PLUTONIC OPERATIONS LIMITED

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EXPLORATION LICENCE 53/94

ELLIOTT BAY
TASMANIA

ANNUAL REPORT

February 1995 to January 1996

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1.0 SUMMARY

Exploration for VHMS deposits during the first year of tenure of EL 53/94 - Elliott Bay by Plutonic has involved:

* Detailed review of previous exploration.

* Moving loop SIROTEM, ground magnetic surveys, reconnaissance mapping and geochemistry at Wart Hill and East Camp prospects.

* Re-logging existing diamond drill core in an attempt at re-interpreting Wart Hill volcanic facies relationships and alteration zonation to infer direction to the source of re-sedimented clasts and lenses of VHMS type massive sulphide in volcaniclastic breccias.

* Evaluation of the Voyager 3 prospect - QUESTEM anomaly EB-1 to determine if it has been adequately tested.

The results have been generally discouraging in that previous exploration was more thorough than originally surmised, and it is concluded that in the Wart Hill - Voyager 19 area there are no untested high priority geophysical targets in favourable geological settings. In addition there are no obvious conceptual-geological targets that can be tested without resorting to high risk deep diamond drilling.

The EB-1 EM anomaly is reasonably attributed to a broad faulted zone of relatively weak but non-uniform conductivity, complicated by surficial conductive zones, and further shallow drilling is unlikely to be conclusive. A nearby coastal exposure of strong, possibly VHMS footwall style alteration is a favourable indicator but the location, poor exposure, extent of brittle deformation and late base metal bearing vein mineralisation are negative factors for exploration.

It is recommended that future exploration programmes should take a conceptual approach to development of drill targets based on systematic stratigraphic-exploratory drilling, major and immobile trace element litho-geochemistry and Pb-isotope studies for identification and mapping of favourable volcanic facies and footwall alteration zones.

This conceptual style of exploration in the Elliott Bay area represents a relatively unattractive proposition for Plutonic Operations. Therefore, it was decided no further exploration was warranted and the tenement should be fully relinquished at the end of the first year.

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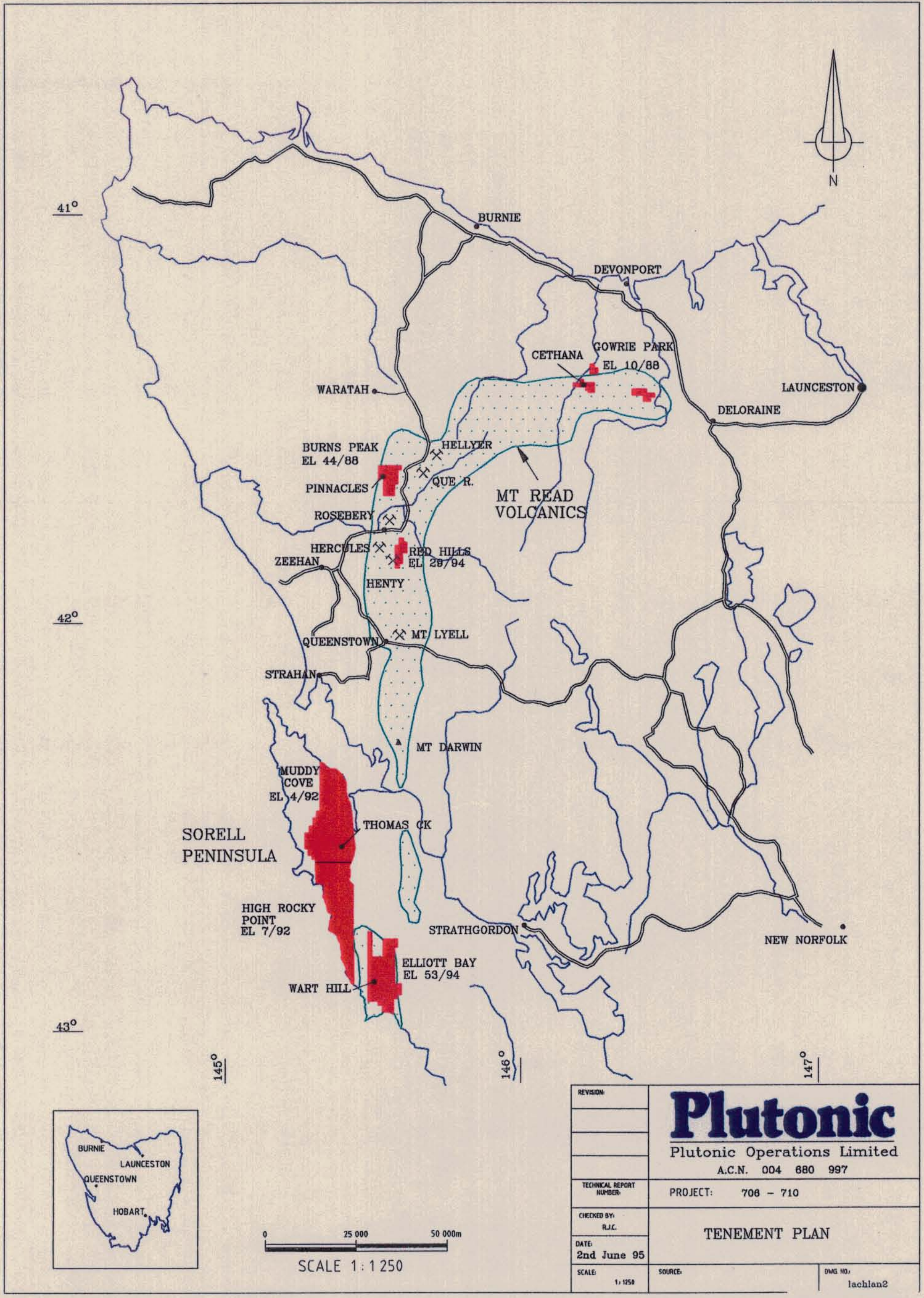

FIGURE 1

5 cm

2.0 INTRODUCTION

EL 53/94, covering an area of 125 km^2 at Elliott Bay in Southwest Tasmania, was granted to Plutonic Operations Ltd. on February 17, 1995 on the basis of a tender application submitted for ETA 367.

The successful tender was based on the intention to test the Wart Hill - (Voyager 19) VHMS prospect at depth by 2 to 3 diamond drill holes totalling 1000 to 1500m, during the first year. Further geological evaluation and diamond drilling (totalling ~1000m) of previously identified Geopeko/Cyprus gold base metal prospects at Voyager 24 - Sassy Creek, Voyager 12 - North Lewis, Voyager 3/EB-1 - Drake Creek and Voyager 20 prospects was proposed for the second year of exploration.

This report, the first Annual and Final Report on EL 53/94, describes the exploration work carried out by Plutonic in 1995. Exploration involved general data review followed by detailed evaluation of the Wart Hill and East Camp (Voyager 29) prospects. Field work included reconnaissance mapping, geochemical sampling followed by moving loop EM and ground magnetic surveys over Wart Hill and East Camp carried out during early 1995. The report also presents a discussion of the development of exploration concepts applied to Wart Hill and attempts to resolve the volcanic facies and possible source direction of massive sulphide clasts in volcaniclastic breccias in order to plan effective exploration strategy.

3.0 EXPLORATION OBJECTIVES AND PHILOSOPHY

EL 53/94 covers the southern most part of the Mt. Read Volcanics - a narrow belt of Cambrian, mainly felsic volcanics and associated volcaniclastics and intrusives which extends in an arc for about 200 km through northwest and western Tasmania and contains five major VHMS deposits and a number of smaller deposits totalling >200Mt of polymetallic, relatively Au rich, Cu-Pb-Zn ores, (Crawford et al., 1992). Two of the deposits: Rosebery and Hellyer, containing about 22Mt and 16Mt respectively, are considered to be of "world class".

A detailed litho-stratigraphic correlation with the sub divisions of the Mt Read Volcanics remains obscure but the Elliott Bay area seems to show lithological similarities to the Eastern (quartz phyric) Sequence extending north from Mt Darwin, (Crawford et al., op. cit.). The Eastern Sequence is not known to host any major economic deposits although there are some possible porphyry style mineralised prospects in the Mt Selina - Lake Dora areas. However the VHMS prospectivity is enhanced, at Elliott Bay, by the outcrops of small but high grade lenses of polymetallic massive sulphide at Wart Hill and numerous examples of low grade base metal and gold mineralisation and widespread hydrothermal alteration.

Plutonic's primary exploration objective at Elliott Bay was to discover a "stand alone" (10-20 million tonne) high grade, polymetallic, volcanic hosted massive sulphide deposit.

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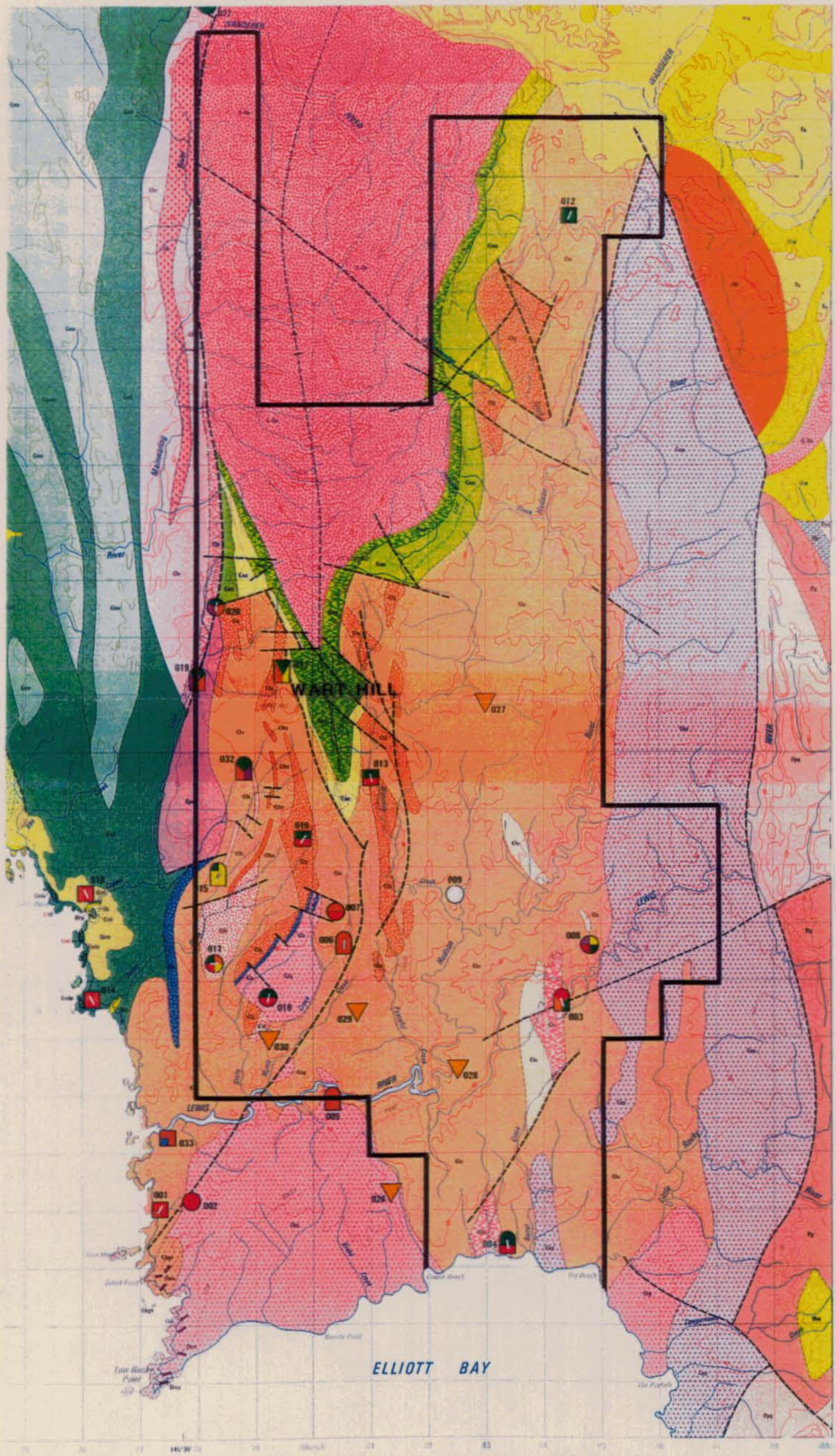


INDEX OF DEPOSITS

	NAME	COMMODITIES
001	Penders Prospect (Voyager 1)	Cu,Fe
002	Voyager 1 (East)	Cu
003	Old Lewis River Prospect (Voyager 2)	Pb,Zn,Ag,Cu
004	Drake Creek Prospect (Voyager 3)	Pb,Zn,Cu
005	Voyager 6	Fe(magnetite)
006	Voyager 9	Fe(magnetite,pyrite)
007	Voyager 9 (North)	Fe(magnetite),Cu
008	North Lewis Prospect (Voyager 12)	Cu,Pb,Zn,As,Au(Ag)
009	Waterloo Creek Prospect (Voyager 16)	—
010	Voyager 18	Cu
011	Voyager 19	Pb,Zn,Ag,Au(Cu)
012	Voyager 20	Pb,Zn
013	Voyager 22	Pb,Zn,Cu
014	Voyager 23	Cu
015	Voyager 24	Au,(Pb,Zn)
016	Voyager 29	Pb,Zn,Cu
017	Voyager 30	Pb,Zn,Ag,Au,Cu
018	Voyager 30 East	Pb,Zn,Cu
019	Voyager 31	Pb,Zn,As,Ag
020	Voyager 33	Pb,Zn,As,Ag
021	Wanderer River	Pb,Zn
022	Wanderer River	Pb
023	Horburg Creek	Au
024	Rheuben Creek	Au
025	Mainwaring River Valley	Au
026		Ti
027		Ti
028		Ti
029		Ti
030		Ti
031	Fletcher Creek	Au
032	Voyager 29 (West)	Pb,Zn,Ag,As
033	Voyager 1 (North)	Fe,W
034	Wanderer River	Pb, Zn
035	Wanderer River	Pb, Zn (Cu, Ag

VALUE OF DEPOSIT

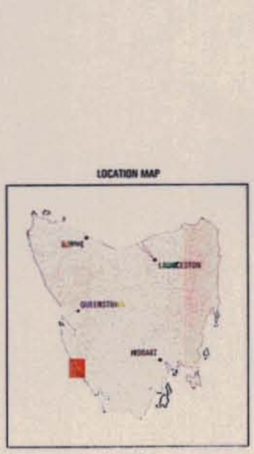
< $10^6	034
$10^6 - $10^7	035
$10^7 - $10^8	056
> $10^8	002

5 cm

SCALE 1 : 100 000

km 0 1 2 3

LOCATION MAP



ELLIOTT BAY EL53/94

REGIONAL GEOLOGY

Figure 2

The recognised potential for low grade stratabound, possibly intrusive related, disseminated/stockwork Au(Pb-Zn) mineralisation (eg: Voyager 24, Voyager 12) and disseminated Cu-Au mineralisation (eg: Voyager 9, Voyager 1 etc.) represent low priority secondary targets.

High grade massive sulphides (> 25% Pb+Zn) of undoubted synvolcanic VHMS type, exist as re-sedimented clasts and lenses up to about 5m long in volcaniclastic mass flow breccias at Wart Hill. It is unlikely that the larger blocks of such dense material would have travelled far in a fluidised medium and may therefore be located close to the original mineralising centre. Although there have been intensive geophysical surveys and 17 diamond drill holes on the prospect, the volcanic facies, hydrothermal alteration and structural setting remain poorly understood.

The exploration philosophy underlying Plutonic's proposed first year exploration programme was to refine conceptual targets at Wart Hill by re-logging existing core to improve the interpretation of volcanic facies and alteration zonation to provide vectors to the exhalative centre and the source of sulphide clasts, and to test these concepts by deep diamond drilling.

4.0 EXPLORATION HISTORY AND DEVELOPMENT OF V19 GEOLOGICAL MODELS

4.1 Introduction - Geopeko Exploration

A comprehensive discussion of the regional geology of the Elliott Bay area, litho-stratigraphic definitions, and exploration concepts up to 1985, was presented by Large et al., 1987.

Geopeko's attention was originally drawn to the Voyager 19 area during reconnaissance mapping by recognition of iron staining and chlorite-sericite alteration associated with anomalous rock chip Cu, Pb, Zn, Fe levels in outcrops on Wart Hill; (Large, 1981). Subsequent detailed mapping indicated that the iron staining was related to oxidation of chlorite in rather diffuse patches of chlorite alteration on Wart Hill which contained low, barely significant (<1%), levels of disseminated pyrite, (Wilson et al., 1981).

However, the sniff of alteration was the stimulus for grid based gradient array IP, magnetic and detailed C-horizon soil geochemical sampling surveys. The geochemistry showed widespread but rather spotty strong Pb-Zn anomalism (not particularly associated with the area of iron staining) with some samples containing percentage levels of Pb-Zn.

Manual shallow trenching across a few of the best anomalous zones revealed two lenses of high grade sphalerite-galena massive sulphides located 250m apart about 500m north of Wart Hill; chip sampling of the exposed sulphides indicated widths and grades of:

Location	Width		Cu%	Pb%	Zn%	Fe%	Ag g/t	Au g/t
13300N / 10085E	5m	at	0.1	10.2	17.9		38	0.52
13045N / 10060E	3m	at	0.2	13.9	21.9	0.3	680	0.84

Gradient array IP indicated a broad zone of high chargeability - low resistivity along the eastern side of the prospect associated with pyritic carbonaceous siltstones of the overlying Waterloo Creek Group (WCG). The ground magnetic survey found a few ~100nT bull's eye anomalies with no particular relationship to mapped geology, geochemistry or mineralisation. Trial SP, moving source Turam EM, dipole-dipole IP and gravity traverses in the vicinity of the exposed massive sulphides did not produce significant responses.

These surveys were followed (Wilson et al., 1982) by a VLF-EM survey which responded only to the WCG carbonaceous siltstones to the east, and a detailed gravity survey (100x25m spacings totalling 1100 stations) which again did not produce anomalies attributable to significantly sized discrete massive sulphide bodies. A broad 0.4mgal anomaly over Wart Hill was interpreted to be possibly due to increased disseminated sulphides associated with the zone of iron staining/alteration; this was subsequently tested by diamond drill hole V19-3 which did not intersect significant mineralisation and was inconclusive about the gravity feature.

Drilling of three holes under the massive sulphide lenses intersected only a few small sulphide clasts in volcaniclastic breccias and showed that the exposed lenses were isolated pods of only a few metres depth; a trial Mise à la Mass survey indicated that the strike extent was similarly limited, (Herrmann, 1983).

Wilson et al., (1982) were reluctantly forced to the conclusion that the drilling, gravity, IP and EM results precluded the existence of a large massive sulphide deposit within about 50m of the surface in the Wart Hill area. They speculated that the lack of continuity of the exposed sulphide lenses could be due to deformation, localised primary exhalative ponding or down slope re-sedimentation of fragments from an exhalative VHMS deposit. The last explanation most adequately explained the absence of a pyritic footwall alteration zone and became the preferred geological model for the prospect.

Nevertheless, it was considered that the existence of the massive sulphide lenses (or clasts) established the "pedigree" of the Wart Hill Pyroclastics (WHP) as a geological setting in which VHMS type mineralisation had occurred, although in the Wart Hill area it had probably been swamped by continuing eruptions and volcaniclastic re-sedimentation. No precise favourable horizon, exhalative centre or zoned alteration system was identifiable, but the whole volcanic package extending south from Mt Osmund, then thought to represent the upper part of the Cambrian volcanic sequence at Elliott Bay, was regarded as prospective.

Accordingly, the project was de-focused in 1982-83 (Herrmann, 1983) to provide a blanket coverage (in conjunction with detailed geological mapping and completion of magnetic survey and C-horizon/bedrock geochemistry coverage) of 50m dipole-dipole IP designed to directly detect shallow massive sulphide deposits (on the basis that a large Pb-Zn rich deposit could be expected to be chargeable but not necessarily very conductive) and outline pyritic footwall alteration zones which could identify the favourable horizon and help to zero in on deeper deposits.

About 100 line kilometres of IP survey was carried out on 200m line spacings over an 8km strike, extending 2km north and 6km south of Wart Hill, and covering an area of about 25 km2 of prospective volcanics. The survey effectively scanned to at least 50m depth and generated strong responses in carbonaceous siltstones to the east and west but no outstanding anomalies were identified in the key prospective area of felsic volcanics.

In the final phase of Geopeko's program, UTEM was used to provide deep penetration and high resolution EM to explore the most prospective (geochemically anomalous) sectors at Voyagers 19, 29, 29W and 9 in a four loop, 40 line km survey covering most of about 6 km of strike southwards from Wart Hill, (Herrmann & Sumpton, 1984). Although the observed massive sulphide lenses at Wart Hill were known to be poor conductors (high sphalerite, low chalcopyrite-pyrite) it was considered that a large (>10Mt) deposit was likely to have some copper rich parts which could be detected by TEM down to the 100-200m depth range, beyond the reach of previous IP and gravity surveys. However, the UTEM survey did not detect any significant conductors and Geopeko, after unsuccessful attempts to attract a joint venture partner, relinquished the exploration licence.

4.2 Cyprus Minerals Exploration

In 1986, exploration by Cyprus Minerals commenced with a helicopter airborne DIGHEM survey over the previously least explored northern part of the Elliott Bay area and some effort was expended in following up the usual multitude of surficial anomalies. However, a lack of encouragement from this work directed attention back to the known mineralised areas such as V19/Wart Hill and the V12 and V24 gold prospects etc., (Torrey et al., 1987).

Cyprus' review of previous Voyager 19 geophysical data concluded that there were no strong VHMS type targets and recommended that blanket IP coverage should be extended on a regional basis over the less explored areas of felsic volcanics to identify and map out prospective "pyritised host horizons". (Bishop, 1986.) This recommendation was not put into effect.

Instead, Cyprus undertook a 12 hole (1973m) diamond drilling program spanning two seasons to further test the immediate environs (~400m strike length, ~200m depth) of the V19 massive sulphide lenses. This programme was presumably encouraged by petrophysical measurements which showed that the sulphides were non-conductive and of low chargeability which could be taken to imply that electrically undetectable sulphide deposits could exist at depth and were a valid target.

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The initial 6 holes were shallow and targeted mainly on C-horizon/bedrock Pb-Zn geochemical peaks, (Torrey et al., 1988). All of them intersected parts of a complex sequence of felsic volcaniclastic sandstone and breccia containing massive sulphide clasts, with intervals up to a few metres of 1 to 5% Pb+Zn. This explained the surface geochemistry and confirmed that the mineralisation was of VHMS type, probably from high level or distal parts of a sulphide mound deposit, which had been re-sedimented by sub-aqueous mass transport debris flows in a volcanically and tectonically active environment.

It was speculated that the nearby contact with the overlying Waterloo Creek Group sediments, outlining the Mt Osmund Syncline, could be a syn-volcanic fault (Osmund Fault) which may have provided a conduit for the mineralising hydrothermal system.

Subsequent deeper holes were more conceptual, designed to intersect the sulphide clast bearing units down dip and along strike. This drilling was to test interpretations that certain mineralised intercepts represented in situ favourable "exhalative" horizons (eg: WH10 to test below cherty rocks at surface interpreted as exhalites, WH12 to test down dip of baritic massive sulphides in WH10), that clast size and frequency increased down dip (eg: WH8 beneath WH1 and WH2) or to test "possible" off hole DHEM anomalies (eg: WH10 beneath WH5). It seems that Cyprus' geologists were (quite reasonably) keeping their interpretations open to the possibility that the observed patchy sericite-carbonate-chlorite alteration, thicker intercepts of possibly exhalative sulphides and the proximity to a postulated syn-volcanic fault could be indicators of a proximal VHMS forming hydrothermal system. The system may have been intermittently partly buried and/or partly re-sedimented by volcaniclastic debris flows with the observed clasts and lenses not travelling far from their source.

However, the deep holes and extensive surface excavator trenching merely found more or less of the same - clasts in volcaniclastic breccias - and did not greatly advance the exploration concepts. The postulated Osmund Fault was disproved and a depositional-unconformable contact was inferred between the WHP and WCG with confusion over coherent rhyolite apparently interdigitating with WCG sediments. The suspected exhalative horizons were found to be impersistent and no trend in alteration zonation or clast size and frequency was apparent. Downhole SIROTEM surveys of all but the last and deepest hole, WH12, did not indicate any anomalies and the low signal levels suggested that there were no conductors within several hundred metres of the holes.

4.3 Aberfoyle Exploration

Aberfoyle joint ventured in to the project in 1991 with a strong EM bias and did no further ground work at Wart Hill, preferring to concentrate on regional coverage with a more powerful but fixed wing and higher terrain clearance airborne QUESTEM survey. Aberfoyle did, however, contribute to a major breakthrough in interpretation of styles of mineralisation at Elliott Bay by supporting a collaborative CODES/CSIRO Pb and S isotope research project, (Gemmel, 1992).

The key findings of this study were:

* Pb-Zn massive sulphide lenses in outcrop and clasts in drill core at Voyager 19 (Group A-B) have similar least radiogenic Pb and S isotopic values indicating they came from a Cambrian sea floor VHMS type deposit.

* Low grade disseminated and veiny mineralisation associated with sericite-chlorite-carbonate alteration at Voyager 19, chlorite-magnetite alteration at Voyager 9 and quartz-sericite+/-chlorite alteration at Voyager 3/EB-1 (Group C) has slightly more radiogenic Pb. This is attributed to a slightly younger (probably still Cambrian?) hydrothermal system which circulated fluids through the sulphide clast bearing volcaniclastic unit and other hangingwall units at Voyager 19 and possibly overprinted the original VHMS footwall alteration system. The Group C system may have also deposited massive sulphides at a higher, as yet unidentified, stratigraphic level.

* Vein style Pb-Zn-(Ag-Au-As) mineralisation which is apparently structurally controlled (Group D; eg V24, V33) has the most radiogenic Pb and lightest S isotopes suggesting a much younger, possibly Devonian, and magmatically related hydrothermal system.

Gemmell's (1992) Figure 15 (included here as Figure 3 schematically illustrates the highly credible genetic model which neatly explains the absence at Wart Hill of a strong proximal footwall alteration system related to the Type A-B massive sulphides and also the presence of patchy sericite-chlorite-carbonate alteration with minor disseminated and veiny Type C Pb-Zn mineralisation which exists in the host breccias, as well as coherent rhyolite units, and is otherwise widespread in the district.

The moderately strong (but not feldspar destructive) patchy quartz-pyrite alteration which occurs locally in the conglomeratic base of the WCG near 13100N/10150E and in WH8 in coherent rhyolite close to the contact proved to be of Type D Devonian? structurally related hydrothermal origin.

It is notable that Gulson et al., (1987) found that C-horizon soil geochemical anomalies in the vicinity of the exposed sulphide lenses have similar least radiogenic Pb-isotopic ratios whilst other soil anomalies>800m to the south and southwest have higher Pb-isotopic ratios similar to Group C mineralisation of Gemmel, (1992). These are co-incident with the Rosebery signature and granitoid intrusives at Elliott Bay. He concluded that Pb-isotopic data could be used to prioritise anomalies for follow up. This was vindicated by Cyprus' trenching of the "West Wart Hill" anomaly which exposed a 10m long sulphide vein with high Pb/Zn ratios unlike typical Tasmanian VHMS deposits.

Gulson also indicated (his minority view) that the least radiogenic signature of the V19 sulphide lenses and clasts was possibly not a reliable indicator of high prospectivity "because no other major massive sulphide deposit in the Mt Read Volcanics exhibits this signature and it has only been observed in minor occurrences". However, in the Elliott Bay context, it is only the least radiogenic V19 sulphide lenses and clasts which provide evidence of a VHMS forming hydrothermal event.

Although Gemmell (1992) pointed out that the Type C hydrothermal system had the potential to form VHMS deposits at some yet unidentified higher stratigraphic level there is, as yet, no direct evidence for it. The widely dispersed "sniffs" of this type, and the possible granitoid association, suggest that this mineralisation may belong to an extensive but not well focused system.

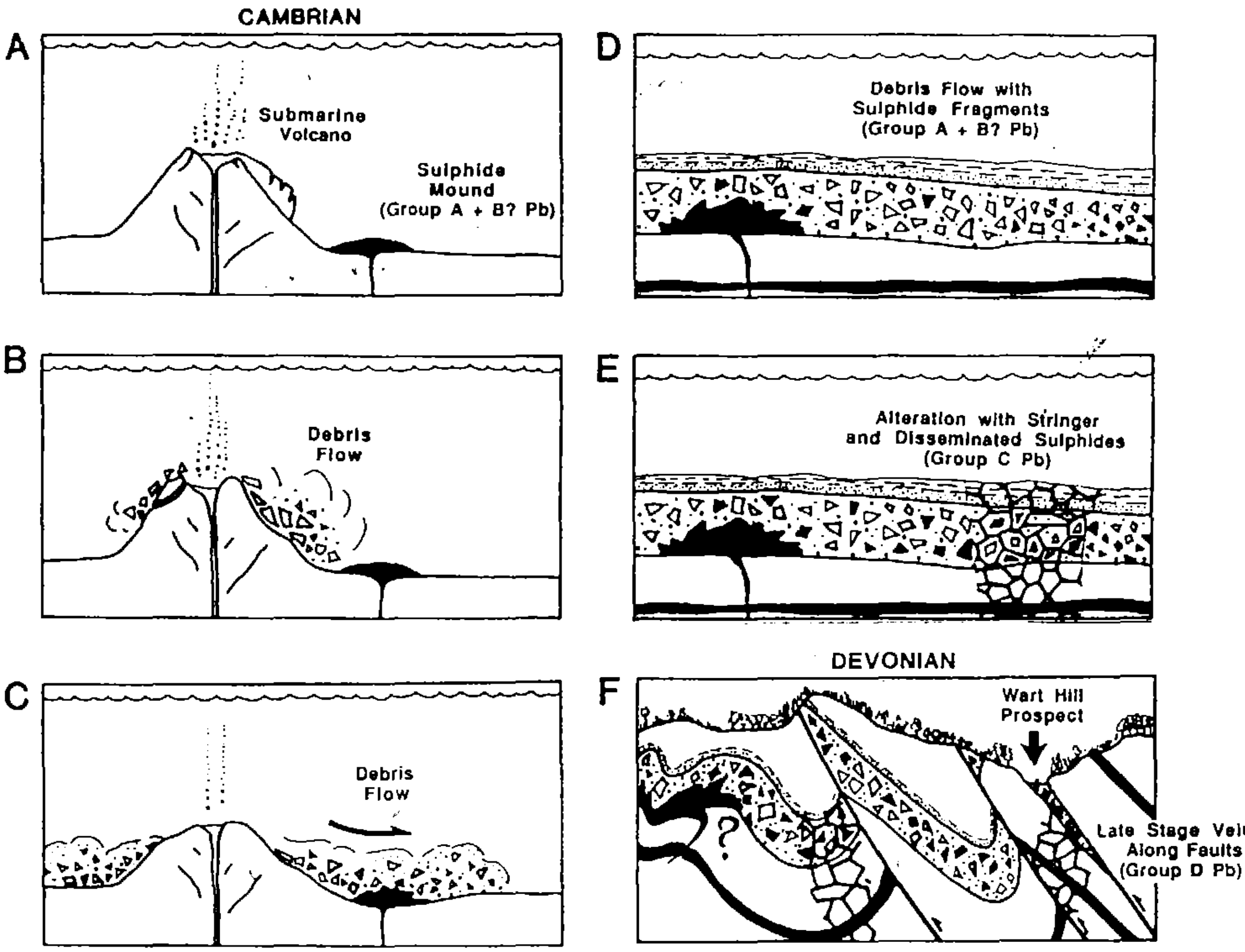


Figure 3 Working model for types of Elliott Bay mineralisation and differing Pb isotope signatures.. A. In the Cambrian a volcanogenic massive sulphide deposit (Groups A and B Pb), of unknown size, formed on the seafloor somewhere in the vicinity of the Wart Hill. B. and C. Subaqueous debris flows incorporated fragments of this mineralisation and deposited them at the present day site of Wart Hill. D. These fragments became one of the clast types in the debris flow deposits. E. Shortly after the deposition of the debris flows a separate generation of hydrothermal fluids passed through these rocks causing alteration (sericite, silica, chlorite, minor carbonate) and precipitation of disseminated and stringer sulphide mineralisation (Group C Pb). F. During, or shortly after, the Devonian deformation another generation of hydrothermal fluids passed through the rocks causing minor alteration and sulphide mineralisation along faults and fractures (Group D Pb).

4.4 Discussion of the Wart Hill Volcanic Environment

It has been suggested that the best chance for VHMS deposits in the Elliott Bay area lies in exploration for an in-situ remnant of the high grade "sulphide mound" source of Type A-B clasts, if any still exists, or another deposit of similar type which may have formed at the same or similar litho-stratigraphic favourable horizon . The clasts are evidence that such a deposit did once exist, probably within a few kilometres of Wart Hill, however, the probability that an economically sized remnant (>5Mt) exists is indeterminate but intuitively low, in consideration of the evidence for re-sedimentation and the apparently large volume of the sulphide clast bearing volcaniclastic breccias in the prospect area.

Massive sulphide clasts are reasonably common in the Mt Read Volcanics. This is not surprising given the number of VHMS deposits and the importance of sub-aqueous mass flow depositional processes. They are known at Hellyer, Mackintosh Dam, Bastyan Dam, White Spur, Newton Creek and Elliott Bay but to date no economic deposits have been discovered by following the trail of clasts.

McPhie et al., (1993) suggested that "some idea of the source direction can be obtained, in favourable circumstances, by systematically mapping the maximum dimensions of [massive sulphide and dense lithic] clasts and the host unit thickness" but concluded that "in most cases, neither the direction nor the distance to the source can be accurately determined".

One of the prospects with resedimented VHMS clasts which has received most exploration attention in recent time is at Newton Creek Dam where about ten sphalerite-galena rich massive sulphide clasts, up to about 30cm in size, are exposed in the spill way. They exist in a single mass flow breccia unit and within the upper 2m of the unit, which is unexpected of such high density clasts.

In a recent interpretation of the Newton Creek volcanic environment, Allen (1994) listed three styles of mineralisation:

1. Zn-Pb rich massive sulphide as clasts in a polymictic mass flow breccia,

2. disseminated-replacement mineralisation in a unit of altered mass flow breccia and sandstone underlying that which hosts the Type 1 clasts,

3. hydrothermal breccia veins and patches in competent units below the above units;

noted that there was uncertainty about whether all styles are related to the same hydrothermal system and considered the source of the massive sulphide clasts to be the highest priority exploration target.

Allen (op. cit.) suggested that the mineralogical similarity of the clasts and their position near the top of a flow unit implied that the clasts are "the remnants of a much larger massive sulphide block that was rafted along in the mass flow and dismembered during transport due to stresses and clast collisions...... Due to high clast concentration in the mass flow, the massive sulphide clasts were not thoroughly mixed into the flow but were simply strung out at the level in the flow of the original sulphide raft." There is some ambiguity here in that Allen's (1994) "high clast concentration" implies a fair degree of clast support yet the sulphide clasts lie in the upper parts of a flow unit which McPhie and Gemmell (1994, p.59) state to be dominantly matrix supported.

Pursuing the sulphide raft concept, Allen (op. cit.) suggested that a "sulphide block of this size [at least several metres across] is unlikely to have been picked up off the sea floor by the mass flow during transport" and consequently must have originated as a synvolcanic lens at or near the sea floor in the source area of the mass flow. The textures and compositions of volcanic clasts in the host mass flow and similarity to intrusive sills in the vicinity were interpreted to indicate that the source of the mass flow is a proximal (volcanic centre) facies association, that the mass flow breccia is a proximal to medial deposit and that the proximal volcanic-massive sulphide source exists, or once existed, within an estimated 5km of the sulphide clasts in the Newton Creek spill way. Cross bedding in the graded sandy top of the mass flow breccia indicated a down dip & SE transport direction which is not favourable for exploration (inferring that the source was above the present erosion surface) but Allen (op. cit.) concluded that this should not be a deterrent because of possible transport complexity and, having identified a VHMS favourable lithofacies/horizon, there was a likelihood that more than one VHMS deposit existed along it.

The Voyager 19 prospect is partly analogous to the model presented for Newton Creek in that there are several styles of Pb-Zn mineralisation (which have been shown to be of separate hydrothermal systems), massive sulphide clasts exist in polymictic mass flow breccias and there is clear evidence of largish rafts represented by the sulphide lenses at surface. In contrast, however, the Voyager 19 volcanic facies are not as well known (or well interpreted), the clasts are of variable size and composition (massive sphalerite-galena, massive pyrite, semi-massive sulphides in barite, pyritic cherty silica) indicating derivation from different parts of a complex zoned deposit or several deposits (as envisaged by Callaghan, 1989) and they appear to be widely distributed in a package of volcaniclastic mass flow breccias and sandstones - not restricted to a single horizon.

Following Allen's (1994) line of interpretation (that large rafts are not likely to be picked up along the flow path and must have originated in the same area as the source of the mass flow) the presence of large rafts at Voyager 19 indicates that the VHMS favourable horizon exists/existed at, or in the near footwall to, the base of the group of mass flow units which contain sulphide clasts. In other words: although there is no recognised exhalative horizon at Voyager 19, the large sulphide rafts indicate that its lateral equivalent exists (or once existed if significant erosion occurred) at a stratigraphic level close to the base of the sulphide clast bearing breccia units.

Recognition of this favourable horizon is important for exploration for the source of VHMS clasts. However, one of the major geological uncertainties at Voyager 19 is the matter of stratigraphic facing. The Geopeko view, based on regional data and consistent sedimentary structures in sandy and shaly marker horizons interbedded with the WHP, was that the sequence faces and dips steeply west which implies that the WHP was locally overturned if the WHP - WCG contact represents a depositional unconformity. Callaghan (1989), appealing for simpler Cambrian tectonics and influenced by apparent interdigitation of felsic volcanics at the base of the WCG, dismissed the west facing in the majority of (albeit equivocal) grainsize grading indications observed in V19 drill cores and considered that the WHP at Voyager 19 area must face east inferring an anticlinal axis just west of Wart Hill to accommodate the unequivocal east facing of the WCG. As discussed in Section 6.3 this intersection is now considered incorrect.

5.0 SUMMARY OF WORK COMPLETED IN 1995

Exploration work on EL 53/94 during 1995 was carried out in two phases.

Phase 1 in March-April 1995 involved:

* Inspection and re-logging of selected Wart Hill drill core and in field geological reconnaissance of the Voyagers 3, 19 & 29 areas by way of geological familiarisation for Plutonic geologists R. Close, P. Rea and R. Reid.

* Review, by Plutonic geophysicist L.Wynn, of data from previous geophysical surveys including:

  1988-89 DHEM surveys of drill holes at Voyager 19,
  1984 UTEM surveys over Voyagers 9, 29 and 19,
  1983 semi regional IP survey over 25sqkm extending from V9 to V33,
  1983 gravity survey over Voyager 19,
  Various IP and EM surveys in the Voyager 3 area.

  Wynn's impressions and recommendations are included here as Appendix I.

* Moving loop SIROTEM surveys totalling 9.7 line km over Wart Hill and East Camp prospects; results and interpretation are presented in Appendices II and III.

* Ground magnetic surveys totalling 22.5 line km over Wart Hill and East Camp prospects; results presented in Appendix IV.

* Limited C-horizon soil sampling (76 samples) over selected parts of Wart Hill and East Camp prospects; results presented in Appendix V.

These surveys were carried out by Plutonic and contract geophysical personnel based at the existing hut camp 2km SSW of Wart Hill with logistic support mainly by helicopter and fixed wing aircraft via Moore's Valley airstrip. A four wheel drive "all terrain" motor cycle was used by one party to travel from Birch's Inlet to Wart hill via the Low Rocky Point bombardier track and for reconnaissance trips to Voyager 3.

Phase 2 was carried out by W. Herrmann in November-December, 1995 and mainly involved:

* Re-logging of Cyprus' twelve drill holes at Wart Hill and one at East Camp, using the graphic logging technique in an attempt to resolve uncertainties of facing direction, form an impression of volcanic facies and facies relationships to map out the style and intensity of hydrothermal alteration and identify the favourable horizon if one exists. This would provide vectors to the centre of hydrothermal activity and the source of massive sulphide clasts or at least gain an impression of whether systematic volcanic facies and alteration mapping are feasible in this environment and capable of leading to development of

conceptual targets for diamond drill testing. Graphic core logs are presented in Appendix VI.

* Analysis of seventeen core samples from drill holes WH8, WH9 & WH10 for major and trace elements; analytical results are listed in Table 1.

* Review of the results of Aberfoyle's follow up and drill testing of the EB-1 QUESTEM anomaly near Voyager 3.

6.0 RESULTS AND DISCUSSION OF 1995 EXPLORATION PROGRAMME

6.1 Introduction

The actual programme conducted in 1995 represents a significant departure from the initially proposed Wart Hill drilling programme which, although it had reached an advanced stage of planning in February 1995, was ultimately considered rather too conceptual, lacking focus and bordered on stratigraphic drilling. The moving loop SIROTEM, ground magnetic and soil geochemical surveys together with reconnaissance mapping were carried out in an attempt to define specific drilling targets which could be tested late in the 1995 summer. Although the Phase I field work resulted in a prioritising of targets these were not considered sufficiently attractive to warrant immediate drilling, therefore a more detailed evaluation of the Wart Hill prospect was conducted as the main part of Phase 2 exploration.

6.2 Phase I - Reconnaissance Exploration

6.2.1 Geology

Initial exploration following data review on this property involved preliminary relogging of drillcore from the Wart Hill and East Camp prospects at the Plutonic field base in Zeehan. The geology was transferred to working cross sections in order to interpret crude three dimensional vectors towards in situ mineralisation at Wart Hill. Although most of the mineralisation has been transported in debris flows, the presence of interbedded baritic exhalite in drill hole WH10 suggested this position may be stratigraphically equivalent and spacially close to the in situ massive sulphide source horizon. Therefore the southern part of the prospect (13,000N - 13,1000N) at depth and to the east was considered the best target for proposed deep drill evaluation of the massive sulphide position and related altered footwall sequence.

In order to check this concept and to verify the validity of Geopeko and Cyprus exploration in general at Wart Hill and south to East Camp prospect, several field trips to site were made during February and March 1995.

Previous explorers and regional mappers have termed the stratigraphic sequence around Wart Hill as the Wart Hill Pyroclastics (WHP). Considering the sequence contains no explicit pyroclastic strata it is therefore suggested the regional package be referred to as the Wart Hill Volcanics (VHV).

On the basis of published maps, company data, and drill core measurements, the Wart Hill Volcanics (VHV) sequence is considered to dip and face west. The prospective mineralised package north of Wart Hill at Voyager 19 consists of a series of polymictic debris flows, minor felsic volcaniclastic siltstone and black shale interbedded with coherent rhyolite lava flows or sills with local hyaloclastic margins. To the west in the hangingwall the sequence is capped by a massive unit the West Wart Rhyolite.

However, south of 12500N in the West Wart Hill area the rhyolite appears to be interbedded with finer felsic quartz eye crystal rich "tuffs" and a prominent micaceous siltstone - sandstone unit thought to mark the southern stratigraphic equivalent of the mineralised sequence to the north.

Reconnaissance mapping in the Wart Hill area failed to differentiate an altered footwall zone east of the mineralised debris flows and west of the unconformably overlying and easterly dipping Waterloo Creek Group (WCG) sediments. Poor exposure north of 13200N and the north easterly trending cross fault interpreted by Cyprus prevented any definitive assessment of the extent of the host sequence and footwall in this direction west of the WCG unconformity. However, trench exposure of carbonaceous siltstone interbedded with felsic volcaniclastics and underlain by rhyolite to the east on 1300N, indicates there is no antiform in this area as suggested by Callaghan (1989) and that the immediate footwall to the debris flow sequence is a relatively unaltered rhyolite.

Traverses to the east and south east of Wart Hill across to the WCG sequence from 11000N to 13000N also did not locate significant footwall-type alteration or stringer vein development in weakly chloritic-sericite crystal rich volcaniclastics, ash flow tuffs and felsic lavas. However, prominent quartz vein outcrops localised close to the eastern contact of the WHV and the WCG mark the position of a significant structure which could represent the Osmund Fault interpreted by Geopeko.

At the northern end of this zone fault around 12800N - 13000N a broad zone of sygmoidal tension gash style milky white quartz veining with minor epidote and carbonate is well exposed within both fine grained WHV volcaniclastics and basal epiclastic sequences of the WCG. This suggests that main movement on this structure was Late Cambrian or younger, most probably during major Devonian deformation of this region. There remains the possibility that earlier movement along this structure may have been syndepositial with the WHV and the zone may have acted as a conduct for VHMS mineralising fluids. However there is no obvious direct field evidence in support of the supposition.

To the west of Wart Hill from 12000N to 12700N and west of the 10000E baseline is the West Wart Hill prospect. This area contains a sequence of fine-grained sediments which include jasperous-haematitic volcaniclastic siltstone, were considered to represent a distal exhalative horizon possibly related to an in situ massive sulphide deposit at depth. Mapping located chlorite-pyrite $\pm$ quartz veining in the felsic volcaniclastics and a local sulphide-rich debris flow with clasts of sulphidic chert, giving rise to coincident geochemical anomalism in a trench-creek section on 12200N. Further north there is coincidental base metal and TEM/IP anomalism along this stratigraphic trend as well as vein hosted high grade base metal mineralisation, located by Cyprus in a trench on 12500N.

The presence of well developed hydrothermal alteration, favourable stratigraphic position and coincident geophysical anomalism indicates this prospect area warrants drill evaluation but on a secondary priority basis compared to the main target area north of Wart Hill.

Further south, reconnaissance mapping over Geopeko geochemical anomalism down to the East Camp prospect, did not reveal any significant targets. The sequence east of the 10000E baseline comprises weakly chlorite altered and locally pyritic (-2%) felsic crystal rich volcaniclastics interbedded with more massive and unaltered rhyolitic flows or ash flow units. The geochemistry tends to be associated with the finer grained volcaniclastics but poor outcrop precluded detailed interpretation.

At East Camp Cyprus drill holes EC1 and EC2 are considered to have adequately tested the prime area of coincident geochemistry, IP and EM anomalism, low grade disseminated mineralisation and minor vein-type mineralisation being attributed the source of this anomalism. To the east, several high-grade Pb-Zn auger bedrock geochemical zones defined by Cyprus, were inspected. Surface evaluation downgraded them because they tend to be narrow, in sheared sericitic volcaniclastics with some quartz veining, suggesting they are late and structurally controlled.

6.2.2 Geochemistry

C-horizon soil geochemical sampling was carried out on selected "in fill" lines at Wart Hill to East Camp but mainly over the Wart Hill West area, to obtain improved detail on some known bedrock geochemical anomalies.

Sampling was by means of a portable motorised, 120mm diameter, post hole auger drilled to point of refusal into firm weathered bedrock. Most samples were taken at a depth of <1m and analysis was by AAS after aqua regia+perchloric acid digestion of an aliquot of total sample (ie: no specific size fraction).

The results (listed in Appendix V) show a few spot high Pb-Zn values with high contrast against low background which is consistent with previous (Geopeko) data suggesting a virtual absence of formation of secondary dispersion haloes in C-horizon soil in this environment. High C-horizon Pb-Zn values appear to be related to very localised primary mineralisation and, in the Voyager 19 context, the very spotty nature of geochemical anomalies is attributable to isolated clasts of re-sedimented massive sulphide and localised younger vein style mineralisation. The peak value in this latest round of soil sampling (No: 15033 at 9787.5E, 12250N) has 7800ppm Pb and 1440ppm Zn with a low Zn ratio characteristic of vein style mineralisation and similar to the vein exposed by Cyprus' trenching at Wart Hill West (Poltock, 1989), and can be confidently dismissed as such.

Very limited detailed sampling, by the same method, at 5m centres across a few existing anomalies at East Camp again showed spot high values with minimal secondary dispersion. Pb and Zn peak values are one to two orders of magnitude lower than previous results from Geopeko's bedrock sampling which was done by a Bombardier mounted, Jacro hydraulic drilling rig with much greater penetration into hard ground. A similar disparity of geochemical levels due to different sampling (and possibly analytical) methods was noted by Richardson (1992) at Voyager 3.

This appears to highlight the lack of a secondary dispersion halo effect in the weathering profile of sedge lands at Elliott Bay where weathering seems to be associated with strong leaching and substantial stripping of metals in the zone of oxidation. The implication for geochemical surveys is that the deepest attainable bedrock horizon should be sampled with consistency, and with the objective of outlining primary (mineralisation) dispersion rather than secondary dispersion. It also casts doubt on the validity of -80# drainage geochemical sampling in streams draining these sedge lands. The strong bedrock geochemical anomalies at Voyager 19 are not reflected in drainage samples and it appears that metal ions leached from the soil and upper bedrock horizons remain very soluble in the (presumably fairly acidic) surface waters and are not significantly adsorbed onto clay particles in sediments.

6.2.3 Geophysics

6.2.3.1 SIROTEM

Although the 1984 UTEM survey had not been successful and it was known that the Voyager 19 zinc rich sulphides are not significantly conductive, it was considered that the UTEM fixed loop system had provided poor EM coupling with (most likely) west dipping conductors and hence moving loop EM was chosen to eliminate this possibility, (Wynn, in Appendix II). However, the moving loop SIROTEM survey similarly did not detect any significant bedrock conductors. This effectively confirms the conclusions from previous airborne, surface and down hole EM surveys that there are no conductive deposits within a few hundred metres of the surface in the Wart Hill prospect area and along strike at East Camp.

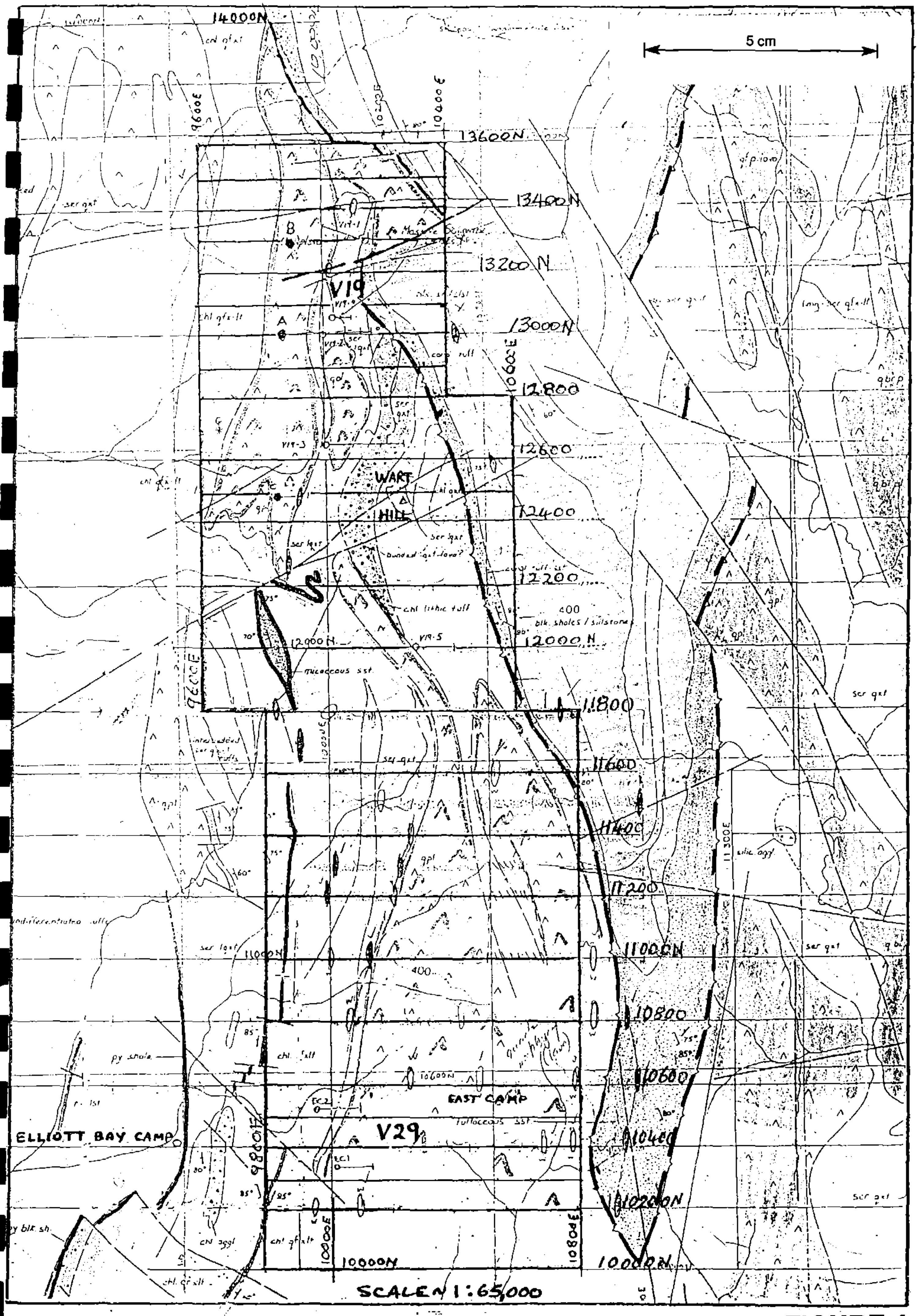
It must now be accepted that, the hoped for typically chalcopyrite rich, conductive, proximal or footwall stringer zones of VHMS deposits do not exist close to the surface and that EM will not be effective in providing drilling targets except possibly in deep DHEM surveys. However, non conductive (Zn rich) bodies of low chargeability, similar to the outcropping V19 lenses could lie undetected by EM and IP surveys in these areas.

Geopeko's 1983 detailed gravity survey effectively precludes the existence of significantly sized (>10Mt) electrically undetectable massive sulphide bodies at depths shallower than 50-100m.

Collins (1989) and Wynn (Appendix I) refer to two coincident gravity-UTEM anomalies which are interpreted to have a source within 100m of the surface, on lines 12600N and 13000N about 170m east of the unconformity with Wart Hill Pyroclastics (WHP), apparently in sediments of the Waterloo Creek Group (WCG). Since the WHP-WCG contact dips at about 80¼ east, these anomalies must lie, if the structure is simple, at least 130m stratigraphically above the base of the WCG in a sedimentary setting not currently regarded as a particularly favourable horizon for VHMS mineralisation.

6.2.3.2 Magnetics

The Wart Hill to East Camp magnetic surveys were carried out to help define stratigraphy, structural dislocations and alteration trends. However the magnetic data reported by Wynn, (Appendix IV) is dominated by a number of weak (<200nT) shallow sourced positive anomalies which are mostly one liners and much enhanced by the 5nT interval used in contour plans of magnetic intensity. They tend to be aligned on NNE trends slightly offset perpendicularly but have no particular relationship to the known geology and the exercise appears to have been a futile repeat of the 1981 magnetic survey.



719023 ELLIOTT BAY / FM GRID

FIGURE 4

Two anomalies lying in the sulphide clast bearing "favourable" volcaniclastic unit at Wart Hill were rated as possible drilling targets though it is not clear what their economic significance might be as the Wart Hill massive sulphide lenses are essentially non-magnetic (magnetic susceptibility = 0.00002 cgs units according to petrophysical measurements quoted by Bishop, 1987). Other Tasmanian VHMS deposits also have low susceptibilities (Bishop and Lewis, 1992) and there is a suggestion that Que River and Hellyer are associated with faint magnetic lows due to magnetite destructive hydrothermal host rock alteration. The area of outcropping massive sulphide lenses at Wart Hill in fact coincides with a very weak (~20nT) magnetic low. Mafic sills or dykes intersected in some drill holes could be possible sources even though they do not seem to be particularly magnetic.

6.2.4 Conclusion

Phase I field work determined that priority VHMS prospects in the Wart Hill area were:

1. Voyager 19 - Wart Hill North
2. Wart Hill West
3. East Camp

Reconnaissance surveys and detailed geophysics failed to establish definitive drill targets at any of these prospects, therefore it was decided not to proceed with expensive high risk drilling until suitable high priority targets were identified within the favourable sequence.

In the conviction that further application of the Cyprus approach of testing C-horizon geochemical spot anomalies with or without weak geophysical support was likely to lead to similar results, it was concluded that any further drilling at Wart Hill would have to be based on geological concepts.

6.3 Phase 2 Exploration

6.3.1 Analysis of Volcanic Facies and Alteration at Wart Hill

6.3.1.1 Stratigraphy

Detailed graphic core logs of drill holes WH1 to WH12A from Wart Hill and EC2/2A from East Camp are presented in Appendix VI. The Wart Hill holes have been roughly plotted on 1:500 scale cross sections (Plates 6 to 15) to assist in interpretation.

There are basically five major lithotypes or lithofacies associations represented in these holes, the first four of which belong to the Wart Hill Volcanics and the last to the Waterloo Creek Group (WCG).

* Coherent quartz (+/-feldspar, biotite) phyric <u>rhyolite</u> and subordinate, compositionally similar monomict breccias, [abbr. = QpR or Q(FBi)pR].

* Massive quartz (+/-feldspar, biotite) phyric, crystal rich, <u>felsic pumiceous breccia</u> and coarse pumiceous sandstone, [abbr. = puBx, puSst].

* Massive to planar bedded and graded polymictic volcaniclastic debris flow breccia, sandstone and minor siltstone. Clast types are dominantly QpR and Q(FBi)pR with rhyolitic pumice, cherty siltstone, white to cream coloured carbonate and massive to semi massive sulphides with varying proportions of sphalerite, galena, pyrite, barite, silica and carbonate in decreasing order of abundance. The clasts range from zero up to about 40% of the rock volume, are variably rounded to irregular or angular and are typically matrix supported in a finer felsic volcaniclastic sandy matrix; [abbr. = polymictBx/Sst].

* Coherent fine grained basalt, sometimes weakly amygdaloidal; usually in narrow intercepts with sharp, finer grained, chilled or peperitic margins; apparently intrusive into all of above lithofacies.

* Massive to planar bedded, well sorted, mature, grain supported volcanolithic coarse sandstone and fine limy sandstone; [abbr. = WCGsst].

In typical Wart Hill cross sections such as 13050N to 13250N, coherent rhyolite Q(FBi)pR exists in a unit of greater than 100m thickness, near surface to the west. Surface mapping shows this lithofacies the West Wart Rhyolite to be ~150m thick increasing to ~300m south of 12700N. It is quite massive without internal brecciation or primary textural variations (apart from some narrow basalt intrusions) and could be a single emplacement unit. Contact relationships are mostly obscure or sharp, only in WH2 and WH8 on 13200N are there vague indications of peperitic or monomict brecciated margins. There is no information on its western contact relationships and the unit could equally well be a sill or flow/dome.

To the east is a mixed sequence of pumiceous breccia/sandstone and polymictic volcaniclastic breccia/sandstone totalling at least 150m thickness with minor intervals (<20m) of coherent to hyaloclastic fragmental rhyolite and peperitic basalt. In some holes (eg: WHs 8, 9 & 12A) the mixed sequence appears to pass eastwards again into coherent rhyolites with associated monomict rhyolite breccias, which show at least 30-40m thickness before being truncated? by bedded eastward facing sandstones of the Waterloo Creek Group (WCGsst). All the holes south of 13150N (WHs 10 & 11 and V19-2) end in the mixed sequence.

The area of drilling covers, if the structure is simple, a relatively small block of ground encompassing ~300m of stratigraphic thickness, ~450m of strike and <300m depth down dip.

6.3.1.2 Facing

Grainsize grading in WCGsst, at the end of WH8, shows clear evidence of easterly facing which is consistent with the interpretation that these rocks are basal units of the WCG and Denison Group equivalents tightly folded around a north plunging synclinal axis running through Mt Osmund. The polymictBx/Sst units in places have vague to reasonably distinct clast size and sand grain size grading (particularly in finer grained clast poor sandy beds); there are some examples of clast proportion grading and in WH2 there are possible load casts. These indicators dominantly show a westerly facing; there are some (uncertain) easterly facings in polymictBx/Sst in WH9 but the overwhelming majority in other holes are westerly.

This is consistent, as discussed above in Section 4, with the district scale westerly facing of the WHV. Although there has been some argument about it (Callaghan, 1989), and mindful that sedimentary facing indicators are not absolute and reverse grading can exist in mass flow deposits, the weight of evidence is for a westerly facing of the WHV sequence which contains re-sedimented massive sulphide clasts at Wart Hill.

6.3.1.3 Volcanic Facies

As noted above, the hanging wall West Wart Rhyolite unit is coherent, massive and uniform and could have been emplaced as a sill or flow/dome unit; the absence of auto clastic textures tends to marginally favour sill emplacement. The eastern (or footwall) rhyolites, in contrast, include substantial auto clastic or hyaloclastic, possibly resedimented, breccias as well as coherent facies which suggest that these were at least partly emplaced as sub aqueous flows or emergent domes. They are to some extent interlayered with pumiceous and polymictic volcaniclastic breccias and the clastic interpretation of the rhyolitic breccias is supported by apparent peperitic margins of basalt sills at ~173m and ~180m in WH9. Most of the coherent footwall rhyolite units have inconclusive upper (western) contacts but at least one (WH11, 128-140m) appears to have both upper and lower peperitic contacts supporting the possibility that some were emplaced as thin shallow sills.

There are slight differences in megascopic appearance: the western rhyolite has slightly more prominent wisps and flakes of chloritised biotite ~2% and some of the eastern rhyolites have sparse elliptical structures, to about 6mm diameter composed of radial quartz+/-feldspar, which may be recrystallised spherulites. Immobile element data also supports a subtle compositional difference; the West Wart Rhyolite has slightly higher Ti/Zr ratio (8.9 to 9.4) in comparison to the eastern rhyolites (6.9 to 7.6), (Table 1 and Figure 6).

The rocks categorised as pumiceous breccia and sandstone are generally massive (not bedded) but rather inhomogenous; they typically consist of blurry irregular patches or wispy fiamme like lenses up to several centimetre scale, containing up to about 40% quartz and feldspar crystals +/- some chloritised biotite flakes in an olive-brown to greenish-grey sericite-chlorite matrix scattered about in a base of paler sericitic-siliceous, variably coarse to fine grained and foliated, quartz crystal bearing, rhyolitic volcaniclastic sandstone commonly containing sparse to 10% orbicular structures resembling the possible recrystallised spherulites mentioned above. The crystal rich "fiamme" are interpreted to be collapsed pumice clasts and there are rare examples of relict tube pumice textures (eg: V19-2, ~161m) although, in general, the outlines of individual pumice clasts tend to be blurred by alteration and deformation.

In some cases it is difficult to distinguish these rocks from possible domainal silica-phyllosilicate altered coherent rhyolite with pseudo-fragmental or pseudo-fiamme fabrics, especially where relict spherulites? are abundant. However the evidence from tube pumice and peperitic contacts with some basaltic sills (eg: WH10, 110-122m; WH11, 66.3m) and the locally sandy granular (rather than murky siliceous-sericitic) matrix supports the interpretation that they are volcaniclastics. They exist in thick massive units, generally without discernible stratification, probably emplaced as large volume, sub aqueous mass flows.

They have similar major and immobile element chemistry to the eastern (footwall) rhyolites (Ti/Zr ratio range 6.8 to 8.2) and the close spatial association and coincidence of relict spherulites? suggests they may be co-magmatic or, probably more likely, represent a re-sedimented mixture of pumiceous and rhyolitic auto-hyaloclastic debris. Certainly some of the rocks classed as pumice breccias (eg: WH8, 186-231m) are essentially duomictic and contain abundant clear QpR clasts as well as relict pumice which is evidence for substantial re-sedimention rather than primary pyroclastic or auto clastic deposition.

Polymictic breccias and associated volcaniclastic sandstones differ from the pumiceous units in clast variety and particularly in bed form; the former tend to be comparatively well bedded with most individual units being 2-10m thick and rarely exceeding 20m. They are internally massive to graded with coarse, dense lithic clasts almost universally matrix supported and an absence of traction current bed forms indicating deep sub aqueous mass flow transport and deposition.

It has proven impossible to make hole to hole correlations of individual units or sequences of units amongst the polymictic breccia sandstone package, which may have allowed inferences of transport direction based on clast size and concentration, even between relatively closely spaced holes such as WH1 and WH2. This lateral impersistence could suggest quite localised mass flows, possibly in or on substantial palaeo slopes.

Likewise, it has not been possible to generalise about massive sulphide clast size to infer a vector from source; most of the sulphide clasts are in the 15-40mm size range and there is no discernible systematic variation. Rare massive sulphide+/-barite intercepts of up to ~1.5m (eg: WH8, 184.8-185.9m; WH10, 186.5-188m) interpreted as large clasts or rafts, similar to the known metre scale outcrops of massive sulphide lenses, exist in proximity to much smaller sulphide and other less dense clasts suggesting that there has not generally been effective clast size and density sorting. For instance: the intercept of massive barite and semi massive sulphide in WH10 at 186.5-188m exists within a clast rich polymictic breccia containing clasts of QpR, carbonate altered QpR and white carbonate up to 50mm and immediately above a 2m section containing several sulphide-barite clasts in the 30-50mm range and one of 150mm. About all that can be inferred from this instance is that the sulphide-barite clasts appear to be concentrated near the base of the polymictic sequence in WH10; they are absent through the middle part of the sequence but paradoxically there are rare galena-barite clasts to 50mm near the upper contact above WH10, 138m.

In WH12A, 140m down dip, there are a few lenses or flattened clasts of semi massive pyrite, again restricted to the basal? 2m of the polymictic sequence. A concentration of sulphide clasts near the base of the sequence is, however, not borne out in other holes; for example: in WH 1, 2 and 8 on section 13200N rare sulphide clasts in the range 10-40mm occur throughout the main part of the polymictic sequence. There is no evidence to indicate that the thicker intercepts of sulphide are in situ exhalative horizons; the absence of significantly different footwall alteration supports the interpretation that they are large clasts, larger than the diameter of the drill core.

In terms of spatial distribution, sulphide clasts seem to be most frequent in shallow holes in the central part of the area tested by drilling, ie: between 13050N and 13350N as outlined in Poltock's (1989, enclosure 22) longitudinal section. There are no sulphide clasts in the southern most hole WH11 or the northern most holes WH3 and WH9. Overall, however, the rarity and sporadic distribution of sulphide clasts provides serious doubts about whether a statistically meaningful population of sizes and densities has been sampled in these drill holes, and any vectors inferred from them are considered extremely tentative.

Pumiceous breccias are most prominent in the southern holes, particularly at depth and are very subordinate in holes WH3 and WH9, north of the inferred shallow NNW dipping dextral fault. On sections 13050N & 13100N the "upper" pumice breccia-sandstone unit appears to thicken dramatically from ~45m in WH10 to ~90m in WH12A over a down dip distance of ~100m. On the same sections the polymictic breccia-sandstone package appears to thin down dip from ~50m to ~15m in the deepest hole, WH12A, where it includes interbeds of grey carbonaceous siltstone which could represent distal, ambient sedimentation.

Taking into account the significant thickness of coherent rhyolite and resedimented hyaloclastite at the end of hole WH12A it is reasonable to speculate on a local facies architecture along the lines schematically represented in Figure 5. In this arrangement the lower rhyolite dome-sill-hyaloclastite complexes are constructional, the pumiceous units fill in volcanic topography and the polymictic breccia-sandstone units wedge out sharply down dip - possibly in a sub marine fan on or adjacent to a palaeo slope of undetermined type but possibly related to synvolcanic faulting or up doming by felsic intrusives - to interdigitate with distal-ambient siltstones. The upper pumice breccia appears to wedge out against the pile of polymictic breccia-sandstone units but this could be an artefact of an irregular lower contact of the upper rhyolite which, as discussed above, may be a sill. There is some support for the latter interpretation in the apparent flattening of the dip of this lower contact between holes WH8 and WH2.

There are too many uncertainties but, on the basis that the down dip thinning of the polymictic sequence, interdigitation with siltstones and decreasing frequency of sulphide clasts represents a distal facies, it may be tentatively inferred that the source direction was up dip.

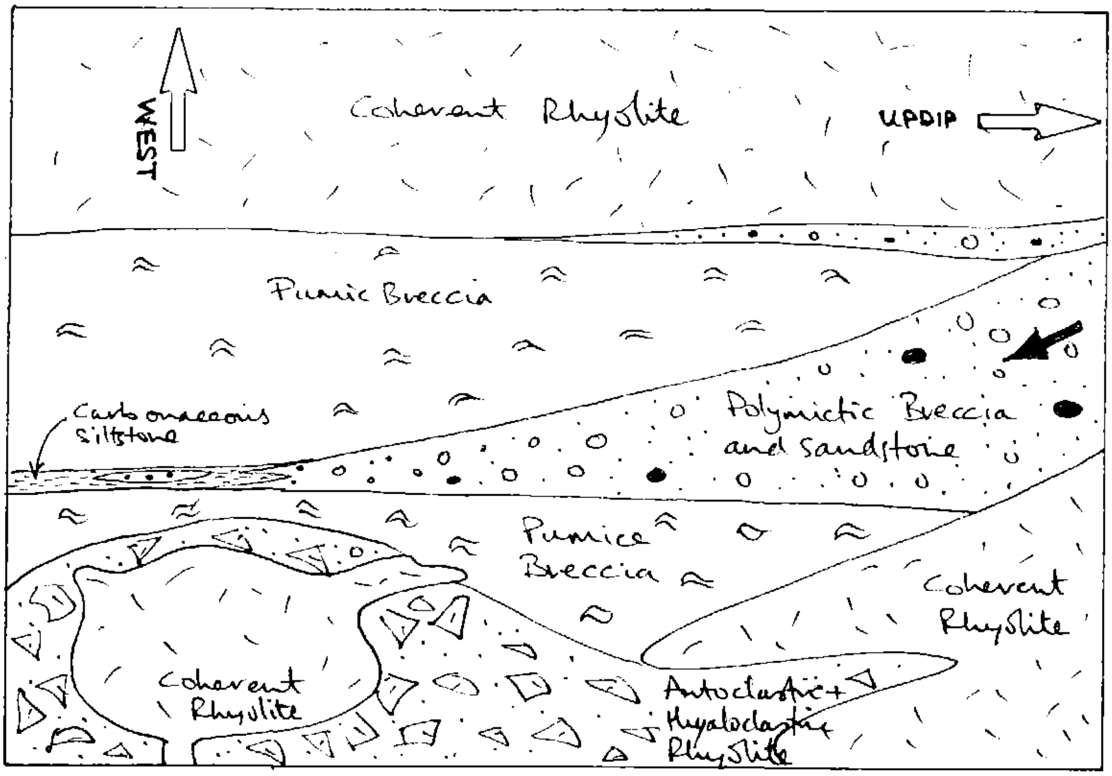


Figure 5 Sketch illustrating possible facies architecture at Voyager 19 at ~13100N.

In the northern hole, WH9, the polymictic sequence is interrupted by peperitic basalt intrusives and the full thickness is uncertain but could be in the range 30-60m. It appears to have greatest thickness of ~70m at around 13200N, immediately south of the dextral fault, and appears to thin gradually southward to a maximum of ~40m in WH 11 where it is also interrupted by two thin coherent rhyolite units, the upper of which could be a peperitic sill inflating the apparent thickness. Following the model above, in which thin is equivalent to distal, it could be taken to infer a polymictic volcaniclastic and sulphide source to the north.

The inference is faintly supported by the west facing sequence intersected in drill holes EC2 and EC2A at East Camp about 2.5km to the south. This sequence is dominated by thick bedded to massive felsic volcaniclastic sandstone with a couple of very minor, <10m thick, units of polymictic lithic breccia (in which clasts are dominantly of carbonate, quartz phyric rhyolite and volcaniclastic siltstone, but no sulphides) suggesting a more distal volcaniclastic environment than the breccia rich polymictic facies of Wart Hill. There is, of course, no basis for direct correlation between these sequences but if it is real, then the scale of lateral facies variation from north to south is much greater than that down dip at Wart Hill which would be consistent with a narrow, meridional extensional basin parallel to the trend of the Mt Read Volcanics.

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These highly tentative indications that the source of massive sulphide clasts was up dip and to the north are not favourable to exploration potential because they infer that the source may have been above the present surface or covered by WCG and Denison Group sediments to the north of Wart Hill.

6.3.1.4 Alteration

Semi pervasive weak sericite+/-carbonate+/-chlorite alteration is virtually ubiquitous in all the drill holes and lithotypes and appears to represent a kind of "background" alteration with subtle and not clearly systematic variations unrelated to pyrite content which rarely exceeds 0.5%vol. and more typically is <0.2%vol. Major element analyses of some of the (megascopically) freshest looking coherent rhyolites (in which feldspar phenocrysts are more or less altered and biotite strongly chloritised) show moderate levels of Na2O, CaO, low SO3 and no indications of major mass changes, (sample nos: 15151, 15152, 15159, 15165,15167 etc. in Table 1). The pumiceous volcaniclastics, which ought to be more permeable and reactive, are slightly more variably altered with suggestions of some moderate mass changes (sample nos: 15154, 15155, 15161, 15166). In terms of VHMS footwall alteration they are rated as only weakly to moderately altered at best, possibly from the peripheral zones of a hydrothermal system or a weak unfocussed system.

Some of the best looking alteration exists in a zone of patchy semi pervasive but not feldspar destructive silicification accompanied by irregular pyrite stringer veins contributing to about 2%vol. pyrite in the lower part of a partly coherent , partly hyaloclastic fragmental rhyolite unit below 255 metres in WH8. The matrix of the presumably unconformably overlying WCG sandstones and basal breccias immediately down hole, contains up to 10% disseminated pyrite which appears to be related to, and extend into, the pyritic veinlets in the rhyolite.

A Pb-isotope analysis from this zone, presented by Gemmell (1992), indicates a high radiogenic lead content which Gemmell (op. cit.) attributes to a Devonian? structurally controlled hydrothermal system, unrelated to the massive sulphide clast/deposit formation. It is similar in style to the patchy quartz-pyrite alteration observed in outcrops and apparently transgressing the WHV-WCG contact near 13100N / 10150E.

Patchy semi pervasive silicification associated 1-2% disseminated pyrite and traces of veiny and disseminated galena-sphalerite-pyrite exists in volcaniclastic sandstone and breccia in the interval 164-179m in WH10, just above the 1.5m sulphide-barite intercept at 186.5-188m mentioned before.

TABLE 1 Major and Trace Element Analyses - Wart Hill -(Analabs Report No: 111715.60.11411)

Sample	Hole	Depth m	Description	Group	SiO2 %	TiO2 %	Al2O3 %	Fe2O3 %	MnO %	MgO %	Cao %	Na2O %	K2O %	P2O5 %	SO3 %	LOI %	Total %	Nb ppm	Y ppm	Zr ppm	Ti/Zr calc	A.I. calc
15151	WH10	51.6	Q(FBI)pR	1	68.30	0.46	12.90	4.68	0.04	1.41	1.97	1.94	4.18	0.074	0.12	4.32	100.4	15	40	309	8.9	59
15152	WH10	60.2	Q(FBi)pR	1	66.50	0.46	12.40	3.68	0.07	1.77	3.16	2.47	3.23	0.076	0.26	5.16	99.2	17	41	292	9.4	47
15165	WH8	24.7	Ser Q(F)pR	1	71.00	0.42	11.90	2.81	0.05	1.35	1.89	0.33	5.29	0.069	0.00	4.15	99.3	14	37	269	9.4	75
15159	WH10	207.4	Ser Q(FBI)pR or Bx	2	63.20	0.29	19.80	2.14	0.00	1.94	0.28	0.75	7.05	0.022	0.03	3.74	99.2	31	67	230	7.6	90
15160	WH10	207.5	Silicified Q(FBI)pR	2	82.80	0.12	9.34	0.61	0.02	0.39	0.57	4.83	0.48	0.100	0.18	1.10	100.5	12	30	99	7.3	14
15167	WH8	240.3	Q(F)pR	2	74.20	0.43	12.60	1.82	0.04	0.55	0.63	1.26	5.56	0.067	0.00	2.06	99.2	13	41	339	7.6	76
15163	WH9	187.8	Rhy Bx?	2	76.20	0.20	12.30	1.46	0.03	1.09	0.80	0.07	4.66	0.019	0.05	2.74	99.6	17	47	173	6.9	87
15154	WH10	123.3	SerChl Pumice Bx	3	71.20	0.42	12.70	2.66	0.04	1.72	2.27	0.92	3.98	0.041	0.08	3.92	100.0	16	53	368	6.8	64
15155	WH10	161.2	Ser Pum QFxt Sst	3	67.70	0.36	14.30	2.35	0.12	2.03	1.98	1.22	4.74	0.020	1.61	3.76	100.2	16	39	262	8.2	68
15161	WH10	229.3	Ser Pumic/lithic Vc Sst	3	74.90	0.19	13.60	1.46	0.00	1.06	0.14	0.69	4.80	0.110	0.44	2.31	99.7	22	47	150	7.6	88
15166	WH8	203.8	QpR/Pumice Bx	3	75.50	0.22	12.80	1.54	0.01	1.55	0.56	0.68	4.16	0.020	0.08	2.62	99.7	19	43	177	7.5	82
15156	WH10	165.6	Silicified Vc Sst	4	86.60	0.08	3.79	0.96	0.07	0.27	1.49	1.12	0.71	0.027	1.79	1.81	98.7	5	11	60	8.0	27
15157	WH10	185.1	Ser polymict Vc Bx	4	68.30	0.25	13.60	2.96	0.09	2.36	2.06	0.24	4.44	0.038	1.26	4.04	99.6	15	41	220	6.8	75
15158	WH10	189.4	Ser polymict Vc Bx	4	60.50	0.61	14.90	4.43	0.18	2.64	4.01	0.40	4.92	0.091	1.89	5.68	100.3	13	41	290	12.6	63
15153	WH10	120.1	Basalt	5	42.90	0.92	15.10	9.02	0.16	4.90	10.55	2.80	1.91	0.190	0.02	11.43	99.9	5	15	150	36.8	34
15162	WH9	134.4	Basalt	5	46.00	1.24	18.50	10.96	0.14	3.54	1.31	0.02	6.86	0.259	0.30	10.02	99.1	8	16	234	31.8	89
15164	WH9	216.3	WCG Qtzwacke	6	63.30	0.53	12.60	3.77	0.07	1.60	5.84	1.39	4.11	0.078	0.11	6.52	99.9	16	37	288	11.0	44
15168	RH1	RH1	Standard RH1		76.80	0.08	11.40	1.45	0.03	0.97	0.60	0.82	6.08	0.008	0.74	1.17	100.1	16	36	138	3.5	83

Analytical Notes: Samples were segments of unoxidised half drill core weighing 0.5-1.5kg.
Analysis was done at ANALABS Perth, WA, using method OX408 (fusion XRF) for the major elements and GX401(pressed powder XRF) for Zr, Nb,Y.

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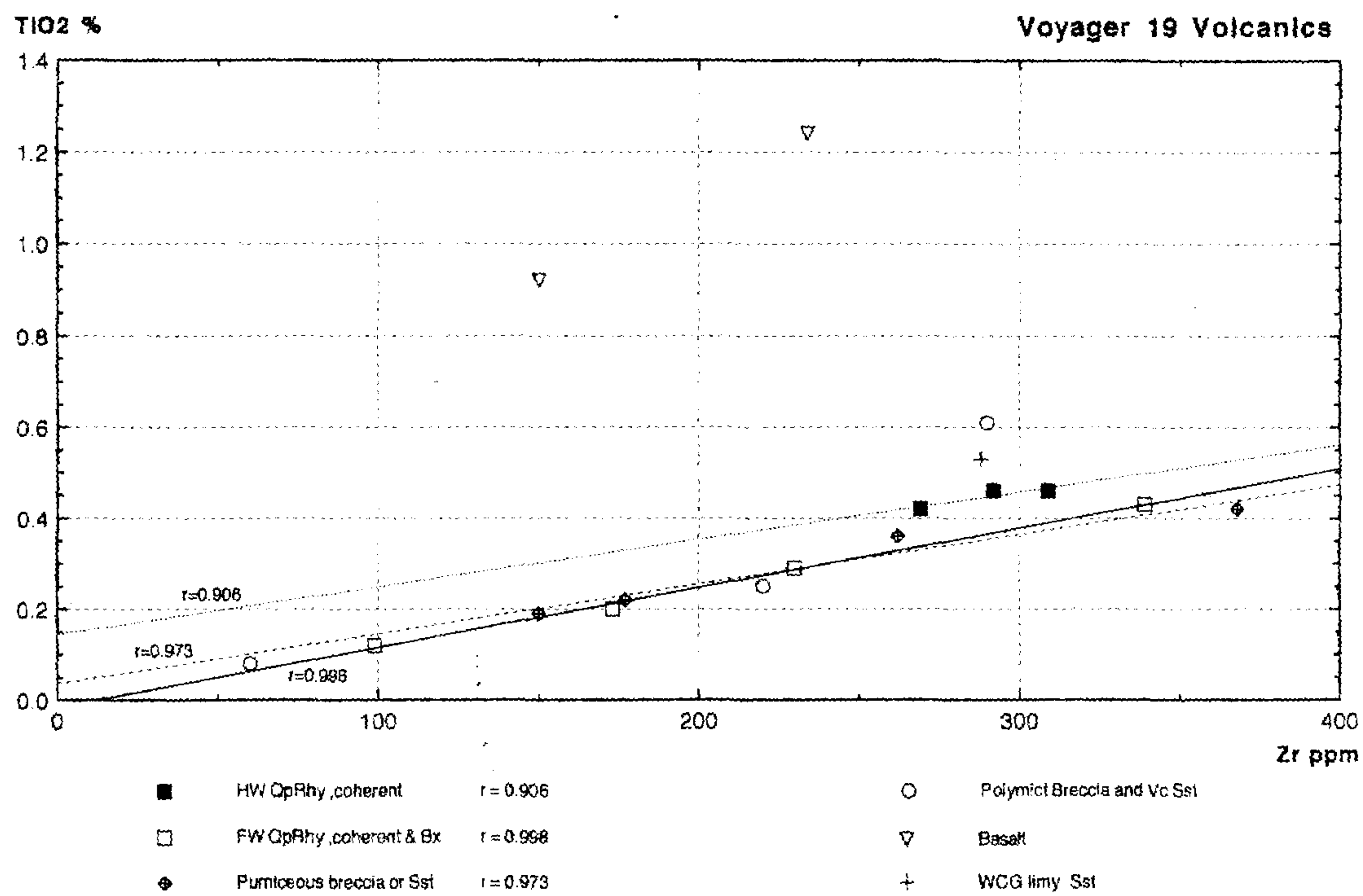

Figure 6. Immobile component plot Zr-TiO_2 for Voyager 19 rocks.

A whole rock analysis from this zone (15156 cf. 15157, 15158 in Table 1) suggests major mass gain in silica (note the apparently diluted concentrations of immobile components Ti, Al and Zr) with apparent slight mass gains of Na2O and losses of K2O. Similar strong silicification with +Na2O, -K2O mass changes exists on a local patchy scale further down the hole in the coherent rhyolite unit between 194-212m (cf. 15159 & 15160). This is unlike typical VHMS, plagioclase destructive, proximal footwall alteration and the Pb-isotope data of Gemmell (1992, sample no: EB1020) indicates it is related to his "Group C" late Cambrian? hydrothermal system which circulated through, and superimposed alteration on, the sulphide clast bearing breccias.

Clasts of carbonate altered rhyolite and creamy-white carbonate are common in the polymictic breccias and are reasonably inferred to be derived from some carbonate alteration zone associated with the sulphide source deposit. Although they have not been studied in any other petrographic or geochemical detail, C and O isotopic studies by Callaghan (1989) led him to conclude that there were two phases of carbonate alteration: An early phase associated with VHMS mineralisation which is the source of the carbonate clasts in breccias, and a widespread semi pervasive later Cambrian phase affecting the Voyager 19 host rocks as well as the WCG sediments which may have isotopically reset the early carbonates and been related to felsic intrusions. However, it is evident that the clasts in the sulphide bearing breccias are resedimented clasts and there is nothing of equivalent intensity elsewhere in the drill cores to suggest proximity to the primary VHMS related alteration system.

There is thus no alteration that is related to the massive sulphide clast forming mineralising system and which could be used to identify the footwall zone of the VHMS favourable horizon or to infer alteration zonation vectors to the centre of mineralisation.

6.3.1.5 Exploration Potential at Wart Hill

The extensive and detailed geophysical surveys which have been conducted in the Voyager 19 to Voyager 29 areas, have exhausted the potential for finding a VHMS deposit by a "cookbook" exploration approach involving definition and drill testing of "anomalies". The fact is, there are no high priority untested anomalous responses in the favourable sequence.

The tantalising co-incident UTEM-gravity anomalies on lines 12600N and 13000N, about 170m east of the unconformity with WHV, represent a very long shot and are conceptually unsound in that they are interpreted to lie within WCG sediments younger than the VHMS clast bearing breccias and, while it is not impossible that some structural complexity has placed the favourable sequence close to surface there, there are well developed carbonaceous shale conductors within the WCG which are a much more likely source of the UTEM response.

Drilling of more, so far untested, geochemical anomalies is likely to lead to more of the same disappointing results as in previous drilling programmes, ie: weak sniffs of disseminated or small vein type mineralisation or isolated resedimented massive sulphide clasts which have been shown to be the sources of strong but spotty C-horizon/bedrock geochemical anomalies. Geochemistry in this environment can be helpful in getting exploration into the right paddock but it may not lead directly to the real goal.

The next stage of exploration in the Wart Hill area requires a longer term commitment to unravelling the complexities of volcanic facies, hydrothermal alteration and deformation structure in an attempt to identify the VHMS favourable horizon(s) and trace it to a favourable focus of alteration and mineralisation.

The volcanic facies are not readily interpretable and the Wart Hill facies architecture is not very distinctive in a district sense. The known overprinting of at least three generations of alteration means that it will not be straightforward to visually and litho-geochemically map out the deformed VHMS related alteration systems. Pb-isotope geochemistry offers a means of discriminating the different alteration systems but the effects of partial overprinting of systems could be complex.

Although much of the favourable volcanic sequence is in open sedgeland-heathland country and outcrop is fair, the outcrops tend to be low profile and leached which has caused previous workers to have difficulty in relating surface geology to drill hole logs due to fabric destructive weathering effects. Thus the low readability of surface exposures is a major limiting factor for volcanic facies and alteration mapping in this environment and calls for systematic stratigraphic-exploratory core drilling for sampling and interpretation below the zone of oxidation. The results of previous geophysical surveys suggest that such drilling will need to go to significant depths >200m to achieve adequate results.

The virtual blanket coverage of previous exploration over the prospective volcanics between the Pleasant Creek Group to the west and the Waterloo Creek Group to the east and extending slightly east of the Osmund Syncline, reduces the prospectivity rating of this area (to moderate at best) at shallow depths down to 100m. The difficulties of exploring at greater depths or beneath the steeply dipping cover sequences combine with climate and remoteness to indicate a low findability factor for VHMS deposits in this area.

6.4 EB-1 QUESTEM Anomaly

6.4.1 Introduction

Anomaly EB-1 was the strongest of nine possible bedrock conductors identified by Aberfoyle's 1991 airborne QUESTEM survey; it is located 1km northeast of Cowrie Beach, in the Voyager 3 area previously explored by Geopeko, (Richardson, 1992).

The main part of the anomaly has a NNW strike length of >700m and appears to lie within a sequence of steeply west dipping felsic volcaniclastic sandstones and siltstones just east of a contact with a large body of coherent quartz-feldspar phyric rhyolite. Coastal exposure of the volcaniclastic sequence about 500m south of the anomaly includes a 100m thick zone of strong hydrothermal alteration which would appear to be about 250m stratigraphically below the coherent rhyolite unit if the structure is simple and facing consistent.

Extensive Cu-Pb-Zn soil/bedrock geochemical anomalies supported by dipole-dipole IP anomalies had been delineated and partly tested by Geopeko in the area north and north-east of the coastal alteration zone; the best mineralisation was 8m @ 0.4% Zn in DDH V3-3 which is about 750m east of QUESTEM anomaly EB-1.

The coastal section exposes a zoned alteration system with pods of chlorite-pyrite in a core of pervasive quartz-chlorite-(sericite-pyrite) which is increasingly siliceous eastwards, and enveloped by peripheral zones of sericite-quartz-(pyrite). Continuous rock chip sampling across this zone indicates strong Na2O and CaO depletion (mostly <0.1%), high alteration indices with AI in the range 90-99 (AI = 100[MgO+K2O]/[MgO+K2O +CaO+Na2O]), up to 20% disseminated pyrite, minor Cpy-Py veins and some Sp-Gn veinlets with short intervals grading up to 0.3%Pb, 1.1%Zn and 3g/tAg and averages of 320ppm Cu in the chloritic core and ~600ppm Zn, 250ppm Pb in the siliceous parts. Pb-isotopes straddle the range between Voyager 19 and Rosebery (ie: Cambrian VHMS) and S-isotope values are in the range 8.9 to 14.3 similar to the Hellyer and Que River footwall stringer zones. Although the precursor rocks in the alteration zone appear to be volcaniclastic, their narrow range of immobile element ratios (Ti/Zr: 7.2 - 8.7) suggests substantial uniformity of composition and provenance and can be used to infer significant mass changes (notably addition of silica) due to hydrothermal alteration. The style of alteration appears to be similar to that observed in the proximal footwall alteration zones of other Australian felsic volcanic hosted massive sulphide deposits, (eg: Rosebery and Thalanga).

The results of a fixed loop TEM ground follow up survey by Aberfoyle indicated that the airborne QUESTEM response was at least partly due to, and complicated by, broad near surface conductors and it was equivocally interpreted (Silic, 1992) that the major response could be due to an eastwards thickening wedge of conductive surficial gravels or a deep, but weak, bedrock conductor. A 25m dipole-dipole resistivity survey was carried out on two lines in order to resolve the effect of surficial conductors; it confirmed the existence of a broad, shallow unit of low resistivity with lowest resistivity towards the east supporting the original interpretation of an eastwards increase in conductivity or thickness. However, the observed EM response could not be entirely attributed to the modelled shallow wedge of conductive overburden and it was understood that the discrepancy could be due either to irregularities in the shape of the overburden wedge or a poorly conductive, current gathering, bedrock source covered by a slightly conductive overburden.

It was concluded that the ambiguity could only be resolved by drilling and, in view of the favourable geology, a 400m drill hole was proposed to test the possible bedrock source at ~200m below surface.

The drilling rig and equipment were landed, in February 1993, from a fishing vessel onto Cowrie Beach and then lifted by helicopter to the drill site which was located east of the anomaly for reasons of site accessibility; ie: holes were drilled E to W down the dip (Richardson, 1993). DDH EB1 was abandoned at 59m after losing the bit in broken ground. DDH EB2 was collared from the same site and terminated at 312m with broken ground and low recovery throughout. The hole was drilled, with great difficulties, to 25m beyond the inferred conductor depth but was stopped about 90m short of the proposed depth and the volcaniclastic-lava boundary due to the risk of losing drill rods in the hole and precluding a DHEM survey.

DDH EB2 intersected a sequence of felsic volcaniclastic sandstones, minor siltstones and shale, with weak to locally intense alteration consisting of an early pervasive quartz-sericite+/-chlorite assemblage overprinted by patchy vein associated epidote-quartz-chlorite alteration. Mineralisation was restricted to traces of disseminated pyrite and rare galena-sphalerite in quartz-chlorite veinlets of <5mm and ranged upto 1200ppmPb and 1500ppmZn over longish core grind intervals however an equivalent to the mineralised intense alteration zone exposed on the coast was not intersected. It was interpreted, therefore, that this favourable zone does not extend significantly inland or lies to the east behind the hole.

A 3 loop Zonge DHEM survey indicated that the hole lies within a broad weakly conductive zone with the most conductive part lying beyond the end of the hole. It was further interpreted (Silic, 1993) to indicate that the responses in surface EM and resistivity surveys (previously inferred to be due to a broad surficial conductor) were probably due to the >200m thick zone of faulted and broken ground which was intersected by the hole and extends to the surface. The possible bedrock source inferred from surface EM was attributed to a more conductive patch within the fault zone, not extending to the surface and not intersected by the hole, ie: lying beyond the end of the hole or between it and the surface.

6.4.2 Discussion

In the first place, it is prudent to accept Silic's expertise in interpreting the EB-1 EM data as reflecting a broad zone of low conductivity containing a patch of slightly higher conductance. On the other hand, the nearby presence of a strong and possibly large hydrothermal alteration zone of apparently similar type to VHMS footwall must be regarded as a very favourable indicator which, if it could be traced through the complexities volcanic facies and structure to a favourable exhalative or sub sea-floor replacement horizon, could lead to a significant deposit. In this regard QUESTEM anomaly EB-1 may be a co-incidental red herring not necessarily related to, but nevertheless useful in drawing attention to, the synvolcanic hydrothermal alteration system.

Apart from surface mapping, geochemical sampling and some petrographic descriptions, the alteration zone has received little attention because exposure is limited to a narrow strip between the shoreline and a coastal plain covered by thin Quaternary sediments. It appears to have been overlooked by Geopeko mapping and not especially targeted by their IP coverage but it seems that possibly analogous alteration and mineralisation may have been picked up by IP and bedrock geochemistry in the vicinity of drill hole V3-3 which intersected felsic volcaniclastics with 1-3% disseminated pyrite and local minor Zn mineralisation. Further mapping of alteration zonation and intensity would probably require a commitment to significant "stratigraphic" diamond drilling, possibly assisted by existing and additional IP surveys.

Given the evidence for extensive faulting and the relatively poorly known structural setting it is possible that the "patch of slightly higher conductance"in the EB1 anomaly could be a dislocated sliver of sulphide mineralised rock rather like the interpreted fault bounded lens, containing the coastal alteration zone which wedges out northwards just south of drill hole EB2. If this is a correct representation of structural complexity in this area, then the alteration system and possible associated VHMS deposits may be seriously dismembered and difficult to trace using alteration and volcanic facies vectors. In this case, step by step testing of geophysical-geochemical targets may be more appropriate than drilling of geological-alteration concepts.

The observed sniffs of possibly peripheral, mineralisation and strong alteration suggest potential remains for VHMS deposits, and due to the complexities of EM sources, structure and consequent drilling difficulties, it cannot be said that EB-1 and the Voyager 3 area in general have been exhaustively tested. These same complexities make it unlikely that deepening drill hole EB2 or additional limited shallow drilling of the EB-1 anomaly alone will provide unequivocal interpretations of the EM response nor necessarily provide adequate testing of the potential.

Consequently, Plutonic decided that further drilling to test the EB-1 EM anomaly was unjustified.

Future exploration of the Voyager 3 prospect requires an integrated approach to interpretation of alteration zonation, volcanic facies and structure to place the geophysical responses in a geological framework and explore the extent and significance of the exposed alteration zones. This will require a substantial commitment to oriented core drilling and detailed geological and litho-geochemical studies to map out the alteration pattern and contribute to development of conceptual or combined conceptual-geophysical drilling targets.

It is suggested that an initial approach could be diamond drilling on sections 5421200N and 5421400N designed to intersect the possible northward extension of the coastal alteration zone 50m and 150m below surface. However two negative factors for exploration of the V3/EB-1 area are:

* the coastal location of the zone of strong alteration with a reasonable possibility that the centre of mineralisation is to seaward,

* the extensive zone of faulted and broken ground which could complicate mining below sea level; the coastal plain in the prospect area is only 10-30m above sea level.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Plutonic exploration in the Elliott Bay licence area during 1995 was focussed on evaluation of the VHMS potential of the Wart Hill, East Camp and Voyager 3 prospects. No attempt was made to assess the various gold targets identified by previous explorers.

Moving loop SIROTEM surveys in the Wart Hill and East Camp prospects have confirmed the results of previous EM surveys that there are no significant conductors in favourable geological settings within about 200m of the surface.

A repeat of V19 and V29 magnetic surveys and a review of previous geophysical surveys in the V3, V9, V19 and V29 areas has not indicated any specific high priority drill targets with VHMS potential.

An attempt at interpreting volcanic facies and alteration relationships at Wart Hill has not succeeded in identifying convincing VHMS footwall alteration vectors and has tentatively inferred that the source of re-sedimented massive sulphide clasts in volcaniclastic breccias may have been up dip and to the north which is unfavourable for exploration potential. There are no obvious geological targets and any further drilling on the prospect at this stage would be stratigraphic-exploratory in nature.

A review of recent exploration in the EB-1/Voyager 3 area has led to the conclusion that the EB-1 airborne QUESTEM anomaly has been adequately tested and is reasonably attributed to a broad weakly conductive fault zone probably containing a patch of slightly higher conductance and complicated by shallow surficial conductors. Further shallow drilling is unlikely to elucidate the nature of the conductive source but there remains scope for some shallow stratigraphic-exploratory drilling to map out a nearby possible footwall alteration zone and place the EM anomaly in a volcanic facies, hydrothermal and structural framework.

In summary, the Wart Hill Volcanics in the Voyager 3, 19 and 29 areas and environs are still considered to have moderate potential but rather low findability factors for VHMS deposits. In the absence of obvious drill targets Plutonic Operations decided further regional exploration was not justified and has relinquished EL 53/94 at the end of the first year of tenure.

It is recommended that future exploration programmes should take a more conceptual approach to development of drill targets based on systematic stratigraphic-exploratory drilling, major and immobile trace element litho-geochemistry and Pb-isotope studies for identification and mapping of favourable volcanic facies and footwall alteration zones.

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APPENDICES

I - VI

Appendix I

Review of Elliott Bay Geophysics

719043

PLUTONIC OPERATIONS LIMITED

MEMORANDUM

Ref:

TO : Bob Close

CC :

FROM : Llew Wynn

DATE : 9 March, 1995

SUBJECT : **ELLIOTT BAY**

Following is review for Elliot Bay Geophysics:

- Wart Hill Prospect - IP/Resistivity Survey (IP)
- Wart Hill Prospect - UTEM EM Survey (Transmitter Loop 2)
- Wart Hill Prospect - Ground Magnetics Survey
- Wart Hill Prospect - Gravity Survey

- Elliott Bay - Downhole EM (DHEM) Surveys
- Elliott Bay - Voyager 3 Prospect - Geophysics
- Elliott Bay - Voyager 9 Prospect - UTEM EM Survey (Transmitter Loop 3)
- Elliott Bay - Voyager 29 Prospect (East Camp) - UTEM (Loops 1 and 4)

Regards,

Llew.

Llew

in accompanying map roll

App I, 1

WART HILL PROSPECT

IP/RESISTIVITY SURVEY (IP)

Introduction

A detailed 10 and 20m dipole-dipole IP survey was conducted over the massive sulphide outcrops, on lines 13300N and 13050N. In addition an extensive (100 line km) dipole-dipole IP survey was completed over Wart Hill and surrounding area.

Discussion

1. **Detailed Survey Over Massive Sulphide Pods.**

Two orientation liness were designed to test the IP/Resistivity responses over outcropping massive sulphides. The results are summarised in Table 1.

Table 1:

Line No.	Dipole Spacing	IP Result	Resistivity Result
13300N	10m 20m	IP high No anomaly	Resistivity low No anomaly
13050N	10m 20m	IP high IP high	Resistivity low No anomaly

Anomalous IP/Resistivity responses were detected with the 10m dipole spacing. This result emphasises the limited size of the sulphide pods and supports the interpretation that the pods are too small to be detected with surface EM and down hole EM.

2. **Extensive Reconnaissance IP Survey**

At the time of reporting the IP/Resistivity data available were:

a) Pseudo sections (which were over-reduced and too small to read).

b) Contours of IP and Resistivity. For this presentation the IP/Resistivity values for n=1 to n=6 were averaged (after Fraser) and presented as contours of IP and Resistivity.

2.1 <u>General</u>

Elevated IP and low Resistivity values were recorded over the pyritic black shales in the Tyndall Group package in contrast to the low IP and high resistivity values measured over the Wart Hill pyroclastics. The contoured IP data shows a steep gradient between the sediments (east) and the Wart Hill pyroclastics (west).

Significant IP anomalies detected are listed below.

2.2 Anomalies Within The Tyndall Group Sediments

These are strong IP responses detected east of the unconformity, over pyritic, graphitic shales and siltstones. The axis of this extensive IP anomaly extends from 14600N - 9700E south-east to 13200N-10200E then continues south-east following the eastern side of the unconformity. Within the elevated IP responses in the sediments, there is a linear IP high extending from 11800N to 12500N. This zone broadens to the north (Plan 47). This linear IP high superimposed on the elevated IP values are most likely defining the more pyritic horizons within the sediments.

2.3 Anomaly: 13600N to 14800N (west of 9000E)

This IP trend coincides with black shales in fault wedges within the Cooper Creek Fault. These responses are from sediments remote from the prospective Wart Hill package (see Plan 34).

2.4 12500N (9800E to 9900E)

This weak IP high is associated with:

1. a weak EM trend; and
2. a 100nT magnetic anomaly (see Ground Magnetics Review).

This anomaly is interesting and certainly requires testing as it also coincides with a geochemical anomaly (R.J. Close pers. comm.).

3.0 Gradient Array

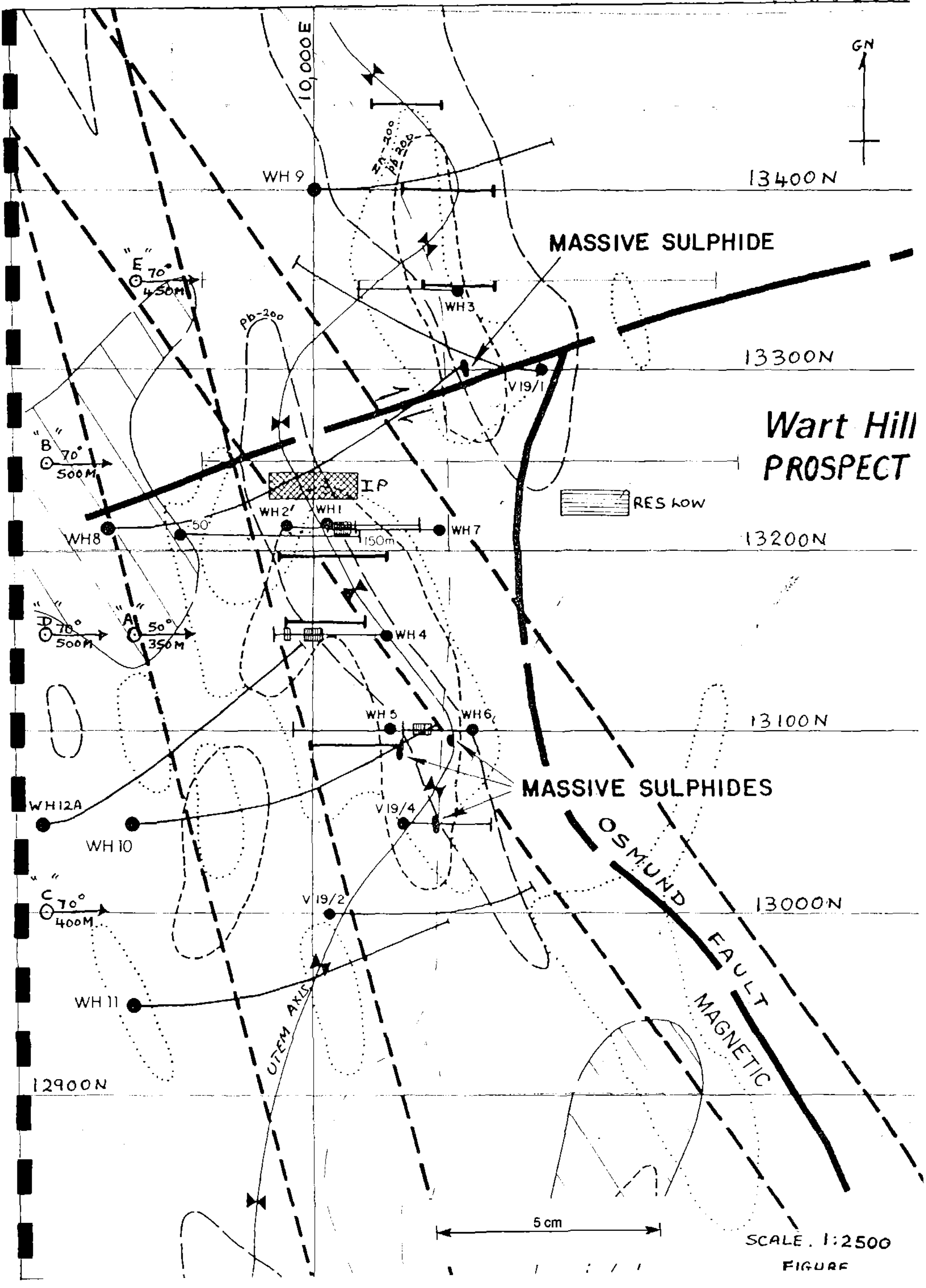
A gradient array was also completed over the Wart Hill area (R.J. Close pers. comm.). This data was not present at the time of reporting.

4.0 Recommendations

* The IP anomaly at 12500N (9800E to 9900E) warrants drill testing as it is associated with:

1. a weak Em trend;
2. an isolated 100nT ground magnetic anomaly; and
3. a geochemical anomaly.

Already tested by Cyprus' "West Wart Hill" trenching indicating Pb-Ag vein style mineralisation
(M.H. 11/95.)


GN
10,000E
13400N
13300N
13200N
13100N
13000N
12900N
WH 9
WH3
WH8
WH2
WH1
WH7
WH4
WH5
WH6
WH12A
WH 10
WH 11
V19/1
V19/4
V19/2
MASSIVE SULPHIDE
MASSIVE SULPHIDES
Zn-200
pb 200
pb-200
"E" 70° 450M
"B" 70° 500M
"D" 70° 500M
"A" 50° 350M
"C" 70° 400M
50°
150m
IP
RES LOW
Wart Hill
PROSPECT
OSMUND FAULT
MAGNETIC
UTEM AXIS
5 cm
SCALE. 1:2500
FIGURE

WART HILL PROSPECT

UTEM EM SURVEY (Transmitter Loop 2)

1.0 Introduction

A fixed loop EM survey testing a strike length of 1.6km (12000N to 13600N) was completed on March 1984. Readings were made every 25m on 100m spaced lines. Lines were surveyed from 9550E eastwards to the pyritic, graphitic shales/siltstones of the Tyndall Group.

The UTEM EM system is the only geophysical method used over Wart Hill which, is capable of detecting conductive sulphides at depth, (>100m below surface) provided the coupling of the primary field with the target horizon is effective. Generally most VMS targets have sufficient conductive sulphides to respond to EM techniques. Despite this, the responses from poorly conducting bodies ie, early to mid-time responses, were considered significant in the UTEM EM evaluation.

2.0 Discussion

The strongest anomalies coincide with the pyritic, graphitic shales/siltstones of the Tyndall Group, immediately east of the mapped (inferred?) unconformity.

The majority of the remaining EM anomalies are low amplitude, early time responses from shallow sources and appear to correlate with formational boundaries. The EM anomalies are shown on a geology plan (Plan 34).

Dips measured within and immediately west of the unconformity are steep (75-85°) to the east. The majority of the area surveyed by EM have measured dips which are steep (70-85°) to the west. Deep targets (down to 200m) with steep westerly dips would be poorly coupled with the transmitting loop, particularly at distances greater than 200m from the western loop edge, ie east of 9700E. (Figure ...)

UTEM EM anomalies considered significant are listed below.

1. 13400N - 10100E and
   13200N - 10025E

   These anomalies have pronounced amplitudes and occur approximately 270m west of the EM anomalies interpreted to be responses from the graphitic shales. The 13200N - 10025E anomaly coincides with 5-10% disseminated pyrite. Depth to the conductive source is 50-60m. A steep westerly dipping target would be poorly coupled with the energising primary field, and is not expected to produce a strong EM response.

2. 1300N - 10375E and
12600 - 10550E

These EM anomalies have coincident gravity highs (internal memo by S. Collins 6/6/1989). Although the EM anomalies coincide with the graphitic shales, a gravity low is expected over the less dense shale horizon. The depths of the EM and gravity anomalies are 75 to 100m (S. Collins - 1989). Any target dipping steeply to the west would have poor coupling with the primary field.

3. 12500N - 9900E
12400N - 9875E
12300N - 9950E

The northern limit of this EM trend coincides with an IP anomaly centred on 12500N - 9850E. Up to 2% disseminated fresh pyrite was evident in auger chips at 12500N - 9770E. Depth to the source of the anomaly is 50 - 80m. Bedding in the vicinity of the EM anomaly is approximately 80° to the west. A potential target with this dip and 100-200m below surface, would be poorly coupled with the primary field.

4. 12700N - 10575E anomaly

This anomaly is detected 75m east of the graphitic shale EM response. The anomaly is only partially covered by the survey. No depth estimates are possible.

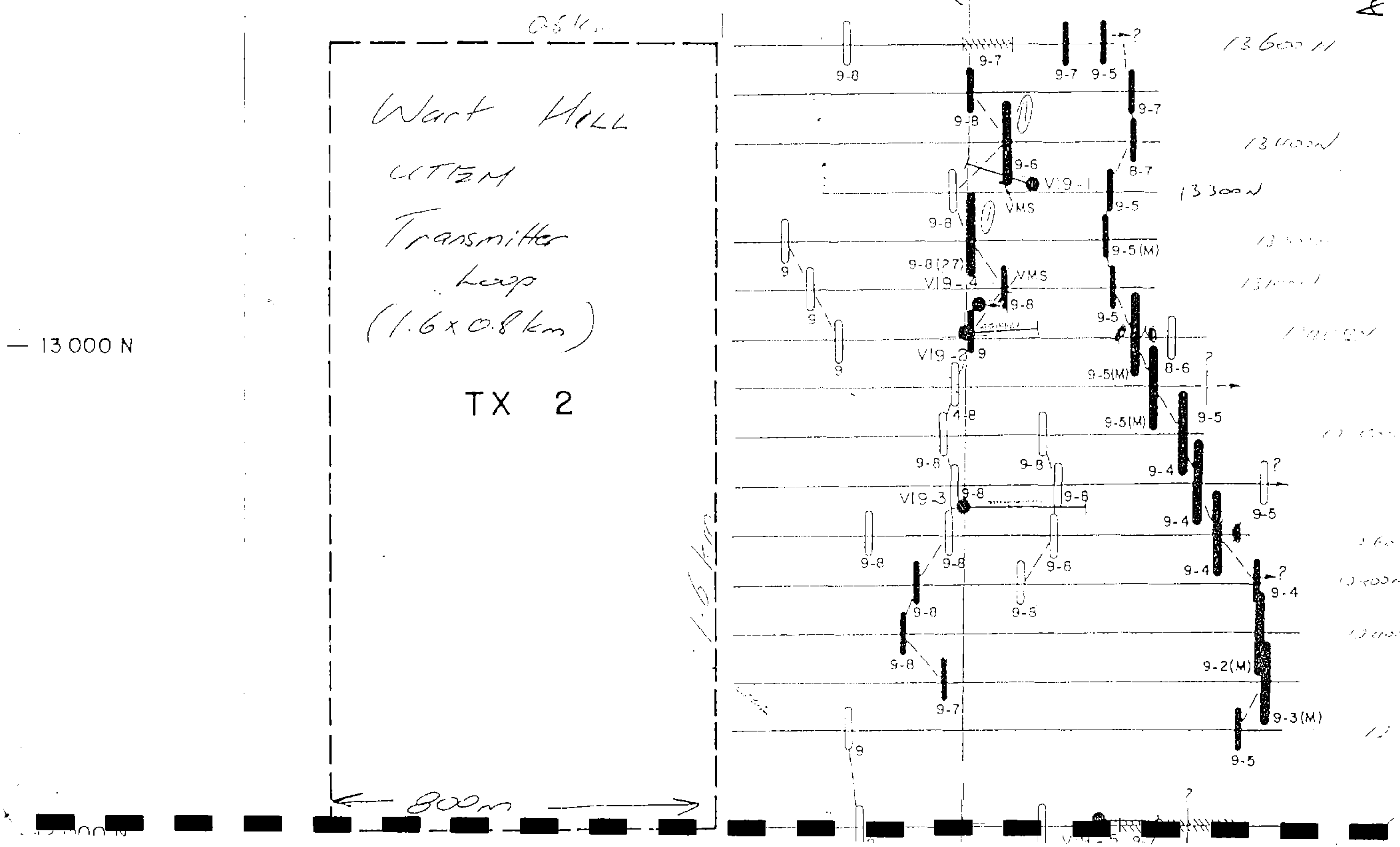
710049

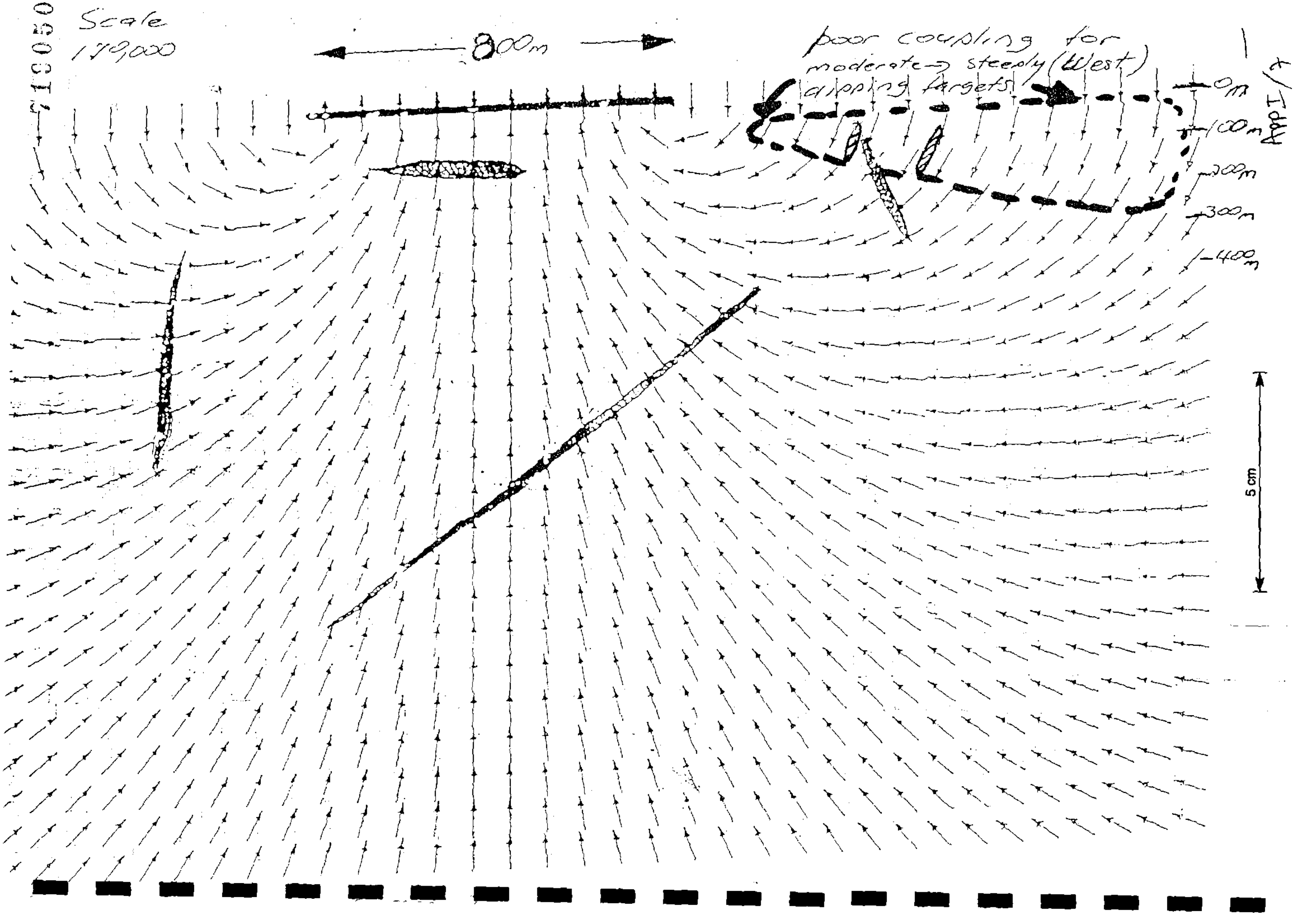
App I/6

Scale 1:19,000

5 cm

Figure 1.




Scale
1:9,000
800m
poor coupling for
moderate-steeply (West)
dipping targets!
0m
100m
200m
300m
400m
5 cm

WART HILLS PROSPECT (Plan 38)

GROUND MAGNETICS SURVEY

Introduction

The only ground magnetic data available are stacked profiles, plotted at a vertical scale of 1cm = 100nT (Plan 49). Subtle magnetic trends are difficult to discern using this vertical exaggeration in this environment.

Discussion

Overall the magnetic responses were quiet. There is little magnetic contrast between the Tyndall Group Sediments and the Wart Hill Pyroclastics to the west. Four discrete anomalies were detected. These are listed in order of priority.

1. 12500N - 9950E
   This magnetic high coincides with an IP anomaly and a weak EM trend. Two percent disseminated fresh pyrite observed in nearby auger chips is the likely source of the IP anomaly.

   The weak EM response trends grid north-south from 12300N to 12500N and is centered on about 9900E. As previously mentioned in the Wart Hill EM review, any moderate to steep, west dipping targets would be poorly coupled with the primary EM field, resulting in weak responses from conductive targets. Estimated depth to the EM source is 50-80m.

2. 12800N - 1300N - centered on 10150E
   The amplitude of this magnetic high is approximately 200nT, the strongest ground magnetic response measured during the survey. The anomaly coincides with a geological contact. Iron staining is evident in nearby outcrops. An increase in magnetite from alteration may be the cause of the magnetic high.

3. 12400N to 12600N - centered on 10400E
   This 100nT anomaly coincides with the mapped unconformity. Iron staining and traces of haematite are evident in the near vicinity.

4. 11800N - 9960E
   This isolated anomaly occurs in the southern portion of the prospect, immediately east of outcropping sericitic quartz crystal tuff.

WART HILL PROSPECT (Plan 34)

GRAVITY SURVEY

Introduction

The gravity data is presented as profiles and contours of residual gravity.

Discussion

A regional gradient is evident in the profiled data. The regional gradient was removed from the data, the results were then presented as contours of residual gravity.

Two significant gravity highs were detected.

1. The first, a broad anomaly, was drill tested by DDH V19-3 (Figure 14). No massive sulphides were intersected. No off-hole conductors were detected in the follow-up downhole EM survey. The source of the gravity high cannot be attributed to variations in the weathered profile, as the depth of weathering is virtually zero. Drill logs from DDH V19-3 indicate significant carbonate and chloritic alteration, (R.J. Close Pers. comm.). The gravity high may be reflecting near surface zones of carbonate/chloritic alteration.

2. The second gravity high was detected on 12700N at approximately 9630E.

   This is an isolated, bull-eyes type response detected near an inferred geological contact.

S. Collins (in an internal memo 6/6/1989) describes two gravity highs which coincide with EM responses over graphitic shales. These EM responses occur at 13000N-10375E and 12600N-10550E. As shales are less dense then the surrounding rocks a gravity low is expected over the shale units (see Wart Hill EM Review).

No quantitative descriptions can be made on these two gravity highs as the gravity data was not present at the time of reporting.

Estimated depths to these EM anomalies vary from 60 to 100m. These coincident gravity/EM anomalies occur well within the Tyndall Group Sediments (150-200m east of the unconformity). If the depth of the Tyndall Group package is >100m at the locations of the gravity/EM anomalies, then the anomalies are due to density/EM variations within the Tyndall Group rocks and not anomalous responses from the prospective underlying stratigraphy.

Recommendations

The isolated gravity high at 12700N - 9630E and the two gravity highs within the unconformity (13000N-10375E and 12600-10550E) warrant further exploration.

ELLIOTT BAY DOWNHOLE EM (DHEM) SURVEYS

Twelve drillholes have been logged with DHEM. The DHEM surveys were completed in two stages:

1. March 1988 and
2. February 1989

1. March 1988

Drillholes WH-1, 2,4,5,6 and 7 were logged during this period. Drillholes WH4,5 and 6 were drilled within 50m of the massive sulphide pods. No conductive responses were detected. Sulphide mineralisation intersected in drillholes did not produce conductive responses. The DHEM results indicate, that the mineralisation is either:

a. non-conductive or
b. too small to respond to EM techniques

The limited extent of the massive sulphide pods at surface suggest that known mineralisation is too small to be detected with EM.

The responses from the western loops of drillholes WH5, and particularly WH7, may be interpreted to be possible build-ups to off-hole responses.

It is more likely these responses are caused by self-response of the sensing probe, i.e. energising of the sensing probe by the primary field. This phenomenon occurs when the surveyed hole lies within a highly resistive environment. The result being the creation of a false anomaly.

2. February 1989

Two Peko holes V19-3 and V19-5, three Cyprus holes WH-8,9 and 10 and a hole at East Camp EC-1 were logged with DHEM. The probe self-response effect was avoided by careful positioning of the transmitter loops. No inhole or offhole responses were detected, indicating no significant conductors are located within 100m of any logged hole.

ELLIOTT BAY

VOYAGER 3 PROSPECT

1. IP/Resistivity Survey

In 1979 Geopeko conducted a 50m dipole-dipole IP survey. The aim of the survey was to define the original (1977-1978) IP anomaly on line 9600N.

Five lines, 9500N to 10200N (excluding 10,000N) were surveyed. The reports available indicate line 10,000 was surveyed later, December 1980? The strongest anomaly (3 times, background) was detected on line 10,000N, 9200E to 9325E. This is a well-defined, moderate to steep dipping chargeable zone. The zone extends from near surface to 100m. A weakly resistive zone coincides with the IP anomaly which suggests the anomaly is not associated with conductive sulphides.

This IP anomaly extends southwards to line 9900N, (9175E to 9325E), where it is still strong (2½ - 3 times background) and is evident down to about 100m.

The anomaly was drill tested with DDH V2/3. The drillhole intersected a zone 80m vertically below 9250E on line 10,000N. No significant sulphides were intersected (R.J. Close pers. comm).

Elevated IP responses were detected on lines 10,100N and 10,200N. The characteristic dipole-dipole anomaly shape is not evident and the cause of the IP responses is interpreted to be from a narrow (<50m), shallow source.

Elevated IP responses were detected on the western ends of lines 9500N to 9900N. These responses do not exhibit the characteristic wedge shape anomaly, possibly because they are only partially surveyed.

The IP anomalies on lines 9700N, 9800N, 9900N coincide with resistivity lows.

2. Geology

A description of the different mineralisation styles is summarised by C.D. Strickland (Progress Report: Exploration Licence 27/76 - Voyager 3 Prospect, June 1980), in which he states:

> "Three distinct styles of mineralisation have been identified within the Voyager 3 area during coastal mapping traverses.
>
> a) Chalcopyrite-malachite mineralisation within narrow (0.5m) shear zones striking predominantly north-south, parallel to the regional schistosity.

b) Minor galena-sphalerite mineralisation within irregular quartz veins which seem to generally cross cut the regional schistosity.

c) Broad stratiform zones of disseminated pyrite and haematite with trace malachite within the fine grained volcaniclastic greywackes and shales.

Styles (a) and (b) have no economic potential, however the stratiform zones represent favourable host environments for massive sulphide mineralisation."

3. VLF-EM/TURAM EM

A VLF-EM survey located two anomalous zones, one of which coincides with the elevated though incomplete IP anomalies at the western limits of lines 9500N to 9900N. The second VLF-EM conductor crosses the grid and is not associated with anomalous IP responses, but coincides with a Cu, Pb, Zn geochemistry trend. This VLF trend appears to be responding to a weakly conductive structural feature responsible for the geochemical trend.

A Turam survey which is an early version of the fixed loop method, was conducted over lines 9600N and 9800N to test the coincident VLF-EM and the partially completed IP anomalies (centred on about 8850E)at the western limits of the lines. No significant EM responses were reported. S.P. was conducted on 9600N and 9800N to test the coincident VLF-EM/IP anomalies at 9600N-8850E. No SP anomaly was detected.

4. Work done on Aberfoyle's EB-1 Prospect

Aberfoyle conducted ground EM over their EB-1 prospect. Three lines were surveyed. The AMG co-ordinates of these lines are:

5241600N (382,250E to 383,200E)
5241800N (382,225E to 383,200E)
5242050N (382,100E to 383,200E).

The AMG co-ordinates of the Geopeko IP lines should be evaluated to see if the IP lines were tested by the Aberfoyle EM lines, if so no further work is required on the IP anomalies. No AMG co-ordinates on the Geopeko IP survey were available in Townsville during the reporting period.

5. Conclusions and Recommendations

Two significant IP anomalies were detected.

The strongest IP anomaly (3 times background) was detected at 10,000N (9200E - 9325E). This anomaly which is associated with a weak resistive zone was drilled. No significant sulphides were intersected.

The second IP trend was detected at the western limits of lines 9500N to 9900N. These anomalies are incomplete. The IP anomalies at the ends of lines 9700N and 9800N and 9900N are associated with resistivity lows.

These partially surveyed anomalies have been tested with Turam and SP methods with no anomalous responses detected. If these IP responses have no geological or geochemcial association, no follow-up exploration is warranted.

VOYAGER 9 PROSPECT

UTEM EM SURVEY (Transmitter Loop 3)

Discussion

The EM survey tested an area with a strike length of 1.6km (7600N-9200N) and a width of 1km (10600E-11600E).

The majority of the anomalies are early-time (ET) with small amplitudes.

The most prominent anomaly was detected on 7600N at 10975E. This anomaly is open to the south and appears to diverge into two, weaker anomalies as it trends grid north-east. Estimated depth to conductive source is 40-60m at 7600N-10975E.

Other significant anomalies occur at,

1. 8600N - 11325E to 9200N - 11250E

   This anomaly strikes north-west (grid). This low amplitude, early-time EM trend is evident over 600m. Estimated depths range from approximately 60m on 9200N to 75-100m on 8600N. This shallow EM trend is most likely reflecting a formational contact.

Anomaly No.	Co-Ordinates	Estimated Depth (m)
2	7800N - 11275E	50 - 60
3	7800N - 11600E	? (anomaly not clearly defined
4	9000N - 10800E,	60 - 100m

719059

EAST CAMP PROSPECT (Voyager 29) (Plan 52)

UTEM EM Survey (Transmitter Loops 1 and 4)

1.0 Introduction

The East Camp Prospect is located immediately south of Wart Hill. Two loops (east and west) were used to test a strike length of 1.6km (10200N to 11800N) between 9200E and 11000E. The east loop would provide more effective coupling for steep to moderate west dipping structures. The UTEM anomalies detected are shown on the Voyager 29 Geology Plan (Plan 52).

2.0 Discussion

Several moderate (mid to late time) EM responses were detected. The stronger of these anomalies are located at:

1. Zone 1

   The zone 1 anomaly trends grid north-south and occurs within a (possible?) unconformity. This EM anomaly extends from 10200N to 10800N centered on about 10950E. The EM responses are evident at the late times (channel 3) on lines 10200N and 10600N, indicating the presence of a moderate conductor. Estimated depth calculations range from 50-80m. Carbonaceous shales/siltstones within the unconformity may be the cause of the moderate EM response.

2. Zone 2

   This low amplitude, early-time anomaly coincides with a narrow (20-100m) zone with outcropping medium-grained sericitic quartz crystal tuffs.

   The anomaly trends grid north-east and extends from 10800N-10050E to 11300N-10250E. The east transmitter loop would produce a stronger EM response for a west dipping target then the west loop. This is not evident in the data, as EM anomalies on lines 11200N and 11300N were only detected with the west loop. EM anomalies on 10800N and 11000N are evident on data sets measured from both transmitting loops. Estimated depths range from 50m on 11000N to 80-100m on 10800N.

3. Zone 3

Zone 3 is a low amplitude, early-time anomaly, trending grid north-south, and is approximately 200m west of Zone 2. This zone extends along 10000E from 11000N to 11300N. This zone occurs in the proximity of a mapped (or inferred) geological contact. Quartz outcrop is mapped 50m east of the northern limit of the EM trend. Anomalies on lines 11000N, 11200N and 11300N were detected with the west loop. Only the 11000N anomaly was detected with the east loop. Calculated depth to the anomaly source at 11300N is approximately 60m.

4. Zone 4 (11500N - 11000E to 11800N - 10750E)

Zone 4 may be the northern extension of Zone 1 as it occurs within the unconformity. The 11500N-11000E anomaly is evident on the later times (channel 3) indicating the EM source is moderately conductive. Depth to the conductive source is 40-60m on line 11800N.

5. Anomaly 1 (11800N - 9825E)
A weak, early-time anomaly located down dip from a fine-grained tuffaceous sandstone/siltstone unit.

6. Anomaly 2 (11400N - 9250E)

No geology available, a weak, (low amplitude) moderate (channel 6) conductor.

7. Anomaly 3 (10600N - 9500E)

No geology available, a weak, moderate to early-time (channel 7) anomaly.

8. Anomaly 4 (10200N - 9950E)

Located in the proximity of outcropping chloritic, quartz-feldspar crystal tuff, weak early-time anomaly.

9. Anomaly 5 (10200N - 10075E)

Occurs 125m east of anomaly 4; an early-time, low amplitude anomaly.

10. Anomaly 6 (10600N - 10250E)

Detected 80m north of quartz outcrop, an early-time, low amplitude anomaly.

Appendix II

Wart Hill EM Survey

PLUTONIC OPERATIONS LIMITED

MEMORANDUM

Ref:710/03/03

TO	**:**	R.J. Close
FROM	**:**	L.F. Wynn
DATE	**:**	1 June, 1995
SUBJECT	**:**	**WART HILL EM SURVEY**

1. INTRODUCTION

An EM survey has been completed over the Wart Hill Prospect, north of Elliott Bay, south-west Tasmania. The survey was carried out by Solo Geophysics from 23/3/95 to 2/4/95. Although fixed loop EM (UTEM system) had previously been carried out over Wart Hill, the position of the fixed UTEM loop produced poor coupling with any west dipping targets within the prospective horizon. A decision was made to conduct moving loop EM to eliminate any possibility of poor coupling with a conductive target.

2. WORK COMPLETED

The moving loop mode using a Sirotem III system was used with measurements made at the centre of each loop. 100m loops were moved in 50m intervals with lines read every 200m.

A total of 5.5 line km was completed.

The original proposed survey coverage of 11.8 line km was not completed. The survey was limited to areas of button grass and moderate scrub. Cut grid lines are necessary for moving loop EM in areas of thick vegetation.

Table 1 summarises the EM completed.

Table 1: Completed EM

Line Surveyed (N)	Co-ordinates (E)	Loop Size	Recording Interval	KM
11950	9650 - 10500	100m	50m	0.85
12150	9650 - 10600			0.95
12350	9750 - 10300			0.55
12550	9700 - 10200			0.50
12750	9650 - 10300			0.65
12950	9650 - 10200			0.55
13150	9650 - 10200			0.55
13350	9750 - 10250			0.50
13550	9750 - 10150			0.40
TOTAL KM				5.50

3.0 RESULTS

The results are presented as:

Figures 1-10: Profiles of Transient EM (uV/A) @ 1.5,000

Plan 1 : Contours of Channel 14 (2.025 millisecs) @ 1:2,500

Plan 2 : Geological Plan and Geophysics Compilation @ 1:2,500

4.0 INTERPRETATION

4.1 General

No bedrock conductors were detected. Very low amplitude responses were measured. These low EM responses indicate a resistive environment.

4.2 EM Contours

Steve Collins reviewed the data and summarised the results with contours of channel 14 (2.025 millisecs), (Plan 1). The EM anomalies detected at 10100E and 10225E on line 12150N (Plan 1) are early-moderate time (2.025 millisecs) anomalies with very low amplitude. An indication of the small amplitudes contoured in Plan 1, can be seen in the profiled channel 14 responses in Figures 1 and 2 (<0.5 uV/A). This EM anomaly may be indicating a slightly more conductive area. Figures 1 and 2 clearly show the elevated early-time responses from a more conductive zone in contrast to the lower amplitude (background) response on line 12350N (Figure 3).

4.3 Negative EM Responses

Negative EM responses were detected on most lines and are shown on Plan 2. It appears most of the negatives coincide with minor pyrite occurrences. These negative EM responses may be outlining the altered footwall.

This, negative EM and disseminated sulphide correlation is common in resistive environments.

4.4 UTEM Anomalies

UTEM anomaly 1, (13350N, 10075E - Plan 2) is not evident in the moving loop data (Figure 8). Although the weak UTEM trend coincides with the outcropping sulphides at 13300N, 10075E (approximately) the UTEM response appears to be reflecting the eastern edge of the West Wart rhyolite (Plan 2).

UTEM anomaly 3, (12350N, 9900E and 12550N, 9900E) is not associated with a moving loop EM anomaly. In addition, the coincident IP response and the isolated magnetic high at 12500N, 9950E is not associated with a conductor. As with UTEM anomaly 1, UTEM anomaly 3 coincides with the eastern margin of the West Wart Rhyolite.

4.5 VMS Outcrops

The outcropping massive sulphides at 13100N, 10075E and 13300N, 10075E are indicated in Figures 7 and 8 respectively. These mineralised outcrops have no anomalous moving loop EM association.

4.6 Ground Magnetics

Magnetic Anomaly 1 (see memo ref: 710/03/02 dated 5/6/95), extending from 12700N to 13100N, centred on 10150E, coincides with a very weak, i.e. low amplitude, early-time response (Figures 5 and 6). The depressed EM responses either side of 10150E in Figure 6 enhances the anomalous shape. Figure 6 shows (in red) the amplitude for channel 11 (1.125msecs) is approximately 0.5uV/A. To emphasise the low signals being measured Figure 10 is included.

Figure 10 shows the moving loop EM response from Boyds-5 9200N. The equivalent channel (1.20 msecs) is highlighted in red. The amplitude recorded for 1.20 msecs over massive sulphides at 9200N is 60uV/A.

In summary, the EM response coincident with Magnetic Anomaly 1 is very weak, and could be background response without the influences of negative EM.

4.7 Gravity

The isolated gravity response at 12700N, 9650E is not associated with an EM conductor.

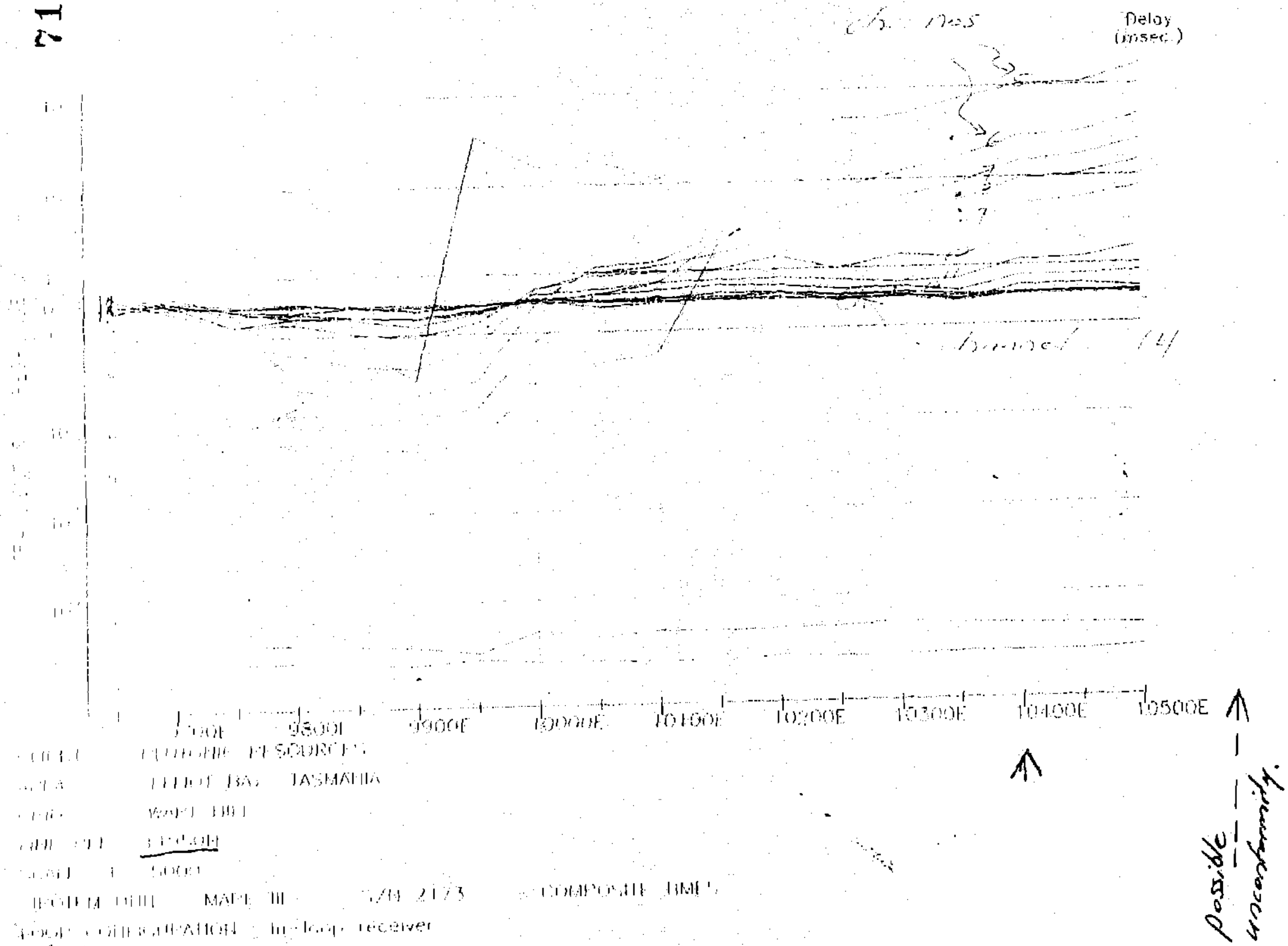
5.0 CONCLUSIONS AND RECOMMENDATIONS

No EM responses from bedrock conductors were detected.

The EM response coincident with Magnetic Anomaly 1 (12950N, 10150E) is very weak and appears to be normal background response. The negative EM horizon coincides with disseminated pyrite occurrences and may be defining part of the altered footwall.

719066

App II 5



TASMANIA

MAPE III 2173 COMPOSITE

loop receiver

100 X 100

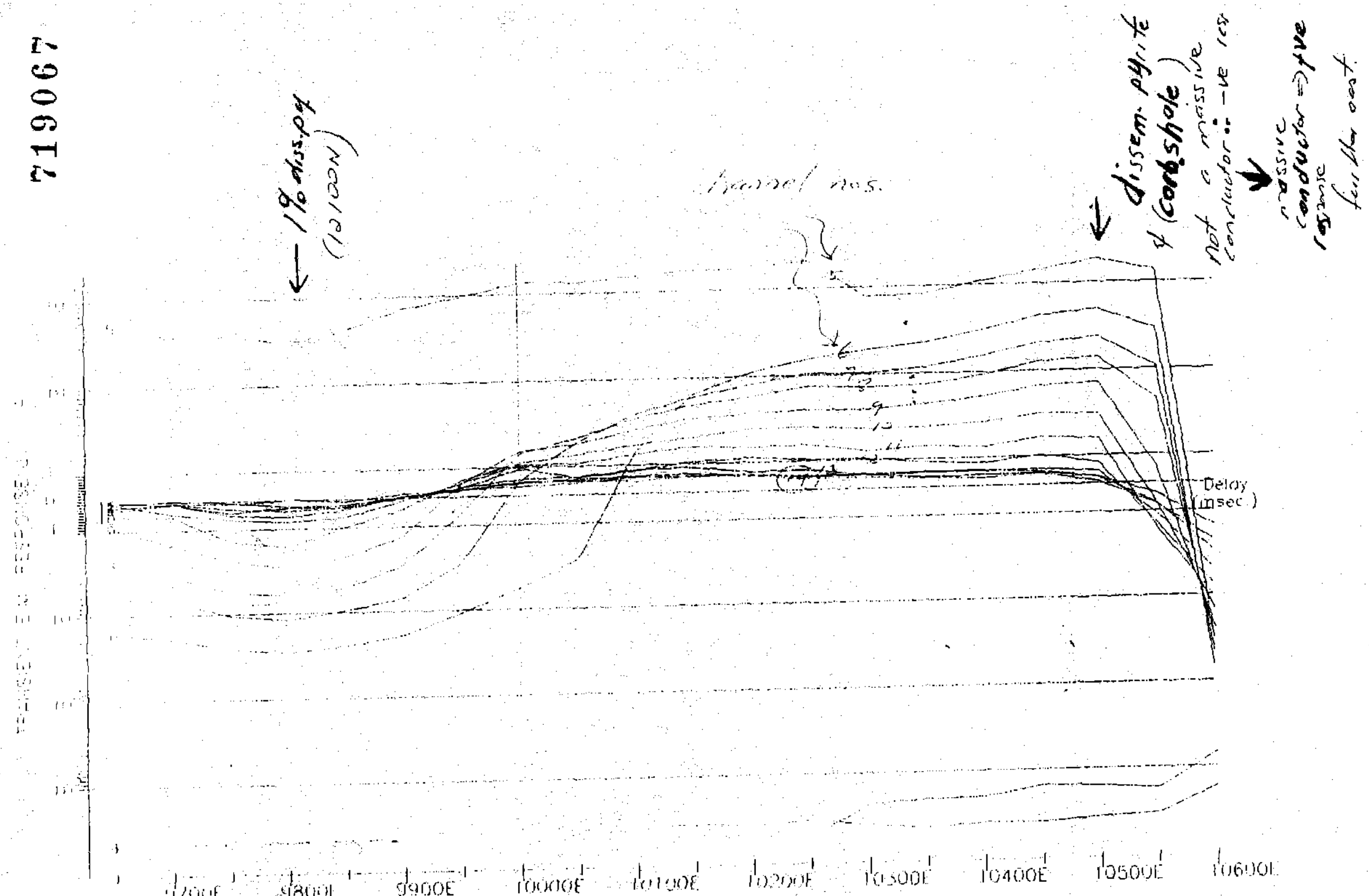
STACKS 1024 CURRENT

5 cm

Fig. 1

719067

App. II 6.



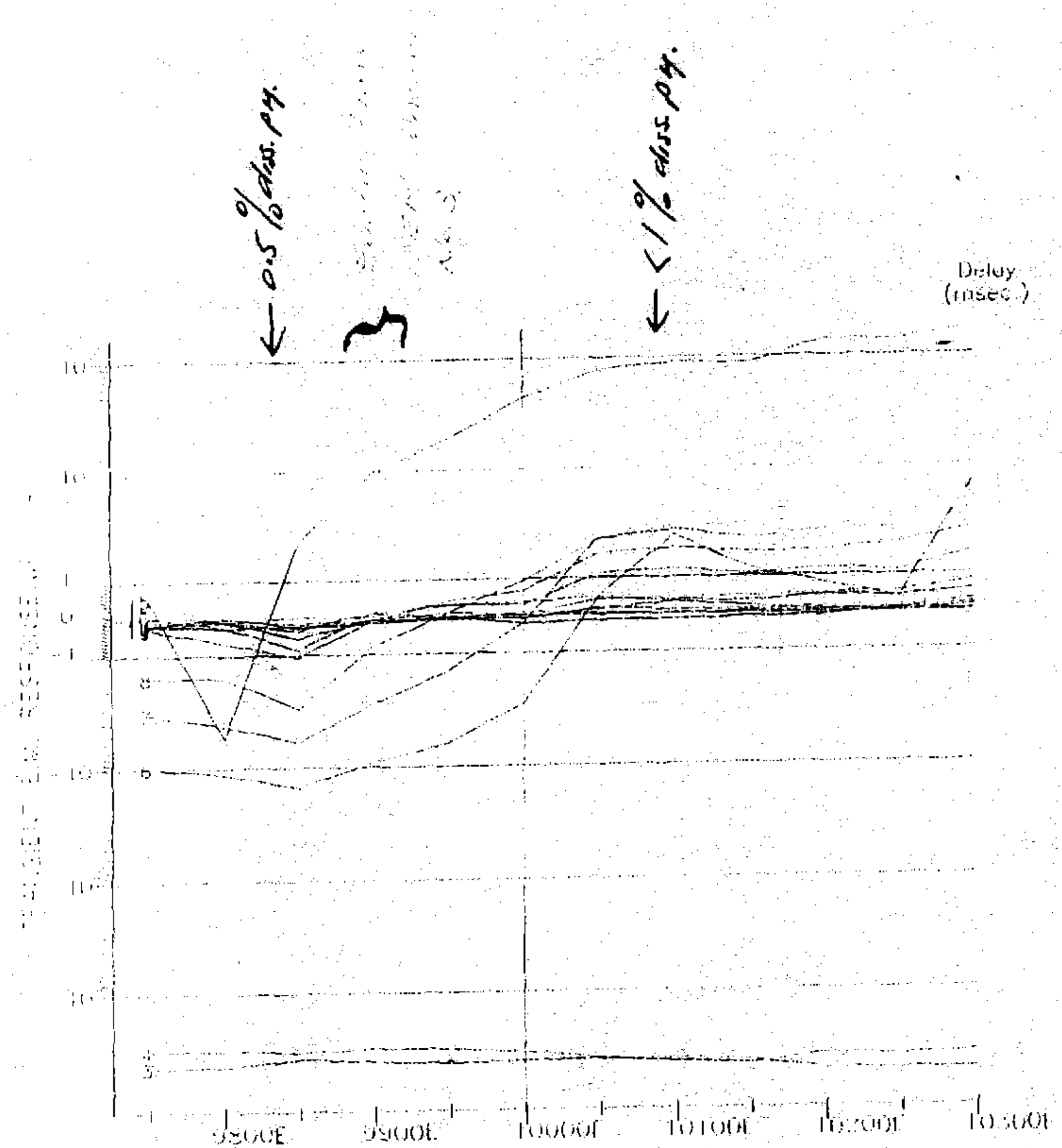
CLIENT PLUTONIC RESOURCES
AREA ELLIOT BAY TASMANIA
GRID WART HILL
LINE REF 12100N
SCALE 1 : 5000
SIROTEM UNIT MARK III S/N 2173 — COMPOSITE TIMES
LOOP CONFIGURATION In loop receiver
LOOP SIZE 100 X 100
CHANNEL PLOTTED 3 - 16 STACKS : 1024 CURRENT : 6.1 amps
[redacted]

5 cm

Fig. 2

719068

App. II



PLUTONIC RESOURCES

AREA ELLIOT BAY TASMANIA

GRID WART HILL

LINE 12550N

SCALE 1 : 5000

MAPLE COMPOSITE TIMES

CONFIGURATION in loop receiver

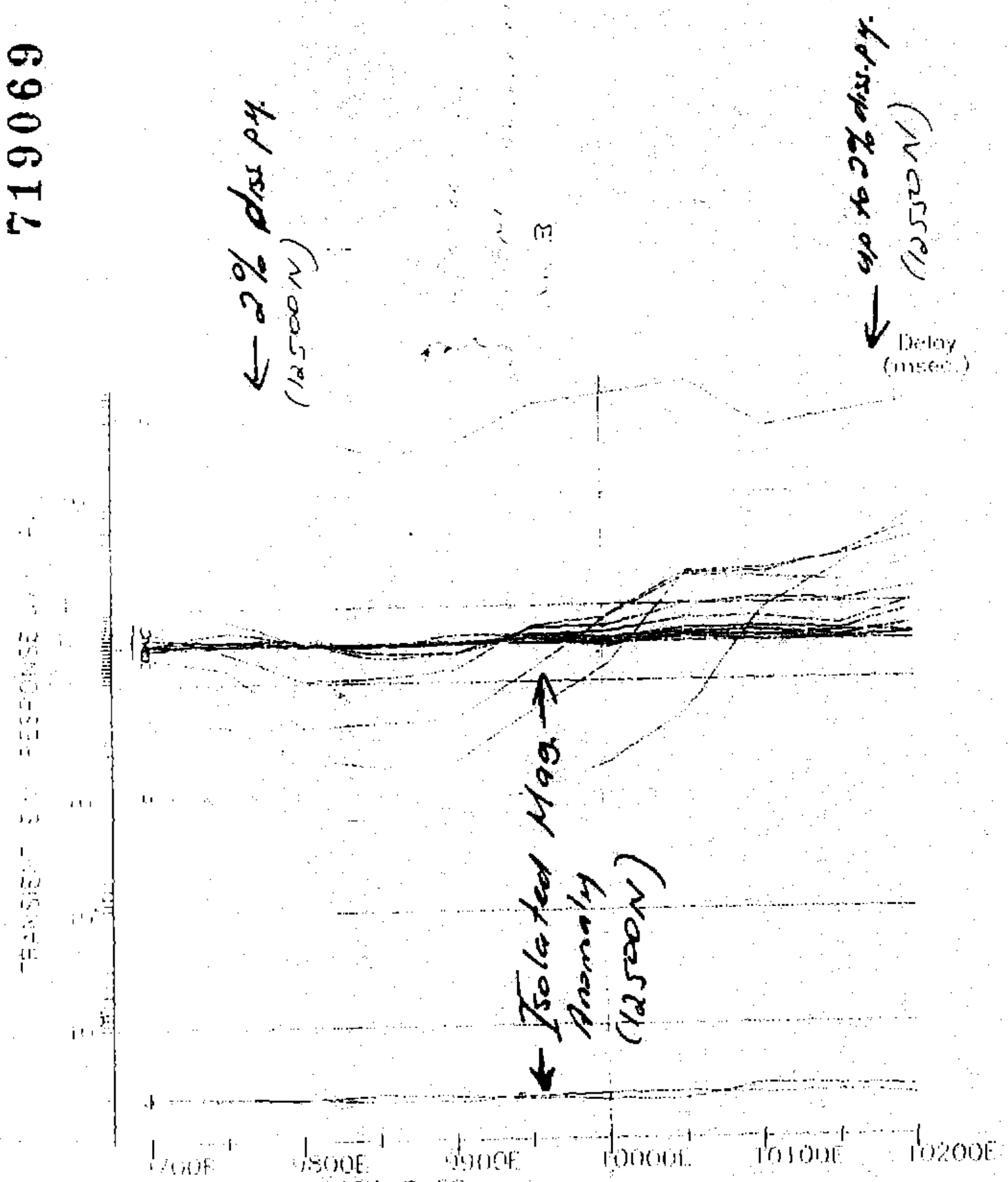
100 X 100

STACKS CURRENT

Fig. 3

719069

App II 8.



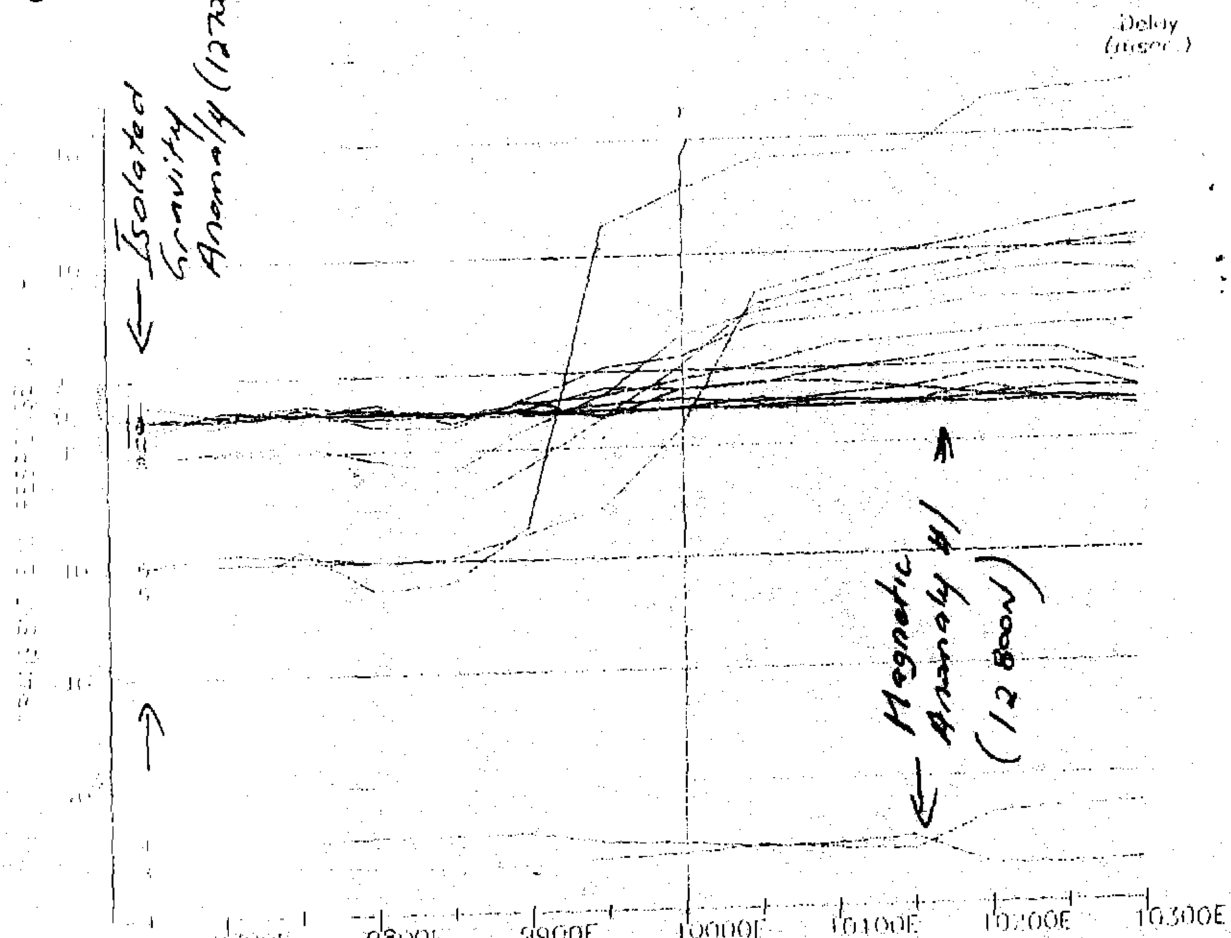
CLIENT: PLUTONIC RESOURCES
AREA: ELLIOT BAY TASMANIA
GRID: WAPT LINE
LINE REF: 12500N
SCALE: 1 : 5000
SYSTEM USED: MARK III S/N 2173 — COMPOSITE TIMES
LOOP CONFIGURATION: In-loop receiver
LOOP SIZE: 100 X 100
CHANNELS PLOTTED: 5 - 16 STACKS: 1024 CURRENT: 6.1 amps

5 cm

Fig. 4

719070

App. II 9.



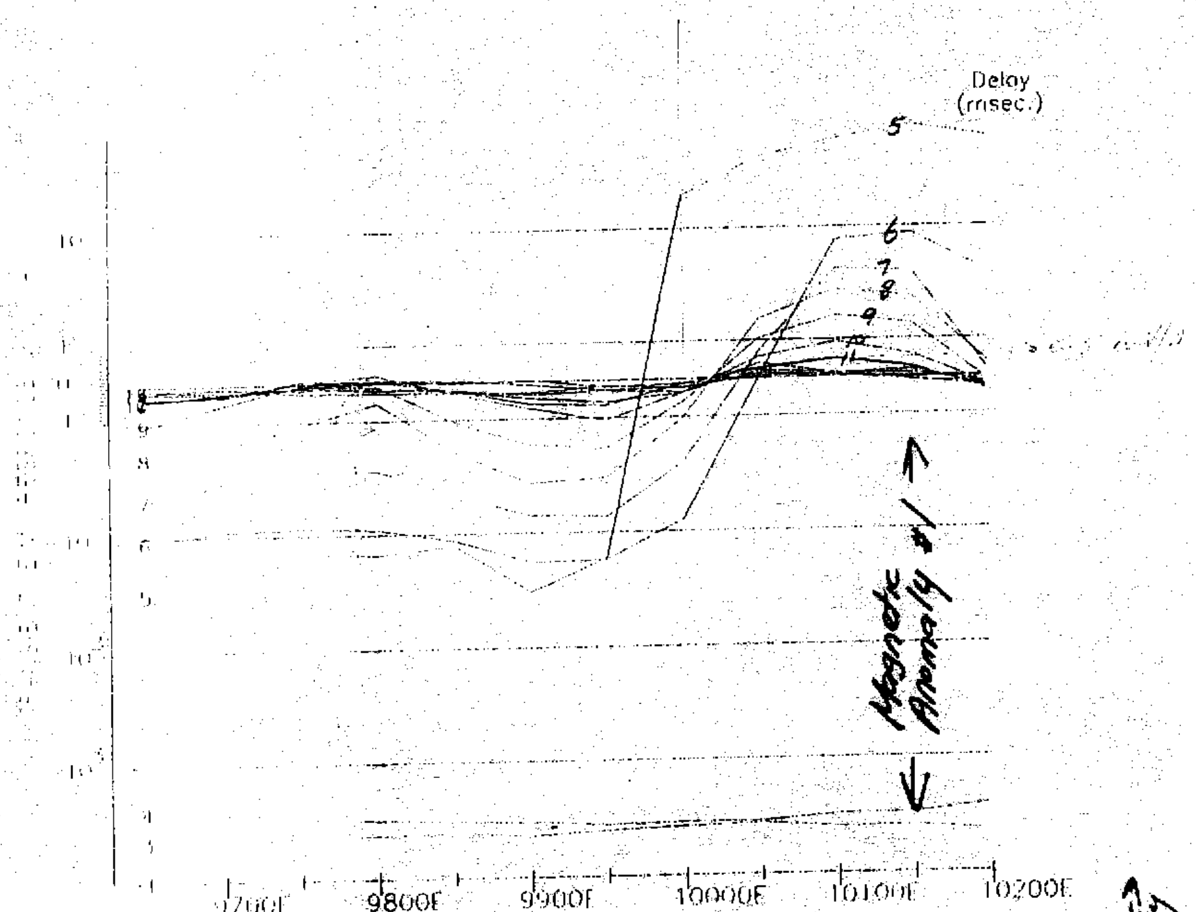
CLIENT PLUTONIC RESOURCES
AREA ELLIOT BAY TASMANIA
GRID WARE HILL
LINE REF 12750N
SCALE 1 : 5000
SIROTEM UNIT MARK III S/N 2173 ---- COMPOSITE TIMES
LOOP CONFIGURATION - In-loop receiver
LOOP SIZE 100 X 100
CHANNELS PLOTTED 5 - 16 STACKS 1024 CURRENT 6.1 amps

5 cm

Fig. 5

719071

App. II



note: channel 11 → 1·125 ms

CLIENT PLUTONIC RESOURCES
AREA ELLIOT BAY TASMANIA
GRID WART HILL
LINE REF 12950N
SCALE 1 : 5000
SYSTEM UNIT MARK III S/N 2173 COMPOSITE TIMES
LOOP CONFIGURATION : In-loop receiver
LOOP SIZE 100 X 100
STACKS 1024 CURRENT 6.1 amps

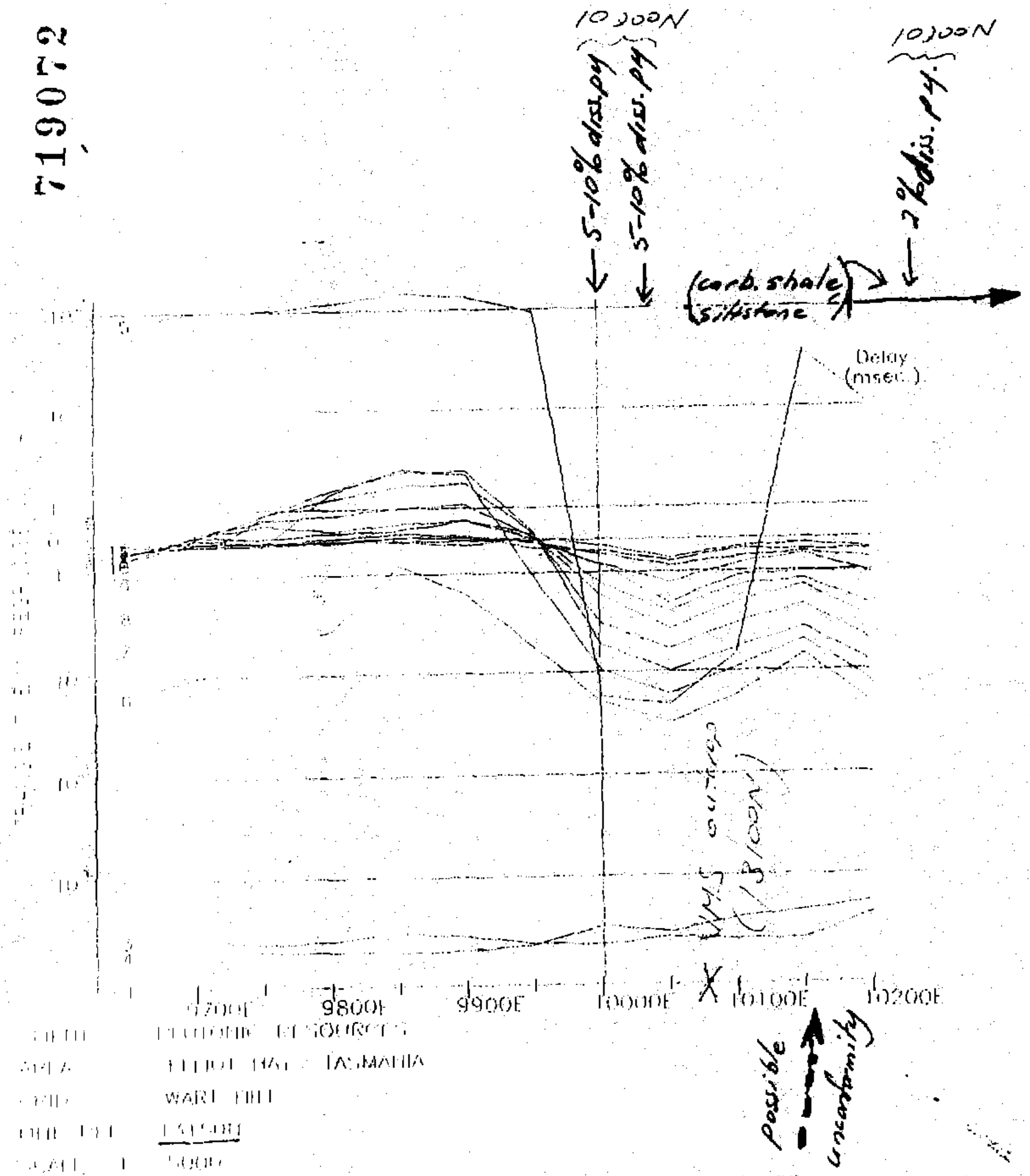
5 cm

Fig. 6

719072

App. II

11



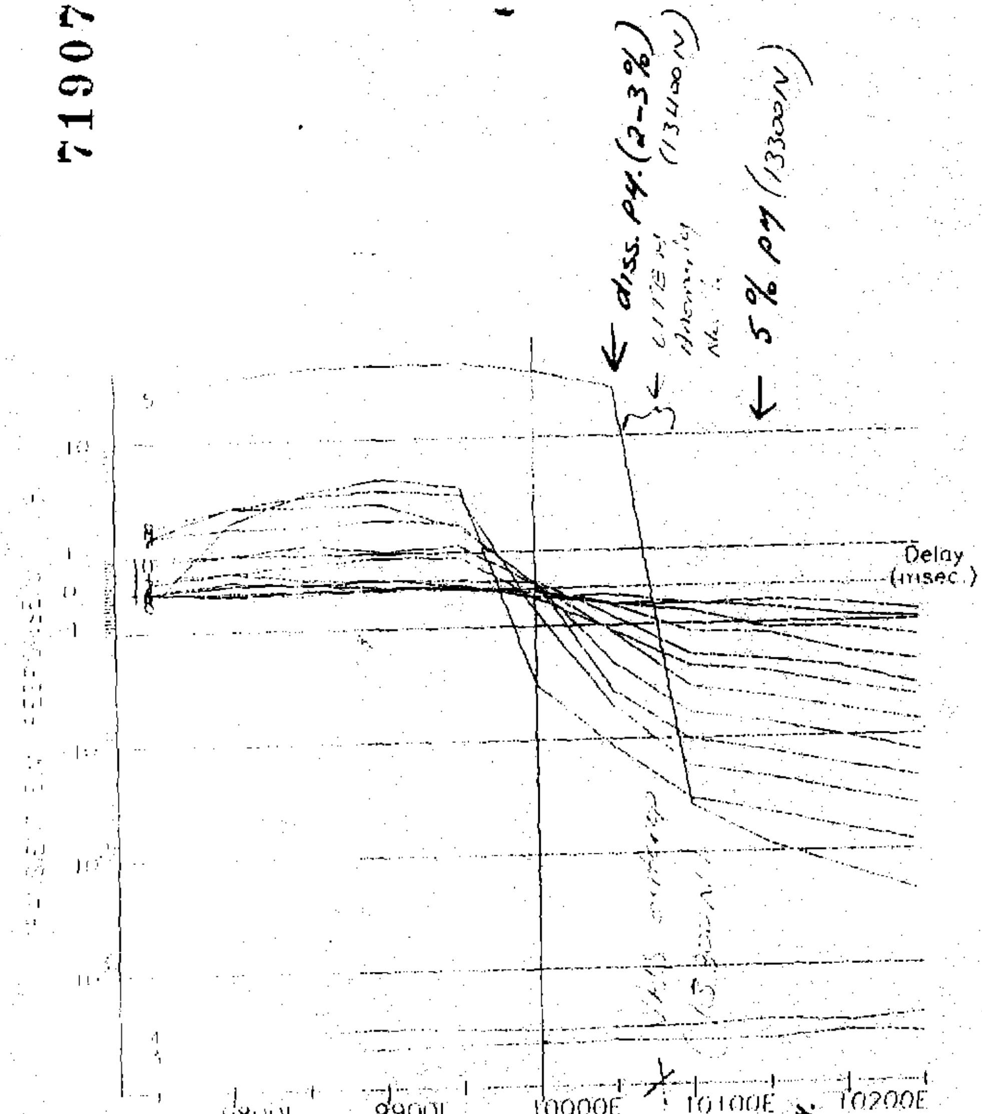
[illegible] [illegible] RESOURCES
AREA [illegible] TASMANIA
GRID WART [illegible]
[illegible] [illegible]
SCALE 1 5000
[illegible] MARK III - S/N 2173 - - - COMPOSITE TIMES
LOOP CONFIGURATION [illegible] loop receiver
LOOP SIZE 100 X 100
CHANNELS PLOTTED 3 - 16 STACKS 1024 CURRENT 6.1 amps

5 cm

Fig. 7

719073

App II 12



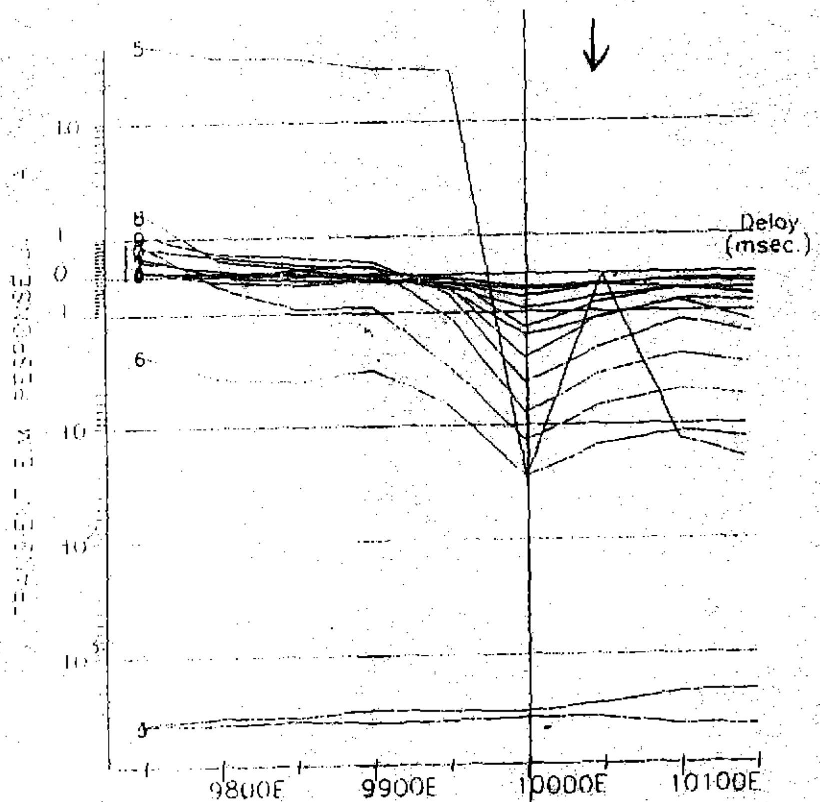
CLIENT PLUTONIC RESOURCES
AREA ELLIOT BAY TASMANIA
GRID WART HILL
LINE REF 13350N
SCALE 1 : 5000
SIROTEM UNIT MARK III --- S/N 2173 --- COMPOSITE TIMES
LOOP CONFIGURATION : In-loop receiver
LOOP SIZE 100 X 100
STACKS 1024 CURRENT 6.1 amps

5 cm

Fig. 8

7190 74

App. II 13

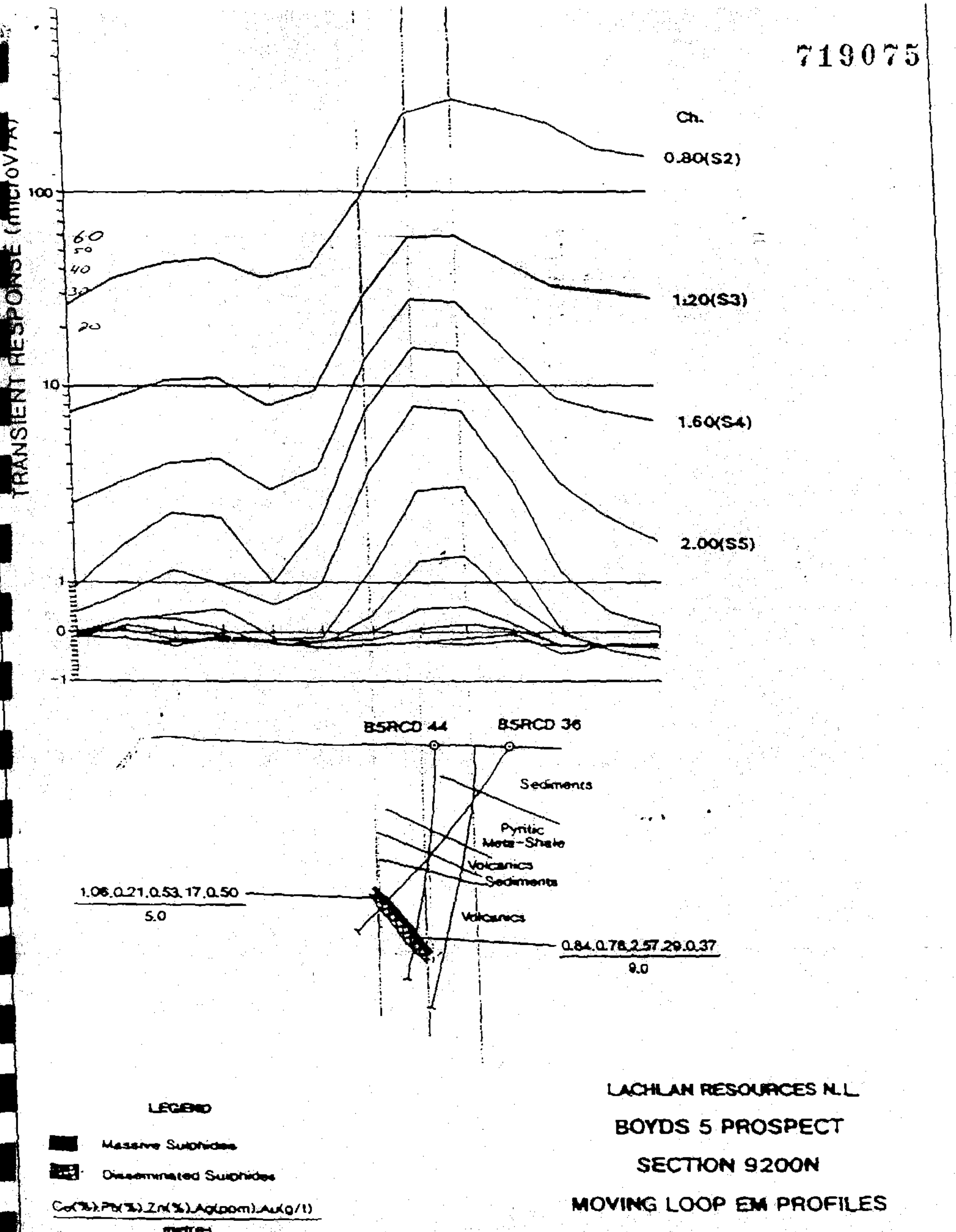


CLIENT PLUTONIC RESOURCES
AREA ELLIOT BAY TASMANIA
GRID WART HILL
LINE REF 13550N
SCALE 1 : 5000
SIROTEM UNIT MARK III --- S/N 2173 --- COMPOSITE TIMES
LOOP CONFIGURATION In-loop receiver
LOOP SIZE 100 X 100
CHANNELS PLOTTED 3 - 16 STACKS 1024 CURRENT 6.1 amps
[redacted]

5 cm

Fig. 9

719075



LACHLAN RESOURCES N.L.

BOYDS 5 PROSPECT

SECTION 9200N

MOVING LOOP EM PROFILES

SCALE 1:5000

Figure 10

5 cm

App II 14

Appendix III

East Camp EM Survey

719077

PLUTONIC OPERATIONS LIMITED

MEMORANDUM

Ref:710/03/04

TO : R.J. Close

FROM : L.F. Wynn

DATE : 6 June, 1995

SUBJECT : **EAST CAMP EM SURVEY**

---

1. INTRODUCTION

A 100m moving loop EM survey has been completed over the East Camp Prospect. The survey was undertaken immediately after the Wart Hill EM survey (see memo dated 1/6/1995, ref 710/03/03).

2. WORK COMPLETED

A Sirotem III EM system was used.

Measurements were made at the centre of each loop in 50m intervals along 200m spaced lines. A total of 4.2 line km was completed (see Table 1 for details).

Table 1 : EM Completed

Line (N)	Co-ordinates (E)	Loop Size	Recording Interval	Km
9,950	9850 - 10550	100m	50m	0.7
10,150	9850 - 10550			0.7
10,350	9850 - 10550			0.7
10,550	9850 - 10550			0.7
10,750	9850 - 10550			0.7
10,950	9850 - 10550			0.7
Total Km				4.2

App III 1

3. RESULTS

The results are presented as:

Figures 1 - 6	:	Profiles of Transient EM (uV/A) @ 1:5,000
Plan 1	:	Geological Plan and EM Interpretation @ 1:2,500

4. INTERPRETATION

No bedrock conductors were detected, Very low amplitude responses were measured. These low background results (similar to Wart Hill) are indicative of resistive rocks.

No moving loop EM anomalies were detected over UTEM responses at Zone 2, Zone 3, Anomaly 4, Anomaly 5 and Anomaly 6 (Figure 5,6,2,4 respectively).

Negative EM responses are indicated in Plan 1.

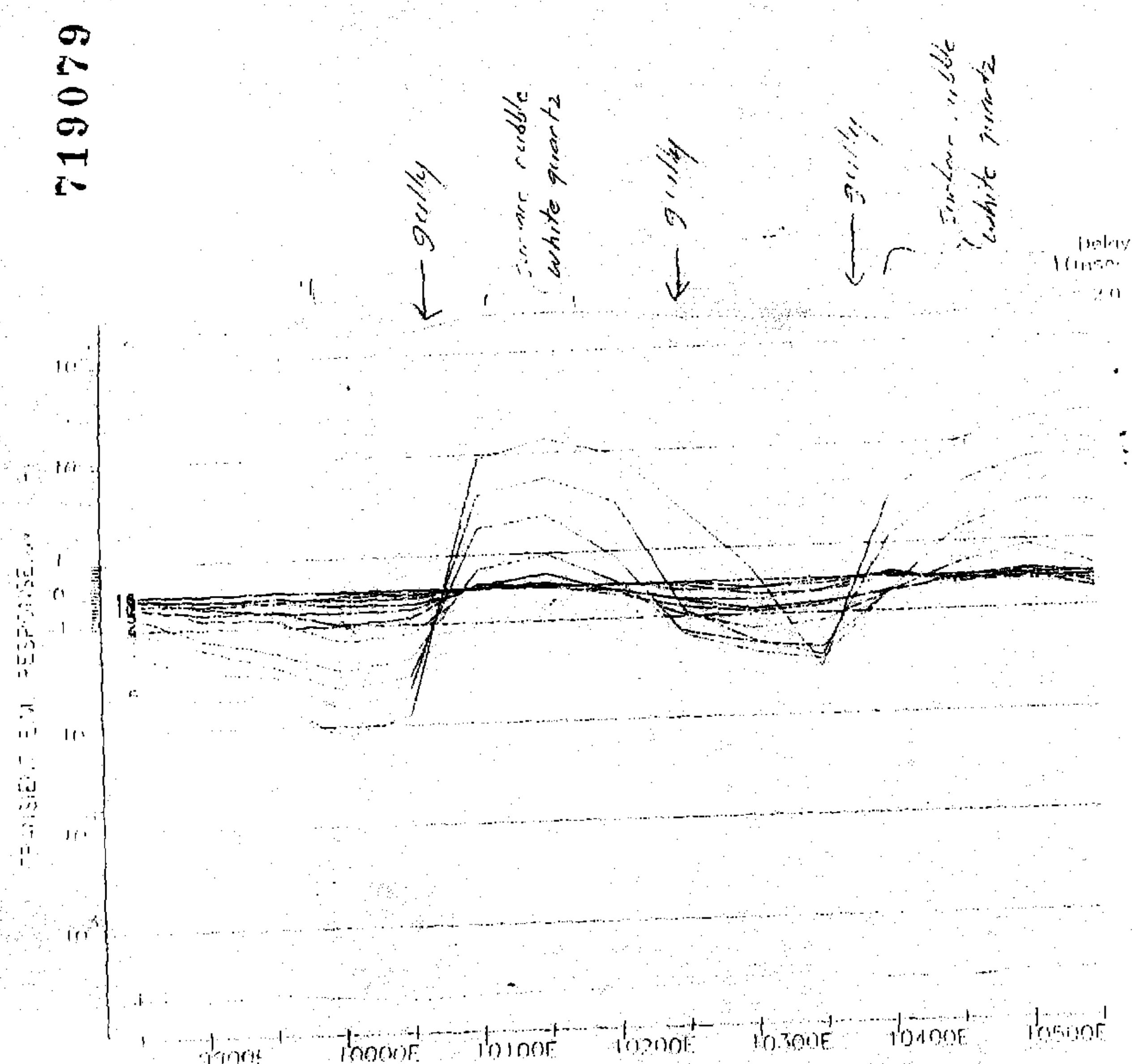
EM negatives have been associated with disseminated sulphides in resistive environments, and these negatives may be indicating alteration zones beneath the extensive surface rubble cover.

5. CONCLUSIONS

No bedrock conductors were detected. The EM survey completed is capable of detecting moderate conductors down to depths of 150-200m in this resistive environment.

719079

App III 3

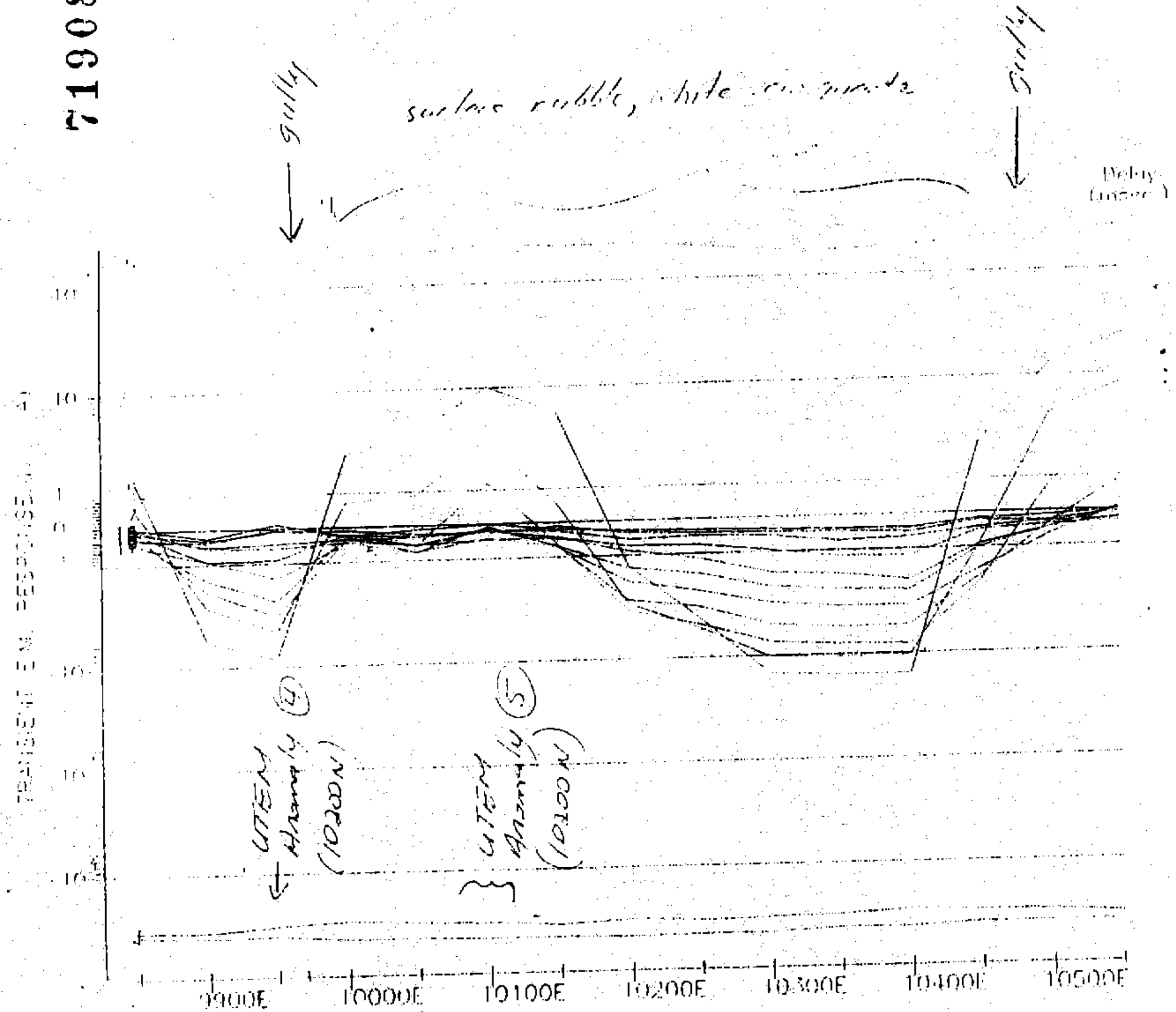


CLIENT : PELTONIC RESOURCES
AREA : ELLIOT BAY TASMANIA
GRID : EAST CAMP
LINE REF : 9950N
SCALE : 1 : 5000
RECEIVER UNIT : MARK III - - - S/N 2123 - - - COMPOSITE TIMES
LOOP CONFIGURATION : In Loop
LOOP SIZE : 100 x 100
STACKS : 1024 CURRENT : 6.1 amps

Fig. 1

719080

App III 4



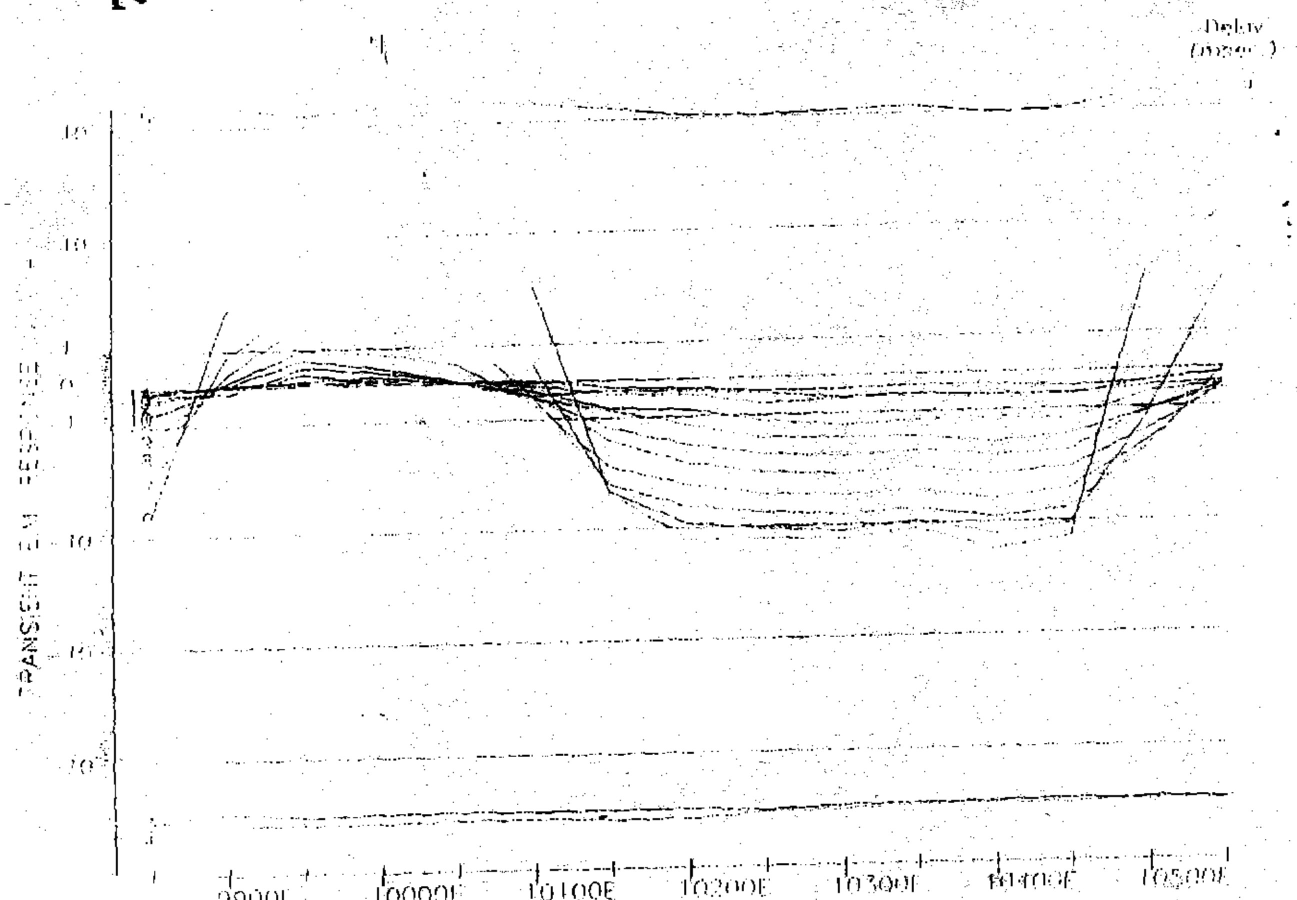
CLIENT : PLUTONIC RESOURCES
AREA : ELLIOT BAY TASMANIA
GRID : EAST CAMP
LINE REF 10150N
SCALE 1 : 5000
SIROTEM UNIT : MARK III ---- S/N 2173 ---- COMPOSITE TIMES
LOOP CONFIGURATION : In Loop
LOOP SIZE : 100 x 100
[redacted] 5.1 amps:

5 cm

FIG. 2

719081

App III 5



CLIENT : PLUTONIC RESOURCES

AREA : ELLIOT BAY TASMANIA

GRID : EAST CAMP

LINE REF : 10350N

SCALE 1 : 5000

SIROTEM UNIT : MARK III --- S/N 2173 --- COMPOSITE TIMES

LOOP CONFIGURATION : In-loop receiver

LOOP SIZE : 100 X 100

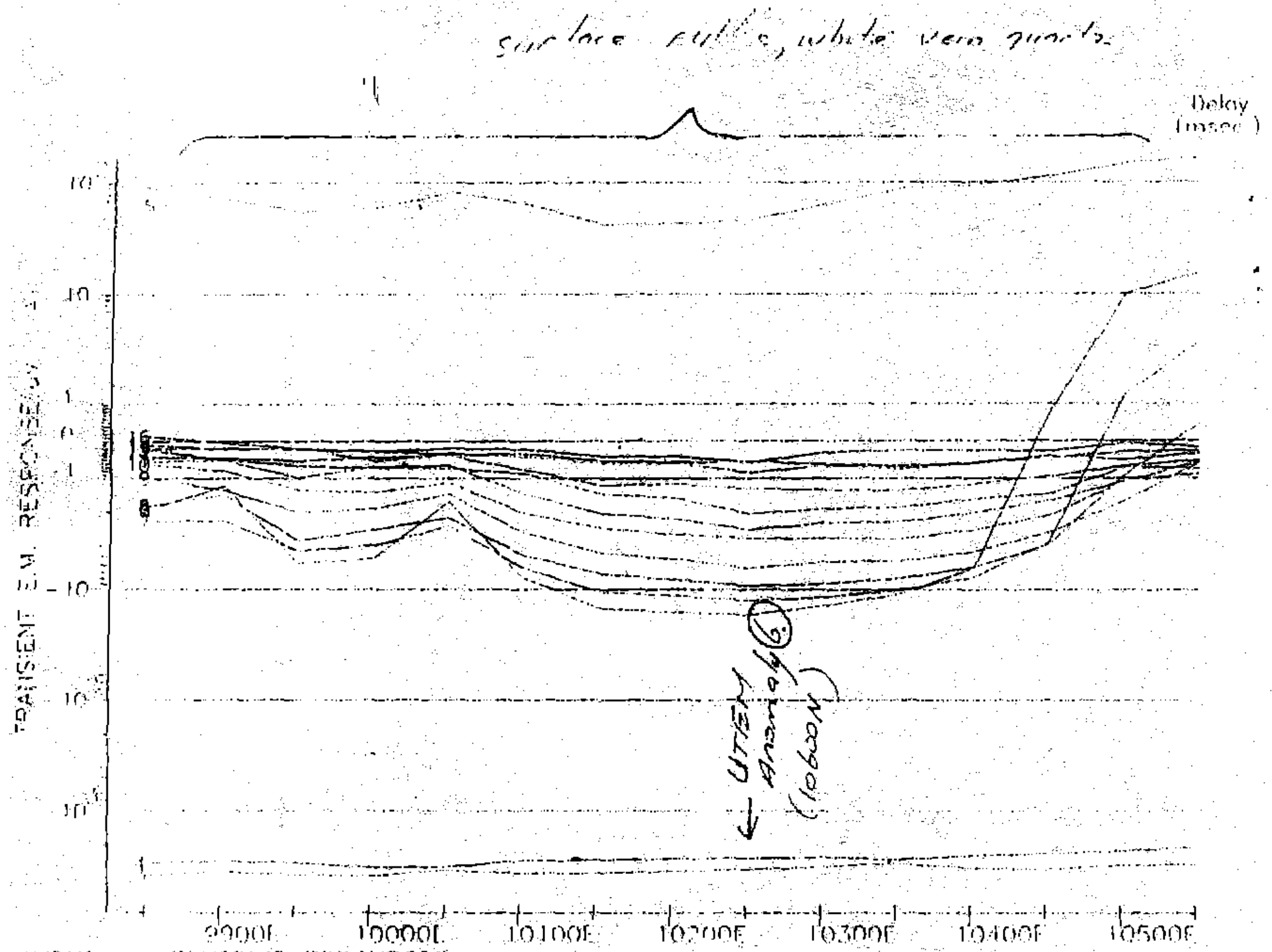
[redacted] STACKS [redacted] 1024 [redacted] CURRENT : 6.1 amps [redacted]

5 cm

Fig 3

719082

App. III 6



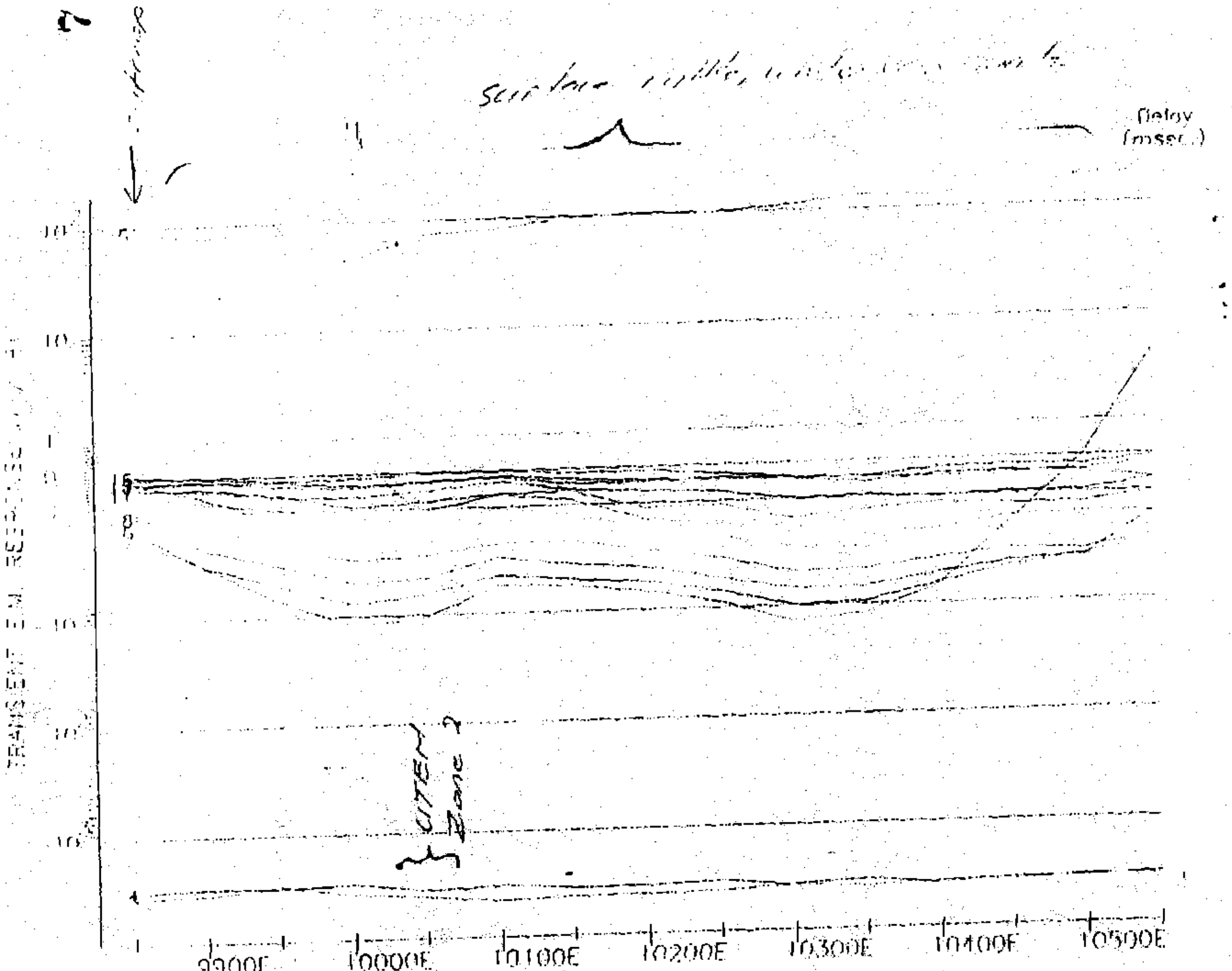
CLIENT : PLUTONIC RESOURCES
AREA : ELLIOT BAY - TASMANIA
GRID : EAST CAMP
LINE REF : 10550N
SCALE : 1 : 5000
SIROTEM UNIT : MARK III --- S/N 2173 --- COMPOSITE TIMES
LOOP CONFIGURATION : In-loop receiver
LOOP SIZE : 100 x 100
[redacted] STACKS : 1024 [redacted] CURRENT : 6.1 amps
[redacted]

5 cm

Fig. 4

719083

App III



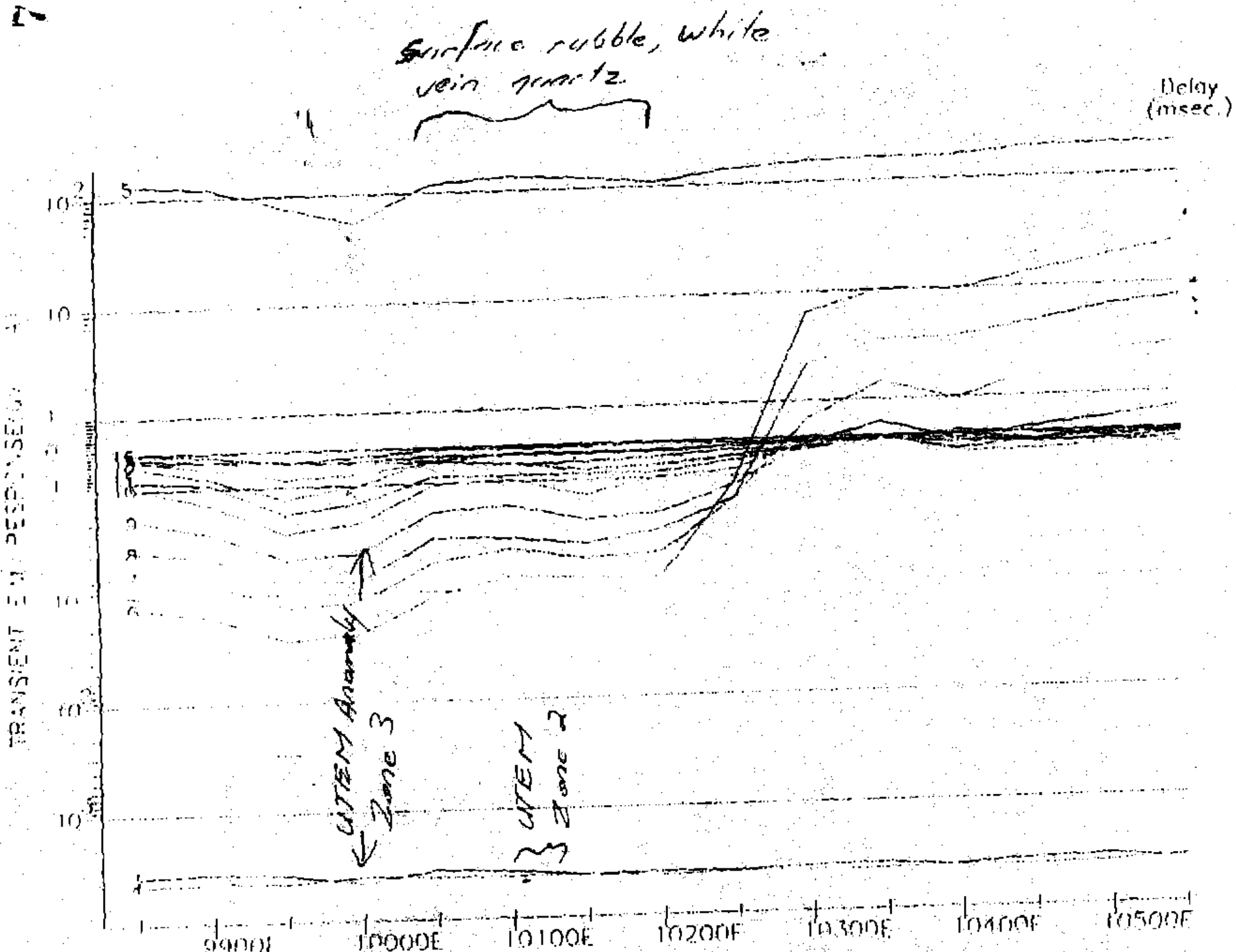
CLIENT : PLUTONIC RESOURCES
AREA : ELLIOT BAY TASMANIA
GRID : EAST CAMP
LINE REF : 10750N
SCALE : 1 : 5000
SIROTEM UNIT : MARK III --- S/N 2173 --- COMPOSITE TIMES
LOOP CONFIGURATION : In-loop receiver
LOOP SIZE : 100 x 100
[illegible] TED [illegible] YS [illegible] 24 [illegible] CURRENT 6 amps

5 cm

Fig. 5

719084

App. III 8



CLIENT : PLUTONIC RESOURCES

AREA : ELLIOT BAY , TASMANIA

GRID : EAST CAMP

LINE REF : 10950N

SCALE 1 : 5000

SIROTEM UNIT : MARK III S/N 2173 - COMPOSITE TIMES

LOOP CONFIGURATION : In-loop receiver

LOOP SIZE : 100 x 100

CHANNELS PLOTTED : 3 - 16 STACKS : 1024 CURRENT : 6.1 amps

5 cm

Fig. 6

Appendix IV

Wart Hill and East Camp - Ground magnetic survey

PLUTONIC OPERATIONS LIMITED

MEMORANDUM

Ref:710/03/02

TO	**:**	R.J. Close
FROM	**:**	L.F. Wynn
DATE	**:**	5 June, 1995
SUBJECT	**:**	**WART HILL AND EAST CAMP - Ground Magnetic Survey**

---

1. INTRODUCTION

Ground Magnetics has been conducted over the Wart Hill and East Camp Prospects by previous explorers (Geopeko). The data reviewed was poorly presented, so both grids were re-surveyed immediately following the 1995 EM survey.

A total of 22.49 line km was completed (12.89 km - Wart Hill and 9.6 km - East Camp).

As with the EM survey the ground magnetic coverage was limited to areas of button grass and less dense vegetation.

A summary of the work completed is shown in Table 1. Readings were made every 10m on 100m spaced lines.

2. RESULTS

The results are shown as:

Plan 1: Wart Hill Magnetic Contours @ 1:2,500
Plan 2: Wart Hill Stacked Profiles @ 1:2,500

Plan 3: East Camp Magnetic Contours @ 1:2,500
Plan 4: East Camp Stacked Profiles @ 1:2,500

App IV 1

TABLE 1 : GROUND MAGNETICS COMPLETED

Prospect	Line (N)	Co-Ordinates (E)	Km
Wart Hill	11,900	9,600 - 10,550	0.95
	12,000	9,600 - 10,550	0.95
	12,100	9,600 - 10,650	1.05
	12,200	9,600 - 10,650	1.05
	12,300	9,650 - 10,350	0.70
	12,400	9,700 - 10,350	0.65
	12,500	9,650 - 10,250	0.60
	12,600	9,650 - 19,250	0.60
	12,700	9,600 - 10,350	0.75
	12,800	9,600 - 10,350	0.75
	12,900	9,600 - 10,250	0.65
	13,000	9,600 - 10,250	0.65
	13,100	9,550 - 10,240	0.69
	13,200	9,600 - 10,250	0.65
	13,300	9,700 - 10,300	0.60
	13,400	9,700 - 10,300	0.60
	13,500	9,700 - 10,200	0.50
	13,600	9,700 - 10,200	0.50
East Camp	9,900	9,800 - 10,600	0.80
	10,000	9,800 - 10,600	0.80
	10,100	9,800 - 10,600	0.80
	10,200	9,800 - 10,600	0.80
	10,300	9,800 - 10,600	0.80
	10,400	9,800 - 10,600	0.80
	10,500	9,800 - 10,600	0.80
	10,600	9,800 - 10,600	0.80
	10,700	9,800 - 10,600	0.80
	18,800	9,800 - 10,600	0.80
	10,700	9,800 - 10,600	0.80
	11,000	9,800 - 10,600	0.80
TOTAL KM			**22.49**

3.0 INTERPRETATION

3.1 Wart Hill

Four discrete magnetic anomalies were detected.

All anomalies discussed below are interpreted to have steep westerly dips.

3.1.1 Anomaly 1 (12700N - 13100N, centred on 10150E)

This is the strongest anomaly detected (170nT), and occurs within the prospective horizon, ie, east of the West Wart Rhyolites. The depth of the magnetic source varies from 30m on line 12900N to approximately 60m on 13000N. Iron staining is evident in nearby outcrops.

This anomaly remains untested. V19-2 was drilled immediately north and V19-3 (testing a gravity anomaly) was drilled 100m to the south. (See Plan 2 on Wart Hill EM memo, ref 710/03/03.)

3.1.2 Anomaly 2 (12500N - 9950E)

This anomaly also occurs at the eastern boundary of the West Wart Rhyolite and coincides with an IP anomaly and a weak UTEM trend. The magnetic anomaly is limited in strike, i.e, evident on one line only (see Plan 2). Depth to the magnetic source is approximately 40m.

The EM anomaly trends grid north-south from 12300N to 12500N. Estimated depth to the weak EM source to 50-80m.

3.1.3 Anomaly 3 (13000N - 13100N, centred on 9670E)

Anomaly 3 occurs west of the West Wart Rhyolites and is evident on two lines. The source to the magnetic anomaly is 15-25m.

3.1.4 Anomaly 4 (13200N - 9830E)

Anomaly 4 is a one line anomaly and coincides with the western edge of the West Wart Rhyolite. Depth to the magnetic source is approximately 25m. This anomaly may be the northern extension of Anomaly 3 which has been offset to the east (Plan 1).

3.1.5 Anomalies Detected by Geopeko

Two additional magnetic anomalies (not included in this survey) were detected by Geopeko (see memo dated 9th March 1995, Subject: Elliott Bay). These anomalies were detected at:

a) 12400N - 12600N (centred on 10400E)
This magnetic high parallels the mapped unconformity and coincides with iron staining and traces of haematite;

b) 11800N - 9960E
This anomaly is a one line anomaly along strike from the West Wart Rhyolites.

These are low priority anomalies.

3.2 East Camp

3.2.1 General

Most of the surveyed area is magnetically quiet. Two magnetic anomalies trending NNE were detected at the western portion of the grid (Plan 3).

3.2.2 Anomaly 5

Anomaly 5 extends from 9900N to 10200N and is open to the south. The peak response (90nT) occurs at 10100N, 9920E, where the magnetic source is estimated to be 20-30m below surface. A weak UTEM response (Anomaly 4) coincides with the northern limit of the magnetic anomaly (see Plan 1 - East Camp EM memo). A negative moving loop EM zone coincides with the peak magnetic response.

The negative EM may be reflecting zones of disseminated pyrite as observed in the Wart Hill area.

3.2.3 Anomaly 6

Anomaly 6 occurs north of Anomaly 5 and extends from 10400N to 10800N. The peak magnetic responses (110nT) was detected at 10500N, 9920E. Depth to the magnetic sources is 20-30m. A weak UTEM anomaly (Anomaly 2) coincides with northern limit of the magnetic trend (Plan 1 - East Camp EM memo).

Magnetic Anomaly 6 may be the northern extension of Anomaly 5 which has been offset to the west.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Wart Hill

Anomaly 1 occurs within the prospective VMS horizon and is evident over 400m. This anomaly is untested and is a priority 1 drill target.

Anomaly 2 also occurs along the prospective horizon. Although this anomaly is evident on one line only it coincides with an IP and weak UTEM trend, and is a priority 2 target.

4.2 East Camp

Two NNE trending magnetic anomalies were detected. These magnetic trends are not associated with conductive responses from a moving loop EM survey.

The significance of these magnetic anomalies is dependant on geochemical anomalism.

Appendix V

Wart Hill and East Camp - Soil geochemical analyses

PLUTONIC
Plutonic Operations Limited
A.C.N. 004 680 997
Level 37, 100 Miller Street, North Sydney, NSW 2060
Telephone (02) 959 3433, Facsimile (02) 955 9620

719091

SAMPLE RECORD SHEET

PROJECT NAME: Elliott Bay CODE: 710 TENEMENT: ....
(or SHEET No.)
PROSPECT NAME: East Camp / Wart West
SAMPLER: Peter Rae / Rob Reid SAMPLE TYPE: .... DATE: 2-3-9?
HOLE I.D.: .... P.O. No.: ....

SAMPLE No.	TYPE	INTERVAL/ LOCATION/CO-ORDS	DESCRIPTION
S 15001	Soil/C-Horiz	10200N, 10265E	East Camp
2	"	" , 10270E	
3	"	" , 10275E	
4	"	" , 10280E	
5	"	" , 10285E	
6	"	10200N, 10415E	
7	B-Horiz	" 10425E	qtz ground? ~0.7m depth
8	Soil/C-Horiz	" 10430E	
9	"	" 10435E	
S 15010	"	10400N, 10415E	
1	"	" 10420E	
2	"	" 10425E	
3	"	" 10430E	
4	"	" 10435E	
5		11000N, 10865E	10865E, Yellow/buff? volcanic
6		" 10870E	10870E "
7		" 10875E	
8		" 10880E	
9		" 10885E	
S 15020	Rock Chip	12300N, ~9785E	lithic-xtal-volc breccia (mass flow above siltstone Bay
1	Rock Chip	12315N, ~9700E	Wart West? mod chl, py ~6%, xtal-lithic?-volc
2	"	12315N, ~9600E	"
3	"	9300N, 8850E	V3, shoreline, intensely chloritised pyritic (8%) tuff.
4	Numbers not used		
5			
6			
7			
8			
9			
S 15030			

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ANALYTICAL REPORT No. 111715.60.10752

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

22 MAR 95

INVOICE TO:
Rob Reid
Plutonic Operations Limited
P O Box 282
ZEEHAN TAS 7469

ORDER No.	PROJECT
2005281	

DATE RECEIVED	RESULTS REQUIRED
03/03/95	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	17/03/95	1	23

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
15001/15023	SR Prep : BP033,BP031	Cu,Pb,Zn,Ag,As/GA140 As/HA140 Au,Au(R)/BB309

FILE: 710.8.3

RESULTS TO
Plutonic Operations Limited
Level 37
100 Miller Street
NORTH SYDNEY NSW 2060

RESULTS TO
Rob Reid
Plutonic Operations Limited
P O Box 282
ZEEHAN TAS 7469

RESULTS TO

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719093

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.10752	17/03/95	2005281	1 OF 1

	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Au(R)	As	As
METHOD		GA140	GA140	GA140	GA140	GG309	GG309	GA140	HA140
1	15001	7	4	25	-	-	-	-	-
2	15002	90	399	630	-	-	-	-	-
3	15003	13	36	23	-	-	-	-	-
4	15004	12	70	14	-	-	-	-	-
5	15005	6	17	25	-	-	-	-	-
6	15006	3	6	39	-	-	-	-	-
7	15007	18	4	775	-	-	-	-	-
8	15008	6	4	21	-	-	-	-	-
9	15009	2	<3	24	-	-	-	-	-
10	15010	4	4	20	-	-	-	-	-
11	15011	3	18	23	-	-	-	-	-
12	15012	10	74	431	-	-	-	-	-
13	15013	4	9	32	-	-	-	-	-
14	15014	3	46	54	-	-	-	-	-
15	15015	3	<3	9	-	-	-	-	-
16	15016	3	3	16	-	-	-	-	-
17	15017	6	<3	212	-	-	-	-	-
18	15018	2	3	20	-	-	-	-	-
19	15019	<2	14	13	-	-	-	-	-
20	15020	16	476	95	10	0.252	-	106	-
21	15021	7	77	114	<1	0.008	<0.008	54	-
22	15022	38	459	319	1	<0.008	-	<50	17.4
23	15023	361	125	188	1	0.012	-	61	-
24	DETECTION	2	3	2	1	0.008	0.008	50	0.5
25	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

Results in ppm unless otherwise specified
- = element not determined

IS = insufficient sample
SNR = sample not received

AUTHORISED OFFICER

PLUTONIC

Plutonic Operations Limited
A.C.N. 004 680 997
Level 37, 100 Miller Street, North Sydney, NSW 2060
Telephone (02) 959 3433, Facsimile (02) 955 9620

719094

APPENDIX V

SAMPLE RECORD SHEET

PROJECT NAME: Elliott Bay/Wart Hill CODE: 710 TENEMENT: (or SHEET No.)

PROSPECT NAME: V19 & Wart West

SAMPLER: RR SAMPLE TYPE: C-Horiz Soil DATE: 27-4-94

HOLE I.D.: P.O. No.:

SAMPLE No.	TYPE	INTERVAL/ LOCATION/CO-ORDS	DESCRIPTION
S 15031	C-Horiz Soils	12250N/9750E	9750E Wart West
2	"	" 9775	
3		" 9787.5	
4	"	" 9792.5	
5		" 9800	
6	"	" 9812.5	
7		" 9825	
8	"	" 9850	
9		" 9875	
S 15040	"	12250N 9900E	Wart West
1		12350N, 9700E	"
2	"	" 9725	
3		" 9745	
4	"	" 9775	
5		" 9800	
6	"	" 9825	
7		" 9850	
8	"	" 9875	
9	"	12350N, 9900E	
S 15050		12450N, 9680E	WART WEST
1	"	9700	
2		9712.5	
3	"	" 9725	
4		9750	
5	"	" 9775	
6		9800	
7	"	" 9825	
8		9850	
9	"	9900	
S 15060		12450N, 9925E	

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APP V 4

719095

PLUTONIC

Plutonic Operations Limited
A.C.N. 004 680 997
Level 37, 100 Miller Street, North Sydney, NSW 2060
Telephone (02) 959 3433, Facsimile (02) 955 9620

APPENDIX

SAMPLE RECORD SHEET

PROJECT NAME: .... CODE: .... TENEMENT: (or SHEET No.) ....

PROSPECT NAME: V19 / WART WEST

SAMPLER: RR SAMPLE TYPE: .... DATE: 27-4-95

HOLE I.D.: .... P.O. No.: ....

SAMPLE No.	TYPE	INTERVAL/ LOCATION/CO-ORDS	DESCRIPTION
S 15061	C-Horiz	12450N, 9950E	WART WEST
2	"	" 9975 E	
3		12450N, 10000 E	
4	"	12550N, 9900E	Wart West
5		12555N, 9925 E	*
6	"	12550, 9950	
7		9975	
8	"	10000	
9		10025	
S 15070	"	10050	
1		10075	
2	"	10100	
3		10125	
4	"	12550N, 10150 E	
5		12950N, 10125 E	V19, Mag high area
6		10150	
7		10175	
8		12950N 10200 E	
9		13450N, 9850E	V19,
S 15080		9875	
1		9900	
2		9925	
3		9950	
4		9975	
5		10000	
6		10025	
7		13450N, 10050E	
8			
9			
S 15090			

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App V 3

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ANALYTICAL REPORT No. 111715.60.10918

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:

Plutonic Operations Limited
Level 37
100 Miller Street
NORTH SYDNEY NSW 2060

ORDER No.	PROJECT
2014716	

DATE RECEIVED	RESULTS REQUIRED
09/05/95	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	23/05/95	1	57

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
15031-15087	SO Prep : GP031	Cu,Pb,Zn,Ag,Mn/GA140 Pb/GA104

RESULTS TO

Bob Close
Plutonic Operations Limited
Level 37
100 Miller Street
NORTH SYDNEY NSW 2060

RESULTS TO

Rob Reid
Plutonic Operations Limited
P O Box 282
ZEEHAN TAS 7469

RESULTS TO

REMARKS

AUTHORISED OFFICER

Analabs

Analabs Pty. Ltd
A.C.N. 004 591 6

719097

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.10918	23/05/95	2014716	1 OF 3

	SAMPLE No.	Cu	Pb	Pb	Zn	Ag	Mn			
METHOD		GA140	GA140	GA104	GA140	GA140	GA140			
1	15031	7	3	-	22	<1	54			
2	15032	5	5	-	59	<1	302			
3	15033	32	>5000	0.78	1440	<1	22			
4	15034	10	18	-	44	<1	58			
5	15035	147	65	-	347	<1	784			
6	15036	14	106	-	55	<1	83			
7	15037	44	29	-	70	<1	189			
8	15038	7	8	-	62	<1	87			
9	15039	2	18	-	48	<1	40			
10	15040	2	4	-	28	<1	23			
11	15041	2	8	-	190	<1	94			
12	15042	4	<3	-	78	<1	177			
13	15043	5	18	-	18	<1	18			
14	15044	4	<3	-	29	<1	41			
15	15045	5	<3	-	233	<1	918			
16	15046	6	3	-	22	<1	64			
17	15047	5	87	-	1740	<1	29			
18	15048	3	<3	-	17	<1	25			
19	15049	2	<3	-	18	<1	16			
20	15050	2	<3	-	6	<1	22			
21	15051	3	61	-	17	<1	34			
22	15052	3	<3	-	20	<1	44			
23	15053	3	4	-	3	<1	7			
24	15054	2	<3	-	11	<1	20			
25	15055	<2	20	-	7	<1	11			

Results in ppm unless otherwise specified
- = element not determined
IS = insufficient sample
SNR = sample not received

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719098

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.10918	23/05/95	2014716	2 OF 3

	SAMPLE No.	Cu	Pb	Pb	Zn	Ag	Mn			
METHOD		GA140	GA140	GA104	GA140	GA140	GA140			
1	15056	<2	7	-	35	<1	77			
2	15057	<2	<3	-	21	<1	45			
3	15058	3	9	-	15	<1	18			
4	15059	2	<3	-	26	<1	16			
5	15060	2	6	-	12	<1	17			
6	15061	2	4	-	15	<1	11			
7	15062	<2	<3	-	13	<1	9			
8	15063	2	<3	-	13	<1	11			
9	15064	3	6	-	23	<1	56			
10	15065	2	19	-	13	<1	18			
11	15066	22	102	-	2000	<1	32			
12	15067	7	36	-	134	<1	52			
13	15068	3	7	-	19	<1	11			
14	15069	3	60	-	53	<1	8			
15	15070	<2	4	-	22	<1	8			
16	15071	2	3	-	14	<1	7			
17	15072	2	3	-	16	<1	12			
18	15073	3	4	-	10	<1	10			
19	15074	2	11	-	15	<1	13			
20	15075	2	<3	-	9	<1	6			
21	15076	2	16	-	34	<1	14			
22	15077	3	11	-	18	<1	8			
23	15078	3	13	-	31	<1	5			
24	15079	2	4	-	19	<1	13			
25	15080	21	186	-	44	<1	9			

Results in ppm unless otherwise specified
- = element not determined
IS = insufficient sample
SNR = sample not received

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.10918	23/05/95	2014716	3 OF 3

	SAMPLE No.	Cu	Pb	Pb	Zn	Ag	Mn			
METHOD		GA140	GA140	GA104	GA140	GA140	GA140			
1	15081	3	17	-	22	<1	6			
2	15082	2	33	-	24	<1	7			
3	15083	<2	111	-	26	<1	4			
4	15084	<2	9	-	6	<1	3			
5	15085	<2	4	-	11	<1	3			
6	15086	2	8	-	16	<1	21			
7	15087	2	5	-	7	<1	8			
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24	DETECTION	2	3	0.01	2	1	3			
25	UNITS	ppm	ppm	%	ppm	ppm	ppm			

Results in ppm unless otherwise specified IS = insufficient sample
- = element not determined SNR = sample not received

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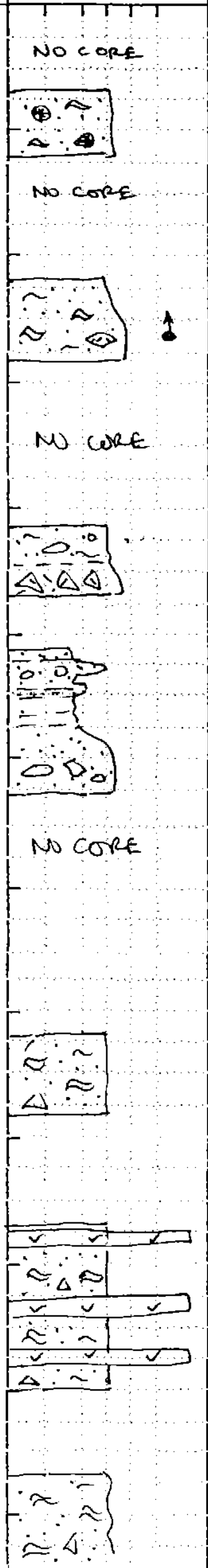
Appendix VI

Graphic Core Logs: WH1-12A and EC2A

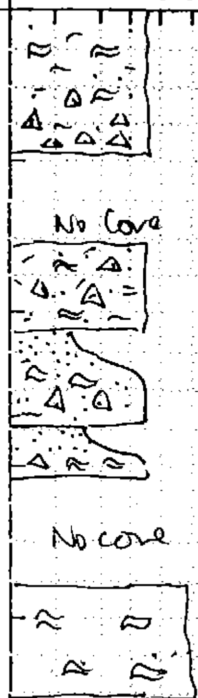
GRAPHIC CORE LOG	Hole No. V19-2 Depth m
Scale 1:500	Project VOYAGER 19 ELLIOTT BAY EL 53/94
By W. HERRMANN	Section
Date 15/12/95	Collar co-ords E N RL
Page 1 of 2	Az. °G °M Incl. °



Depth m	Max. clast ϕ & Structure	Description
0–7		NO CORE
10	HQ	Orbicular Qtz xtal rich pumiceous sst. Leached + weathered.
13–20	NQ	NO CORE
20	cl: 45°	Sericitic M.g. Qtz rich pumiceous/lithic Volcaniclastic Sst/Bx.
30		NO CORE
40		Sericitic lithic-Qxtal Sst, some cherty pyritic and jasper clasts. Coarse QpR lithic rich Bx
50	cl: 50°	Sericitic to siliceous, cherty felsic Sst/Slst. interbedded c̄ minor QpR lithic Bx. Trace dissem Cu.
60		NO CORE
70		
80		sericitic massive (locally chloritic) Q-Fs xtal rich pumice Bx/Sst, few coherent QpR lithics and fiamme.
90		
100		3 thin basalt sills sub // cleavage. (Similar to 82–88 m.)
110		
120		sericitic massive Q-Fs xtal rich Pumice bx and minor pumice Sst.

GRAPHIC CORE LOG	Hole No. V19-2 Depth 164.2 m
Scale 1:	Project Voyager 19.
By	Section
Date	Collar co-ords E N RL
Page 2 of 2	Az. °G °M Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
			Increasing small QpR lithics downhole
130	No Core		
			" "
140			Sericitic felsic V/clastic sst. grading downhole to pumice (QpR lithic) Breccia.
150	No core		
160			Sericitic coarse pumice Breccia with traces of relict tube pumice fabric.
164.2			



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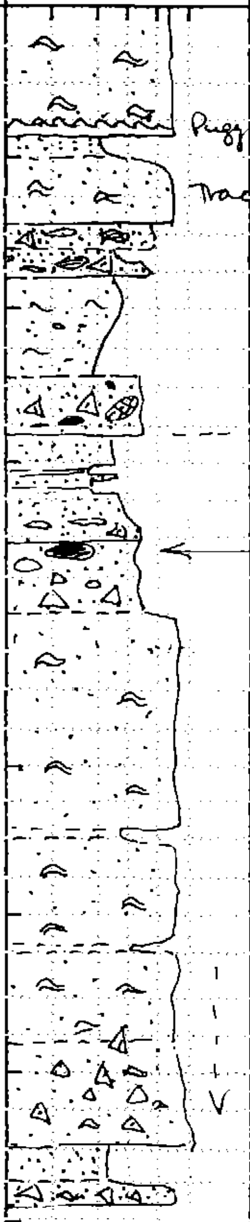
GRAPHIC CORE LOG

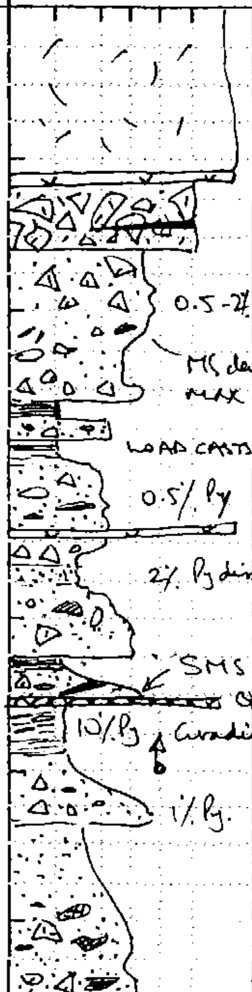
Scale 1: 500
By W. HERRMANN
Date 27/10/95
Page 1 of 1

Hole No. ERT 88 – WH1 Depth 78.5 m
Project VOYAGER 19
Section
Collar co-ords E N RL
Az. °G °M Incl. °

Depth m	Mean Grainsize (Mud 0.5 2 8 32 mm)	Max. clast φ & Structure	Description
		5-100mm	Weathered massive Rhy Pumice Bx 10% fiamme.
10	Puggy Shear 20cm.		Fine volcaniclastic Sandstone.
	Trace diss. Py.		
			Polymictic Sst. + Breccia. QpR, mudst. lithics to 50 mm. Few small MPy. clasts.
20			Sericitic massive pumiceous Sandstone.
30		BOCO –	Sericitic Tabular bedded f-m.g. felsic V/c Sandstone
		0.2% diss Py.	
	←		Large clast pyritic cherty siltstone.
40			Sericitic Polymict Bx mainly QpR + chert clasts.
			Sericitic banded/massive Pumice Bx/SSt.
		cl: 40:	Minor bands f.g. ashy volc. Slst.
50			Small QpRhyolite lithic clasts near down hole contact.
60			
		Patchy dissem. 0.5-1% Py	
70			
80	EOH.		



GRAPHIC CORE LOG	Hole No. EBT-88 WH2 Depth m
Scale 1:500	Project EBT-88 WH2 Voyager 19.
By W. HERRMANN	Section
Date 26/10/95.	Collar co-ords E N RL
Page 1 of 1	Az. °G °M Incl. °

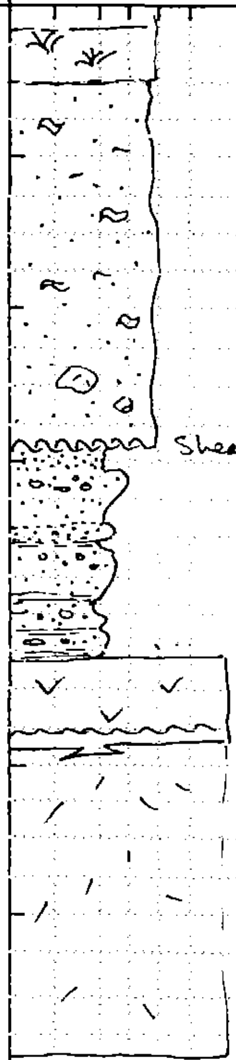


Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
0			Weathered (chalky) cleaved Q(F,Bi) phyric Rhyolite
		cl : 40°	
10			
		--Boco	{ Weathered pseudofragmental or hyaloclastic Q(F) p Rhyolite c 20mm band fed Sp-Cu-Py MS // to clvg at 40°.
20	0.5-2% diss Py.		Sericitic massive polymictic Bx/Sst. mainly QpR, some chert, rare MS clasts total 5-30%. Clasts decreasing in size + prop. downhole.
	MS clasts round max ~20mm		
30	LOAD CASTS; 0.5% Py		
		BASALT	
	2% Py dissem.		
40			
	SMS bands to 100m.		
	Q. Vn		Sheared cherty Mudstone
50	10% Py; Grading.	MS to 15mm	
	1% Py.		Polymictic Bx/Sst.
60		<0.5% Py.	Sericitic Carbonated Polymict Bx/Sst. lithics are chert, CO3, Pumice, QpR. No sulphide

GRAPHIC CORE LOG

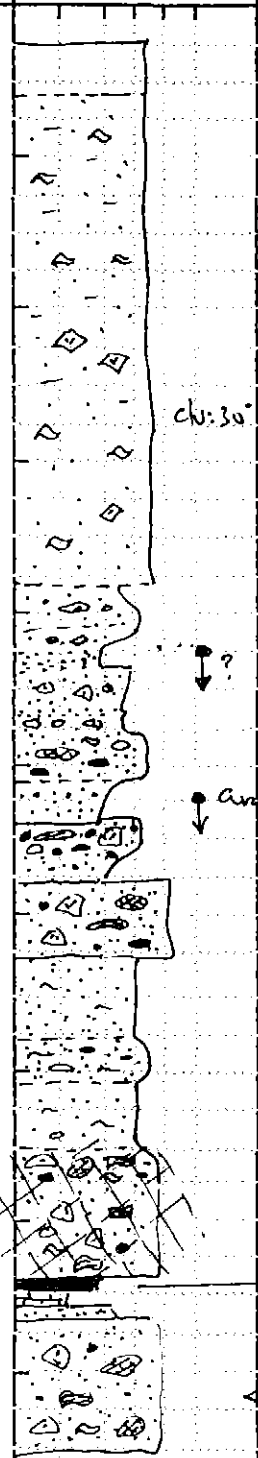
Scale 1:500
By W. HERRMANN
Date 8/11/95
Page 1 of 1

Hole No. EBT-88 WH3 Depth m
Project Voyager 19 Elliott Bay EL53/94
Section
Collar co-ords E N RL
Az. °G °M Incl. °

Depth m	Mean Grainsize (Mud 0.5 2 8 32 mm)	Max. clast ϕ & Structure	Description
0			Peaty Gravel.
10			Weathered clayey/sericitic massive Pumiceous felsic volcaniclastic Sandstone.
20			Strongly leached c relict pumice fabric, some indistinct possible QpR lithic fragments below 24 m.
30		Shear/Poggy.	
		BOCO	Sericitic fine to coarse grained Qtz xtal + rhyolitic lithic volcaniclastic Sandstone.
		Bd=cl ~35°	Well bedded with sharp boundaries from fine to coarse but facing equivocal.
40		Bd: 50°	
		Shear.	Chloritic massive fine grained amygdaloidal Basalt.
50			
60			Sericitic (weakly carbonated) massive coherent Quartz (Feldspar-Biotite) porphyritic Rhyolite.
		ClV: 35°	5-10%, 2-4mm clear, embayed qtz phenocrysts and ~5% tabular altered FS with shreds of altered biotite evenly distributed in pale buff grey aphanitic matrix. Weak spaced cleavage.

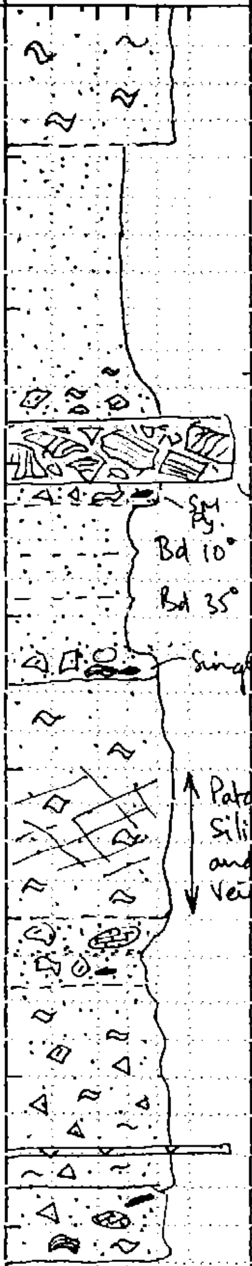
719106

GRAPHIC CORE LOG	Hole No. EBT-88 WH4 Depth m
Scale 1:500	Project VOYAGER 19 EL 53/94
By W. HERRMANN	Section
Date 2/11/95	Collar co-ords E N RL
Page 1 of 1	Az. °G °M Incl. °

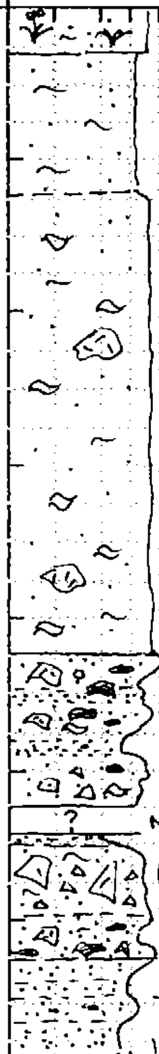


Depth m	Max. clast φ & Structure	Description
0–38	clv: 30°	Sericitic (Chloritic) massive Pumiceous Breccia and Sandstone. 10% greenish grey qtz+fs xt. rich "fiamme" 5-30 mm size matrix supported in muddy pale buff-grey siliceous arty-sandy matrix with ~5-10% qtz xt. fragments upto 2mm. Occasional indistinct sparsely qtz phyric phyllitic lithic frags.
38–63	QpR 10-40mm; ↓? Bd//cl: 30°; MS: 20mm; QpR: 40mm; ↓ graded; MS: 100mm; MS: 20mm; QpR: 100mm	Sericitic massive to planar bedded volcaniclastic Sandstone interbedded with units of sericitic massive Polymictic volcaniclastic Breccia/Conglomerate. Some units crudely graded. Clasts in breccias predominantly of QpR, also white CO_3, chert and Semi-massive sulphide. Chert + SMS clasts dominant in interval 53-55m.
63–76	<0.5% Py; clv: 40°	Sericitic massive medium grained felsic volcaniclastic Sandstone.
76–84	SMS 20-50mm (Sparse); 1% Py.	Carbonated massive polymictic Breccia. Similar to breccias above but with strong pervasive CO_3 alth. overprint.
84–86	Bd: 75°	Banded massive Sphalerite > Galena-Py-Ba-Cc and f.g massive-nodular CO_3-Marble-Intraclast?
86–96	clasts ≤40-120 mm	Sericitic massive Polymictic Lithic Volcaniclastic Breccia. Mostly rounded QpR, CO_3, CO_3 altered QpR and subordinate qtz xt. rich pumice fiamme in med. grained sandy qtz xtal rich matrix. Rare rounded blebs massive Py to 10mm. No MS or chert clasts.

GRAPHIC CORE LOG	Hole No. EBT-88 WH5 Depth 825. m
Scale 1:500	Project VOYAGER 19 WH5.
By W. HERRMANN	Section
Date 2/11/95.	Collar co-ords E N RL
Page 1 of 1	Az. °G °M Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast ϕ & Structure	Description
0			Weathered clayey massive Pumiceous Breccia. Local relict fiamme but pretty weathered.
10			(Very weathered + Pyoggy above 24m)
			Sericitic (clayey) massive m.g. Qtz xtal rich volcaniclastic sandstone Qtz ~20%.
20			Last metre or so has upto 15% fiamme and creamy flow banded irregular shaped Rhyolitic clasts
		-BOCO--	
		clasts 50mm.	Sericitic Autoclastic Flow Banded Rhyolite Breccia
30		clasts to 100mm. Contact Broken.	Sparsely Q(F)phyric Rhyolite, Monomict.
	SM Py. Bd 10°		Sericitic massive to diffuse bedded m.g. felsic volcaniclastic Sandstone; with thin
40	Bd 35°	<0.5% diss Py.	polymict Breccia beds near upper + lower contacts. Clasts mainly QpR, few mudst.
		Single clast MPy 15mm.	and rare SMS Py.
		cl: 40-50	Sericitic (chloritic) massive Pumice Bx/Sst.
50	Patchy pervasive Silicification and Qtz-CO3 Veins.		10% 10-50mm chloritized fiamme in paler sericitic qtz xtal rich m.g. sandy matrix.
60		Bd. 40°	
			Silicic/sericitic/chloritic massive c.g. Rhyolitic lithic + Pumiceous Sst/Bx.
70		<0.2% diss. Py.	largely composed of Rhy clasts <10mm in ashy muddy siliceous matrix.
			F.g. Aphyric Basalt c chilled f.g. margins.
		Bd: 60°	
80		<0.5% Py.	Sericitic (Chloritic) massive Polymictic volcaniclastic Breccia.
			Clasts dominantly rounded QpR, CO3 alt. QpR, white CO3, Pumice fiamme, mudstone and pyritic chert. (No sulphides)
90/95			Clasts 10-50mm some upto 150mm matrix supported in fine - med. gr. green grey sst.

GRAPHIC CORE LOG	**Hole No.** ERT-88 WH6 Depth 68.8 m
Scale 1:500	Project VOYAGER 19 EL53/94.
By U. HERRMANN	Section
Date 3/11/95	Collar co-ords E N RL
Page 1 of 1	Az. °G °M Incl. °



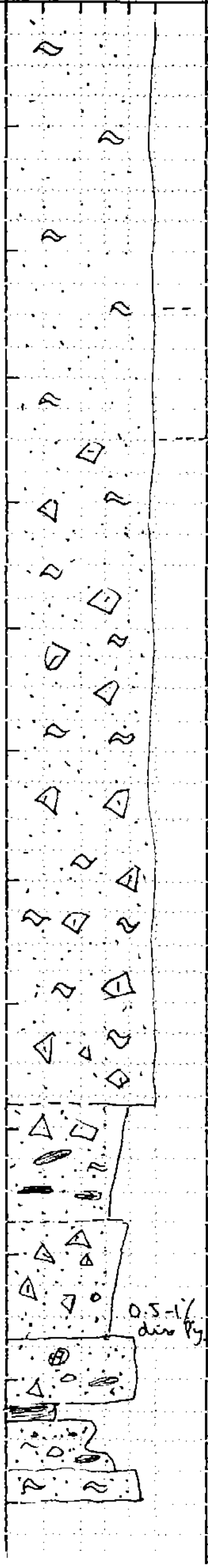
Depth m	Mean Grainsize (Mud 0.5 2 8 32 mm)	Max. clast ϕ & Structure	Description
0			Peaty gravel + clay.
			Weathered clayey qtz phyric volcanic similar to below?
10			
		cl: 20°	Sericitic massive qtz phyric pumice (Rhyolitic lithic) Breccia/Sst.
20		cl: 60°	Sparse fiamme and few rounded qtz porphyritic Rhyolite clasts 5-50mm in messy sericitic m.g. matrix.
30			
		cl: 0°	
40	BOCO	cl: 30°	
	graded	Bd: 35°	Sericitic bedded Polymictic Volcaniclastic Breccia and Sandstone: clasts incl. QpR, pumice? mudstone, pyritic clast, MPy and M sulphide
50		Bd: 30°	
	No core		
	(locally bedded)		Silicified (sericitic) Rhyolitic lithic rich V/c Breccia. 8-50mm QpR clasts in parts framework supported, patchy pervasive grey silicification c̄ minor Cu-Py-Sp veinlets
60			Polymictic Bx c̄ abundant chert clasts
	TOFR	Bd: 40°	
	1-2% dissem Py 5% Carbonate.		Sericitic (Carbonated) massive to diffusely bedded quartz crystal rich (Rhyolitic) lithic volcaniclastic Sandstone.
			~25% qtz xts, >25% rhyolitic lithic granules c̄ buff coloured sericitic matrix.

GRAPHIC CORE LOG

Scale 1: 500
By W.HERRMANN
Date 1/11/95
Page 1 of 1

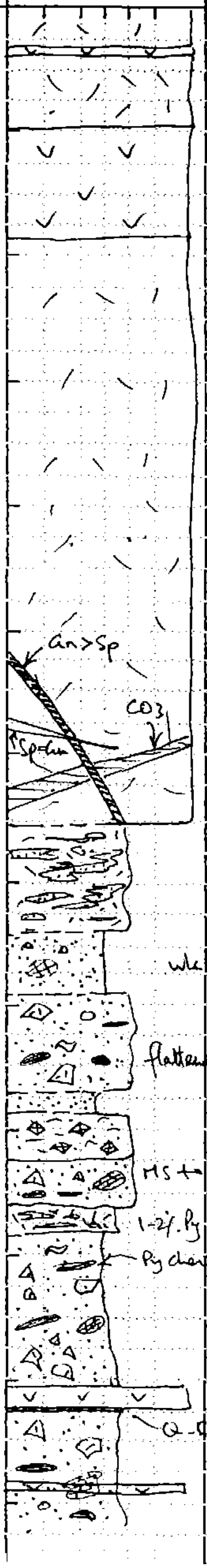
Hole No. EBT-88 WH7 Depth m
Project VOYAGER 19 EL53/94. TAS.
Section
Collar co-ords E N RL
Az. °G °M Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
0			
10			Sericitic massive Pumiceous + Rhyolitic lithic Breccia.
20			Rhyolite clasts to 20cm distinct below 35M. but still containing wisps/streaky collapsed pumice fiamme?
		BOCO	
30			
		TOFR	
40			
50		clasts to 200mm.	
60			
70			
80			
90		clasts 100mm	Sericitic (carbonated) massive polymictic Breccia SandStone. Q(F)pR and well rounded cherty Slst clasts dominant, minor pumice fiamme. Matrix supported.
		clasts < 50mm	
100	0.5-1% diss Py	Cl: 45° ↓ clasts diminish	Sericitic massive monomict Rhyolite Bx/Sst. Only matrix supported Q(F)pRhy clasts (no chert etc)
110			Polymict Bx./Sst.
			cherty Pyritic Siltstone (could be large clast?).
		Bd: 35-40° Clv. 40°	Polymict Sericitic Breccia/Sst 5-10% clasts.
120		0.5% diss. Pyrite.	Sericitic massive (Rhyolitic) Pumice Breccia



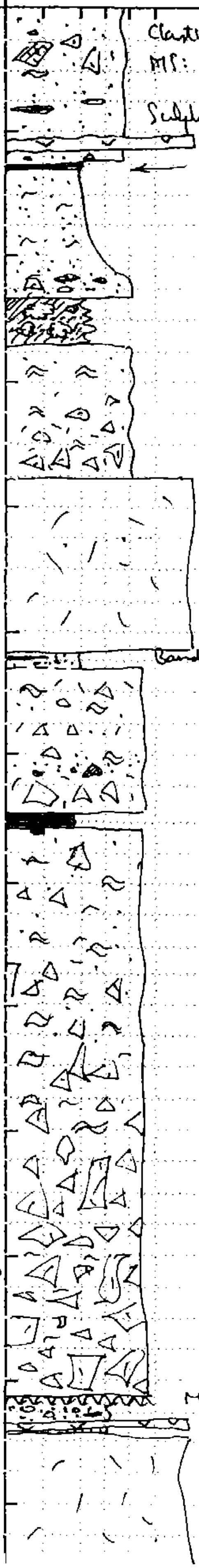
GRAPHIC CORE LOG

Scale 1: 500	Hole No. EBT-89 WH8 Depth m
By W. HERRMANN	Project Voyager 19. EL 53/94.
Date 24/10/95.	Section
Page 1 of 3	Collar co-ords E N RL
	Az. °G °M Incl. °



Depth m	Max. clast φ & Structure	Description
	<0.1% Py	Sericitic massive qtz phyric Rhyolite
	Sharp	↑ leached above 10m.
10		Chloritic amygdaloidal f.g. massive Basalt.
	Sharp.	
20		
30		
		Sericitic qtz phyric coherent massive Rhyolite
40	Py <0.1%	3% 1-4mm clear qtz phenocrysts in sericitized pale buff grey felsic aphanitic matrix c minor shreds chlorite ex. Bist?
50	cl: 30°	Occasional fine <2mm Gn-Sp-Q-Cc veinlets both sub // and cross cutting clvg. (ie partly post tectonic)
60		
	Contact indistinct/indeterminate.	
70	3-4% diss. Py	Sericitic streaky/foliated Slst + Pumice Bx. Mixtite of f.g. mudstone disrupted by pumiceous bx emplacement? looks vaguely peperitic?
	wk cl: 35°	Sericitic massive felsic V/c Sst, sparse "cannonballs" of pervasive CO3 alteration.
80	30% clasts, flattened MS 20-30mm	Sericitic (carbonated) massive polymictic Volcaniclastic Breccia. Clasts: QpR, CO3 alt. QpR, rare pyritic cherty slst + Sp rich MS.
90	←	Sericitic Qtz xtal rich pumiceous Sst?
	MS to 20mm	Similar to 78.8 – 87.1m. + CO3 clasts.
	1-2% Py	Similar to 65.3 – 74.2m
100	Py chert.	Sericitic (carbonated) massive polymictic Breccia
	cl: 50°	fewer CO3 and MS clasts; clast conc. increasing down
110		Basalt.
	Q-CO3 vein.	
120		

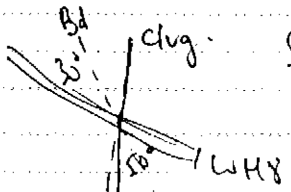
GRAPHIC CORE LOG	Hole No. WH8 Depth m
Scale 1:	Project
By	Section
Date	Collar co-ords E N RL
Page 2 of 3	Az. °G °M Incl. °



Depth m	Max. clast ϕ & Structure	Description
	Clasts: 5-400mm; MS: 20-40mm; Sulphide ~0.2%	Clast rich Polymict Bx. 10-20% clasts. Some large clasts/bands py clast. Rare Sp-Cn-Py-Qtz MS clasts.
130		Dark Chlorite.
	20mm. cl: 65°	Sericitic (chloritic) Pumiceous (lithic) V/C Sst + Bx. 5% "fiamme", rare lithics except near downhole contact
140		Nodular/cauliflower patches of Cream CO_3 (20mm) in f.g. massive chlorite-sericite matrix c̄ minor relict sst. felsic. Alteration chl-CO_3?
150		Sericitic massive Pumice Breccia grading downhole to murky fine-coarse Rhyolite breccia. Could be pseudofragmental??
160	cl: 60°; <0.2% Py.	Sericitic massive QFBi p. Rhyolite, coherent. 3-5% 1-4mm clear qtz xts. 1% 1-2mm chloritized biotite flakes and murky Fs ph.xts. in grey buff aphanitic matrix.
170	Band 20mm SMS	in bedded ser. felsic Sst.
180	QPR 20-100; <0.5% Py.	Sericitic (carbonated) massive Pumiceous/Rhyolitic lithic Breccia. Locally polymictic below ~183m
	80% Sulph.	MASSIVE SULPHIDE f.g. Sp-Py-Cn in silica-CO_3 gangue. Lower contact irregular + tourmaline.
190		Sericitic massive Pumice/Rhyolitic lithic Breccia. Large coherent Rhy lithic frags increasing (and clearer outlined) downhole.
200		
210		
220	cl: 70°; <0.2% Py	Polymictic Bx below 231m. c̄ rounded clasts chert, CO_3 alt. QPR and fed/ser QPR.
230	Minor Shear.	Basalt.
240		

GRAPHIC CORE LOG	**Hole No.** WH8 Depth m
Scale 1:	Project
By	Section
Date	Collar co-ords E N RL
Page 3 of 3	Az. °G °M Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
			Sericitic massive Qtz (Fs) phyric Rhyolite. Coherent.
250			
	— Bucky Qtz-Cog vns.		
	— Irregular Pyritic stringer veins. overprinted by later Q-Cog veins. assoc. c̄ semi pervasive silicification		
260		1-2% Py in vns	
		Trace Cu-Sp.	
			In situ hyaloclastite near lower contact?
270			
	contact indistinct. Pyritic lithic SSt/Bx.		Angular-subround QPR matrix supported in well sorted clean sandstone. 5-15% Py in matrix. extending into fractures in QPR bx above.
	10% Py.		
	3-10% Pyrite		
280			
283.4	EOH.	Bd: 30° Cl: 50°	Pyritic lithic Sandstone. Coarse to med. grained, well sorted, mature, grain supported crudely bedded and c̄ grainsize grading fining downhole.



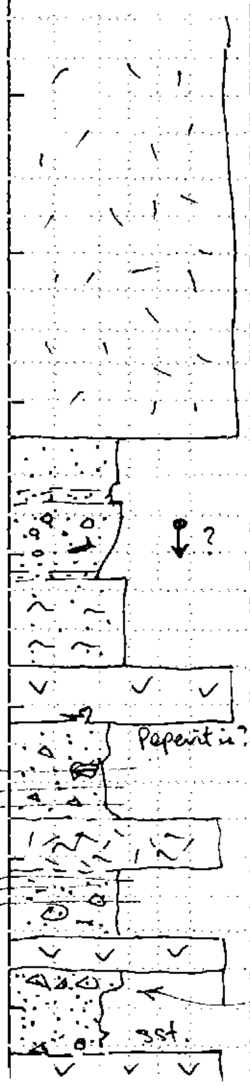
Clvg: Bedding relationship indicates steep bedding dips to East.

Dissem Py upto 10% above 277m gradually diminishing to 1-2%.

GRAPHIC CORE LOG

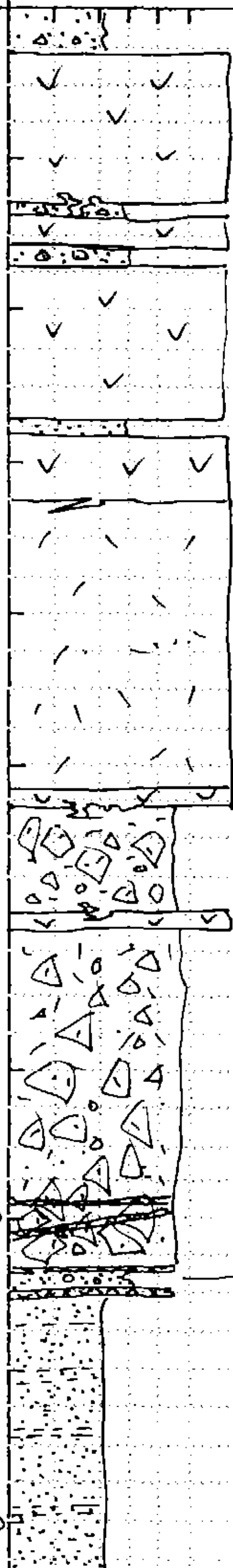
Scale 1: 500	Hole No. EBT-89 WH9 Depth m
By W. HERRMANN	Project VOYAGER 19' EL 53/94 TAS.
Date 8/11/95	Section
Page 1 of 2	Collar co-ords E N RL
	Az. °G °M Incl. °

Mean Grainsize: Mud 0.5 2 8 32 mm



Depth m	Max. clast ϕ & Structure	Description
10		
20		
30		
40		
50		
60		Sericitic (weakly Carbonated) massive coherent Q(Fs, Bi) phyric Rhyolite.
	Cl: 30°	Similar to QpR at end of WH3, slightly more flattened + cleaved.
70	<0.1% Py	Weak stockwork of cream CO_3 veinlets.
80		
	Bd // Clv. 35°	Interbedded sericitic massive to laminated volcaniclastic sandstone and minor Rhyolitic lithic sandstone / breccia. QpR + chert clasts.
90	Clasts <80mm	
	clv: 35°	Sericitic massive Pumiceous Sandstone.
100		Chloritic aphyric massive Basalt.
		Sericitic massive lithic v/c Sandstone with patches of pervasive CO_3 alteration overprint.
110	clast? = 3m.	Pseudofiamme? altered coherent QpR?
		Carbonate veined Basalt.
120	Mainly QpR clasts to 100 mm	

GRAPHIC CORE LOG	**Hole No.** WH 9 Depth m
Scale 1: 500	Project
By	Section
Date	Collar co-ords E N RL
Page 2 of 2	Az. °G °M Incl. °



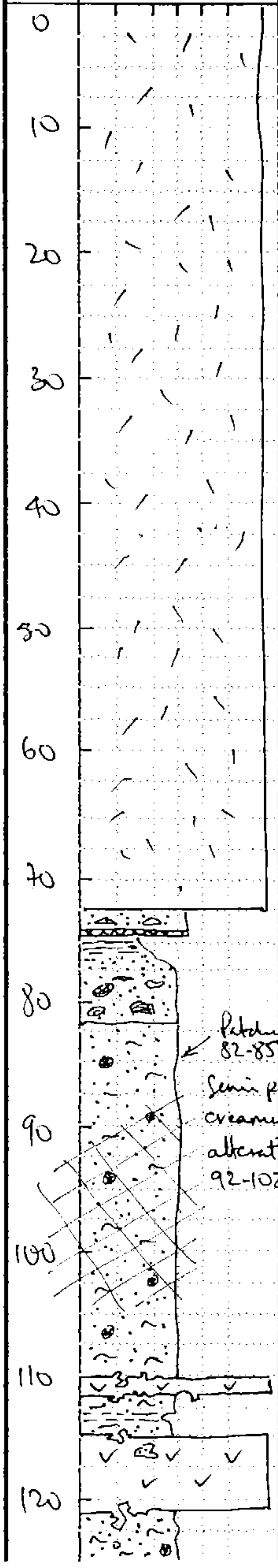
Depth m	Max. clast φ & Structure	Description
120		
130	Peperitic	Chloritic carbonated f.g. massive aphyric amygdaloidal Basalt.
140	Contacts obscured by veins Q-CO3	
150	Contact sharp + irregular	
160		Sericitic massive / pseudofiamme altered sparsely quartz phyric Rhyolite. Interpreted as coherent with pseudofiamme alteration.
170	Contact: 20°.	Basalt
		Sericitic/siliceous QpR Rhyolite - Breccia. Hyaloclastite?
180	Peperitic	Basalt.
		Rhyolitic Hyaloclastite Breccia?
190		
200	Bucky Quartz Veins	
	→	Volcaniclastic Conglomerate. Rounded clasts of QpR and Carbonated QpR, sandy matrix.
210	Bd: 50-55°	Siliceous - limy calcareous bedded
	cl: 15-25°	Sandstone. (WGG?)
		Well sorted grey quartz wacke, minor pale calcareous beds and black silty beds.
220		

* Oriented core at 219 m suggests clvg: trend ~120° / dip 80SW which is unlikely. If cleavage is trending // regional clvg. ie: NNW Then bedding is <20° to NE implying minor folding.

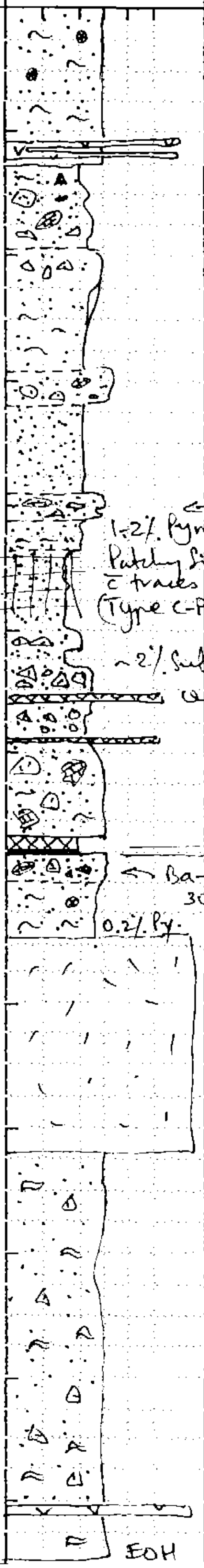
GRAPHIC CORE LOG

Scale 1: 500	Hole No. ERT-89 WH10 Depth m
By W.HERRMANN	Project VOYAGER 19 EL53/94.
Date 3/11/95	Section
Page 1 of 2	Collar co-ords E N RL
	Az. °G °M Incl. °

Depth m	Mean Grainsize (Mud 0.5 2 8 32 mm)	Max. clast φ & Structure	Description
0–70		BOCO	Sericitic massive (coherent) Quartz (Fs-Bi) porphyritic Rhyolite. Equant embayed phenocrysts clear quartz (1.5-3mm, ~5%) with subordinate tabular sericitized feldspar and book like flakes of chloritized biotite in pale buff grey aphanitic felsic matrix c̄ weak wispy streaks (<10mm) of sericite aligned with spaced anastomosing cleavage. Irregular stockwork of carbonate veins generally 2-10/m increasing downwards. Alteration intensity is weak; insignificant Py.
80		Clasts: 100 m.	Sericitic Massive Polymictic lithic volcaniclastic Sandstone + Breccia. Clasts include white CO3, blk mudstone, grey chert, CO3 alt. Rhyolite and minor pumice?
		Patchy Py ±5% 82-85m, type D Pb-Isotopes (Gemmell, 1992).	
90–100		Semi pervasive creamy CO3 alteration 92-102m.	Sericitic/chloritic (locally Carbonated) Massive quartz crystal rich Pumice Breccia? No discernible relict pumice but has vague eutaxitic fabric and faint fiamme, uneven distribution of qtz xtls (0.5-4mm) and locally distinctive ellipsoidal aggregates of radial quartz to 10mm, possibly relict spherulites.
110–120			Chloritic f.g. massive Basalt, c̄ peperitic contacts.

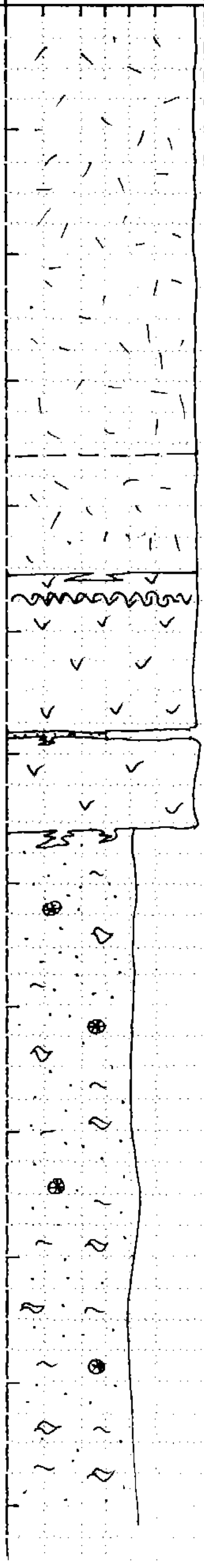


GRAPHIC CORE LOG	**Hole No.** WH10 Depth m
Scale 1:	Project
By	Section
Date	Collar co-ords E N RL
Page 2 of 2	Az. °G °M Incl. °



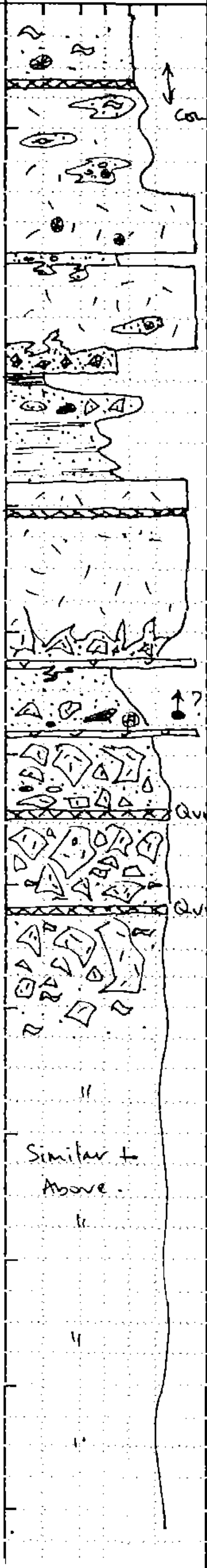
Depth m	Max. clast φ & Structure	Description
120		
130		Basalt.
	CO_3 → 150mm; Ba-Cu to 50mm.	Sericitic Massive Polymictic Sandstone/Breccia clasts QpR, CO_3 and rare SM Ba-Cu and grey chert, matrix supported, sandy base.
140		
150		Sericitic massive Med grained Qtz xtal rich volcaniclastic Sandstone.
160		Duomictic Breccia CO_3 alt. QpR + CO_3 clasts
	1-2% Pyrite; Patchy Sil. alt'n c̄ traces Cu+Sp (Type C-Pb Isotope)	
170	~2% Sulphide; Qtz veins 15-100 mm	Sericitic - Silicified - Carbonated (patchy) massive (monomict) clast rich Rhyolite Breccia
180		Sericitic massive clast rich polymictic Breccio-conglomerate. Mainly QpR, carbonate altered QpR and carbonate clasts.
		Massive Barite c̄ ~~trace~~ minor Py-Sp
	Ba-MS clasts 30 to 50 mm; 1 @ 150mm	Massive Sulphide - Barite
190	0.2% Py.	Chloritic/Sericitic Pumiceous Massive Sst.
		Siliceous-Sericitic massive to pseudo fragmental Q-Fs porphyritic Rhyolite looks originally coherent!
200	0.1% dism Py.	
210		
		Sericitic massive Pumiceous and Rhyolitic lithic volcaniclastic Sandstone.
220		QpR lithics more abundant and distinct downhole, matrix supported. Dark "fiamme" of phyllosilicates interp as collapsed pumice?
230	cl: 70°	Normal sericitic alteration with very low pyrite concentration.
240	contacts 70° LAC	Basalt.
244.5	EOH	

GRAPHIC CORE LOG	Hole No. ~~EBT 89~~ WH11 Depth m
Scale 1: 500	Project VOYAGER 19 EL 53/94 TAS.
By W.HERRMANN	Section
Date 22/12/95	Collar co-ords E N RL
Page 1 of 3	Az. °G °M Incl. °



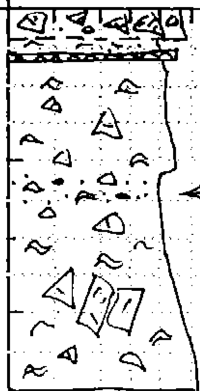
Depth m	Max. clast ϕ & Structure	Description
10		Leached/bleached clayey weathered Q(FBi)p Rhy. Some bucky Qtz +/- chl veins c̄ trace py.
20		
30	BOCO	cleared massive coherent Q(FBi)p Rhyolite.
40	Clv: 25°	
45.4	Contact 30° CA sharp intrusive Bx	
	0.3m Shear.	chloritic massive f.g. Basalt. Low frequency Qtz-Cb veins to 2cm.
50		
60		
66.3	Peperitic	
70		Sericitic massive M.g. Q(F) xtal rich Pumiceous Volcaniclastic Breccia/Sandstone.
80		with characteristic "orbicular" relict spherulites? ~ 4-8mm diam. <4% above 100m increasing locally 10-15%@110-125m
90		Locally chloritic. Few distinct clasts or fiamme. Vague wavy eutaxitic fabric suggesting high primary pumice content.
100		Relict spherulites? are radial aggregates of qtz, exist in dark fiamme as well as paler sericitic matrix.
110		Peperitic basalt contact evidence against pseudo fragmental alteration of coherent rhyolite.
120		

GRAPHIC CORE LOG	Hole No. WH 11 Depth m
Scale 1:	Project Voyager 19.
By	Section
Date	Collar co-ords E N RL
Page 2 of 3	Az. °G °M Incl. °

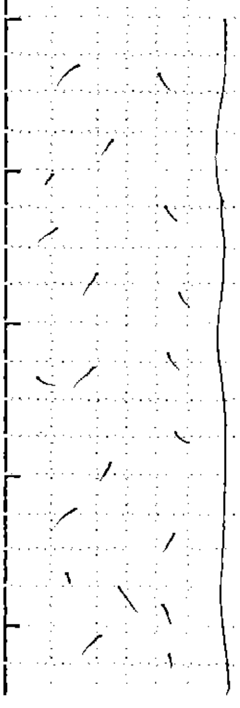


Depth m	Max. clast φ & Structure	Description
120		
	Bucky Qtz vein.	
130	contact gradational.	
		MIXED ZONE peperitic mixtite?
	Contact	gradational.
		Sericitic massive coherent Spherulitic QpR.
140	peperitic	
		" "
	peperitic	Sericitic foliated c.g. QFs xtal Rich Sst. >40% Q+Fs xtals 2-6mm c minor Bi in ser foli. matrix
150		
	Bd=clv. @ 60-70°	Ser. massive to crude bedded felsic Volc. Sst. c minor coarse polymict bx. clasts 10-150mm mainly QpR, some grey cherty slst.
160	Qtz vn.	Sericitic (weakly carbonated) massive coherent Q(F)pRhyolite. 5-10% 0.5-2mm qtz ph.xts. in creamy sil-ser aphanitic matrix.
	<0.5% Py.	Blurry pseudoclastic or hyaloclastic bx fabric in last 2m.
170	Peperitic	– Basalt.
		Sericitic M-f.g. sst + polymict Breccia; QpR, chert, CO_3 clasts and single 25mm clast of SM qtz-CO_3-sp-cu.
180	Basalt.	
		Siliceous-sericitic QpR clast rich Breccia; minor polymict sandy sections and sparse pumice fiamme.
	<0.5% Py.	
190		
		Sericitic - siliceous QpR lithic and Qxtal rich pumice rich volcaniclastic massive Breccia.
200		
		(Similar to mixed breccias in WH8 below 186m.)
210		
220		QpR lithics to at least 10cm increasing downhole, pumice fiamme decreasing below 220m.
230		
240		

GRAPHIC CORE LOG	Hole No. WH 11 Depth m
Scale 1:	Project VOYAGER 19.
By	Section
Date	Collar co-ords E N RL
Page 3 of 3	Az. °G °M Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
240		Q-CO3 vein.	
			Similar to above but abundant increase in pumice and smaller QPR lithic clasts.
250			
			Locally phyric c̄ rare angular cherty s/st, or aphyric rhyolite frags.
260			

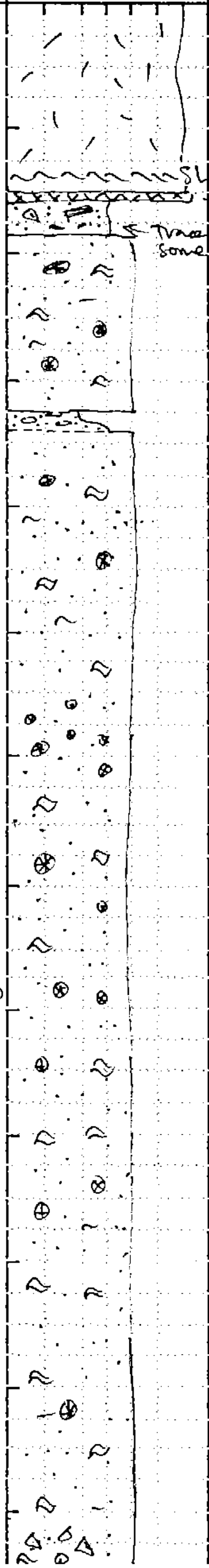
GRAPHIC CORE LOG	Hole No. EBT-89 WH12A Depth m
Scale 1: 500	Project
By W. HERRMANN	Section
Date 14/11/95	Collar co-ords E N RL
Page 1 of 3	Az. °G °M Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
0			
10			
20			
30			
40			
50			
60			
70	Not Logged. ↑		
80			
			Sericitic (locally carbonated) massive coherent Qtz (Fs+Bi) porphyritic Rhyolite.
90			(Alteration: weak, No Pyrite.)
100			
110			
120			

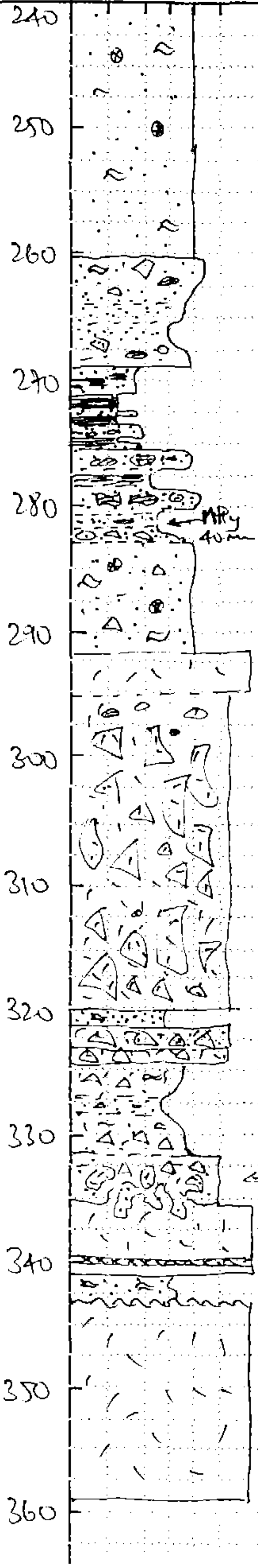
GRAPHIC CORE LOG

Scale 1:	Hole No. WH12A Depth m
By	Project
Date	Section
Page 2 of 3	Collar co-ords E N RL
	Az. °G °M Incl. °

Depth m	Mean Grainsize (Mud 0.5 2 8 32 mm)	Max. clast ϕ & Structure	Description
120			
130	Shear		
	Bucky Quartz Vein		
		Trace Sp in some lithics.	
140		Bd: 40°	Sericitic, faintly bedded Rhy. lithic V/clastic Sandstone.
		0.5-2% Py.	Sericitic/chloritic massive felsic Pumiceous Breccia/Sandstone.
150		clv: 45-50°	(Similar to 81.5-110.3m in WH10)
		Bd: 40° // clvg.	
160			Sericitic/chloritic massive felsic Pumiceous Breccia Sandstone.
170			Generally massive ~10% 0.5-2mm qtz xtls and ~2% relict spherulites to 6mm (small radial quartz aggregates.), blurry greenish grey wispy pumice interpreted as collapsed pumice clasts.
180			
190			
200			
210			
220			
230			
240			

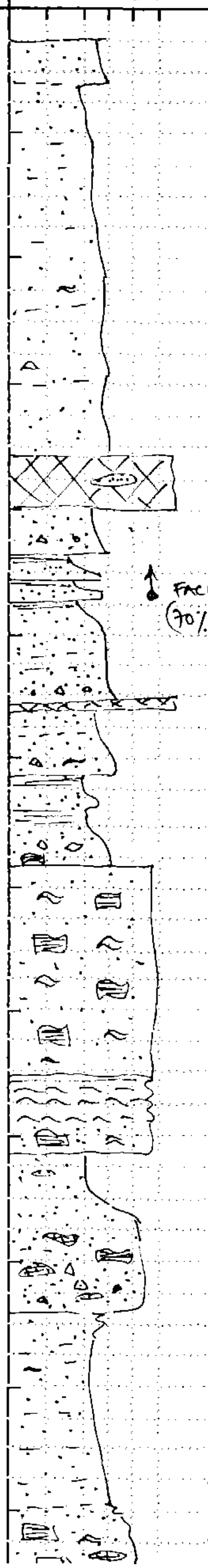


GRAPHIC CORE LOG	Hole No. WH 12A. Depth m
Scale 1:	Project
By	Section
Date	Collar co-ords E N RL
Page 3 of 3	Az. °G °M Incl. °



Depth m	Max. clast φ & Structure	Description
260–270	clv: 60°	Sericitic weakly stratified Volcaniclastic Sandstone with minor polymictic breccia beds. Clasts dominantly QPR and some chert, pumice.
270–278		"Mixtite" of sericitic qtz xtal v/c. Sandstone and interbedded/partly transposed dk. grey carbonaceous siltstone.
278–283	clasts to 100 mm.	Polymictic interbeds c̄ clasts QPR, CO3 and intraclasts of pyritic cherty siltstone. Few small "lenses" massive Pyrite ~~near~~ in lower few metres.
283–293		Sericitic massive Rhyolitic Lithic/Pumice Breccia
293–320		Sericitic/Silicified massive (QFBi phyric) Rhyolitic Breccia QPR clasts constitute about 80% vol. upto at least 1m size possible hyaloclastite. Rare clasts buff coloured aphanitic Rhyolite or cherty slst? and some possible fiamme/collapsed pumice clasts.
320–330		Sericitic pumiceous Sandstone.
330–337		Sericitic peperitic? mixtite of coherent Q(FBi)p Rhyolite and qtz xtal rich pumiceous sandstone.
340–344	Qtz Vn. Q.S/diss Pyrite	
344–360	Cl: 60°	Sericitic/Siliceous massive coherent Q(FS) phyric Rhyolite.

GRAPHIC CORE LOG	Hole No. EBT 89 . EC2/2A Depth 189.8 m
Scale 1:500	Project VOYAGER 29. EL53/94.
By W. HERRMANN	Section
Date 1/12/95	Collar co-ords E N RL
Page 1 of 2	Az. °G °M Incl. °

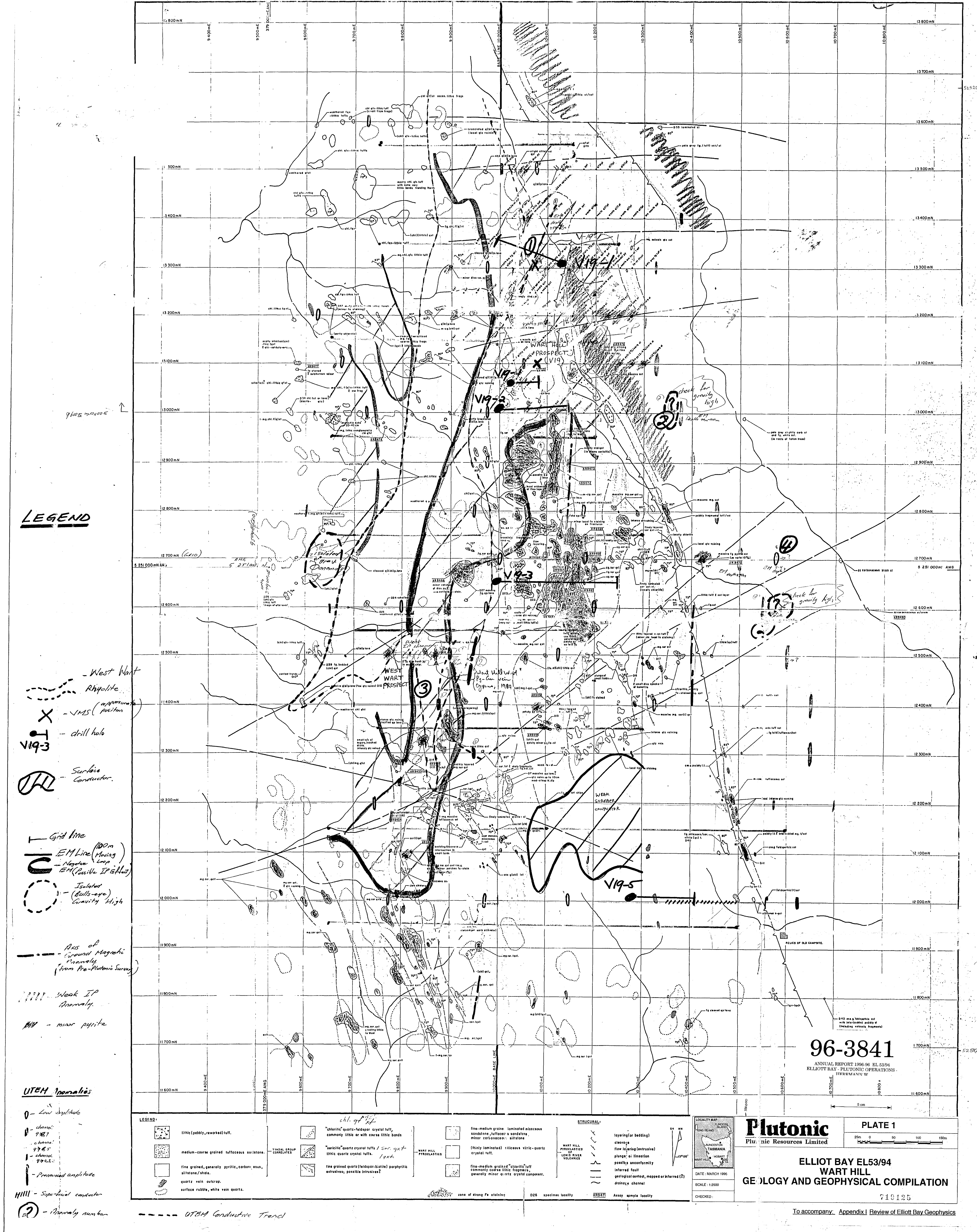


Depth m	Max. clast ϕ & Structure	Description
10	<0.2% Py.	Sericitic massive to thickly bedded felsic (qtz xtal) volcaniclastic f.g. Sandstone and minor siltstone. (Qtz xtal content rather low: 2-10%.)
30	BOCO	
40		Massive Bucky quartz vein, locally drusy. No significant sulphides.
	Bd//clv. 60°	
	FACING. (70% confident)	
50		
60		Minor CO3 alt'n. QPR lithics and mudstone intraclasts.
70		Sericitic/chloritic massive mixtite or Jumble Breccia of qtz xtal rich pumice and f.g. silty volcaniclastic Sandstone.
80		
	Shear	Zone.
90		
100	<0.5% Py.	Sericitic (chloritic carbonated) massive polymictic Volcaniclastic Breccia. Very flattened clasts of grey CO3, minor f.g. V/c siltstone and rare hematitic jasper, 5-100mm, matrix supported in cse-med.gr. sst.
110	clv: 65-70°	Sericitic/chloritic massive f.g.-m.g. Volcaniclastic Sst. (Qtz xtal content rather low 2-10%.)
120		

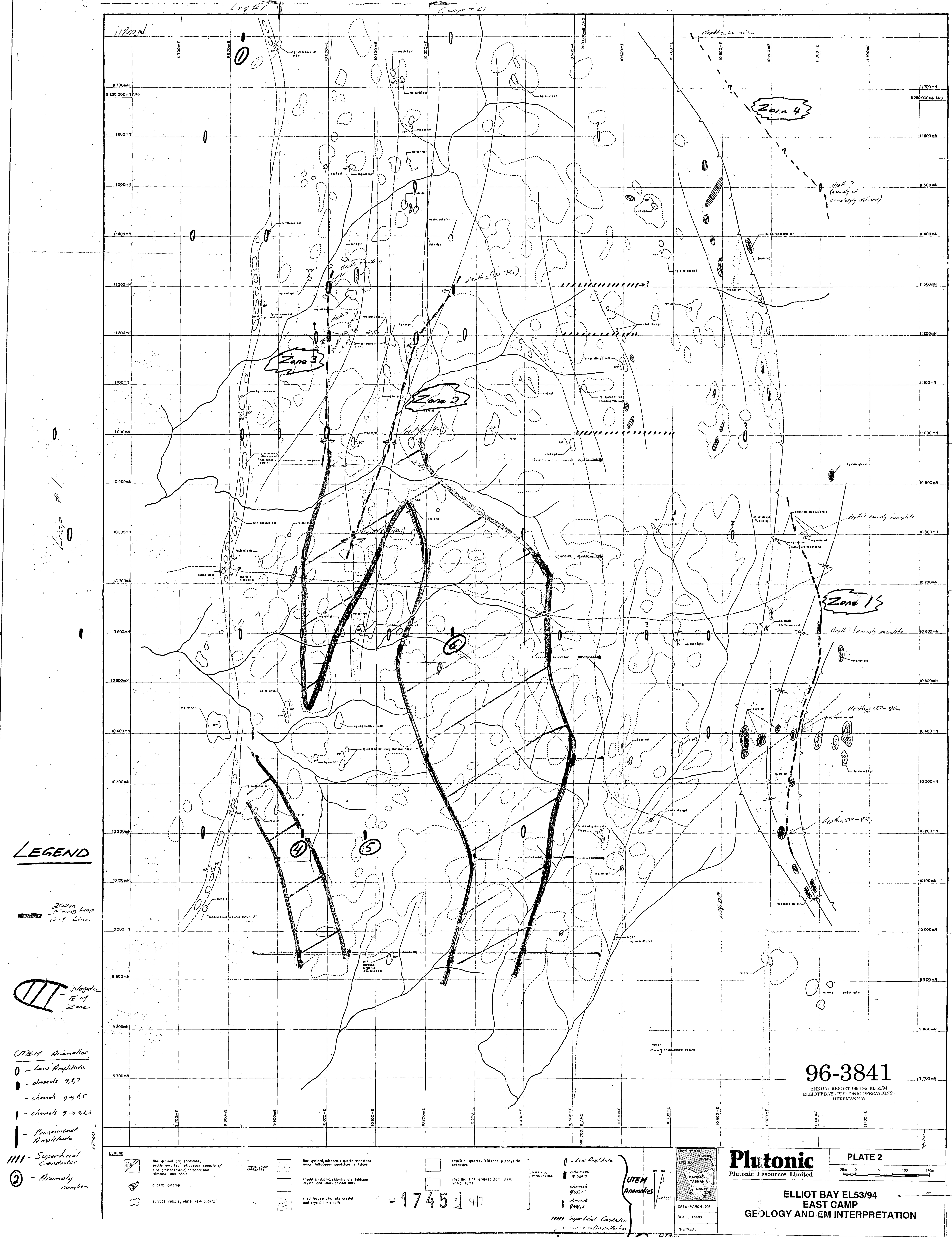
GRAPHIC CORE LOG

Scale 1:	Hole No. EC2A	Depth	m
By	Project VOYAGER 29	EL 53/94	
Date	Section		
Page 2 of 2	Collar co-ords E	N	RL
	Az. °G °M	Incl.	°

Depth m	Mean Grainsize (Mud 0.5 2 8 32 mm)	Max. clast ϕ & Structure	Description
120			Sericitic massive pumiceous + silty pumice breccia texturally similar to interval 68 - 91.2 m (above) but with pumiceous xtal rich clasts dominant 3:1 over fine silty volcaniclastic sst. lenses and intraclasts. Some greenish grey CO_3 clasts esp. near ~130 m. Sericite: chlorite about 3:1
130			
		<0.2% Py.	
140			
	Transition.		
150		↓ Sericite increasing.	
160			Sericitic massive to diffusely bedded f-m grained Qtz xtal felsic volcaniclastic Sandstone.
	v/c Slst intraclasts		
170			
180			
190	189.8m		



To accompany: Appendix I Review of Elliott Bay Geophysics



96-3841

ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -
HERRMANN W

Plutonic
Plutonic Resources Limited

PLATE 2

ELLIOT BAY EL53/94
EAST CAMP
GEOLOGY AND EM INTERPRETATION

To accompany: Appendix I Review of Elliott Bay Geophysics

-1745-47

719126

96-3841

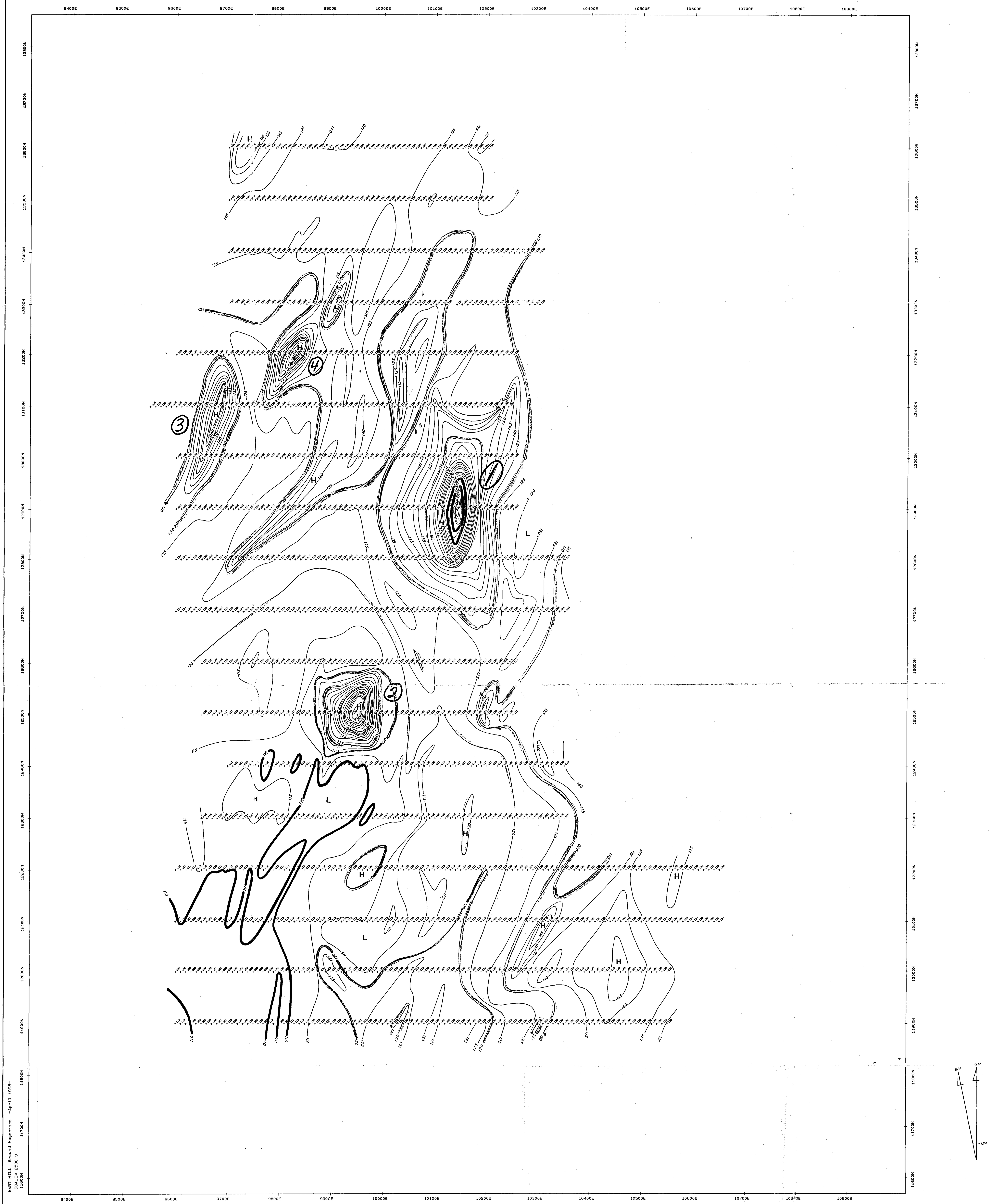
ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -
HERRMANN W

5 cm

To accompany: Appendix II Wart Hill EM Survey

LOCALITY MAP — KING ISLAND, FLINDERS ISLAND, LAUNCESTON, TASMANIA, WART HILL, HOBART	**Plutonic** Plutonic Resources Limited	PLATE 3 (25m 0 50 100 150m)
DATE : MARCH 1996 SCALE : 1:2500 CHECKED :	ELLIOT BAY EL53/94 WART HILL TEM SURVEY CHANNEL 14	

719127



LEGEND

① - Anomaly number

Plan 1.

96-3841

ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -
HERRMANN W

SCALE 1:2500

METRES

5 cm

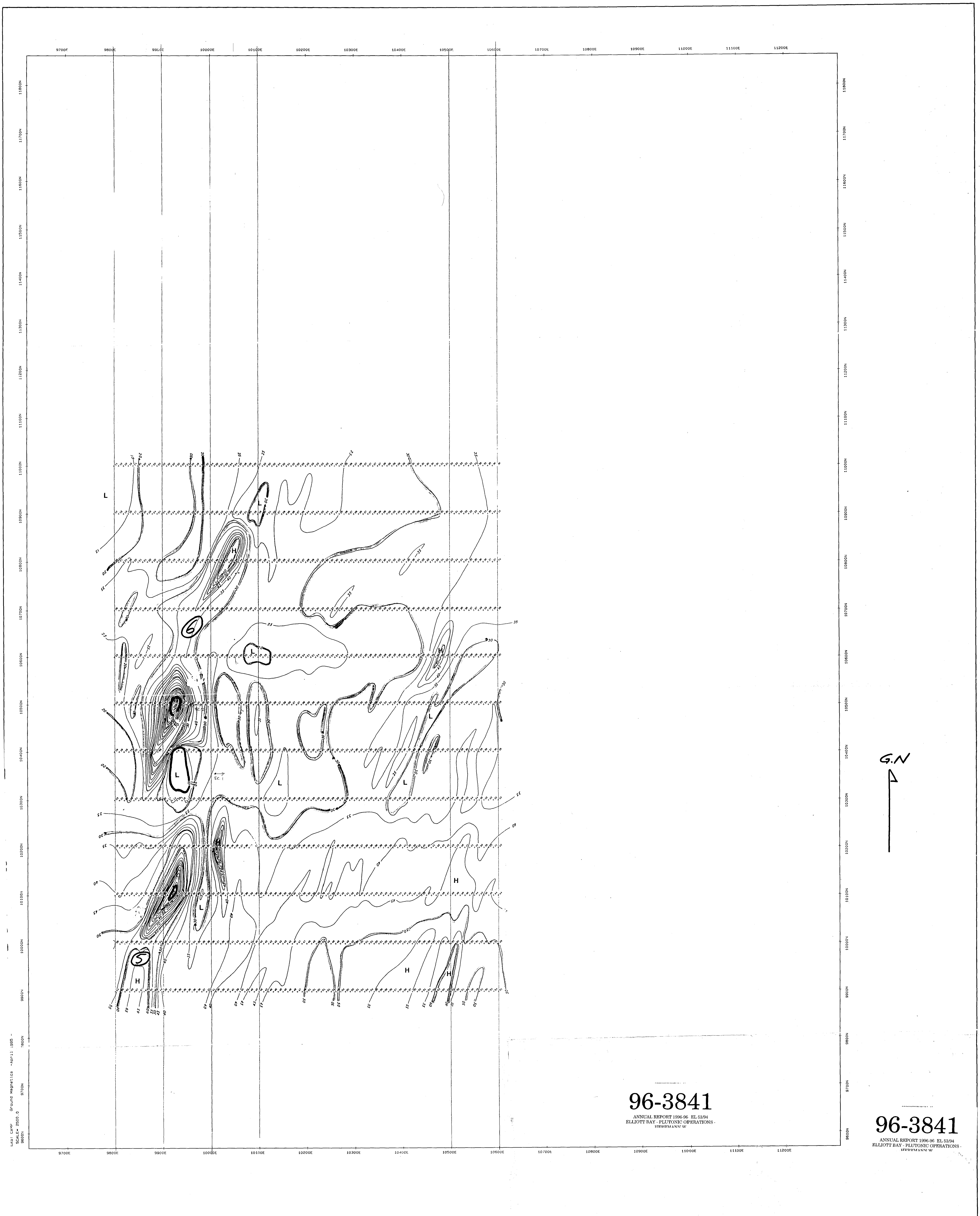
719128

To accompany: Appendix IV Wart Hill and East Camp magnetic survey

CONTOUR INTERVALS
110-200 : 5nT
200-290 : 10nT
Note : 62,300nT to be added to each value

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997	
Technical Report No:	PROJECT: ELLIOTT BAY EL53/94	
ORIG. OFFICE TOWNSVILLE	WART HILL GRID	
CHECKED BY:	GROUND MAGNETIC CONTOURS	
DATE: MAY, 1995	DRAWN BY: L.H. BENNETT	DWG. No. 710/WH/03-001
SCALE: 1:2500	SURVEYED BY: L.F. WYNN	PROJECT No. 710

PLATE 4



SCALE 1:2500

100 50 0 100 200

METRES

5 cm

Plan 3

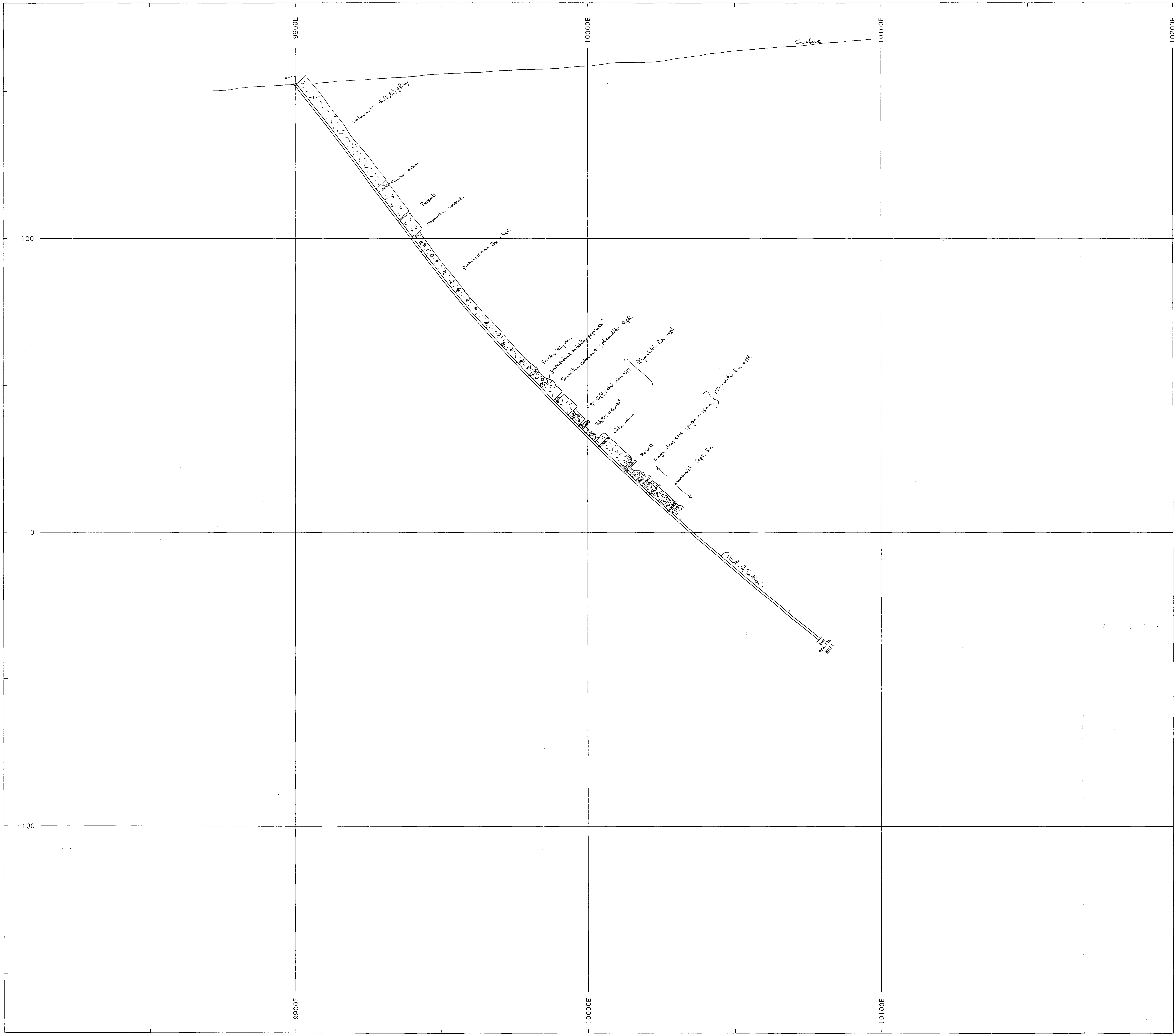
To accompany: Appendix IV Wart Hill and East Camp magnetic survey

719129

CONTOUR INTERVAL : 5nT
Note : 62,390nT to be added to each value.

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997	
Technical Report No:	PROJECT: ELLIOTT BAY EL53/94	
ORIG. OFFICE TOWNSVILLE / CHECKED BY:	EAST CAMP GRID GROUND MAGNETIC CONTOURS	
DATE: MAY, 1995 SCALE: 1:2500	DRAWN BY: L.H. BENNETT SURVEYED BY: L. F. WYNN	DWG. No. 710/EC/03-001 PROJECT No. 710

PLATE 5



5 cm

SCALE 1:500

10 0 10 20

METRES

PLUTONIC RESOURCES LIMITED

PROJECT 710 ELLIOT BAY
WART HILL

SECTION 12950.N

GEOLOGY

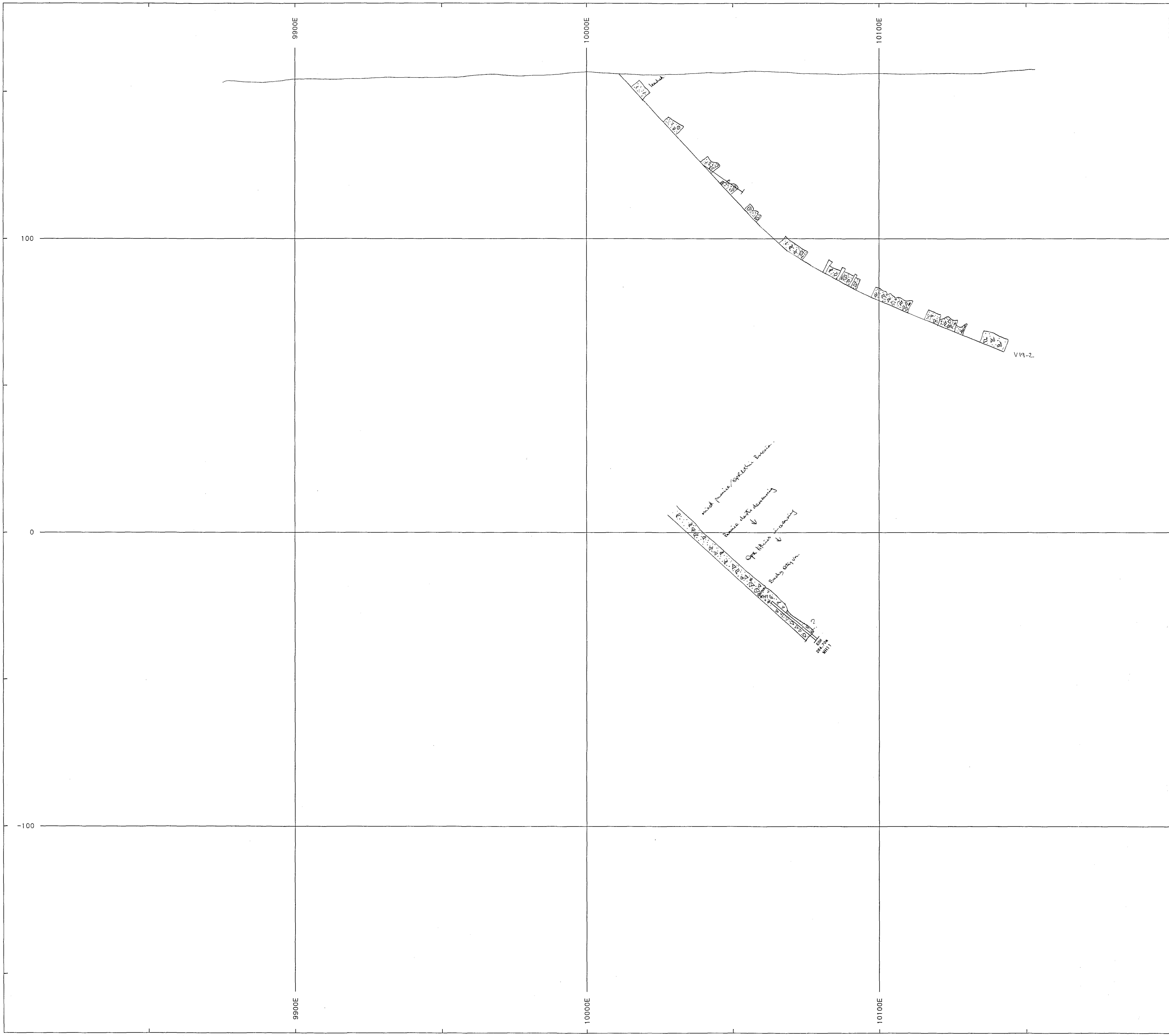
LOOKING NORTH
GMR: 8012 (OLGA), TAS.

EL 53/94	DATE :FEB 95
LOGGED :	DRAWN :P.Rea
CHECKED: Jan 1996	DRAWING

PLUTONIC OPERATIONS LIMITED

A.C.N. 004 680 997

PLATE 6



96-3841

ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -
HERRMANN W

5 cm

SCALE 1:500

10 0 10 20

METRES

719131

PLUTONIC RESOURCES LIMITED

PROJECT 710 ELLIOT BAY
WART HILL

SECTION 13000.N

GEOLOGY

LOOKING NORTH
GMR: 8012 (OLGA), TAS.

EL 53/94	DATE :FEB 95
LOGGED :	DRAWN :P.Rea
CHECKED:	DRAWING

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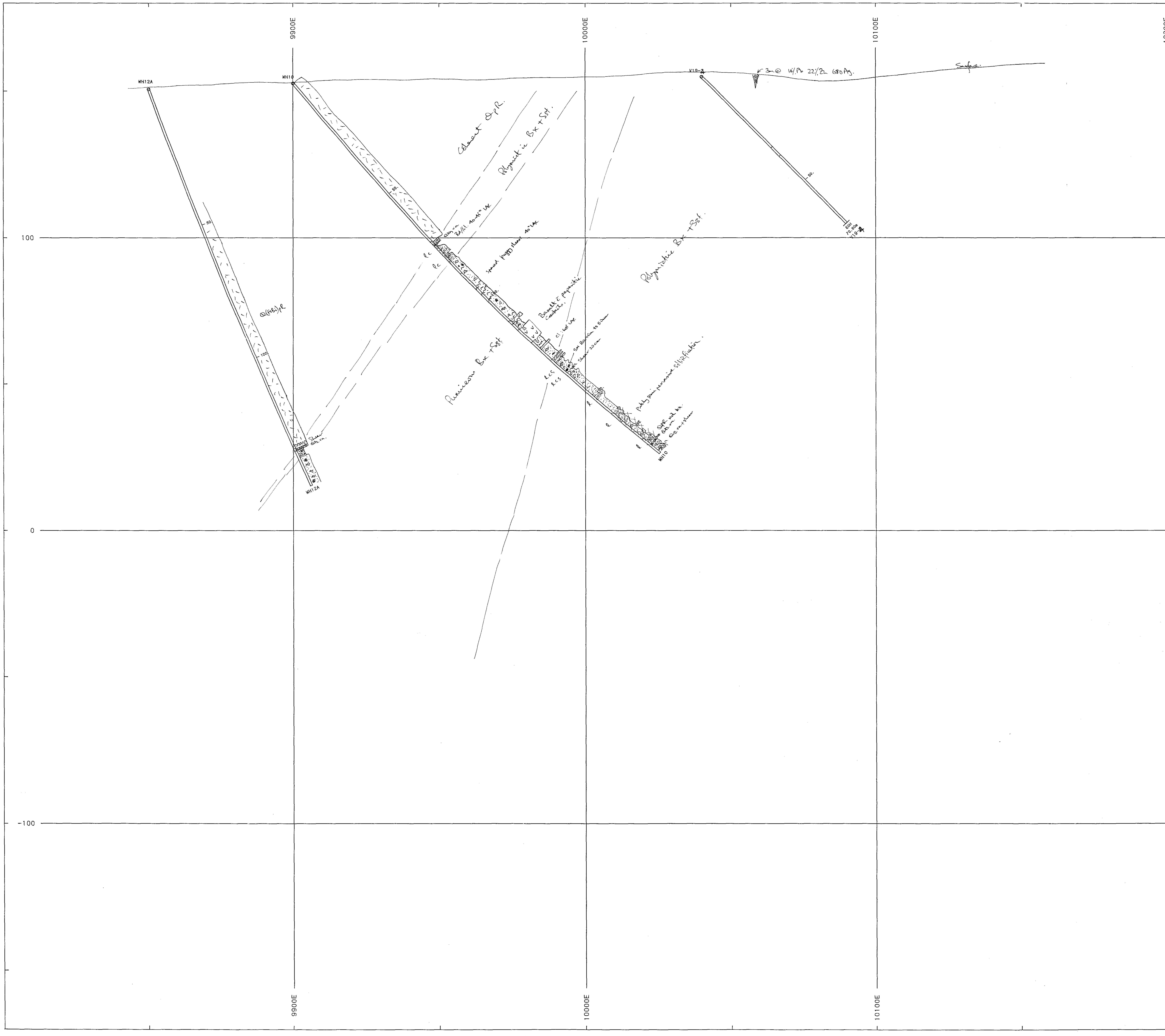
A.C.N. 004 680 997

PLATE 7



96-3841

ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -

719132

5 cm

SCALE 1:500

10 0 10 20

METRES

PLUTONIC RESOURCES LIMITED

PROJECT 710 ELLIOT BAY
WART HILL

SECTION 13050.N

GEOLOGY

LOOKING NORTH
GMR: 8012 (OLGA), TAS.

EL 53/94
LOGGED:
CHECKED:

DATE :FEB 95
DRAWN :P.Rea
DRAWING:

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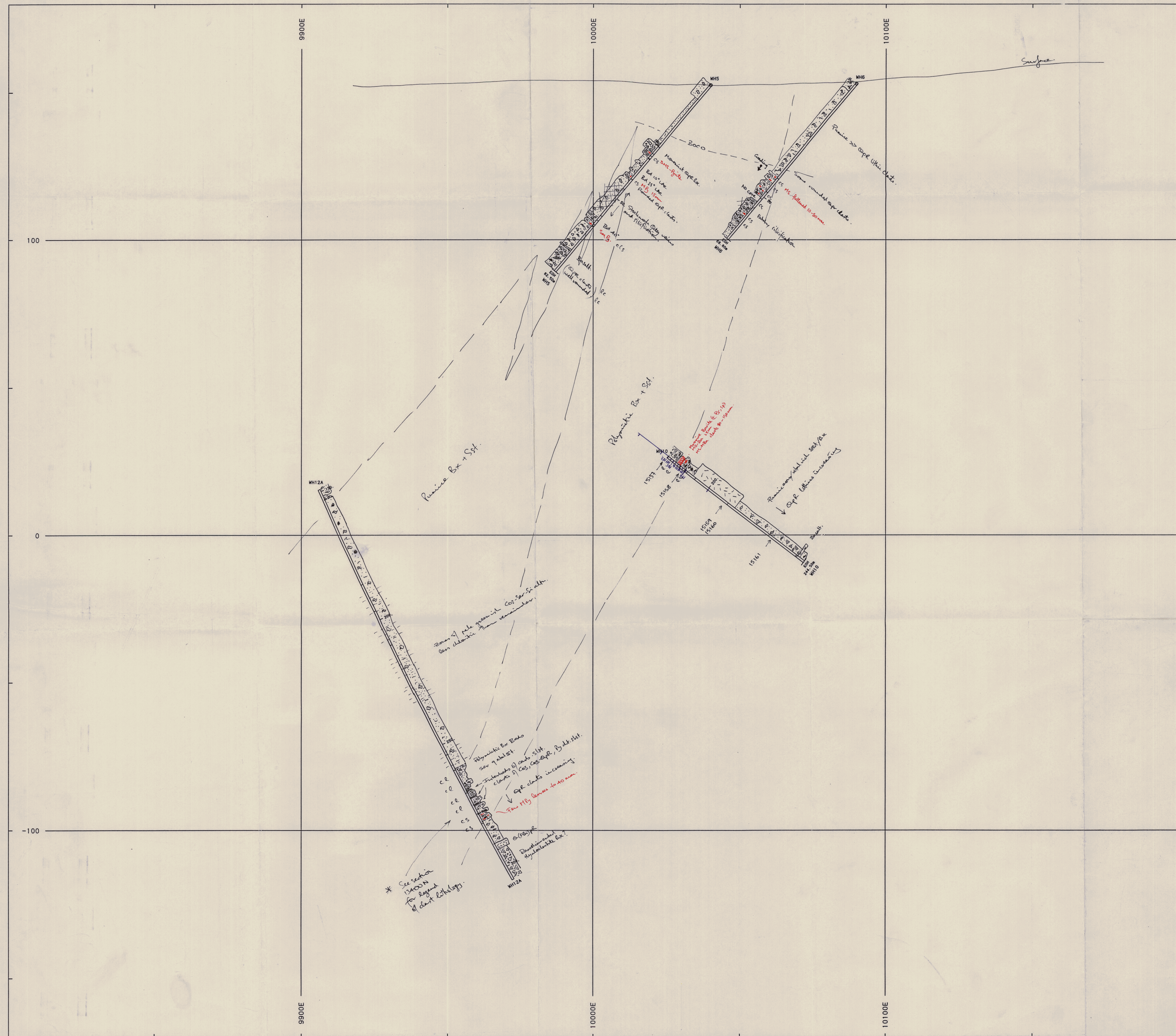
A.C.N. 004 680 997

PLATE 8



5 cm

SCALE 1:500

10 0 10 20

METRES

PLUTONIC RESOURCES LIMITED

PROJECT 710 ELLIOT BAY
WART HILL

SECTION 13100.N

GEOLOGY

LOOKING NORTH
GMR: 8012 (OLGA), TAS.

EL 53/94	DATE : FEB 95
LOGGED :	DRAWN : P.Rea
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PLATE 9

HERRMANN W

96-3841

ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -

719134

5 cm

SCALE 1:500

10 0 10 20

METRES

PLUTONIC RESOURCES LIMITED

PROJECT 710 ELLIOT BAY
WART HILL

SECTION ~~13150~~ N ✓

GEOLOGY

LOOKING NORTH
GMR: 8012 (OLGA), TAS.

EL 53/94	DATE : FEB 95
LOGGED : W Herrmann	DRAWN : P.Rea
CHECKED : JAN 1996	DRAWING :

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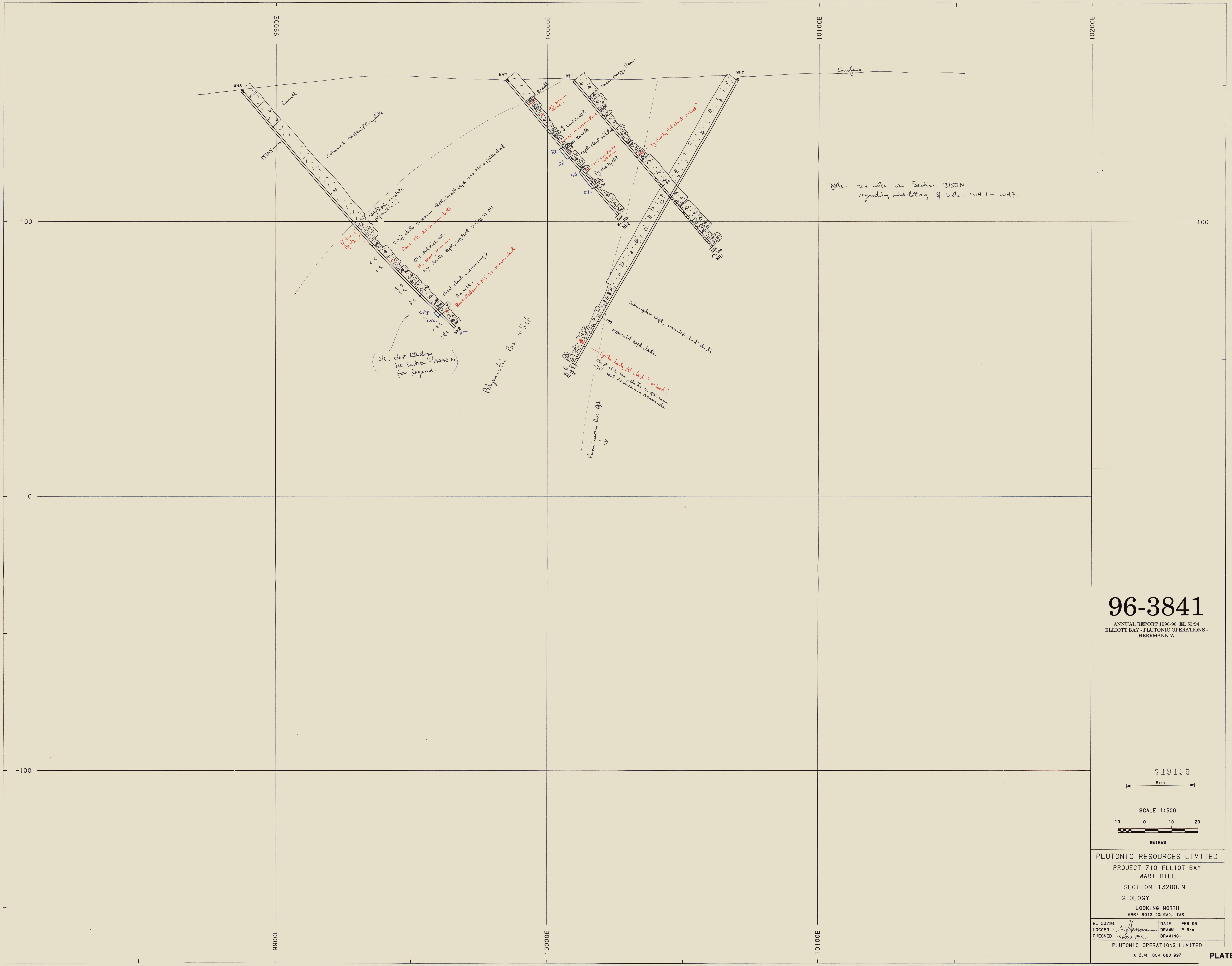
A.C.N. 004 680 997

PLATE 10



9900E
10000E
10100E
10200E
100
0
-100
Surface
WH8
WH2
WH1
WH7
Basalt
Note: see note on Section 13150N regarding re-plotting of holes WH1 - WH7.
c/s: clast lithology see Section 13400 N for legend.
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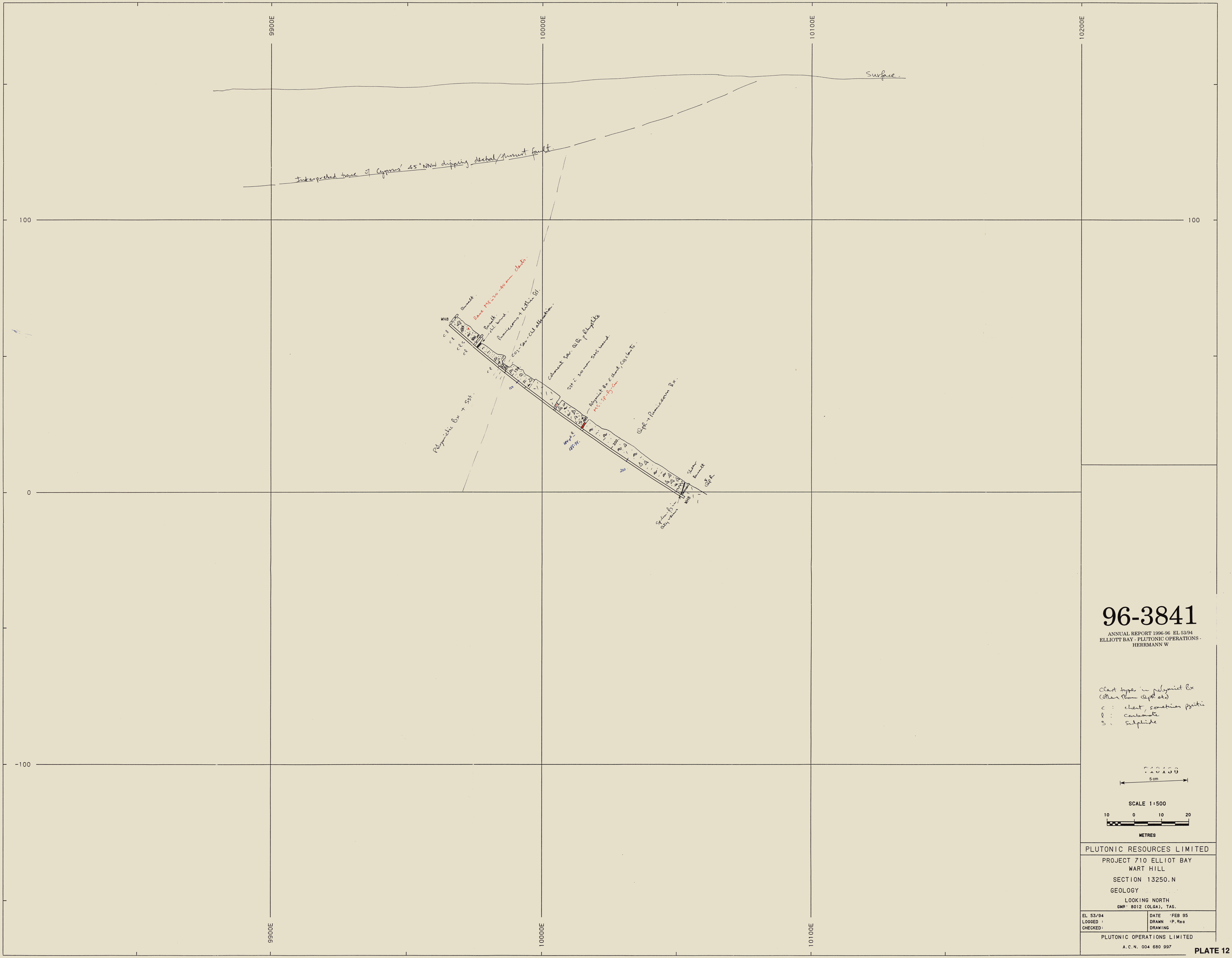
ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -
HERRMANN W
719135
5 cm
SCALE 1:500
10 0 10 20
METRES
PLUTONIC RESOURCES LIMITED
PROJECT 710 ELLIOT BAY
WART HILL
SECTION 13200.N
GEOLOGY
LOOKING NORTH
GMR: 8012 (OLGA), TAS.
EL 53/94
LOGGED :
CHECKED
DATE FEB 95
DRAWN P.Reo
DRAWING:
PLUTONIC OPERATIONS LIMITED
A.C.N. 004 680 997
PLATE 11


9900E
10000E
10100E
10200E
100
0
-100
Surface.
Interpreted trace of Cypress' 45°NNW dipping detachment/thrust fault.
Polymictic Bx + Sst.
Qtz-Ph + Pumiceous Bx.
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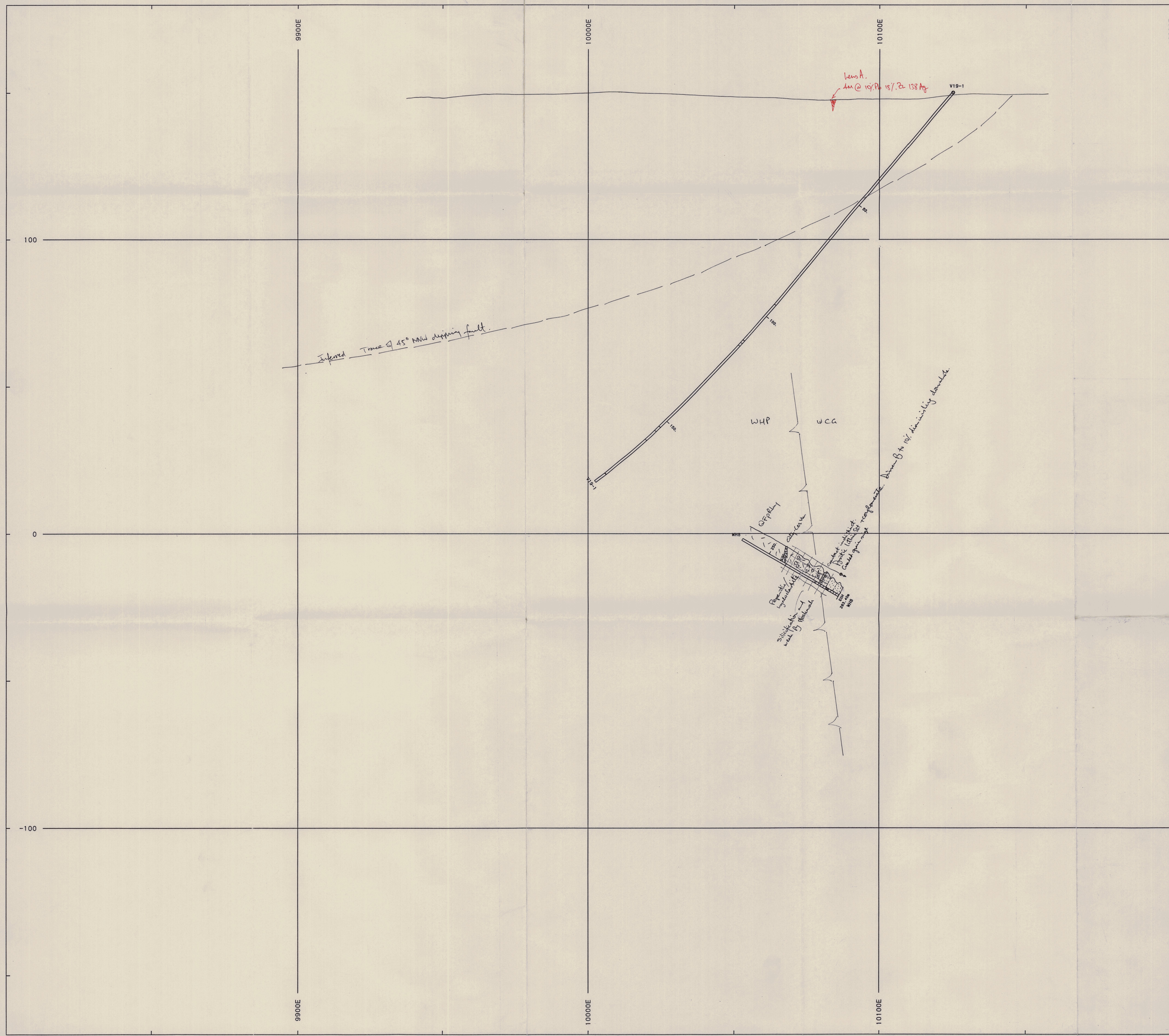
ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -
HERRMANN W
Clast type in polymict Bx
c : chert, sometimes pyritic
l : carbonate
s : sulphide
5 cm
SCALE 1:500
10 0 10 20
METRES
PLUTONIC RESOURCES LIMITED
PROJECT 710 ELLIOT BAY
WART HILL
SECTION 13250.N
GEOLOGY
LOOKING NORTH
GMR: 8012 (OLGA), TAS.
EL 53/94
LOGGED :
CHECKED:
DATE : FEB 95
DRAWN : P.Res
DRAWING
PLUTONIC OPERATIONS LIMITED
A.C.N. 004 680 997
PLATE 12



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ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -
HERRMANN W

719137

5 cm

SCALE 1:500

10 0 10 20

METRES

PLUTONIC RESOURCES LIMITED

PROJECT 710 ELLIOT BAY
WART HILL

SECTION 13300.N

GEOLOGY AND ASSAYS

LOOKING NORTH
GMR' 8012 (OLGA), TAS.

EL 53/94	DATE 'FEB 95
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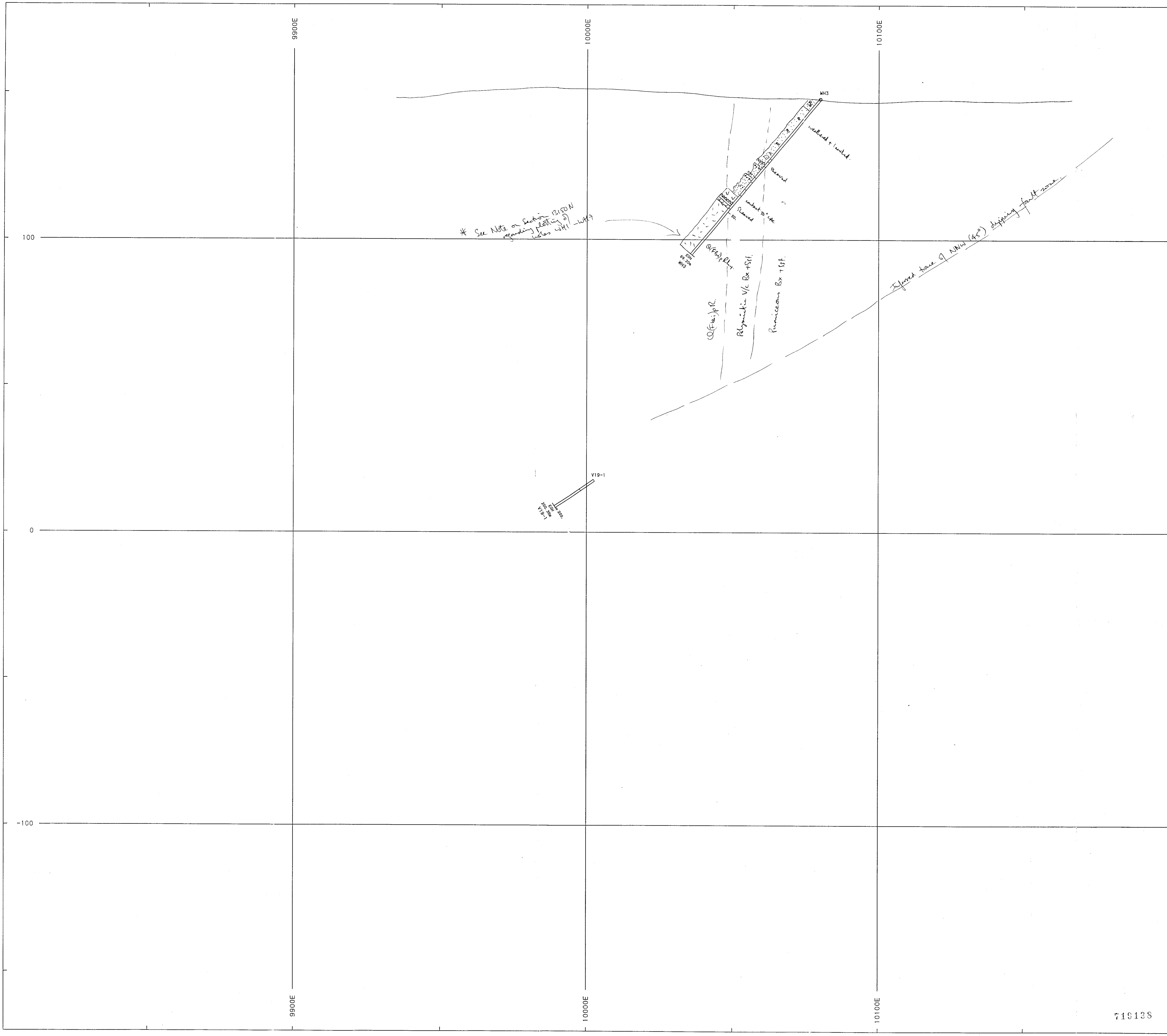
PLUTONIC OPERATIONS LIMITED

A.C.N. 004 680 997

PLATE 13



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ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -
HERRMANN W

5 cm

SCALE 1:500

10 0 10 20

METRES

PLUTONIC RESOURCES LIMITED

PROJECT 710 ELLIOT BAY
WART HILL

SECTION 13350.N

GEOLOGY

LOOKING NORTH
GMR: 8012 (OLGA), TAS.

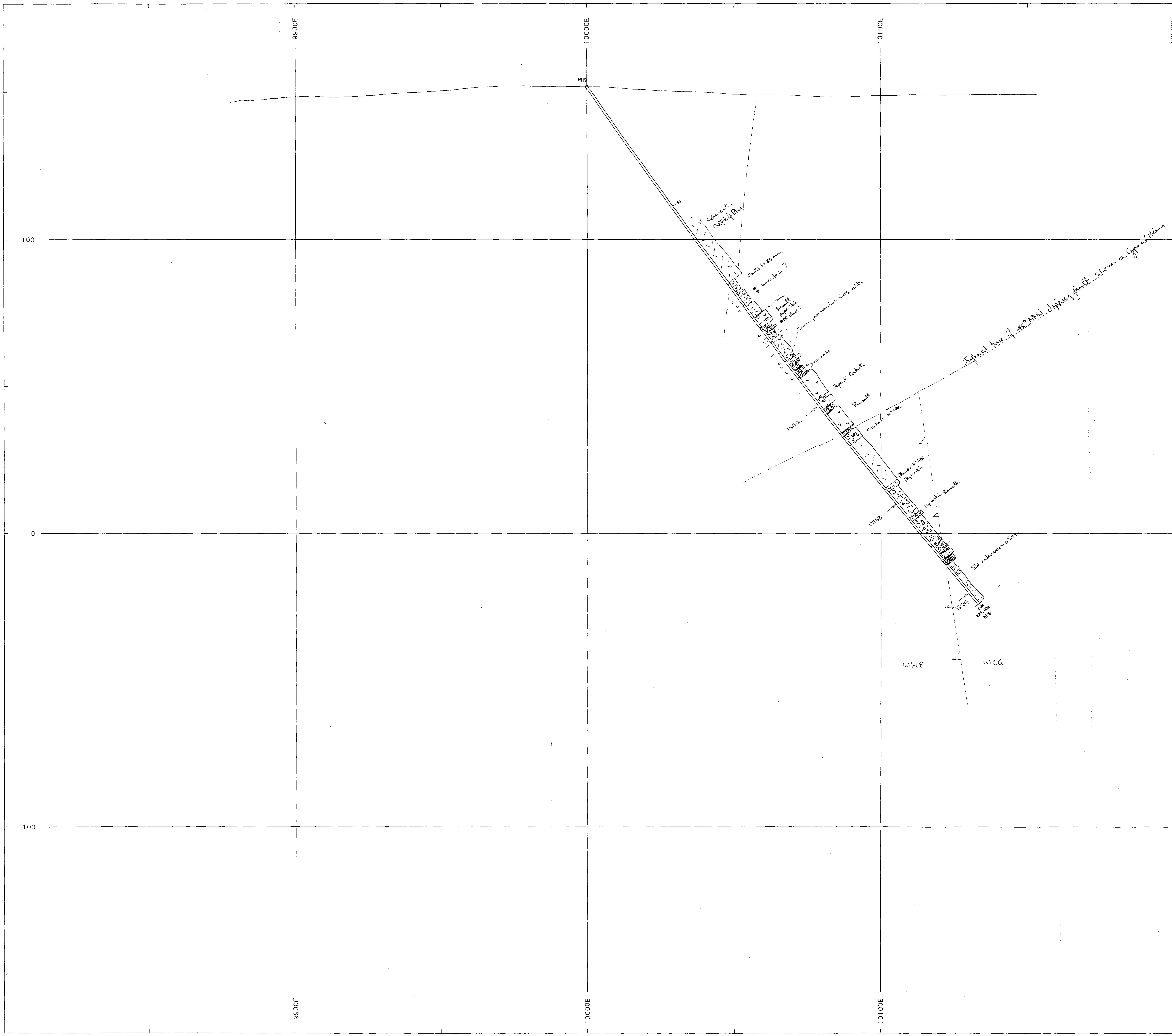
EL 53/94	DATE :FEB 95
LOGGED :	DRAWN :P.Rea
CHECKED:	DRAWING:

PLUTONIC OPERATIONS LIMITED

A.C.N. 004 680 937

719138

PLATE 14



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ANNUAL REPORT 1996-96 EL 53/94
ELLIOTT BAY - PLUTONIC OPERATIONS -
HERRMANN W

Main clast types in Polymictic Breccias (other than Qp Rhyolite)

c : cherty siltstone, sometimes c̄ disseminated pyrite
l : white-cream Carbonate
s : sulphides.

5 cm

SCALE 1:500

10 0 10 20

METRES

PLUTONIC RESOURCES LIMITED

PROJECT 710 ELLIOT BAY
WART HILL

SECTION 13400.N

GEOLOGY

LOOKING NORTH
GMR· 8012 (OLGA), TAS.

EL 53/94	DATE :FEB 95
LOGGED ·	DRAWN ·P.Rea
CHECKED:	DRAWING

PLUTONIC OPERATIONS LIMITED

A.C.N. 004 680 997

719139

PLATE 15