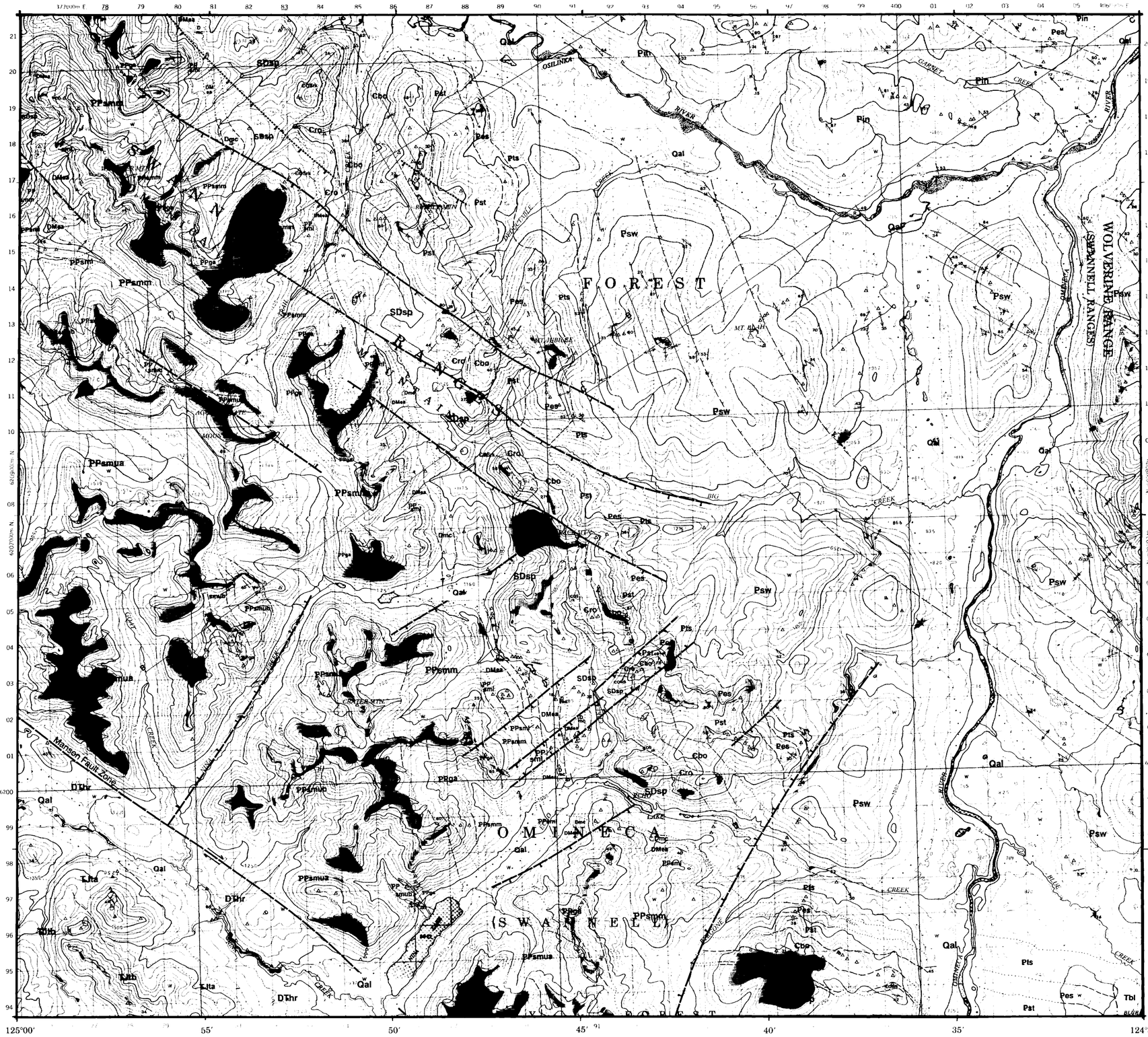
CANADA



Province of British Columbia

Ministry of Energy, Mines and Petroleum Resources

MINERAL RESOURCE DIVISION
GEOLOGICAL SURVEY BRANCH

OPEN FILE 1990-17 (SHEET 1 OF 2)

GEOLOGY BETWEEN NINA LAKE AND OSILINKA RIVER, BRITISH COLUMBIA

NTS 93N/15(NORTH HALF), 94C/2(SOUTH HALF)

FILIPPO FERRI
AND
DAVID M. MELVILLE

SCALE 1:50 000

LAYERED ROCKS

QUATERNARY

Qal — *ALLUVIUM, POORLY SORTED SANDS AND GRAVELS*

TERTIARY(?)

BLUE LAKE VOLCANICS

Tbl — *BASALT, AUGITE PHYRIC, MASSIVE OR BRECCIATED, DARK GREY*

UPPER TRIASSIC AND LOWER JURASSIC

TAKLA GROUP

TaJta — *ARGILLITE, MASSIVE TO THICKLY BEDDED, IN PART SILICEOUS; GREY TO DARK GREY; SILTSTONE, GREY TO GREENISH, MASSIVE TO POORLY BEDDED; VOLCANIC SANDSTONE, GREY TO GREENISH GREY, MASSIVE TO THINLY BEDDED*

TaJtb — *VOLCANIC SANDSTONE; MINOR SILTSTONE AND ARGILLITE; BASALT, MASSIVE FLOWS BRECCIA, AUGITE AND FELDSPAR PHYRIC*

DEVONIAN TO TRIASSIC(?)

HARPER RANCH GROUP

DThr — *ARGILLITE, MASSIVE TO THINLY BEDDED, SILICEOUS IN PART, GREY; SILTSTONE, MASSIVE TO POORLY BEDDED, GREENISH GREY*

PENNSYLVANIAN AND PERMIAN

SLIDE MOUNTAIN GROUP

PPsmua — *BASALT, MASSIVE, PILLOWED; BASALTIC BRECCIA; MINOR VARICOLOURED CHERT, SILICEOUS ARGILLITE AND GABBRO*

PPsmub — *ARGILLITE, DARK GREY TO GREY, SILICEOUS; CHERT, VARICOLOURED (CREAM, GREY, MAROON, GREEN), MASSIVE TO MODERATELY BEDDED; GABBRO SILLS, GREEN, FINE TO MEDIUM GRAINED*

PPsmuc — *ULTRAMAFIC ROCKS (MERILITE), FINE GRAINED, DARK GREY TO BLACK, SLIGHTLY MAGNETIC, MINOR SERPENTINE AND ASBESTOS; MAFIC GABBRO; MINOR VARICOLOURED CHERT*

PPsmm — *ARGILLITE, DARK GREY, GREY TO LIGHT GREY, MASSIVE TO POORLY BEDDED, SILICEOUS; CHERT, VARICOLOURED (CREAM, GREY, GREEN, MAROON) MASSIVE TO MODERATELY BEDDED; GABBRO SILLS, GREEN TO DARK GREEN, FINE TO MEDIUM GRAINED; MINOR MICRITIC LIMESTONE, QUARTZ AND QUARTZ-CHERT WACKES AND QUARTZ BEARING FELSIC TUFFS*

PPsml — *ARGILLITE, BLACK TO DARK GREY, SLIGHTLY SILICEOUS, MASSIVE TO POORLY BEDDED; MINOR QUARTZ WACKE IN LOWER PART*

UPPER DEVONIAN TO MISSISSIPPIAN

EARN GROUP

DMea — *SHALE, BLUE-GREY, FISSILE; MINOR ARGILLITE AND QUARTZ SANDSTONE*

MIDDLE DEVONIAN

McDAME GROUP

Dmc — *DOLOMITE AND LIMESTONE, DARK GREY, FETID, POORLY BEDDED, LOCALLY FOSSILIFEROUS; DOLOMITE, GREY, MASSIVE*

SILURIAN TO LOWER DEVONIAN

SANDPILE GROUP

SDsp — *UPPER PART: SANDY DOLOMITE, DOLOMITE AND LIMESTONE, GREY, MASSIVELY BEDDED, LOCALLY SILICIFIED; MINOR GREY-BROWN ARGILLITE AND DARK GREY TO GREY QUARTZITE. LOWER PART: LIMESTONE, GREY, MASSIVE TO THINLY BEDDED, ALGAL LAMINAE AND OOLITES, LOCALLY SILICIFIED; MINOR DARK GREY ARGILLITE*

CAMBRIAN TO SILURIAN

KECHIKA AND ROAD RIVER GROUPS

COSrk — *ROAD RIVER GROUP: SHALE, SLATE, THINLY BEDDED, GREY TO DARK GREY; LIMESTONE, ARGILLACEOUS, THIN BEDDED.* KECHIKA GROUP: *LIMESTONE, ARGILLACEOUS, THIN BEDDED, GREY TO BLACK/LOWER CAMBRIAN*

LOWER CAMBRIAN

ATAN GROUP

ROSELLA FORMATION

Cro — *LOWER PART: LIMESTONE, THIN BEDDED, PLATY, DARK GREY TO GREY. UPPER PART: LIMESTONE, GREY, MASSIVE TO THICKLY BEDDED, SLIGHTLY ARGILLACEOUS AND LOCALLY DOLOMITIC, MAY BE OOLITIC*

BOYA FORMATION

Cbo — *UPPER PART: SHALE, SILTSTONE, OLIVE-GREEN TO GREY, THIN TO MODERATELY BEDDED; SANDSTONE, FINE GRAINED, BEIGE TO TAN, MODERATELY BEDDED; MINOR QUARTZITE. LOWER PART: QUARTZITE, MASSIVE TO THICKLY BEDDED, WHITE, GREY, BEIGE OR MAROON.*

PROTEROZOIC

INGENIKA GROUP

Pin — *BIOTITE-CHLORITE-MUSCOVITE SCHISTS AND GNEISSES WHICH LOCALLY CONTAIN CHLORITOID, GARNET, STAUROLITE, TOURMALINE, AND SILLIMANITE; QUARTZITE; MARBLE; INTRUDED BY PEGMATITE AND GRANODIORITE IN HIGH GRADE REGIONS*

STELKUZ FORMATION

Pst — *SLATE, SILTSTONE, GREEN TO GREY; FINE GRAINED SANDSTONE AND IMPURE QUARTZITE IN UPPER PART, GREY TO BROWN, FINE GRAINED AND PLANAR BEDDED; MINOR DOLOMITIC LIMESTONE*

ESPEE FORMATION

Pes — *LIMESTONE, LOCALLY DOLOMITIC , MODERATELY TO THINLY BEDDED, MARBLE*

TSAYDIZ FORMATION

Pts — *SLATE, PHYLLITE, GREENISH GREY TO GREY, INTERLAYERED WITH THINNLY BEDDED LIMESTONE TO ARGILLACEOUS LIMESTONE; MINOR SILTSTONE, QUARTZ AND FELDSPATHIC WACKES, AND MARBLE*

SWANNELL FORMATION

Psw — *UPPER PART: IMPURE QUARTZITE AND SANDSTONE, MASSIVELY BEDDED; LESSER SILTSTONES, SLATES PHYLLITES AND FELDSPATHIC WACKES. MIDDLE PART: FELDSPATHIC WACKE, MASSIVE, COARSE GRAINED; LESSER SLATE, PHYLLITE, QUARTZ WACKE AND SANDSTONE. LOWER PART: QUARTZ AND FELDSPATHIC WACKES, THIN TO THICKLY BEDDED, LESSER IMPURE SANDSTONES, SILTSTONE, MARBLE, SLATE AND PHYLLITE; METAMORPHOSED TO GARNET, STAUROLITE AND SILLIMANITE BEARING SCHISTS AND GNEISSES TO THE NORTHEAST; INTRUDED BY PEGMATITE AND RELATED GRANODIORITE WITHIN SILLIMANITE ZONE*

INTRUSIVE ROCKS

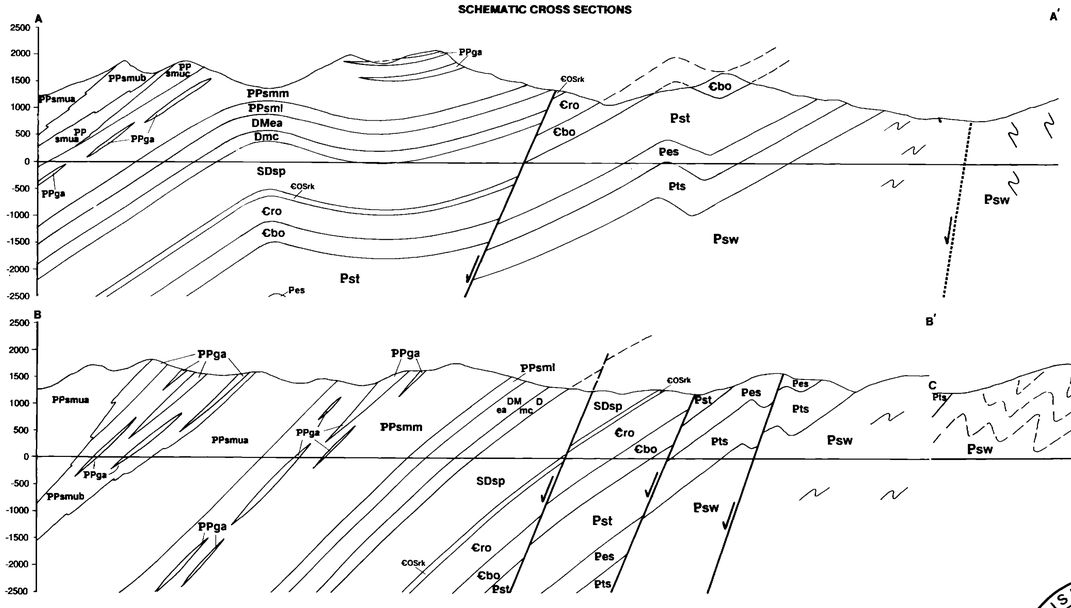
PENNSYLVANIAN TO PERMIAN

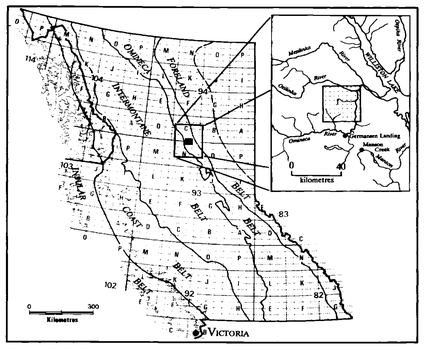
PPga — *GABBRO, GREEN TO DARK GREEN, FINE TO COARSE; MINOR ARGILLITE AND VARICOLOURED CHERT*

SYMBOLS

- Geological boundary (defined, approximate, assumed)
- Normal fault (defined, approximate, assumed)
- Strike-slip fault
- Bedding/compositional layering (inclined, vertical, tops unknown)
- Pillows (inclined)
- F_1 and F_2 foliation (inclined, vertical)
- F_3 foliation (inclined)
- F_1 minor fold axis with vergence indicated (arrow indicates plunge)
- F_2 minor fold axis (arrow indicates plunge)
- F_3 minor fold axis (arrow indicates plunge)
- Bedding-cleavage intersection
- Mineral lineation (arrow indicates plunge)
- Anticlinal fold axis (arrow indicates plunge)
- Synclinal fold axis (arrow indicates plunge)
- F_3 synformal fold axis
- F_3 antiformal fold axis
- Mineral isograd (biotite, garnet, staurolite, sillimanite; ticks indicate direction of increasing metamorphism)
- Cross section line — A A′
- Isolated outcrop/station locality
- Area of rock exposure
- Limit of Quaternary cover

SCHEMATIC CROSS SECTIONS





94C/6	94C/7	94C/8
94C/3	94C/2	94C/1
93N/14	93N/15	93N/16
93N/11	93N/10	93N/9

TRUE 1976 MAGNETIC BEARING is 29 27′ (524 mils) EAST of GRID NORTH

ANNUAL CHANGE DECREASING 4 2′

GRID NORTH is 1 27′ (26 mils) WEST of TRUE NORTH for centre of map

Le REPERE MAGNETIQUE en 1976 est à 29 27′ (524 mils) EST du NORD DU QUADRILLAGE

VARIATION ANNUELLE DECROISSANTE 4 2′

NORD DU QUADRILLAGE est 1 27′ (26 mils) à l ouest du NORD GEOGRAPHIQUE au centre de la carte

ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL

CONTOUR INTERVAL ..... 50 METRES

NORTH AMERICAN DATUM 1927

TRANSVERSE MERCATOR PROJECTION

BRITISH COLUMBIA GEOLOGICAL SURVEY

ADDITIONAL SOURCES

Borovic, I. (1977): A Report on the Geochemical Survey of the Alfie 1 to 4 Claims; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Report 6485.

Ferri, F., Melville, D.M. and Arksey, R.L. (1989): Geology of the Germansen Landing Area, 93N/10 and 93N/15; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Open File 1989-12.

Gabrielse, H. (1975): Geology of Fort Grahame E1/2 Map-Area, British Columbia; *Geological Survey of Canada*, Paper 75-33, 28 pages.

Leighton, D.G. (1988): Geological Report on the Nina Property, Germansen Landing, B.C.; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Report 16946.

Sonnendrucker, P.F. (1975): A Geological and Geochemical Report on the Sheila M.C. Group; Nine Miles North of Germansen Landing; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Report 5453.

Sheet 2 of 2

OPEN FILE 1990-17 GEOLOGY BETWEEN NINA LAKE AND OSILINKA RIVER

ANALYTICAL PROCEDURES FOR GEOCHEMISTRY

ANALYTICAL PROCEDURES FOR 1989 MOSS-MAT AND STREAM SEDIMENT GEOCHEMISTRY

Analyses performed by ACME Analytical Laboratories Ltd., 852 E. Hastings St., Vancouver, B.C, V6A 1R6

1. ELEMENTS Cu THROUGH W

Inductively Coupled Plasma-Emission Spectroscopy(ICP-ES) A 0.500 gram sample is digested with 3 ml 3-1-2 HCl-HNO_3-H_2O (aqua regia) at 95 ^{0}C for one hour and is diluted to 10 ml with water. This leach is almost total for base metals, but partial for Fe, Mn, Sr, Ca, Mg, Ba, Ti, B, W, and is limited for Na, K, and Al.

2. ELEMENTS As THROUGH Te

Hydride Generation of volatile elements and determination by ICP-ES. Ge is partial leached. Digestion as in Analytical procedure 1 above.

3. GOLD (Au)

Acid Leach/Atomic Absorption A 10 gram sample (or the sample material remaining after Analytical procedure 1 (above) was completed) was ignited at 600 ^{0}C, digested with hot aqua regia, extracted with MIBK, and analyzed by graphite furnace atomic absorption.

4. MERCURY (Hg)

Cold Vapour/Atomic Absorption The sample - acid solution above is reduced by the addition of $SnCl_2$ (stannous chloride) producing Hg vapour. The vapour is swept through a cell in the AAS light path and measured.

ANALYTICAL PROCEDURES FOR 1983 STREAM SILT GEOCHEMISTRY - *See British Columbia Department of Energy, Mines, and Petroleum Resources, Geological Survey Branch - Regional Geochemical Survey Open File #11 and Geological Survey of Canada Open File #1001.*

ANALYTICAL PROCEDURES FOR 1989 ROCK GEOCHEMISTRY

Analysis performed by B.C.Geological Survey - Analytical Sciences Laboratory

1. GOLD (Au) AND SILVER (Ag)

Fire Assay/Atomic Absorption A 0.5 Assay Ton (approx. 15 gram) sample weight is subjected to a standard fire assay technique to generate a Au/Ag bead. The bead is dissolved in acid and Au is measured to a detection limit of <20 ppb and Ag is measured to a detection limit of <0.5 ppm by atomic absorption analysis.

2. BASE METALS (Cu, Pb, Zn, Co*, Mo, Bi)

Atomic Absorption Samples are digested using a mixed acid attack which includes HF. The dilute acid dissolution of the residue is further diluted to a specific volume and the elements are measured using AAS.

3. TRACE ELEMENTS (Rb, Sr, Y, Zr, Nb, Mo, Ta, Ba, U, Th, Cs, La, Ce, Co, Cr, Ni, W)

X-Ray Fluorescence An approximate 4 gram pulverized sample is mixed with boric oxide and a fusion-flux (lithium tetra-borite and lithium meta-borite) and fused at 1150 ^{0}C until completely dissolved in a platinum crucible. The resulting fused disk is then subjected to the x-ray fluorescence spectrometer.

4. COMPLETE OXIDES

X-Ray Fluorescence The sample is fused into a glass disk and is then subjected to the x-ray fluorescence spectrometer.

5. MERCURY

Cold Vapour/Atomic Absorption A 0.1 g to 1 g sample is subjected to a HCl and HNO_3 digestion followed by the generation of Hg vapour using $SnCl_2$ as a reducing agent. The vapour is swept through a cell in the AAS light path and measured.

6. ELEMENTS As AND Sb

Hydride Generation A 1 g sample is digested using a mixture of HCl and HNO_3; a portion of the diluted sample solution is treated with $NaBH_4$ and the liberated hydride compound is swept into a hot cell in the light path of the AAS unit. The hydride decomposes to give a vapour of the element which is measured.

* - As samples are crushed using tungsten carbide equipment inevitable contamination may occur.

Notes: 1 - Tables indicate data available at time of publication

1990 COMPLETE OXIDE AND WHOLE ROCK GEOCHEMISTRY

FIELD NUMBER	UTM EASTING	UTM NORTHING	SiO2 %	TiO2 %	Al2O3 %	Fe2O3 %	MnO %	MgO %	CaO %	Na2O %	K2O %	P2O5 %	LOI %	TOTAL %	Cu ppm	Pb ppm	Zn ppm	Ni ppm	Co ppm
FFE89-6-5	386366	6203993	47.14	1.27	11.57	10.92	0.20	11.20	11.56	1.54	0.98	0.11	3.05	99.52	15	4	65	188	46
FFE89-6-7	386093	6203782	50.23	1.55	14.32	10.79	0.18	6.96	7.94	4.23	0.26	0.14	2.67	99.27	50	6	77	72	31
FFE89-6-10	385919	6203446	48.76	1.49	14.04	10.72	0.16	6.22	12.60	2.59	0.03	0.15	2.97	99.73	57	6	111	76	33
FFE89-15-08	384117	6198147	49.10	1.56	12.65	11.59	0.20	7.40	11.99	1.77	0.24	0.13	3.28	99.91	86	4	194	100	37
FFE89-16-09	383513	6200840	48.83	1.01	15.06	9.66	0.17	7.13	11.59	2.13	0.04	0.08	4.11	99.81	31	4	84	67	30
FFE89-18-09	376490	6203168	48.61	1.34	14.40	10.63	0.17	7.20	10.34	3.38	0.06	0.11	3.15	99.39	68	4	85	90	32
FFE89-18-14	376231	6204902	48.96	1.30	14.22	10.27	0.17	7.29	10.35	3.44	0.25	0.11	3.10	99.46	63	4	77	97	34
FFE89-19-8	380053	6206391	50.05	1.31	14.31	10.68	0.18	7.49	8.29	3.79	0.21	0.12	2.78	99.21	46	4	76	82	30
FFE89-20-12	384420	6212444	46.12	2.88	12.64	16.05	0.25	5.27	9.43	2.70	0.41	0.14	3.35	99.24	60	4	116	17	42
FFE89-23-27	378089	6217301	48.91	1.07	13.93	9.74	0.20	8.47	11.04	2.58	0.71	0.09	2.72	99.46	28	4	92	122	34
FFE89-24-12	380816	6214157	49.40	1.65	14.11	10.58	0.21	6.53	10.40	3.41	0.11	0.15	2.74	99.29	6	4	52	76	33
FFE89-24-12*	380816	6214157	49.28	1.65	14.11	10.58	0.20	6.48	10.39	3.41	0.12	0.14	2.73	99.09	6	4	55	65	33
FFE89-29-17	381971	6215827	47.74	1.71	14.10	11.74	0.20	7.45	10.35	3.38	0.02	0.13	2.94	99.76	7	4	82	85	38
FFE89-41-14	376722	6195365	50.55	1.21	16.06	10.27	0.18	5.26	7.55	4.93	0.20	0.10	2.89	99.22	91	4	76	23	25
DME89-08-07	390896	6198554	47.14	1.32	15.85	10.00	0.17	6.80	10.73	3.26	0.06	0.12	3.60	99.07	18	4	63	60	35
DME89-15-6	379041	6202679	47.39	1.68	13.46	12.32	0.20	7.94	9.43	3.49	0.07	0.13	3.04	99.15	67	4	87	88	40
DME89-16-9	377366	6207814	49.38	1.47	13.80	10.45	0.19	5.87	14.00	0.78	0.09	0.14	3.56	99.73	50	4	81	64	33
DME89-18-9	377916	6211219	49.14	1.78	15.14	11.49	0.17	7.15	7.12	3.54	0.43	0.16	3.08	99.20	64	4	86	79	36
JWH89-3-7	377801	6212518	36.79	0.43	3.16	17.20	0.25	29.87	2.59	0.00	0.02	0.04	9.36	99.71	11	4	76	0.10%	123
JWH89-5-6	380465	6217169	48.33	1.79	13.89	11.55	0.23	7.12	10.14	3.22	0.04	0.17	2.82	99.30	7	4	82	92	37

* - Duplicate Sample Run

1983 REGIONAL GEOCHEMICAL SURVEY

SAMPLE NUMBER	UTM EASTING	UTM NORTHING	Ag ppm	Zn ppm	Cu ppm	Pb ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	Sb ppm	Hg ppb	U ppm	U IN WATER ppb	F IN WATER ppb	pH OF WATER
831625	398657	6197797	0.4	285	46	30	61	18	552	2.80	6.0	1.0	80	4.2	1.5	70	8.2
831626	394951	6196210	0.1	57	56	1	56	24	800	3.60	1.5	0.2	30	1.5	0.04	46	7.7
831627	398721	6196725	0.2	88	56	11	50	23	710	3.35	3.0	0.6	60	2.9	0.47	54	7.8
831628	398721	6196725	0.2	86	54	10	48	22	658	3.30	2.5	0.4	40	2.7	0.64	56	7.8
831629	403604	6196869	0.1	34	15	5	19	8	241	1.50	1.5	0.3	10	5	0.2	56	7.3
831630	404553	6199636	0.2	58	35	11	34	13	740	2.65	2.5	0.2	50	7.4	2.24	70	7.8
831632	404580	6199298	0.1	16	7	1	2	2	3250	0.15	0.5	0.2	70	2.3	0.2	84	7.8
831633	404061	6200172	0.1	30	14	3	17	7	187	1.25	1.5	0.2	20	8.2	0.21	64	7.3
831635	405818	6204699	0.1	25	10	2	13	5	105	1.05	1.0	0.1	20	8	0.12	72	6.4
831636	406080	6206316	0.1	40	13	4	17	6	126	1.30	1.0	0.1	20	11.2	0.13	110	6.5
831637	399616	6202982	0.2	53	32	9	35	15	490	2.30	3.5	0.1	30	2.2	0.53	52	7.9
831638	398118	6201971	0.1	65	37	10	31	10	173	1.70	2.0	0.1	50	4.2	0.6	54	7.7
831639	391623	6200630	0.3	280	74	66	36	7	557	1.25	6.0	1.0	200	9.3	0.9	52	7.8
831640	391275	6199840	0.2	74	33	23	16	5	286	0.80	3.5	0.2	160	2.8	0.74	56	7.7
831642	391103	6203155	0.9	980	40	437	56	16	1000	2.05	10.0	2.0	900	2.8	0.2	30	7.8
831643	391103	6203155	1.0	1160	56	530	76	19	1180	3.10	9.5	2.4	1300	3.6	0.13	36	7.6
831644	388376	6205417	0.3	409	72	18	72	20	710	2.90	5.5	0.8	170	5.6	0.59	60	7.5
831649	386486	6196529	0.1	76	84	1	81	31	1160	4.60	5.5	0.2	90	0.6	0.04	40	7.5
831650	389213	6195347	0.2	66	85	1	41	26	816	4.20	1.5	0.1	80	0.6	0.04	32	7.2
831651	388341	6197572	0.3	185	51	33	54	10	286	1.85	3.0	0.2	180	8.5	0.7	54	7.2
831652	388009	6203357	1.4	1200	115	30	640	14	522	2.10	7.0	2.6	710	130	0.39	110	7.4
831653	387119	6205639	0.3	25	28	2	11	4	198	1.05	2.5	0.1	120	11.7	0.03	56	7.3
831654	383744	6208002	0.1	43	73	2	33	15	431	2.15	2.5	0.1	60	1.9	0	0	0
831655	382628	6204924	0.1	65	83	1	52	20	688	1.15	1.5	0.1	70	0.8	0.01	46	7.3
831656	383346	6205042	0.1	50	59	1	35	20	669	3.10	1.5	0.1	50	0.3	0.01	34	6.8
831657	382801	6202891	0.1	41	52	1	37	20	573	3.10	1.5	0.1	50	0.6	0.03	32	7
831658	378692	6201980	0.1	50	54	1	40	22	609	3.45	1.5	0.1	40	0.5	0.01	36	6.9
831659	380003	6199552	0.1	52	56	1	43	22	635	3.25	1.5	0.1	40	0.8	0.02	30	7
831660	379580	6199647	0.1	42	43	1	38	23	578	3.30	1.0	0.1	50	0.4	0.01	40	7.1
831662	377182	6199548	0.1	48	56	1	23	15	359	2.90	3.0	0.1	90	1.4	0.01	38	7.7
831663	375973	6195118	0.4	63	134	3	47	17	807	3.40	5.0	0.6	200	1.8	0.01	34	6.2
831664	380201	6196255	0.1	63	88	3	30	20	616	3.50	5.0	0.2	110	1.6	0.01	36	7.5
831665	380868	6196704	0.2	142	88	14	70	26	861	4.10	18.0	2.6	310	3.4	0.02	40	7.5
831666	380868	6196704	0.3	148	87	14	70	26	923	4.10	18.0	4.0	350	4.1	0.04	40	7.4
833246	382402	6194479	0.1	72	65	3	40	16	771	3.20	3.5	0.7	160	1.6	0.01	32	7.5
833247	388447	6198128	0.2	73	86	4	56	18	1000	3.15	2.5	0.3	70	2.1	0.02	28	7.6

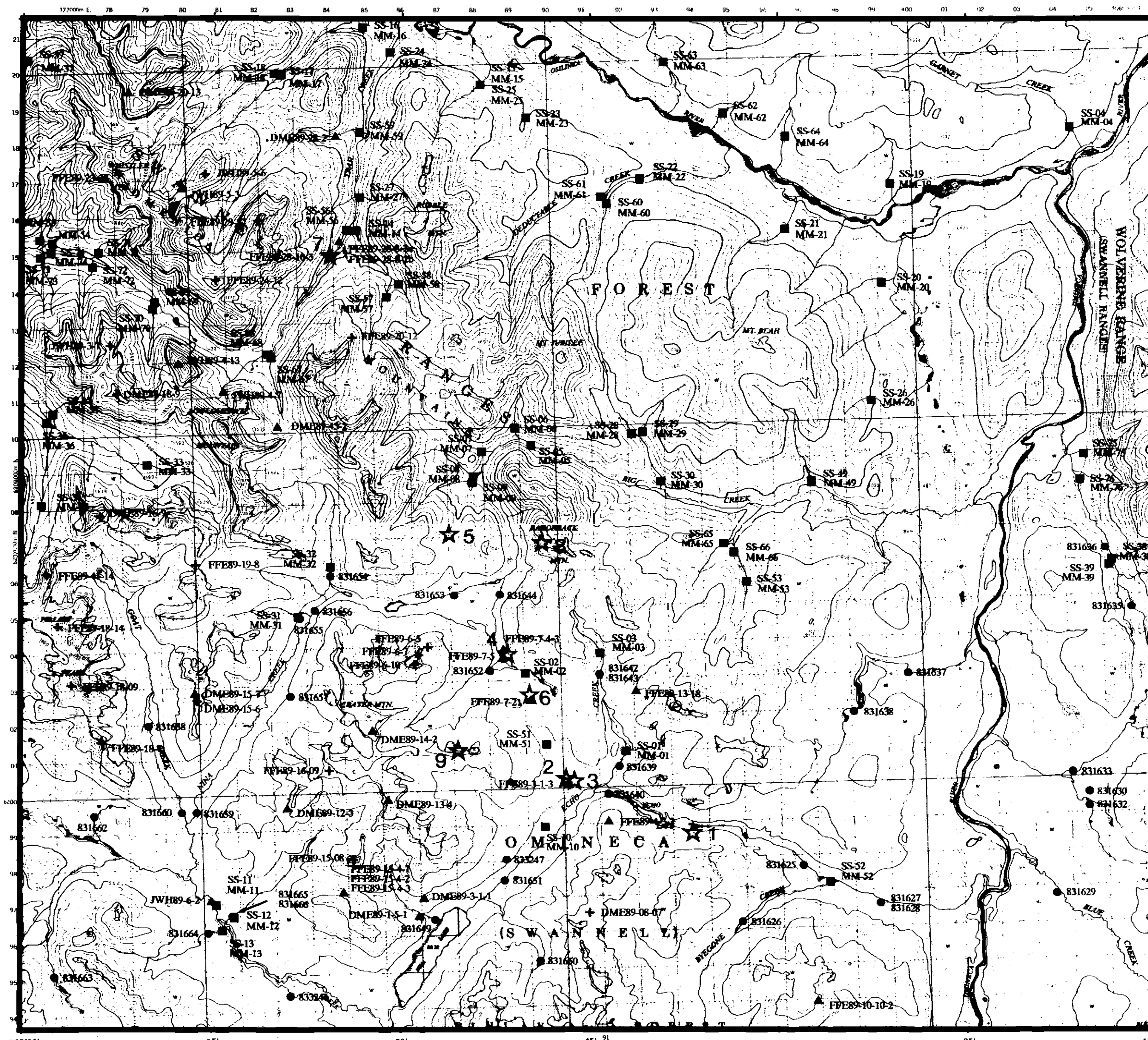
1990 GEOCHEMISTRY RESULTS

FIELD NUMBER	UTM EASTING	UTM NORTHING	ROCK TYPE	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Ni ppm	Co ppm	Mo ppm	As ppm	Sb ppm
DME89-1-5	386016	6198620	Altered Basalt?	2	0.3	45	3	82	51	26	8	2	0.8
DME89-3-1	386149	6197123	Gabbro	2	0.3	58	3	84	102	40	8	1	0.5
DME89-12-3	382455	6199858	Basalt	6	0.3	51	3	73	63	30	8	1	0.6
DME89-13-4	385231	6199864	Gabbro	2	0.3	55	3	82	49	36	8	1	3
DME89-14-2	384837	6201744	Basalt	6	0.3	142	3	87	17	20	14	13	0.6
DME89-14-2*	384837	6201744	Basalt	6	0.3	144	6	88	23	23	8	12	0.5
DME89-15-7	379064	6202872	Basalt	2	0.3	49	4	89	44	34	8	1	0.5
DME89-20-13	378533	6219441	Quartz Vein	4	0.3	67	10	56	50	11	8	5	0.5
DME89-28-2	384198	6218091	Calcareous Siltstone	2	0.3	27	24	270	#	24	8	1	0.7
DME89-43-2	382428	6210161	Chert	2	0.3	345	4	37	#	4	8	2	0.5
FFE89-3-1-3	390200	6200191	Massive Sulphide	2	84	51	5.20%	8.70%	#	6	10	16	58
FFE89-4-3-2	391280	6199124	Carbonate Breccia	2	0.3	2	15	10	#	3	8	1	0.5
FFE89-7-4-3	388480	6203882	Carbonate Breccia	2	28	88	10	4.1%	#	3	8	3	3
FFE89-7-5	388483	6203870	Silty Carbonate	2	32	18	5.40%	20	#	9	8	240	42
FFE89-7-5*	388463	6203870	Silty Carbonate	4	32	17	5.50%	16	#	7	8	244	36
FFE89-7-21	389194	6202531	Massive Sulphide	2	115	150	0.67%	14.7%	#	3	8	13	18
FFE89-10-10	398932	6194087	Dolomitic Limestone	2	0.3	3	19	15	#	3	8	3	0.9
FFE89-13-18	392121	6202705	Carbonate Breccia	2	0.3	3	60	64	#	3	8	2	0.6
FFE89-15-4-1	383933	6197341	Altered Basalt	2	0.3	48	4	47	58	30	8	3	0.5
FFE89-15-4-2	383933	6197341	Altered Basalt	2	0.3	22	4	36	34	16	8	2	0.5
FFE89-15-4-3	383933	6197341	Altered Basalt	16	0.3	29	4	41	42	17	8	3	0.5
FFE89-18-4	377368	6201662	Altered Basalt	10	0.3	52	3	59	81	34	8	1	0.5
FFE89-28-8-2a	384229	6215216	Dolomite	4	0.3	6	65	36	#	3	8	61	4
FFE89-28-8-2b	384229	6215216	Dolomite	4	0.3	9	47	17	#	3	8	59	4
FFE89-28-10-3	383973	6214855	Dolomite	2	0.8	46	0.32%	6.60%	#	3	48	7	8
JWH89-4-7	380944	6211173	Chert	4	0.3	149	6	112	63	22	12	6	0.5
JWH89-4-13	379724	6211987	Quartz Vein	8	0.3	114	25	26	8	2	12	13	0.5
JWH89-5-3	379947	6216777	Gabbro	6	0.3	217	3	45	74	32	8	1	0.5
JWH89-6-2	380270	6197148	Siliceous Argillite	22	0.6	48	13	64	30	5	20	10	2
Detection Limits				2	0	2	3	7	3	2	8	1	1

* - Duplicate sample run

- Data not recieved at time of publication

CANADA



MANSON CREEK PROJECT

NORTH HALF OF GERMANSEN LANDING (93N/15) AND SOUTH HALF OF END LAKE (94C/2)

ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL
CONTOUR INTERVAL........................ 50 METRES

NORTH AMERICAN DATUM 1927
TRANSVERSE MERCATOR PROJECTION

94C/6	94C/7	94C/8
94C/3	94C/2	94C/1
93N/14	93N/15	93N/16
93N/11	93N/10	93N/9

Province of British Columbia — Ministry of Energy, Mines and Petroleum Resources

MINERAL RESOURCE DIVISION
GEOLOGICAL SURVEY BRANCH

OPEN FILE 1990-17 (SHEET 2 OF 2)

GEOCHEMISTRY AND MINERAL OCCURRENCES BETWEEN NINA LAKE AND OSILINKA RIVER

NTS 93N/15(NORTH HALF), 94C/2(SOUTH HALF)

FILIPPO FERRI AND DAVID M. MELVILLE

SCALE 1:100 000

LEGEND

1983 Regional Geochemical Survey..●

1990 Regional Geochemical Survey (*Moss-Mat and Stream Sediment*)........................■

Lithogeochemistry

1990 Geochemistry (*"Grab Samples"*)........................▲

1990 Complete Oxide and Whole Rock Geochemistry........................+

MINFILE Mineral Occurrences........................☆

MINFILE MINERAL OCCURRENCES

No.	MINFILE No./Name	Economic Commodities	Geological Description
1	093N 172 Sheila	Zn, Ba, Pb, Ag	Sulphide mineralization occurs disseminated to massive in dolomitic units of the McDame Group.
2	093N 075 W. Vernon	Zn, Pb, Ba, Ag	"
3	093N 076 Vernon	Zn, Pb, Ba, Ag	"
4	093N 114 Biddy	Zn, Pb, Ge, Ag	"
5	093N 158 Crin	Pb, Zn	"
6	093N 010 Jemima	Zn, Pb, Ba	Sulphides occur massively in irregular pods hosted in arenaceous dolomites of the McDame Group.
7	093N 191 Whistler*	Zn, Pb, Ba	Sulphides occur within a coarsely crystalline dolomite of the McDame Group.
8	093N 170 Osi	Pb, Zn, Ag	Disseminated sulphides occur in siderite and hematite veinlets within the massive Sandpile Group carbonates.
9	093N 011 Nina	Au, Ag, Cu	Sulphides, with varying gold and silver concentrations, occur in a shear zone within Slide Mountain Group gabbro.

** - Denotes New Occurrence*

1990 REGIONAL GEOCHEMICAL SURVEY - STREAM SEDIMENT RESULTS

SAMPLE NUMBER	UTM EASTING	UTM NORTHING	Au ppb	Ag ppm	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Hg ppb	LOI %
SS-01	391873	6201020	1	0.3	4	22	72	292	24	6	324	1.66	5	5	1	36	1	2	2	33	8.63	0.089	9	18	4.48	190	0.03	13	0.61	0.01	0.04	2	460	26.0
SS-02	389248	6203324	1	0.2	1	10	22	177	16	3	190	0.85	3	5	1	32	1	7	2	23	10.92	0.055	3	8	5.76	208	0.06	2	0.44	0.01	0.02	2	280	25.2
SS-03	391255	6203744	1	0.2	1	20	18	188	15	3	286	0.76	8	5	1	27	2	9	2	17	14.93	0.061	3	8	8.65	76	0.01	6	0.37	0.01	0.03	2	340	40.7
SS-04	404392	6217887	1	0.1	1	21	6	74	26	9	255	2.72	4	5	8	49	1	2	2	20	0.83	0.046	21	23	0.83	50	0.05	3	1.45	0.02	0.12	3	60	4.8
SS-05	389329	6209805	1	0.2	2	37	18	225	49	12	499	2.75	7	5	1	24	1	2	2	63	2.37	0.089	6	36	1.63	480	0.21	2	1.48	0.01	0.03	1	110	7.4
SS-06	388958	6209996	13	0.2	2	29	27	151	37	12	488	2.97	6	5	2	34	1	2	2	45	3.06	0.058	10	30	1.91	289	0.13	6	1.22	0.01	0.03	1	90	10.4
SS-07	388129	6209406	9	0.4	6	53	25	285	78	12	538	2.70	10	5	1	36	2	2	2	49	4.37	0.087	8	40	2.56	642	0.10	13	0.99	0.01	0.04	1	270	13.6
SS-08	387782	6208766	1	3.9	4	40	107	945	233	22	720	1.87	16	5	1	36	4	6	2	36	10.01	0.226	8	12	5.35	470	0.02	2	0.46	0.01	0.04	1	690	22.4
SS-09	387766	6208614	1	4.4	4	40	111	1024	265	22	1007	1.88	12	5	1	35	5	2	2	35	8.97	0.226	9	13	4.92	492	0.02	12	0.49	0.01	0.04	1	750	21.8
SS-10	389688	6199085	2	0.6	1	66	15	163	67	16	838	3.59	5	5	1	21	1	2	2	82	1.88	0.062	7	50	1.56	420	0.25	3	2.01	0.01	0.03	2	90	11.3
SS-11	380507	6197109	4	0.2	1	62	6	82	34	15	591	4.93	7	5	1	33	1	2	2	128	1.70	0.058	5	48	1.34	79	0.24	6	2.05	0.01	0.03	1	80	5.0
SS-12	380864	6196642	2	0.4	5	80	19	138	61	19	880	5.15	18	5	1	31	1	2	2	92	1.40	0.056	6	48	1.18	141	0.19	11	1.75	0.01	0.03	1	220	8.4
SS-13	380639	6196304	5	0.1	1	89	6	100	30	17	725	5.01	9	5	1	72	1	2	2	117	1.60	0.059	8	50	1.42	71	0.22	11	2.59	0.01	0.04	1	120	10.7
SS-14	384710	6215571	6	0.3	1	30	19	280	41	10	637	2.39	4	5	2	26	2	2	2	56	2.07	0.092	9	33	1.39	527	0.13	3	1.13	0.01	0.05	1	160	8.2
SS-15	388190	6219452	1	0.1	1	18	18	69	22	10	369	2.40	4	5	5	42	1	2	2	11	0.60	0.056	31	14	0.32	128	0.01	4	0.76	0.01	0.07	1	100	7.8
SS-16	385066	6221158	7	0.8	6	56	44	350	77	12	838	2.90	11	5	1	50	1	2	2	32	3.27	0.094	11	24	2.01	1091	0.02	2	0.79	0.01	0.06	1	150	12.7
SS-17	382731	6219843	9	0.8	10	70	25	433	98	15	1061	3.46	14	5	2	57	2	2	2	36	1.05	0.109	12	26	0.88	1267	0.03	11	0.91	0.01	0.06	1	260	8.0
SS-18	382657	6219921	2	0.5	11	51	18	407	119	14	890	2.98	9	5	1	41	2	2	2	38	0.96	0.077	11	27	0.80	1264	0.03	4	0.87	0.01	0.05	1	120	7.3
SS-19	399434	6216447	3	0.1	1	20	10	56	25	8	244	2.01	2	5	5	17	1	2	2	26	0.36	0.060	23	19	0.47	126	0.05	2	0.87	0.01	0.11	1	90	4.0
SS-20	399140	6213860	1	0.1	1	19	14	65	28	10	360	2.59	2	5	6	13	1	2	2	16	0.30	0.054	22	23	0.63	49	0.05	2	1.13	0.01	0.09	1	30	6.5
SS-21	396517	6215274	1	0.1	1	27	17	65	34	12	431	3.18	8	5	9	20	1	2	2	21	0.36	0.056	29	26	0.64	49	0.02	10	1.18	0.01	0.03	1	90	6.6
SS-22	392524	6216774	3	0.1	1	23	23	73	29	12	347	3.75	5	5	9	63	1	2	2	37	1.38	0.091	45	26	0.78	125	0.03	9	1.14	0.01	0.04	1	100	8.0
SS-23	389464	6218504	2	0.1	1	20	14	63	25	12	447	3.44	2	5	6	65	1	2	2	26	1.10	0.064	34	18	0.50	102	0.02	9	0.93	0.01	0.06	1	80	8.9
SS-24	385784	6220352	1	0.1	3	39	26	123	40	12	518	2.98	4	5	1	41	1	2	2	61	2.07	0.061	8	35	1.45	771	0.18	9	1.31	0.01	0.04	1	150	6.4
SS-25	388177	6219439	1	0.1	1	18	9	50	22	10	367	2.41	3	5	5	39	1	2	2	11	0.60	0.053	32	13	0.34	151	0.01	6	0.75	0.01	0.07	1	120	7.4
SS-26	398791	6210613	1	0.1	1	21	6	67	42	11	498	2.44	3	5	6	18	1	2	2	19	0.48	0.040	28	19	0.45	57	0.03	2	0.99	0.01	0.04	1	60	8.5
SS-27	384821	6216459	2	0.2	1	24	19	53	25	12	455	2.55	6	5	4	31	1	2	2	15	0.70	0.075	21	14	0.45	136	0.03	2	0.89	0.01	0.06	1	100	7.7
SS-28	392296	6209759	1	0.2	1	27	23	107	39	15	731	3.78	3	5	8	81	1	2	2	30	1.70	0.054	34	30	1.00	132	0.06	2	1.17	0.01	0.03	1	80	11.0
SS-29	392450	6209806	1	0.1	1	21	10	61	33	11	455	2.51	4	5	8	34	1	2	2	12	0.51	0.053	35	22	0.56	48	0.01	2	1.03	0.01	0.03	1	50	8.8
SS-30	392988	6208419	1	0.1	1	23	18	83	36	12	703	3.05	3	5	8	60	1	2	2	21	1.27	0.065	38	28	0.86	103	0.04	9	1.04	0.01	0.03	1	290	8.9
SS-31	382867	6204985	1	0.2	1	78	6	96	54	17	766	4.05	3	5	1	20	1	2	2	107	1.94	0.051	6	77	1.46	274	0.37	9	2.63	0.02	0.02	1	90	11.4
SS-32	383801	6206208	5	0.3	1	52	9	90	37	16	600	3.78	2	5	1	15	1	2	2	108	1.96	0.051	3	50	1.41	111	0.43	4	2.56	0.01	0.02	1	80	9.3
SS-33	378814	6209195	1	0.2	1	43	2	133	36	18	1036	3.90	2	5	1	16	1	2	2	116	1.69	0.048	4	52	1.26	271	0.37	8	2.41	0.02	0.02	1	120	10.4
SS-34	375863	6206150	1	0.2	1	44	6	83	31	16	660	3.84	3	5	1	12	1	2	3	112	1.68	0.042	3	32	1.29	250	0.44	5	2.25	0.01	0.02	1	80	5.5
SS-35	376231	6210672	1	0.2	1	121	8	86	47	18	762	4.61	4	5	1	29	1	2	2	132	2.06	0.087	7	75	1.42	117	0.32	9	3.03	0.02	0.05	1	100	21.7
SS-36	376072	6210421	1	0.2	1	84	9	194	39	17	733	3.92	2	5	1	23	1	2	2	108	1.82	0.068	5	54	1.27	251	0.32	2	2.47	0.02	0.04	1	120	17.6
SS-37	375787	6220349	1	0.6	5	67	11	290	91	11	918	2.21	13	5	3	60	1	3	2	23	1.11	0.065	11	21	0.75	1301	0.01	4	0.71	0.01	0.05	1	60	6.5
SS-38	405175	6206027	1	0.2	1	18	7	67	23	13	307	1.72	4	5	5	19	1	2	2	16	0.48	0.126	15	18	0.44	341	0.08	4	0.87	0.01	0.21	1	20	5.5
SS-39	405044	6205890	1	0.1	1	6	2	26	10	3	99	1.00	2	5	4	6	1	2	2	13	0.17	0.049	13	15	0.32	27	0.07	2	0.71	0.01	0.17	1	50	2.3
SS-49	397171	6206378	3	0.2	1	20	7	69	31	10	394	2.35	7	5	9	15	1	2	2	10	0.27	0.049	27	21	0.53	24	0.01	4	1.04	0.01	0.03	2	60	6.4
SS-51	389705	6201252	1	0.6	14	55	16	522	139	16	1173	3.11	16	18	1	34	6	2	2	66	1.06	0.092	11	41	0.69	676	0.12	3	1.38	0.01	0.05	1	190	12.0
SS-52	397338	6197296	1	0.4	1	45	12	106	51	18	636	4.35	3	5	4	41	1	2	2	95	2.07	0.042	11	54	1.40	164	0.27	5	2.26	0.01	0.02	2	60	7.4
SS-53	395269	6205580	5	0.2	1	17	10	58	22	9	548	2.31	7	5	4	161	1	2	2	11	8.70	0.052	22	19	0.55	47	0.01	3	0.68	0.01	0.04	1	50	20.7
SS-56	384492	6215513	1	0.5	1	64	41	117	49	14	691	3.38	3	5	1	45	1	2	2	79	1.95	0.049	6	44	1.59	1125	0.29	2	1.90	0.01	0.03	1	40	7.9
SS-57	385502	6213669	1	0.4	3	49	29	450	56	11	621	2.18	5	5	1	33	4	2	2	59	2.78	0.072	11	41	1.60	616	0.09	2	1.03	0.01	0.06	1	70	13.8
SS-58	385905	6214053	1	0.5	4	31	33	682	55	10	1212	2.33	10	5	2	35	5	2	2	56	3.27	0.180	12	34	1.59	548	0.06	8	0.94	0.01	0.08	1	80	14.5
SS-59	384904	6218237	4	0.4	21	49	26	137	43	9	481	2.32	15	5	2	70	1	2	2	51	1.73	0.062	10	20	0.75	766	0.04	3	0.60	0.01	0.05	3	60	8.1
SS-60	391617	6216135	2	0.1	1	20	12	59	31	12	363	3.01	3	5	8	55	1	2	4	17	0.84	0.051	42	24	0.57	56	0.02	2	1.15	0.01	0.02	1	20	8.1
SS-61	391506	6216341	1	0.1	1	19	16	93	27	12	361	3.41	10	5	14	89	1	2	3	31	2.27	0.100	56	25	0.79	119	0.02	2	1.02	0.01	0.04	1	40	6.4
SS-62	394896	6218558	1	0.1	1	11	2	40	12	9	189	1.21	2	5	4	8	1	2	2	13	0.18	0.051	19	12	0.29	35	0.04	3	0.65	0.01	0.11	1	30	2.7
SS-63	393354	6219983	1	0.2	1	13	5	38	14	9	147	1.31	2	5	4	12	1	2	2	13	0.16	0.038	20	13	0.33	42	0.05	4	0.77	0.01	0.15	2	20	4.2
SS-64	396582	6217829	1	0.2	1	12	4	29	12	5	200	1.29	2	5	8	12	1	2	2	20	0.34	0.089	24	11	0.27	46	0.04	3	0.57	0.01	0.08	2	20	1.8
SS-65	394987	6206499	2	0.1	1	11	19	67	14	6	330	1.71	4	5	3	43	1	2	2	11	5.10	0.069	18	16	2.72	61	0.01	2	0.59	0.01	0.05	1	40	19.1
SS-66	394635	6206673	1	0.1	1	16	17	85	21	10	395	2.41	6	5	5	128	1	2	2	12	7.58	0.049	22	19	0.87	40	0.02	3	0.68	0.01	0.04	2	20	16.4
SS-67	382255	6212150	4	0.3	1	65	8	79	45	18	692	3.95	2	5	1	20	1	2	2	100	2.02	0.043	3	48	1.55	118	0.39	2	2.42	0.01	0.02	1	50	6.8
SS-68	382200	6212190	3	0.4	1	78	2	77	63	19	626	4.19	2	5	1	13	1	2	2	110	1.75	0.045	3	62	1.76	113	0.36	2	2.59	0.01	0.02	1	30	9.4
SS-69	379207	6213700	2	0.7	4	69	11	135	66	13	771	2.87	8	18	2	38	2	2	2	71	1.07	0.054	8	64	0.86	862	0.19	3	1.52	0.01	0.03	2	60	8.7
SS-70	379101	6213625	1	0.4	1	70	2	146	90	21	1234	4.31	2	5	1	20	1	2	2	95	1.29	0.037	6	60	1.80	369	0.29	2	2.33	0.01	0.02	1	30	8.0
SS-71	377522	6214976	1	0.4	5	94	25	463	90	16	927	2.97	16	7	3	61	2	2	2	35	0.54	0.065	14	33	0.56	2524	0.07	6	1.11	0.01	0.06	1	100	7.0
SS-72	377414	6214712	1	0.4	7	103	3	131	104	22	845	4.37	7	5	1	38	1	2	2	108	1.60	0.063	6	74	1.53	304	0.29	4	2.55	0.02	0.03	1	210	12.7
SS-73	378008	6214963	1	0.4	1	76	9	124	66	16	729	4.05	8	5	2	35	1	2	2	88	1.29	0.092	12	89	1.09	586	0.16	5	2.41	0.01	0.06	1	60	16.7
SS-74	376252	6215046	22	0.3	7	88	29	386	115	19	1107	3.61	14	5	1	66	4	2	2	64	1.04	0.065	9	48	1.03	1523	0.14	2	1.61	0.01	0.04	1	80	10.5
SS-75	404591	6209094	2	0.1	1	14	2	56	20	9	220	1.45	2	5	3	15	1	2	2	15	0.29	0.077	15	13	0.36	255	0.06	2	0.86	0.01	0.18	1	30	6.3
SS-76	404450	6208538	7	0.1	1	18	7	88	24	10	227	1.78	2	5	5	17	1	2	2	17	0.35	0.087	17	20	0.44	62	0.07	2	1.02	0.01	0.20	1	20	5.9

1990 REGIONAL GEOCHEMICAL SURVEY - MOSS-MAT RESULTS

SAMPLE NUMBER	UTM EASTING	UTM NORTHING	Au ppb	Ag ppm	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B pm	Al %	Na %	K %	W ppm	Hg ppb	LOI %
MM-01	391873	6201020	1	0.4	4	22	87	314	26	6	302	1.77	8	5	1	39	3	2	2	39	9.41	0.099	10	17	4.79	227	0.04	7	0.69	0.01	0.07	1	250	28.9
MM-02	389248	6203324	4	0.4	3	29	54	390	40	6	519	1.58	10	5	1	32	7	2	3	31	6.21	0.199	5	27	2.81	481	0.02	8	0.49	0.01	0.11	1	340	56.2
MM-03	391255	6203744	1	0.2	2	34	27	231	18	3	226	0.69	4	5	1	22	3	2	2	16	8.81	0.145	3	11	4.59	111	0.01	15	0.41	0.01	0.18	2	150	60.9
MM-04	404392	6217887	1	0.1	1	20	7	66	25	9	290	2.94	4	5	11	42	1	2	2	29	0.54	0.081	35	25	0.61	48	0.05	9	1.50	0.02	0.11	7	30	5.7
MM-05	389329	6209605	4	0.3	2	43	15	272	56	12	500	2.90	4	5	1	32	1	2	2	70	2.79	0.083	8	39	1.77	623	0.23	4	1.71	0.01	0.07	1	70	13.0
MM-06	388958	6209996	1	0.3	2	29	34	155	37	12	473	3.12	7	5	2	44	1	2	2	58	3.25	0.086	13	32	1.89	289	0.17	3	1.49	0.01	0.04	1	50	12.6
MM-07	388129	6209406	1	0.4	6	46	37	270	68	11	461	2.73	8	5	1	37	2	2	2	56	4.69	0.090	9	36	2.94	798	0.14	16	1.08	0.01	0.05	1	60	13.6
MM-08	387782	6208766	14	3.5	4	52	83	1005	262	21	787	1.85	12	5	1	45	6	5	2	38	6.12	0.219	9	22	3.00	865	0.03	4	0.63	0.01	0.21	1	350	44.0
MM-09	387766	6208614	4	2.8	4	34	75	852	200	19	705	1.52	12	5	1	43	4	3	2	30	8.92	0.218	8	12	4.46	532	0.02	6	0.41	0.01	0.09	1	280	40.3
MM-10	389688	6199085	3	0.3	1	80	10	109	51	16	837	4.02	2	5	1	24	1	2	2	99	1.79	0.066	9	56	1.47	452	0.32	3	2.59	0.01	0.04	1	50	13.0
MM-11	380507	6197109	1	0.1	1	56	5	69	30	16	567	7.53	3	5	1	36	1	2	2	201	1.90	0.066	6	66	1.23	72	0.27	18	2.20	0.01	0.03	1	90	4.5
MM-12	380864	6196642	10	0.2	2	66	4	101	48	18	674	5.66	9	5	1	34	1	2	2	137	1.71	0.061	7	61	1.23	139	0.25	10	2.21	0.02	0.04	1	180	9.7
MM-13	380639	6196304	1	0.2	1	90	2	93	29	17	687	4.78	7	5	1	87	1	2	2	118	1.97	0.073	10	53	1.41	69	0.22	9	2.79	0.01	0.06	1	70	16.0
MM-14	384710	6215571	2	0.2	2	32	19	311	44	12	684	2.69	2	5	1	30	2	2	2	66	2.46	0.103	11	39	1.57	632	0.17	19	1.41	0.01	0.07	1	40	9.8
MM-15	388190	6219452	1	0.1	1	18	10	63	20	10	350	2.46	2	5	6	49	1	2	2	12	0.74	0.074	41	15	0.35	129	0.02	2	0.85	0.01	0.10	1	20	10.5
MM-16	385066	6221158	7	0.8	6	53	46	349	71	11	737	2.87	11	5	1	59	2	2	3	33	4.98	0.104	13	24	2.92	1230	0.02	3	0.83	0.01	0.08	1	160	20.0
MM-17	382731	6219843	93	0.7	8	65	13	375	86	14	934	3.46	13	5	2	60	2	2	2	42	1.17	0.116	17	27	0.93	1373	0.05	2	1.00	0.01	0.07	1	90	8.0
MM-18	382657	6219921	2	0.4	8	52	23	408	111	13	728	2.85	9	5	1	49	2	2	3	38	1.12	0.090	12	28	0.81	1356	0.03	10	0.97	0.01	0.07	2	110	14.0
MM-19	399434	6216447	1	0.1	1	20	12	63	27	9	300	2.71	3	5	10	20	1	2	2	45	0.44	0.082	39	28	0.52	108	0.06	21	1.06	0.01	0.12	6	30	5.1
MM-20	399140	6213860	9	0.1	1	17	13	61	25	9	342	2.25	3	5	6	15	1	2	2	16	0.33	0.087	26	21	0.50	39	0.02	12	1.09	0.01	0.08	1	20	10.2
MM-21	396517	6215274	1	0.1	1	25	15	72	34	12	457	3.18	6	7	7	28	1	2	2	23	0.53	0.079	30	29	0.73	52	0.02	2	1.43	0.01	0.04	1	30	12.1
MM-22	392524	6216774	6	0.1	1	20	7	74	29	13	345	5.61	2	5	12	65	1	2	2	97	1.48	0.114	52	36	0.76	126	0.04	2	1.16	0.01	0.04	1	40	7.0
MM-23	389464	6218504	1	0.1	1	18	5	69	25	11	408	3.29	2	5	7	68	1	2	2	26	1.14	0.081	41	20	0.50	133	0.02	2	1.01	0.01	0.13	1	30	10.5
MM-24	385784	6220352	1	0.2	3	44	40	137	43	14	535	4.21	6	5	2	43	1	2	2	96	1.91	0.078	12	43	1.35	1164	0.21	6	1.55	0.01	0.06	2	60	8.5
MM-25	388177	6219439	1	0.1	1	19	20	57	23	10	355	2.66	2	6	6	49	1	2	2	14	0.74	0.077	40	16	0.38	180	0.02	5	0.96	0.01	0.11	1	40	10.8
MM-26	398791	6210613	1	0.1	1	21	7	63	42	12	488	2.52	2	5	6	22	1	2	2	20	0.59	0.054	32	22	0.51	51	0.03	4	1.22	0.01	0.07	1	50	12.4
MM-27	384821	6216459	1	0.1	1	20	9	56	24	10	441	2.45	5	5	5	41	1	2	2	17	0.80	0.107	29	16	0.42	154	0.03	5	0.76	0.01	0.14	1	30	14.8
MM-28	392296	6209759	1	0.1	2	31	24	135	45	17	4112	5.36	9	5	4	163	1	2	2	34	2.66	0.072	25	36	0.93	309	0.06	3	1.39	0.01	0.11	1	30	19.2
MM-29	392450	6209806	3	0.1	1	25	16	65	37	10	855	2.58	2	5	6	49	1	2	2	12	0.79	0.083	37	27	0.61	57	0.01	9	1.24	0.01	0.21	1	20	20.1
MM-30	392988	6208419	1	0.1	1	24	17	90	37	13	1087	3.21	2	5	7	72	1	2	2	23	1.79	0.078	39	29	0.97	110	0.05	2	1.11	0.01	0.19	1	40	12.3
MM-31	382867	6204985	1	0.1	1	67	9	83	51	17	680	4.03	2	5	1	18	1	2	2	118	2.36	0.054	5	74	1.52	221	0.41	2	2.99	0.03	0.06	1	50	12.2
MM32	383801	6206208	2	0.1	1	60	9	88	35	15	671	3.44	5	5	1	25	1	2	2	104	2.11	0.078	4	52	1.29	143	0.39	2	2.59	0.01	0.11	1	40	22.1
MM-33	378814	6209195	2	0.1	1	44	16	71	34	17	1065	3.91	2	5	1	19	1	2	2	122	1.94	0.080	5	56	1.26	248	0.39	11	2.72	0.01	0.04	2	40	14.0
MM-34	375863	6206150	2	0.1	1	35	5	56	26	14	521	3.34	2	5	1	12	1	2	2	118	1.95	0.039	3	27	1.14	190	0.52	14	2.18	0.01	0.03	1	20	4.5
MM-35	376231	6210672	1	0.1	1	86	10	99	41	15	594	3.75	2	5	1	24	1	2	2	114	2.04	0.098	6	59	1.26	96	0.32	5	2.68	0.01	0.19	1	30	25.5
MM-36	376072	6210421	1	0.1	1	45	8	76	32	16	635	3.75	3	5	1	15	1	2	2	120	2.02	0.046	4	37	1.28	232	0.47	11	2.50	0.01	0.04	1	20	6.8
MM-37	375787	6220349	79	0.5	6	78	28	406	110	12	1083	2.55	12	5	1	77	2	2	2	25	1.32	0.086	10	21	0.87	1476	0.01	3	0.80	0.01	0.11	1	110	11.7
MM-38	405175	6206027	1	0.1	1	18	13	48	15	11	304	1.85	2	5	11	17	1	2	2	16	0.46	0.149	34	18	0.39	65	0.06	2	0.90	0.01	0.21	2	20	5.6
MM39	405044	6205890	1	0.1	1	7	9	28	11	6	178	1.13	2	5	12	10	1	2	2	13	0.25	0.067	41	14	0.31	32	0.06	2	0.73	0.01	0.16	1	20	3.8
MM-49	397171	6206378	3	0.1	1	19	15	69	28	9	455	2.57	6	5	9	18	1	2	2	11	0.34	0.066	28	23	0.60	29	0.01	2	1.16	0.01	0.05	1	30	9.0
MM-51	389705	6201252	1	0.5	7	42	16	411	108	14	668	2.69	7	5	1	36	2	2	2	55	1.01	0.074	12	35	0.71	674	0.19	5	1.39	0.01	0.07	1	90	9.5
MM-52	397338	6197296	14	0.2	1	49	18	115	47	18	654	4.57	5	5	4	33	1	2	2	100	2.10	0.050	10	57	1.54	178	0.28	2	2.37	0.01	0.03	2	50	8.3
MM-53	395269	6205589	3	0.2	1	20	18	72	22	9	458	2.56	9	5	4	132	1	2	2	16	4.53	0.076	21	23	0.63	49	0.02	9	0.76	0.01	0.09	1	60	24.4
MM-54	376078	6215229	2	0.4	31	63	15	991	300	30	913	4.34	29	9	1	100	8	3	2	62	0.89	0.115	10	25	0.47	998	0.05	4	0.93	0.01	0.10	1	110	14.0
MM-55	375992	6215333	1	0.6	18	71	65	1043	275	16	598	3.18	20	5	1	71	6	6	2	49	0.96	0.096	11	28	0.63	1205	0.05	3	0.97	0.01	0.08	1	180	12.0
MM-56	384492	6215513	2	0.3	1	61	72	102	44	15	646	3.39	3	5	1	40	1	2	2	76	1.56	0.047	5	42	1.47	1247	0.29	2	1.87	0.01	0.04	1	60	7.6
MM-57	385502	6213669	1	0.5	3	51	35	491	58	12	619	2.54	9	5	1	30	3	2	2	54	2.23	0.061	9	46	1.53	724	0.11	4	1.26	0.01	0.06	1	120	14.6
MM-58	385905	6214053	2	0.5	2	38	49	704	54	12	1167	2.77	7	5	1	34	5	2	2	55	2.93	0.171	12	40	1.63	662	0.07	5	1.21	0.01	0.06	1	100	17.4
MM-59	384904	6218237	5	0.4	20	47	31	149	40	9	449	2.55	17	5	2	57	1	5	2	53	1.32	0.065	11	22	0.82	1052	0.05	2	0.62	0.01	0.06	2	70	7.9
MM-60	391617	6216135	1	0.1	1	22	19	89	35	12	441	3.41	5	5	8	56	1	2	2	24	0.95	0.057	42	26	0.67	118	0.03	4	1.20	0.01	0.06	1	30	8.8
MM-61	391506	6216341	1	0.1	1	21	20	85	26	12	343	4.41	3	5	13	81	1	2	2	58	1.93	0.129	51	30	0.80	147	0.03	2	1.09	0.01	0.10	1	40	7.8
MM-62	394896	6218558	1	0.1	1	18	10	49	18	14	270	1.81	2	5	7	18	1	2	2	19	0.30	0.063	41	18	0.42	57	0.05	2	0.97	0.01	0.17	2	20	5.7
MM-63	393354	6219963	1	0.1	1	16	9	56	16	12	210	1.53	2	5	5	18	1	2	2	15	0.26	0.057	36	16	0.37	47	0.05	2	0.87	0.01	0.23	8	10	10.6
MM-64	396582	6217829	1	0.1	1	19	16	48	20	8	288	2.34	2	5	11	20	1	2	2	39	0.41	0.098	40	23	0.48	69	0.06	2	0.96	0.01	0.15	3	30	4.2
MM-65	394987	6206499	1	0.1	1	14	20	78	16	8	343	2.06	2	5	2	49	1	2	2	13	3.78	0.081	17	20	2.11	71	0.01	3	0.73	0.01	0.07	1	40	21.3
MM-66	394635	6206673	1	0.1	1	20	20	66	24	11	358	3.02	8	5	6	136	1	2	2	18	6.38	0.066	26	23	0.97	44	0.02	2	0.80	0.01	0.04	1	20	15.6
MM-67	382255	6212150	1	0.2	1	64	2	63	40	19	635	3.77	2	5	1	15	1	2	2	100	1.72	0.048	3	48	1.61	104	0.39	2	2.40	0.01	0.03	1	30	7.2
MM-68	382200	6212190	1	0.1	1	101	7	77	69	21	694	4.18	4	5	1	16	1	2	2	108	1.81	0.070	3	67	1.89	106	0.31	2	2.66	0.01	0.06	1	50	17.5
MM-69	379207	6213700	3	0.6	4	73	8	161	72	13	721	2.69	11	5	1	47	1	2	2	65	1.33	0.086	8	91	0.82	1063	0.12	2	1.45	0.01	0.05	1	100	21.4
MM-70	379101	6213525	1	0.2	1	91	11	93	86	22	1143	4.43	3	5	1	21	1	2	2	101	1.41	0.047	6	62	1.81	252	0.3	2	2.54	0.01	0.03	2	50	3.6
MM-71	377522	6214976	1	0.6	7	122	45	616	117	16	915	3.58	15	5	2	62	7	2	2	26	0.42	0.076	14	21	0.46	1533	0.04	2	1.11	0.01	0.08	1	150	8.1
MM-72	377414	6214712	6	0.2	4	86	12	119	83	21	776	4.14	7	5	1	30	1	2	2	104	1.58	0.061	5	70	1.58	423	0.31	2	2.49	0.02	0.09	1	60	13.7
MM-73	378008	6214963	1	0.2	1	78	14	109	62	16	648	4.22	7	5	1	34	1	2	2	95	1.35	0.087	12	96	1.14	575	0.18	2	2.51	0.01	0.06	1	70	19.3
MM-74	376252	6215046	1	0.3	6	68	29	283	81	16	826	3.48	12	5	1	52	3	2	2	67	1.04	0.065	9	47	1.02	1427	0.18	2	1.49	0.01	0.04	1	110	8.5
MM-75	404591	6209094	1	0.1	1	11	4	39	15	7	203	1.28	2	5	9	15	1	2	2	14	0.35	0.104	37	15	0.29	151	0.06	11	0.73	0.01	0.20	1	20	9.0
MM-76	404450	6208538	1	0.1	1	17	11	65	20	9	219	1.79	2	50	7	20	1	2	2	18	0.36	0.092	30	20	0.42	47	0.06	2	0.98	0.01	0.21	1	20	8.2