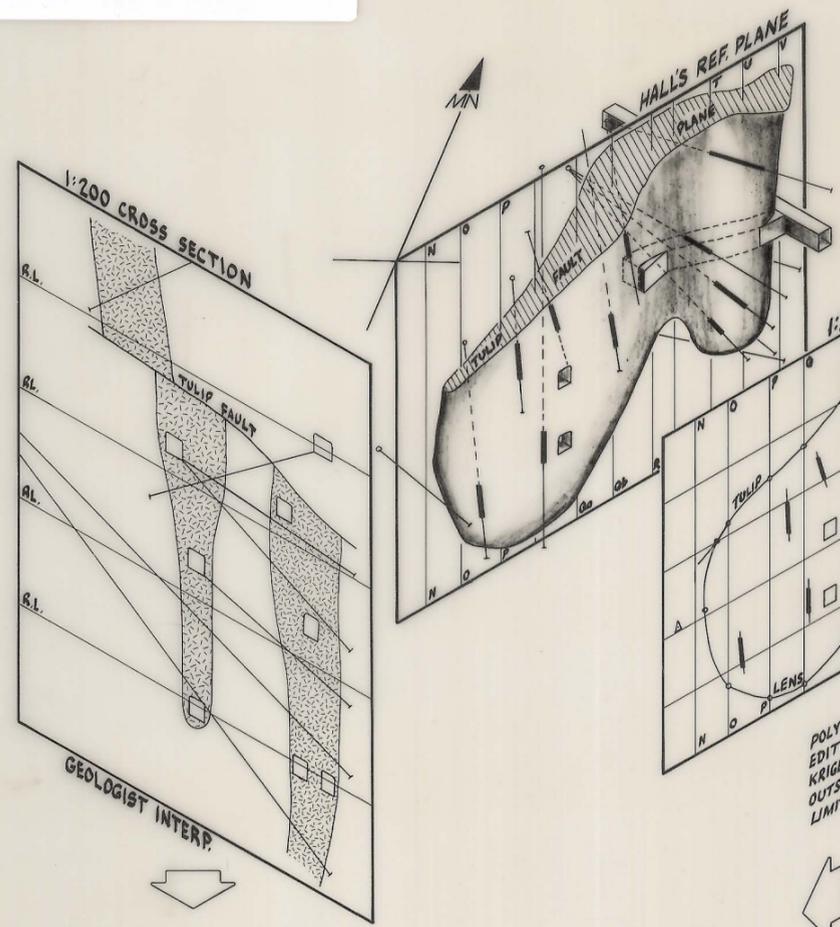
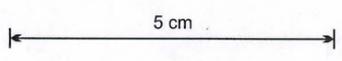
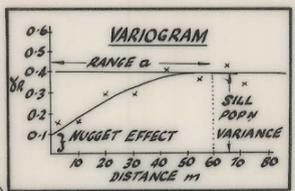


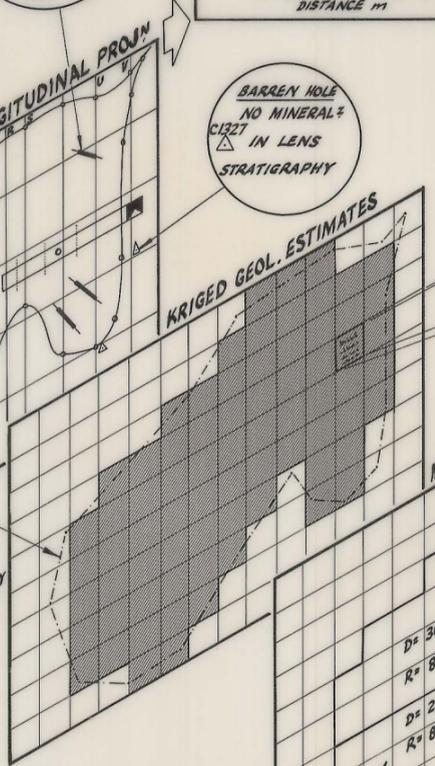
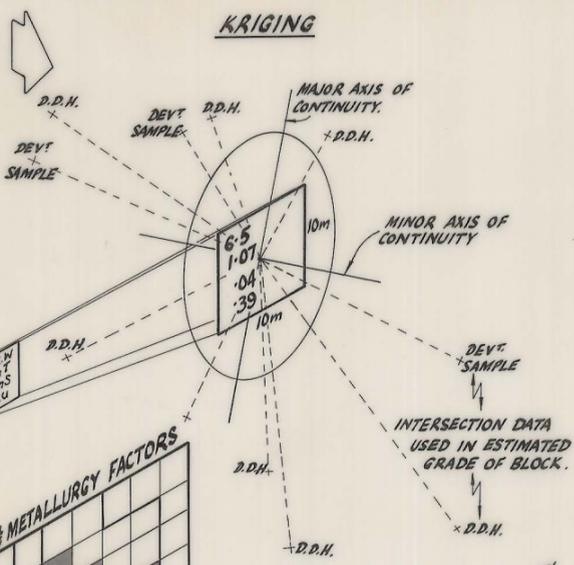
'ROCKS TO RESERVES'



NA INCLUDES INTERNAL WASTE
 $\%SnT$ 1.17, 0.06, 0.47
 $\%SnS$ 8.3, 4.9
 $\%Cu$ 4.9
 D/HOLE HORZ. LENGTH WIDTH
 C153 H.N.



GIVEN THE SPATIAL DISTRIBUTION OF SAMPLES ABOUT THE BLOCK CENTRE, AND THE EXPERIMENTALLY MEASURED CONTINUITY PARAMETERS (VARIOGRAM), A PROCESS OF MATHEMATICAL OPTIMIZATION LEADS TO A UNIQUE SOLUTION OF WEIGHTS WHICH WHEN APPLIED TO THE SAMPLES PROVIDES A NON-BIASED ESTIMATE OF MINIMUM ESTIMATION ERROR.



MINING & METALLURGY FACTORS

D=0	R=0	D=25	R=75
D=30	R=85	D=0	R=0
D=25	R=80		

MINED OUT DATA

40	50	50	50
25			
25			

CALCULATION OF GEOLOGICAL RESOURCE

TONNEAGE
 VOLUME = AREA IN LONG. PROJⁿ x HORZ. WIDTH
 = 10 x 10 x 6.5
 = 650 m³
 TONNEAGE = VOLUME x S.G. x (100 - MINED OUT %)
 = 650 x 2.05 x 1
 = 1332.5 (ROUNDED)
 = 1983 t (ROUNDED)

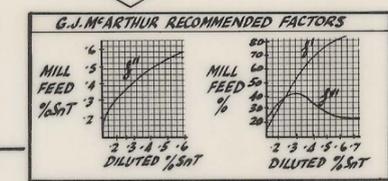
GRADE
 $\%SnT$
 $\%SnS$
 $\%Cu$
 as estimated by kriging process.

CALCULATION OF DILUTED TONNEAGE & GRADE

DILUTED TONNEAGE = GEO. RES. TONNEGE x $\frac{100 + DIL}{100}$ x $\frac{MINE REC.}{100}$
 = 1983 x $\frac{100 + 25}{100}$ x $\frac{75}{100}$ = 1859 t (ROUNDED)

DILUTED $\%SnT$ = $\frac{(GEO. RES. \%SnT \times 100) + (WASTE \%SnT \times DILUTION)}{100 + DILUTION}$
 = $\frac{(1.07 \times 100) + (0.05 \times 25)}{100 + 25}$ = 0.87% SnT (ROUNDED)

DILUTED $\%Cu$ = $\frac{(GEO. RES. \%Cu \times 100) + (WASTE \%Cu \times DILUTION)}{100 + DILUTION}$
 = $\frac{(0.39 \times 100) + (0.05 \times 25)}{100 + 25}$ = 0.32% Cu (ROUNDED)



SIMULATION OF GRADE CONTROL

MILL FEED TONNEAGE = DILUTED TONNEAGE x MILL FEED PROPORTION FACTOR
 = 1859 x (f' (DILUTED $\%SnT$))
 = 1859 x (0.09 + 51.16x - 961.88x² - 3300.09x³ + 5045.25x⁴ - 3741.76x⁵ + 1083.71x⁶)
 where x = 0.87
 = 1859 x 0.969
 = 1802 t (ROUNDED) (ORE RESERVE)

MILL FEED $\%SnT$ = f'' (DILUTED $\%SnT$)
 = $\frac{(0.05 + 138x - 2.52x^2 + 11.72x^3 - 25.32x^4 + 24.01x^5 - 8.32x^6)}{100}$
 where x = 0.87
 = 0.91% SnT (ROUNDED)

MILL FEED $\%Cu$ = MILL FEED $\%SnT$ x $\frac{GEO. RES. \%Cu}{GEO. RES. \%SnT}$
 = 0.91 x $\frac{0.39}{1.07}$
 = 0.33% Cu.

LOW GRADE TONNEAGE = DILUTED TONNEAGE x LOW GRADE PROPORTION FACTOR
 = 1859 x (f' (DILUTED $\%SnT$))
 = 1859 x (0.06 + 160.31x - 223.51x² - 606.60x³ + 1746.41x⁴ - 1570.58x⁵ + 498.15x⁶)
 = 1859 x 0.025 where x = 0.87
 = 46 t (ROUNDED)

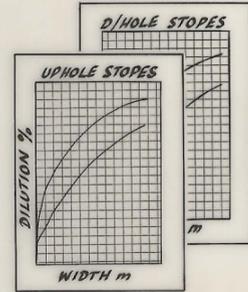
WASTE TONNEAGE = 1859 - 1802 - 46 = 11 t

CALCULATION OF RECOVERABLE GRADE

MILL FEED RECOVERABLE Sn GRADE = MILL FEED $\%SnT$ x MILL PRODUCTIVITY COEFF (M.P.C.)
 = 0.91 x $\frac{34}{100}$ = 0.31% SnT RECOVERABLE (ROUNDED)

MILL FEED RECOVERABLE Cu GRADE = MILL FEED $\%Cu$ x MILL Cu RECOVERY
 = 0.33 x $\frac{62}{100}$ = 0.21% Cu RECOVERABLE (ROUNDED)

MILL FEED RECOVERABLE Sn EQUIVALENT = MILL FEED REC. Sn GRADE + f' EQUIV. for Cu
 = 0.31 + ($\frac{5.16}{8.19}$ x 0.21) = 0.33% SnT eq.



MINING ENGINEER SELECTS MINING DILUTION AND RECOVERY FACTORS

C.M.S. REPORT ON ORE CHARACTER?
 X.R.D. ANALYSIS
 SEARCHING FOR AMPHIBOLE-STILPNOEMELANE ORE TYPES
 METALLURGIST/GEOLOGIST SELECT METALLURGICAL REC. & THRUPUT RATES.

? M LENS :: 22 FILE
 NORTHING
 R.L.
 GEOLOGICAL TONNES
 TOTAL HAULAGE TONNES
 MILL FEED TONNES
 LOW GRADE TONNES
 GEOLOGICAL $\%SnT$
 GEOLOGICAL $\%Cu$
 MILL FEED $\%SnT$
 MILL FEED $\%Cu$
 MILL RECOVERABLE $\%SnT$
 MILL RECOVERABLE $\%Cu$
 MILL RECOVERABLE $\%SnT$ eq.
 LOW GRADE $\%Cu$
 HORIZONTAL WIDTH
 GRADE CONTROL SORTING REC.
 MILL PRODUCTIVITY COEFF.
 MINED OUT %

DATA STORED ON COMPUTER FILE

CLEVELAND TIN LTD	
DRAWING N ^o	
SCHEMATIC 1983 ORE RESERVE PROCEDURE	
APPENDIX 1A.	
31 May 1983.	DRAWN G.J.MSA TRACED Paul SCALE N.T.S. SHEET

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