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GEOCHEMICAL AND RADIOMETRIC INVESTIGATION STAPLETON, RUM JUNGLE DISTRICT, NORTHERN TERRITORY 1970

by

G.C. Lau

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SUMMARY

Reconnaissance geological, geochemical and radiometric surveys of an area 9 miles south of Batchelor, N.T., were made during 1970 by the Darwin Uranium Group of the Bureau of Mineral Resources. A geophysical survey of the same area is described in a report by P. Bullock (in prep.).

A 1,200-foot by 200-foot grid in the Territory Enterprises Pty Ltd Mine Grid system was auger drilled, sampled, and radiometrically probed. The samples were analysed for copper, lead, zinc and nickel by the Australian Mineral Development Laboratories. No anomalies of economic potential were located.

Geological mapping showed that the Batchelor Group in the area surveyed differs from rocks of the group elsewhere in the district. The area is considered to lie near the southern limit of Batchelor Group Sedimentation, the western limit of Goodparla Group sedimentation (both lower Proterozoic) and the eastern limit of Adelaidean Tolmer Group Sedimentation.

No further work is recommended.

INTRODUCTION

The Stapleton Area covered in this report lies 9 miles (14.5 km) due south of Batcheloar; it is bounded in the east by the North Australian Railway Line, and in the west by the Waterhouse Granite. The area is on the Batchelor 1:50,000 Sheet, approximately between 400,000 yds E - 403,500 yds E, and 3,324,000 yds N- 3,320,000 yds N. See Plate 1.

Territory Enterprises Pty Ltd, (T.E.P.) requested that the area be examined because it is similar to the Castlemaine Hill area, west of Batchelor. The stratigraphic succession youngs eastward from the Archaean (?) Waterhouse Granite dome, and includes units of the Proterozoic Batchelor, Goodparla, Finniss River, and Tolmer Groups. The units trend north-northeast, and dip to the east (as shown by regional mapping). This report described the work carried out by a geological field party in the period from May to August 1970. Geophysical surveys conducted in the same area are described in a report (in prep.) by P. Bullock (Geophysicist).

PREVIOUS WORK

Accounts of the regional geology of areas including Stapleton have been given by Malone (1958), Walpole (1960), and Walpole et al. (1968).

In 1963, P.W. Pritchard supervised exploration for phosphate in hematite quartz breccia, hematitic sandstone, and hematitic mudstone at Rum Jungle (Ivanac, 1965). The project included both diamond and rotary-percussion drilling. Holes including DG29 and R137 were drilled on a local grid, on Stapleton North, at about 38300E, 33500S. They failed to intersect economic phosphate deposits.

Shatwell & Duckworth (1966) carried out reconnaissance geological, geophysical, and geochemical surveys in the Gould Area in 1965. Their most southerly traverse, 33300S, was extended and re-examined in this survey.

In 1969, officers from Territory Enterprises Pty Ltd made a brief survey of this area, before recommending it for examination by BMR.

Costeans at gridlines 29100E 44800S and 33300E 44000S, and old claim pegs in various localities are from previous unlisted surveys. Nevsam Mining hold a Mineral Claim No. MC 52B over an area which includes the more easterly costeans.

GRID SURVEY

A north-south baseline was established along 38000E of the T.E.P. Mine Grid in 1965 (Shatwell & Duckworth, 1966). For the 1970 survey, a contract surveyor extended the baseline from 33300S to 44100S. East-west traverses were pegged at 100-foot intervals and spaced 1,200 feet apart south from traverse 33300S, which was repegged. The connection to the National Grid System is given below:

T.E.P. Mine Grid

Grid North 359° 58'00" True

T.E.P. Mine Grid Co-ords	National Grid Co-ords
14,245.2 ft East	394,969.33 yds East
35,154.1 ft North	3,346,545.15 yds North

METHODS USED

Auger holes were drilled with a trailer-mounted Gemco-drill at 200-foot intervals along the traverses. The holes allowed subsurface radiometric probing, and provided B or C horizon soil samples for geochemical analysis.

Radioactivity at all sample points was tested with an EMI type 239 ratemeter with various G-M probes. Readings were taken down auger holes at 1-foot intervals. Unfortunately, the instruments were unreliable, and the survey involved eight different ratemeter-probe combinations. Consistency of results between traverses and comparison with the surface geophysical survey suggest that the instruments were nevertheless capable of detecting anomalies.

Samples for geochemical analysis were taken at 200-foot intervals along the traverses. Outcrops were chip - sampled, and bottom-hole samples were taken from auger drill holes in soil-covered areas. All samples were analysed at the Australian Mineral Development Laboratories (AMDL). Optical emission spectroscopy (Spectroscan) for 29 elements on samples from traverse 33300S guided the choice of analysis for Cu, Pb, Zn, and Ni by atomic absorption spectroscopy on the remaining samples.

PHYSIOGRAPHY

The area is divided into three roughly defined sections of relief (central, western, and eastern) which parallel the north-northeast trend of the geological units.

Occupying the central portion is a plain 600-900 m wide covered by sand derived from disaggregated Depot Creek Sandstone.

There is virtually no surface drainage pattern in the porous sand cover. The flat forms a divide between drainage west into the Finniss River, and east into Stapleton Creek and the Adelaide River.

The western portion contains flats of dark soil over Celia Dolomite, and grey sandy soil over Waterhouse Granite, separated by discontinuous quartzite ridges of Beestons Formation. In the eastern portion, dissected hilly terrain over resistant silicified shale and subgreywacke passes downslope into flat areas of fine grey soil alluvium on less resistant shales.

STRATIGRAPHY

The stratigraphic succession referred to in this report is based on the Pine Creek 1:250,000 sheet SD 52-8. The following units have been recognized and mapped.

post-Proterozoic	Laterite, Hematite-Quartzite-Breccia (HQB)
Adelaidean	Depot Creek Sandstone Member, Buldiva Sandstone
Lower Proterozoic	Noltenius Formation Golden Dyke Formation Crater Formation Celia Dolomite Beestons Formation
Archaean (?)	Waterhouse Granite

The regional characteristics of these units were described by Walpole et al. (1968). The descriptions below refer particularly to the units in the Stapleton Area.

ARCHAEAN

WATERHOUSE GRANITE

The Waterhouse Granite dome has not yet been studies in detail. It has been described as a mass of biotite adamellite and granite, but it includes schists, and most probably has a complex structure similar to that of the Rum Jungle Complex. French (1970, p.9) described cleaved quartz-mica-feldspar schist in the Waterhouse Granite; Walpole et al. (1968) record variations in the adamellite and granite, and the presence of granitized actinolite-biotite schist; in this survey, a large mass of quartz-muscovite schist was found to strike approx. 300° into the granite dome at 41700S, 28000E.

The granite-metasediment contact is concealed in this area, so traverse lines were pegged over the contact to the first outcrops of granite or schist. On several of the traverses, quartz veins with poor quality amethyst crop out west of the metasediment exposures, and presumably lie within the granite. The approximate position of the granite margin is detectable by a rise in radioactivity.

French concluded that the Waterhouse Granite is probably, like the Rum Jungle Complex, of Archaean age, because it is unconformably overlain by the Lower Proterozoic Beestons Formation.

LOWER PROTEROZOIC

BEESTONS FORMATION

Around the Rum Jungle Complex the Beestons Formation consists of arkose, arkose conglomerate, quartz greywacke, greywacke, and siltstone in a sequence about 300 m thick.

In the Stapleton Area, strike ridges of white friable quartz sandstone, less than 100 m thick, crop out discontinuously at the margin of the Waterhouse dome. Walpole et al. correlated this bed with Beestons Formation.

The ridges strike about 020°, are up to 15 m high, and appear to dip very steeply eastward, though bedding is poorly defined or absent. Weathering produces dark grey, rounded blocks, often sonorous when struck, with a thin, silicified surface layer. The rock contains saccharoidal quartz (c. 95%, medium to fine grains, completely interlocking with absence of pore space or visible overgrowths suggesting recrystallization) and minor sericite.

CELIA DOLOMITE

No dolomite crops out in the area mapped as Celia Dolomite between the ridges of Beestons Formation and Crater Formation. The area is occupied by low-lying flats of grey to black soft powdery soil, on which only a few massive or jointed blocks of white indurated quartzite crop out. These may represent siliceous interbeds, or preferentially silicified horizons within dolomite. Auger drilling on the flats revealed green to brown clay, with a variable content of biotite(?) and carbonate. Cuttings from some holes are composed of dark green-grey, moderately indurated, slightly schistose quartz/actinolite rock believed to be the product of greenschist facies metamorphism of impure dolomite. Moderate to high values of Cu, Zn, and Ni Characterize the Celia Dolomite and aided the mapping of its concealed boundaries. The formation was identified and mapped from its stratigraphic position and composition.

CRATER FORMATION

The Crater Formation is the thickest unit in the Batchelor Group, composed typically of about 600 m of greywacke, arkose, conglomerate, sandstone and siltstone. Around the Waterhouse dome, however, it is patchily exposed and is usually less than 300 m thick.

A well defined ridge can be followed south-southeastwards through the Gould Area (Shatwell & Duckworth, 1966) about as far as gridline 33000S, within a few hundred metres of the Stapleton Area boundary. A ridge of similar rock types (hematite quartz breccia, hematitic grit, hematitic quartzite, and hematitic siltstone) trends south-southwestwards from gridline 40500S to beyond the southern boundary. Small outcrops of hematitic rocks can be traced north from 40500S to traverse 36900S. A strong electromagnetic disturbance is located at the western margin of the Crater Formation ridge: its south-southwesterly trend runs across all ten traverses, indicating the alignment of the Crater Formation/Celia Dolomite boundary.

Hematite quartz breccia is described in a separate section (p.). The hematitic quartzite rocks are white to red-brown, well indurated orthoquartzite (quartz c. 90% composed mainly of recrystallized subrounded to subangular quartz grains. Accessories include hematite in interstices and along grain boundaries, sericite mica, and subhedral tourmaline).

The rocks are poorly sorted, and include many quartz granules. Indeterminate exposures of red brown banded hematitic siltstone appear to dip 60° east-southeast.

COOMALIE DOLOMITE

Shatwell & Duckworth (1966) mapped Coomalie Dolomite south of traverse 33300S. This area is remapped as Depot Creek Sandstone Member. However, the sandstone is suspected to overlie Coomalie Dolomite.

GOLDEN DYKE FORMATION

Regional mapping has shown that the Golden Dyke Formation thins out near Stapleton Siding, and that it interfingers with the Noltenius Formation sediments. Beds of the Golden Dyke Formation crop out in the eastern part of Stapleton Area. They form rocky hills up to about 50 m high, and are dissected by narrow, flat-bottomed valleys.

Greyish shale and siltstone crop out along the western margin of Golden Dyke Formation, and were intersected in auger drill holes in areas covered by superficial deposits. Surface exposures are indurated. Folds are only very poorly exposed.

Scattered silicified cherty outcrops, with extensive scree, occur in most of the area occupied by Golden Dyke Formation rocks. All gradations between massive grey or red-brown chert, grey brecciated silicified shale, and HQB are present.

Four areas of alluvium shown on the regional map are bordered by outcrops of weathered brown limonitic rock. Shatwell & Duckworth (1966) mapped the northernmost outcrop, on gridline 33300S, as tremolitic siltstone. They noted that fresh specimens were composed mostly of quartz, tremolite, and sphene, and suggested that the rock was a dolomitic siltstone altered by low-grade regional metamorphism. In the two central areas, on 36900S and 41700S, only soft, often porous, limonitic rock crops out. Thin-section examination* indicated that the rock is composed of about 40% tremolite and about 60% iron oxides.

Gently dipping slabs of brown ironstained rock also crop out around gridline 44100S. Visual estimates of the composition of fresh indurated specimens are: dolomite (?) 60%, tremolite 30%, chlorite 10%, and opaque mineral 5%. These rocks strike southwest towards Meaney's farmhouse.

Higher values of Cu, Zn, and Ni characterize these rocks, and helped to delineate their boundaries where covered by eluvium. The general north-northeast trend of rocks in the four areas and their present mineralogy indicates that they were lenticular dolomitic interbeds of the Golden Dyke Formation, subsequently altered by green schist facies metamorphism.

NOLTENIUS FORMATION

Scattered tongues of Noltenius Formation rocks, intercalated with shales of the Golden Dyke Formation, form hills in the eastern portion of the area surveyed. Since outcrops near the Golden Dyke/Depot Creek Sandstone boundary are separated by shale bands, no interpolation was made for the area covered by alluvium between eastern exposures. The rocks examined are pink-brown poorly sorted granule conglomerates, and ferruginous and tourmaline-bearing subgreywacke. The rock tends to be massive, but weak foliation is locally present. Boundaries between subgreywacke bodies and siliceous rubble of the Golden Dyke Formation were difficult to determine. No evidence was found to support Shatwell's (Shatwell & Duckworth, 1966) suggestion that the contact in this area may be unconformable.

ADELAIDEAN

DEPOT CREEK SANDSTONE MEMBER

The area mapped by Malone (1958) as Depot Creek Sandstone Member of the Buldiva Sandstone formation crops out patchily in the central portion of the area surveyed. Other small outcrops appear to sit uncomformably on the Golden Dyke and Noltenius Formations, east of the main outcrop. Much of the area mapped as sandstone is actually disaggregated sand.

Scattered outcrops are composed of basal conglomerate and breccia, containing fragments of subgreywacke and siltstone from granule to boulder size. The matrix is probably reworked subgreywacke detritus. The basal conglomerate is overlain by fine sandstone, and siliceous (quartz overgrowths) orthoquartzite. The sandstone in places includes sufficient shale and siltstone rock fragments to be subgreywacke. The arenite is indurated, with pink-brown to red-brown patches of hematite staining. A local variant of the arenite, often termed 'lilac rock', is phosphatic. P.W. Pritchard investigated the North Stapleton outcrop in 1963 (Ivanac, 1965). Bedded outcrops often show gently plunging folds. Dips are moderate, 30°-40°, but seem to have random azimuths.

Small outcrops of sandstone at Stapleton rest uncomformably on Golden Dyke and Noltenius Formations. Most of the sandstone and unconsolidated sand occurs at a lower level, stratigraphically between the Crater and Golden Dyke Formations, where Coomalie Dolomite would be expected. Elsewhere in the Rum Jungle District, similar fine to medium grained, subangular quartz sand overlies Coomalie Dolomite. Some of this sand may be reworked, but much of it may be disaggregated.

Following their deposition and deformation, the Lower Proterozoic sediments probably weathered to a surface of low relief, with depressions over the dolomite (C.E. Prichard, pers. comm.). On this surface Adelaidean sandstone was deposited. Erosion lowered the land surface to slightly below the pre-Adelaidean level, exposing residual sandstone deposits.

The Depot Creek Sandstone Member at Stapleton was probably deposited on a weathered surface composed of Coomalie Dolomite.

POST-PROTEROZOIC

HEMATITE-QUARTZITE-BRECCIA (HQB)

The HQB is described separately, as it overlies rocksof both the Crater and Golden Dyke Formations. The widespread occurrence and uniform appearance suggest that the HQB was formed as a deposit on an erosion surface.

Hematite-quartz-breccia has been described by numerous writers. Two origins have been considered: the silicification of brecciated carbonate rock, or alternatively the induration of brecciated arenaceous or semi-pelitic sediments. At Stapleton HQB usually contains white to grey inclusions in a reddish brown matrix. At the surface it is commonly indurated to a depth of about 5 m. The induration is laterally discontinuous.

The rocks from Stapleton are slightly hematitic quartzite, in which random distribution of hematite forms a mottled texture. Shale breccia contains grey silicified shale fragments in a hematitic matrix. In both, the distribution of hematite is controlled by the breccia-like texture, modified by recrystallization of quartz.

Beside the railway, at gridlines 34800S and 36400S approx., the surface is littered with HQB or shale breccia scree, but nearby cuttings expose underlying folded and silicified shales of the Golden Dyke Formation from which the breccia is derived. HQB is not only a superficial deposit, at Castlemaine Hill it extends at least 190 m below surface and was found at 75m depth in North Stapleton (Ivanac, 1965, DG 29).

LATERITE

Laterite forms a discontinuous crust over the area, but most occurs in the fluctuating water level surrounding swamps.

STRUCTURE

As previous mapping has shown, the Lower Proterozoic rocks of the Stapleton area strike approximately 020° and dip at about 50° east, away from the Waterhouse Granite mass. Dips in the Beestons Formation, if the surfaces measured are bedding planes, are much steeper, suggesting doming of the sediments. Mesoscopic folds are poorly exposed in Golden Dyke Formation shale.

Randomly oriented dips in the Depot Creek Sandstone Member may represent initial bedding attitudes of the sand when deposited on an irregular land surface.

No faulting was detected.

GEOCHEMICAL RESULTS

The geochemical results are tabulated in Appendix 1.

At many points, samples were taken from the C soil horizon or from outcrop (the two are considered comparable). Where the drill failed to reach weathered rock in the C horizon, and in areas of soil cover inaccessible to the drill vehicles, B horizon samples were collected; previous work in this district showed that the B and C horizon samples are comparable (Shatwell & Duckworth, 1966).

The geochemistry is closely related to geology. Nickel values are profiled on Plate 4 to illustrate this relationship. Element concentrations are generally low, probably reflecting low content in the underlying rocks. Higher concentrations of Cu, Zn, and Ni characterize the

Celia Dolomite, and a brown-coloured interbed of the Golden Dyke Formation. The boundaries of these beds are mostly concealed, but their approximate limits are shown on geochemical profiles. A few high Pb values were detected in Waterhouse Granite. Galena and pyrite were found with amethyst on traverse 38100S.

The results do not seem amenable to statistical analysis. Since the area includes a number of different rock types, cumulative frequency graphs including all sample values are complex. Attempts to reduce the complexity by plotting separate values from each lithological unit are invalidated by the limited data, and the abundance of very low, poorly resolved concentration values. The complex curves including all samples suggest thresholds of : Cu 90 ppm, Pb 55 ppm, Zn 45 ppm, and Ni 100 ppm. Contours at threshold delineate the Celia Dolomite and interbed of the Golden Dyke Formation, and all anomalous values appear to relate to the primary dispersion patterns of these two rock types.

No economically significant Cu, Pb, Zn, or Ni anomalies were found.

RADIOMETRIC RESULTS

Radioactivity in the metasediments typically reaches a maximum within a metre or so of the surface, then remains constant or slowly decreases lower in the soil profile. The values are generally low. Only over the Waterhouse Granite are values moderate and increase with depth.

The maximum radiometric readings from sample points are shown as profiles on Plate 3. On a cumulative frequency graph the readings fall within one population, and have close approximation to lognormal distribution, with background of 0.025 mR/hr. Values twice background and higher occur along most of the Waterhouse Granite margin. Other twice background maximum values occur over tongues of the Noltenius Formation along the Depot Creek Sandstone/Golden Dyke Formation contact, and over a carbonaceous shale bed in the southeast corner of the area (this bed also appears anomalous on electromagnetic and surface radiometric profiles). Values remain constant or decrease with depth in these areas.

CONCLUSIONS AND RECOMMENDATIONS

No economically significant radiometric or geochemical anomalies were detected.

French (1970) observed that the Waterhouse Granite and the Rum Jungle Complex are uncomformably overlain by the Batchelor Group, and concluded that Waterhouse Granite must also be of Archaean age. The presence of schist in the granite suggests that it may be a complex.

Exposures of rocks at the Batchelor Group are thinner than, and lithologically different from, Batchelor Group rocks exposed southeast of the Rum Jungle Complex. Along the eastern margin of the Waterhouse Granite, facies changes and thinning towards the south are quite marked; these formations probably lens out a few kilometres south of Stapleton.

The Golden Dyke and Noltenius Formations are not lithogically distinct from elsewhere, but are interbedded in the Stapleton area.

The Depot Creek Sandstone Member also appears to be a marginal deposit. Outcrops at Stapleton are thin, and are the most easterly occurrence of the sandstones in this area. They may overlie Coomalie Dolomite.

No further geological work in the reserve area is recommended.

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APPENDIX

Geochemical and radiometric results.

Samples are listed by co-ordinates and sample number. Samples are either bottom-hole samples taken at the depth shown or mattock samples, shown as MS.

AMDEL provided geochemical analyses. Emission spectroscopy (Codes A1 and A2) was performed on samples from traverse 33300S, and atomic absorption spectroscopy (Code C1, Cu - Pb - Zn - Ni) on the remainder

(5)	Limit of detection
100	result in ppm
x	not detected
-	Less than

Results show:

(W(50), Mo(3), Ta(100), Th(100), Cd(3).)
(Au(3), Ge(1), As(50), Sb(30), Pt(10),)
(Pd(10), Os(10), Ir(2), Rh(2), Ru(2))
(were not detected in any sample.)

Radioactivity at all sample points was measured at 1-foot depth intervals with a GM probe - E.M.I. 239 ratemeter combination. Results show:

0.035 Maximum radioactivity in mR/hr.

CO-ORDINATES (TEP MINE GRID)	SAMPLE NUMBER	Co (5)	Ni (5)	Cr (20)	Cu (0.5)	Pb (1)	Zn (20)	V (10)	Mn (10)	Nb (20)	Be (1)	Sn (1)	Bi (1)	Ag (0.1)	Ga (1)	MAX. RADIO-METRIC	HOLE DEPTH FEET
33300S40000E	70123074	5	20	300	1	3	x	50	150	x	8	1	x	0.1	10	0.035	6
39800	073	5	50	400	1	1	x	100	300	x	8	1	x	0.1	5	0.023	6
39600	072	5	x	200	1	5	x	80	1000	x	8	3	x	x	20	0.034	9
39400	071	5	5	200	3	3	x	120	100	x	3	1	x	0.1	10	0.015	MS
39200	070	5	5	300	3	1	x	120	150	x	1	1	x	x	8	0.015	MS
39000	069	5	30	400	1	1	x	80	100	x	8	2	x	0.1	15	0.015	MS
38800	068	5	100	150	3	1	x	50	1500	x	10	1	x	x	20	0.025	6
38600	067	50	1200	5000	3	1	100	1500	800	20	10	3	x	x	50	0.031	21
38400	066	50	1000	800	5	1	120	200	1000	20	8	1	x	0.1	20	0.030	18
38200	065	50	1500	400	10	3	150	200	1000	20	8	1	x	0.1	30	0.025	12
38000	064	5	150	3000	20	10	50	3000	100	20	8	3	x	0.1	50	0.034	15
37800	075	5	80	500	3	3	x	120	800	30	8	3	x	0.1	10	0.030	MS
37600	076	10	100	400	1	3	x	200	350	30	3	x	x	x	1	0.023	MS
37400	077	10	100	400	3	5	x	300	500	30	15	1	x	x	30	0.052	24
37200	078	5	10	300	5	8	x	80	30	x	1	1	x	1	10	0.035	6
37000	079	15	100	1000	10	3	x	500	800	30	15	1	x	x	20	0.060	12
36800	080	5	80	800	3	3	x	100	350	30	10	1	x	x	30	0.050	18
36600	081	10	30	500	15	5	x	100	200	20	8	1	x	1	30	0.048	6
36400	082	15	10	800	10	1	x	150	500	20	10	1	x	0.1	20	0.048	9
36200	083	10	30	800	8	1	x	150	100	20	8	1	x	0.1	20	0.048	15
36000	084	10	20	800	8	3	x	100	50	20	8	2	x	0.1	20	0.053	21
35800	085	15	300	1000	10	5	50	800	250	x	8	2	x	0.1	30	0.042	12
35600	086	10	80	300	8	5	X	100	30	x	3	1	x	x	10	0.037	6
35400	087	15	50	500	8	3	x	80	100	x	3	1	x	x	20	0.035	15

CO-ORDINATES (TEP MINE GRID)	SAMPLE NUMBER	Co (5)	Ni (5)	Cr (20)	Cu (0.5)	Pb (1)	Zn (20)	V (10)	Mn (10)	Nb (20)	Be (1)	Sn (1)	Bi (1)	Ag (0.1)	Ga (1)	MAX. RADIO-METRIC	HOLE DEPTH FEET
33300S35200	70123088	10	30	300	8	3	x	100	50	x	1	1	x	x	10	0.037	15
35000	089	10	30	300	8	3	x	150	30	x	1	1	x	x	10	0.041	9
34800	090	5	10	300	3	1	x	100	50	x	1	1	x	x	5	0.031	9
34600	091	5	80	500	3	3	x	100	80	x	1	1	x	x	20	0.030	9
34400	092	5	50	300	5	1	50	150	300	x	3	1	1	x	10	0.033	9
34200	093	5	80	400	1	1	x	100	200	x	x	1	x	x	10	0.026	6
34000	094	5	5	400	1	3	50	100	50	30	1	1	x	0.1	30	0.037	15
33800	095	5	5	300	0.5	1	x	30	50	x	1	1	x	x	3	0.031	6
33600	096	5	20	300	0.5	1	x	80	20	x	3	1	x	x	10	0.037	18
33400	097	100	150	200	100	3	150	300	1000	x	20	x	x	x	5	0.035	42
33200	098	400	400	300	0.5	1	200	50	-10000	x	30	x	x	0.1	5	0.031	29
33000	099	50	150	300	100	8	250	100	1500	x	8	1	x	x	8	0.024	29
32800	100	80	150	150	50	1	100	100	800	x	10	x	x	x	1	0.026	18
32600	101	30	80	150	20	1	80	80	1000	x	5	x	x	x	1	0.028	29
32400	102	50	80	500	300	2	50	100	1000	x	1	x	x	x	10	0.030	18
32200	103	100	150	500	100	1	150	100	1500	x	10	x	x	x	3	0.032	29
32000	104	10	10	500	3	100	x	80	100	x	5	1	1	0.3	30	0.061	9
31800	105	5	10	200	3	50	x	30	30	x	8	1	1	x	25	0.039	6
31600	106	5	5	200	1	30	x	30	150	x	5	1	1	x	10	0.047	6
31400	70123107	5	5	300	3	40	x	30	200	20	10	3	x	x	50	0.040	6
31200	108	5	5	300	0.5	50	x	50	100	20	10	3	x	x	30	0.044	9
31000	109	15	30	150	3	200	200	100	1500	20	10	1	3	0.1	3	0.053	15

Co-ordinates (TEP Mine Grid)		Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
34500 S	39800 E	70123154	5	5	5	5	0.029	MS
	39600	153	5	10	5	5	0.017	MS
	39400	152	5	5	5	5	0.023	MS
	39200	151	5	5	5	- 5	0.017	MS
	39000	150	- 5	5	5	5	0.021	MS
	38800	149	5	5	5	15	0.027	MS
	38600	148	- 5	- 5	5	5	0.025	MS
	38400	147	5	5	10	10	0.032	MS
	38200	146	- 5	5	10	15	0.034	MS
	38000	145	5	10	5	- 5	0.029	MS
	37800	144	- 5	10	5	- 5	0.024	MS
	37600	143	5	10	5	- 5	0.033	MS
	37400	142	5	10	5	- 5	0.029	MS
	37200	141	5	10	5	- 5	0.054	9
	37000	140	30	20	35	-20	0.040	9
	36800	139	10	15	20	10	0.095	12
	36600	138	5	- 5	5	- 5	0.043	6
	36400	137	5	5	5	- 5	0.043	9
	36200	136	10	30	15	20	0.049	9
	36000	135	10	35	15	25	0.058	9
	35800	134	10	30	15	20	0.042	9
	35600	133	10	35	25	20	0.038	9
	35400	132	10	30	15	20	0.032	9
	35200	131	15	35	15	20	0.038	9
	35000	130	15	30	10	20	0.035	9
	34800	129	25	25	15	15	0.042	9
	34600	128	10	15	10	20	0.036	12
	34400	127	5	15	5	15	0.038	12
	34200	126	5	15	- 5	5	0.021	9
34500 S	34000 E	70123125	5	20	5	20	0.031	9

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34500 S

Co-ordinates (TEP Mine Grid)		Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
34500 S	33800 E	70123124	15	15	5	25	0.033	12
	33600	123	45	25	10	35	0.038	18
	33400	122	85	10	50	90	0.024	18
	33200	121	30	45	45	25	0.038	18
	33000	120	140	90	200	70	0.035	29
	32800	119	90	35	310	100	0.034	29
	32600	118	220	35	40	30	0.036	18
	32400	117	110	5	55	50	0.029	24
	32200	116	200	10	80	50	0.029	18
	32000	115	75	- 5	65	75	0.025	18
	31800	114	160	15	100	40	0.038	24
	31600	113	30	20	5	20	0.025	3
	31400	112	- 5	20	10	- 5	0.054	9
	31200	111	10	50	35	- 5	0.076	9
34500 S	31000 E	70123110	5	15	5	5	0.058	6

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Co-ordinates (TEP Mine Grid)		Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
35700 S	38800 E	70123174	25	5	5	15	0.035	18
	38600	155	50	15	10	30	0.033	9
	38400	156	5	5	5	- 5	0.038	9
	38200	157	5	5	5	15	0.042	12
	38000	158	5	5	5	5	0.034	9
	37800	159	5	5	5	5	0.029	MS
	37600	160	5	5	5	5	0.034	MS
	37400	161	5	5	5	5	0.032	MS
	37200	162	5	5	5	- 5	0.050	6
	37000	163	5	5	5	- 5	0.043	6
	36800	164	- 5	5	5	5	0.050	6
	36600	165	5	- 5	15	5	0.048	12
	36400	166	5	- 5	15	20	0.035	6
	36200	167	- 5	- 5	5	10	0.032	6
	36000	168	- 5	- 5	5	5	0.024	6
	35800	169	- 5	- 5	5	5	0.024	2
	35600	170	- 5	- 5	5	- 5	0.043	24
	35400	171	5	- 5	5	5	0.025	6
	35200	172	- 5	5	5	5	0.029	9
	35000	173	5	10	5	15	0.043	9
	34800	175	5	5	5	10	0.038	9
	34600	176	5	10	5	10	0.034	12
	34400	177	5	25	5	5	0.040	18
	34200	178	10	25	5	10	0.025	9
	34000	179	5	15	5	5	0.043	12
	33800	180	5	15	5	10	0.033	9
	33600	181	25	15	10	15	0.034	12
	33400	182	25	15	20	30	0.036	12
	33200	183	15	20	15	20	0.026	3
	33000	184	25	30	15	25	0.034	MS
	32800	185	90	240	200	55	0.034	29
	32600	186	110	20	100	85	0.042	29

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Co-ordinates (TEP Mine Grid)		Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
35700 S	32400 E	70123187	140	30	40	75	0.024	6
	32200	188	95	40	20	55	0.036	6
	32000	189	100	10	70	40	0.036	24
	31800	190	110	30	15	25	0.042	6
	31600	191	220	55	55	35	0.043	9
	31400	192	5	15	310	90	0.062	21
	31200	193	10	30	15	10	0.060	9
35700 S	31000 E	70123194	5	25	20	5	0.058	9

36900 S

Co-ordinates (TEP Mine Grid)		Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
36900 S	39600 E	70123235	5	10	- 5	- 5	0.016	MS
	39400	234	5	25	15	50	0.030	MS
	39200	233	5	- 5	- 5	- 5	0.017	MS
	39000	232	5	15	5	- 5	0.021	MS
	38800	231	5	10	- 5	5	0.019	MS
	38600	230	5	15	- 5	10	0.021	MS
	38400	229	5	15	- 5	20	0.027	6
	38200	228	5	10	- 5	5	0.032	9
	38000	227	5	10	- 5	5	0.030	6
	37800	226	5	10	- 5	10	0.027	9
	37600	225	10	10	- 5	65	0.021	1
	37400	224	35	15	10	200	0.036	6
	37200	223	330	15	45	360	0.027	24
	37000	222	15	15	10	120	0.047	15
	36800	221	15	15	15	270	0.019	MS
	36600	220	20	10	25	280	0.069	6
	36400	219	5	5	- 5	10	0.024	6
	36200	218	5	5	- 5	- 5	0.021	6
	36000	217	- 5	- 5	- 5	- 5	0.038	6
	35800	216	- 5	- 5	5	- 5	0.021	MS
	35600	215	- 5	- 5	- 5	- 5	0.015	6
	35400	214	- 5	- 5	- 5	- 5	0.021	6
	35200	213	5	5	- 5	- 5	0.041	21
	35000	212	5	10	5	20	0.025	9
	34800	211	- 5	25	5	20	0.038	9
	34600	210	- 5	- 5	- 5	- 5	0.022	12
	34400	209	- 5	5	- 5	- 5	0.039	24
	34200	208	- 5	5	- 5	- 5	0.026	18
	34000	207	- 5	- 5	- 5	- 5	0.029	15
	33800	206	- 5	- 5	- 5	- 5	0.027	21
	33600	205	- 5	5	5	10	0.032	12
	33400	204	5	25	5	10	0.030	18
	33200	203	5	20	5	20	0.032	9
36900 S	33000 E	70123202	35	50	30	50	0.023	9

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36900 S

Co-ordinates (TEP Mine Grid)		Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-Metric	Hole Depth Feet
36900 S	32800 E	70123201	70	25	25	50	0.026	9
	32600	200	130	25	130	95	0.017	6
	32400	199	95	5	65	75	0.017	9
	32200	198	90	15	65	70	0.017	18
	32000	197	130	20	35	40	0.016	27
	31800	196	310	50	110	55	0.040	18
36900 S	31600 E	70123195	5	35	35	- 5	0.073	15

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Co-ordinates (TEP Mine Grid)		Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
38100 S	40600 E	70123236	10	5	5	20	0.027	9
			10	10	5	40	0.032	9
			10	5	- 5	30	0.040	12
	40000	239	5	5	- 5	20	0.036	6
			15	5	5	40	0.036	15
			5	5	- 5	10	0.038	27
			- 5	5	- 5	- 5	0.039	29
			- 5	5	- 5	5	0.025	6
	39000	244	- 5	5	- 5	10	0.027	6
			- 5	5	- 5	- 5	0.037	6
			- 5	5	- 5	- 5	0.021	MS
			5	5	- 5	- 5	0.017	MS
			5	5	- 5	- 5	0.021	MS
	38000	249	5	5	- 5	- 5	0.017	MS
			5	5	- 5	5	0.019	MS
			5	10	- 5	5	0.021	MS
			5	5	- 5	- 5	0.017	MS
			5	5	- 5	- 5	0.019	MS
	37000	254	5	5	- 5	- 5	0.017	MS
			5	5	- 5	- 5	0.017	MS
			5	5	- 5	- 5	0.019	MS
			5	5	- 5	- 5	0.021	MS
			- 5	- 5	- 5	20	0.021	MS
	36000	259	5	5	90	550	0.025	9
			5	5	5	40	0.029	9
			5	- 5	- 5	- 5	0.036	6
			- 5	- 5	- 5	- 5	0.034	6
			- 5	- 5	- 5	- 5	0.031	21
	35000	264	5	5	- 5	5	0.021	6
			- 5	5	- 5	- 5	0.017	6
		266	5	5	- 5	5	0.015	9
		284	5	15	5	10	0.014	21
		267	- 5	5	- 5	5	0.017	6
	34000	268	- 5	15	5	10	0.020	29
			- 5	15	- 5	5	0.011	29
			- 5	10	- 5	5	0.020	6

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Co-ordinates (TEP Mine Grid)	Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
		5	35	10	20	0.019	9
		5	35	10	10	0.021	9
33000	273	5	30	5	10	0.023	9
		5	20	5	10	0.021	12
		40	20	5	10	0.019	12
		110	30	140	120	0.019	18
		150	20	85	90	0.013	29
32000	278	85	20	65	85	0.010	29
		85	15	75	65	0.015	29
		75	10	60	95	0.013	29
		120	20	100	95	0.016	29
		210	20	200	95	0.022	29
31000	283	190	180	50	85	0.018	6
	302	45	40	15	20	0.013	MS
	303	55	1100	10	10	0.019	MS
	295	30	30	15	5	0.072	21
38100 S 30200 E	70123296	5	15	30	5	0.072	18
39300 S 38000 E	70123337	35	20	- 5	5	0.042	29
		15	20	5	20	0.023	9
		15	20	5	40	0.030	6
		20	30	5	25	0.025	6
		15	15	5	55	0.034	18
37000	332	5	10	75	150	0.032	29
		5	20	5	65	0.021	6
		5	25	10	75	0.030	12
		20	25	70	200	0.027	15
		5	20	10	85	0.017	MS
36000	327	- 5	10	5	5	0.019	MS
		- 5	15	5	5	0.023	MS
		5	10	- 5	- 5	0.025	MS
		- 5	5	- 5	- 5	0.023	MS
		- 5	10	5	- 5	0.019	MS
35000	322	- 5	10	5	- 5	0.036	6
		- 5	10	- 5	5	0.051	12
		- 5	10	- 5	5	0.015	6
		- 5	30	5	15	0.036	12
		- 5	10	- 5	5	0.019	6

Co-ordinates (TEP Mine Grid)	Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
34000	317	5	30	25	20	0.030	12
		- 5	10	- 5	- 5	0.025	6
		5	15	5	5	0.019	6
		10	50	10	20	0.021	9
		5	10	5	10	0.019	6
33000	312	10	10	5	5	0.025	6
		5	10	5	10	0.019	6
		- 5	15	5	10	0.019	6
		5	10	5	10	0.032	9
		5	20	5	10	0.053	18
32000	307	30	10	10	40	0.021	18
		75	70	5	35	0.019	6
	305	75	65	100	85	0.021	29
	301	85	20	85	55	0.019	29
		85	20	50	100	0.023	29
31000	299	85	60	65	80	0.019	29
		170	95	170	95	0.032	29
	297	25	20	25	5	0.042	2
	304	5	30	5	5	0.021	1
	294	15	20	5	- 5	0.037	6
30000	293	5	20	5	- 5	0.070	9
		10	25	10	5	-	9
		10	10	15	5	-	9
		15	10	15	- 5	-	12
		10	15	15	- 5	-	12
29000	288	5	10	5	5	-	9
		5	20	5	5	-	9
39300 S 28600 E	70123286	5	15	5	5	-	9
40500 S 38000 E	70123338	5	- 5	5	5	0.036	29
		30	10	30	55	0.040	29
	340	5	20	5	5	0.038	9
	553	5	15	5	15	0.058	MS
	341	15	5	5	10	0.012	MS

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Co-ordinates (TEP Mine Grid)	Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
37000	342	40	10	5	20	0.016	MS
		590	30	15	290	0.034	9
		15	15	5	100	0.027	9
		5	20	10	210	0.040	12
		5	20	50	400	0.027	12
36000	347	5	15	5	40	0.036	12
		- 5	10	5	5	0.066	9
		5	10	5	10	0.033	MS
		20	10	5	50	0.043	MS
		- 5	15	5	5	0.049	MS
35000	352	- 5	10	- 5	5	0.049	MS
		- 5	10	5	- 5	0.057	MS
		- 5	10	- 5	5	0.082	6
		15	20	10	20	0.062	9
		15	30	15	20	0.057	18
34000	357	5	15	5	10	0.025	9
		5	25	5	30	0.020	9
		15	30	15	40	0.025	15
		15	30	25	25	0.025	12
		5	15	5	10	0.012	6
33000	362	- 5	10	5	10	0.008	6
		- 5	10	5	10	0.012	6
		- 5	5	- 5	5	0.012	6
		- 5	5	- 5	5	0.012	6
		- 5	15	5	20	0.020	12
32000	367	- 5	10	- 5	10	0.020	12
		- 5	10	5	10	0.037	6
		75	80	55	250	0.020	12
		- 5	25	15	20	0.020	29
		25	25	60	20	0.025	29
31000	372	50	25	60	55	0.016	18
		30	35	55	75	0.012	29
		55	25	55	40	0.025	29
		50	20	50	25	0.025	15
		95	10	25	40	0.016	21

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Co-ordinates (TEP Mine Grid)	Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
33000	413	5	30	5	20	0.016	9
		5	30	5	10	0.020	9
		- 5	20	5	10	0.025	12
		5	10	- 5	5	0.020	9
		5	5	- 5	5	0.016	6
32000	408	- 5	20	5	10	0.016	6
	407	5	20	5	15	0.016	MS
	405	- 5	10	- 5	5	0.008	MS
	404	- 5	5	- 5	5	0.008	MS
		5	15	- 5	5	0.008	MS
31000	402	15	35	15	10	0.020	12
		15	25	15	50	0.020	9
		15	35	5	20	0.016	9
		5	15	25	40	0.012	18
		75	30	120	65	0.008	29
30000	397	15	30	5	25	0.008	2
		100	10	60	65	0.012	21
		95	15	65	50	0.012	15
		170	15	90	40	0.016	18
		160	10	35	85	0.012	12
29000	392	35	20	35	30	0.008	MS
	552	5	20	- 5	5	0.025	MS
	391	5	15	5	5	0.016	MS
		5	20	5	5	0.029	6
		5	10	- 5	5	0.037	9
41700 S 28000 E	70123388	5	10	- 5	5	0.016	MS
42900 S 38000 E	70123449	30	10	10	15	0.031	6
		15	10	15	10	0.043	24
		140	30	5	15	0.052	18
		40	35	5	20	0.038	9
		5	10	- 5	10	0.020	9
37000	454	10	10	- 5	10	0.032	12
		5	15	- 5	10	0.031	6
		- 5	20	- 5	5	0.015	MS
		- 5	10	5	5	0.020	MS
		- 5	10	- 5	5	0.017	MS

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Co-ordinates (TEP Mine Grid)	Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
30000	377	75	15	40	60	0.041	18
		60	50	10	40	0.037	12
		35	40	15	30	0.012	6
		65	50	10	75	0.016	6
		20	20	10	10	0.020	9
29000	382	15	15	15	5	0.025	6
		5	25	10	- 5	0.037	9
		5	15	5	5	0.033	9
		15	20	35	5	0.037	12
		5	10	15	5	0.037	12
40500 S 28000 E	70123387	5	15	5	5	0.033	9
41700 S 38000 E	70123437	5	20	- 5	10	0.026	6
		15	30	5	50	0.052	18
	435	10	65	5	25	0.049	12
	406	5	10	15	20	0.039	9
	434	- 5	20	5	10	0.014	MS
37000	433	- 5	15	- 5	10	0.019	MS
		- 5	15	5	10	0.017	MS
		- 5	10	- 5	10	0.014	MS
		120	25	25	460	0.015	6
		50	15	15	220	0.026	15
36000	428	45	20	15	150	0.019	15
		95	20	20	350	0.021	9
		75	15	15	360	0.014	3
		5	- 5	25	260	0.037	18
		15	15	5	150	0.016	MS
35000	423	- 5	10	- 5	- 5	0.012	MS
		- 5	10	- 5	- 5	0.025	MS
		- 5	10	- 5	5	0.016	MS
		- 5	30	30	40	0.016	MS
		- 5	15	15	30	0.016	MS
34000	418	- 5	15	10	20	0.008	MS
		5	15	5	10	0.004	MS
		5	20	5	10	0.008	6
		15	35	10	20	0.016	9
		10	30	5	20	0.041	6

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Co-ordinates (TEP Mine Grid)	Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
36000	459	5	10	- 5	5	0.021	MS
		- 5	15	- 5	10	0.029	MS
		- 5	5	- 5	10	0.025	MS
		5	30	30	65	0.029	9
		10	40	20	210	0.021	12
35000	464	5	15	- 5	10	0.020	MS
		5	30	5	40	0.019	MS
		- 5	- 5	- 5	10	0.009	MS
		- 5	5	- 5	5	0.014	MS
		5	15	5	20	0.023	9
34000	469	5	- 5	5	5	0.031	9
		- 5	- 5	- 5	- 5	0.043	9
		10	10	5	20	0.021	MS
		- 5	10	- 5	10	0.012	6
		- 5	- 5	- 5	10	0.014	6
33000	474	- 5	15	- 5	20	0.014	MS
		- 5	10	- 5	10	0.014	MS
		- 5	5	- 5	15	0.017	MS
		- 5	10	- 5	20	0.014	MS
		5	20	5	20	0.012	MS
32000	479	- 5	15	- 5	10	0.009	MS
		- 5	15	5	10	0.014	MS
		5	20	5	10	0.014	MS
		5	5	- 5	5	0.014	MS
		5	10	- 5	10	0.012	MS
31000	484	5	15	- 5	20	0.011	MS
		5	15	- 5	10	0.017	MS
		5	10	- 5	20	0.021	MS
		5	10	- 5	10	0.019	MS
		5	10	- 5	- 5	0.026	MS
30000	489	5	15	- 5	- 5	0.032	12
		20	70	55	35	0.034	18
		85	100	5	85	0.020	9
		110	20	75	75	0.017	12
		150	35	170	65	0.035	21

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Co-ordinates (TEP Mine Grid)	Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
29000	494	240	35	110	85	0.009	6
		50	40	15	35	0.014	3
		20	25	- 5	- 5	0.038	9
		- 5	20	- 5	- 5	0.031	6
		25	25	15	20	0.021	9
28000	499	110	25	75	60	0.043	12
27800 E	70123500	10	30	35	10	0.043	9
44100 S 38000 E	70123501	30	15	25	20	0.016	9
		55	20	35	20	0.016	12
		50	20	15	20	0.016	9
		25	40	5	20	0.016	9
		5	15	5	10	0.016	MS
37000	506	- 5	10	- 5	- 5	0.020	MS
		5	10	5	5	0.016	MS
		- 5	20	5	10	0.016	MS
	509	120	20	75	570	0.024	12
	554	190	25	75	400	0.020	9
36000	510	340	20	55	870	0.016	15
		130	35	20	320	0.020	9
		30	20	5	140	0.020	12
		25	15	55	630	0.016	12
		10	20	15	240	0.028	9
35000	515	25	20	10	190	0.024	9
		15	15	5	95	0.016	9
		15	15	- 5	65	0.016	9
		15	15	5	15	0.020	9
		15	20	5	40	0.020	6
34000	520	15	20	5	40	0.024	6
		15	15	- 5	40	0.024	6
		10	20	- 5	140	0.027	9
		5	20	- 5	35	0.027	9
		- 5	20	- 5	40	0.035	9

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Co-ordinates (TEP Mine Grid)	Sample Number	Cu (2)	Pb (5)	Zn (1)	Ni (5)	Max. Radio-metric	Hole Depth Feet
33000	525	5	20	45	360	0.024	9
		5	30	5	55	0.016	9
		5	15	- 5	35	0.016	12
		5	15	- 5	40	0.012	9
		5	35	5	60	0.016	9
32000	530	5	10	- 5	25	-	9
		- 5	10	- 5	20	0.012	9
		- 5	5	- 5	20	0.016	9
		- 5	15	5	30	0.016	9
		- 5	5	- 5	15	0.012	9
31000	535	- 5	10	- 5	20	0.012	9
		- 5	15	- 5	15	0.008	MS
		- 5	15	- 5	20	0.008	MS
		- 5	5	- 5	5	0.008	MS
		- 5	10	- 5	5	0.008	MS
30000	540	- 5	15	- 5	20	0.020	9
		- 5	20	5	95	0.024	15
		- 5	10	- 5	- 5	0.012	MS
		- 5	10	- 5	- 5	0.016	6
		- 5	5	- 5	- 5	0.020	6
29000	545	5	20	10	5	0.035	9
		95	10	50	80	0.012	24
		90	5	75	75	0.016	15
		15	35	5	20	0.024	12
		5	60	15	5	0.035	15
28000	550	30	55	- 5	20	0.035	9
44100 S 27800 E	70123551	20	30	- 5	40	0.035	9

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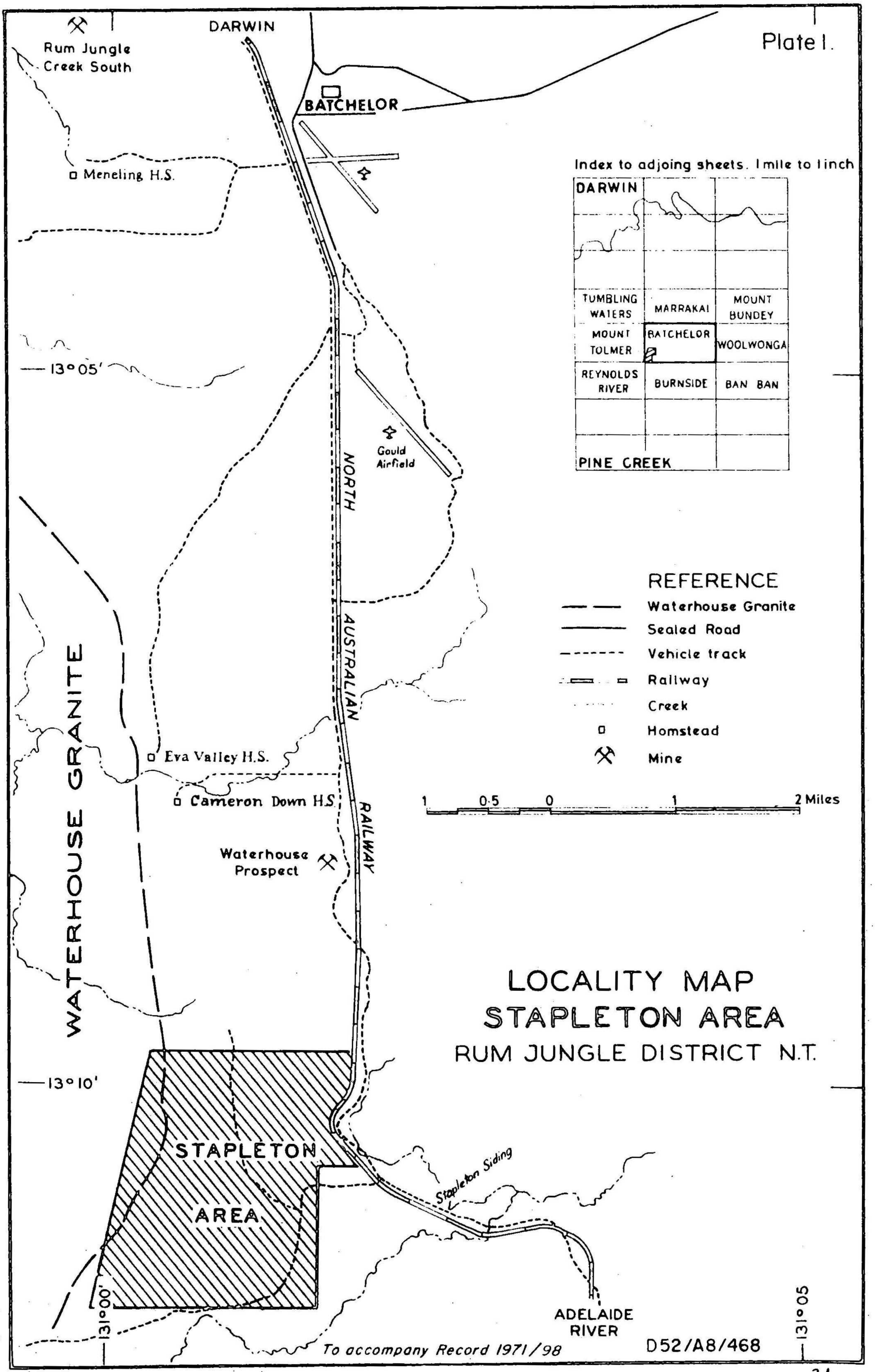


Plate I.
DARWIN
Rum Jungle Creek South
BATCHELOR
Meneling H.S.
Index to adjoing sheets. 1 mile to 1 inch
DARWIN
TUMBLING WATERS
MARRAKAI
MOUNT BUNDEY
MOUNT TOLMER
BATCHELOR
WOOLWONGA
REYNOLDS RIVER
BURNSIDE
BAN BAN
PINE CREEK
13°05'
Gould Airfield
NORTH AUSTRALIAN RAILWAY
REFERENCE
Waterhouse Granite
Sealed Road
Vehicle track
Railway
Creek
Homstead
Mine
WATERHOUSE GRANITE
Eva Valley H.S.
Cameron Down H.S.
1 0.5 0 1 2 Miles
Waterhouse Prospect
LOCALITY MAP
STAPLETON AREA
RUM JUNGLE DISTRICT N.T.
13°10'
STAPLETON AREA
Stapleton Siding
131°00'
131°05'
ADELAIDE RIVER
To accompany Record 1971/98
D52/A8/468

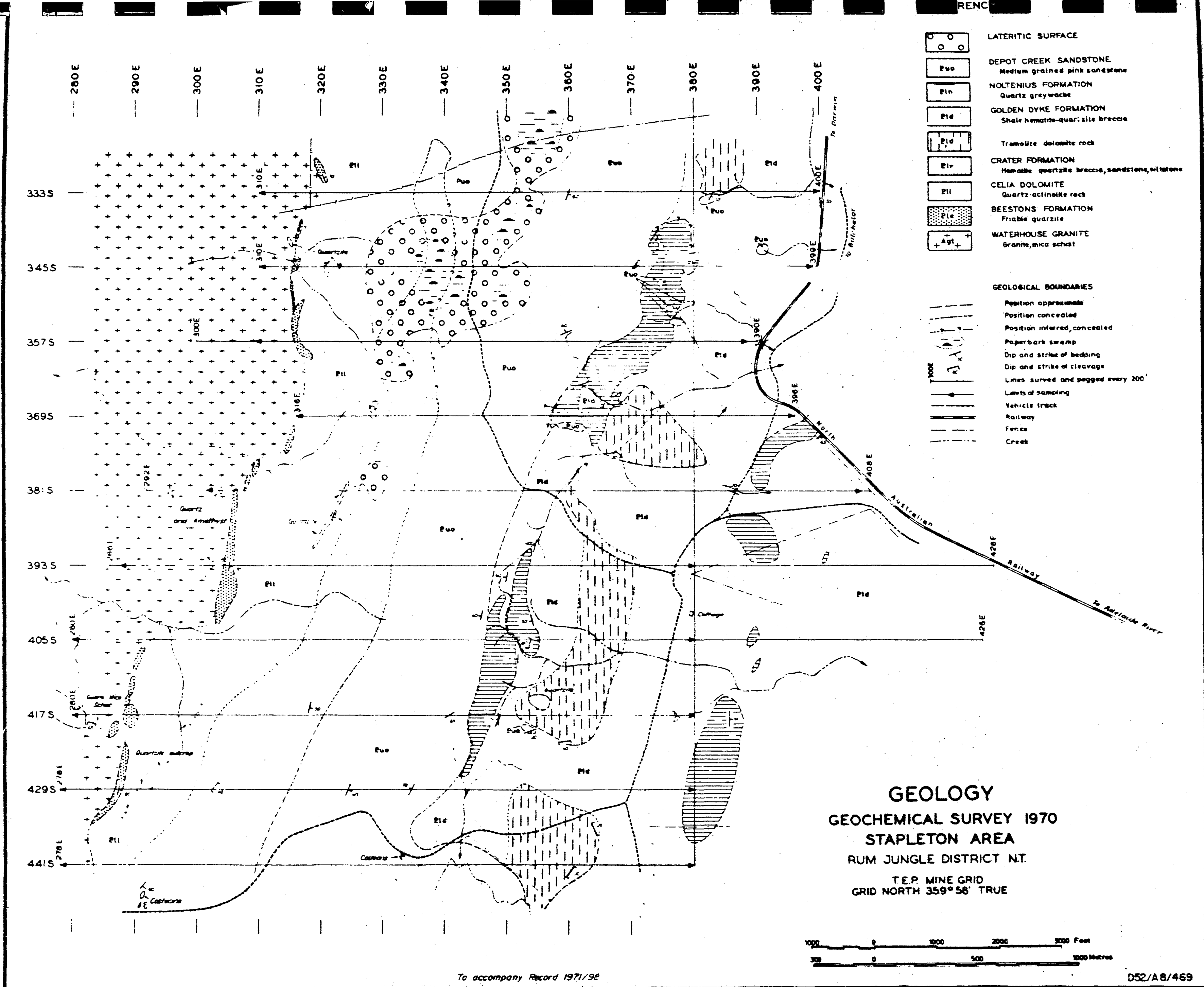
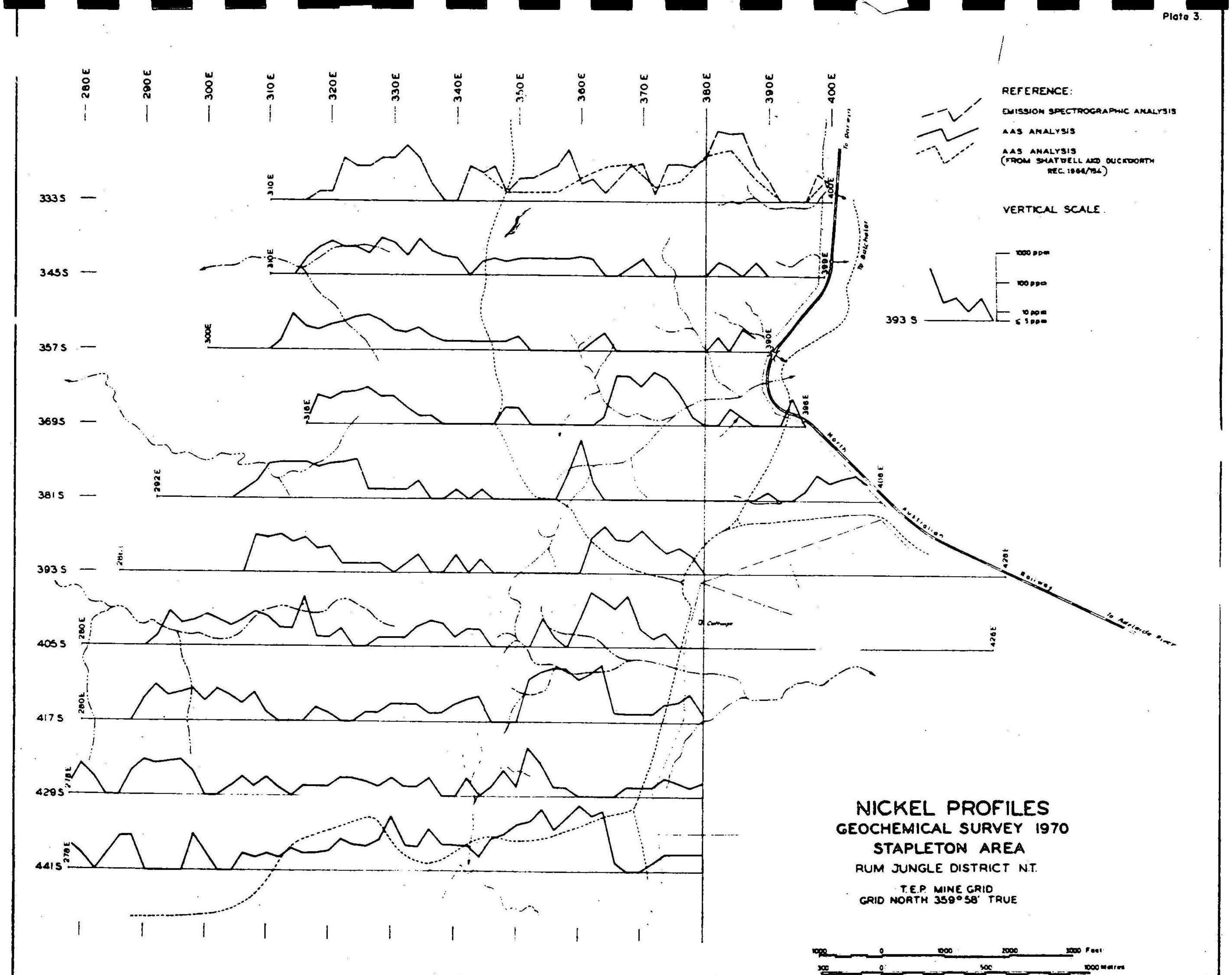

LATERITIC SURFACE
DEPOT CREEK SANDSTONE
Medium grained pink sandstone
NOLTENIUS FORMATION
Quartz greywacke
GOLDEN DYKE FORMATION
Shale hematite-quartzite breccia
Tremolite dolomite rock
CRATER FORMATION
Hematite quartzite breccia, sandstone, siltstone
CELIA DOLOMITE
Quartz-actinolite rock
BEESTONS FORMATION
Friable quarzite
WATERHOUSE GRANITE
Granite, mica schist
GEOLOGICAL BOUNDARIES
Position approximate
Position concealed
Position inferred, concealed
Paperbark swamp
Dip and strike of bedding
Dip and strike of cleavage
Lines surved and pegged every 200'
Limits of sampling
Vehicle track
Railway
Fence
Creek
GEOLOGY
GEOCHEMICAL SURVEY 1970
STAPLETON AREA
RUM JUNGLE DISTRICT N.T.
T.E.P. MINE GRID
GRID NORTH 359° 58' TRUE
1000 0 1000 2000 3000 Feet
300 0 500 1000 Metres
To accompany Record 1971/98
D52/A8/469

Plate 3.



To accompany Record 1971/98

D52/A8/470

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