	112°03'	56.4	63.9	29.3	6.8	2.0	277	9	100	39	138	120	2770	0.0	3	7.6	10 YR5/3	10	85		>90	I	V			sorted nets, 7.5YR 3/2
82HCA22/7- 6 *	661	72°05'	112°11'	15.2	32.8	35.8	31.4	45.2	51	9	66	9	23	44	235	0.3	6	3.5	7.5YR6/2	5	60	<< 1	>50	I	M			1 deg. slope, 10YR 4/3
82HCA22/7- 7 *@	662	72°13'	111°50'	30.9	37.2	37.5	25.4	56.2	94	8	68	11	23	43	285	0.0	5	3.0	10 YR6/1	2	75		<25	I	V			3 deg. slope, sorted stripes, 10YR 5/3
82HCA22/7-10 *@	665	72°15'	111°08'	30.5	43.6	39.2	17.3	70.3	58	15	97	9	25	37	280	0.5	10	3.3	10 YR6/2	1	75			I	V			sorted nets, 10YR 4/2
82HCA22/7-14 *	669	72°32'	110°39'	8.7	28.4	41.1	30.5	59.2	48	13	27	7	19	27	415	0.5	6	1.9	10 YR6/3	< 1	50		>50	I	MN			very silty, lacustrine? 10YR 5/2
82HCA22/7-15 *	670	72°33'	110°05'	29.0	42.4	38.8	18.8	58.8	54	20	44	10	21	30	320	0.3	16	2.8	7.5YR6/4	15	50	< 1	40	I	M			7.5YR 5/4
82HCA22/7-16 *@	671	72°26'	109°53'	21.6	41.4	40.9	17.7	60.2	51	16	40	11	20	28	325	0.5	15	2.9	7.5YR6/4	10	50	< 1	25	I	M			sorted stripes, 7.5YR 4/4
82HCA22/7-17 *@	672	72°21'	110°28'	39.1	55.4	36.3	8.3	71.8	137	25	133	25	39	58	1185	0.4	10	5.1	10 YR6/3	0	65		15	I	V			sorted nets, 10YR 5/3
82HCA22/7-20	675	72°15'	110°03'	11.5	47.5	42.7	9.8	71.5	44	32	60	14	26	35	600	0.5	16	3.1	7.5YR6/4	10	50	<< 1	10	I	MN			7.5YR 5/6
82HCA22/7-21A*@	676	72°12'	109°56'	5.9	47.5	41.3	11.2	71.8	36	38	62	12	24	35	410	0.6	20	2.9	7.5YR6/4	5	55		05	I	M			7.5YR 5/4
82HCA22/7-21B*	676	72°12'	109°56'	16.0	48.8	41.1	10.1	72.8	42	37	76	12	29	41	355	0.7	20	3.4	7.5YR6/4									
82HCA22/7-22 *	677	72°01'	110°00'	12.7	47.7	43.8	8.5	68.2	52	38	88	15	30	43	440	0.7	20	3.6	7.5YR6/4	5	35	<< 1	10	I	M			10YR 5/4
82HCA22/7-23 *@	678	71°43'	111°13'	22.3	49.1	41.5	9.4	57.6	111	24	124	21	40	94	380	0.3	15	6.0	10 YR6/4	25	40	<< 1	10	I	M			10YR 5/4
82HCA22/7-24 *@	679	71°39'	111°30'	16.1	46.1	44.2	9.8	58.2	74	33	124	16	38	60	410	0.3	19	4.6	10 YR6/4	25	40	0	05	I	M			10YR 5/4
82HCA23/7- 1	680	71°58'	113°22'	27.9	41.8	35.2	23.0	27.2	190	20	120	18	45	76	475	0.3	16	5.0	10 YR5/3	40	30	0	50	I	M			carbonate till stream, veg. stripes, 10YR 4/3
82HCA23/7- 3 *	682	72°03'	113°07'	39.7	49.2	35.6	15.2	37.3	200	14	100	24	52	55	710	0.1	9	4.9	10 YR5/3	50	30	0	50	I	M			veg. stripes, 7.5YR 4/2
82HCA23/7- 4 *	683	72°04'	113°06'	30.6	51.2	41.7	7.1	79.6	103	77	77	18	36	41	505	0.0	92	4.5	10 YR7/3	5	80	0	1	W	M			stone nets, carbonate till stream, 10YR 5/4
82HCA23/7- 6 *@	685	72°09'	112°38'	32.7	53.8	31.2	15.0	44.2	135	23	95	23	44	64	675	0.0	11	4.8	10 YR5/4	5	60	0	5	W	M			ridge crest, 10YR 4/3
82HCA23/7- 7 *@	686	72°22'	112°38'	34.6	36.6	47.4	16.1	43.8	136	26	127	23	51	81	880	0.2	18	5.5	10 YR5/4	5	80	0	15	W	V			sorted nets and stripes, 10YR 4/4
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as CaCO³ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation

- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

-Identification-		-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
82HCA23/7- 8A*@	687	72°26'	112°24'	24.1	41.4	41.6	16.9	47.3	110	17	95	19	43	73	490	0.0	14	4.8	10 YR6/4	15	50	0	5	I	M			10YR 5/4
82HCA23/7- 8B*@	687	72°26'	112°24'	22.9	51.0	37.2	11.7	49.8	118	20	102	18	41	64	480	0.4	15	4.5	10 YR5/4									
82HCA23/7- 9 *@	688	72°23'	112°16'	36.8	50.5	33.7	15.8	45.0	156	27	94	24	44	69	680	0.3	16	5.4	10 YR6/4	15	70	0	10	I	M			10YR 4/4
82HCA23/7-10 *	689	72°20'	112°10'	29.9	48.1	41.2	10.7	78.1	30	27	58	15	38	32	320	1.0	20	3.5	10 YR7/4	5	70	0	1	I	M			sorted nets and stripes, 10YR 5/4
82HCA23/7-13 *	692	72°26'	111°50'	26.0	40.2	40.3	19.5	69.5	51	31	34	11	23	27	390	0.5	22	2.5	10 YR7/4	5	65	0	5	I	M			sorted nets, 10YR 5/4
82HCA23/7-15 *	694	72°34'	111°26'	49.3	41.5	37.3	21.2	54.6	37	14	42	12	25	31	325	0.3	11	2.3	7.5YR6/4	10	50	0	5	I	M			7.5YR 5/4
82HCA23/7-16 *@	695	72°34'	111°38'	18.5	38.4	39.3	22.3	59.0	42	20	34	11	21	32	395	0.5	15	2.4	7.5YR6/4	10	60	5	?	I	M			clasts chiefly red and buff ss, some carbonate, 7.5YR 5/4
82HCA23/7-17 *@	696	72°40'	112°51'	20.8	29.9	55.1	15.0	53.0	77	22	112	16	42	64	485	0.4	18	4.4	10 YR6/4	15	35	0	15	I	M			10YR 4/4
82HCA23/7-20 *	697	72°51'	112°54'	24.4	33.7	46.6	19.7	58.2	62	18	79	12	33	47	345	0.0	14	3.4	10 YR6/3	10	35	0	15					7.5YR 5/4
82HCA23/7-22 *@	701	72°53'	113°18'	5.5	14.7	47.0	38.3	59.4	38	17	56	11	25	33	370	0.5	11	2.5	10 YR6/2	10	20	< 1	5	I	N			10YR 4/2
82HCA28/7- 1 *	703	71°43'	113°32'	34.9	45.8	26.1	28.1	15.9	93	11	77	13	33	50	430	0.0	5	4.4	5 YR5/3	25	60	0	40	I	M			7.5YR 4/2
82HCA28/7- 2 *	704	71°39'	113°19'	30.5	38.8	41.2	19.9	7.9	469	18	139	37	62	91	945	0.0	7	8.0	10 YR5/4	25	65	0	>90	I	V			weathered rock? 7.5YR 3/2
82HCA28/7- 5 *@	707	71°38'	111°51'	14.5	43.4	49.6	7.0	60.0	114	28	112	25	49	72	625	0.5	17	5.6	10 YR6/4			< 1	40	I	M			patchy veneer, 10YR 5/6
82HCA28/7- 7 *@	709	71°46'	110°32'	40.4	44.0	46.6	9.3	66.3	106	36	100	19	49	56	605	0.0	18	4.8	10 YR6/4	10	70	0	10	I	V			10YR 5/4
82HCA28/7- 8 *@	710	71°47'	110°15'	47.5	51.0	42.7	6.4	76.0	64	49	92	20	41	62	1825	0.0	18	5.6	10 YR6/4	1	80	<<1	1	I	V			10YR 5/4
82HCA28/7- 9 *@	711	71°35'	110°22'	29.2	47.1	44.9	8.0	71.8	54	44	56	16	28	34	715	0.5	23	3.8	10 YR7/4	5	75	<<1	1	W	M			possible mixed with outwash, 10YR 5/6
82HCA28/7-10A*@	712	71°34'	110°12'	28.6	42.3	46.0	11.7	78.7	34	38	47	8	19	24	340	0.3	21	2.3	10 YR7/4	50	25		1	I	MN			10YR 5/4
82HCA28/7-10B*@	712	71°34'	110°12'	13.1	38.9	52.3	8.8	75.0	26	31	63	8	20	28	305	0.3	13	2.3	10 YR6/3									10YR 6/6
82HCA28/7-11 *@	713	71°32'	109°53'	16.6	41.1	50.8	8.0	74.9	23	33	61	11	24	31	515	0.5	14	2.5	10 YR7/3	25	40	< 1	1	I				10YR 5/4
82HCA28/7-12 *	714	71°27'	110°14'	28.3	45.6	42.6	11.8	77.9	33	41	54	12	26	32	420	0.5	22	2.8	10 YR7/4	40	30	<<1	1	I	M			sorted polygons, 10YR 5/6
82HCA28/7-13 *	715	71°25'	110°35'	15.4	48.4	45.0	6.6	72.8	32	33	68	13	28	39	390	0.7	22	3.1	10 YR7/4	30	40	<<1	1	I	M			sorted polygons, 10YR 5/6
82HCA28/7-14 *	716	71°25'	110°41'	27.1	45.1	46.6	8.3	69.5	36	40	73	15	32	41	455	0.0	22	3.2	10 YR7/4	30	30	<<1	1	W	M			sorted polygons, 10YR 5/6
82HCA28/7-15 *@	717	71°27'	111°12'	27.0	37.7	52.8	9.5	64.0	40	35	108	17	34	46	470	0.0	18	3.3	10 YR6/4	30	30	<<1	1	I	MN			10YR 4/4
82HCA28/7-16 *@	718	71°22'	111°46'	76.0	56.3	32.2	11.5	39.2	38	32	73	19	29	34	390	0.0	16	2.9	10 YR5/4	60	30	0	< 1	W	VM			10YR 4/4
82HCA28/7-17 *	719	71°14'	111°59'	23.0	47.9	42.4	9.7	77.8	32	45	54	11	19	28	390	0.6	32	2.4	10 YR7/3			< 1	< 1	W	M			sorted nets, 10YR 5/4
82HCA28/7-18 *	720	71°08'	112°17'	17.6	33.8	55.5	10.7	64.9	24	36	74	11	23	33	365	0.5	18	2.8	10 YR6/3	50	20	< 1	< 1	P	MN			silty lake plain? frost fissure troughs,10YR 5/4
82HCA28/7-19 *	721	71°06'	112°32'	13.7	38.5	51.0	10.5	71.2	30	36	60	12	18	33	310	0.0	17	2.7	10 YR7/4	50	15	0	1	PI	MN			silty lake plain? frost fissure troughs, 10YR 5/6
82HCA28/7-20 *	722	71°07'	112°36'	26.7	40.7	51.9	7.5	66.6	32	39	104	14	25	37	330	0.4	16	2.7	10 YR6/4	50	15	< 1	1	PI	MN			desiccation cracks, slight polygon fissures, 10YR 5/4
82HCA28/7-21 *@	723	71°05'	113°21'	20.7	46.2	47.7	6.1	75.4	32	33	80	11	27	37	330	0.2	20	2.7	10 YR6/3	35	35	< 1	1	I	M			10YR 4/4
82HCA31/7- 1 *@	724	70°34'	111°30'	10.2	54.1	36.3	9.6	61.5	16	26	95	8	19	29	380	0.7	11	2.3	7.5YR6/4	60	20	< 1	< 1	I	M			frost fissure troughs, 7.5YR 5/4
82HCA31/7- 2 *	725	70°48'	111°17'	19.1	44.0	44.4	11.6	78.1	24	43	36	9	21	24	355	0.5	25	2.4	10 YR7/4	15	55	< 1	1	I	M			frost fissure troughs, 10YR 5/5-6
82HCA31/7- 3 *	726	70°49'	111°16'	12.2	44.6	44.5	10.9	75.8	20	40	40	8	18	27	295	0.5	23	2.4	10 YR7/3	15	50	< 1	< 1	I	M			frost fissure troughs, 10YR 5/6
82HCA31/7- 5 *	728	70°51'	110°43'	8.9	34.2	55.5	10.2	74.2	28	40	67	11	22	33	310	0.5	21	2.7	10 YR7/4	25	40	< 1	1	I	M			frost fissure troughs, 10YR 5/6
82HCA31/7- 7A*@	730	70°47'	110°23'	18.6	34.3	55.8	9.9	72.0	25	27	70	10	20	31	315	0.5	16	2.5	10 YR7/3	40	20	< 1	1	PI	MN			washed? 10YR 5/4
82HCA31/7- 7B*@	730	70°47'	110°23'	19.4	37.2	49.0	13.8	79.2	23	32	38	8	16	21	430	0.5	11	1.9	10 YR7/4									
82HCA31/7- 8 *@	731	70°49'	110°14'	17.7	36.8	53.7	9.5	80.1	24	36	58	12	19	28	290	0.9	21	2.5	10 YR7/4	25	35	< 1	1	I	N			5 deg. slope, 10YR 5/4
82HCA31/7- 9 *@	732	70°53'	110°15'	30.9	41.8	47.8	10.4	76.6	32	35	63	13	25	28	420	0.5	19	2.4	10 YR7/4	25	35	< 1	1	W	MN			10YR 5/4
82HCA31/7-10A*@	733	70°59'	110°14'	32.5	45.3	43.9	10.8	75.8	34	41	57	11	25	29	355	0.2	26	2.5	10 YR7/4	5	70	< 1	1	W	M			3 deg. slope, sorted nets and stripes, 10YR 5/4
82HCA31/7-10B*@	733	70°59'	110°14'	47.5	53.5	39.4	7.1	75.6	36	45	73	12	25	38	400	0.5	30	3.3	10 YR6/4									
82HCA31/7-12 *@	735	71°06'	110°22'	15.2	50.2	40.5	9.3	72.3	35	43	54	14	26	37	440	0.4	22	3.2	10 YR7/4	20	60	< 1	1	I	M			10YR 5/6
82HCA31/7-14 *@	737	71°03'	110°37'	33.2	50.4	42.4	7.2	69.7	36	41	87	17	34	45	580	0.8	22	3.8	10 YR7/3	15	60	< 1	1	W	M			sorted nets, 10YR 4/4
82HCA31/7-15 *@	738	71°03'	111°24'	3.8	50.2	39.8	10.0	71.3	30	40	76	16	33	46	480	0.0	18	4.0	10 YR7/4	50	20	< 1	1	I	M			sorted nets, outwash?, 10YR 5/6
82HCA31/7-16 *@	739	71°02'	111°47'	24.8	47.8	41.2	11.0	69.8	29	27	69	11	28	40	315	1.0	19	2.9	10 YR7/3	30	40	< 1	1	I	M			sorted nets and polygons, 10YR 5/4
82HCA31/7-19 *	742	70°54'	111°37'	11.7	49.4	39.2	11.4	67.5	26	37	57	10	26	34	390	0.7	20	2.8	10 YR7/4	40	40	< 1	< 1	I	M			sorted polygons, frost fissure troughs, 10YR 5/4
83HCA19/7- 1	751	72°09'	111°57'	32.4	37.1	29.9	33.0	22.8	61	13	74	12	32	47	280	9.3	4	3.6										
83HCA19/7- 3	753	72°07'	112°01'	27.8	38.3	32.9	28.8	39.2	20	9	47	10	22	36	250	0.7	4	2.6										
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO^3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation

- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

-Identification-		-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
82NJ 301	*@ 761	69°47'	115°46'	61.5	53.5	34.7	11.8	77.1	22	8	21	3	10	10	200	0.4	3	0.7	10 YR8/2	40	55	< 2	< 1	W	VM	X		till plain
82SBB 21CN	761	69°47'	115°46'	36.2	56.2	32.2	11.8	73.8	22	6	16	4	7	9	130	0.5	2	0.5	10 YR8/2									
82NJ 305	*@ 764	69°29'	111°34'	23.9	45.9	38.1	16.0	57.8	34	19	42	8	20	24	330	0.9	7	2.0	5 YR7/3	30	55	3	5	W	M	X	X	hill top
82NJ 314	*@ 765	70°13'	114°10'	48.0	88.2	10.2	1.6	74.2	30	35	53	12	29	32	460	0.7	23	2.4	2.5YR6/2	10	85	2	5	W	M	X		moraine ridge
82NJ 315	*@ 766	70°06'	113°10'	33.1	49.6	43.2	7.2	60.7	50	36	57	10	25	36	330	0.8	20	3.2	10 YR7/3	30	25	6	6	W	M	X	X	small moraine remnant, 20% erratic clasts
82NJ 317	*@ 767	70°06'	112°38'	25.1	43.8	44.5	11.7	61.7	45	30	45	9	23	29	340	0.5	16	2.5	10 YR7/4	60	30			I	M	X	X	moraine, mud boils, 15% erratics
82NJ 318	*@ 768	70°03'	112°16'	28.1	51.7	36.4	11.9	76.5	26	27	22	4	10	12	210	0.9	15	1.2	2.5Y 8/2	40	40			W	M		X	drumlin, veneer of silty sand
82NJ 316	*@ 769	70°00'	113°25'	13.6	48.1	36.7	15.2	51.8	48	26	62	12	27	37	410	0.9	13	3.1	10 YR7/4	80	15	4	10	I	N	X	X	till plain, weak polygons, 20% erratic boulders
82NJ 319	*@ 770	70°33'	116°40'	15.4	27.8	42.6	29.6	60.8	60	18	52	9	20	28	260	0.5	13	2.2	7.5YR6/4	30	60	0	80	I	M	X		washed tillplain, 40% outcrop, shells, 7.5YR 5/4
82NJ 320	*@ 771	70°14'	115°13'	56.1	57.6	38.7	3.7	77.0	50	39	126	12	36	40	530	0.8	25	3.6	10 YR7/3	15	50			W	M	X		moraine
82NJ 321	*@ 772	69°47'	112°23'	35.8	50.8	34.2	15.1	42.8	39	19	54	10	26	33	430	0.5	6	2.7	7.5YR7/4	30			10		M	X	X	moraine, 15m polygons
82NJ 322	*@ 772	69°47'	112°23'	19.7	46.4	40.8	12.8	44.2	46	18	54	9	25	32	380	0.5	6	2.5	5 YR7/3	20	75		10	I	M		X	moraine, polygons, 73% carbonate boulders, 14% red siltstone
82NJ 323	*@ 773	69°47'	112°29'	52.9	71.0	20.3	8.7	44.5	49	22	56	13	28	32	470	0.9	10	2.6	5 YR7/3	35	55			W		X	X	upland, 10 m polygons with 1m relief
82NJ 324	*@ 774	69°15'	112°20'	12.2	44.6	40.5	14.9	61.2	32	20	32	9	18	20	400	0.6	12	2.0	10 YR7/4	55	10			W	M	X	X	drumlin crest, 2 m polygons,10% boulders
82NJ 325	*@ 775	69°04'	112°27'	17.3	47.3	36.7	16.0	47.8	49	17	45	8	23	30	330	1.1	7	2.5	7.5YR7/4	75	15			W	M	X		drumlin crest, shells, <1% boulders
82NJ 326	*@ 775	69°04'	112°27'	12.0	47.2	42.2	10.6	44.2	53	15	51	9	24	32	355	0.7	7	2.7	5 YR7/3	85	10			W	M	X		drumlin flank
82NJ 327	*@ 776	69°04'	112°20'	22.3	52.3	34.7	13.0	52.6	49	12	43	6	23	28	330	0.5	5	2.2	5 YR7/3	80	15			I	M	X	X	2-3m ploygons, 10-15cm relief, shells
82NJ 328	*@ 777	69°02'	111°49'	18.0	54.3	37.2	8.5	38.7	58	17	61	12	35	40	440	0.3	9	3.6	7.5YR6/4	75	20			W	V		X	drumlin, boils, <5% boulders
82NJ 329	*@ 778	68°43'	111°41'	7.3	29.3	65.2	5.5	31.8	120	14	54	11	34	35	380	0.7	10	3.3	10 YR8/3	80	10				N	X	X	40% outcrop, <1% boulders,pink quartzite common
82NJ 330	*@ 779	68°45'	111°34'	26.7	45.7	40.2	14.1	13.4	45	19	70	20	39	50	640	0.7	10	4.2	7.5YR7/2	80				I	M		X	veneer, 30cm/rock, 75% of erratics are pink quartzite
82NJ 331	*@ 779	68°45'	111°34'	45.4	68.2	26.6	5.2	25.7	78	16	57	16	33	34	620	0.3	15	3.3	10 YR7/2	80	15			W	V	X	X	veneer/rock, 30% quartzite erratics
82NJ 332	*@ 780	68°43'	111°19'	16.3	58.2	30.3	11.5	27.5	52	14	48	11	32	34	380	0.5	7	3.4	5 YR7/3	85	15		10	W	M	X	X	<10% boulders, 70% carb., 20% quartzite, 10% granitic
82NJ 333	*@ 781	68°42'	110°51'	36.9	50.7	37.4	11.9	15.9	61	19	64	17	38	45	495	0.7	9	4.5	5 YR7/2	85	10			I	M		X	30cm veneer,1-2%boulders,70%carbonates, 20% quartzite
82NJ 334	*@ 782	68°40'	110°27'	14.9	40.3	35.9	23.8	17.9	68	14	85	13	41	58	365	1.4	7	4.2	5 YR6/2	95	2			W	M			veneer
82NJ 335	*@ 783	68°38'	110°24'	20.7	53.2	37.2	9.6	22.9	73	13	63	11	35	42	320	0.8	7	4.2	5 YR7/4	80	15	10	4	W	N		X	colluvial slope,striped,overlain by sand
82NJ 336	*@ 783	68°38'	110°24'	35.0	58.9	34.3	6.8	18.2	83	16	67	16	37	46	335	0.7	10	4.8	5 YR7/3	90	5	20	4	I-W	N	X		colluvial slope, 5 deg., boils, pebble lith. 40% carb.,20% basic,25% q.,25% s.s
82NJ 337	*@ 784	68°59'	111°04'	26.2	46.8	43.7	9.5	42.9	69	17	55	11	33	38	380	0.5	9	3.3	5 YR7/3	80	20			I-W	M	X	X	low ridge, veneer, 40cm/rock,5%boulders,boils
82NJ 339	*@ 786	69°47'	117°04'	22.7	32.4	40.2	27.3	62.0	32	16	44	7	22	28	330	0.5	8	2.3	7.5YR8/2	40	40	10	10	I	M	X	X	gently undulating, washed, 10m polygons, 20% erratics
82NJ 340	*@ 787	69°37'	116°34'	31.2	37.1	39.1	23.8	65.1	27	14	39,	8	20	27	320	0.3	6	2.0	5 YR8/2	25	70	9	7	W	M	X	X	moraine ridge, weak polygons, 16% erratics
82NJ 341	*@ 787	69°37'	116°34'	23.5	34.6	46.7	18.8	65.2	26	14	39	5	19	24	315	0.3	6	1.9	5 YR8/2	20	75			I	M	X	X	moraine, 2m polygons with low relief
82NJ 342	*@ 788	69°27'	116°20'	29.2	64.7	28.6	6.7	58.4	34	13	67	11	30	38	335	0.0	11	3.0	10 YR7/3	60	30	8	2	W	M	X	X	till plain, veneer/rock, near esker, 20% erratics
82NJ 343	*@ 789	69°31'	115°55'	25.0	35.7	48.5	15.8	64.8	27	11	31	4	17	24	260	0.0	6	1.6	7.5YR8/4	40	25			I	M	X		ribbed till plain, 15% erratic boulders, boils
82NJ 353	* 790	69°32'	115°20'	40.0	45.5	35.9	18.5	50.6	52	19	66	13	39	48	400	0.5	11	3.7	5 YR7/3	15	70	5	9	W	V	X	X	hummocky moraine, 1m polygons with 30cm relief, 20% erractic clasts
82NJ 344	* 790	69°32'	115°20'	25.2	41.8	38.2	20.0	50.3	51	15	64	11	34	45	420	0.3	10	3.5	5 YR7/3	25	65			W	V	X		moraine ridge
82NJ 345	*@ 791	69°31'	115°17'	28.8	56.6	36.9	6.4	51.9	66	27	89	13	38	50	390	0.7	17	4.6	10 YR7/3	10	85	5	10	W	V	X		kame, 1 to 3m polygons to stripes, 25% boulders, 15% erractic
82NJ 346	*@ 792	69°29'	115°14'	31.6	44.9	42.6	12.5	60.0	36	16	36	9	23	26	350	0.3	7	2.1	5 YR7/2	20	75	8	16	W	M	X	X	small moraine ridge, 25% erratic clasts
82NJ 347	*@ 793	69°21'	114°32'	18.9	43.1	39.1	17.8	63.3	26	15	25	3	13	18	270	0.3	5	1.4	5 YR8/2	70	15			W	M	X	X	drumlin, 2-5 deg. slope, 5m polygons
82NJ 348	*@ 794	69°19'	114°17'	28.2	56.7	32.6	10.7	54.6	37	16	58	9	25	40	290	0.5	13	2.9	2.5Y 7/2	70	25	4	12	W	M	X	X	drumlin, beached, 2-3 m polygons, 16% erratic clasts
82NJ 349	*@ 794	69°19'	114°17'	17.6	37.6	42.5	19.9	60.2	30	15	34	7	18	24	285	0.2	4	1.9	5 YR8/3			2	13	W	M	X	X	drumlin, beached, 2-3 m polygons, 15% erratic clasts
82NJ 350	*@ 795	69°21'	114°16'	18.2	41.1	40.6	18.2	66.1	23	11	28	8	19	20	290	0.2	6	1.5	7.5YR8/2					W	V	X	X	small drumlin, 5 deg. slope, 1 m polygons, compact till
82NJ 351	*@ 796	69°43'	114°05'	80.2	50.7	41.8	7.5	54.9	47	21	85	11	39	42	310	0.3	13	4.0	10 YR7/3	25	50	2	2	W	M	X	X	moraine, stone stripes, mud boils, 5% erratic clasts
82NJ 352	*@ 797	69°47'	114°13'	27.3	47.7	45.9	6.4	54.5	49	25	80	16	42	50	460	0.0	15	4.3	10 YR7/4	45	40	5	25	W	M	X	X	till plain, small mud boils, 30% erratic clasts
82NJ 354	*@ 799	70°04'	110°49'	35.1	66.8	27.5	5.7	67.2	26	24	24	5	19	20	280	0.5	13	1.9	10 YR7/3	50	35	4	18	W	M	X	X	drumlins, 2-5 deg. slope, 10 m polygons, 22% erratic clasts
82NJ 355	*@ 800	70°04'	110°39'	18.5	47.6	37.0	15.4	68.6	22	20	22	4	15	16	260	0.6	9	1.6	10 YR8/3	40	40	5	19	W	M	X	X	ground moraine, 10 m polygons, mud boils, 24% erratic clasts
82NJ 356	*@ 801	69°55'	111°37'	23.5	49.4	39.4	11.2	61.2	41	20	39	8	27	30	300	0.4	14	2.4	10 YR7/3	50	40	12	18	W	M	X	X	upland, 20% boulders, 30% erratic clasts
82NJ 357	*@ 802	69°50'	111°27'	14.8	23.7	51.2	25.2	42.9	39	18	53	12	28	36	400	0.6	8	2.9	5 YR8/3	25	60	5	20	I	N	X	X	small moraine ridge, 5 m high, 3m ploygons, stripes, 25% erratic clasts
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO^3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation

- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

-Identification-			-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample		site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
82NJ 358	*@	803	69°21'	111°26'	26.8	58.4	31.2	10.5	63.4	57	29	46	11	26	31	360	0.7	17	2.9	10 YR7/3	60	25	2	8	W	V	X	X	3 deg. slope, no polygons, near glaciofluvial features, <10% erratic clasts
82NJ 359	*@	804	69°26'	111°20'	39.3	49.8	40.1	10.1	60.2	53	16	60	10	25	36	275	0.9	10	2.6	10 YR6/2	30	50	2	7	I	M	X	X	till plain, mud boils, 25% boulders, 18% erratics
82NJ 360	*@	805	69°15'	110°41'	33.0	48.4	37.3	14.3	61.3	30	27	58	15	38	32	320	1.0	20	3.5	2.5Y 7/4	90	5	15	20	W	V	X	X	till veneer/rock, mud boils, 5% boulders, 35% erratic clasts
82NJ 361	*@	805	69°15'	110°41'	36.1	43.1	45.8	11.1	66.3	29	33	53	12	31	28	360	0.9	18	3.6	2.5Y 7/4	75	15			I	M	X	X	till plain, veneer/rock
82NJ 362	*@	806	69°15'	110°33'	27.6	40.7	44.2	15.1	69.1	34	26	24	10	19	20	355	0.5	14	2.0	10 YR8/3	70	15	3	13	I	M	X		till plain, sorted mud boils, 16% erratic clasts
82NJ 363	*@	807	69°07'	110°19'	11.9	43.3	47.2	9.5	59.2	68	22	33	14	24	26	420	0.9	13	2.2	10 YR8/3	70	15	4	20	W	M	X	X	drumlin ridge in lake, boils, outcrop, 24% erratic clasts
82NJ 364	*@	808	69°18'	110°11'	27.1	51.9	38.2	9.8	56.6	58	30	51	14	33	36	350	0.7	21	3.2	2.5Y 8/4	70	20	2	7	W	M	X	X	fluted plain,10m polygons, mud boils, 10% erratic clasts
82NJ 365	*@	809	69°24'	110°34'	28.3	43.0	42.8	14.2	72.5	31	28	47	10	28	21	345	0.7	18	2.4	2.5Y 7/4	65	25	7	7	W	V	X	X	drumlin ridge,mud boils & stripes, 14% erratic clasts
82NJ 366	*@	810	69°28'	112°44'	21.4	48.3	42.1	9.6	58.6	41	17	43	9	22	30	340	0.6	9	2.2	10 YR7/3	40	50	3	15	W	M	X		low moraine ridge,10m weak polygons, 18% erratic clasts
82NJ 367	*@	811	69°36'	112°51'	26.1	50.7	40.7	8.6	61.2	43	19	39	9	23	32	280	0.5	9	2.3	10 YR8/3	45	45	7	19	W	M	X	X	moraine ridge, 10m polygons, 26% erratic clasts
82NJ 701	*@	812	71°18'	115°15'	36.6	51.9	29.9	18.2	17.4	296	13	160	29	44	54	540	0.0	8	9.0	2.5Y 5/4	25	60	0	90	I	M	X		plateau top, till veneer/basic sill
82NJ 702	*@	812	71°18'	115°15'	26.9	54.1	29.3	16.6	12.3	329	18	160	27	39	55	600	0.2	9	9.4	2.5Y 5/4									
83NJ 402	@	813	69°14'	113°12'	20.3	50.0	39.8	10.2	54.7	46	13	39	8	23	30	210	0.3	5	2.2	7.5YR7/6	80	10			P	M	X	X	swale between drumlin ridges
82NJ 703	*@	814	71°18'	115°08'	22.3	46.4	37.7	15.7	33.9	392	18	160	31	47	54	776	0.2	12	9.7	2.5Y 6/4	5	90	0	95	I	V	X		plateau, thin till or regolith/basic
82NJ 704	*@	815	72°33'	114°51'	12.9	17.4	55.3	27.2	48.2	41	18	95	15	38	62	230	1.4	28	4.4	2.5Y 6/2	50	40	R	50	I	M	X		knoll showing through stony marine sediment
82NJ 705	*@	816	71°33'	115°22'	43.4	34.9	40.9	24.2	33.1	70	15	77	22	36	58	360	0.0	11	4.1	7.5YR6/2	25	40	0	40	W	V		X	colluvial slope, most clasts mudstone
83NJ 370A	@	817	69°53'	110°56'	26.4	44.0	40.1	15.9	62.2	32	21	28	7	18	23	290	1.0	12	2.1	10 YR7/3	60	35	0	5		M	X		drumlin top, gentle slope, mud boils
83NJ 370B	@	817	69°53'	110°56'	14.5	42.0	41.8	16.2	61.7	30	20	24	5	17	20	260	1.0	9	2.0	10 YR7/3	30	60	0	2		M	X		drumlin top, gentle slope, mud boils
83NJ 371	@	819	69°53'	110°48'	15.3	39.0	42.2	18.7	70.2	22	14	20	4	14	16	240	0.9	8	1.5	10 YR7/3									
83NJ 372	@	820	69°50'	110°33'	16.8	36.9	44.5	18.6	66.2	24	17	21	5	16	16	240	1.6	9	1.7	10 YR7/3	60	20	0	R	IW	M	X	X	plain, veneer/rock?, weak 5m polygons
83NJ 373		821	69°53'	110°56'	8.7	43.0	40.4	16.6	61.4	34	21	30	6	21	24	280	0.9	11	2.2	10 YR7/4					W	M	X		drumlin crest
83NJ 374		821	69°53'	110°56'	13.4	41.5	41.5	17.0	61.8	32	17	31	6	20	23	260	1.0	9	2.1	10 YR7/4									
83NJ 375		821	69°53'	110°56'	23.0	41.0	42.0	17.0	64.3	31	19	27	7	20	20	310	1.4	10	2.0	10 YR7/3									
83NJ 376		821	69°53'	110°56'	17.6	42.9	40.8	16.3	62.4	32	19	27	6	18	20	280	1.1	11	2.0	10 YR7/3									
83NJ 377		821	69°53'	110°56'	20.3	40.1	42.7	17.2	66.4	25	16	23	5	16	18	280	1.4	9	1.7	10 YR7/3									
83NJ 378		821	69°53'	110°56'	26.4	39.6	43.0	17.4	64.6	22	14	24	7	17	20	320	1.4	8	1.6	10 YR7/3									
83NJ 379		821	69°53'	110°56'	35.5	42.8	39.8	17.4	64.0	18	14	24	6	16	20	300	1.0	5	1.5	10 YR7/2									
83NJ 380		821	69°53'	110°56'	37.2	41.5	41.3	17.2	66.3	18	14	23	6	15	18	300	1.4	5	1.5	10 YR7/2									
83NJ 383	@	823	69°20'	113°05'	22.5	47.9	34.8	17.3	26.3	30	10	46	14	29	34	380	0.9	4	2.9	5 YR6/3	90	5			I	M	X	X	till plain
83NJ 384	@	823	69°20'	113°05'	10.1	50.3	34.6	15.1	40.5	31	14	42	10	26	32	320	1.4	5	2.7	7.5YR6/4									
83NJ 385	@	824	69°22'	113°06'	24.7	42.7	40.6	16.7	55.0	18	16	26	6	16	18	300	0.6	6	1.7	10 YR7/3	65	30			W	V	X	X	veneer/rock platform
83NJ 386	@	825	69°38'	113°39'	34.1	51.5	34.8	13.7	52.2	42	16	42	10	26	28	380	0.0	5	2.4	7.5YR7/4	10	85			W	V	X	X	moraine, hummocky, 5m polygons
83NJ 387	@	826	69°58'	115°53'	27.0	50.0	34.6	15.4	45.0	39	12	53	11	34	42	380	0.9	3	2.8	10 YR6/3	25	65			W	V	X	X	moraine ridge
83NJ 388	@	827	70°04'	115°46'	7.5	43.9	47.8	8.3	60.2	24	15	54	7	22	26	270	0.8	6	2.3	10 YR6/4	65	45			I	N	X	X	plain
83NJ 389	@	827	70°04'	115°46'	25.8	51.1	39.7	9.2	68.9	29	17	46	7	23	27	270	0.6	8	2.4	2.5Y 7/4									
83NJ 390	@	829	70°08'	115°54'	28.1	43.8	42.3	13.9	84.9	20	19	26	4	15	16	200	0.0	0	1.5	10 YR7/3	5	85			W	V	X	X	hummocky moraine
83NJ 391		830	69°12'	113°22'	17.2	46.1	37.0	16.9	62.9	26	9	22	5	15	16	230	0.5	2	1.4	7.5YR7/4					W	M	X	X	drumlin crest, washed, shell fragments
83NJ 392		830	69°12'	113°22'	26.0	46.3	37.3	16.4	60.9	30	11	26	5	16	18	210	0.6	3	1.5	7.5YR7/4									
83NJ 393		830	69°12'	113°22'	19.6	46.9	35.9	17.2	61.8	26	10	26	4	14	16	220	0.5	2	1.4	7.5YR7/4									
83NJ 394		830	69°12'	113°22'	23.1	45.4	37.5	17.1	63.1	24	9	24	5	12	18	200	0.0	0	1.3	7.5YR7/4									
83NJ 395		830	69°12'	113°22'	26.0	44.2	38.4	17.4	63.3	30	11	29	4	16	18	240	0.8	3	1.5	7.5YR7/4									
83NJ 396		830	69°12'	113°22'	27.6	45.5	37.3	17.2	64.3	22	10	23	5	13	16	230	0.6	2	1.3	5 YR7/3									
82SBBI10-1	*	831	68°54'	112°05'					47.0	80	20	63	12	32	38	420	1.1	10	3.0	10 YR7/3									
82SBBI10-2		832	68°52'	112°13'					42.3											7.5YR7/2									
82SBBI10-3	*@	833	68°49'	112°18'					42.2	86	16	67	15	32	44	400	1.1	10	3.4	7.5YR7/2									
82SBBI11-3	*	834	68°57'	112°00'					45.8	64	22	57	16	32	40	460	0.9	6	3.0	7.5YR6/4									
sample		site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO_3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation
- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

-Identification-		-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
82SBBI14-1	835	69°55′	111°21′					65.8											10 YR7/2									
82SBBI14-2 *	836	69°48′	111°21′					63.0	31	24	36	10	23	26	400	0.7	11	2.0	10 YR7/3									
82SBBI14-4A	837	69°42′	111°20′					63.9	81	21	68	12	28	28	420	0.8	10	2.0	10 YR7/3									
82SBBI14-4B	837	69°42′	111°20′					61.3											10 YR7/3									
82SBBI15-2 *	838	70°09′	111°24′					71.1	18	20	22	5	12	16	310	0.6	6	1.2	10 YR7/3									
82SBBI16-4	839	70°21′	111°25′					76.6											10 YR7/2									
82SBBI17-2	840	70°40′	111°57′	9.0	32.9	59.0	8.1												10 YR7/2									
82SBBI17-4B	841	70°32′	111°42′					66.0											10 YR7/3									
82SBBI18-3	842	70°48′	112°12′	3.0	36.1	57.1	6.8												10 YR7/3									
82SBBI21-1	843	71°36′	113°42′	12.0	39.8	51.1	9.1												7.5YR7/2									
82SBBI21-4	844	71°22′	113°29′																10 YR6/3									
82SBBI23-1A	845	73°06′	114°30′	19.0	44.4	48.2	7.4	70.1	57	25	62	19	34	34	800	0.7	12	2.8	10 YR7/2									
82SBB 1 *	846	69°40′	116°11′	26.3	58.9	27.5	13.6	75.3	24	10	29	5	11	16	220	0.6	5	1.4	7.5YR7/2			4	1	W	M	X		exposure
82SBB 3 *	848	69°37′	116°08′	37.5	70.6	23.0	6.4	66.8	66	17	69	12	26	37	420	0.8	15	3.0	10 YR7/3	25	65	< 1	2	W	M	X		moraine
82SBB 6C *	851	69°38′	116°29′	45.8	52.7	33.3	14.0	79.3	16	6	21	4	6	10	180	0.9	3	0.7						W				exposure
82SBB 14B1	860	69°36′	116°22′	34.4	57.4	34.4	8.2	57.2	45	17	84	17	28	41	535	0.9	14	3.0	10 YR7/3	20	80			W	M			hill side
82SBB 14B2	860	69°36′	116°22′	9.4	12.6	65.4	22.0	55.0	38	15	60	12	22	32	370	0.5	6	2.4	7.5YR7/4									
82SBB 14C *	860	69°36′	116°22′	24.6	48.2	42.6	9.2	60.6	45	14	64	12	21	32	390	0.7	10	2.3	10 YR7/3									
82SBB 20B2	865	69°47′	115°47′	37.6	51.3	42.2	6.5	55.8	51	18	109	16	33	44	600	0.5	13	3.6	10 YR7/4									
82SBB 20CDX *	865	69°47′	115°47′	58.7	73.9	23.5	2.6	74.2	28	12	38	8	21	20	425	0.5	8	1.6	10 YR8/3									
82SBB 23 *	868	69°43′	115°53′	30.3	50.5	34.6	14.9	65.3	20	7	28	4	11	16	240	0.5	4	1.1	10 YR7/2	25	60	2	2					fluted plain
82SBB 25	870	69°43′	115°56′	20.2	45.0	39.2	15.8	72.1	16	8	21	3	5	11	178	0.4	3	0.8	10 YR8/2									
82SBB 26B1	871	69°42′	116°25′	16.5	39.9	44.7	15.4	66.6	22	7	30	6	10	16	290	0.7	4	1.3	7.5YR7/2									
82SBB 26B2 *	871	69°42′	116°25′	27.9	39.0	46.1	14.9	62.9	26	9	31	6	9	19	285	0.9	13	1.7	5 YR7/2									
82SBB 27IIIX	872	69°42′	116°25′	27.7	44.1	42.1	13.8	57.4	41	11	67	11	24	35	370	1.4	8	2.4	7.5YR7/4			6	2	W	M			exposure
82SBB 27IIIZ	872	69°42′	116°25′					65.8	30	9	38	6	12	22	320	1.1	5	1.4	7.5YR7/2									
82SBB 43AB	887	69°44′	116°03′	18.6	46.9	45.2	7.9	61.0	22	10	67	6	14	22	270	0.4	5	1.6	7.5YR6/2									
82SBB 43B	887	69°44′	116°03′	14.3	40.2	47.4	12.4	58.7	21	7	39	4	12	18	215	0.4	5	1.4	10 YR7/2									
82SBB 43CDX *	887	69°44′	116°03′	21.8	49.4	40.8	9.8	66.1	24	10	37	6	13	19	230	0.3	8	1.4	10 YR7/2									
82SBB 43CN	887	69°44′	116°03′	22.5	38.9	46.9	14.1	73.0	16	5	19	4	6	10	165	0.2	4	0.8	10 YR8/2									
82SBB 46 *	890	69°23′	111°56′	23.7	46.2	42.8	11.0	62.5	30	13	35	8	12	20	355	0.7	10	1.4	10 YR7/3			2	6	W	M	X		thaw flow scar
82SBB 58 *	902	69°24′	111°47′	27.6	35.3	42.1	22.6	62.5	26	8	33	6	11	18	280	0.7	4	1.3	7.5YR7/4						VM			exposure
82SBB 69B *	913	69°21′	112°00′	9.6	37.5	48.9	13.6	57.7	27	19	41	11	22	28	400	1.1	8	2.2	7.5YR7/4	80	10	3	5	W	M	X		fluted plain
82SBB 69CN	913	69°21′	112°00′	28.9	45.9	43.3	10.8	68.9	28	10	27	7	10	15	280	0.9	6	1.4	7.5YR7/2									
82SBB 92B	936	69°38′	112°00′	15.1	49.0	40.4	10.7	45.7	38	11	54	12	23	30	425	0.7	8	2.3	5 YR7/3									
82SBB 92CN *	936	69°38′	112°00′	19.0	45.6	42.9	11.5	53.3	36	8	47	9	15	25	340	0.7	5	1.9	5 YR7/3									
82SBB105AB	949	69°29′	111°47′	27.7	51.6	39.8	8.6	61.8	26	12	65	8	12	20	370	0.3	10	1.8	10 YR5/2									
82SBB105CDX	949	69°29′	111°47	25.5	54.2	36.2	9.6	57.2	30	17	48	9	16	25	350	0.9	17	2.3	7.5YR7/4									
82SBB105CN	949	69°29	111°47′	18.4	45.7	43.8	10.4	58.8	32	12	42	9	15	25	320	0.7	12	2.0	10 YR7/3									
82NJ 302 *@	949	69°29′	111°47′	26.2	46.6	39.0	14.4	60.8	30	18	44	8	15	24	335	1.1	12	2.2	7.5YR6/4	75	15	< 1	5	W	MN	X	X	till,plain
82SBB107AB	951	69°28′	111°42	21.4	48.2	37.8	14.1	64.0	26	12	51	8	12	20	260	0.5	11	1.5	10 YR7/2									
82SBB107B	951	69°28′	111°42′	8.4	44.4	39.9	15.7	55.7	39	25	69	13	22	30	395	1.0	15	2.9	10 YR7/4									
82SBB107C	951	69°28′	111°42′	36.6	52.2	35.6	12.2	66.2	31	14	39	10	11	20	310	0.5	10	1.6	10 YR7/3									
82NJ 303 *@	951	69°28′	111°42′	40.3	52.9	35.1	12.0	66.5	31	19	36	7	8	18	300	0.9	11	1.7	10 YR8/3	60	20	2	5	W	M	X	X	fluted plain
82NJ 304 *@	951	69°28′	111°42	42.0	52.5	35.7	11.8	67.2	34	20	36	5	19	21	270	0.8	13	1.8	10 YR8/3									
82SBB114 *@	958	69°33′	112°23′	27.0	51.8	40.1	8.1	60.3	44	23	51	10	26	26	350	1.0	14	2.5	7.5YR7/4									
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO_3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation

- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

-Identification-			-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample		site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
82NJ 306		969	69°29'	112°05'	24.4	45.8	40.6	13.6	62.8	35	18	42	8	20	24	360	0.9	9	1.9	7.5YR7/4	35	50	5	5	W	MN			knoll at base of moraine
82NJ 307		969	69°29'	112°05'	18.9	46.0	40.5	13.5	62.5	35	19	41	7	17	24	320	0.8	8	2.0	10 YR7/3									
82NJ 308	*	969	69°29'	112°05'	22.2	45.1	41.2	13.7	62.0	36	18	44	6	19	24	315	0.9	7	2.0	10 YR7/3									
82NJ 309		969	69°29'	112°05'	18.9	47.0	39.0	14.0	62.2	38	20	44	6	19	24	310	1.1	10	2.1	10 YR7/3									
82NJ 310		969	69°29'	112°05'	23.8	45.0	40.7	14.2	61.5	35	20	42	7	17	23	320	0.9	10	1.9	10 YR7/3									
82NJ 311		969	69°29'	112°05'	14.9	46.1	39.8	14.1	62.7	38	18	40	10	18	28	330	0.7	8	1.9	10 YR7/3									
82NJ 312		969	69°29'	112°05'	12.1	46.5	39.2	14.3	61.3	37	19	42	6	20	30	350	0.8	8	1.9	10 YR7/3									
82NJ 313		969	69°29'	112°05'	14.5	45.6	40.3	14.1	61.0	33	19	38	7	21	28	360	0.5	8	2.0	10 YR7/3									
82SBB125A		969	69°29'	112°05'	35.8	61.9	30.9	7.2	58.1	24	17	57	9	25	28	405	0.8	10	1.8	10 YR6/2									
82SBB125B		969	69°29'	112°05'	12.6	44.6	44.9	10.5	61.3	34	16	39	8	22	28	340	0.8	8	2.0	10 YR7/3									
82SBB125COX		969	69°29'	112°05'	15.6	45.1	44.8	10.1	60.8	35	16	39	8	23	29	310	1.0	9	2.0	10 YR7/3									
82SBB125CN		969	69°29'	112°05'	14.7	44.4	45.0	10.6	62.0	34	17	43	8	20	28	360	0.9	8	1.8	7.5YR7/2									
82SBBH 6	*	975	70°11'	113°09'	31.8	30.1	55.2	14.6	75.5	26	26	42	9	18	26	300	1.2	14	2.0	10 YR8/2									
82SBBH 7AB		976	70°01'	112°46'	18.8	51.1	40.4	8.5	50.6	39	19	63	12	27	34	320	0.8	10	2.4	7.5YR5/2									
82SBBH 8	*	977	70°04'	112°44'	13.6	37.5	47.1	15.4	57.5	46	23	56	11	26	40	330	1.0	18	2.8	10 YR7/3									
82SBBH12		981	70°09'	112°31'	32.9	45.4	47.7	6.9	70.0	42	29	46	6	20	22	215	1.5	13	1.4	10 YR7/2									
82SBBH15	*	984	70°11'	112°15'	29.0	86.0	10.6	3.4	69.3	20	37	62	15	27	44	420	1.1	36	2.8	10 YR7/4									
82SBBH16	*	985	70°13'	112°11'	23.9	40.8	47.4	11.8	74.7	18	17	20	5	12	16	270	1.2	10	1.2	10 YR7/3									
82SBBH25	*	993	70°03'	117°04'	17.7	34.5	51.4	14.1	65.7	36	21	70	10	25	33	420	1.0	15	2.7	10 YR7/3									
82SBBH32C1		1000	70°01'	117°14'	13.1	35.1	53.8	11.1	79.2	16	16	29	5	13	18	270	1.1	8	1.2	10 YR7/2									
82SBBH32G		1000	70°01'	117°14'	28.7	27.3	60.8	11.9	55.0	50	23	84	13	35	36	525	0.3	18	3.4	10 YR7/3									
82SBBH32B	*	1000	70°01'	117°14'	8.3	9.3	79.7	11.0	28.7	75	33	160	21	44	47	540	1.9	20	5.3	2.5YR7/2									
82SBBH33A	*	1001	70°02'	117°16'	11.9	31.4	53.5	15.1	69.0	28	14	47	7	20	26	330	0.3	8	1.8	7.5YR8/2									
82SBBH33B		1001	70°02'	117°16'	29.3	40.3	46.6	13.0	84.3	14	14	20	2	7	8	200	0.3	6	0.7	10 YR8/2									
82SBBH38	*	1006	69°49'	113°31'	10.0	51.7	42.7	3.6	57.0	43	21	54	10	25	33	320	0.5	10	2.6	10 YR7/4									
82SBBH39	*	1007	69°47'	112°55'	20.6	43.6	41.7	14.7	54.4	48	25	52	10	27	34	430	0.7	11	2.8	10 YR7/3									
82SBBH40	*	1008	69°47'	112°35'	29.2	48.5	40.7	11.8	45.5	45	16	54	9	24	34	415	0.8	10	2.7	7.5YR7/4									
82SBBH42	*	1010	69°13'	112°04'	14.8	41.6	41.0	17.4	60.3	36	20	36	9	23	22	400	1.0	11	1.8	7.5YR7/4									
82SBBH47		1015	68°53'	110°54'	30.4	50.0	37.4	12.6	33.7	70	20	91	19	37	41	640	0.7	14	3.6	7.5YR6/4									
82SBBH56	*@	1024	69°55'	117°09'	22.5	43.1	40.3	16.6	64.0	34	14	49	9	19	24	370	0.7	7	1.9	10 YR7/2									
82SBBH57	*	1025	69°46'	117°59'	24.4	45.6	37.4	16.9	65.8	30	12	43	8	17	22	330	0.5	7	1.8	7.5YR7/2									
82SBBH60		1028	69°25'	116°23'	15.0	19.0	50.3	30.7	60.7	25	11	40	7	17	24	330	0.8	8	1.9	5 YR7/3									
82SBBH62		1030	69°30'	116°03'	40.3	51.3	37.2	11.5		36	14	46	8	23	28	380	0.5	7	2.2										
82SBBH66		1034	69°23'	115°50'	38.3	68.7	23.0	8.3		28	13	40	6	14	18	310	0.3	7	1.5										
82SBBH71AB		1039	69°32'	115°20'	40.3	56.6	36.8	6.6	53.4	40	16	77	15	33	44	520	0.7	9	3.3	7.5YR6/2									
82SBBH71B		1039	69°32'	115°20'	37.8	74.5	21.6	3.9	52.2	55	19	65	14	32	41	580	0.5	14	3.2	7.5YR7/4									
82SBBH77	*@	1045	69°58'	114°56'	24.1	48.7	42.5	8.8	61.1	41	19	47	10	30	32	360	0.5	10	2.5	10 YR7/3									
82SBBH78	*	1046	70°03'	115°21'	23.3	48.2	34.4	17.5	51.7	35	14	65	12	27	40	340	0.7	8	2.6	7.5YR7/4									
82SBBH82	*	1050	70°05'	112°44'	34.3	43.0	48.3	8.7	69.2	60	32	40	7	23	23	275	0.9	27	2.5	10 YR7/3									
82SBBH86	*	1054	69°22'	111°36'	46.0	58.0	30.5	11.5	69.0	60	32	40	7	23	23	275	0.9	14	2.5	10 YR7/4									
82SBBH88	*	1056	69°20'	111°24'	47.6	62.1	28.6	9.3	67.2	36	26	51	9	24	28	350	1.1	17	2.4	7.5YR7/4									
82SBBH91	*	1059	69°24'	110°25'	20.1	47.2	39.0	13.7	57.6	34	25	45	9	22	28	325	0.9	18	2.6	7.5YR7/4									
83SBB 2		1061	69°54'	110°56'	19.7	40.3	42.2	17.5	67.3	18	13	19	4	15	14	250	1.0	6	1.2	10 YR7/3									
83SBB 15		1074	69°52'	111°05'	33.9	45.7	38.9	15.4	61.7	28	16	27	7	19	19	290	1.0	7	1.7	10 YR7/4									
83SBB 21		1080	69°45'	111°03'	15.2	26.5	44.6	28.9	56.1	31	17	35	8	22	24	330	1.0	10	2.2	7.5YR6/4									
83SBB 64		1124	69°46'	115°41'	27.6	51.3	37.3	11.4	45.3	51	15	74	13	44	44	350	1.0	8	3.6	10 YR6/4									

sample site latitude longitude gravel sand silt clay carbonate Cu Pb Zn Co Ni Cr Mn U As Fe Munsell %veg %stns %gr %bs dr st ox org

- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO_3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation

- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

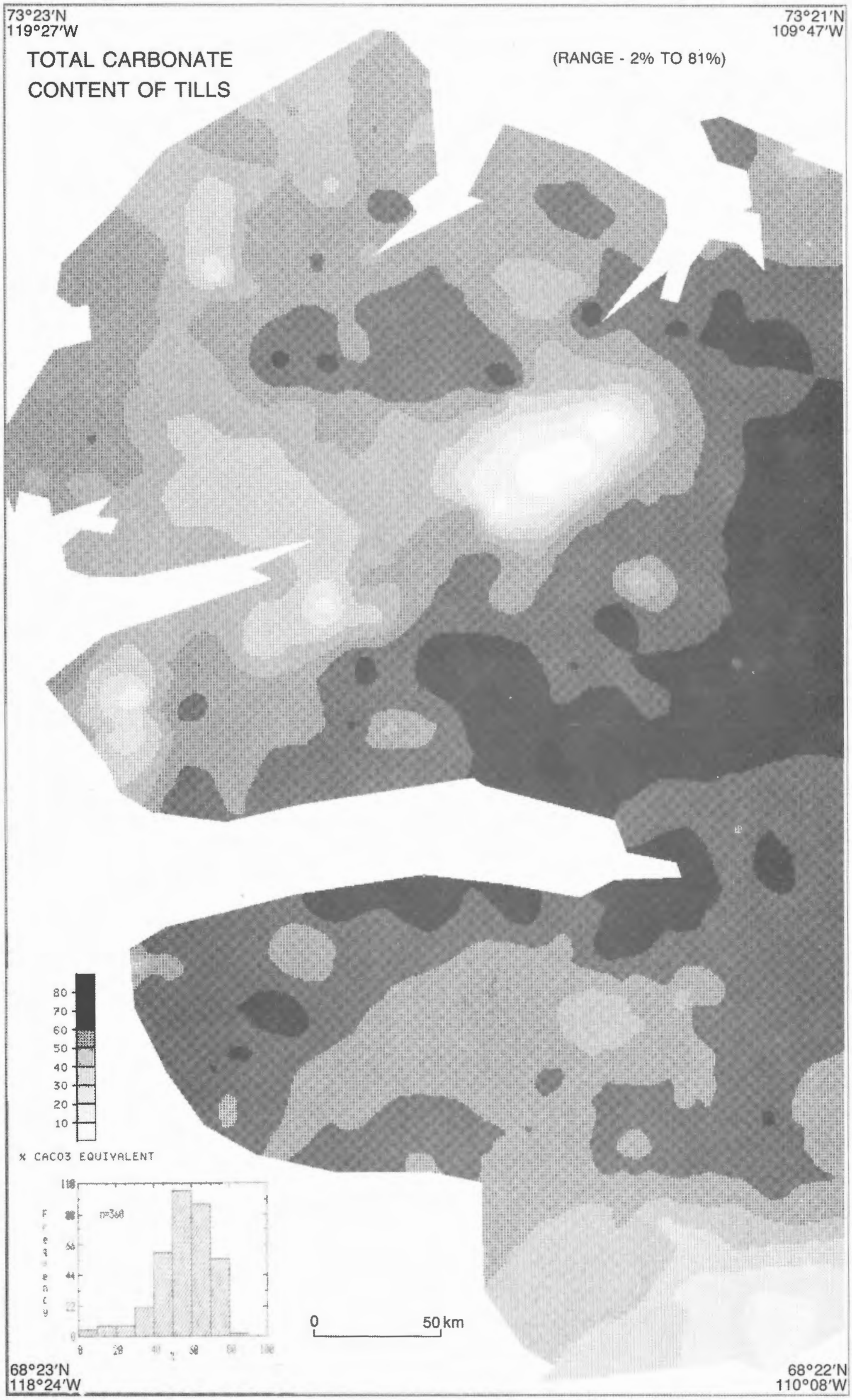
-Identification-		-Location-		-Grain size-				-Geochemistry-											-Colour-	-Surface features-				-Pit observations-				-Comments-
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	
83SBB 69	1129	69°44'	115°10'	35.0	81.5	12.0	6.5	45.9	35	15	38	9	31	30	340	0.8	6	2.2	10 YR6/3									
83SBB 73	1133	69°45'	115°13'	28.3	52.3	36.5	11.2	48.9	48	13	60	14	38	40	540	0.8	5	3.0	10 YR6/3									
83SBB 94	1154	69°53'	110°56'	7.7	60.1	30.8	9.1	51.1	31	8	31	8	19	20	300	1.0	3	1.7	7.5YR6/4									
83SBB 97A	1157	70°07'	116°42'	18.2	35.9	47.2	17.2	74.3	13	11	22	4	14	14	200	1.1	3	1.0	10 YR7/2									
83SBB105	1165	69°11'	113°17'	28.5	47.3	38.4	14.3	47.3	41	14	45	11	30	29	390	1.1	4	2.4	10 YR6/3	15	60			W	V	X	X	gentle slope
83SBB123-3A	1183	70°08'	116°46'	1.4	14.2	65.6	20.3	77.3	20	17	32	6	17	17	230	0.9	4	1.5	10 YR7/3									
83SBB127	1187	69°34'	114°54'	26.6	45.8	35.9	18.3	51.7	36	12	46	9	27	32	320	0.9	0	2.4	7.5YR6/4									
83SBB129A	1189	69°35'	114°18'	25.5	45.9	37.5	16.6	59.0	26	11	34	8	22	23	280	0.9	2	1.6	10 YR6/3									
83NJ 019	1224	69°50'	116°40'	27.0	39.2	41.6	19.2	62.4	35	12	40	5	17	20	280	0.9	6	1.7	10 YR7/2									
83NJ 029	1229	69°47'	116°48'	21.5	47.0	36.2	16.8	65.0	32	11	33	4	17	20	220	0.6	4	1.7	10 YR7/3	20	60	10	8	M	M	X		low drumlin crest
83NJ 033	1230	69°48'	116°39'	28.3	47.9	36.3	15.8	63.3	28	8	35	6	17	21	270	0.8	3	1.7	10 YR7/3	20	60	4	8	W	M			hummocky moraine, level, irregular frost cracks
83NJ 397	1234	69°49'	116°41'	25.3	43.2	39.3	17.5	60.8	26	12	35	4	15	20	240	0.6	4	1.6	10 YR7/2	15	65			W	M	X		outwash terrace, polygons, till showing through
83NJ 398	1234	69°49'	116°41'	22.8	44.1	39.0	16.9	60.4	28	10	37	6	17	18	290	0.5	4	1.7	10 YR7/3									
83NJ 399	1234	69°49'	116°41'	26.1	43.5	39.6	16.9	61.7	24	8	31	5	15	16	270	0.3	4	1.5	10 YR7/3									
83NJ 400	1234	69°49'	116°41'	28.1	42.7	41.0	16.3	63.0	28	8	36	6	17	20	270	0.3	4	1.3	10 YR7/3									
83NJ 401	1234	69°49'	116°41'	24.9	43.5	39.4	17.1	64.5	28	14	38	6	19	22	280	0.0	5	1.9	10 YR7/3									
83NJ 403	@ 1235	69°39'	114°46'	56.6	61.1	30.0	8.9	60.3	54	17	46	12	32	30	460	0.3	8	2.5	10 YR7/4									
sample	site	latitude	longitude	gravel	sand	silt	clay	carbonate	Cu	Pb	Zn	Co	Ni	Cr	Mn	U	As	Fe	Munsell	%veg	%stns	%gr	%bs	dr	st	ox	org	

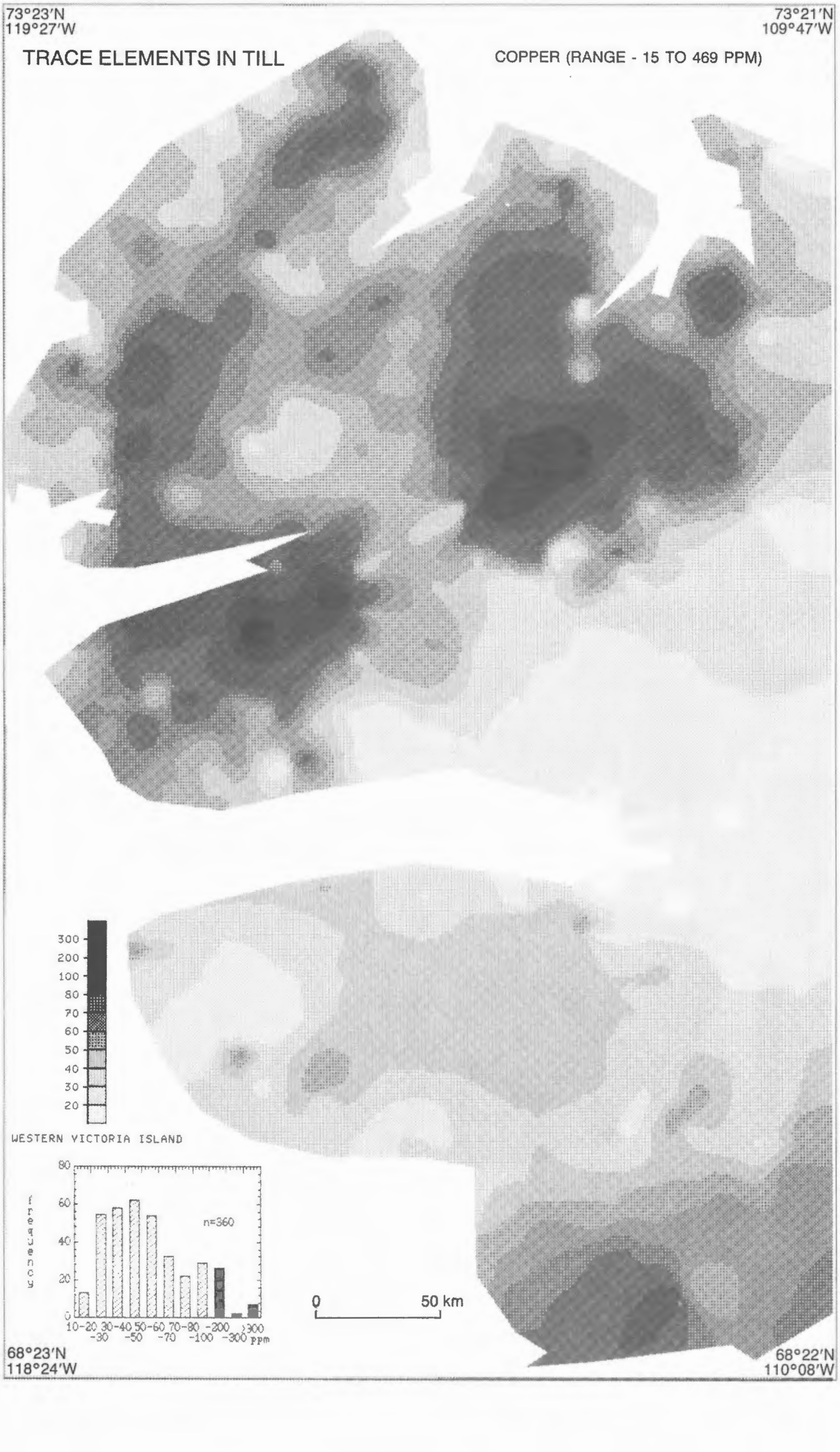
- *=data used for plotting, @=sample part of formal design, gravel as % of whole sample, sand/silt/clay as % of <2mm fraction
- carbonate is % expressed as $CaCO^3$ equivalent, iron is %, all other elements ppm in <2 micron fraction, 0=below detection limit
- Munsell colour of dried sample under fluoresent light, colour in comments is field observation

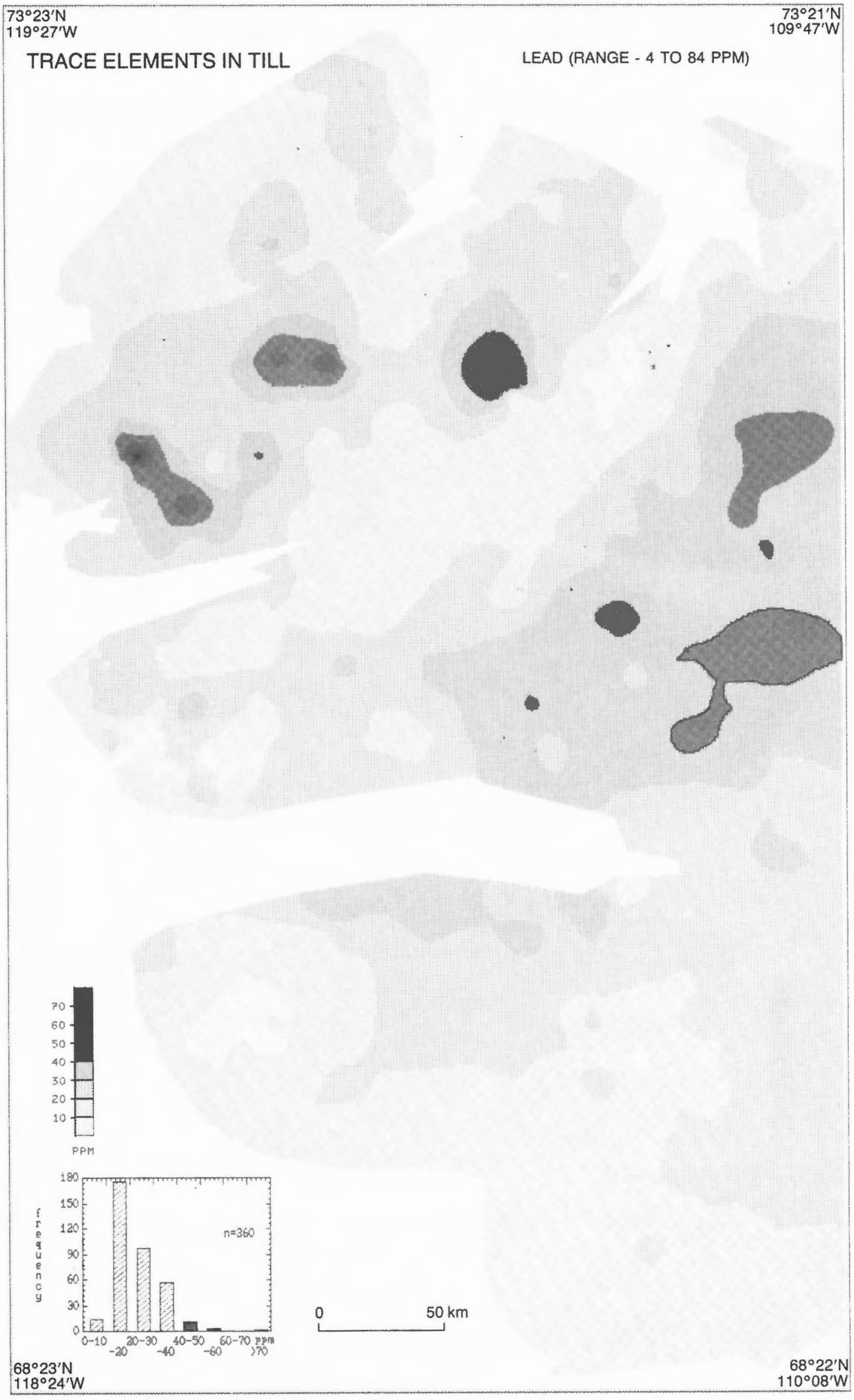
- %veg and %stns = estimate of percent vegation and stone cover on site surfaces
- %gr and %bs = granitic and basic igneous clasts in the stone cover (% or MR=moderately rare, R=rare VR=very rare)
- dr represents drainage; (W)ell drained, (I)ntermediate and (P)oor drainage
- st represents stoniness; (V)ery stony, (M)oderately stony, and (N)ot stony
- ox and org are columns for presence of oxidation and organics denoted by (X)

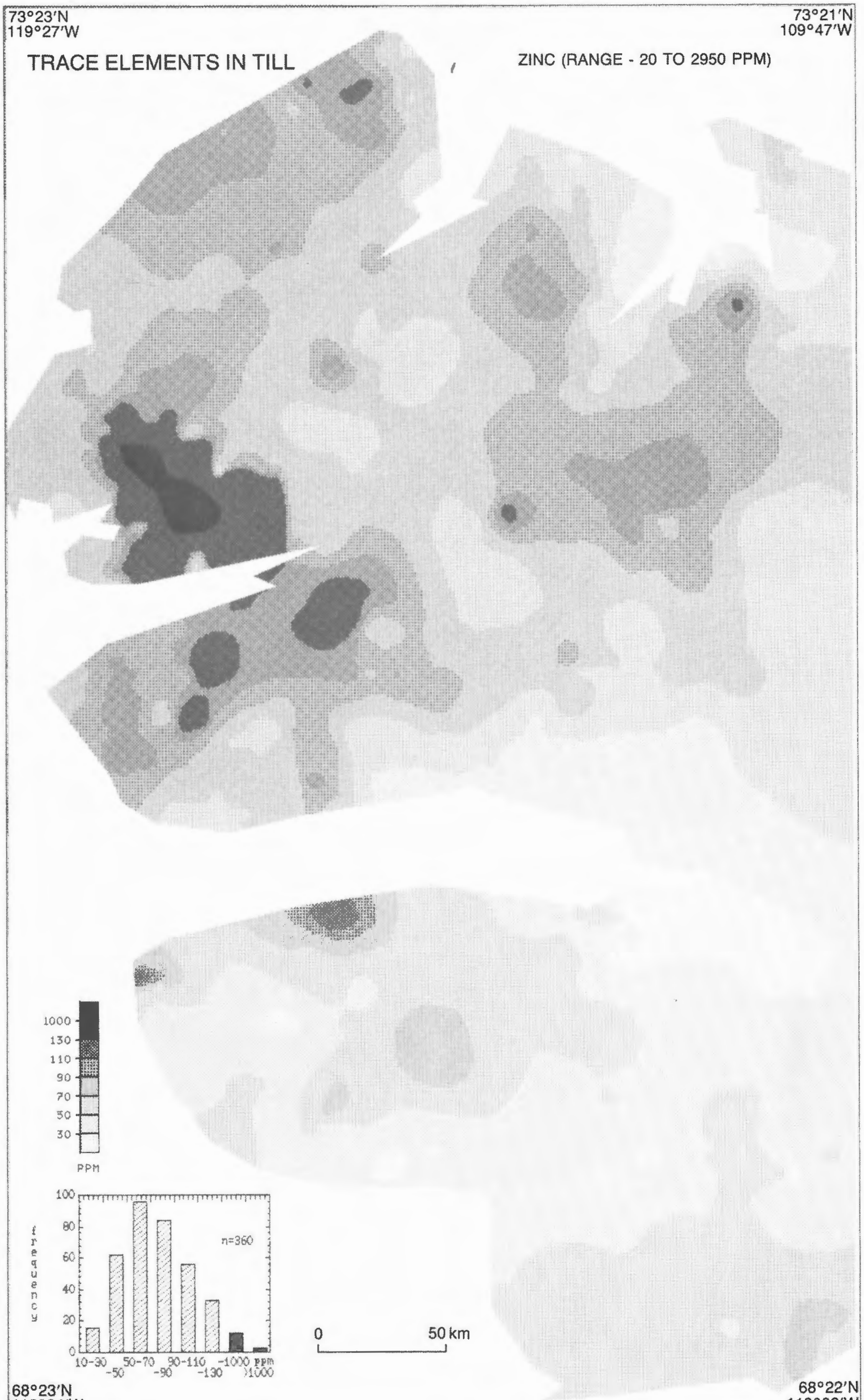
APPENDIX 2

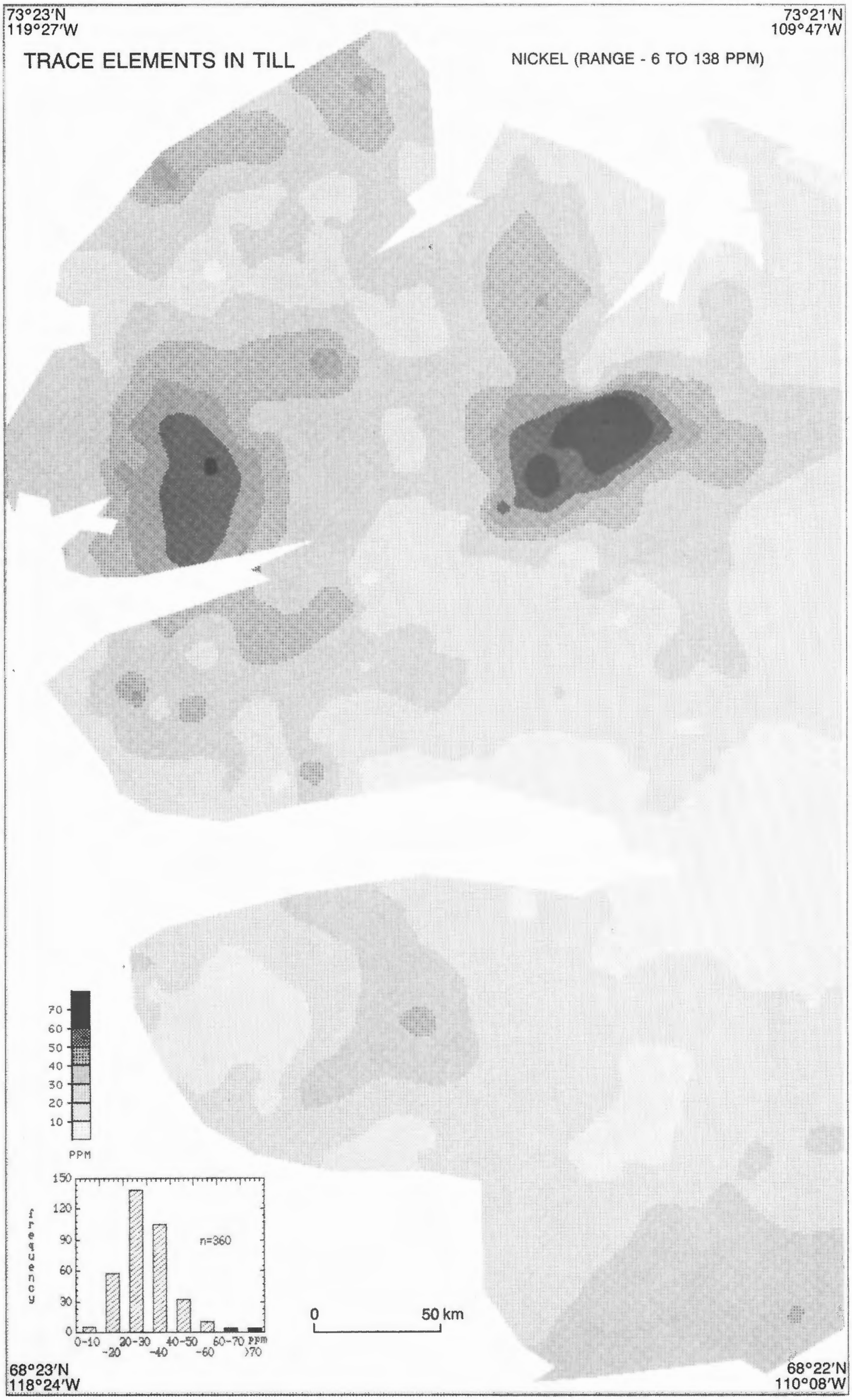
Contoured plots of selected trace elements in till



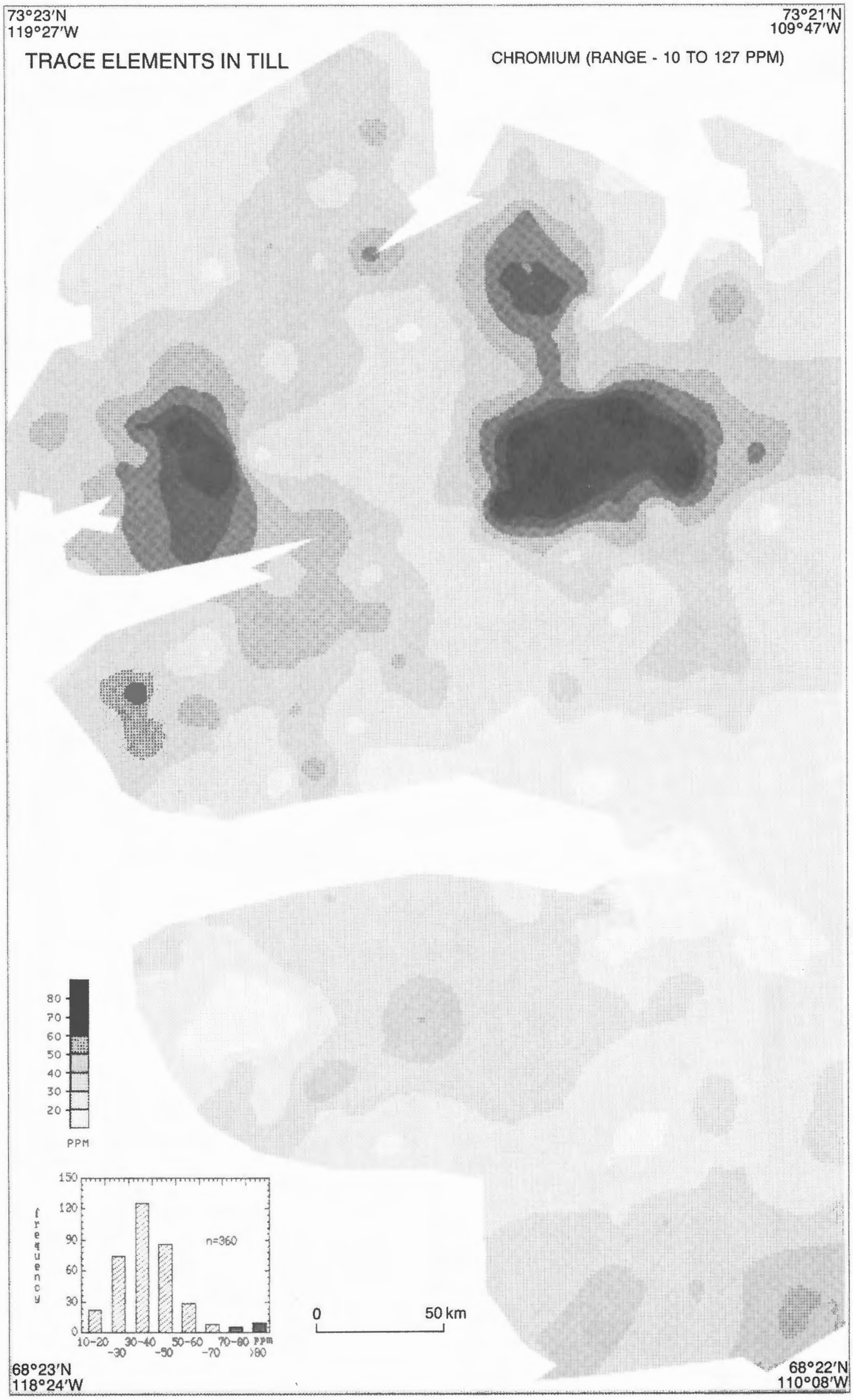

73°23′N
119°27′W
73°21′N
109°47′W
TRACE ELEMENTS IN TILL
COPPER (RANGE - 15 TO 469 PPM)
300
200
100
80
70
60
50
40
30
20
WESTERN VICTORIA ISLAND
frequency
n=360
10-20 30-40 50-60 70-80 -200 ≥300
-30 -50 -70 -100 -300 ppm
0 50 km
68°23′N
118°24′W
68°22′N
110°08′W


73°23'N
119°27'W
73°21'N
109°47'W
TRACE ELEMENTS IN TILL
LEAD (RANGE - 4 TO 84 PPM)
70
60
50
40
30
20
10
PPM
180
150
120
90
60
30
0
frequency
n=360
0-10
-20
20-30
-40
40-50
-60
60-70
>70
ppm
0
50 km
68°23'N
118°24'W
68°22'N
110°08'W


73°23′N
119°27′W
73°21′N
109°47′W
TRACE ELEMENTS IN TILL
ZINC (RANGE - 20 TO 2950 PPM)
1000
130
110
90
70
50
30
PPM
frequency
n=360
10-30
-50
50-70
-90
90-110
-130
-1000
>1000
ppm
0
50 km
68°23′N
118°24′W
68°22′N
110°08′W

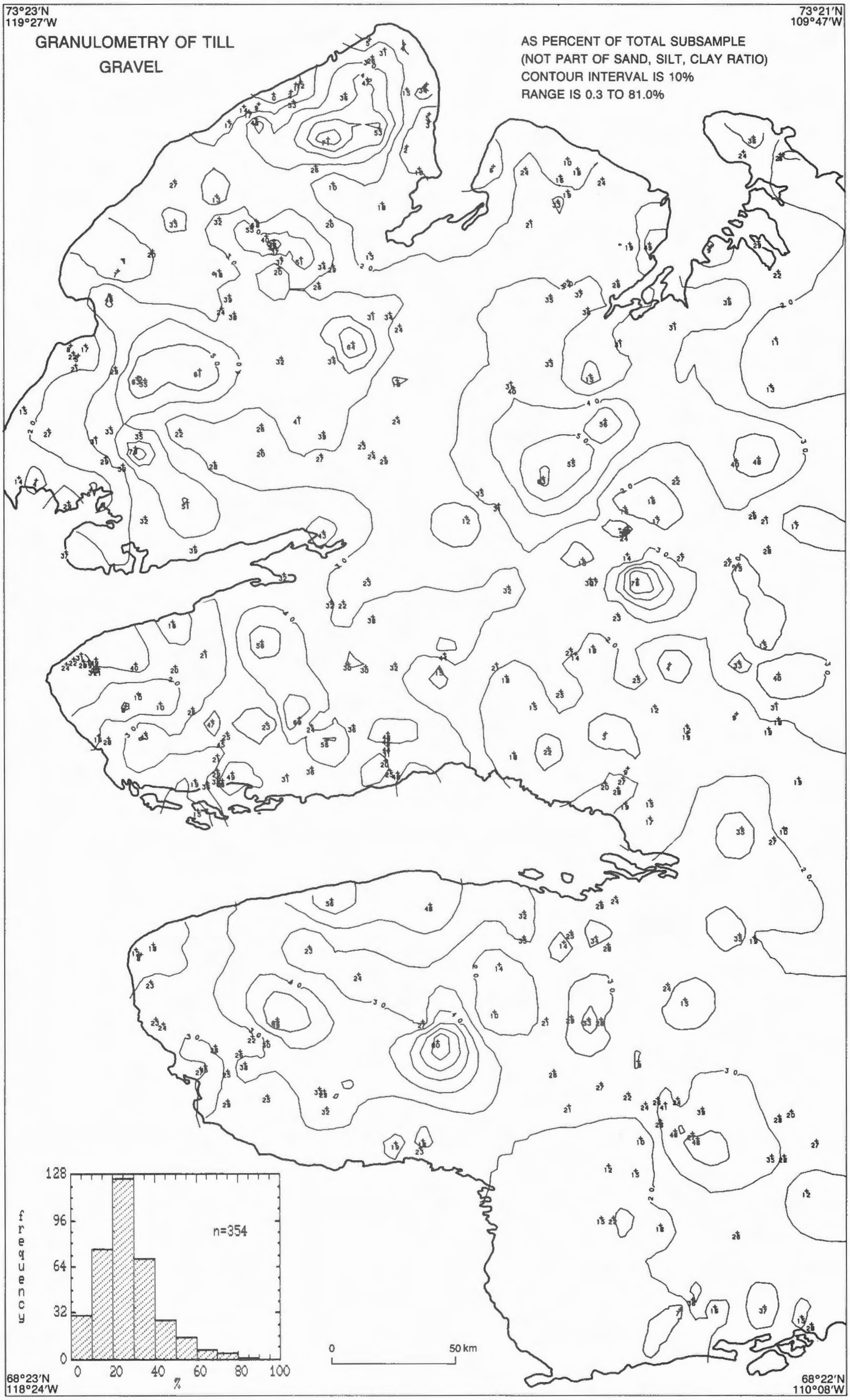


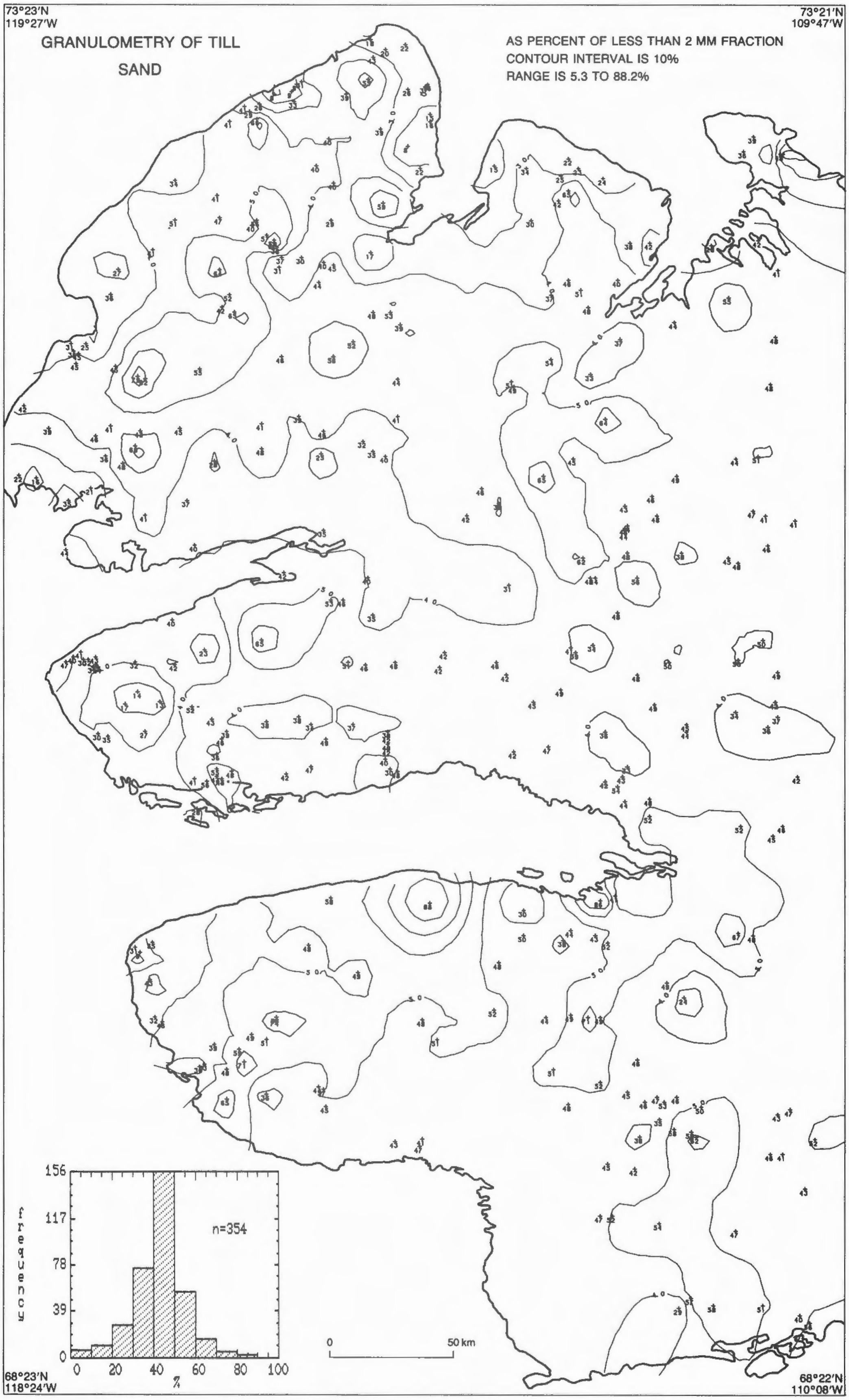
73°23′N
119°27′W
73°21′N
109°47′W
TRACE ELEMENTS IN TILL
NICKEL (RANGE - 6 TO 138 PPM)
70
60
50
40
30
20
10
PPM
150
120
90
60
30
0
frequency
n=360
0-10
-20
20-30
-40
40-50
-60
60-70
>70
PPM
0
50 km
68°23′N
118°24′W
68°22′N
110°08′W

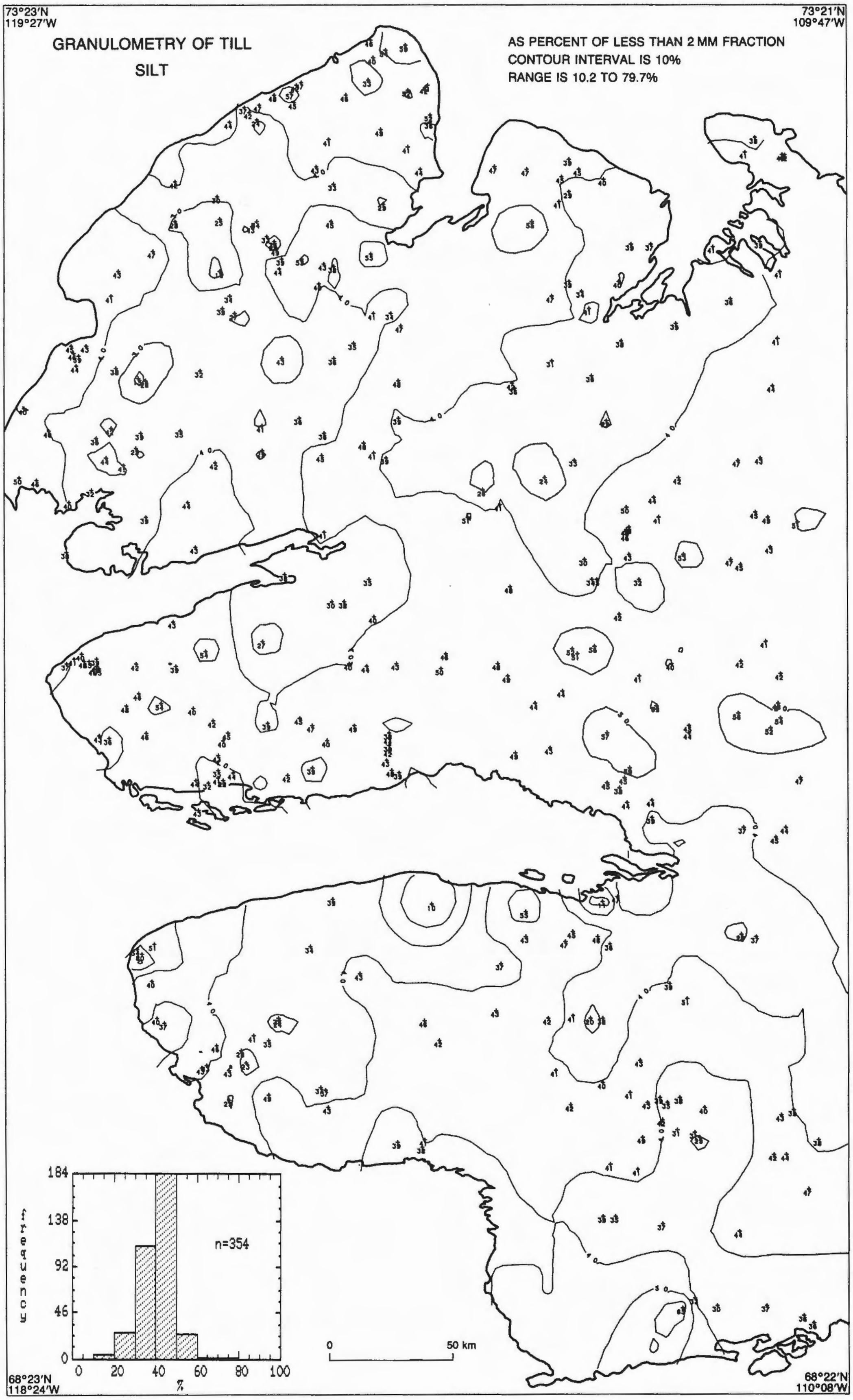


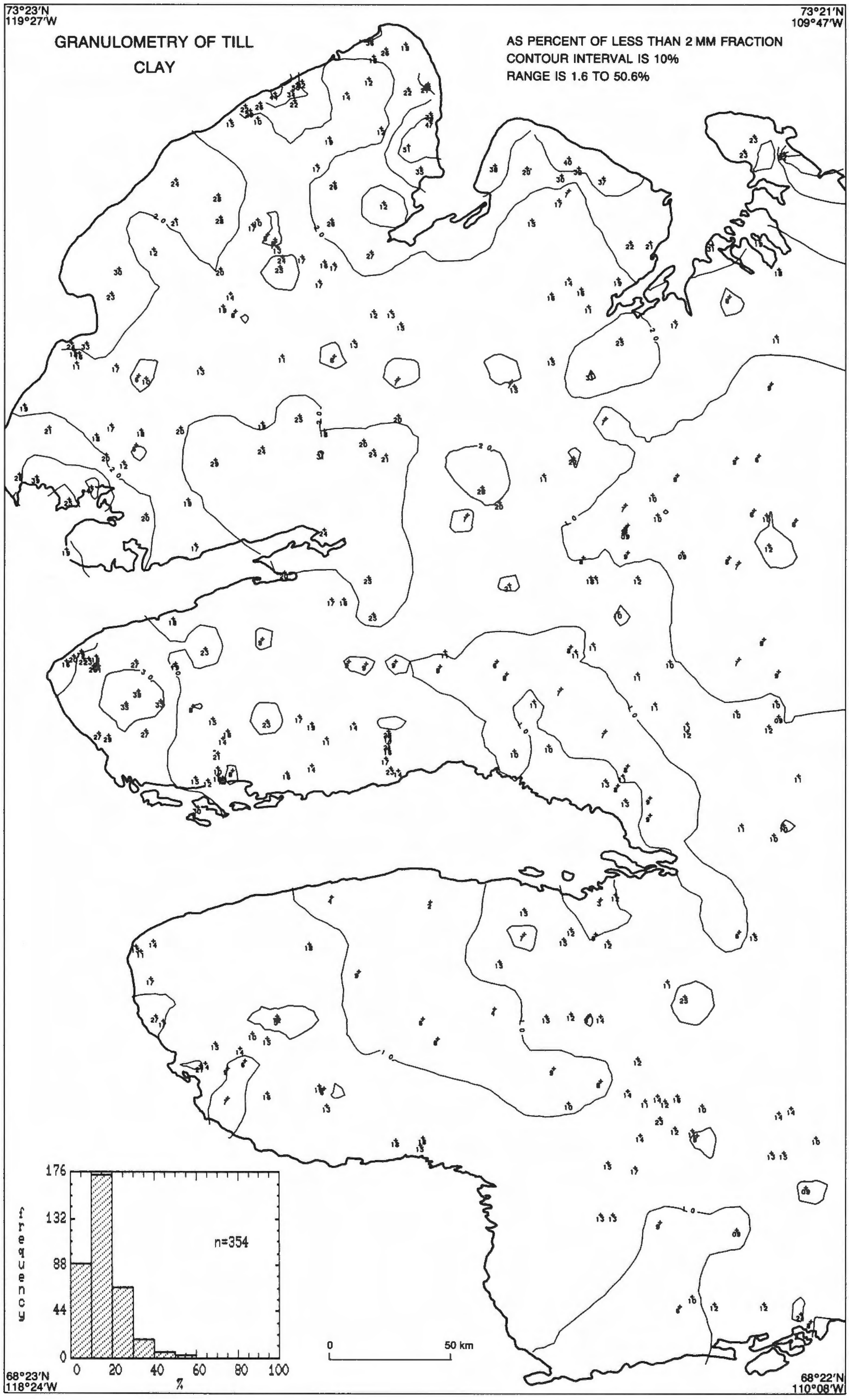
73°23'N
119°27'W
73°21'N
109°47'W
TRACE ELEMENTS IN TILL
CHROMIUM (RANGE - 10 TO 127 PPM)
80
70
60
50
40
30
20
PPM
150
120
90
60
30
0
frequency
n=360
10-20
-30
30-40
-50
50-60
-70
70-80
>80
PPM
0
50 km
68°23'N
118°24'W
68°22'N
110°08'W

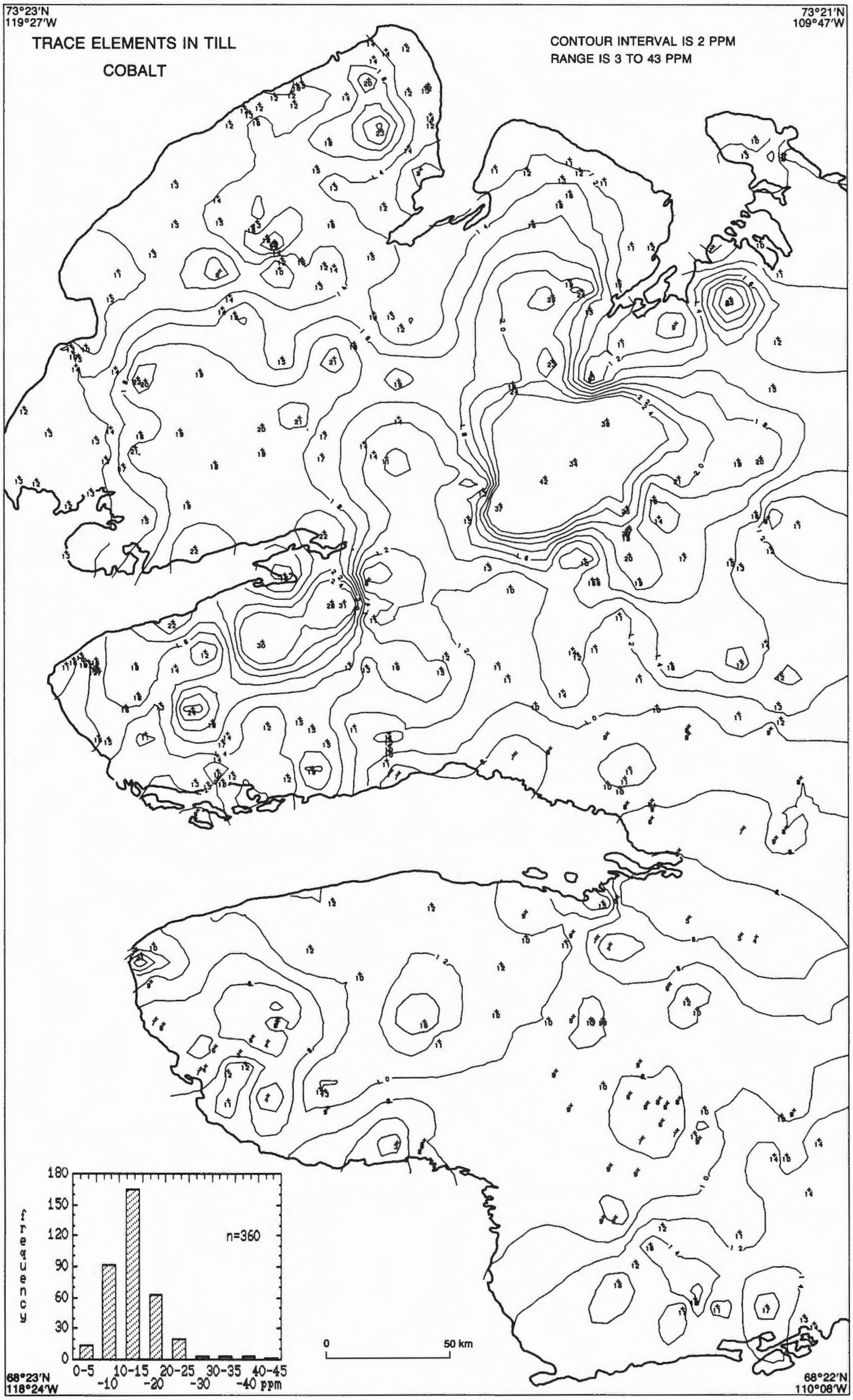
APPENDIX 3
Point plots of granulometric and trace element data

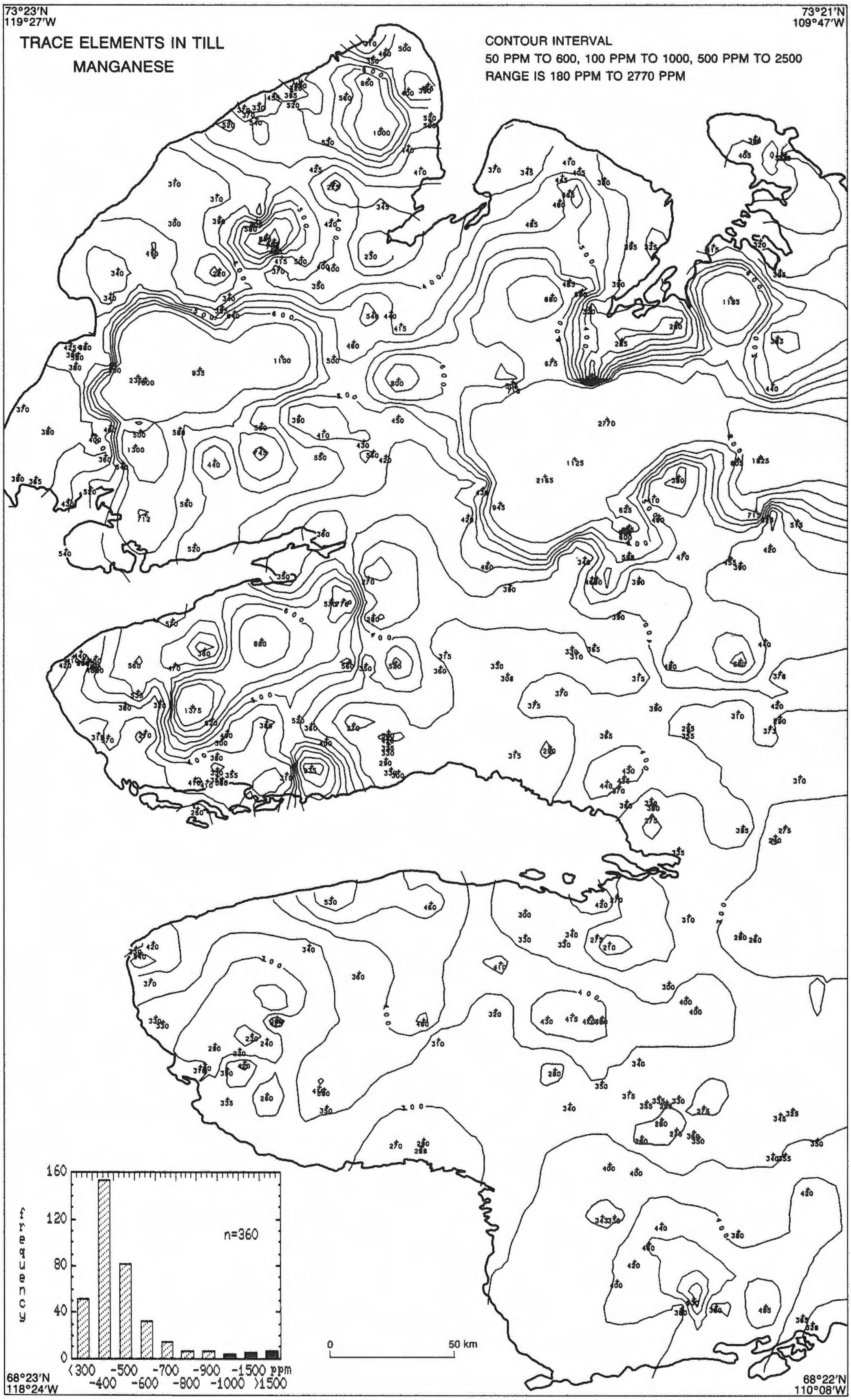


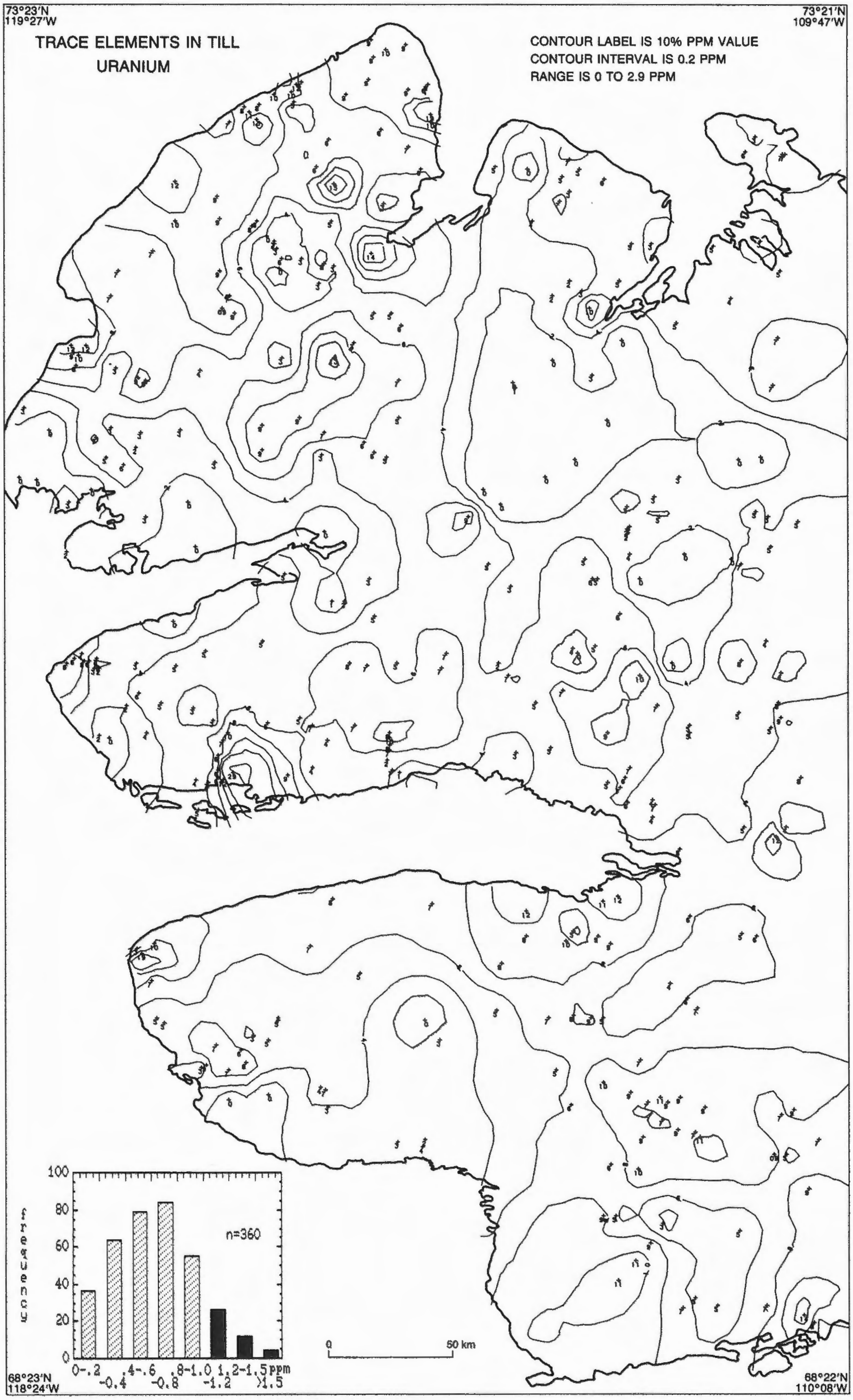

73°23'N
119°27'W
GRANULOMETRY OF TILL
SAND
AS PERCENT OF LESS THAN 2 MM FRACTION
CONTOUR INTERVAL IS 10%
RANGE IS 5.3 TO 88.2%
73°21'N
109°47'W
156
117
78
39
0
frequency
n=354
0 20 40 60 80 100
%
0
50 km
68°23'N
118°24'W
68°22'N
110°08'W

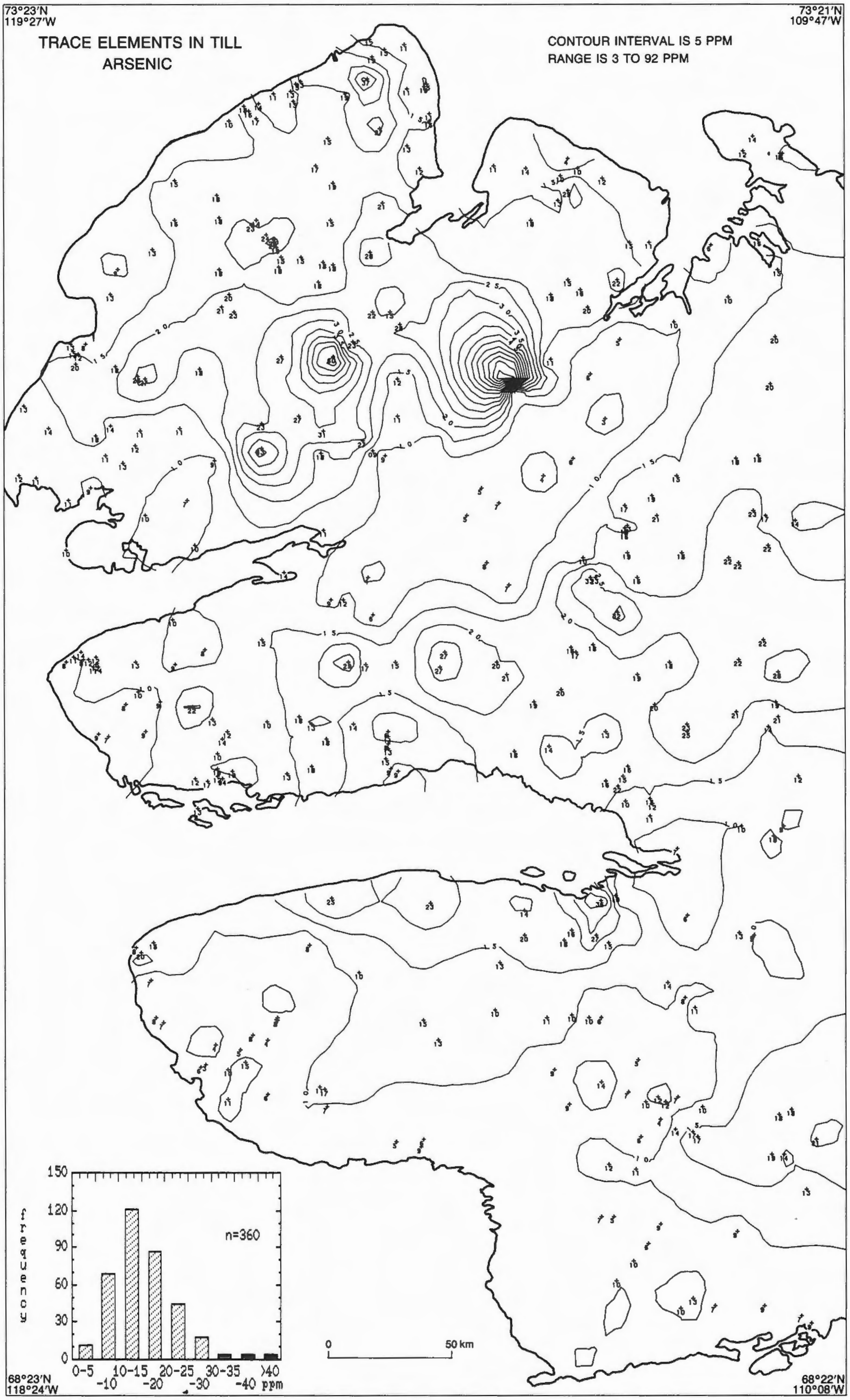

73°23'N
119°27'W
73°21'N
109°47'W
GRANULOMETRY OF TILL
SILT
AS PERCENT OF LESS THAN 2 MM FRACTION
CONTOUR INTERVAL IS 10%
RANGE IS 10.2 TO 79.7%
frequency
n=354
%
0
50 km
68°23'N
118°24'W
68°22'N
110°08'W

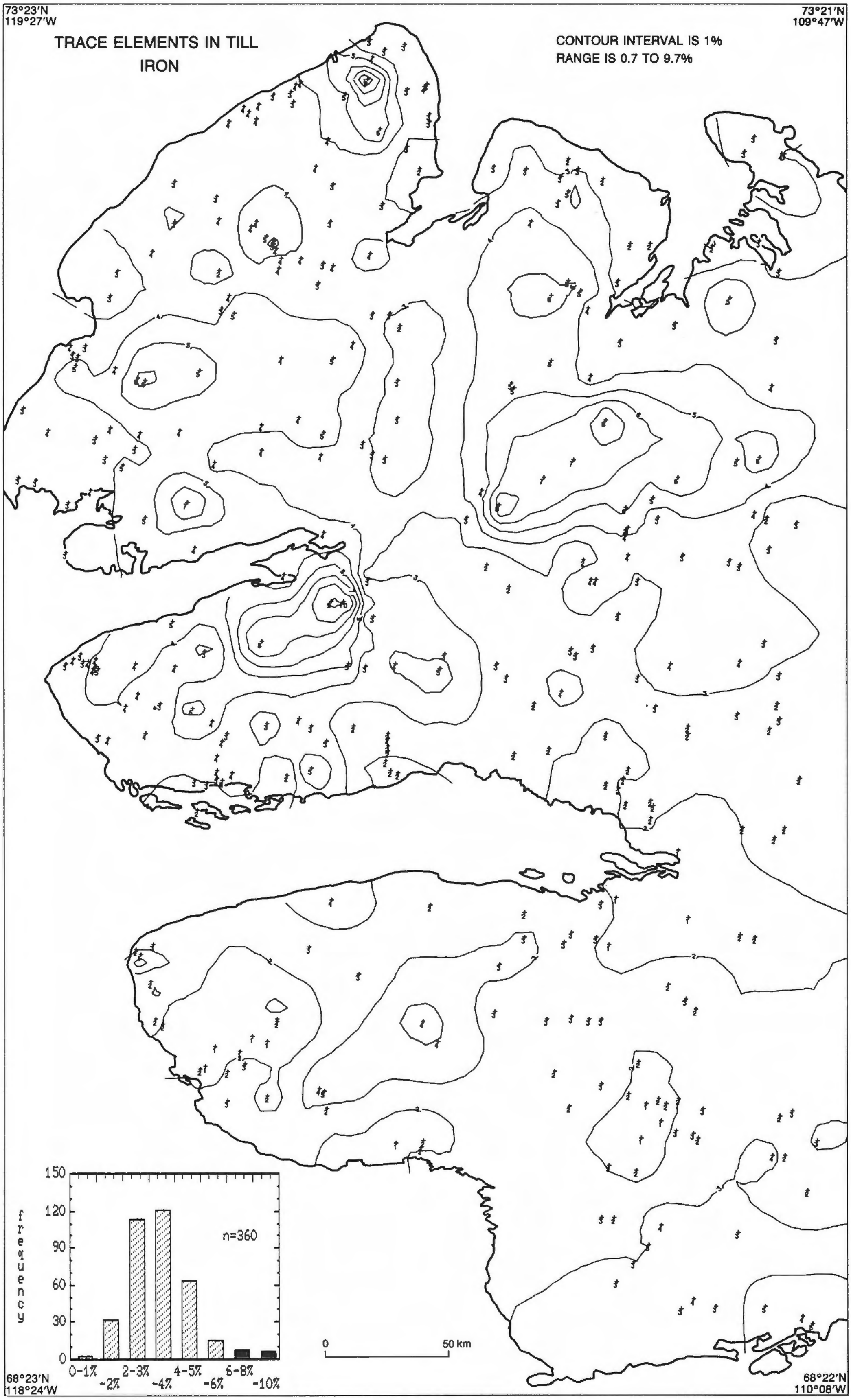

73°23'N
119°27'W
73°21'N
109°47'W
GRANULOMETRY OF TILL
CLAY
AS PERCENT OF LESS THAN 2 MM FRACTION
CONTOUR INTERVAL IS 10%
RANGE IS 1.6 TO 50.6%
176
132
88
44
0
frequency
n=354
0
20
40
60
80
100
%
0
50 km
68°23'N
118°24'W
68°22'N
110°08'W


73°23'N
119°27'W
TRACE ELEMENTS IN TILL
COBALT
CONTOUR INTERVAL IS 2 PPM
RANGE IS 3 TO 43 PPM
73°21'N
109°47'W
n=360
frequency
0-5 -10 10-15 -20 20-25 -30 30-35 -40 40-45 ppm
0 50 km
68°23'N
118°24'W
68°22'N
110°08'W


73°23'N
119°27'W
TRACE ELEMENTS IN TILL
MANGANESE
CONTOUR INTERVAL
50 PPM TO 600, 100 PPM TO 1000, 500 PPM TO 2500
RANGE IS 180 PPM TO 2770 PPM
73°21'N
109°47'W
n=360
frequency
<300 -400 -500 -600 -700 -800 -900 -1000 -1500 >1500 ppm
0 50 km
68°23'N
118°24'W
68°22'N
110°08'W


73°23'N
119°27'W
73°21'N
109°47'W
TRACE ELEMENTS IN TILL
URANIUM
CONTOUR LABEL IS 10% PPM VALUE
CONTOUR INTERVAL IS 0.2 PPM
RANGE IS 0 TO 2.9 PPM
frequency
n=360
0-.2
-0.4
.4-.6
-0.8
.8-1.0
-1.2
1.2-1.5
>1.5
ppm
0
50 km
68°23'N
118°24'W
68°22'N
110°08'W


73°23'N
119°27'W
TRACE ELEMENTS IN TILL
ARSENIC
CONTOUR INTERVAL IS 5 PPM
RANGE IS 3 TO 92 PPM
73°21'N
109°47'W
frequency
n=360
0-5
-10
10-15
-20
20-25
-30
30-35
-40
>40
ppm
0
50 km
68°23'N
118°24'W
68°22'N
110°08'W



73°23'N
119°27'W
73°21'N
109°47'W
TRACE ELEMENTS IN TILL
IRON
CONTOUR INTERVAL IS 1%
RANGE IS 0.7 TO 9.7%
150
120
90
60
30
0
frequency
n=360
0-1%
-2%
2-3%
-4%
4-5%
-6%
6-8%
-10%
0
50 km
68°23'N
118°24'W
68°22'N
110°08'W