

REGIONAL LAKE SEDIMENT AND WATER GEOCHEMICAL DATA, SASKATCHEWAN 1985, GSC OF-1213, NGR 78-1985, PARTS OF NTS 730, 73P, 74A, 74B, 74C

```
*****  
*                                     *  
*          OPEN FILE    1213        *  
*                                     *  
*****
```

	PAGE
SURVEY NOTES	1
DATA LIST	7
SUMMARY STATISTICS	34

GEOLOGICAL SURVEY OF CANADA OPEN FILE 1213.
REGIONAL LAKE SEDIMENT AND WATER GEOCHEMICAL RECONNAISSANCE DATA,
NORTH-CENTRAL SASKATCHEWAN, CONSISTING OF PARTS NTS 730, 73P, 74A, 74B
AND 74C.

THE RECONNAISSANCE SURVEY WAS UNDERTAKEN BY THE GEOLOGICAL SURVEY OF CANADA IN
CONJUNCTION WITH THE SASKATCHEWAN DEPARTMENT OF ENERGY AND MINES
UNDER THE CANADA-SASKATCHEWAN MINERAL DEVELOPMENT AGREEMENT (1984-1989).

E.H.W. HORN BROOK DIRECTED THE SURVEY PROGRAM.

P.W.B. FRISKE COORDINATED THE OPERATIONAL ACTIVITIES OF THE CONTRACTING
AND GEOLOGICAL SURVEY OF CANADA STAFF THROUGHOUT THE SURVEY.

CONTRACTS LET FOR COLLECTION, SAMPLE PREPARATION AND ANALYSIS WERE THE
RESPONSIBILITY OF, AND WERE SUPERVISED AND/OR MONITORED BY THE STAFF OF
THE RESOURCE GEOCHEMISTRY SUBDIVISION AS FOLLOWS:

COLLECTION: - M.P.H. CONSULTING LTD., TORONTO, ONTARIO.
- P.W.B. FRISKE, E.H.W. HORN BROOK

PREPARATION: - GOLDER ASSOCIATES, OTTAWA, ONTARIO
- J.J. LYNCH

ANALYSIS: - BARRINGER MAGENTA LTD., REXDALE, ONTARIO
- BARRINGER MAGENTA (ALBERTA) LTD., CALGARY, ALBERTA
- J.J. LYNCH

H.R. SCHMITT AND N.G. LUND COORDINATED OPEN FILE PRODUCTION.
B.E. ELLIOTT WAS RESPONSIBLE FOR DATA MANAGEMENT AND FOR THE PREPARATION
OF THE REGIONAL TREND MARGINAL MAPS UTILIZING A PROGRAM DEVELOPED BY
D. J. ELLWOOD.

J. YELLE SUPERVISED MAP PREPARATION.

COMPUTING AND PLOTTING FACILITIES WERE PROVIDED BY THE COMPUTER SCIENCE
CENTER, E.M.R.

OPEN FILE TEXT WAS MANUFACTURED BY K.G. CAMPBELL CORPORATION LASER PRINTING,
OTTAWA

HELICOPTER SUPPORTED SAMPLE COLLECTION WAS CARRIED OUT DURING
THE SUMMER OF 1985.
LAKE SEDIMENT AND WATER SAMPLES WERE COLLECTED AT AN AVERAGE DENSITY OF ONE
SAMPLE PER 13 SQUARE KILOMETERS THROUGHOUT THE 17,000 SQUARE KILOMETERS
OF THE NORTH-CENTRAL SASKATCHEWAN SURVEY AREA.

SAMPLE SITE DUPLICATE SAMPLES WERE ROUTINELY COLLECTED IN EACH
ANALYTICAL BLOCK OF TWENTY SAMPLES.

IN OTTAWA, FIELD DRIED SAMPLES WERE AIR-DRIED, CRUSHED, BALL MILLED AND SIEVED. THE MINUS 80 MESH (177 MICRONS) FRACTION WAS USED FOR SUBSEQUENT ANALYSES. AT THIS TIME, CONTROL REFERENCE AND BLIND DUPLICATE SAMPLES WERE INSERTED INTO EACH BLOCK OF TWENTY SEDIMENT SAMPLES. FOR THE WATER SAMPLES, ONLY CONTROL REFERENCE SAMPLES WERE INSERTED INTO THE BLOCK. THERE WERE NO BLIND DUPLICATE WATER SAMPLES.

ON RECEIPT, FIELD AND ANALYTICAL DATA WERE PROCESSED WITH THE AID OF COMPUTERS. THE FIELD DATA WERE RECORDED BY THE FIELD CONTRACT STAFF ON STANDARD LAKE SEDIMENT FIELD CARDS (REV. 74) USED BY THE GEOLOGICAL SURVEY OF CANADA (GARRETT, 1974). THE SAMPLE SITE POSITIONS WERE MARKED ON APPROPRIATE 1/250,000 SCALE NTS MAPS IN THE FIELD. THESE MAPS WERE DIGITIZED AT THE GEOLOGICAL SURVEY IN OTTAWA TO OBTAIN THE SAMPLE SITE UTM COORDINATES.

THE SAMPLE SITE COORDINATES WERE CHECKED AS FOLLOWS: A SAMPLE LOCATION MAP WAS PRODUCED ON A CALCOMP 1051 DRUM PLOTTER USING THE DIGITIZED COORDINATES; THE FIELD CONTRACTORS'S SAMPLE LOCATION MAP WAS THEN OVERLAYED WITH THE CALCOMP MAP; THE TWO SETS OF POINTS WERE CHECKED FOR COINCIDENCE. THE DOMINANT ROCK TYPES IN THE LAKE CATCHMENT BASINS WERE IDENTIFIED ON APPROPRIATE GEOLOGICAL MAPS USED AS THE BEDROCK GEOLOGICAL BASE ON RGR MAPS.

THOROUGH INSPECTIONS OF THE FIELD AND ANALYTICAL DATA WERE MADE TO CHECK FOR ANY MISSING INFORMATION AND/OR GROSS ERRORS.

QUALITY CONTROL AND MONITORING OF THE GEOCHEMICAL DATA WAS UNDERTAKEN BY A STANDARD METHOD USED BY THE RESOURCE GEOCHEMISTRY SUBDIVISION AT THE GEOLOGICAL SURVEY OF CANADA.

FOR THE DETERMINATION OF ZN, CU, PB, NI, CO, AG, MN, FE, CD, AND AS A 1 GRAM SAMPLE WAS REACTED WITH 6 ML OF A MIXTURE OF 4M HNO₃ AND M HCL IN A TEST-TUBE OVERNIGHT AT ROOM TEMPERATURE. AFTER DIGESTION, THE TEST-TUBE WAS IMMERSUED IN A HOT WATER BATH AT ROOM TEMPERATURE AND BROUGHT UP TO 90C AND HELD AT THIS TEMPERATURE FOR 2 HOURS WITH PERIODIC SHAKING. THE SAMPLE SOLUTION WAS THEN DILUTED TO 20 ML WITH METAL FREE WATER AND MIXED. ZN, CU, PB, NI, CO, AG, MN, FE AND CD WERE DETERMINED BY ATOMIC ABSORPTION SPECTROSCOPY USING AN AIR-ACETYLENE FLAME. BACKGROUND CORRECTIONS WERE MADE FOR PB, NI, CO, AG AND CD. AS WAS DETERMINED BY ATOMIC ABSORPTION USING A HYDRIDE EVOLUTION METHOD WHEREIN THE HYDRIDE (ASH₃) IS EVOLVED, PASSED THROUGH A HEATED QUARTZ TUBE IN THE LIGHT PATH OF AN ATOMIC ABSORPTION SPECTROPHOTOMETER. THE METHOD IS DESCRIBED BY ASLIN (1976).

MOLYBDENUM AND VANADIUM WERE DETERMINED BY ATOMIC ABSORPTION SPECTROSCOPY USING A NITROUS OXIDE ACETYLENE FLAME.
A 0.5 GRAM SAMPLE WAS REACTED WITH 1.5 ML CONCENTRATED HNO₃ AT 90C FOR 30 MINUTES.
AT THIS POINT 0.5 ML CONCENTRATED HCL WAS ADDED AND THE DIGESTION WAS CONTINUED AT 90C FOR AN ADDITIONAL 90 MINUTES.
AFTER COOLING, 8 ML OF 1250 PPM AL SOLUTION WERE ADDED AND THE SAMPLE SOLUTION WAS DILUTED TO 10 ML BEFORE ASPIRATION.

MERCURY WAS DETERMINED BY THE HATCH AND OTT PROCEDURE WITH SOME MODIFICATIONS. THE METHOD IS DESCRIBED BY JONASSON ET AL. (1973).
A 0.5 GRAM SAMPLE WAS REACTED WITH 20 ML CONCENTRATED HNO₃ AND 1 ML CONCENTRATED HCL IN A TEST-TUBE FOR 10 MINUTES AT ROOM TEMPERATURE PRIOR TO 2 HOURS OF DIGESTION WITH MIXING AT 90C IN A HOT WATER BATH.
AFTER DIGESTION, THE SAMPLE SOLUTIONS WERE COOLED AND DILUTED TO 100 ML WITH METAL FREE WATER.
THE HG PRESENT WAS REDUCED TO THE ELEMENTAL STATE BY THE ADDITION OF 10 ML 10% W/V SnSO₄ IN M H₂SO₄.
THE HG VAPOUR WAS THEN FLUSHED BY A STREAM OF AIR INTO AN ABSORPTION CELL MOUNTED IN THE LIGHT PATH OF AN ATOMIC ABSORPTION SPECTROPHOTOMETER.
ABSORPTION MEASUREMENTS WERE MADE AT 253.7 NM.

LOSS ON IGNITION WAS DETERMINED USING A 500 MG SAMPLE.
THE SAMPLE, WEIGHED INTO 30 ML BEAKER, WAS PLACED IN A COLD MUFFLE FURNACE AND BROUGHT UP TO 500C OVER A PERIOD OF 2-3 HOURS.
THE SAMPLE WAS LEFT AT THIS TEMPERATURE FOR 4 HOURS, THEN ALLOWED TO COOL TO ROOM TEMPERATURE FOR WEIGHING.

URANIUM WAS DETERMINED USING A NEUTRON ACTIVATION METHOD WITH DELAYED NEUTRON COUNTING.
A DETAILED DESCRIPTION OF THE METHOD IS PROVIDED BY BOULANGER ET AL (1975).
IN BRIEF, A 1 GRAM SAMPLE IS WEIGHED INTO A 7 DRAM POLYETHYLENE VIAL, CAPPED AND SEALED.
THE IRRADIATION IS PROVIDED BY THE SLOWPOKE REACTOR WITH AN OPERATING FLUX OF 10^{12} NEUTRONS/SQ.CM./SEC.
THE SAMPLES ARE PNEUMATICALLY TRANSFERRED FROM AN AUTOMATIC LOADER TO THE REACTOR, WHERE EACH SAMPLE IS IRRADIATED FOR 60 SECONDS.
AFTER IRRADIATION, THE SAMPLE IS AGAIN TRANSFERRED PNEUMATICALLY TO THE COUNTING FACILITY WHERE AFTER A 10 SECOND DELAY THE SAMPLE IS COUNTED FOR 60 SECONDS WITH SIX BF₃ DETECTOR TUBES EMBEDDED IN PARAFFIN.
FOLLOWING COUNTING, THE SAMPLES ARE AUTOMATICALLY EJECTED INTO A SHIELDED STORAGE CONTAINER.
CALIBRATION IS CARRIED OUT TWICE A DAY AS A MINIMUM, USING NATURAL MATERIALS OF KNOWN URANIUM CONCENTRATION.

ANTIMONY WAS DETERMINED IN LAKE SEDIMENTS AS DESCRIBED BY (ASLIN, 1976). A 500 MG SAMPLE IS PLACED IN A TEST TUBE; 3 ML CONCENTRATED HNO₃ AND 9 ML CONCENTRATED HCL ARE ADDED AND THE MIXTURE IS ALLOWED TO STAND OVERNIGHT AT ROOM TEMPERATURE. THE MIXTURE IS HEATED SLOWLY TO 90C AND MAINTAINED AT THIS TEMPERATURE FOR AT LEAST 90 MINUTES. THE SOLUTION IS COOLED AND DILUTED TO 10 ML. A 400 MICRO L ALIQUOT OF THIS TEST SOLUTION IS REMOVED AND DILUTED TO 10 ML WITH 1.8M HCL. THE ANTIMONY IN AN ALIQUOT OF THIS DILUTE SOLUTION IS THEN DETERMINED BY HYDRIDE EVOLUTION-ATOMIC ABSORPTION SPECTROMETRY .

FLUORIDE IN LAKE WATER SAMPLES WAS DETERMINED USING A FLUORIDE ELECTRODE. PRIOR TO MEASUREMENT AN ALIQUOT OF THE SAMPLE WAS MIXED WITH AN EQUAL VOLUME OF TISAB II SOLUTION (TOTAL IONIC STRENGTH ADJUSTMENT BUFFER). THE TISAB II BUFFER SOLUTION IS PREPARED AS FOLLOWS: TO 50 ML METAL FREE WATER ADD 57 ML GLACIAL ACETIC ACID, 58 GM NA₂CO₃ AND 4 GM CDTA (CYCLOHEXYLENE DINITRILE TETRAACETIC ACID). STIR TO DISSOLVE AND COOL TO ROOM TEMPERATURE. USING A PH METER, ADJUST THE PH BETWEEN 5.0 AND 5.5 BY SLOWLY ADDING 5 M NAOH SOLUTION. COOL AND DILUTE TO ONE LITER IN A VOLUMETRIC FLASK.

HYDROGEN ION ACTIVITY (PH) WAS MEASURED WITH A COMBINATION GLASS-CALOMEL ELECTRODE AND A PH METER.

URANIUM IN WATERS WAS DETERMINED BY A LASER-INDUCED FLUOROMETRIC METHOD USING A SCINTREX UA-3 URANIUM ANALYSER. A COMPLEXING AGENT, KNOWN COMMERCIALY AS FLURAN AND COMPOSED OF SODIUM PYROPHOSPHATE AND SODIUM MONOPHOSPHATE, (HALL, G.E.M., 1979) IS ADDED TO PRODUCE THE URANYL PYROPHOSATE SPECIES WHICH FLUORESCES WHEN EXPOSED TO THE LASER. SINCE ORGANIC MATTER IN THE SAMPLE CAN CAUSE UNPREDICTABLE BEHAVIOUR, A STANDARD ADDITION METHOD WAS USED. FURTHER, THERE HAVE BEEN INSTANCES AT THE G.S.C. WHERE THE REACTION OF URANIUM WITH FLURAN IS EITHER DELAYED OR SLUGGISH; FOR THIS REASON AN ARBITRARY 24 HOUR TIME DELAY BETWEEN THE ADDITION OF THE FLURAN AND THE ACTUAL READING WAS INCORPORATED INTO THIS METHOD. IN PRACTICE, 500 UL OF FLURAN SOLUTION WERE ADDED TO A 5 ML SAMPLE AND ALLOWED TO STAND FOR 24 HOURS. AT THE END OF THIS PERIOD FLUORESCENCE READINGS WERE MADE WITH THE ADDITION OF 0.0, 0.2 AND 0.4 PPB U. FOR HIGH SAMPLES THE ADDITIONS WERE 0.0, 2.0 AND 4.0 (20 UL ALIQUOTS OF EITHER 55 OR 550 PPB U WERE USED). ALL READINGS WERE TAKEN AGAINST A SAMPLE BLANK.

THE FOLLOWING TABLES DISPLAY THE DATA RECORD FORMAT SPECIFICATIONS.
 THE DETECTION LIMITS OF THE ANALYTICAL METHODS ARE GIVEN.
 THE SECOND FIGURE UNDER THE DETECTION LIMIT HEADING IS USED
 AS AN ARBITRARY SET VALUE IF THE RESULTS FALL BELOW THE
 DETECTION LIMIT. (USUALLY 1/2 THE DETECTION LIMIT)

ELEMENT FIELD		CARD	COLUMNS
MAP		1	01-06
ID		1	07-12
UTM ZONE		1	13-14
UTM EAST	(METER)	1	15-20
UTM NORTH	(METER)	1	21-27
ROCK TYPE		1	28-31
LAKE AREA		1	32-35
SAMPLE DEPTH	(METER)	1	36-38
REPLICATE STATUS		1	39-40
RELIEF		1	41-43
CONTAMINATION		1	48-51
SAMPLE COLOUR		1	52-57
SUSPENDED MATTER		1	58-59
AGE		1	60-61

THE ANALYTICAL DATA WERE RECORDED AS FOLLOWS:

ELEMENT	UNITS	CARD	COLUMNS	DETECTION LIMIT	
SEDIMENT					
ZN	PPM	2	21-25	2	1
CU	PPM	2	26-30	2	1
PB	PPM	2	31-35	2	1
NI	PPM	2	36-40	2	1
CO	PPM	2	41-45	2	1
AG	PPM	2	46-50	0.2	0.1
MN	PPM	2	51-55	5	2
AS	PPM	2	56-60	1	0.5
MO	PPM	2	61-65	2	1
FE	PCT	2	66-70	0.02	0.01
HG	PPB	2	71-75	10	5
LOI	PCT	2	76-80	1.0	0.5
U	PPM	3	21-25	0.5	0.2
V	PPM	3	31-35	5	2
CD	PPM	3	36-40	0.2	0.1
SB	PPM	3	56-60	0.2	0.1
WATER					
F	PPB	4	26-30	20	10
PH		4	31-35		
U	PPB	4	36-40	0.05	0.02

REFERENCES

- ASLIN, G.E.M. (1976) THE DETERMINATION OF ARSENIC AND ANTIMONY IN GEOLOGICAL MATERIALS BY FLAMELESS ATOMIC ABSORPTION SPECTROPHOTOMETER
JOURNAL OF GEOCHEMICAL EXPLORATION, VOL. 6, PP. 321-330.
- BOULANGER, A., EVANS, D.J.R. AND RABY, B.F. (1975) URANIUM ANALYSIS BY NEUTRON ACTIVATION DELAYED NEUTRON COUNTING: PROC. OF THE 7TH ANNUAL SYMP. OF CANADIAN MINERAL ANALYSTS. THUNDER BAY, ONTARIO, SEPT. 22-23, 1975.
- GARRETT, R.G. (1974) FIELD DATA ACQUISITION METHODS FOR APPLIED GEOCHEMICAL SURVEYS AT THE GEOLOGICAL SURVEY OF CANADA: GEOL SURV. CAN. PAPER 74-52.
- HALL, G.E.M. (1979) A STUDY OF THE STABILITY OF URANIUM IN WATERS COLLECTED FROM VARIOUS GEOLOGICAL ENVIRONMENTS IN CANADA; IN CURRENT RESEARCH, PART A, GEOL. SURV. CAN. PAPER 79-1A, P. 361-365.
- JONASSON, I.R., LYNCH, J.J. AND TRIP, L.J. (1973) FIELD AND LABORATORY METHODS USED BY THE GEOLOGICAL SURVEY OF CANADA IN GEOCHEMICAL SURVEYS: NO. 12, MERCURY IN ORES, ROCKS, SOILS, SEDIMENTS AND WATER: GEOL. SURV. CAN. PAPER 73-21.

DATA LIST LEGEND

MAP- NATIONAL TOPOGRAPHIC SYSTEM (NTS) - LETTERED QUADRANGLE
(SCALE 1:250000). PART OF SAMPLE NUMBER

ID- REMAINDER OF SAMPLE NUMBER- YEAR(2), FIELD CREW(1),
SAMPLE SEQUENCE NUMBER(3)

UTM COORDINATS- UNIVERSAL TRANSVERSE MERCATOR (UTM) COORDINATE
SYSTEM- SAMPLE COORDINATES

ZN- ZONE

EAST- EASTING (METERS)

NORTH- NORTHING (METERS)

ROCK TYPE- MAJOR ROCK TYPE OF LAKE CATCHMENT AREA

AGE- STRATIGRAPHIC AGE OF ROCK TYPE

LAKE AREA- AREA OF LAKE SAMPLED

SMP DTH- SAMPLE DEPTH MEASURED TO THE NEAREST METER

RP ST- REPLICATE STATUS- RELATIONSHIP OF SAMPLE WITH
RESPECT TO OTHERS WITHIN THE SURVEY

RELF- RELIEF OF THE SURROUNDING LAKE CATCHMENT BASIN

CONT- CONTAMINATION- HUMAN OR NATURAL (WORK-DRILL/TRENCH,
CAMP, FUEL OR GOSSAN)

SMPL COLOR- SEDIMENT COLOUR

SUSP- SUSPENDED MATTER

ZN- ZINC BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

CU- COPPER BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

PB- LEAD BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

NI- NICKEL BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

CO- COBALT BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

AG- SILVER BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

MN- MANGANESE BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

AS- ARSENIC BY COLOURIMETRY (PPM)

MO- MOLYBDENUM BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

FE- IRON BY ATOMIC ABSORPTION SPECTROSCOPY (%)

HG- MERCURY BY FLAMELESS SPECTROSCOPY (PPB)

LOI- LOSS ON IGNITION BY WEIGHT DIFFERENCE (%)

U- URANIUM BY DELAYED NEUTRON ACTIVATION (PPM)

V- VANADIUM BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

CD- CADMIUM BY ATOMIC ABSORPTION SPECTROSCOPY (PPM)

SB- ANTIMONY BY HYDRIDE EVOLUTION-ATOMIC
ABSORPTION SPECTROMETRY (PPM)

F-W- FLUORIDE IN WATERS BY SPECIFIC ION ELECTRODE (PPB)

PH- PH BY COMBINATION GLASS-CALOMEL ELECTRODE

U-W- URANIUM IN WATERS BY SCINTREX (PPB)

ROCK TYPE:

CENOZOIC

QUATERNARY

(RMOR 44) - RESSIONAL MORAINE: UNCONSOLIDATED SAND AND GRAVEL OF THE CREE LAKE MORAINE.

MESOZOIC

LOWER CRETACEOUS

(SNDS 36) - MANNVILLE GROUP: SANDSTONE, VARIABLY ARGILLACEOUS AND CARBONACEOUS QUARTZOSE SANDS, LOCAL MUDSTONE AND LIGNITIC INTERBEDS.

PALEOZOIC

CAMBRIAN

(SNDS 12) - DEADWOOD FORMATION: QUARTZ SANDSTONE, UNSTRATIFIED POLYMICCTIC CONGLOMERATE NEAR BASE, MINOR SANDY DOLOMITE. OVERLIES SEVERELY WEATHERED, SAPROLITIC PRECAMBRIAN BASEMENT.

PRECAMBRIAN

PROTEROZOIC

(UFMC 04) - ULTRAMAFIC AND MAFIC ROCKS, INCLUDES GABBRO, DIORITE, PYROXENITE, QUARTZ DIORITE AND BASALT, LOCALLY SERPENTINIZED.

(CLCC 04) - CALC-SILICATE AND MARBLE, LOCALLY INTERBANDED META-ARKOSE AND DOLOMITIC MARBLE.

(PRGS 04) - PSAMMITIC GNEISS AND META-ARKOSIC GNEISS, WITH INTERBANDED CALC-SILICATE ROCK AND PELITIC GNEISS.

(PCSC 04) - PELITIC TO PSAMMOPELITIC GNEISS AND SCHIST, GENERALLY CONTAIN MORE THAN 10 PERCENT MAFIC MINERALS, BIOTITE + OR - GARNET, + OR - CORDIERITE, + OR - SILLIMANITE, + OR - GRAPHITE, + OR - TOURMALINE.

(MQRZ 04) - METAQUARTZITE AND MINOR ORTHOQUARTZITE WITH A PERSISTENT BASAL POLYMICCTIC CONGLOMERATE.

(BGNS 04) - BIOTITE GNEISS OF POSSIBLE VOLCANO-SEDIMENTARY ORIGIN, CONFORMABLE GRANITOID SHEETS MAY COMPRISE UP TO 50 PERCENT OF UNIT.

(MPRK 04) - MIXED METASEDIMENTARY AND METAVOLCANIC ROCKS, PROBABLY DERIVED FROM MUDSTONE, SANDSTONE, ARKOSE, CONGLOMERATE, ACID TO BASIC VOLCANIC AND VOLCANICLASTIC ROCKS.

(BMGT 04) - WATHAMAN BATHOLITH: BIOTITE MONZOGRANITE-GRANODIORITE.

(SGNT 04) - SYENOGANITE AND MONZOGRANITE, GENERALLY LEUCOCRATIC.

(MGMT 04) - MIGMATITE AND MYLONITE ZONES; COMPLEXES OF MIXED METASEDIMENTS AND GRANITIC ROCKS AND STRONGLY FLASERED OR AUGENED WATHAMAN BATHOLITH ROCKS.

ROCK TYPE (CONT.):

ARCHEAN-PROTEROZOIC

(APBG 03) - AMPHIBOLITE AND HORNBLende BEARING GNEISSES, METAGABBRO AND METADIORITE.

(GRNG 03) - GRANITOID GNEISS, SYENOGANITIC TO GRANODIORITIC IN COMPOSITION, MAY INCLUDE ALASKITE AND AMPHIBOLITE INCLUSIONS.

AGE: 44 - QUATERNARY
36 - CRETACEOUS
18 - DEVONIAN
12 - CAMBRIAN
04 - PROTEROZOIC
03 - ARCHEAN-PROTEROZOIC

LAKE AREA: POND- POND
LT 1- 1/4 TO 1 SQ KM
1-5- 1 TO 5 SQ KM
GT 5- GREATER THAN 5 SQ KM

RP ST: 00- ROUTINE REGIONAL SAMPLE
10- FIRST OF FIELD DUPLICATE
20- SECOND OF FIELD DUPLICATE

REL F: L- LOW
M- MEDIUM
H- HIGH

CONT: BLANK- NONE
1- PRESENT

SMPL COLOR: TN- TAN
YL- YELLOW
GN- GREEN
GY- GREY
BR- BROWN
BK- BLACK

SUSP: BLANK- NONE
L- LIGHT
H- HEAVY