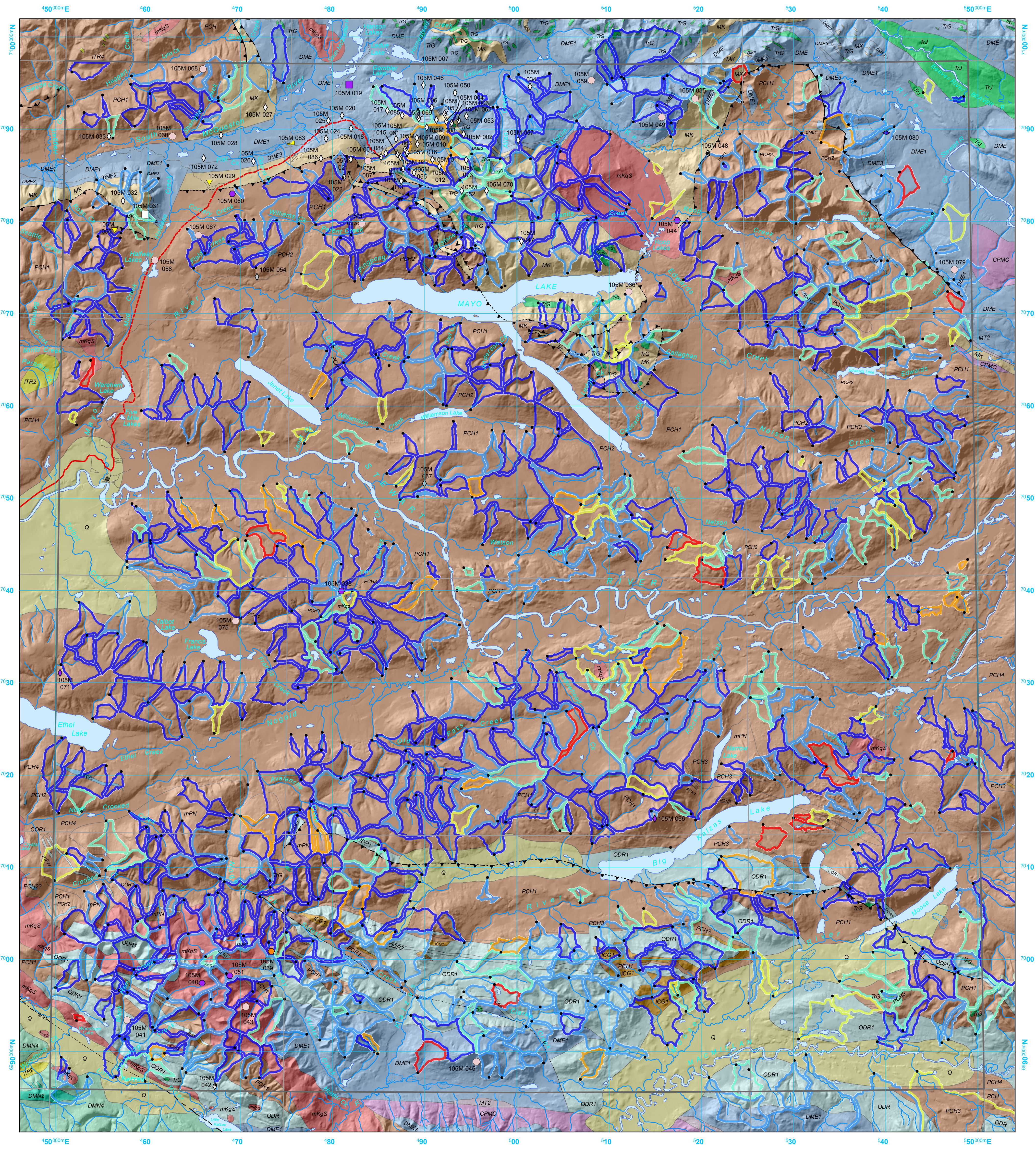
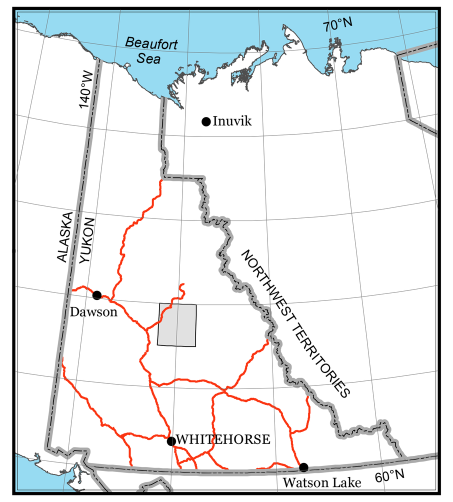
Yukon Geological Survey

Heberlein Geoconsulting
Extracting value from geochemistry

Yukon
Energy, Mines and Resources





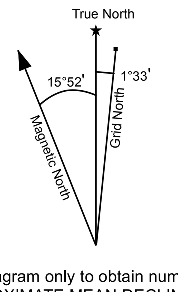
1:250 000-scale topographic base data produced by CENTRE FOR TOPOGRAPHIC INFORMATION, NATURAL RESOURCES CANADA

ONE THOUSAND METRE GRID
Universal Transverse Mercator Projection
North American Datum 1983
Zone 8

CONTOUR INTERVAL 100 FEET
Elevations in metres above Mean Sea Level

WEIGHTED SUMS MODEL AND GEOLOGY
S (LEVELLED)
YUKON

SCALE 1:250 000
0 1 2 3 4 5
kilometres



Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION 2013
FOR CENTRE OF MAP

116A LARSEN CREEK	106D NASH CREEK	106C NADALEEN RIVER
115P MCQUESTEN	105M **THIS MAP**	105N LANSING RANGE
115I CARMACKS	105L GLENLYON	105K TAY RIVER

Weighted Sums Modelling

The application of Weighted Sums Modelling (WSM) to exploration geochemistry was described by Garrett and Grunsky (2001) as a means to model multi-element data using a priori knowledge of the mineralogy and element composition of the sought after mineral deposit (Kane, 1977; Garrett et al., 1980). In this procedure weights or relative importances are assigned to each variable, or a subset of variables, according to some geochemical or mineralogical model of the target mineral deposit type or geological process. Weighted sums (WS) are new variables calculated from the multi-element geochemical results. Like Principal Components Analysis (PCA) or Factor Analysis scores, WS scores have the form of normal or standardized scores with a mean of zero and a standard deviation of one. The main difference between WSM and traditional multivariate statistical methods is that the user assigns the variable weightings rather than determining them with a covariance/correlation matrix for the dataset, as is done in PCA. Furthermore WSM is a robust statistical technique that is not influenced by the presence of outliers (Beckman & Cook, 1983).

The reader is referred to Garrett and Grunsky (2001) for a description of the WS calculation. In summary, relative importance is assigned for each variable. A weighting of 3, for example, means that that particular element is three times more important than an element with a weighting of one. Weighting can be positive or negative. Positive weightings mean that the target model is associated with elevated concentrations of an element. Negative weightings indicate that low concentrations or depletions of an element are important.

Individual relative importance is converted into weights that sum to one by dividing each importance by the sum of the absolute values of importance (i.e., ignoring the negative signs). A requirement of the method is that the sums of the squares of the final weights also equal one. This is achieved by dividing each weight by the square root of the sum of the squares of the weights.

The next step involves calculation of the normal scores for the variables included in the model for each individual sample. To do this, robust estimates of the mean and standard deviation are used. The median (or 50th percentile) is used as a robust estimate of the mean and the inter-quartile range (IQR) multiplied by 0.7413 is used as a robust estimate of the standard deviation. IQR is the difference between the 75th and 25th percentiles of the data distribution and therefore covers a band of data 25% wide (or 0.67449 standard deviation units) on either side of the mean. The constant 0.7413 is used to convert the IQR, which covers a range of 1.3490 standard deviation units to an equivalent standard deviation[1]. Weighted sums are then calculated by multiplying the normal scores for each element by the element's corresponding weight and summing for each sample. The high resistance of the median and IQR to outliers mean that it is not usually necessary to trim outlier and far outliers from the dataset before calculation.

[1] For a normal distribution the standard deviation is equal to 0.7413*IQR, where 0.7413 is the reciprocal of 1.349.

Models and Weightings

Six mineral deposit types (SEDEX, Porphyry Cu, W-Skarn, IRCG, Polymetallic veins and Carlin) that are either known or believed to occur in the map sheet areas and one geochemical process (hydromorphic dispersion) are modeled using the WS method. Included elements and their relative importance are presented in Table 1.

Data Presentation

Results of each WS model are attached to the corresponding catchment basin polygons using a spatial join in ArcGIS. This process allows for the entire polygon to be assigned a colour based on its WS score. Colours are assigned on the basis of the following percentile breaks:

0-50% Dark blue
50-75% Pale blue
75-90% Pale green
90-95% Yellow
95-98% Orange
98-100% Red

With this scheme, catchment basins with the hotter colours represent samples with geochemical characteristics consistent with the mineralization style being modelled.

Table 1: Table of Relative Importances used to calculate weighted sums models

Deposit Type	Ag	Au	As	Ba	Bi	Cd	Co	Cu	Cs	Fe	Hg	K	Mn	Mo	Ni	Pb	S	Sb	Tl	W	Zn
Polymetallic Veins	4	4	3			4	1	2		1	1		1	1	1	5		3			5
W-Skarn			3		3					1		3		3						5	1
Porphyry Cu	2	2			1			5	3					3			2				
Intrusive Related Cu-Au	1	2	5		5			2		1	5		1	2		1		1		2	
SEDEX				5		3									1	5		1	5		5
Carlin	2	1	5	2							4							5			
Hydromorphic Dispersion	2		1			4	5	2		5			5	2	4	2		1			3

Regional Geochemistry Sample (RGS) location
National Topographic System grid (1:250 000 scale)
National Topographic System grid (1:50 000 scale)
highway, paved
highway, unpaved
local road, paved
local road, unpaved
watercourse
waterbody
wetland

S (Levelled)

WSM Percentiles: WSM Score, Number of RGS Samples

0 - 50%: -2.025 - -0.135, 422 samples
50 - 75%: -0.134 - 0.580, 245 samples
75 - 90%: 0.581 - 1.209, 98 samples
90 - 95%: 1.210 - 1.843, 40 samples
95 - 98%: 1.844 - 2.625, 26 samples
98 - 100%: 2.626 - 3.737, 16 samples

LEGEND

QUATERNARY

Q — QUATERNARY: unconsolidated glacial, glaciofluvial, and glaciolacustrine deposits; fluviatile silt, sand, and gravel, and local volcanic ash, in part with cover of soil and organic deposits

LOWER TERTIARY, MOSTLY(?) EOCENE

ITR2 — ROSS: rhyolite flows, tuffs, ash-flow tuffs, and breccias, locally laminated; small stocks and necks of white weathering, flow-banded, quartz-sanidine porphyry to granite porphyry, locally obsidian bearing; local shale, sandstone and conglomerate

ITR4 — ROSS: light coloured felsic quartz feldspar porphyry and rhyolite; minor acid tuff breccia, crystal lithic tuff and ignimbrite; quartz-feldspar porphyry stocks and dikes

MID-CRETACEOUS

mKgS — SELWYN SUITE: resistant, blocky, fine to coarse-grained equigranular to porphyritic (K-feldspasr) biotite quartz monzonite and granodiorite and minor quartz diorite; minor leuco-quartz monzonite and syenite

mKqS — SELWYN SUITE: equigranular to porphyritic (K-feldspar) biotite hornblende muscovite granite, quartz monzonite and granodiorite; porphyritic biotite hornblende granite with large smoky grey quartz phenocrysts and locally K-feldspar phenocrysts

mKqC — CASSIAR SUITE: medium to coarse-grained, equigranular to porphyritic (K-feldspar) granite and biotite quartz monzonite; biotite-hornblende quartz monzonite and granodiorite

mKqC? — CASSIAR SUITE: medium to coarse-grained, equigranular to porphyritic (K-feldspar) granite and biotite quartz monzonite; biotite-hornblende quartz monzonite and granodiorite

MIDDLE TO UPPER TRIASSIC

TrJ — JONES LAKE: brown to buff weathering, calcareous fine-grained sandstone, argillite and shale; extensive ripple cross-lamination and bioturbation; massive,light grey weathering, fine crystalline, dark grey limestone; minor orange weathering platy limestone

TrG — GALENA SUITE: massive, medium-grained hornblende diorite and gabbro sills; massive chloritic and locally serpentinized greenstone (diorite, gabbro, and altered equivalents) sills; minor occurrences of possible mid to Late Paleozoic age

CARBONIFEROUS TO PERMIAN

CPMC — MOUNT CHRISTIE: burrowed, interbedded greenish grey cherty shale and green shale; thin to medium-bedded, light grey-green to black chert; black siliceous slate and siltstone; minor quartzite, limestone, and dolostone; locally abundant, large grey barite nodules

MISSISSIPPIAN

MK — KENO HILL: massive to thick-bedded quartz arenite; thin to medium-bedded quartz arenite interstratified with black shale or carbonaceous phyllite; local scour surfaces and shale intraclasts; locally foliated and lineated

MT1 — TAY: recessive, dark brown weathering, thin to medium-bedded, calcareous, dark grey to brown siltstone and shale, commonly burrowed; thin to thick interbeds of fine crystalline, dark grey limestone; minor quartz arenite

MT2 — TAY: grey and buff weathering, generally thick-bedded to massive, dark grey to black fetid limestone; fine crystalline to cryptocrystalline; commonly bioclastic

DEVONIAN AND MISSISSIPPIAN

DME — EARN: complex assemblage of submarine fan and channel deposits (1) or within black siliceous shale and chert (2); barite common, and many occurrences of stratiform Pb-Zn

DME1 — EARN: thin bedded, laminated slate with thin to thickly interbedded fine to medium-grained chert-quartz arenite and wacke; thick members of chert pebble conglomerate; black siliceous siltstone; nodular and bedded barite; rare limestone

DME3 — EARN: massive felsic to intermediate volcanic flows, tuffs, and subvolcanic plug(s); locally highly altered; greenish chert and minor black slate; quartz eye quartz-sericite chlorite phyllite; local vesicular or amygdaloidal basalt, locally pillowed

DMN2 — NASINA: marble

DMN4 — NASINA: quartzite, micaceous quartzite, quartz muscovite (chlorite; feldspar augen) schist, and minor metaconglomerate and metagrit, but may locally include significant Klondike Schist Assemblage

MID-PALEOZOIC?

mPN — NOGOLD: buff, maroon, and minor green argillite with quartz sandstone and siltstone interbeds; basal green chert; rare light grey weathering, dark grey limestone beds of Early to Late Devonian age; thick-bedded, green to yellow grey weathering sandstone and grit

ORDOVICIAN TO LOWER DEVONIAN

ODR — ROAD RIVER - SELWYN: black shale and chert (1), overlain by orange siltstone (2), or buff platy limestone (3); locally contains beds as old as Middle Cambrian (4); correlations with basinal strata in Richardson Mountains include: ODR1 with CDR2 (upper part) and ODR2 with CDR4

ODR1 — ROAD RIVER - SELWYN: black, gun-blue, or silvery white weathering black graptolitic shale and black chert; resistant grey weathering, thin to medium-bedded, light grey to black, greenish grey or turquoise chert; minor argillaceous limestone

ODR2 — ROAD RIVER - SELWYN: rusty dark green to orange buff weathering, pyritic, burrowed, thin to thick-bedded argillite and dolomitic siltstone with members or partings of black shale and chert; minor bright orange dolostone

CAMBRIAN TO SILURIAN

CSM — MARMOT: lower Paleozoic mostly mafic volcanics, in locally thick accumulations (1) - (6) but also of common occurrence as undifferentiated thin scattered members within other units (e.g. COR, OSR)

UPPER CAMBRIAN AND ORDOVICIAN

COR1 — RABBITKETTLE: thin-bedded, wavy banded, silty limestone and grey lustrous calcareous phyllite; limestone intraclast breccia and conglomerate; massive to laminated, grey quartzose siltstone and chert and rare black slate; local mafic flows, breccia, and tuff

COR1? — RABBITKETTLE: thin-bedded, wavy banded, silty limestone and grey lustrous calcareous phyllite; limestone intraclast breccia and conglomerate; massive to laminated, grey quartzose siltstone and chert and rare black slate; local mafic flows, breccia, and tuff

LOWER CAMBRIAN

ICG — GULL LAKE: dominantly fine clastic assemblage (1) with local volcanic units

ICG1 — GULL LAKE: shale, siltstone, and mudstone, locally bioturbated, with minor quartz sandstone; rare green-grey chert; local basal limestone and limestone conglomerate; phyllite to quartz-muscovite-biotite schist (garnet, sillimanite, staurolite, andalusite)

UPPER PROTEROZOIC TO LOWER CAMBRIAN

PCH — HYLAND: consists upwards of coarse turbiditic clastics (1), limestone (2), and fine clastics typified by maroon and green shale (3)

PCH1 — HYLAND: thin to thick bedded, brown to pale green shale, fine to coarse-grained quartz-rich sandstone, grit, and quartz pebble conglomerate; minor argillaceous limestone; phyllite, quartzofeldspathic, and micaceous psammite, gritty psammite, and minor marble

PCH2 — HYLAND: grey weathering, dark grey to grey white, thin to thick-bedded, very fine crystalline limestone, locally sandy; calc-silicate and marble; may locally include carbonate members within (1) or (4)

PCH2? — HYLAND: grey weathering, dark grey to grey white, thin to thick-bedded, very fine crystalline limestone, locally sandy; calc-silicate and marble; may locally include carbonate members within (1) or (4)

PCH3 — HYLAND: distinctive, recessive, maroon weathering, interbedded maroon and apple-green slate; "Oldhamia" trace fossils; rare grey chert; locally basal member and interbeds of quartz siltstone, sandstone, and quartz-pebble conglomerate

PCH4 — HYLAND: quartzose clastic rocks as described in (1); mostly(?) equivalent to (1) but may include younger units

fault, defined, thrust, upright
fault, defined, thrust, overturned
fault, approximate, movement undefined
fault, approximate, thrust, upright
fault, approximate, dextral
fault, assumed, movement undefined
fault, assumed, thrust, upright
fault, extrapolated, movement undefined
fault, extrapolated, thrust, upright
fault, extrapolated, dextral

Table 2: List of Mineral Occurrences for NTS map sheets 105O and part of 105P

OCCURRENCE #	OCCURRENCE NAME	ALIAS(ES)	DEPOSIT TYPE	STATUS	ECONOMIC COMMODITIES	OTHER COMMODITIES
105M 001	KENO HILL	BELLEKENO, ELSA, KENO 700, LUCKY QUEEN, ONEK, SILVER KING	Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag, Zn	Cd, Au, Sn
105M 002	FAITH		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Au, Pb, Ag, Zn
105M 003	DUNCAN		Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag	
105M 004	GOLDEN QUEEN		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Sb, Pb, Ag
105M 005	SILVER BASIN		Polymetallic Veins Ag-Pb-Zn+/-Au	Prospect	Ag	Au, Pb
105M 006	NABOB	LAURASIA, RUM TUM	Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Au, Pb, Ag
105M 007	MONUMENT		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Pb, Ag
105M 008	COMSTOCK	PORCUPINE VEIN	Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag, Zn	
105M 009	APEX		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Pb, Ag, Zn
105M 010	VANGUARD		Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag	
105M 011	HOMESTAKE		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Au, Pb, Ag, Zn
105M 012	CHRISTINE		Polymetallic Veins Ag-Pb-Zn+/-Au	Prospect		Pb, Ag
105M 013	MO		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Au, Pb, Ag
105M 014	MAYBRUN		Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Ag, Pb	
105M 015	HOGAN		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Pb, Ag
105M 016	RUNER	MT. KENO	Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag	Au, Zn
105M 017	WERNECKE	RAILROAD	Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Au, Pb, Ag, Zn
105M 018	FORMO	YUKENO	Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag, Zn	
105M 019	NOMAD		Porphyry W	Anomaly		
105M 020	PADDY		Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag, Zn	Au
105M 021	EAGLE		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Pb, Ag, Zn
105M 022	FISHER		Polymetallic Veins Ag-Pb-Zn+/-Au	Anomaly		Au, Pb, Ag, Zn
105M 023	PARENT		Unknown	Anomaly		
105M 024	CREAM AND JEAN		Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag	Cu, Zn
105M 025	NORD		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		As, Au, Pb, Ag, Zn
105M 026	GERLITZKI		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Pb, Zn, Ag
105M 027	TITAN		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Pb, Ag, Zn
105M 028	SHANGHAI	NORTH LIMB	Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Cu, Pb, Ag, Zn
105M 029	MCQUESTEN	WAYNE	Plutonic Related Au	Past Producer	Au, Pb, Ag, Zn	Bi
105M 030	ARGENT		Unknown	Anomaly		Zn
105M 031	STREBCHUK	JOUMBIRA	Porphyry Sn	Prospect		As, Cu, Pb, Ag, Sn, W, Zn
105M 032	MT HALDANE	LOOKOUT	Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag	As, Au, Zn
105M 033	LAYSIER		Polymetallic Veins Ag-Pb-Zn+/-Au	Anomaly		Pb, Ag, Zn
105M 034	COBALT		Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag	Sb, Cu, Zn
105M 035	PATTERSON		Unknown	Anomaly		As, Cu, Au, Pb, Ag, Zn
105M 036	ETTA		Unknown	Anomaly		
105M 037	GORDON		Stibnite Veins & Disseminations	Prospect		Sb, As, Bi, Au, Hg, Ag
105M 038	TWO BUTTES		W Skarn	Drilled Prospect		W
105M 039	SIDE SLIP		Cu Skarn	Showing		Cu
105M 040	GREAT HORN		W Skarn	Prospect		Cu, W, Zn
105M 041	RAM		Unknown	Unknown		
105M 042	HOTSPRING		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Pb, Ag
105M 043	LOST WERNECKE COPPER		Unknown	Unknown		Cu
105M 044	ROOP		W Skarn	Showing		
105M 045	ABLE		Unknown	Anomaly		
105M 046	MOON		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Au, Pb, Ag, Zn
105M 047	MT. ALBERT		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Pb, Ag
105M 048	MCKIM		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Ag
105M 049	VACA		Unknown	Anomaly		
105M 050	NERO		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Pb, Ag
105M 051	FRIESEN		W Skarn	Prospect		Cu, Au, Pb, Mo, Ag, W
105M 052	MT HINTON		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Au, Ag
105M 053	AVENUE		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		
105M 054	CHANCE		Stibnite Veins & Disseminations	Showing		Sb
105M 055	YONO		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Pb, Ag
105M 056	SUNDOWN		Plutonic Related Au	Showing		As, Bi, Au, Pb, Ag, Sn, W
105M 057	GUSTAVUS		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Pb, Ag
105M 058	HALFWAY	SINISTER	Unknown	Drilled Prospect		Au, Hg, W
105M 059	RANKIN		Unknown	Anomaly		
105M 060	NEWRY	AUREX	W Skarn	Drilled Prospect		As, Bi, Cu, Au, Pb, W, Zn
105M 061	CHRISTAL	DOROTHY	Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Pb, Ag, Zn
105M 062	SEGSWORTH	CARIBOU HILL	Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag	
105M 063	IRON CLAD		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		
105M 066	KALZAS	FLO	W Veins	Drilled Prospect		Be, Pb, Mo, Ag, Sn, W
105M 067	CORKERY		Unknown	Unknown		
105M 068	WEASEL		Unknown	Unknown		
105M 069	GAMBLER		Polymetallic Veins Ag-Pb-Zn+/-Au	Past Producer	Pb, Ag	Zn
105M 070	HAVRENAK		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Au, Pb, Ag
105M 071	DRILL		W Veins	Showing		W
105M 072	BELEY		Polymetallic Veins Ag-Pb-Zn+/-Au	Drilled Prospect		Pb, Ag, Zn
105M 073	BEMA		Polymetallic Veins Ag-Pb-Zn+/-Au	Showing		Au, Ag
105M 075	WHITEMAN		Unknown	Unknown		
105M 079	TINY ISLAND		Unknown	Prospect		
105M 080	GORDEY		Sediment-Hosted Barite	Prospect		barite
105M 082	BELLEKENO		Polymetallic Veins Ag-Pb-Zn+/-Au	Producer	Pb, Ag, Zn, Au	Cd, Sn
105M 083	ELSA TAILINGS		Tailings Reprocessing	Deposit	Au, Pb, Ag, Zn	
105M 084	ONEK		Polymetallic Veins Ag-Pb-Zn+/-Au	Deposit	Ag, Pb, Au, Zn	In
105M 085	LUCKY QUEEN		Polymetallic Veins Ag-Pb-Zn+/-Au	Deposit	Ag, Pb, Zn, Au	
105M 086	BERMINGHAM		Polymetallic Veins Ag-Pb-Zn+/-Au	Deposit	Pb, Zn, Ag, Au	
105M 087	FLAME & MOTH		Unknown	Deposit	Au, Ag, Pb, Zn	

Mineral Occurrence Deposit Type (Total on map)

Cu Skarn (1)
Plutonic Related Au (2)
Polymetallic Veins Ag-Pb-Zn+/-Au (49)
Porphyry Sn (1)
Porphyry W (1)
Sediment-Hosted Barite (1)
Stibnite Veins & Disseminations (2)
Tailings Reprocessing (1)
Unknown (15)
W Skarn (5)
W Veins (2)

REFERENCES

Beckman, R.J. and Cook, R.D.,1983. "Outliers," Technometrics, vol. 25, no. 2, p. 119-149.

Garrett R.G. and Grunsky, E.C., 2001. Weighted sums – knowledge based empirical indices for use in exploration geochemistry. Geochemistry: Exploration, Environment, Analysis, vol. 1 2001, p. 135–141.

Garrett, R.G., Kane, V.E. & Zeigler, R.K., 1980. The management and analysis of regional geochemical data. Journal of Geochemical Exploration, vol. 13, no 2.3, p. 115-152.

Jackaman, W., 2011. Regional stream sediment geochemical data Mayo area, central Yukon (105M). Yukon Geological Survey Open File 2012-8.

Kane, V.E., 1977. Geostatistics Symposium on Hydrogeochemical and Stream-Sediment Reconnaissance for Uranium in the United States. United States Department of Energy Report, GJBX-77(77), p. 203–222.

RECOMMENDED CITATION

HEBERLEIN, D., 2013. Yukon Geochemistry Weighted Sums Model and Geology for NTS 105M: S (Levelled). Yukon Geological Survey, Open File 2013-16, 116 sheets. Scale 1:250 000.

Digital cartography and drafting by J.O. Bruce, Yukon Geological Survey.

Any revisions or additional geological information known to the user would be welcomed by the Yukon Geological Survey.

Paper copies of this map and the accompanying report may be purchased from Yukon Geological Survey, Energy, Mines and Resources, Government of Yukon, Room 102 - 300 Main St., Whitehorse, Yukon, Y1A 2B5. Ph. 867-667-3201, Email geosales@gov.yk.ca.

A digital PDF (Portable Document File) file of this map may be downloaded free of charge from the Yukon Geological Survey website: http://www.geology.gov.yk.ca.

Funding for this project was provided by the Canadian Northern Economic Development Agency (CanNor) through their Strategic Investments in Northern Economic Development initiative.

Yukon Geological Survey
Energy, Mines and Resources
Government of Yukon

Open File 2013-16

Yukon Geochemistry Weighted Sums Model and Geology for NTS 105M: S (Levelled) (1:250 000 scale)

by

David Heberlein

Canadian Northern Economic Development Agency
Agence canadienne de développement économique du Nord