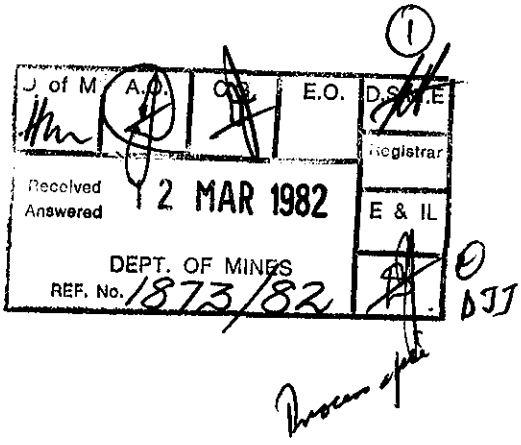
82-1708.

649001

PROJECT A-78-60

DISC 99




PROGRESS REPORT

JULY 1981 TO JANUARY 1982

ZEEHAN

EXPLORATION LICENCE 4/78

TASMANIA

P.A. JONES JANUARY 1982 REPORT 279

DISTRIBUTION

- o Denver
- ● Mines Department
- o Sydney
- o Field
- o Spare
- o Trade

CONTENTS


| | Page |
|---|---|
| SUMMARY AND CONCLUSIONS | 1 |
| LOCATION AND ACCESS | 4 |
| DESCRIPTION OF THE PROPERTY AND OWNERSHIP | 5 |
| HISTORY AND EXPLORATION TO DATE | 7 |
| GEOLOGY OF THE TENEMENT | 8 |
| WORK CONDUCTED BY AMOCO | 10 |
| PROPOSED PROGRAM | 27 |
| EXPENDITURE | 29 |


FIGURE


| | | After page |
|---|---|---|
| 1 | LOCATION | 4 |

TABLES


| | | Page |
|---|---|---|
| 1 | NUBEENA - ROCKCHIP SAMPLING | 15A |
| 2 | PYRAMID - ROCKCHIP SAMPLING | 15 |
| 3 | SOUTH AUSTRAL CREEK - STREAM SEDIMENT AND CHANNEL SAMPLING | 16 |
| 4 | AUSTRAL DRILLHOLE ZT-81A-4 - CORE DENSITY TESTS | 20 |
| 5 | AUSTRAL - DIAMONDDRILLING SUMMARY | 21A |


APPENDICES

* NOTE: Appendices 1,4,5, are in folded map form and accompany the Enclosures.


1. PHOTOGEOLOGICAL MAP OF THE ZEEHAN AREA, TASMANIA
   by Hunting Geology and Geophysics
2. GENERAL RECONNAISSANCE VISIT TO THE OCEANA-AUSTRAL CARBONATE HOSTED Pb-Zn-Ag MINERALIZATIONS, ZEEHAN DISTRICT, TASMANIA
   by K.J. Wolf
3. MYRTLE - BEDROCK GEOCHEMISTRY AND GRAVITY
4. SASSAFRASS - GRAVITY RESIDUALS
5. PYRAMID - BOUGUER GRAVITY
6. AUSTRAL - INFILL GRAVITY RESIDUALS
   by Mitre Geophysics
7. AUSTRAL GRAVITY REPORT
   by S. Collins
8. ZT-79A-1, 80A-2, 81A-4 thru 10 - DRILL LOGS AND SECTIONS (INCLUDING LOGS ONLY FOR HOLES ZT-79-2, 80-3 thru 8, 80A-3)
9. PULSE ELECTROMAGNETIC RECORD SHEETS (Geoterrex)

ENCLOSURES

| | | | Scale |
|---|---|---|---|
| 1 | EL 4/78 | • PROSPECT LOCATION | 1:50000 |
| 2 | | • PRE-EXISTING TENEMENTS | 1:50000 |
| 3 | Nubeena | • FACTUAL GEOLOGY | 1:2500 |
| 4 | | • BOUGUER GRAVITY | 1:2500 |
| 5 | Austral | • FACTUAL GEOLOGY | 1:2500 |
| 6 | Austral - Soil Geochemistry | • LEAD | 1:2500 |
| 7 | | • ZINC | 1:2500 |
| 8 | Myrtle to Rose Valley | • RESIDUAL GRAVITY | 1:5000 |




# Project Location

Reproduced with permission

SUMMARY AND CONCLUSIONS

Exploration Licence 4/78 was granted to Amoco Minerals Australia Company for a period of six months from June 14, 1978 with further renewals subject to Mines Department approval. Amoco negotiated a joint venture with Electrolytic Zinc to farm-in to Mining Lease 60M/77 located within EL 4/78, which embraces the southern portion of the Austral prospect. The tenement embraces potential shale or carbonate hosted basemetal prospects.

Precambrian basement sediments are overlain by Cambrian sediments and volcanics which are localized within graben structures. These are in turn overlain by Lower Ordovician conglomerate. Transgresive upon these units are Ordovician to Devonian basinal units including sandstones, siltstones, shales, dolomites and limestones.

Detailed geological mapping was undertaken on the Nubeena prospect situated due west of the Austral grid. A detailed airphoto interpretation study was conducted by Hunting Geology and Geophysics on the area encompassing the Oceana, Austral, Pyramid and North Austral prospects.

Hydraulic auger sampling, using a Jackro 200 auger mounted on a bombadier was initiated to alleviate the problem of thick gravels occurring in the valleys occupied by the Gordon Limestone. Portions of some grids were too rugged to allow this sampling procedure and hand augering was resorted to where necessary. Highly anomalous results were obtained on the Myrtle and Nubeena grids, with sampling at Nubeena yet to be completed.

High tenor results were obtained from rockchip sampling on the Nubeena and Pyramid prospects with five composite dump samples from the Pyramid workings assaying 19.64% lead, 0.27% zinc and 145.5 g/t silver.

An ongoing program of diamond drill core grinding to quickly scan previously unassayed core continued during the period.

Gravity reduction and interpretation was completed during the period outlining significant anomalies on a number of grids. One anomaly has dimensions 400 by 400 meters with a gravity response of 1.0 milligal and is located between the Baura and Rose Valley grids. A small gravity survey detailing part of the Austral gravity trend was conducted by Mitre Geophysics.

Geoterrex was contracted to conduct PEM surveys on the North Austral and Nubeena prospects, however, receiver malfunction and bad weather conditions led to its premature termination.

Amoco contracted Geoex to conduct an airborne magnetometer survey over EL 4/78 in conjunction with a regional survey being carried out by the Mines Department.

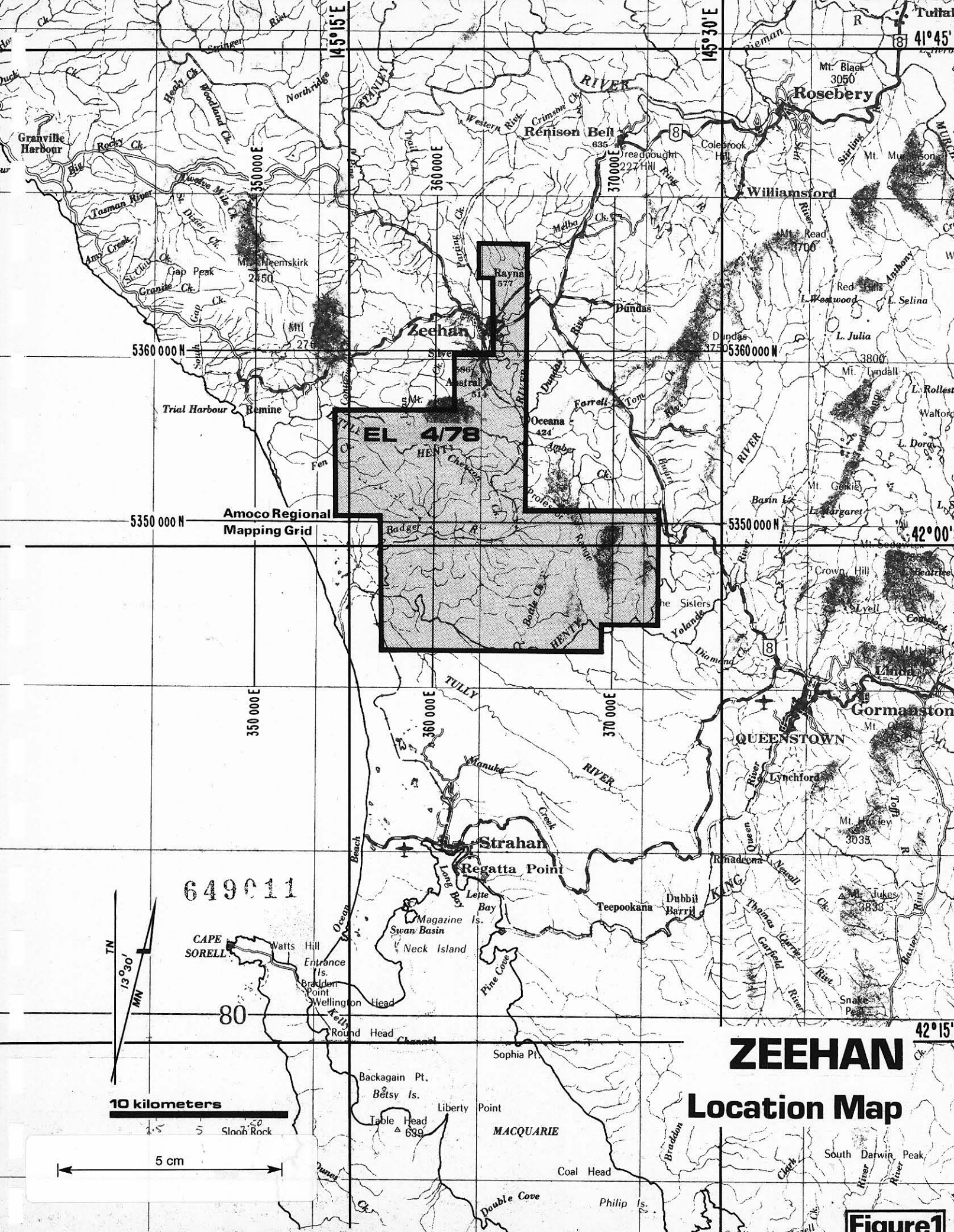
A seven hole diamond drilling program was conducted to test coincident gravity and geochemistry responses on the Austral prospect. Hole ZT-81A-6 intersected encouraging lead-zinc-silver mineralization over a number of zones at the base of the Gordon Limestone. Minor basemetal mineralization associated with both calcite and siderite gangue minerals similar to that at Oceana, was intersected by drillholes ZT-81A-5, 7, 8 and 10.

Further drilling at the Austral prospect is recommended to test for massive sulfides at depth, under holes ZT-81A-5 and ZT-81A-7. A further hole is planned to intersect the westerly dipping ironstone sequence at the Flux Quarry. Detailed gravity and geochemical surveys are to be continued to further delineate anomalous zones.

## LOCATION AND ACCESS

Exploration Licence 4/78 (EL 4/78) is located immediately south of the town of Zeehan which has a population of approximately 5,000. (Figure 1). The Emu Bay Railway and a sealed road connect Zeehan with the port of Burnie, located 140 kilometers to the north. Access within the tenement is relatively good for Western Tasmania, as a number of tracks are located along the dolomites which form topographic lows. Permission was granted by the Tasmanian Mines Department to bulldoze a number of access tracks into drill sites.

Zeehan is the service town for the Renison Tin Mine, and no difficulties would be anticipated with respect to power, water and transport should a mine be developed. The area has an annual rainfall of 250 centimeters.


EL 4/78
Amoco Regional Mapping Grid
ZEEHAN
Location Map
Figure1
10 kilometers
5 cm
FROM QUEENSTOWN 1:250 000 SHEET DRAWING M78-906
649011
80
13°30' MN
145°15'E
145°30'E
350 000E
360 000E
370 000E
5360 000N
5350 000N
41°45'
42°00'
42°15'
Zeehan
Rosebery
Williamsford
Queenstown
Strahan
Regatta Point
Gormanston
Dundas
Renison Bell
Granville Harbour
Trial Harbour
Remine
Oceana
Rayna
Mt. Black 3050
Mt. Kleemskirk 2550
Mt. Read 3700
Mt. Lyell 3800
Mt. Jukes 3833
Mt. Owen 3035
Mt. Sedgwick
Mt. Gaskell
Mt. Darwin
Cape Sorell
Watts Hill
Entrance Is.
Bradden Point
Wellington Head
Round Head
Kelly Channel
Backagain Pt.
Betsy Is.
Liberty Point
Table Head 639
Sloop Rock
Sophia Pt.
Coal Head
Double Cove
Philip Is.
Harbour
Macquarie
Teepookana
Dubbil Barril
Magazine Is.
Swan Basin
Neck Island
Lette Bay
Long Bay
Pine Cove
Ocean Beach
Tasman River
Stanley River
Henty River
Franklin River
Queen River
King River
Linda
Lynchford
Crown Hill
The Sisters
Lake Margaret
Lake Julia
Lake Selina
Lake Westwood
Lake Dora
Lake Rollest
Red Hills
Basin Lk
Snake Pass
Soldiers Is.
Hazell
Pillinger
South Darwin Peak
Granite Ck
Twelve Mile Ck
Rocky Ck
Healy Ck
Woodland Ck
Northridge
Crimson Ck
Western River
Trail Ck
Farting Ck
Melba Ck
Dundas River
Farrell Ck
Tony River
Amber Ck
Fen Ck
Cheyne Ck
Badger R
Battle Ck
Yolande River
Diamond Ck
Manuka Creek
Thomas Creek
Garfield River
Jane River
Anthony River
Braddon River
Clark River
Collingwood River
Queenstown Lynchford Toft R
Rinadeena
Newall
Teepookana
Dubbil Barril
Lyell
Comstock
Beatrice
Walford
Tullah
Mt. Murchison
Sterling
Colebrook Hill
Read Mountain
Mt. Lyell
Mt. Owen
Mt. Jukes
Mt. Darwin
Mt. Sedgwick
Mt. Gaskell
Mt. Black
Mt. Kleemskirk
Gap Peak
Mt. Zeehan
Mt. Australia
Mt. Dundas
Mt. Farrell
Mt. Oceana
Mt. Rayna
Mt. Renison Bell
Mt. Read

## DESCRIPTION OF THE PROPERTY AND OWNERSHIP

Exploration Licence 4/78 has an area of approximately 208 square kilometers, and was granted to Amoco Minerals for the period of six months from June 14, 1978. Renewal of the tenement for further periods of twelve months is dependent on Mines Department approval of previous exploration and proposed programs.

Amoco negotiated a joint venture with Electrolytic Zinc Company to farm-in to the Mining Licence 60M/77 embracing the southern portion of the Austral prospect. The lease is designed to cover the slag dumps from the old Zeehan smelters.

Amoco applied for and was granted a three hectare mining lease; 34M/81, encompassing the Oceana mine environs (Enclosure 2).

Four other mining leases are present within the tenement (Enclosure 2). Two leases granted to J.N.R. Enraght-Moony (38M/77 and 39M/77) are designed to embrace slag dumps from the Oonah tin mine. Two small leases held by Tasmanian Mineral Developments were forfeited late in 1981 due to non compliance with the Mining Act. These leases, covering the mine environs at the Queensberry deposit, were reissued for a twelve month period, subject to Mines Department approval, to the Malcolm Bendall Mining syndicate at the Wardens Court.

## HISTORY AND EXPLORATION TO DATE

A detailed description of the mining history and exploration carried out within EL 4/78 was summarized in the two previous progress reports:

Progress Report for the period June 1979 to June 1980 (Amoco Report 179)

Progress Report for the period June 1980 to June 1981 (Amoco Report 249)

*GEOLOGY OF THE TENEMENT*

The basement complex is comprised of Precambrian schists, quartzites, siltstones, shales, spillitic or keratophyric lavas and pyroclastics and forms a stable craton to the northwest of the tenement. The Lower Cambrian units such as the Crimson Creek Formation, are predominantly shallow water sediments, including argillites, grits, and tuffaceous arenites. Cambrian sedimentation appears confined to fault bounded blocks or graben structures.

The Ordovician to Devonian strata of the Zeehan Basin occur within a series of synclinal structures with northwest axial trends. The quartzose and hematitic Owen Conglomerate at Mt. Zeehan, was deposited within a graben structure in the Lower Ordovician period and is transgressively overlain by micaceous siltstones, tubicolar sandstones, grits and minor sandstones and

shales. It is the time equivalent of the Moina Sandstone which was deposited in the Zeehan Basin. The Moina Sandstone is overlain disconformably by the Ordovician Gordon Limestone. The disconformity is marked by a white conglomerate followed by an interbedded sequence of siltstones, dolomites and minor sandstone and limestones. The Gordon Limestone is comprised of interbedded limestones and dolomites with numerous breccia horizons and zones of clastic sedimentation including fossiliferous sandstones, siltstones and shales. Siluro-Devonian sediments within the basin are fossiliferous marine, coarse grained and cross bedded quartzose sandstones, siltstones, minor quartzites and dolomitic to pyritic shales and siltstones.

The western portion of the tenement has been blanketed by Permian glacials, lacustine sediments and Jurassic dolerite flows.

Extensive Tertiary and Quaternary deposits blanket much of the prospective dolomite and shale units.

The Zeehan area has been intensely disturbed by the Paleozoic Tabberaberan orogeny which caused major northwest folding and faulting. East and northwest trending fault systems are considered to have been contemporaneous. North-northeast striking faults are thought to have developed in post Permian times and are not common within the tenement area.

A geologic map of the tenement and surrounding area was included in the previous progress report for the period July 1978 to July 1979. (Amoco Report 151, Enclosure 1)

WORK CONDUCTED BY AMOCO

Work conducted during the period July 1981 to January 1982, included gridding, detailed geological mapping, geochemical, airborne magnetic, gravity and PEM surveys and core density tests. A further seven diamond holes, six within the EZ joint venture area, were drilled on the Austral Prospect. An airphoto interpretation study encompassing the structurally complex Zeehan area was carried out by Hunting Geology and Geophysics (Appendix 1) A detailed report summarizing Amoco's exploration program and results obtained to date was undertaken by K.H. Wolf (Appendix 2). All computer contouring of geochemical and geophysical surveys was conducted by CEA of Sydney.

Gridding

About 18 kilometers of gridding and infill gridding were completed on three prospects (Enclosure 1).

At North Austral, 2.5 line kilometers of infill gridding was staked in readiness for a detailed PEM survey. The additional lines are from 2650N to 3250N, from the baseline eastwards to 1800E or to the tenement boundary.

One line kilometer of infill gridding was completed in preparation for a small detailed gravity survey to be carried out on lines 450N to 750N, from 1300E to 1600E, on the Austral prospect.

A grid of thirteen line kilometers was staked over the Sassafrass prospect in the northeast corner of the tenement to allow gravity surveying over the Gordon Limestone sequence, south of Renison Ltd's EL 42/71.

Geological Mapping

Detailed geological mapping at a scale of 1:1000 was completed on the Nubeena Prospect and is presented at 1:2500 (Enclosure 3).

The mapping has shown the area to be heavily mineralized with many workings including shafts, adits, pits and costeans located throughout the entire grid. The geology is structurally complex with many of the faults manifest by large outcrops of concretionary ironstones and ferruginous quartz breccias.

The sequence youngs from west to east, with Precambrian massive interbedded quartzites, black shales, sandstones, minor volcanics and ironstones of the Oonah Formation being overlain to the east, unconformably or in fault contact by Cambrian interbedded volcanoclastics, tuffs, conglomerates, shales and ironstones of the Crimson Creek Formation. The Cambrian sequence, as is evidenced at North Austral, is heavily mineralized with numerous workings and ironstones. A number of the lead-zinc-silver mineralized dumps contained siderite as the major gangue mineral and may require further evaluation. Overlying the Cambrian sequence are Ordovician conglomerates, grits, and sandstones of

the Mount Zeehan Conglomerate. This sequence is in fault contact with the Cambrian sequence, the trace of which is generally marked by an ironstone development and minor workings. The Mount Zeehan Conglomerate is overlain conformably to the east by the Moina Formation and is comprised of sandstones, micaceous siltstones, tubicolor siltstones and grits. The formation is cut by numerous east-west and northeast trending, steeply dipping faults. Possibly unconformably overlying this sequence is the Gordon Limestone observed in the southeast corner of the grid. Here the unconformity is evidenced by a thin quartz conglomerate horizon filling in an erosional surface at the base of the Gordon Limestone. The unconformity is folowed by a sequence of dolomitic slump breccias and clastic sediments in which lead-zinc mineralization has been observed at Austral on surface and in diamond drillhole ZT-81-A6 at 1700N:1120E (74-77 meters = 3meters of 9.5% lead + 6.6% zinc + 71.3g/t silver).

Costeaning

Two trenches (Enclosure 5) totalling 30 meters were excavated at Austral using an hydraulic excavator. The trenches were cut to ascertain dip directions before drilling commenced on hole ZT-81-A5. It was thought the overturning of strata, observed south of the Flux Quarry may continue along strike to the south. However, the trenches showed the strata to dip 60-75° to the east. Minor veined galena mineralization was cut in costean adjacent to a small working.

Airphoto Interpretation

Hunting Geology and Geophysics was contracted to prepare a detailed structural map from both black and white and colored aerial photos with scales varying from 1:6000 to 1:44000. The interpretative map (Appendix 1) shows the complex nature of the heavily faulted Zeehan area as well as its complex folding and lithologic distribution.

Geochemistry

The bombadier mounted Jackro auger rig was used to penetrate thick gravel deposits blanketing much of the prospective horizon, as well as negotiating rugged country containing thick talus and scree deposits. Areas too steep for bombadier work, as at Nubeena, were either hand auger sampled or sampled using a Stihl power auger. A total of 577 top of bedrock samples were taken from Nubeena, Austral and Myrtle prospects, with holes at 25 meter intervals along grid lines at depths varying from one to five meters.

Samples were dried, crushed and pulverised before being split and dispatched to Comlabs Pty Ltd in Adelaide for analysis for copper, lead, zinc and silver. Check assays on every twentieth sample were carried out by Amdel in Adelaide. A number of samples at the Myrtle prospect were also assayed for mercury and barium. Analyses for basemetals was by AAS after hydrochloric acid digestion.

Rockchip samples were prepared in the same manner as the soils but were analyzed for an additional twelve elements being tin, tungsten, arsenic, antimony (by XRF) and gold, nickel, cobalt, bismuth, molybdenum, vanadium, cadmium, manganese (by AAS).

Contoured soil geochemical results for the Austral prospect (ammended from that supplied in Amoco Report 249, June 1980 - June 1981) with data deleted from contaminated areas surrounding the Zeehan lead smelters is included (Enclosures 6 and 7). Contoured soil geochemistry for Myrtle is also included (Appendix 3). Geochemical sampling on the Nubeena prospect has yet to be completed due to poor access and rugged terrain.

Austral:

Two hundred and five samples were taken by both Jackro and hand auger to complete the sampling of the gridded area. Some 46 samples were deleted from contouring due to contamination from

the Zeehan Smelter and its associated slime dump. The additional results have not changed the overall geochemical trend although a highly anomalous zone of coincident lead-zinc geochemistry was increased in tenor and broadened in areal extent. The anomalous zone lies between 450N and 600N from 1425E to 1600E and averages greater than 1000 ppm lead and zinc. This anomaly has values ranging up to 10.5% lead, 0.73% zinc and is coincident with major cross structure with associated brecciation and ironstone development. Diamond drillhole ZT-81A-10 was collared to penetrate this zone and intersected 3 meters of 2.57% lead, 0.67% zinc, 20 g/t silver within a heavily pyritic dolomite breccia.

Mayltle:

One hundred and sixty two samples were taken by Jackro and hand auger over a moderate tenor zinc-mercury anomaly outlined by the previous hand augering program. The anomalous zone was delineated further using the Jackro auger and has dimensions 450 by 100 meters assaying up to 1.45%, 4.1% zinc and 43 g/t silver. This high tenor response is open to the north with values of 1.0%, 1.5% lead and 1.15%, 2.1% zinc occurring on line, 50600N.

Nubeena:

Two hundred and ten samples have been augered, covering approximately 25% of the gridded area with approximately 140 samples being taken using the Jackro auger combination. The remainder, including those yet to be sampled, will have to be taken using either a hand auger or Stihl power auger as the rugged topography precludes bombadier access.

Assays received to date range up to 0.67% lead, 1.2% zinc and 0.21% copper with the higher values generally occurring in close proximity to outcropping ironstones and minor workings.

Rockchip Geochemistry

Nubeena:

A total of 151 composite rockchip samples have been taken from

outcropping ironstones, ferruginous quartzites and other rock types and dump material (locations are shown on Enclosure 3 with rock types and assay results summarized in Table 1, following page).

Results from dump material varied from less than 1% to 68.7% lead, less than 1% to 10.5% zinc and 3 g/t to 860 g/t silver with minor high copper and antimony results (sample 37511 1.10% copper and 1.2% antimony).

Outcropping ironstones vary greatly in tenor with a few having highly anomalous manganese as well as lead-zinc-silver assays. One anomalous zone from 1200N to 1300N centered at 1600E, averages 2.7% lead, 0.6% zinc, 18 g/t silver and has an associated three channel PEM response occurring at depth. High levels of nickel, cobalt and vanadium occur from other ironstones on the grid indicating a possible scavenging effect and ferricrete deposition.

Pyramid:

Five composite rockchip samples, averaging 19.6% lead, 0.3% zinc, 145 g/t silver, were taken from dumps at the Pyramid workings, and assay results are presented in Table 2. A moderate to strong tenor (0.5 milligal) gravity anomaly trending southeast, occurs coincident with the workings. A soil geochemical survey and detailed mapping is planned to aid delineation of the zone in preparation for drilling.

TABLE 2 - PYRAMID ROCKCHIP SAMPLING

| Sample | Location | Rock Type | Cu | Pb | Zn | Ag | Cd | Sb | Sn | Au | Co | Bi |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27606 | Pyramid | Sideritic limestone | 440 | 18.9% | 0.38% | 170 | Not assayed | | | | | |
| 27607 | Workings | " " | 530 | 19.2% | 0.29% | 210 | " | | " | | | |
| 27608 | Ore | " " | 395 | 23.9% | 0.20% | 140 | " | | " | | | |
| 27609 | Dumps | " " | 360 | 34.4% | 0.22% | 200 | " | | " | | | |
| 29742 | " | " " | 185 | 1.8% | 0.25% | 7.5 | 5 | 64 | -0.01 | -0.02 | 4 | -1 |

Note: -1 indicates less than 1

TABLE 1 - NUBEENA ROCKCHIP DETAILS

| No | Sample | Coords | Rock Type | Cu | Pb | Zn | Ag | Sn | Au | Sb | Ni | Co | Bi | Mo | V | Cd | W | Mn | As |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 36288 | 1780N:1495E | Ironstone (o/c) | 6 | 24 | 145 | <1 | 4 | <0.05 | <4 | 145 | 4 | 4 | <4 | 170 | <1 | 20 | - | - |
| 2 | 36289 | 1765N:1502E | Ironstone (o/c) | 4 | 10 | 42 | <1 | 8 | <0.05 | <4 | 20 | <4 | <4 | <4 | 130 | <1 | <10 | - | - |
| 3 | 36290 | 1760N:1485E | Ironstone (o/c) | <2 | 8 | 55 | <1 | <4 | <0.05 | 6 | 85 | 8 | 4 | <4 | 80 | <1 | 15 | - | - |
| 4 | 36291 | 1742N:1500E | Ironstone (o/c) | 4 | 20 | 50 | <1 | 4 | <0.05 | 4 | 75 | 4 | <4 | <4 | 110 | <1 | <10 | - | - |
| 5 | 36292 | 1590N:1502E | Galena (dp) | 420 | 62.5% | 4900 | 860 | 260 | <0.05 | 1000 | 8 | <4 | 8 | <4 | <10 | 40 | <10 | - | - |
| 6 | 36293 | 1570N:1530E | Green Vale (dp) | 18 | 4300 | 1200 | 8 | <4 | <0.05 | 26 | 175 | <4 | 4 | <4 | 60 | <1 | <10 | - | - |
| 7 | 36294 | 1580N:1507E | Py brec blk sh (dp) | 10 | 9300 | 220 | 10 | 8 | <0.05 | 30 | 28 | 8 | 4 | <4 | <10 | <1 | <10 | - | - |
| 8 | 36295 | 1515N:1375E | Galena (dp) | 1100 | 55.0% | 1.05% | 790 | 520 | <0.05 | 1000 | 40 | 4 | 4 | <4 | <10 | 85 | <10 | - | - |
| 9 | 36296 | 1507N:1475E | Qtz brec Gal(dp) | 65 | 11.6% | 3.00% | 150 | 100 | <0.05 | 130 | <4 | <4 | 4 | 4 | <10 | 2 | <10 | - | - |
| 10 | 36297 | 1507N:1485E | Galena (dp) | 430 | 45.5% | 5600 | 590 | 380 | <0.05 | 500 | 28 | 4 | <4 | <4 | <10 | 44 | <10 | - | - |
| 11 | 37509 | 1925N:1070E | Pytic blk sh (o/c) | 24 | 145 | 24 | 2 | <4 | <0.05 | 12 | 145 | 24 | <4 | 10 | 70 | <1 | <10 | 44 | 310 |
| 12 | 37510 | 1925N:1050E | Galena (dp) | 1350 | 19.9% | 660 | 370 | 4 | <0.05 | 2200 | 14 | 8 | <4 | <4 | 20 | 7 | <10 | 240 | 3550 |
| 13 | 37511 | 1930N:1075E | Galena (Sb?)(dp) | 1.10% | 18.7% | 3200 | 790 | 470 | <0.05 | 1.2% | 10 | 4 | 28 | <4 | <10 | 30 | <10 | 3300 | 8800 |
| 14 | 37512 | 1800N:890E | Galena (dp) | 620 | 22.0% | 530 | 570 | 16 | <0.05 | 960 | 4 | <4 | <4 | <4 | 10 | 7 | 10 | 2300 | 730 |
| 15 | 37513 | 1612N:1335E | Galena (dp) | 270 | 40.7% | 4950 | 580 | 170 | <0.05 | 600 | 4 | <4 | 6 | <4 | 20 | 36 | 20 | 44 | 440 |
| 16 | 37514 | 1610N:1370E | Galena (dp) | 115 | 68.7% | 2250 | 730 | 85 | <0.05 | 760 | 4 | <4 | 8 | <4 | <10 | 28 | <10 | 36 | 680 |
| 17 | 37515 | 1635N:1415E | Malachite? (dp) | 26 | 1.39% | 190 | 17 | 4 | <0.05 | 240 | 140 | 4 | <4 | <4 | 60 | <1 | <10 | 16 | 40 |
| 18 | 37516 | 1630N:1407E | Galena/py/sph (dp) | 145 | 28.1% | 6200 | 400 | 85 | <0.05 | 380 | 10 | <4 | <4 | <4 | <10 | 35 | 30 | 16 | 860 |
| 19 | 37517 | 1440N:1380E | Ironstone (o/c) | 14 | 1100 | 60 | 2 | 4 | <0.05 | 12 | <4 | <4 | <4 | <4 | 290 | <1 | <10 | 250 | 210 |
| 20 | 37518 | 1425N:1380E | Galena/cpy/py (dp) | 1350 | 55.4% | 2600 | 690 | 320 | <0.05 | 1000 | 12 | <4 | <4 | <4 | <10 | 55 | <10 | 80 | 350 |
| 21 | 37519 | 1375N:1010E | Ferrug Arenite (dp) | 55 | 1500 | 65 | 3 | <4 | <0.05 | 20 | <4 | <4 | 6 | <4 | 50 | <1 | <10 | 28 | 100 |
| 22 | 37520 | 1320N:1600E | Ironstone (o/c) | 640 | 3.2% | 6000 | 13 | 350 | <0.05 | 30 | 210 | 580 | <4 | <4 | 40 | 65 | 15 | 12.5% | 50 |
| 23 | 37521 | 1305N:1605E | Ironstone (o/c) | 400 | 2.2% | 5500 | 23 | 36 | <0.05 | 14 | 550 | 270 | <4 | <4 | 160 | 50 | <10 | 8.0% | 160 |
| 24 | 37522 | 1430N:1475E | Galena/py (dp) | 470 | 29.0% | 4500 | 410 | 200 | <0.05 | 480 | 8 | 4 | 4 | <4 | 10 | 38 | <10 | 250 | 400 |
| 25 | 37523 | 1475N:1505E | Ironstone (o/c) | 16 | 1000 | 950 | 2 | <4 | <0.05 | 16 | 155 | 40 | <4 | <4 | 510 | <1 | <10 | 560 | 310 |
| 26 | 37524 | 1500N:1615E | Ironstone (o/c) | 18 | 650 | 1550 | <1 | <4 | <0.05 | <4 | 65 | 24 | <4 | <4 | 180 | <1 | <10 | 1.30% | 36 |
| 27 | 37528 | 1900N:1940E | Gn/Ironstone (dp) | 220 | 1.73% | 1.80% | 12 | 32 | <0.05 | 44 | 170 | 36 | <4 | <4 | 60 | 115 | <10 | 6300 | 34 |
| 28 | 37529 | 1915N:1965E | Ironstone (o/c) | 26 | 620 | 500 | 1 | 10 | <0.05 | <4 | 6 | 14 | <4 | <4 | 80 | <1 | <10 | 5200 | 65 |
| 29 | 37530 | 1925N:1980E | Ironstone (o/c) | 20 | 210 | 650 | <1 | <4 | <0.05 | 14 | 48 | 16 | <4 | <4 | 100 | <1 | 15 | 3700 | 22 |
| 30 | 37531 | 1930N:2000E | Ironstone (o/c) | 28 | 610 | 2400 | 1 | 34 | <0.05 | 28 | 50 | 14 | <4 | <4 | 90 | 1 | <10 | 1.54% | 28 |
| 31 | 37532 | 1800N:1875E | Ironst/gn/sphl (dp) | 260 | 9.0% | 6.3% | 40 | 42 | <0.05 | 90 | 260 | 100 | <4 | <4 | 20 | 340 | <10 | 9500 | 40 |
| 32 | 37533 | 1775N:1890E | Siderite/Ironst(dp) | 220 | 4200 | 1.6% | 4 | <4 | <0.05 | 24 | 480 | 250 | <4 | <4 | 40 | 48 | <10 | 7300 | 60 |
| 33 | 37534 | 1760N:1875E | Gn/sphl Ironst (dp) | 710 | 9.3% | 10.5% | 70 | 140 | <0.05 | 150 | 300 | 170 | <4 | <4 | 30 | 510 | 50 | 6500 | 130 |
| 34 | 37535 | 1000N:1550E | Ironstone (o/c) | 1600 | 900 | 2400 | 2 | <4 | <0.05 | 26 | 180 | 85 | <4 | 4 | 40 | 1 | <10 | 1000 | 175 |
| 35 | 37536 | 1150N:1045E | Gn in blk sh (dp) | 360 | 16.4% | 7000 | 140 | 80 | <0.05 | 270 | 10 | 6 | <4 | <4 | 10 | 38 | <10 | 1.25% | <2 |
| 36 | 37537 | 1150N:1080E | Gn/py in blk sh(dp) | 640 | 13.0% | 1400 | 450 | <4 | <0.05 | 640 | 10 | <4 | <4 | <4 | 10 | 12 | 30 | 7600 | 12 |
| 37 | 37538 | 1170N:1165E | Ferrug blk sh (dp) | 18 | 860 | 85 | 3 | 6 | <0.05 | 8 | 8 | <4 | <4 | 4 | 10 | <1 | 10 | 700 | 8 |
| 38 | 37539 | 1145N:1170E | Gn/py qtz/blk sh (o/c dump) | 350 | 18.1% | 2600 | 390 | 8 | <0.05 | 500 | 6 | <4 | <4 | <4 | <10 | 16 | 10 | 360 | 260 |
| 39 | 37540 | 1140N:1505E | Gn in sid. brec (dp) | 38 | 2050 | 2000 | 3 | <4 | <0.05 | 10 | 800 | 65 | <4 | <4 | 30 | 6 | <10 | 4100 | 28 |
| 40 | 37541 | 1205N:1607E | Ironstone (o/c) | 730 | 6400 | 2600 | 2 | 8 | <0.05 | 170 | 430 | 28 | <4 | <4 | 150 | <1 | <10 | 190 | 270 |
| 41 | 37542 | 1260N:1210E | Gn blk sh (dp) | 630 | 23.0% | 1600 | 227 | 55 | <0.05 | 830 | 6 | <4 | <4 | <4 | <10 | 16 | 10 | 1250 | 120 |
| 42 | 37543 | 1505N:1155E | Ferrug mic sct(o/c) | 230 | 240 | 32 | 2 | 55 | <0.05 | 60 | <4 | <4 | <4 | <4 | 30 | <1 | <10 | <4 | 480 |
| 43 | 37544 | 1600N:1700E | Ironstone (o/c) | 10 | 75 | 730 | <1 | <4 | <0.05 | 10 | 65 | 10 | <4 | <4 | 35 | <1 | 20 | 3600 | 20 |
| 44 | 37545 | 1920N:1350E | Gn py sid. qtz(dp) | 3400 | 13.4% | 1.5% | 680 | 20 | <0.05 | 3400 | 18 | 6 | <4 | <4 | <10 | 110 | <10 | 1.9% | 880 |
| 45 | 37546 | 1445N:1610E | Ironst gn py sid. | 24 | 3550 | 9000 | 3 | 42 | <0.05 | 38 | 500 | 100 | <4 | <4 | <10 | 36 | 10 | 7.4% | 26 |
| 46 | 37547 | 1525N:1665E | Ironst gal clay(o/c) | 44 | 3.8% | 1.30% | 31 | 4 | <0.05 | 75 | 380 | 75 | <4 | <4 | <10 | 85 | <10 | 7.0% | 26 |
| 47 | 37548 | 1540N:1655E | Gn Sl Sb? py Sid(dp) | 220 | 33.0% | 1.65% | 250 | 16 | <0.05 | 290 | 300 | 38 | <4 | <4 | <10 | 120 | <10 | 6.4% | 100 |
| 48 | 37549 | 1757N:1765E | Mangano Ironst+gn (dp) | 85 | 7.9% | 1.45% | 12 | 30 | <0.05 | 65 | 140 | 44 | <4 | <4 | <10 | 55 | <10 | 8.9% | 40 |
| 49 | 37550 | 1770N:1755E | Ironstone (o/c) | 12 | 660 | 840 | <1 | <4 | <0.05 | 22 | 26 | 30 | <4 | 4 | 50 | <4 | 10 | 4900 | 80 |
| 50 | 29887 | 1875N:1905E | Ironstone + gn (dp) | 120 | 2.3% | 1.2% | 20 | 130 | <0.05 | 55 | 220 | 36 | <4 | <4 | <10 | 44 | <10 | 6.9% | 40 |
| 51 | 29888 | 1875N:1905E | Ironstone (o/c) | 30 | 1.3% | 4000 | 5 | 170 | <0.05 | 30 | 60 | 16 | <4 | <4 | <10 | 6 | 20 | 4.5% | 12 |



64902 3

Austral:

Five creek and nine channel samples, each five meters in length, were taken from the lower Austral area from 500N to 650N and from 1550E to 1650E (Enclosure 5).

The creeks were sampled to ascertain the potential of the unconformable contact between the Gordon Limestone and the overlying Crotty Quartzite. The assay values (Table 3) were generally quite low averaging 85ppm lead and 160ppm zinc, however, strongly anomalous values up to 0.77% lead were obtained in close proximity to a major northeast trending cross structure occurring approximately from 450N to 550N.

The nine channel samples were taken when bulldozing of diamond hole pads 9 and 10 exposed ferruginous black dolomite and ironstone. These rocks had previously been covered by a layer of gravel and scree up to one meter thick. Results from these varied (Table 3) but all showed the area to be strongly anomalous in both lead and zinc with the samples averaging 0.44% lead + 0.32% zinc + 3.2 g/t silver.

TABLE 3 - SOUTH AUSTRAL CREEK STREAM SEDIMENT AND CHANNEL SAMPLING

| Sample | Coords | Comments | Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|
| Stream Sediment Sampling | | | | | | |
| 37717 | Ck 605N 1600E | Black dolomite outcropping in drainage creek. | 14 | 85 | 230 | 2 |
| 37718 | Ck 620N 1600E | Black dolomite outcropping in creek. | 14 | 85 | 90 | 1 |
| 29898 | Start 550N:1600E | Dolomite in creek (Map 29898) | 8 | 780 | 55 | 1 |
| 29899 | Map 29898 | Black dolomite | 10 | 3900 | 145 | 2 |
| 29900 | Map 29898 | Black dolomite | 8 | 7700 | 36 | 1 |
| Channel Sampling | | | | | | |
| 37719 | 550N:1625E | Ferruginous clay and dol. 5m samples, map 37719 | 115 | 1.45% | 1950 | 6 |
| 37720 | 555N:1625E | | 46 | 2500 | 1800 | 2 |

| | | | | | |
|---|---|---|---|---|---|
| 37721 | 550N:1600E | Dolomite outcrop. 5m smpl | 22 | 4200 | 4200 | -1 |
| 37722 | 550N:1595E | Map 37721 | 20 | 1500 | 3000 | -1 |
| 37723 | 550N:1590E | | 18 | 1350 | 2800 | -1 |
| 37724 | 550N:1585E | | 14 | 250 | 1050 | -1 |
| 37725 | 545N:1550E | Ironstone outcrop and | 42 | 4900 | 790 | 7 |
| 37726 | 545N:1545E | ferruginous clay, map 37725 | 22 | 4700 | 6500 | 7 |
| 37727 | 545N:1540E | 5m samples | 26 | 5700 | 6300 | 7 |

Note: -1 indicates less than 1 etc.

Diamond Drill Core Filleting

An ongoing program of diamond drill core filleting to quickly scan previously unassayed material continued during the period with some three meter zones assaying up to:-

| | | | |
|---|---|---|---|
| Oceana | holes | ZT-80-3 | 110 ppm Pb, 640 ppm Zn (completed) |
| | | ZT-80-4 | 1850ppm Pb, 1400ppm Zn (completed) |
| Austral | holes | ZT-80A-3 | 590 ppm Pb, 5500ppm Zn (completed) |
| | | ZT-81A-4 | 155 ppm Pb, 1850ppm Zn (completed) |
| | | ZT-81A-5 | 185 ppm Pb, 970 ppm Zn (incomplete) |
| | | ZT-81A-6 | 1650ppm Pb, 3000ppm Zn (complete) |

(See also Appendix 8 for updated drill logs)

Geophysics

Geophysical surveys and data interpretation included Pulse Electromagnetic (PEM) surveys by Geoterrex, infill gravity by Mitre Geophysics, airborne magnetics by Geoex (in conjunction with a Tasmanian Mines Department Survey), core density tests and data interpretation of previous gravity results. All gravity data were computer contoured by CEA in Sydney. Preliminary results of the interpretative gravity are as follows:-

Sassafrass:

Lithological features with no discrete highs occur from approximately 2200N to 4000N. This sequence is cut off to the south by a major cross structure at 2200N trending roughly grid east-west. The gravity map (Appendix 4) shows an alternating

sequence on linear highs and lows indicating a non uniform limestone sequence.

Nubeena:
Here the gravity is masked by a severe regional trend of approximately 2 milligals (Enclosure 4). The gravity is cut obliquely from 2000N, 1950E to 1150N, 1550E by a major fault (Enclosure 3), with moderate associated ironstone development. A number of anomalously high responses requiring further field checking, were observed within the Precambrian sequence of interbedded black shales, quartzites and sandstone. Numerous small workings (silver, lead, zinc) are found within this sequence only some of which have associated ironstone devlopment.

Pyramid:
A strong gravity response of 0.5 milligals, dimensions 200 by 100 meters (Appendix 5) was delineated on the Pyramid grid coincident with the mine workings. Five composite dump samples (Table 2) taken from the mine area averaged 19.6% lead, 0.3% Zn, 145 g/t silver.

Myrtle:
A moderate tenor gravity response of 0.35 milligals (Appendix 3) was delineated in the northern portion of the prospective Gordon Limestone sequence. This response, of dimensions 200 by 100 meters, occurs coincident with anomalous 0.85% zinc and 210,000 ppb mercury soil geochemistry. Further highly anomalous geochemistry occurs some 200 meters north assaying up to 4% zinc, 2% lead and 43 g/t silver (Appendix 3).

Myrtle to Rose Valley:
Two major gravity responses were delineated from the previous Solo survey (Enclosure 8). The main zone, of dimensions 400 by 400 meters, has a 0.8 milligal response and occurs at the junction of the Rose Valley and Baura grids. This response is coincident with a major air photo linear and anomalous

reconnaissance soil geochemistry obtained early 1979. The second anomalous zone with a 0.5 milligal response has dimensions 200 by 150 meters and occurs on the Rose Valley grid approximately 400 meters south of the latter response.

A further anomalous zone trends from the Myrtle to Baura grids and appears to trace a lithological feature.

Mitre Geophysics was contracted to complete a small infill gravity survey on a portion of the large gravity response (up to 1.0 milligals of dimensions 800 by 250 meters) observed on the Austral prospect. The survey, detailing a large bullseye anomaly, was undertaken with 25 meter station intervals on lines 50 meters apart, the results of which confirmed the size and tenor of the original response (Appendix 6).

The overall anomalous trend, with coincident moderate tenor lead-zinc soil geochemistry, observed from 600N to 1400N and 1250E to 1500E on the Austral grid was diamond drilled to test for massive sulfides. All holes (ZT-81A-4,5 and 7) failed to intersect significant mineralization or explain the gravity source. Measurements on four core samples (Table 4) indicate density variations less than 0.1 gm/cc which is not consistent with the anomaly produced. Further drillcore density measurements and downhole Sirotem surveys are planned; the latter to test for possible adjacent massive sulfide occurrences. A report by Amoco geophysicist is included (Appendix 6).

Pulse Electromagnetics:
PEM surveys by Geoterrex, were implemented on the North Austral and Nubeena grids, however, receiver malfunction, bad weather conditions, giving high telluric noise and initial poor results led to its premature termination (Appendix 9).

Minor late channel responses were recorded over the Montagu Mine workings coincident with chargeability high/resistivity low and a

magnetic high on the North Austral grid. A number of the dumps contain argillaceous calcite and siderite veined limestone, some of which are brecciated and well mineralized indicating that the mine penetrated the overlying Silurian formation and passed into mineralized Ordovician Gordon Limestone.

Minor 2-3 channel anomalies occur over a massive ironstone on the Nubeena grid with composite assays averaging 2.7% lead, 0.6% zinc, 18 g/t silver.

Aeromagnetics:

Geoex was contracted to fly an airborne magnetometer survey over EL 4/78 in conjuction with a planned regional survey being conducted by the Tasmanian Mines Department. Lines were spaced at 250 meter intervals oriented east-west, across the tenement aiding exploration for possible tin deposits as well as aiding regional mapping. Results from this survey are anticipated in mid 1982.

Core Density Test:

A core density test was conducted on Austral hole ZT-81A-4

TABLE 4 - AUSTRAL DRILLHOLE ZT-81A-4 - CORE DENSITY TESTS

Core Density Tests ZT-81A-4

| | |
|---|---|
| Dolomite | 2.64 gm/cc |
| Fossil Breccia | 2.73 " |
| Calclutite | 2.74 " |
| Interbedded Calclutite-Calcarenite | 2.70 " |

Diamond Drilling

Seven holes totalling 1447.5 meters were drilled at the Austral prospect, six of which (ZT-81A-4,5,7,8,9 and 10) were drilled solely within the Amoco/EZ joint venture area. Hole ZT-81A-6, drilled within the Amoco portion of the tenement, intersected encouraging lead-zinc-silver mineralization. Of the other six

holes, four (those being ZT-81A-5,7,8 and 10) intersected minor to low grade accumulations of silver-lead-zinc. Drilling details and assay results from this program and previous drilling at Austral are summarized (Table 5). Drillhole locations are plotted (Enclosure 5) and drill sections and logs are included (Appendix 8).

- ZT-81A-4 (EZ J.V. Area)

  Location : 1300N:1530E
  Declination : 50°
  Azimuth : 249°T (Grid west)
  Total Depth : 259 meters

  This hole was sited to test the northern extent of a 0.35 milligal gravity response with coincident anomalous lead-zinc geochemistry assaying up to 0.3% lead and 0.74% zinc. The hole was terminated at 259 meters after passing through unmineralized interbedded calclutites, calcarenites, dolomites, fossil breccias, slumped limestones and laminar calclutites and calcmicrites. The entire hole is strongly pyritic with trace amounts of sphalerite and galena being observed sporadically throughout. No satisfactory answer to the observed gravity response was ascertained in the core.

- ZT-81A-5 (EZ J.V. Area)

  Location : 897.5N:1373E
  Declination : 50°
  Azimuth : 249°T (Grid west)
  Total Depth : 340 meters

  This hole was collared to test the central portion of a 0.75 milligal gravity response with coincident high lead-zinc soil geochemistry (assaying up to 0.35% lead, 0.76% zinc) and surface workings. The hole was terminated at 340 meters having cut three weakly mineralized, vertically trending calcite/siderite/sphalerite/galena zones of similar texture

TABLE 5 - AUSTRAL DIAMOND DRILLING SUMMARY

| HOLE | CO-ORD | BEARING | DECLIN | DEPTH (M) | COORDINATES AZIMUTH DEFLECTION (at terminal depth) | RESULTS (* including) |
|---|---|---|---|---|---|---|
| ZT-79A-1 | 1800N 1225E | 270°G | -50° | 163 | Unknown (acid) | 76- 82= 6m @ 1.06% Pb + 1.66% Zn + 1.6g/t Ag<br>130-143=13m @ 2.61% Pb + 0.62% Zn + 13.8g/t Ag |
| ZT-80A-2 | 1850N 1300E | 270° | -60° | 331 | 1850N 1135E | 40- 46= 6m @ 0.69% Pb + 1.62% Zn + 5.8g/t Ag<br>284-299=15m @ 0.80% Pb + 0.86% Zn + 4.8g/t Ag<br>*284-290= 6m @ 1.44% Pb + 0.65% Zn + 5.1g/t Ag<br>and 294-299= 5m @ 0.29% Pb + 1.40% Zn + 3.8g/t Ag |
| ZT-80A-3 | 1610N 1300E | 270° | -65° | 373.50 | 1535N 1097E | 294-296= 2m @ 0.42% Pb + 2.05% Zn + 15.5g/t Ag<br>341-355=14m @ 0.86% Pb + 0.23% Zn + 4.4g/t Ag<br>*347-351= 4m @ 2.25% Pb + 0.28% Zn + 9.0g/t Ag |
| ZT-81A-4 | 1300N 1530E | 270°G | -50° | 259 | | No significant mineralization |
| ZT-81A-5 | 897.5N 1373E | 270°G | -50° | 340 | | 201-202= 1m @ 0.63% Pb + 1.15% Zn + 5.0g/t Ag<br>278-281= 3m @ 0.57% Pb + 0.59% Zn + 2.3g/t Ag |
| ZT-81A-6 | 1695N 1050E | 090°G | -55° | 194.2 | | 42-43 = 1m @ 0.63% Pb + 5.00% Zn + 18.0g/t Ag<br>74-77 = 3m @ 9.50% Pb + 6.60% Zn + 71.3g/t Ag<br>153-167=14m @ 2.54% Pb + 0.35% Zn + 40.4g/t Ag<br>181-183= 2m @ 4.20% Pb + 0.18% Zn + 40.0g/t Ag |
| ZT-81A-7 | 750N 1535E | 250°g | -50° | 254 | | 50.2-52.2= 2m @ 1.40% Pb + 0.16% Zn + 42.5g/t Ag<br>122-125= 3m @ 4.34% Pb + 0.29% Zn + 17.0g/t Ag<br>*124-125= 1m @ 10.60% Pb+ 0.27% Zn + 42.0g/t Ag<br>*244-245.8= 1.8m @ 0.06% Pb + 1.89% Zn + 1.0g/t Ag |
| ZT-81A-8 | 1030.5N 1340E | 270°G | -45° | 150 | | 12-13 = 1m @ 3.30% Pb + 5.30% Zn + 23.0g/t Ag |
| ZT-81A-9 | 555N 1500E | 242°G | -45° | 149.5 | | No significant mineralization |
| ZT-81A-10 | 550N 1598E | 255° | -45° | 100 | | 52-58 = 6m @ 1.79% Pb + 0.58% Zn + 14.8g/t Ag<br>* 52-55 = 3m @ 2.57% Pb + 0.67% Zn + 20.0g/t Ag |



649030

and style to that observed in hole ZT-80-4 at Oceana. The better assay results are 1 meter of 0.63% lead, 1.15% zinc, 5 g/t silver (correlating with the surface workings) and 3 meters of 0.57% lead, 0.59% zinc, 2.3 g/t silver (correlating with anomalous geochemistry at 1200E). The hole passed through fossil breccias and slump breccias, slumped limestones, interbedded calclutites and dolomites, calcmicrites and calcareous quartz arenites similar to that drilled at Oceana. No satisfactory answer to the observed gravity response was ascertained in the core.

- ZT-81A-6 (Amoco)

| | | |
|---|---|---|
| Location | : | 1695N:1050E |
| Declination | : | 55° |
| Azimuth | : | 069°T (Grid east) |
| Total Depth | : | 194.2 meters |

This hole was sited between costeans H & K (best results: H - 4 meters of 4.01% lead, 9.33% zinc, 28 g/t silver and 12 meters of 3.91% lead, 0.28% zinc, 17.7g/t silver and K - 4 meters of 1.36% lead, 1.04% zinc, 7g/t silver and 22 meters of 2.71% lead, 1.63% zinc, 9g/t silver) to test the down dip extension of mineralization intersected in these as well as testing coincident high tenor lead-zinc soil geochemistry and shallow workings. Outcropping galena-sphalerite mineralization and ironstone was to be cut by a hole drilled eastwards on line 1695N. The hole was positioned to penetrate the overturned and westerly dipping sequence at the base of the Gordon Limestone as evidenced in the costeaning program. The hole was abandoned due to caving at 194.2 meters in black pyritic dolomites having cut four zones of interesting mineralization.

The interval 74-77 meters, assaying 3 meters of 9.5% lead, 6.6% zinc, 71.3 g/t silver represents the down dip extension of the outcropping lead-zinc mineralization. A fourteen

meter zone from 153 to 167 meters assaying 2.54% lead, 0.35% zinc, 40.4 g/t silver represents the down dip expression of the massive ironstone. Two further narrow intersections coinciding with a fault breccia and an ironstone, have intervals, 42-43 meters assaying 1 meter of 0.63% lead, 5.0% zinc, 18 g/t silver and 181-183 assaying 2 meters of 4.2% lead, 0.18% zinc, 40 g/t silver.

The hole was prematurely terminated due to badly caving ground and swelling clays within the ironstone and dolomites making further penetration impossible.

- ZT-81A-7 (EZ J.V. Area)

  Location : 750N:1535E
  Declination : 50°
  Azimuth : 229°T (Grid southwest)
  Total Depth : 254 meters

This hole was collared to test the southern extent of a 0.7 milligal gravity response with associated coincident lead-zinc soil geochemistry. A projected mineralized lode horizon taken from a circa 1900 geological map showing plans of all workings on the Zeehan field, was also to be tested. The hole passed through interbedded calclutites, dolomites, calcarenites, slumped units, fossil breccias, laminar calcmicrites and calcareous quartz arenites as well as three mineralized and veined calcite-siderite breccias.

The zone 50.2 to 52.2 assaying 2 meters of 1.4% lead, 0.16% zinc, 42.5 g/t silver corresponds with the projected lode horizon taken from the old map. The three meter intercept, from 122-125 meters assaying 4.34% lead, 0.29% zinc, 17 g/t silver occurs within a siderite breccia of replacement type similar to that observed at Oceana in hole ZT-80-4. The third zone from 244 to 245.8 meters assaying 1.8 meters of 0.06% lead, 1.89% zinc, 1 g/t silver is also associated with

a calcite-siderite-carbonaceous breccia which is weakly mineralized with pink, disseminated, colloform or concretionary textured sphalerite with minor (2-5%) pyrite.

- ZT-81A-8 (EZ J.V. Area)

  Location : 10305N:1340E
  Declination : 45°
  Azimuth : 249°T (Grid west)
  Total Depth : 150.8 meters

This hole was sited to ascertain the nature of lead-zinc mineralization observed on the dumps and within Costean I (6 meters assaying 2.07% lead, 1.23% zinc, 31g/t silver) at Coates workings (1030N:1285E). The hole was also designed to penetrate the western flank of a 0.35 milligal gravity response.

The hole was terminated at 150.8 meters after cutting a one meter mineralized zone from 12-13 meters assaying 3.30% lead, 5.30% zinc, 23 g/t silver. The target horizon was encountered from 48-52 meters and is manifest by disseminated pervasive galena-sphalerite mineralization and a massive siderite veined breccia from 50.6-50.95. Assays from this zone (4 meters of 0.17% lead, 0.29% zinc, 2.2g/t silver) show only moderate tenor geochemical responses exist indicating the lode does not persist at depth. The remainder of the hole comprised of an unmineralized sequence of fossil breccias, interbedded calclutites, dolomites, and laminar limestones.

- ZT-81A-9 (EZ J.V. Area)

  Location : 555N:1500E
  Declination : 45°
  Azimuth : 221°T (Grid southwest)
  Total Depth : 149.5 meters

Collared 100 meters south of the main gravity response but was positioned to penetrate two zones of outcropping galena-ironstone mineralization assaying up to 9% lead and 46 g/t silver.

The hole was prematurely terminated at 149.5 meters after passing through interbedded calclutites, dolomites, slumped and laminar limestones, calcarenites and fossil breccias. A calcite-siderite breccia was cut from 138-142 meters containing trace amounts of galena-sphalerite and probably represents the downhole expression of the high tenor soil geochemistry response observed at 500N:1350E.

The hole was prematurely terminated due to badly broken and caving ground from 142-149.5 meters, surrounding the faulted contact between the Gordon Limestone sequence and the Amber Slate to the southwest.

- ZT-81A-10

| | | |
|---|---|---|
| Location | : | 550N:1598E |
| Declination | : | 45° |
| Azimuth | : | 234°T (Grid southwest) |
| Total Depth | : | 100 meters |

The hole was also sited 100 meters south of the main gravity response but was positioned to penetrate an anomalous gossan (10 meters wide) assaying up to 1.03% lead, 1.35% zinc and 28 g/t silver, in close proximity to a major cross cutting fault.

A mineralized zone assaying 6 meters of 1.79% lead, 0.58% zinc, 14.8 g/t silver was cut from 52-58 meters containing approximately 15% disseminated pyrite as its major gangue mineral. A one meter intercept from 52-53 meters assayed 3.5% lead, 1.15% zinc, 22 g/t silver. The lithologies encountered within this hole include dolomites, very

weathered calclutites and calcarenties, slump breccias, quartz arenites, brecciated, silicified and weakly mineralized pyritic dolomites and a possible mylonite from 99.2-100 meters. The hole appears to have been terminated within a mylonitized and pughy fault zone.

Observations from Drilling

Very high, linear trending, chargeability anomalies observed from an IP survey, carried out by Scintrex in 1979 are due to moderate to strong pyritization within the interbedded carbonate sequence. Numerous zones from some of the drillholes are comprised of finely disseminated pyrite set in the matrix of both dolomites and calclutites and calcarenties. Fossil fragments may also be completely replaced by pyrite and occasionally on caliths composed of concretionary layered carbonate material, are also replaced by pyrite.

Secondary dolomitization occurs throughout the sequence and appears to be intimately associated with mineralized zones. The coarse grained, cream-white, crystals occur pervasively throughout but increase in content towards mineralized zones and decrease away.

PROPOSED PROGRAM

Geochemical surveys, using the bombadier mounted Jackro 200 auger rig, will be conducted on the Baura and Rose Valley grids to detail a 1.0 milligal gravity response with dimensions 400 by 400 meters. Further surveys using the Jackro combination will be conducted on the Pyramid, Myrtle Extended and Greive grids. Hand auger sampling will be carried out on the remainder of the Nubeena grid and on the area to the north of the high geochemistry zone on the Myrtle prospect, once the grid has been extended. The bedrock auger sampling program has been designed to overcome the presence of Quaternary gravels and talus within the tenement.

Downhole geophysical surveys are planned for all diamond holes drilled during the period. These surveys will include gamma logging, density logging, downhole Sirotem (by Geoex) and further

density testing is to be carried out on specific portions of core.

Subject to results of these surveys, two diamond holes are planned intersecting approximately 100 meters deeper vertically, coincident gravity responses of 0.5 milligals and low grade galena-sphalerite-siderite mineralization observed in holes ZT-81A-5 and ZT-81A-7. The calcite-siderite veined and brecciated mineralization may emanate from a deeper sulfide source giving rise to the large gravity feature. The overturned Austral Valley flux quarry ironstone sequence, centered on 1120E from 1750N to 1875N is also to be diamond drilled as two previous holes, ZT-79A-1 and ZT-80A-2 failed to penetrate the entire mineralized sequence.

Any anomalous responses delineated from the airborne survey will be ground checked using a Geometrics G816 magnetometer. Both the Nubeena and North Austral grids will be surveyed using the magnetometer, screening these prospective zones for potential tin deposits.

The Myrtle and Pyramid grids will be geologically mapped. Additions and reinterpretations to the local geology of Austral, Oceana, Nubeena and North Austral prospects will be made incorporating diamond drillhole information from the latest program, the downhole geophysical data and any magnetometer data.

Costeaning will be carried out where necessary to aid the geological interpretation and elucidate the extent and type of mineralization observed at or near the surface on all the grids. A number of Winkie diamond drillholes may also be used to obtain information from a slightly deeper level.

SIGNED .....

P.A. JONES

AMOCO MINERALS AUSTRALIA COMPANY

EXPENDITURE FOR THE PERIOD JULY 1, 1981 TO DECEMBER 31, 1981

EXPLORATION LICENCE NO. 4/78

| | |
|---|---|
| Salaries and Wages | 34,626.53 |
| Supplies | 5,688.91 |
| Supplies - maps | - |
| Cookery | 2,343.49 |
| Field Office Rent | (521.27) |
| Field Supplies | (1,426.62) |
| Freight | 1,472.12 |
| Travel | 4,054.13 |
| Communications | 1,007.68 |
| Geophysics | 7,453.23 |
| Consultants | 3,060.15 |
| Contractors | 4,281.38 |
| Drilling | 17,068.00 |
| Assays | 3,455.24 |
| Legal Fees | 431.06 |
| Equipment Rental | 2,760.86 |
| Equipment Operation & Maintenance | 1,412.82 |
| Property Payments | (3,209.00) |
| Outside Services | - |
| Entertainment | 885.43 |
| | 84,844.14 |
| Overhead | 12,399.23 |
| | $97,243.37 |

T.J. CONQUEST
ACCOUNTANT

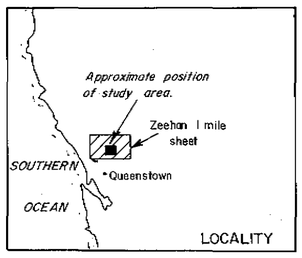
649639

D of M | A.O. | C.G. | E.O. | D.S.M.E
Registra
Received 12 MAR 1982 | E & IL
Answered
DEPT. OF MINES
REF. No. 1873/82

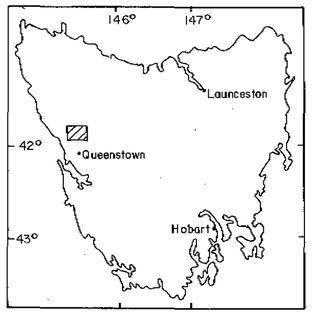
DISTRIBUTION

- o Denver
- ● Mines Department
- o Sydney
- o Field
- o Spare
- o Trade

* Note: Apendices 1,4 and 5 are in folded map form and accompany



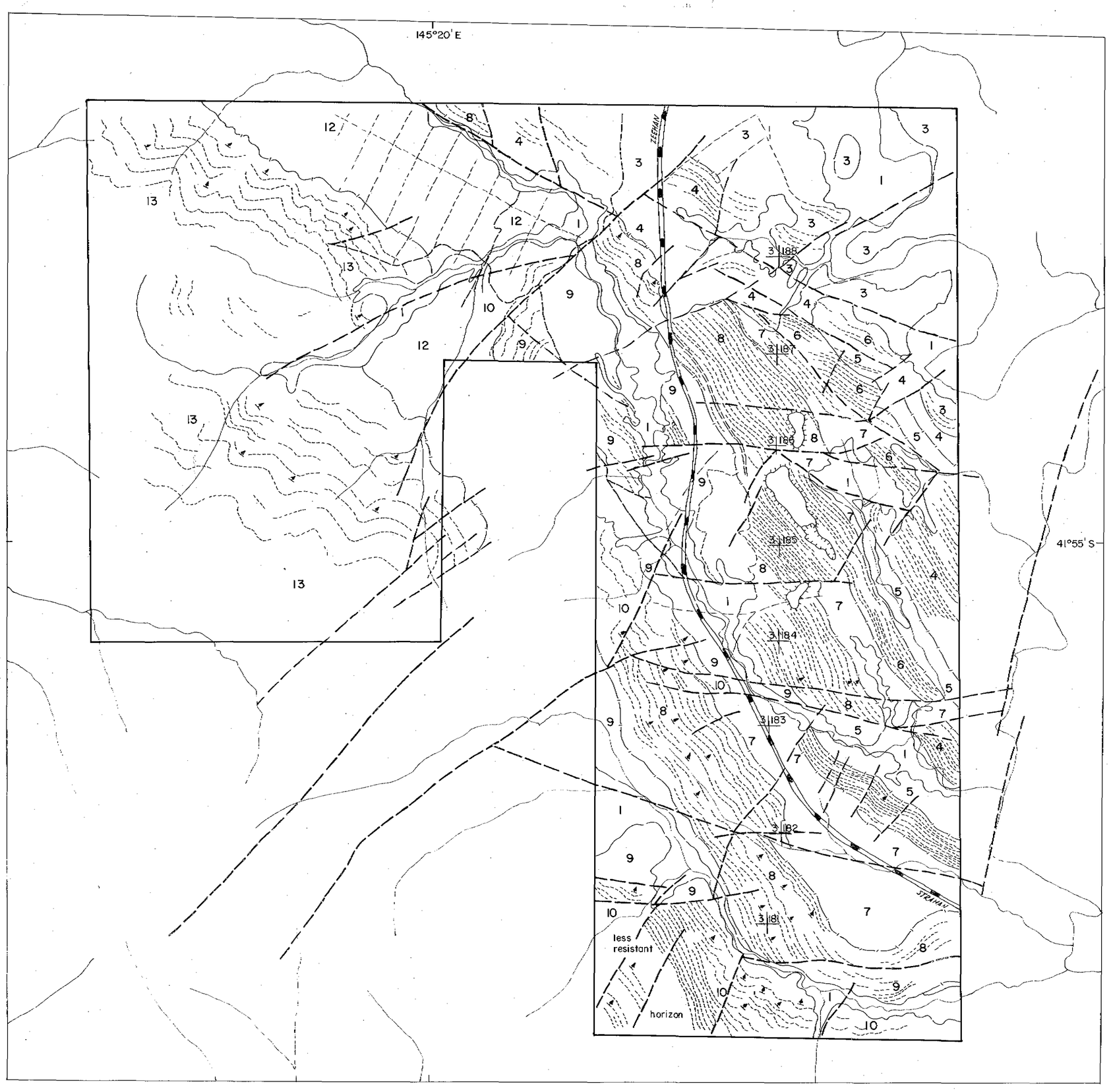

# PHOTOGEOLOGICAL MAP OF THE
# ZEEHAN AREA, TASMANIA




SCALE 1: 10 000

0 km

5 cm




## LEGEND

**QUATERNARY**

- 1 Alluvium
- 2 Conglomerate talus

**DEVONIAN**

- 3 Bell Shale
- 4 Florence Quartzite

**SILURIAN**

- 5 Austral Creek Siltstone
- 6 Keel Quartzite
- 7 Amber Slate
- 8 Crotty Quartzite

**ORDOVICIAN**

- 9 Gordon Limestone
  - Interbedded calcareous sandstone
  - Ironstone
- 10 Moina Sandstone
- 11 Mt. Zeehan Conglomerate

**CAMBRIAN**

- 12 Crimson Creek Formation

**PROTEROZOIC**

- 13 Oonah Quartzite and Shale
  - Volcanics

- Fault (interpreted)
- Trend of bedding
- Contact
- Unconformity
- Dip and strike of bedding
- River, creek
- Outline of area studied on large-scale (1:6 000) aerial photographs.
- 3|186 Photocentre

Photogeological map compiled in a period of 3 days, using 1:6 000 scale black and white aerial photographs flown 16.2.81 (Tasmania Lands Dept)

No field verification carried out - identification of rock units based on map supplied by AMOCO.

Traces of faults outside detailed study area derived from interpretation of 1:25 000 scale colour aerial photographs flown 16.2.81 (Tasmania Lands Dept)

Photogeological map compiled on behalf of AMOCO AUSTRALIA MINERALS COMPANY.
by HUNTING GEOLOGY AND GEOPHYSICS (AUSTRALIA) PTY LIMITED
Canberra, July 1981.
Job No. GA. 66/81.

649040

1270

649041

APPENDIX 2

# GENERAL RECONNAISSANCE VISIT TO THE OCEANA-AUSTRAL CARBONATE HOSTED Pb-Zn-Ag MINERALIZATIONS, ZEEHAN DISTRICT, TASMANIA

by K.J. Wolf

649042

# GEOLOGICAL RECONNAISSANCE VISIT TO THE OCEANA-AUSTRAL CARBONATE-HOSTED Pb-Zn-Ag MINERALIZATIONS ZEEHAN DISTRICT, TASMANIA

Amoco Open-File Report, Sydney, N.S.W. (Australia)

By

K.H. Wolf, B.Sc.(Canada), Ph.D. (Australia)

August, 1981

649043

CONTENTS


| | Page No. |
|---|---|
| Conclusions | 1 |
| Recommendations | 3 |
| Introduction | 6 |
| Purpose of present study | 6 |
| Information available - brief statement | 7 |
| Sources | 7 |
| Reliability | 8 |
| Regional geological information of Zeehan Area | 8 |
| Data of the Oceana (Austral) Prospects | 9 |
| Data-source reliability | 9 |
| Petrography/petrology of thin/polished sections | 11 |
| Core descriptions | 16 |
| Discussions | 20 |
| Geology of the Oceana-Austral Prospects | 22 |
| Genesis of ore deposits | 26 |
| Introduction | 26 |
| Earlier-proposed genetic hypotheses | 28 |
| Interim conclusions on earlier-proposed hypotheses | 40 |
| Temporary proposal in absence of definitive genetic hypothesis guiding prospecting/exploration | 40 |
| Epigenesis vs. syndiagenesis influencing prospecting/exploration | 41 |
| Exploration | 43 |
| References | 52 |

CONCLUSIONS

(1) From the beginning of this 10-day cursory examination of the Oceana-Austral Pb-Zn-Ag district, the writer encountered various problems; hence it was decided that a constructive critical analysis of both the prospecting methods and the technical information would serve Amoco's interests best.

(2) The best possible geological, geochemical, and geophysical methods were utilized by Amoco to prospect the Zeehan area. However, the standard of the geological information is somewhat below expectation.

(3) The core descriptions are inadequate - even for routine work - so that the petrography (terminologies, classifications, identifications), petrology (genesis of minerals and rocks), and paleoenvironmental reconstructions cannot be accepted. Many examples of misinterpretations are discussed. (In contrast, see report by M.G. Kile (May, 1981) on the Lennard Shelf, Canning Basin, W.A., Report No. EW/MK/01.) The resident geologist at Zeehan agrees.

(4) The reliability of the thin- and polished-section petrography, petrology, and environmental reconstructions in Amoco's reports is very low, so that the data should not be used for establishing a model.

(5) As to the geochemical and geophysical methods, only minor suggestions are offered: analysis for additional elements, use of modern rock-geochemical concepts and application of (simple) numerical methods for a variety of reasons; and utilization of more down-hole geochemical and geophysical techniques.

(6) No modern regional synthesis of the Zeehan district is available; i.e. no comprehensive summary of the numerous

mines or mineralizations, no modern local or regional structural analyses, no comparative study to establish similarities and differences between the Tasmanian mines - in short, no metallogenic study has been performed.

(7) Many modern techniques (such as analysis of trace elements, isotopes and fluid inclusions) have as yet not been applied to determine the type(s) and origin of the Zeehan mineralization.

(8) An unequivocal "exploration model" cannot be proposed at present as a direct consequence of the absence of a genetic "*working hypothesis*". It is unknown from the available data whether the Zeehan mineralization is syndiagenetic or epigenetic. The only conclusion is that most likely a *hybrid of syngenetic-diagenetic-epigenetic-remobilization* ± replacement processes was involved.

(9) A brief preliminary interim comparison of better-known mineralizations in the world has led to the conclusion that the Zeehan Pb-Zn-Ag concentrations may have similarities to the McArthur River and the Irish Navan/Tynagh deposits, and possibly partly to certain Mississippi Valley - type (Laznicka, 1981) as well as to Mt. Isa deposits (Fenlow-Bates, 1980). After redescribing the cores and thin/polished sections, a better reconstruction will be possible.

(10) From all the information available to the present writer, the Zeehan district offers <u>good</u> (notwithstanding the critical comments) prospects to locate commercial mineral concentrations.

RECOMMENDATIONS

(1) To raise the standard of geological data available, first all the cores stored at Zeehan should be redescribed. This is in agreement with the resident geologist. If there is at present an interim period of no drilling and curtailed geochemical-geophysical exploration, the available time can be used to restudy the cores (and outcrops). As discussed below, some minor equipment is needed. A consultant could within about 40 working days restudy the cores, train the resident geologist in certain techniques and concepts.

(2) All thin and polished sections should be re-described/reinterpreted. A few additional ones may be required.

(3) If similar situations occur in Amoco's other projects, it may be advisable to let a consultant evaluate the methodologies. Eventually a unified approach can be accomplished by preparing a field-cum-laboratory manual. The present writer is available to prepare such manual and offer information to discussion groups. A liaison geologist (either permanent with Amoco or as a retained consultant) can offer periodic advice on any exploration project.

(4) In the future, all reports by consultants to Amoco should be checked prior to full acceptance. If the need arises, the report(s) are to be discussed with the consultant, although his expertise will make his judgements superior in his field(s) of special experience. In cases of conflicts, a second opinion by an expert is obtainable. Here too a consultant (retained) is of value.

(5) Consider the proposed geochemical and geophysical methods.

(6) A regional metallogenic investigation of Northern Tasmania is of benefit to all mines and, of course, to exploration in general. No individual company may be able to support financially such an extensive study. I recommend that several companies pool their efforts in supporting a small group of geologists (either by establishing a research center or by offering support to a university - in conjunction with the geological survey?) to study the metallogeny of Tasmania.

(7) In the first instance, a comprehensive review of all the literature on the Zeehan district should be prepared. The effectiveness is partly demonstrated by Curtis' (1981) report. However, future reviews must encompass surrounding mining districts for a comparative approach - only a regional study can eventually establish the extent to which regional structures and lithologies controlled epigenetic (vs. syngenetic) mineralization.

(8) Review case histories and genetic models of mineral districts in other parts of the world and Australia to establish similarities and dissimilarities between them and Zeehan. At the same time, the geological-geochemical-geophysical methods employed elsewhere are evaluated as to their applicability at Zeehan.

(9) An interim "exploration philosophy" is proposed, namely based on a model that combines a syndiagenetic origin (in its broadest sense) with subsequent (epigenetic) remobilization, thus suggesting that all sections of the Gordon Limestone host rock is prospective. To adhere to a late-stage, possibly restricted to a fault-controlled, mineralization would propose a localized deposit. At this stage of exploration, this is a dangerous assumption. In future studies more emphasis must be placed on structural analyses, in addition to the requested detailed lithologic-

facies-environmental reconstruction. Alternative interpretations should be offered - with assumptions stated; fence diagrams to be prepared from core-hole data(?); when examining older prospects, trenches to be cut to examine stratigraphy-facies-host rocks in some detail for proper correlations and environmental (proximate to distal) interpretations.

(10) After redescribing the cores, the differences in opinion related to correlating host rocks and mineralization in both outcorps and in the subsurface can be reconsidered.

(11) It is recommended that Amoco's proposed drill-hole program be carried out, e.g. in the Austral, Oceana and in the future in the Mariposa and other localities. As to the precise sites, the newly suggested geochemical techniques should be applied to locate anomalies, in conjunction with the geophysical methods.

(12) Possible non-coinciding geochemical and geophysical anomalies must be expected and properly evaluated.

## INTRODUCTION

On behalf of Amoco Minerals Australia Company, the writer was engaged as a Consultant for ten working days to examine the Oceana-Austral prospects of the Zeehan district, Tasmania. The time was spent as follows:

- August 5 to 7, 1981: Collected from Amoco's office and other sources (e.g. University of Sydney library) publications on the Zeehan area; studied and prepared comments on these publications.
- August 10 to 14, 1981: Visited the Zeehan area. The time was divided as follows:
  1 day travelling (1/2 day to and 1/2 day from Zeehan),
  1-1/2 days outcrop examination,
  1-1/2 days cursory core examination (under poor conditions, see below), and
  1 day examination and discussions with local Amoco geologist (Mr. Phil Jones) of logs, maps, publications, genesis, and logging/exploration methodology,
- August 17 to 20, 1981: Writing of present report.

## PURPOSE OF PRESENT STUDY

No agreement was made between Amoco and the writer for the latter to concentrate on any specific problem of the geology of the Zeehan area, so that he had some flexibility in examining the whole project. It was felt best to follow the usual sequence of examining the available publications, including those of consultants, succeeded by a visit to the Zeehan area to study outcrops and cores; all of which culminated in the preparation of this report. The initial aim of the investigation was the commonly accepted one: to provide a useful consultative-evaluative synopsis of the geology, possibly spiced with new proposals and interpretations; and despite the time constraints,

significant impressions were gained. However, it soon became clear (and this should be made unequivocally clear at the outset) that the present writer can serve Amoco's interests best by not only offering geological opinions, but in particular by a constructive analysis of both the technical information available and the various methodologies employed in the past. Hopefully, these critical comments will be well received and utilized to eliminate some of the problems encountered by the writer.

The present report is not a comprehensive summary, as it is founded merely on a brief reconnaissance to provide an initial overview confined to a small locality (i.e. Oceana-Austral prospects); thus the regional geological context cannot be seriously considered. Also, details on locality, accessibility, climate, earlier geological studies, for example, are to be sought in some of the reports listed in the References. A Summary or Abstract has not been prepared as the more pertinent comments are given in the Conclusions and Recommendations.

## INFORMATION AVAILABLE

### Sources

The sources of the information on the Zeehan district can be divided into:

(a) generally available publications (e.g. reports from Geological Surveys, journals, symposia-proceedings-memoirs),
(b) Amoco's company reports, and
(c) consulting reports prepared for Amoco.

All the publications listed in the References have been examined, including those that are not directly related to the Zeehan area; the latter provided a comparative basis for genetic reconstructions.

Reliability

This section may be an unusual one, but it is felt a necessary one. In particular the petrology sections in the Amoco progress reports Nos. 151 and 179 require careful reconsideration as their "reliability" seems to fall below a minimum standard (see below). Also, although the cores of several diamond drill holes of the Oceana-Austral projects could have provided the best geological data of the poorly exposed formations, the lithologic descriptions are of a low standard (see below). These two unreliable information sources cause more than a minor consternation in attempting to reconstruct the geological environments, in making plausible genetic interpretations and, consequently, also in formulating an exploration philosophy based on the characteristics and genesis of the ore and host rocks. Details, including examples and consequences, of these problems emerge in several sections below; a number of proposals are made in the Recommendations to rectify the situation.

## REGIONAL GEOLOGICAL INFORMATION OF ZEEHAN AREA

A cursory geological report, such as the present one, is not the appropriate place to offer a synopsis of the regional geology, in particular since the report confines itself to a narrower, more specific problem and is addressed to readers well versed in the geology of the surrounding districts.

A reader who wishes such an introduction and a brief summary is referred to Blissett (1962) and Both and Williams (1968) in Survey reports and journals; to Jones (1979) and Roxburgh and Jones (1980) in Amoco annual reports; and to Jones-Russell (1980), Mason (1980), and Wilkins (1981) who have presented discussions on ore genesis in what I called "Amoco's Geological Notes".

Only a few authors have seriously attempted to put the mines of northwestern Tasmania into a regional context, i.e., no metallogenic-minerogenic study based on modern concepts has as yet been attempted - the only one seems to be that by Both/Williams (1968), which puts the Pb-Zn ores of the Zeehan field into the class of ore veins providing "excellent examples of hydrothermal zoning centred around the Heemskirk Granite stock" (Abstract). New genetic hypotheses have been developed in various parts of the world during the past twenty years that could well be applicable to the Zeehan field - especially the multi-phase ones (see below), some of which require a regional geological evaluation as well as localized studies.

It is hoped that in the near future these newer concepts will be applied to the Zeehan district which may take place in two forms:

(a) "direct" application of these concepts to the Pb-Zn(-Ag) mineralization during local prospecting, and/or
(b) a "comparative study" during which the "Zeehan-type" mineralizations are contrasted-compared (i.e. to establish similarities and differences) with several other ore districts in Australia and overseas to test the genetic concepts (see below). These studies should be done on both the regional and local scale.

DATA OF THE OCEANA-AUSTRAL PROSPECTS

Some aspects of the geology of the Oceana and Austral prospects are given in Blissett (1962), Williams and Both (1971), Jones (1979), Roxburgh and Jones (1980), and Curtis (1981). No details are present in this cursory report, and no summary is provided - only some discussions which the writer feels are of immediate concern in prospecting and in making future exploration plans.

Data-Source Reliability

As pointed out above in the section "Information Available -

Reliability", there are two data-sources available to Amoco geologists that must be considered with prudence - because the reliability is very variable, especially from the specialists point-of-view who wishes to reconstruct, for example, the environment of deposition. (See the writer's discussions in Wolf, 1981). (The writer strongly believes this not to be an undue criticism and is quite willing to demonstrate point-by-point the many examples of "geological misjudgements" beyond the ones discussed below.) These two sources are -

(1) The consultants' reports in Jones (1979) (i.e. Mineralogical Report by A.W.G. Whittle, Appendix 5), and in Roxburgh/Jones (1980) (i.e. Petrological Report by G.G. Lowder, Appendix 3; and Petrological Report by A.W.G. Whittle, Appendix 4).

(2) The core (and outcrop) descriptions and interpretations available to the writer at Zeehan are very inadequate - even for routine work - let alone for detailed correlation, petrologic and environmental reconstructions. Since so many references are being made as to syngenesis versus epigenesis, sedimentary precipitation versus replacement, etc. - all concepts directly influencing the exploration design to a certain degree - the above criticism will be supported by some examples, as requested.

As to the reasons for the reinterpretations proposed by the present writer, it should be remembered that a distinction has to be made between occasional errors, matters of opinion and consistently indifferent presentation, on one hand, in contrast to many errors, factual and accepted concepts and clear presentation, on the other. In the former situation innumerable mistakes in petrology, for example, can compound the environmental guiding principle during geological work: once the errors are introduced, they have a tendency to be perpetuated and are recompounded by new errors caused by judgements based on the earlier mistakes. This chain of errors, can be repaired only by reviewing constructively the earlier work.

In the criticism provided below, the wrong interpretations have been pointed out - without offering a correct one. This is unavoidable because I believe that first a redescription of the specimens and cores is necessary. Also, the lack of time in this 10-day study makes a proper reinterpretation for this report impossible.

1. Petrography-Petrology of Thin and Polished Sections

In the Mineralogical Report, Appendix 5, Amoco Report 151, Specimen No. 93801, the descriptions are not presented in a logical sequence that would allow easy reconstruction of what the petrologist saw in the thin and polished sections (cf. Wolf 1981). (Test: Make a sketch from the descriptions and in a sequence of diagrams show the stage-by-stage development of the textures.) The "siliceous facies and chert" are assumed to be syngenetic without providing evidence, i.e. no replacement origin was considered. The same applies to the dolomite. Numerous statements are woolly/confused: "Brecciated dolomitic chert, because of the extensive brecciation and fracturing, appear to have accommodated the sulphides and associated siderite gangue"; followed by "the main mass of sulphides and siderite was therefore preferentially dispersed as more or less continuous masses of several mm thicknesses through the chert horizon." The first sentence seems to suggest intra-fragmental open-space filling, which is not in agreement with the remainder of the data supplied by the petrologist. No plausible evidence was provided for "preferential dispersal".

The conclusion that remobilisation of syngenetic components may have taken place cannot be substantiated from the petrographic data, because neither syngenetic material nor remobilization has been demonstrated. For example, no evidence was given on the differences between sheared/fractured pre-tectonic sulphide (i.e. earlier formed sulphide that remained in place and was merely tectonically deformed) and sulphide that was mobilized

and reconcentrated elsewhere as a consequence of tectonism.

For specimen No. 93811 (Oceana mine), the several criteria listed to support a syngenetic origin is equivocal, except perhaps for the framboidal pyrite (however, see page 16) - a multi-stage origin of the sulphide and gangue minerals is not considered. In many ores in various parts in the world, it has been found that syngenetic pyrite is associated by later-formed (epigenetic) copper-lead-zinc-silver mineralization.

Although it was stated that the galena in specimen 93811 darkens, probably because of the containing silver, the report maintains that in specimen 93812 (Austral mine) there is "moderately abundant galena... but no silver-bearing minerals". Question: What is the reason for that galena not being Ag-bearing?

In the Petrographic Examination of ten Drill Core Samples, Appendix 3, Amoco Report 179, Sample No. 22107, like all other descriptions of this section, appears to be a quickly prepared petrographic report reproduced from laboratory notes without bothering to polish either the technical data or format. Some of the accepted modern terminology (like pellets, intraclasts, sparite cement vs. micrite matrix) has been avoided in favour of circumlocutory and ambiguous descriptions, haphazardly presented. The absence of sketches makes it difficult to visualize the textures and structures. Organic or carbonaceous matter is described as graphite (in unmetamorphised sedimentary carbonate rock?). The rock name or classification is inadequate - even for handspecimen petrology; and no proper use was made of the thin-section data in its formulation. There is no clear differentiation between "arenaceous" and "calcarenite" grains,...

The material of sample 22109 was interpreted to have originated "in close proximity to a reef structure", with the carbonaceous host being indicative of "reworking of a reef limestone into a chemically reducing back-reef environment". Such extrapolations

are not acceptable because (a) the colonial ("=biolithic" in modern limestone terminology) organisms (present as fragments) do not necessarily construct reefs, but can produce small patches along a shelf (not all bioherms and biostromes are wave-resistant reefs); (b) the biolithite debris can be transported far beyond the edge of the shallow-water milieu and is not unequivocally demonstrating "close proximity"; (c) instead of a (shallow?) "back-reef" environment, the sequence with its high proportion of fine-grained limestone (micrite) plus carbonaceous material (again wrongly called graphite?) points to a deeper-water fore-reef (basinal?) milieu.

Similar arguments may be advanced for the environmental reconstruction of sample No. 22110's "fossil fragmental limestone"; no evidence has been provided to demonstrate a "nearby reef" source. Also, to refer to "graphite as irregular veins is probably a diagenetic feature" is questionable because the black material is more likely to be some organic or carbonaceous material (how was the "graphite" identified?), which may be the residue of "distilled" former hydrocarbons - see petroleum geology literature. (See further discussion below.) The quality of the interpretations offered is exemplified by the concluding statement: "The absence of clearly syngenetic graphite in this rock may be an indication of deposition in an open fore-reef environment": absence of anything is a poor, if non-existing, criteria; "clearly syngenetic graphite" is unacceptable on several mineralogic/petrologic and environmental grounds; and "indicates open fore-reef environment" is likewise wrong for several environmental reasons.

As to the description of sample No. 22111, at least a diagram or two (applicable request for ALL sections) could have been presented. To interpret the sulphide as of remobilization origin, indicated by the <u>evidence of recrystallization</u>, is somewhat imaginary because (a) mobilization of sulphides and reconcentration can occur without "recrystallization" (note:

there are several styles of recrystallization as known from the metallurgical and geological literature) of the host rock, for example, and (b) in situ recrystallization of either the host rock or the ore minerals or both can take place without mobilization/remobilization of ore minerals. Also, recrystallization may precede, succeed or be concomitant with remobilization - or vice versa (it is easy here to invert the cause-and-effect relationships). Additionally, a replacement origin for both the ore and host rock minerals has not been considered in contrast to remobilization.

Sample 22112 is described as "carbonate-altered, slumped, argillaceous quartz sandstone and carbonaceous shale", but then is referred to as "essentially a quartz sandstone with a carbonate cement", with the large amount of carbonate explained as "formed by replacement of the earlier argillic material". No evidence is given of the presence of a "carbonaceous shale" (unless description was omitted). (To use "argillic" for "argillaceous" seems to substitute a hydrothermal term of alteration zones around copper porphyries for a sedimentary petrologic one.) It seems that the presence of a large proportion of carbonate with a few argillaceous patches was taken as proof of a replacement of a former shaly matrix, as seen by the statement "carbonate that appear to represent shaly lenses in the original rock"! The genetic reconstructions are even more amateurish: "The presence of lenticular bodies of more argillic matter ... suggests that the original clastic sediment underwent some penecontemporaneous slumping, with the sandy layers of the original sediment breaking up into lenticular or elliptical pods." Several alternative, more logical, interpretations are possible - some related merely to "soft-sediment-deformation". No evidence of either "replacement" or "slumping" is present. "The carbonate was probably precipated later as a diagenetic product" - question: Carbonate precipitated diagenetically into 50% open spaces? "The original sediment was thus probably a laminated quartz sandstone and carbonaceous siltstone". Any

evidence of silt? Other contradictions exist. Example: Wasn't it first proposed that much of the carbonate originated as a replacement origin? The presence of acid volcanic debris should be re-examined for possible contemporaneous volcanism, maybe associated by hydrothermal exhalative supply of metal that could have resulted in syngenetic ores. Are the grains volcanogenic epiclasts or pyroclastic fragments? The former may have been derived from a "much older basement" whereas the latter from a *penecontemporaneous* volcanic source. Only in the latter situation would one expect volcanism concomitant with the deposition of the *Gordon Limestone*.

In sample 22114, metamorphic textures appear not to have been recognized and were believed to be original clastic in nature, e.g. quartz-grain elongation-alignment-parallelism, strain or andulose extinction, much quartz cement and chemical solution of grains to supply silica for authigenic overgrowths. These features may have been inherited, but it seems that meta- and ortho-quartzite features were confused (?). Similarly, in several thin-sections, other low-grade metamorphic features were not recognized. This sandstone is considered to be a "mature" deposit (without distinguishing between textural and mineralogical/chemical maturity) and is supposed to suggest "fairly deep water" deposition. This is unacceptable on numerous sedimentological-environmental-petrological grounds, aside from the fact that "maturity" is not at all indicated by the subangular grains, detrital mica, and argillaceous cement.

The incomplete, haphazard description of the "impure calcarenite" of Sample 22115, and its interpretation indicates the petrographer's lack of understanding of sedimentary petrology, and related disciplines such as environmental reconstructions, e.g. reference to "close proximity to a reef where rounding was affected by wave action but transport was relatively short and did not allow thorough sorting".

As to sample No. 22116: the rock-type is given as ? fossil-fragmental "limestone" - yet it is stated that "the lack of effervescence in HCl... This carbonate clearly does "not include calcite". Later it is decided that it is maybe siderite. Also, no mention is made of the presence of fossils.

---

The Appendix 4 of Amoco report 179, Petrological Report, describes samples 21401 - 21405 from drill cores in which too many petrographic and petrologic inconsistencies exist; thus, the report is of only limited use in reconstructing the environments.

Example: in some cases the presence of framboidal pyrites is supposed to prove syngenesis; then they are described as "precipitated from mobile solutions within sedimentary breccia" without proof that the breccia is actually of sedimentary origin and not tectonic in nature. (It would be a circulatory argument to say that since framboids are known (?) to be syngenetic, their presence between breccia fragments indicates that brecciation was also syngenetic, because the precise mode of framboids is not as yet established. I do have many papers that propose a biological/organic-bacterial origin of the framboids. But, in the laboratory they have been inorganically produced, and it is not known to what depth in the subsurface they can form epigenetically.)

(2) Core Description

The diamond drill-hole cores stored in Zeehan are the best source for lithologic (i.e. petrologic), stratigraphic and environmental descriptions of both the mineralizations and the host rocks. Consequently, the present writer examined several crucial cores together with the resident geologist (Mr. Phil Jones). Even during the cursory examinations it became clear

that the petrography (=descriptive nomenclature/terminologies, classification), petrology (microscopic genetic interpretations of minerals and rocks), lithologies, and environmental (sedimentary milieux) models are not reliable. This has been extensively discussed with the resident geologist who feels that he has not had the experience in sedimentology and stratabound ore genesis to do detailed work in these disciplines beyond a quick superficial study. However, he is very eager to obtain the required knowledge and experience, is co-operative and open to suggestions (I enjoyed working with him) - and would welcome if an experienced geologist was given the opportunity to redescribe the cores and concomitantly pass on his expertise to the resident geologist over a period of about 40 working days. The field lithologic descriptions, as a result of the same problem, are likewise not as reliable as they could be. For remedies of the situation see Recommendations. In order to demonstrate that the data-base provided from the cores at Zeehan is insufficient (in addition to the poor petrographic thin- and polished-section work discussed above), the following examples are provided:

- All limestones are incompletely described, i.e. not according to the modern (since 1957) petrographic concepts; thus numerous contradictions and errors are present, although an acid-etched surface examined with a handlens reveals details.
- Chert or silicification is frequently mentioned but in many instances not present.
- Ankerite vs. siderite vs. dolomite are not differentiated; these terms are applied as "field" terms (criteria: colour, texture and "occurrence"), hence not reliable in ore and host rock investigations. Simple HCl-etching and staining tests are known for hand specimens. Also, even in the thin and polished section studies, the various carbonate minerals have been "very loosely" identified - no method of identification has been mentioned (see Wolf et al., 1967, fig.5).

- Breccias of various types are not clearly differentiated (i.e. no criteria listed or discussed) despite their possible importance in influencing ore mineralization. They are merely named "sedimentary", "fossil", "tectonic", "fault" breccia (or have no genetic connotation). (The same criticism applies to the thin section petrography.) In particular, the recognition of fault-breccias is important in order to establish any relations between tectonism and late-stage epigenetic mineralization, or between penecontemporaneous sedimentary breccias and syngenetic ore genesis.
- Clastic units, such as quartz sandstone, as well as "siltstone", or silty material in carbonates, have not been adequately described so that they can be of little use as marker beds in hole-to-hole and hole-to-surface correlation. Also, they possibly could be useful in the differentiation between deep-water fore-reef and shallow-water back-reef environmental reconstructions of the Gordon Limestones, and in recognizing transgressions and regressions (?).
- What seems to me "soft-sediment-deformation" structures (of several possible origins) have been described in several cores (and even in thin sections) as "slumps" without properly evaluated criteria.
- Stromatolites (of algal origin) have been misidentified in several cores - they may be stromatoporoid colonial (=biolithite) fragments.
- Oolites, pellets, oncolites, pisolites, and intraclasts have been misidentified, although the textures and structures are recognizable on HCl-etched surfaces with the aid of a hand lens (Wolf et al., 1967).
- Matrix, cement, recrystallization products; sorting, graded-bedding, and related textures/structures are not considered.
- Contact-relationships between different units are seldom, if ever, mentioned or discussed.
- No important vertical changes were observed, e.g. vertical

fractures lined by minerals passing into higher-grade ore (=conduit zone?) vs. sharp contacts.

- No attempt was made in most instances to mention the paragenetic relations between host rock, gangue and ore minerals, not even of the larger open-space fillings.
- Certain alteration zones (apparently related to ore precipitation) are not described, including corrosion, leaching/bleaching, and replacement features. (Does gangue form a "halo"; any vertical or horizontal variations?)
- "Shear" zones are inadequately described.
- "Sedimentary matrix" vs. rock flour/mylonite is not recognized; hence breccia types, shears and faults not differentiated.
- Top-and-bottom criteria (=geopetal features) are not described and discussed. Some may assist in differentiating syngenetic vs. epigenetic ore genesis, e.g. brachiopod shells with detrital (=penecontemporaneous reworked) fine-grained sulphide filling the bottom half indicate syngenetic mineralization (cf.Sloss, 1956?, "Sequence in Layered Rocks").
- The organic or carbonaceous matter (called "graphite" by the petrographer?) is poorly described and any consistent relationship (if any) with mineralization seems to have been ignored.
- No obvious ore-hostrock relationships have been sought and described, e.g. contact relations, distribution patterns, paragenesis, replacement vs. open-space fillings vs. "primary-bed" features, relations with carbonaceous matter, syngenetic vs. epigenetic features, gangue vs. ore relationships.
- The disseminated mineralization has not been studied sufficiently to deduce any possible relationship to the massive metal concentrations. Does the dissemination form an envelope? Is the distribution symmetrical or asymmetrical? If the latter applies, is the plane of asymmetry horizontal or vertical and therefore reflects a

primary or secondary origin? In other words, could the so-called "dissemination" be a geochemical "halo" (cf. Beus and Grigorian, 1977).

Discussions

Curtis (1981, p.6) stated that "NBH's drilling and mining programs appear to have been carried out without the benefit of trained geological observation, and the geological descriptions accompanying the drill logs are basic. They cannot be used to correlate and extrapolate, so that the interpreted geological trends can be shown only on those sections containing Amoco's drill holes". The underlining in the quotation is by the present writer who contends that although the data available from Amoco is useful for basic correlations, they are inaccurate for precise geologic work. However, the necessary information can still be easily obtained by redescribing the cores. The reasons are simple and the situation can be easily rectified: (a) The resident geologist could be given the opportunity to gain specialized experience and to obtain up-to-date knowledge, (b) a few additional instruments are needed, and (c) consultant's work should be checked.

(a) With the company maintaining a long-term exploration basis in Zeehan (consisting of a house, sheds, etc.), one should aim to obtain maximum practical information without increasing the expenditure beyond acceptability.

The problem has been discussed with the resident geologist in Zeehan, who is in agreement with my opinions expressed here. He is amenable and approachable with good suggestions; I enjoyed working with him. I recommend that the below-listed equipment be made available to him to permit the cores to be properly examined, first under the guidance of an experienced geologist (approximately 40 working days). The latter should also supply all the necessary up-to-date concepts (literature included). [The writer is available for such a job to the Zeehan project (to

set up the equipment, re-study the cores and train associate) as well as to any other project on a temporary or more permanent arrangement, including retainer basis.]

After the initial period the resident geologist should be able to continue relatively independently, especially in the study of future cores of the Zeehan district, which may comprise correlations and environmental comparative work (of host-rocks; back-reef vs. fore-reef) from the Oceana prospect to the south (along paleo-shore?) and to the Mariposa prospect (to the deeper paleo-basin?) (see discussions below on depositional milieux).

Concomitant with the binocular microscope descriptions of the core, thin- and polished-section studies should be made by a competent consultant. The details observed in the thin-sections under higher magnification assist to "develop an eye" for specific textures, so that the petrologist/resident geologist can properly identify them under lower (hand-lens/binocular microscope) magnification in HCl-etched specimens.

(b) To obtain all of the necessary data from the cores (and outcrop samples), the specimens should be examined under a binocular microscope (zoom type, at least up to X25 magnification - some request even greater magnification), using proper illumination. Limestones should be etched with 1:10 HCl and then examined water-wetted. Hand-lens examination in daylight are insufficient, although in sunlight quite a bit of information can be obtained. (But the Tasmanian climate is such that for days, if not for 2-3 week periods, no sunlight is available.) Dolomites can be etched in warm diluted HCl. In some cases, the specimens should be powdered.

In general, all finer-grained sedimentary, igneous and metamorphic specimens should be properly described under a binocular microscope when conditions allow it, and these

conditions can be made available in larger field base camps and such town bases as Zeehan.

The following equipment is therefore required at Zeehan:

(1) Binocular microscope, zoom-type(?), at least up to X25 magnification, preferably up to X60;
(2) two powerful spot-lights;
(3) HCl-acid, water bucket to wash and wet specimens, several eye-dropper bottles (for field-work also);
(4) staining fluids to differentiate carbonates;
(5) small hot-plate to heat small carbonate fragments in HCl-drops: method to differentiate dolomite and limestone from other carbonates;
(6) Polishing equipment to polish crucial core sections and occasional outcrop specimens;
(7) Up-to-date literature on petrographic terminologies and classification schemes;
(8) Table or bench, etc., and some space in core shed.

(c) The three reports prepared by consultants are inadequate in regard to the petrography (descriptive part; identifications, terminologies, classifications), petrology (genetic interpretations; e.g. diagenesis, paragenesis), and sedimentary environmental reconstructions.

To prevent similar situations in the future, an Amoco-appointed geologist should check carefully the standard of the material submitted, discuss matters with the consultant(s), and possibly spot-check the data. In crucial cases, a second independent opinion can easily be obtained.

## GEOLOGY OF THE OCEANA-AUSTRAL AREA

Publications that specifically concentrate on the geology of the Oceana-Austral area are scarce and only three were available to

the writer: the brief statement by Blissett (1962), and the somewhat more detailed papers by Both/Williams (1968) and Williams and Both (1971). The only other information consulted during the present cursory study is that supplied by Amoco's company reports Nos. 151 (1978-79), 179 (1979-80), and 249 (1980-81) plus the report by Curtis (1981). The reader is referred to these publications, and merely Figs. 1 to 3 of the regional setting, the stratigraphy, and the geology of the Zeehan field are given without discussions.

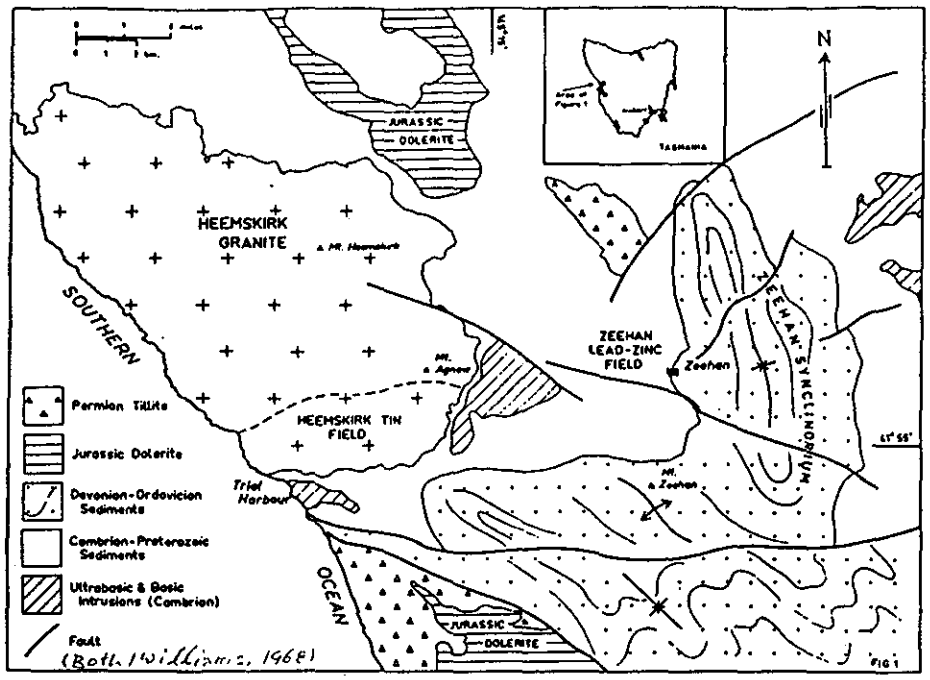



Fig. 1. Regional geology of the Heemskirk-Zeehan area.

5 cm

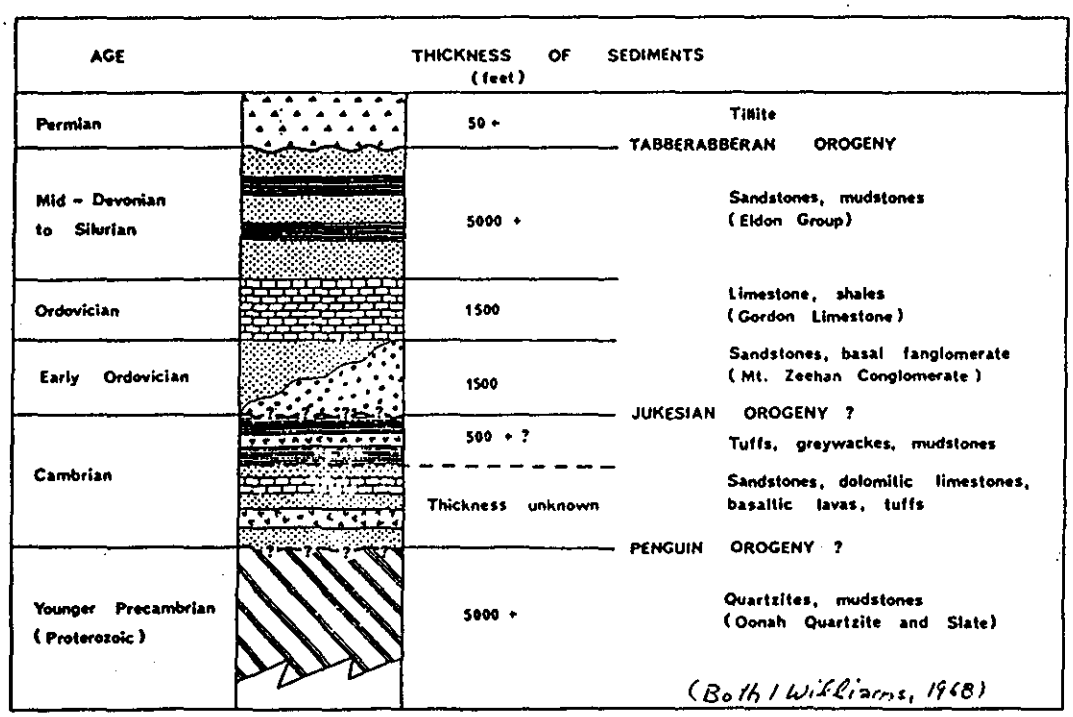



Fig. 2. Stratigraphic sequence at Zeehan.

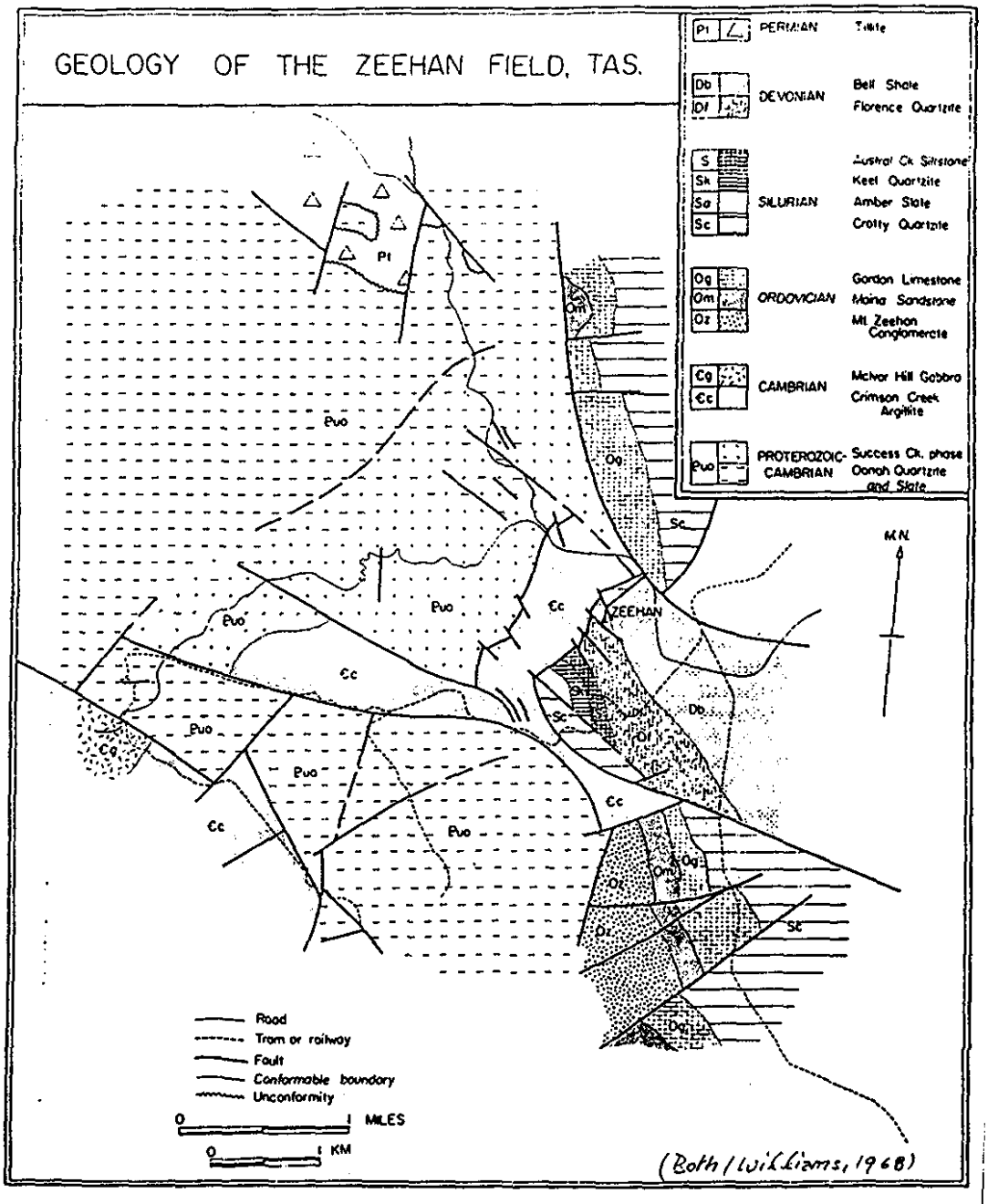



Fig. 3. Geology of the Zeehan field.

5 cm

GENESIS OF ORE DEPOSITS

Introduction

Unless one is willing to undertake prospecting on a haphazard basis, one of the early aims is to establish a sound, plausible "working hypothesis" (McKinstry, 1948, chapter 7; Wolf, 1981). This guiding (genetic) hypothesis must, of course, be based on reliable descriptive geological data and possibly on geochemical plus geophysical observations (see below in section on Exploration). Unfortunately, as pointed out repeatedly here, especially the geological information available so far is not as complete and reliable as it could be. Thus, the past discussions on genesis are very speculative indeed. At this stage, one actually should speak of "multiple working hypothesis". Some details on the influence of a "working hypothesis" on exploration and prospecting in the Zeehan area are provided below (cf. Finlow-Bates, 1980).

Basically, all the genetic models possibly applicable to the Zeehan mineralizations can be divided into syngenetic-diagenetic and epigenetic types and combinations thereof. Considering the numerous inter-related variables that control ore genesis (see Wolf, 1973, fig. 11 for example) [such as source of metals, mode of mobilization, types of conduits, structural-stratigraphic-lithologic controls, surface vs. sub-surface deposition (time-space relations) mode of precipitation, + remobilization, etc.], several sub-models can be proposed for each of the syngenetic-diagenetic and epigenetic types. The incomplete and unreliable geological information obtained so far does not even allow an allocation of the Zeehan mineralization to any one of the basic classes; several studies have concluded that a combination may best explain the observations, i.e. the mineralization is a remobilized (replacement?) syngenetic deposit. However, this interpretation is also open to dispute because both the

"syngenetic (diagenetic)" and the "epigenetic" aspects are poorly described, let alone proved; no precise study of the criteria has been made - and in nearly all instances no attention was paid to alternative interpretations of both the "syngenetic" and "epigenetic" features. Under such operative conditions, it would be quite dangerous to utilise either the "syngenetic" or the "epigenetic" hypothesis in designing an exploration program - all that remains for the geologist is the "trial-and-error" approach. (Below it will be shown that for certain practical reasons the syngenetic hypothesis is the better one to follow until one or the other is proven. Note, however, that merely suggesting the syngenetic hypothesis, does not make it factual!) Let us consider briefly some of the genetic hypotheses advocated for the Zeehan area, prior to suggesting a solution to the present dilemma.

In discussions such as these, it is easily predicted that the proverbial academic-versus-practical argument is advanced in counteracting the request for or explaining the ignoring of (obtainable!) geological details. McKinstry (1948), for example, proposed (p.7) that in an early stage of exploration one should

"1. Give primary attention to the ore and to structures most obviously connected with it", and

"2. Assemble first the facts that can be most quickly observed and reworded. When these observations have been pieced together and studied, the broader picture emerges and points to the problems that cry for immediate solution."

These suggestions (except for the last sentence) are not applicable any longer to the study of the Zeehan area, because the exploration phase is far beyond the "early" stage. Hence Wilson's (1924) comment applies, namely that -

"It is rare that the significant features, that is, those which may help to find ore, are all definitely known. It is only after details, no matter of how much present unimportance(!), have been

mapped, studied and correlated that the essential ones can be selected."

As pointed out above, much detailed information could have been obtained from the numerous cores in the Oceana and Austral prospects, but the cores were only superficially described - and those observations made follow out-dated concepts and are frequently wrong.

According to McLaughlin and Sales (1933): "Ability to see obscure but critical details comes only with repeated examinations of exposures and from actually living with the problems of a district." As to "repeated examinations", they have not been undertaken by a person experienced in the particular geologic setting (i.e. carbonates, reefs vs. non-reef, shallow vs. deep-water milieux, syngenesis vs. epigenesis, etc.) - and it is here where a consultant could greatly assist (see Recommendations). In regard to "actually living with the problems"; of course this is almost self-evident. But this statement is based on certain assumptions, namely that the conditions of the investigations are conducive (see above and Recommendations for need of binocular microscope study) and that the resident geologist has the required technical background. Although the statement is supposedly self-evident, it has become a well-known fact, that new ideas are often offered by someone using experiences gained under similar conditions outside the district under consideration. Here too a consultant can be of distinct assistance, who may offer new "flashes of revelation" (McKinstry, 1948, p.201).

Earlier-Proposed Genetic Hypothesis

A brief review of the earlier ideas of the genesis of the Zeehan field mineralization was provided by Both and Williams (1968) - and the present discussion will begin with their contribution. Taylor (1978) and Williams et al. (1975; in Knight) are briefly mentioned as they agree with the earlier hypothesis. Some new

(unpublished) ideas are offered by Mason (1980), Jones/Russell (1980), Wilkins (1981), and the Amoco annual reports, and finally Curtis (1981).

Both/Williams (1968) stated (Abstract):

"The lead-zinc ore veins of the Zeehan field have long been accepted as excellent examples of hydrothermal zoning centred around the Heemskirk Granite stock, despite several anomalies apparent in earlier descriptions and a general lack of detailed information about the distribution and textural relationships of the ore and gangue minerals. Mineralogical studies show that the zoning can be substantiated, and the apparent anomalies have arisen as a consequence of the combined effects of multiple mineralization and post-mineralization faulting. When allowance is made for these effects, the zoning is seen to be manifested by progressive changes, with increasing distance from the parent stock, in ore and gangue mineralogy. Although the changes are mostly transitional, they can be conveniently described in terms of four successive zones, namely, 1. Cassiteritic; 2. Pyritic; 3. Sidero-pyritic; and 4. Sideritic. In general, the zonal sequence closely parallels the paragenetic sequence, as determined from detailed textural studies. Systematic changes in sphalerite geochemistry also closely parallel the zonal sequence.

The zoning is interpreted as having arisen from progressive changes in the physical and chemical environment of ore deposition, and hence provides an excellent basis for further geochemical and isotopic studies."

Their conclusions, based on detailed petrologic work and a summary of regional geology has been unquestionably(?) accepted and perpetuated in print without providing additional data, as for example by Williams et al. (1975, in Knight, 1975, p.578). Taylor (e.g. 1978) also accepts the epigenetic mechanism and the direct relationship between the granitoid intrusion, zoning and

Pb-Zn mineralization, although he mentioned that the northwest Tasmanian ores are difficult to categorize and may be a transitional type (in his classification scheme; see his Fig.2 and text, page 178).

Now to the unpublished - often informal - newer proposals on the origin of the Zeehan deposits. Mason (1980) was unable to come to a conclusion as to genesis. He merely discussed the possibility of Mississippi Valley-type occurrences (without offering any acceptable criteria) (for a review see Sangster, 1976; Hagni, 1976; Hoagland, 1976; Kyle, 1981; Laznicka, 1981) in the Gordon Limestone (Oceana and Austral prospects), but stated that the "diversity of minerals" (which he listed) are evidence of an origin other than the MV-type - some minerals suggested an elevated temperature of precipitation - to be proven by "fluid inclusion, sphalerite geothermometry or mineral stability field studies". He also considered that as a MV-type deposit minor metamorphic remobilization may have taken place, and then the whole Gordon Limestone would be a possible host-rock for the Pb-Zn mineralization. His short introduction (see his itinerary of 20 hours) to the problems only allowed him to conclude that "such a brief exposure with extremely metal-rich and structurally complex geology, accompanied by highly divergent ore deposit types, has raised a great number of questions in my mind". He suggested among others, that a "total information" compilation and paleogeographic reconstruction of some 30 to 50% of Tasmania would be prudent.

The present writer wholeheartedly agrees with the last statement.

Jones/Russell (or Russell/Jones ?) (1980), after inspecting for one day the cores and prospects of the Oceana and Austral area, concluded that the mineralization (in holes Nos. ZT-80-2 and 4) are of two distinct types:

(1) Syndiagenetic massive sulfides within sedimentary breccias, and

(2) replacement massive sulfide within interbedded calcilutites and dolomite.

A comparison is then made with the Irish Navan and Tynagh deposits (see Evans, 1976), referring also to the McArthur River district (see Lambert, 1976; Walker et al., 1977). Some comments are in order:

As to a useful summary of the Irish and the McArthur River deposits, the reader is referred to the above-cited references. Russell/Jones (1980) did not explain the genetic and stratigraphic (space-time) relations between the epigenetic mineralization in the so-called "slump breccia" near the fault and the (presumably) syngenetic basinal BIF and shale-hosted Pb-Zn deposits of the Irish deposits. Are the latter to be expected at Zeehan? Applying this model to the Oceana mineralization, Russell/Jones stated: "fluids, emanating from a deep structural break, were not exhaled onto the sea floor but were trapped and dispersed into a sequence of slump breccias, i.e. syndiagenetic semi-massive sulfides observed lower down in ZT-79-2 (204-218m) appear to have precipitated, along with coarse-grained, primary ankerite and siderite, on or near the basin floor (Petrographic Rept. 80-1, A.W.G. Whittle)."

In regard to this description, note the following:

(i) First it was stated that the fluids did not exhale onto the sea floor; but then the ankerite-siderite formed "on or near the basin floor" (Whittle?).

(ii) From earlier discussions, the present writer has concluded that the core (and thin plus polished section) descriptions are insufficient to establish syngenetic vs. diagenetic vs. epigenetic features (or remobilized material). Hence, such comparisons are premature.

(iii) The expression "syndiagenetic" is too loosely used to make any sense. Is it referring to mode of origin,

(space relations) time, source, mode of precipitation or what?; (see Wolf 1981 for discussions) - because the "dispersion into a slump breccia" (below the surface - far below surface?) from fluids moving up a fault could be more properly called "epigenetic", in particular since no proof is offered as to syngenesis-diagenesis.

(iv) No evidence is provided to establish the "slump breccia" as of slump origin. Could it be a tectonic breccia?

(v) How did the coarse-grained "primary" ankerite-siderite form on or near the basin floor? The emphasis lies on "coarse-grained"; coarsely crystalline material precipitated at the surface without subsequent recrystallization?

(vi) In addition to the mineralization in the breccia, there are other styles unrelated to the presence of breccia. What is their origin? Since the replacement origin (their second, and only other, mode of origin) does not seem to be capable of explaining all occurrences, Russell/Jones (1980) failed to explain them.

(vii) Under no circumstances should one accept statements of importance without providing details, e.g. "the mineralization in ZT-79-2 is very similar to that observed in the Cooley and Ridge deposits at McArthur River". No comparative data was given. (See below.)

(viii) As to the replacement massive sulfide in DDH ZT-80-4, no plausible explanation was proffered for the genetic, stratigraphic, structural and environmental relationships between the syndiagenetic and replacement deposits. Also, what are the criteria upon which "replacement" is recognized? - those provided are not unequivocal.

(ix) "Russell emphasized the importance of structure" in the origin of the Navan, McArthur and Oceana deposits, "especially deep crustal breaks (hinge zones)". I do agree with this, and one should carefully consider the details offered in the two figures in Russell/Jones (1980). According to the plan of Oceana, the shallow

marine paleoenvironment is to the west and the basin to the east, with the hinge line running approximatley N-S. Hence, the assumed reef, back-reef, slump-breccia and "calcareous turbidite" deposits also extending N-S. (That is to say, the axes of individual slumps and turbidites would be approximately E-W, because the source was to the E.) Russell postulated low-angle thrust faults observed in the Oceana mine and which trend meridionally (i.e. parallel to the sedimentary depositional strike), probably representing hinge faults within the initial basin. "At approximately 700', two such faults seem to indicate a sudden drop-off possibly representing a deepening of the basin. This sort of environment is essential to locate a shale-hosted stratiform Pb-Zn deposit similar to McArthur River or Navan. Large cross-faults at Oceana (i.e. the Oceana and South Oceana faults) possibly aid the development of traps for mineralizing solutions. Both massive sulfide intersections from holes 2 and 4 occur in very close proximity of the above-mentioned faults."

This genetic model is a rather appealing one - and I agree that it looks as if it might explain the Oceana mineralization. But considering the economic importance of establishing such a model on which then exploration decisions are based, more than a comparison with other "similar appearing" deposits, and more than superficially obtained geologic information is required. I re-emphasize the latter again, because of the valuable ("invaluable") data that could have and can be gained from a detailed description and interpretation of the cores at the Oceana and Austral localities by a specialist.

In summary, the Navan-Tynagh-McArthur(-Mt.Isa partly?) model may well be applicable to the Oceana-Austral area,

but this view is based at present more on the proverbial "gut-feeling" and "intuition". Both of these "philosophical" methods are necessary but they should be based on observable data, especially if it is there and can be easily obtained.

(x) The same deliberations apply to Russell's comments in "Zeehan Area - Exploration": they are plausible, but based on generalized, sweeping statements rather than detailed reliable descriptions.

Russell stated that the observed cores "show little evidence of tectonism, i.e. corals, shells, crinoids, pisoliths, etc. are not squashed; indicating that the old theory of Pb-Zn mineralized shear zones in preference to a replacement or syndiagenetic deposit is not valid". In my opinion, this conclusion is premature because

(a) the carbonate host rock does show shearing in places,

(b) replacement by both gangue minerals (including carbonates) and ore minerals may have obliterated many shearing features in the easily replaced limestone, the latter of which could have been "soaked" by the mineral-replacing fluids. This "soaking" and obliterating of both primary sedimentary as well as secondary shearing features can be recognized and reconstructed only when some (however small) pre-mineralization textures/fabrics/structures are preserved, and when the cores are studied carefully in both hand specimens and thin plus polished sections. That has not been done as yet.

(c) My own cursory examinations revealed that the ore and gangue minerals are of syngenetic-diagenetic, open-space, replacement, ± remobilization or tectonically deformed origin; i.e. at least four

or even five different mechanisms were involved - not just two (syndiagenetic and replacement).

(d) That shearing has affected some of the ore seems "obvious" - but whether and to what extent (i) the ore (of whatever origin) was of pre-tectonic (pre-shearing) origin and was subsequently sheared; (ii) the ore was localized by shear zones; and/or (iii) the ore minerals replaced volume-by-volume (and thus mimicked or preserved the fabric structure) pre-mineralization shear-features, can only be established by detailed micro and macro- studies. Until then, alternative interpretations should be listed.

Note: Even the best descriptive and/or genetic conceptual models from anywhere in the world (e.g. Irish, Mississippi Valley, McArthur River, Mt. Isa,... deposits) cannot be plausibly applied to a deposit that has been described only superficially, although a model can be legitimately used at any stage in prospecting.

As to the mineralization in "slump" breccias, comments have been made elsewhere in the present report: to reiterate - as long as no detailed investigation has been made of the different possible breccias [e.g. sedimentary-intraenvironmental, soft-sedimentary, compaction, slump, reef-type (fore vs. back-reef), intra-formational of various types, fault, karst, solution breccias], a snap decision may lead to misinterpretations. In not one report did I find a list of criteria used to differentiate, for instance, between sedimentary (numerous types!) and fault breccias! Even in quick routine core-studies it is easily possible (supplemented later) to make such a list.

The same comments applies to the "turbidites", i.e. "calcareous turbidites"; no evidence was found to indicate the presence of a genuine turbidite, such as the Bouma sequence (a to e). The

presence of a weakly developed graded bed is not sufficient to call something a "turbidite" - not even a "fluxo-turbidite" or a "distal turbidite". Also, shallow-water vs. deeper-water basinal milieux, etc., cannot be reconstructed on such evidence, let alone possible transgressions, regressions, periodic sediment influx, etc. (Graded bedding has been reported from at least six non-turbidite environments.)

I wholeheartedly agree with Russell/Jones when they say "the stratigraphy and sedimentation should be studied in detail..."

Wilkins (1981) believed that the mineralization in the Gordon Limestone is of the Mississippi-Valley-type. For summaries of the M-V-type, the reader may wish to refer to Kyle (1981), Laznicka (1981), Sangster (1976) Hagni (1976), and Hoagland (1976), for example. These papers, among many others, should form the basis for a more detailed comparative study once the geologic data of the Zeehan area has been properly described. Just a few comments below.

Wilkins has gone somewhat beyond Russell/Jones' discussions in that he used a semi-regional consideration from Despatch via Maxim, Austral, Oceana to Pyramid - this regional extrapolation can be continued as soon as Amoco will expand its prospecting to the Mariposa area east of Zeehan, especially if drilling is to be done there. Similar to Russell/Jones' ideas, Wilkins' proposals have merit, i.e. some of his paleoenvironmental reconstructions are plausible. However, I must re-emphasize that a comparison with the M-V-type and Mc Arthur River deposits is premature.

Curtis (1981; see Jones, 1981) offered information and interpretations that have a bearing on genetic reconstructions. Since he emphasized structural control, his ideas are important. He stated (see summary) that "from old mining records, massive Pb/Zn mineralization at the Oceana is known to occur in two semi-parallel bedding-plane shears, 2m to 5m apart. North of the

mine, three NNW-trending zones of mineralization have been defined, two of which contain massive Pb/Zn at depth. ...the massive shear-hosted Pb/Zn is surrounded by an envelope of disseminated low-grade, Zn rich mineralization".

Using this description to enable plausible genetic interpretations, the following must be known:

(a) If two of the just-cited NNW-trending mineralizations are massive, of what type is the third? Disseminated?

(b) Precise petrographic/petrologic - structural (i.e. total geology) data of the sheared host and mineralization is required.

(c) Could the "disseminated envelope" be a "geochemical halo"? (See Beus and Grigorian, 1977; Levinson, 1980.) What approach has been used to differentiate the two?

(d) The characteristics of the envelope of disseminated low-grade, Zn-rich mineralization is significant in unravelling the origin of the mineralization (and its relationship to the shearing). For example, is the dissemination identical around the massive Pb-Zn concentration? Or are there variations in the underlying (older) in contrast to the overlying (younger) host rocks? If the mineralization is of "sedimentary" (i.e. syndiagenetic or exhalative) origin the disseminated envelope would probably be more intense in the underlying host rocks. If the mineralization is of late-stage, epigenetic origin, the envelope would be identical in both the older and younger host rocks. If mineralization occurred prior to folding of the country rocks, the characteristics (e.g. symmetry) of the disseminated "halo" would differ from that formed subsequent to deformation. (For many styles of relationships between massive ore and disseminated envelopes, and especially on differentiation between "halos" and disseminated ore mineralization, see Beus and Grigorian, 1977).

Answers to the above-mentioned problems are important in order to

decide whether the mineralization is of syndiagenetic or of any one of several possible epigenetic origins, in particular since Curtis (1981, Summary) mentioned that "From the sections and plans it is concluded that the high-grade mineralization is located in a gentle dip inflexion in the westerly dipping overturned limb of the Zeehan Syncline, and that the thickest zones are in the area where the beds revert from a westerly dip to an easterly dip." (See also p.9, Curtis, 1981.)

As to the possible influence of tectonism on the origin of the Zeehan mineralization, a regional structural analysis must be made as part of a metallogenic study of all the ore districts circumjacent to the Oceana district. Many mineralizations outside the Gordon Limestone can be aligned with the Zeehan deposits, giving the impression that fractures, faults or lineaments controlled the localization of the mineralization, even independent of host rock type. To what extent this supports a late-stage epigenetic origin, remains to be determined.

In the past the genesis of the numerous types of mineralizations was believed to be related to Heemskirk Granite hydrothermal solutions. Only recently some alternative models have been proposed, e.g. Mississippi Valley and McArthur River types, but they did not resolve the question of zoning around the Granite. Curtis offered a composite genetic model which deserves particular attention (pp.20-24) as he reconciled some of the "epigenetic" with the "syndiagenetic" features. "It is suggested that the tin, wolframite, bismuthinite, and possibly part of the pyrite mineralization originated from the Heemskirk Granite hydrothermal solutions, while most of the pyrite and the lead and zinc originated from connate brines entrapped within the Zeehan basinal sediments. If this is correct, the zonal arrangement of the mineralization is of composite origin, resulting from a primary distribution of the mineralization, and a concentrating effect due mainly to structure, the increase in temperature attendant on the Heemskirk Granite intrusion, and the

passage of hydrothermal solutions through the necks."

From my own point-of-view, it is interesting that Curtis suggested that lead and zinc may have originated from connate brines - interesting because during summarizing the literature on ores in sedimentary basins frequent reference was made to a possible genetic connection between hydrocarbon and metalliferous concentrations during basin evolution (Wolf, 1976). In the Zeehan area, nobody has commented in detail on the large volume of carbonaceous matter, kerogen, hydrocarbon or "tar" or "graphite" in the Gordon Limestone. Is it a distillate of former oil? Is there any relationship between it and the mineralization? Has it been remobilized with the metals? If the Heemskirk Granite supplied (plutonic-igneous) hydrothermal fluids, what would have been their effect on the carbonaceous matter in the surrounding sediments - i.e. can the present-day characteristics of the carbon be used in determining whether the associated metal was supplied by igneous hydrothermal solutions? For a review of "the significance of organic matter in ore geneses" see Saxby (1976).

Saxby (1976) referred to the McArthur River, Cobar, Broken Hill, Mt. Isa, Woodcutters and Rum Jungle deposits, and stated that "a general association of organic carbon with sulphides and particularly with fine-grained pyrite has been observed, especially for the McArthur River deposit". As to the carbon in the Gordon Limestone, Oceana-Austral area, the question arises whether the intrusion of the Heemskirk Granite into the sedimentary pile remobilized the hydrocarbons and caused migration towards the east. The increase in temperature may then have distilled the original oil and gas - similar occurrences have been recorded from other parts in the world.

In future studies of the cores, one should determine whether the carbon is "graphitic", as proposed, or of some other composition; its distribution; its horizontal and vertical variations (from

the Oceana to the Mariposa); whether solution of the Limestone caused the concentration of carbon as insoluble residues at the surface and in the subsurface.

Interim conclusions on earlier-proposed hypothesis

Based on the review of the data of earlier workers and the brief exposure of the present writer to the Zeehan area, some general comments are possible which, however, may have to be revised after a proper redescription of all the cores available.

I am visualizing a genetic model for the Zeehan district that is a hybrid of the just-cited models (namely of the Irish, McArthur River, and Mississippi Valley types) (and some features of the Mt. Isa model proposed recently by Finlow-Bates, 1980; and Finlow-Bates and Stumpfl, 1980), combining several syndiagenetic and epigenetic mechanisms. Consequently, sedimentary precipitation, remobilization, open-space in-fillings in breccia (of several possible origins), replacements and tectonic remobilization and deformation, may all have been involved. (It seems to me, however, that nobody has given consideration to the possiblity that the earlier-formed mineralizated units acted as weak zones for subsequent preferential deformation, thus resulting in the spatial coincidence of the mineralization with the shearing. This would have resulted in an accidental, i.e. coincidental, association of older mineralization with younger shearing. It must also be said here, that much mineralization at Zeehan is not associated with shearing or other deformation structures.)

Temporary proposal in absence of definitive genetic hypothesis guiding prospecting/exploration

There is little doubt that a genetic concept influences the design of an exploration or prospecting program. If the ore in the Oceana and Austral area is controlled by "adequate structural preparation" of the host rock (Curtis, 1981, p.26) then the

search would be for appropriate structures. However, if it can be proved that the mineralization is of syndiagenetic origin, any part of the proximal-to-distal parts of the Gordon Limestone is prospective. Epigenetic models tend to suggest that mineralizations occur in smaller areas (with exceptions, of course), whereas syngenetic-diagenetic concepts imply larger potential regions.

In so far as it has been concluded above that syndiagenesis most likely has had an influence on the mineralization in the Gordon Limestone, I believe that this whole Limestone is prospective and must be explored. Otherwise I agree with all the Recommendations made by Curtis 1981, pp.24-27); however, I add that the cores should be redescribed in detail before a plausible genetic hypothesis can be fully developed.

Epigenesis vs. syndiagenesis influencing prospecting/exploration

The source(s) and mechanisms of concentration/precipitation of metals will determine both the localization and distribution of mineralization: particular epigenetic processes may form localized discordant bodies of limited regional extent and may occur independent from host rock lithology, in contradistinction from syndiagenetic types that are stratabound-stratiform, of wide occurrence, and are restricted to specific lithologies and/or stratigraphic formations. The Gordon Limestone is an excellent exemplar as it can host either epigenetic fault/shear-controlled or replacement bodies, or stratabound/stratiform deposits. For instance, a fault may have acted as a conduit for metal-bearing solutions which formed mineralization similar to that illustrated in the figures by Evans (1976), Russell/Jones (1980), and Walker et al. (1977) of the Irish, Tynagh and Navan, and of the McArthur River (H.Y.C) deposits, respectively (see also recent models of Mt. Isa; Finlow-Bates, 1980; and Finlow-Bates and Stumpfl, 1980). In this case, the fault is either of pre-mineralization origin or penecontemporaneous with the mineralization, so that no displacement of earlier-formed

deposits should be expected. However, if a fault is of post-mineralization origin, a displacement must be expected and should be explored for.

Inasmuch as syndiagenesis and epigenesis (including re-mobilization) has been invoked for the Zeehan mineralizations, the latter may have characteristics of both types. Evans (1976), for example, has depicted in his Fig.4 four ore districts arranged in order of increasing concordancy of ore zones and stratigraphy; which model applies to the Zeehan area is as yet not known.

From the preliminary observations made along the surface (e.g. ironstone/gossan distribution) and subsurface drilling data, there is a good chance that the mineralization in the Gordon Limestone is stratabound-stratiform; consequently the whole of the Limestone should be carefully prospected by geological, geochemical and geophysical means for proximal- and distal-type metal concentrations.

As to detailed paleoenvironmental reconstructions, first the Oceana-Austral area should be re-investigated, as proposed repeatedly, followed by a study of the Limestone and associated rocks to the south and east (Mariposa prospect area) and north to establish facies changes. These will indicate the possible environmental changes along the dip and strike of the Limestone, i.e. from shallow- to deep-water facies and along the paleo-shoreline. If the mineralization is of syndiagenetic origin, it will vary according to the depositional milieux (proximal to distal?).

At present it is impossible -

(a) to distinguish between back- and fore-reef environments,

(b) to reconstruct the facies trends from the Oceana-Austral area to the west, south and east (i.e. down-dip and along strike), so that proximal and distal deposits cannot be

recognized. Note that at present it is assumed that the shallow-water deposits are in the west, but no unequivocal evidence is known as to how far to the west the inferred reef may have been. Thus, we do not know how proximal or distal the Oceana area is within the former sedimentary basin.

(c) No transgressions-regressions have been worked out.

One additional comment; in the future more attention should be paid to establishing criteria for syngenesis and epigenesis - see Garlick (1965).

## EXPLORATION

The exploration methods used by Amoco in the Zeehan area comprise geological, geochemical and geophysical procedures, all of which have been described in various reports by Jones (1979), Roxburgh and Jones (1980), Jones (1981), and Curtis (1981). In particular since the best possible approaches (except for those criticised here) were utilized under the prevailing conditions, there is no need for discussions and only some suggestions are proffered.

The geological investigations consisted of field work (mapping of outcrops and exposures in trenches), drilling with subsequent descriptions of the cores, thin- and polished-section studies (see above), review studies by a consultant (Curtis, 1981), and discussions with visiting geologists which resulted in brief comments (e.g. Mason, 1980; Russell/Jones, 1980; Wilkins, 1981). Only two comments are necessary here. One is to reiterate the necessity to redescribe all the available cores to answer the numerous questions posed in this report and to establish a plausible genetic hypothesis as a basis for an exploration philosophy (cf. Finlow-Bates, 1980) - this in conjunction with the geochemical and geophysical techniques proposed below. All the other geological recommendations I would suggest have already

been listed in the various Amoco reports. These include more detailed structural mapping using ERTS method, for example, and rechecking of aerial-photo interpretation by ground work.

The second proposal concerns tectonic and geological interpretations, namely that in the future all possible multiple reconstructions of the structures and movement patterns are to be provided. The brief engagement of the present writer to examine the Zeehan area did not permit him to investigate all possibilities; let it suffice to provide an exemplar. It must be stressed that such multiple interpretations should be used in all aspects of geology - and when one of these reconstructions is accepted as the "factual" or most plausible one, it is of great assistance to list the reasons for preferring this particular interpretation.

To illustrate the "multiple-hypothesis" approach advocated above, I have chosen Fig.3 in Curtis (1981). His interpretation is shown as Possibility No.1 - followed by No.2 to 4. By introducing minor complexities, one can offer several other, additional, interpretations. Aside from the fact that several movement patterns are possible, it would be of assistance to list the criteria used to prove the unequivocal presence of a fault or faults (in contrast to, say, strong shearing, cleavage, etc.).

The four interpretations are not discussed here as they are self-explanatory - including the economic relevancy. If the situation arises that it is impossible to select one as the "factual" interpretation, then one should wisely choose those reconstructions that suggest the presence of mineralization until proven otherwise by drilling, i.e. one should ignore the interpretations indicating "uplift, erosion and destruction of the mineralization". Methods must then be devised to select the correct interpretation from the several possible structural reconstructions suggesting the presence of mineralization.

In this context, it has to be said that one should also state the reasons in any report for having chosen a particular drilling site. One more problem: poor core recoveries must be handled with special care:

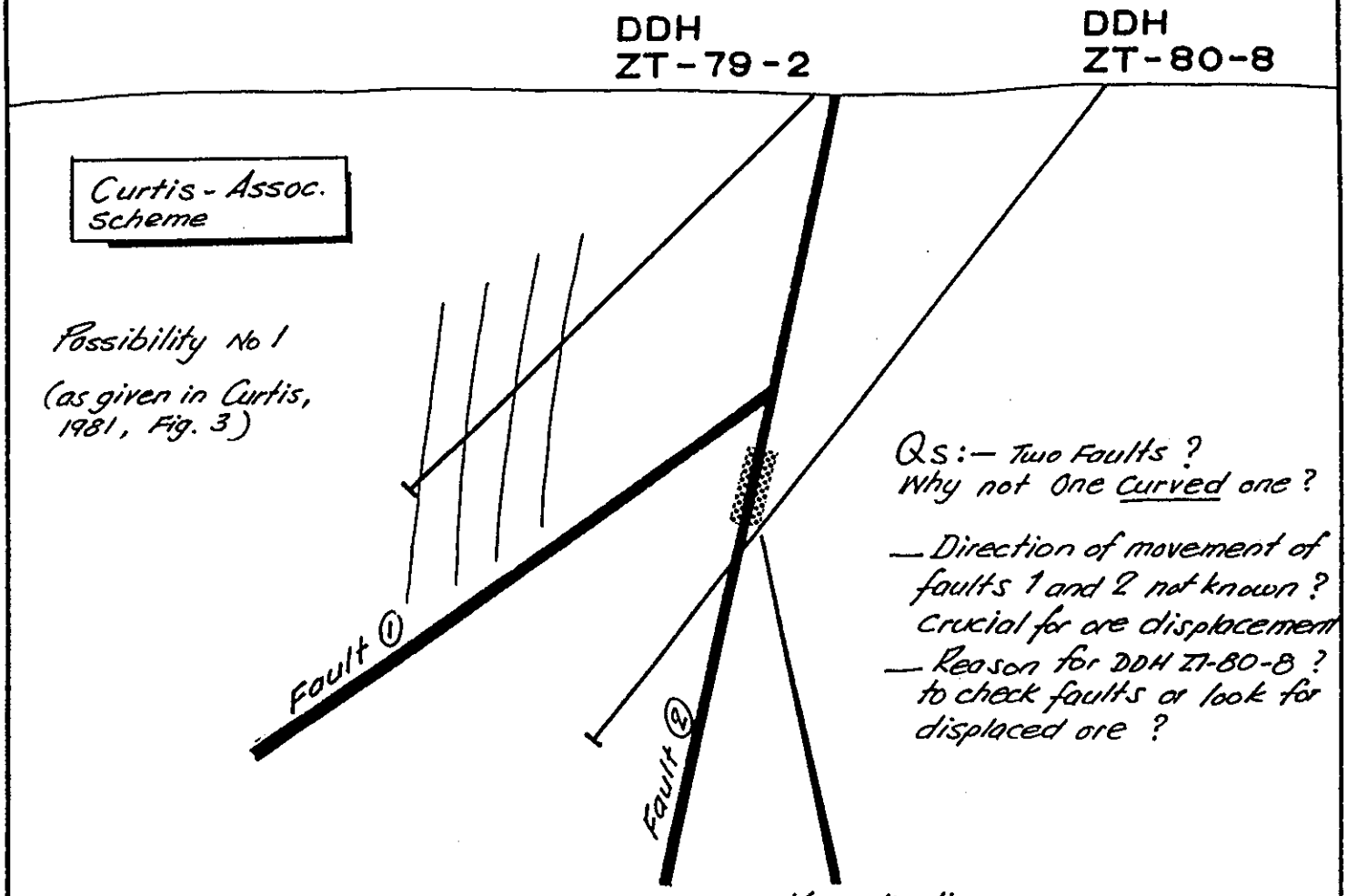
(a) it may coincide with a mineralized section, so that no data is available on the ore potential after poor recovery;

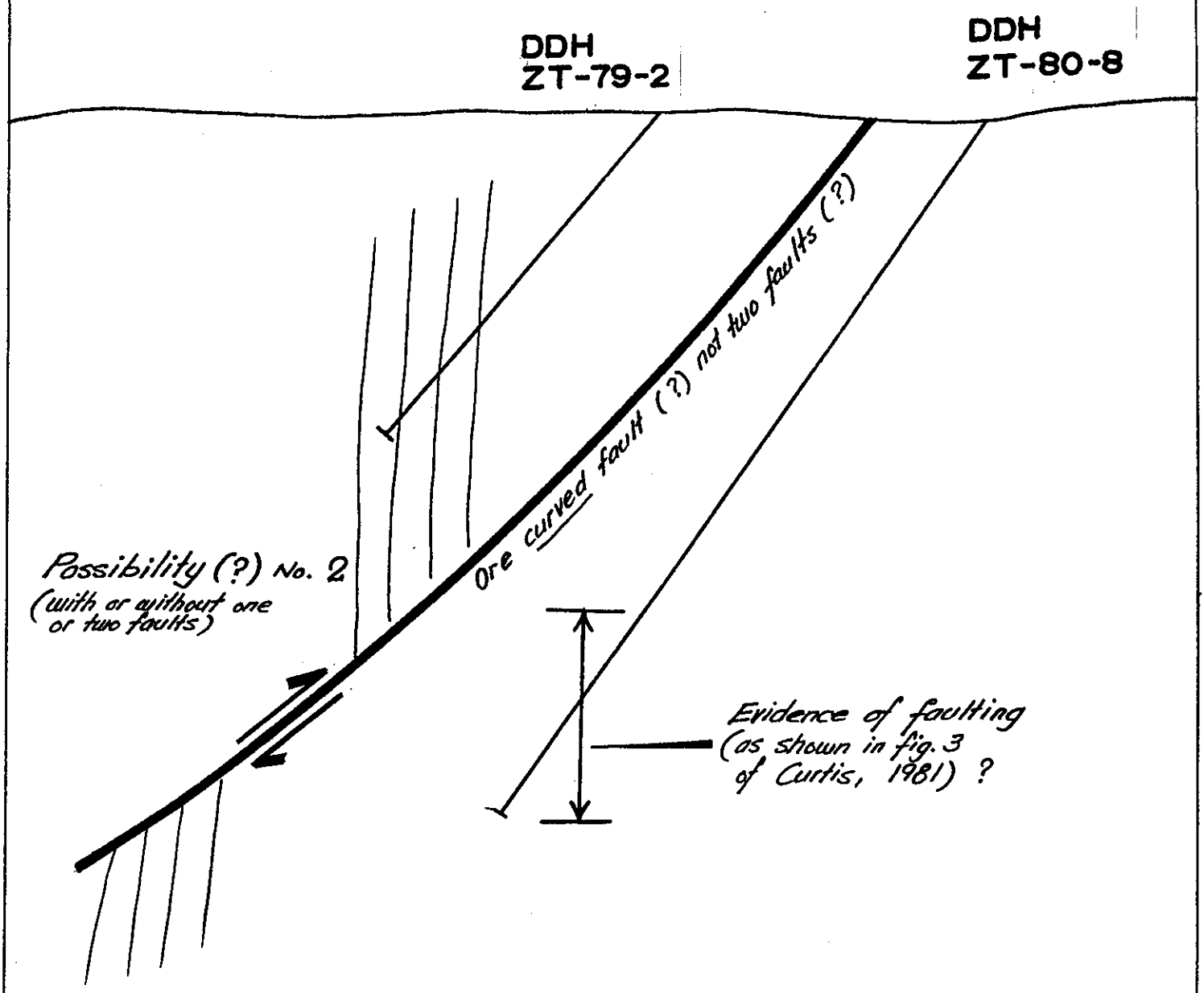
(b) in at least one case at Zeehan, the drill-hole terminated within mineralization due to poor ground conditions.

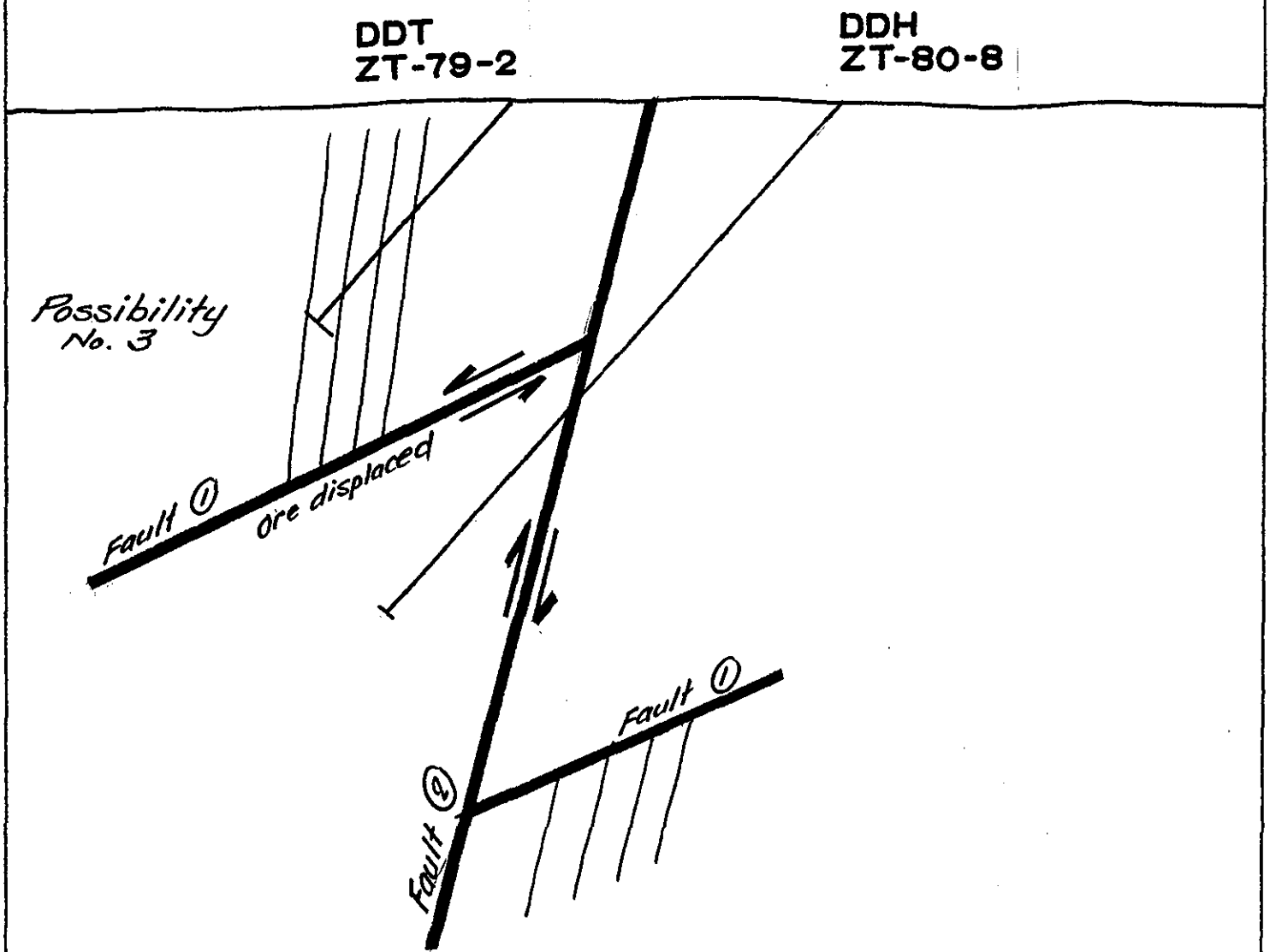
Based on (a) and (b), no proper estimation is possible.

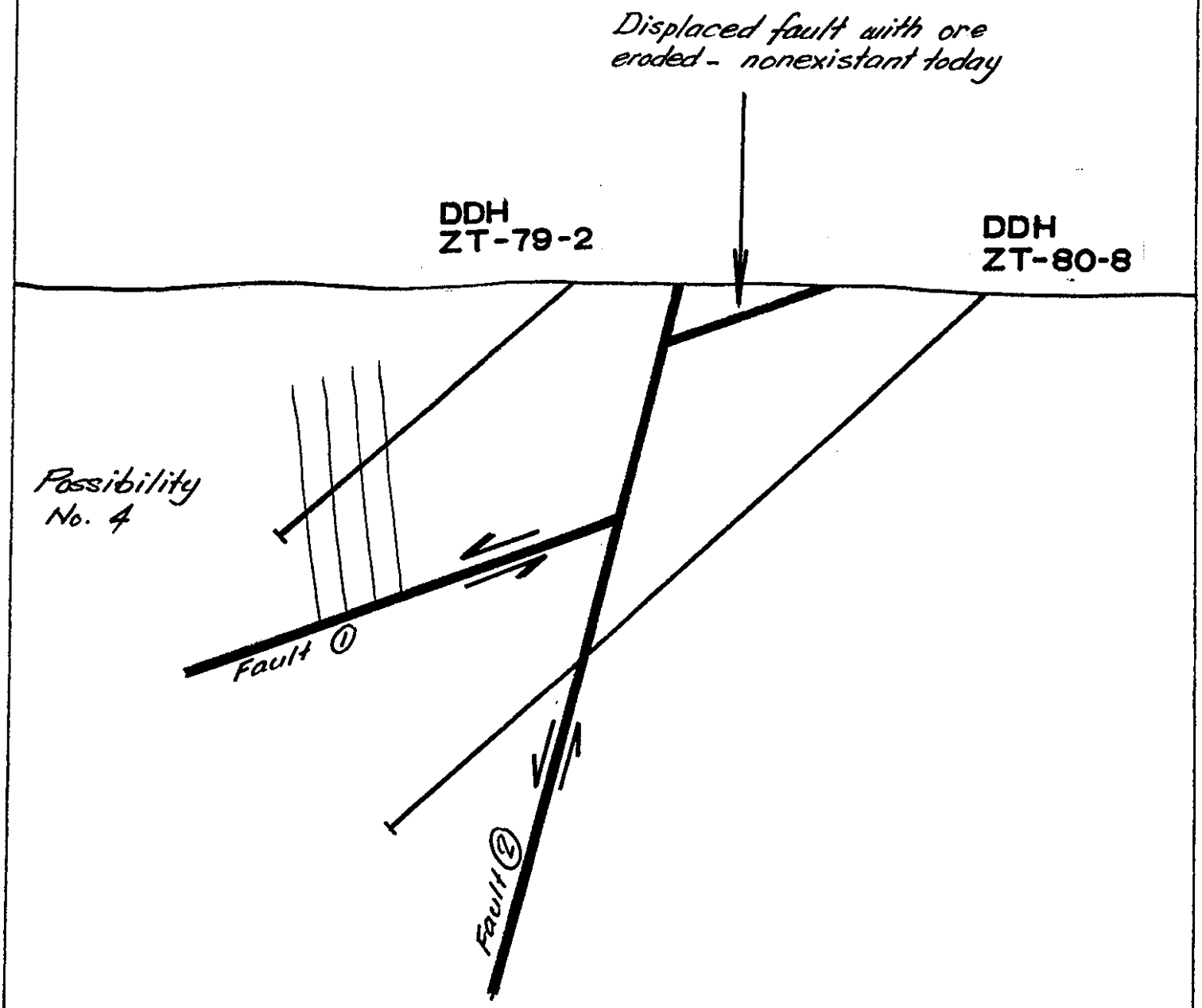
As to the geochemical prospecting/exploration, a number of approaches have been used with success to warrant continual application of these methods, but some additional techniques are recommended. In general, the litho-geochemical methods have been the most successful ones in the Zeehan area - and the analyses were made on both surface rock samples and cores. The suggestions as to future geochemical prospecting/exploration are related to (a) well-logging techniques, (b) one aspect of methodology (i.e. calculations), and (c) elements analyzed. The comments below are only brief as useful details at this stage would necessitate lengthy presentation of case histories and discussions.

(a) During the past few years new downhole (=well-logging, borehole) geophysical and geochemical methods have been developed which may be useful in the Zeehan area. Two introductory reviews are provided by Scott and Tibbetts (1974) and Dick et al. (1975) - and a literature survey would supply the more recent case histories up to 1981. Tables are provided in the just-cited two summaries that list the numerous electrical, magnetic, sonic, nuclear and other logging techniques, plotted versus the metals and non-metals, including those in sedimentary rocks of the type found at Zeehan. Eleven nuclear techniques are listed, for example, applicable to mineral exploration of fortysix detectable elements.


DDH
ZT-79-2
DDH
ZT-80-8
Curtis - Assoc. scheme
Possibility No 1
(as given in Curtis, 1981, Fig. 3)
Fault ①
Fault ②
Qs:— Two Faults ?
Why not One Curved one ?
— Direction of movement of faults 1 and 2 not known ? Crucial for ore displacement
— Reason for DDH ZT-80-8 ? to check faults or look for displaced ore ?
— Mineralization :
Possibly by solution carrying metals from earlier formed fault-crossed ore ; see fig 6
∴ Does not prove that fault was conduit for ore-forming solutions.


DDH
ZT-79-2
DDH
ZT-80-8
Possibility (?) No. 2
(with or without one
or two faults)
One curved fault (?) not two faults (?)
Evidence of faulting
(as shown in fig. 3
of Curtis, 1981) ?


DDT
ZT-79-2
DDH
ZT-80-8
Possibility
No. 3
Fault ①
ore displaced
Fault ①
Fault ②


Displaced fault with ore eroded - nonexistant today
DDH ZT-79-2
DDH ZT-80-8
Possibility No. 4
Fault ①
Fault ②

Some of these nuclear techniques may be more versatile, more accurate, and can simultaneously determine more elements by downhole measurements in contrast to the standard techniques applied to core chip samples, for instance.

The practical importance of downhole geochemistry (i.e. of cores) has been discussed by Beus and Grigorian (1977), Ross et al. (1979) and Levinson (1980) - the first book specifically devoted to rock (litho-) geochemical methods. As to the neglect of the downhole methods, see the admonition by Boyle (1974a, p.346; quoted by Levinson, 1980, p.778). To merely search for visually obvious anomalie at the surface, thus suggesting the presence of near-surface or close-by mineralization, is inadequate; it must be supplemented by a search for less conspicuous anomalie in cores and surface outcrops indicating remoter metal concentrations.

(b) Possible refinements in handling the geochemical data is recommended. During discussions I was informed that sophisticated statistical manipulations did not provide useful results. However, some relatively simple numerical methods have been described by Beus and Grigorian (1977), Ross et al. (1979) and Levinson (1980), together with discussions of concepts (e.g. differentiation between "disseminated mineralization" and "geochemical halos", enhancing of weak to more distinct halos, detection of hidden mineralization in drillholes, distances over which anomalies are indicative of mineralization, various types of zoning, etc.).

(c) As to the elements analyzed, only the major, and therefore most basic, ones have been used, i.e. Pb, Zn, Cu, Hg. From the review publications by Boyle (1974b), Beus/Grigorian (1977), Rose et al. (1979), and Levinson (1980), it is

obvious that a few other elements - expecially minor and trace elements - can be considered to possibly act as indicators. How to select these elements?

Table 4.2 in Rose et al. (1979) and Table 2.4 in Levinson (1980) demonstrate that the major and associate pathfinder elements (or total association of elements) are classified according to type of deposit or host rock type, i.e. these lists are genetic. Inasmuch as the precise mechanisms of the Zeehan mineralizations are unknown, the possible pathfinder elements should be chosen from all those types that may be applicable until orientation surveys have determined the most suitable ones.

The present writer suggests some of the following elements: Ba, F, Ag, Mn (e.g. Levinson, 1980, p.751-752), Cd, Te (e.g. Rose et al. 1979, p.111), As, Sb, Se, Bi, Sb, Ga, Co, Ni, Mo, U. (Others are listed by Boyle, 1974 b, e.g. p.13 for zinc.)

Not all are required, but a selection of a few of these depends on careful consideration of several factors, e.g. an orientation survey (see Boyle, 1974b). Some of these elements are used only in the search for shale-hosted mineralization rather than for those in carbonates, but the lithologies at Zeehan contain a large amount of fine-grained, including clayey, host rock material and, importantly, in places much organic/hydrocarbon constituents.

As mentioned above, the elements chosen should be determined in surface samples as well as during downhole surveys.

In regard to the geophysical methods applied at Zeehan, no discussions are possible here. Some details are found in the Amoco and consultants' reports. I merely wish to recommend that consideration be given to the newly available downhole techniques outlined as early as the mid-1970's by Scott/Tibbetts (1974) and Dyck et al. (1975), and offer the following discussion. (Which

case history studies of Pb-Zn districts in the world have been used in the initial stage?)

In general, Amoco's studies have led to the conclusion that "coincident geochemical (soil-rock chip) and gravity anomalies are to be drilled". This seems to ignore the "depth-penetration" of both the geochemical and the geophysical methods, i.e. to what depth and under what conditions can these methods provide a signature of mineralization? Which is more sensitive? If the "coincidence" is stressed, is a gravity anomaly without a geochemical anomaly (or vice versa) to be ignored? During orientation surveys the enhancing techniques of geochemical anomalies described by Beus and Grigorian (1977) should be tested, therefore. (See also Levinson, 1980, pp.14-16, 317-332, 748-774.)

REFERENCES

Beus, A.A., and Grigorian, S.V., 1977. Geochemical Exploration Methods for Mineral Deposits. Applied Publishing Ltd., Wilmette, Illinois, 287pp.

Blissett, A.H., 1962. Geological Survey - Explanatory Report: One-mile geological map series K'55-5-50 - Zeehan, 272pp.

Both, R.A., and Williams, K.L., 1968. Mineralogical zoning in the Pb-Zn ores of the Zeehan field, Tasmania. Part I: Introduction and review. Part II: Paragenetic and zonal relationships. J. Geol. Soc. Australia, 15(1):121-137; (2):217-243.

Boyle, R.W., 1974a. The use of major elemental ratios in detailed geochemical prospecting utilizing primary halos. J. Geochem. Explor. 3:345-369.

Boyle, R.W., 1974b. Elemental associations in mineral deposits and indicator elements of interest in geochemical prospecting (revised). Geol. Surv. Canada Paper 74-45, 40pp.

Curtis, R., 1981. Review of the Oceana mine area, Zeehan, Tasmania with: note on the Austral Prospect. R. Curtis & Associates, Sydney: 33pp. (Incorporated in Jones, 1981, Amoco Report 249.)

Dyck, A.V. (edit.), 1975. Borehole geophysics applied to metallic mineral prospecting: a review. Geol. Soc. Canada Paper 75-31, 66pp.

Evans, A.M., 1976. Genesis of Irish base-metal deposits. In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, vol.5, pp 231-256, Elsevier Publishing Co.

Finlow-Bates, T., 1980. The chemical and physical controls on the genesis of submarine exhalative orebodies and their implications for formulating exploration concepts. A review. Geol. Jb., D40:131-168 (Hannover, West-Germany).

Finlow-Bates, T., and Stumpfl, E.F. 1979-1980. The Cu and Pb-Zn-Ag orebodies of Mt. Isa Mine, Queensland: products of one hydrothermal system. Ann. Soc. Geol. Belgique, t.102-1979: 487-517.

Garlick, W.G., 1965. Criteria for recognition of syngenetic sedimentary mineral deposits and veins formed by their remobilization. 8th Commonwealth Mining Metall. Congress, vol.6, Proceedings - General, Paper No.33: 1393-1418.

Hagni, R.D., 1976. Tri-State ore deposits: the character of their host rocks and their genesis. In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, vol.6,pp.447-494, Elsevier Publishing Co.

Hoagland, A.D., 1976. Appalachian Zn-Pb deposits. In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, vol.6, pp.495-534, Elsevier Publishing Co.

Jones, P., 1979. Zeehan Project EL4/78, Tasmania; Project A-78-60. Progress Report June 1978 to June 1979. Amoco Minerals Australia Co., Report 151.

Jones, Phil, 1980. Zeehan Tour with Mike Russell. Geological Notes, Amoco, 5pp.

Jones, P.A., 1981. Zeehan Project EL4/78, Tasmania; Project A-78-60. Progress Report June 1980 to June 1981. Amoco Minerals Australia Co., Report 249.

Knight, C.L., 1975. Economic geology of Australia and Papua New Guinea. Vol.1-Metals. A.I.M.M., Monogr. No.5, pp.1126.

Kyle, J.R., 1981. Geology of the Pine Point Pb-Zn district. In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, Vol.9, pp.643-742, Elsevier Publishing Co.

Lambert, I.B., 1976. The McArthur Zn-Pb-Ag deposit: features, metallogenesis and comparisons with some other stratiform ores. In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, vol.6, pp.535-585, Elsevier Publishing Co.

Large, D.E., 1981. Sediment-hosted submarine exhalative Pb-Zn deposits - a review of their geological characteristics and genesis. In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, vol.9, chapter 8, pp.469-509, Elsevier Publishing Co.

Laznicka, P., 1981. The concept of ore types - summary, suggestions and a practical test ("M.V. type" ores). In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, vol.8, Elsevier Publishing Co.

Levinson, A.A., 1980. Introduction to Exploration Geochemistry, 2nd Edition. Applied Publishing Ltd. Wilmette, Illinois, 924pp.

Mason, G.D., 1980. To visit Amoco Prospects in Western Tasmania during August, 1980. Geological Notes, Amoco, 2pp. (Robertson Research, Canada Ltd.)

McKinstry, H.E., 1948. Mining Geology. Prentice-Hall, Inc., 680pp.

McLaughlin, D.H. and Sales, R., 1933. Utilization of geology by mining companies. In: Ore Deposits of the Western States (Lindgren Volume), pp.686, AIME, New York.

Ochler, J.H. and Logan, R.G., 1977. Microfossils, cherts, and associated mineralization in the Proterozoic McArthur (H.Y.C.) Pb-Zn-Ag deposits. Econ.Geol., 72(8):1393-1409.

Ross, A.W., Hawkes, H.E., and Webb, J.S., 1979. Geochemistry in Mineral Exploration. Academic Press, 657pp.

Roxburgh, B., and Jones, P., 1980. Zeehan Project EL4/78, Tasmania; Project A-78-60. Progress Report June 1979 to June 1980. Amoco Minerals Australia Co., Report 179.

Rye, D.M., and Williams, N., 1981. Studies of the base metal sulfide deposits at McArthur River, N.T., Australia: Part III. The stable isotope geochemistry of the H.Y.C., Ridge, and Cooley deposits. Econ.Geol. 76(1):1-27.

Sangster, D.F., 1976. Carbonate-hosted Pb-Zn deposits. In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, vol.6, pp.447-456, Elsevier Publishing Co.

Saxby, J.D., 1976. The significance of organic matter in ore genesis. In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, vol.2, pp.111-134, Elsevier Publishing Co.

Scott, J.H., and Tibbetts, B.L., 1974. Well-logging techniques for mineral deposit evaluation: a review U.S. Bureau of Mines. Inf. Circular 8627, 45pp.

Taylor, R.G., 1978. A classification of tin provinces. Stydia Geologica, XIV: 171-181.

Walker, R.N., Logan, R.G. and Binnekamp, J.G., 1977. Recent geological advances concerning the H.Y.C. and asssociated deposits, McArthur River, N.T. J.Geol.Soc. Australia, 24(8):365-380.

Wilkins, N., 1981. Notes on my visit to Tasmania. Geological Notes, Amoco, 7pp.

Williams, K.L., and Both, R.A., 1971. Mineralogy of the mines and prospects of the Zeehan field. Tasmania Dept. of Mines, Geol. Surv. Rec. No.11, 47pp.

Wilson, P.D., 1924. Report on the collection, recording and economic application of geological data. Am.Min. Congress, 25th. Ann. Convention.

Wolf, K.H., et al., 1967. Techniques of examining and analyzing carbonate skeletons, minerals and rocks. In: Chilingar et al. (edit.), Carbonate Rocks, Developments in Sedimentology, vol.9B, pp 253-341, Elsevier Publishing Co.

Wolf, K.H., 1973. Conceptual models. Part 1... ore deposits. Sedimentary Geol., 9:153-193.

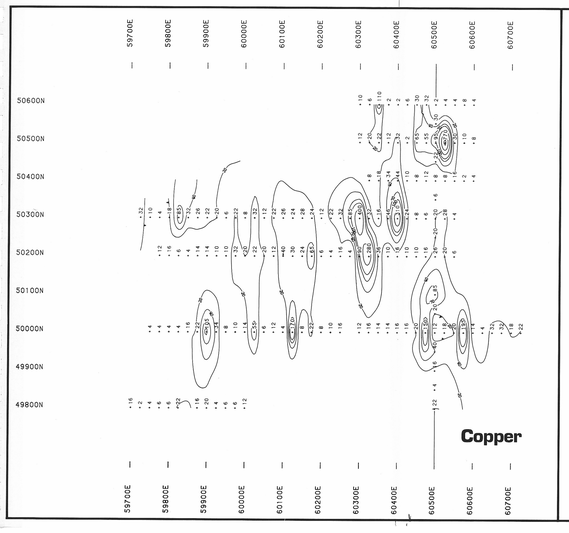
Wolf, K.H., 1976. Ore genesis influenced by compaction. In: Chilingar, G.V./Wolf, K.H. (edits.), Compaction of Coarse-Grained Sediments, vol.2, Elsevier Publishing Co. Chapter 5, pp.475-676.

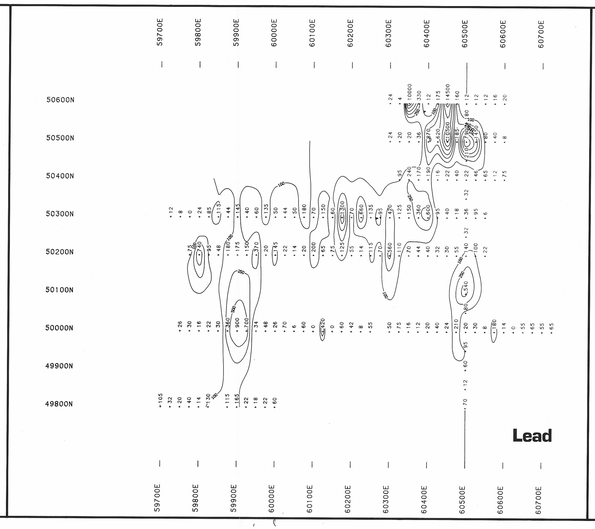
Wolf, K.H., 1981. Terminologies, structuring and classifications in ore and host rock petrology. In: K.H. Wolf (edit.), Handbook of Stratabound and Stratiform Ore Deposits, vol.8, Chaper 2, Elsevier Publishing Co., 338pp., 106 figs., 127 tables.

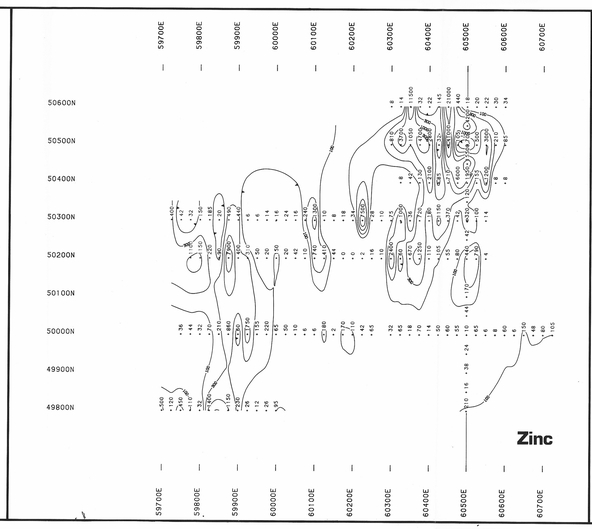
649100

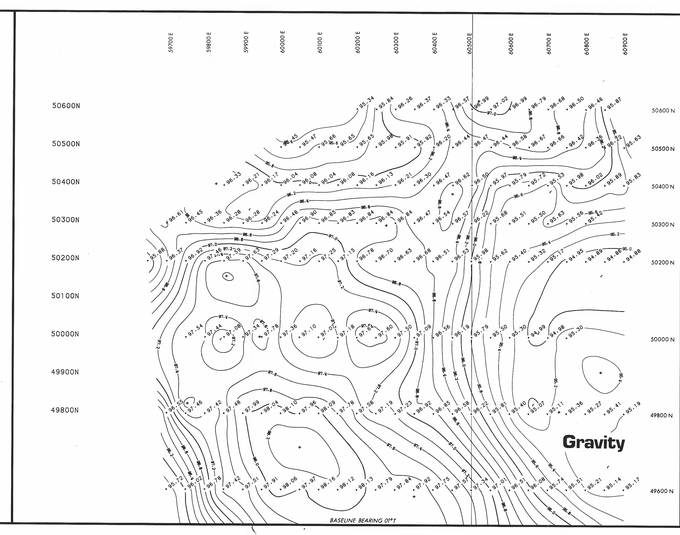
APPENDIX 3

MYRTLE - BEDROCK GEOCHEMISTRY AND GRAVITY




649101

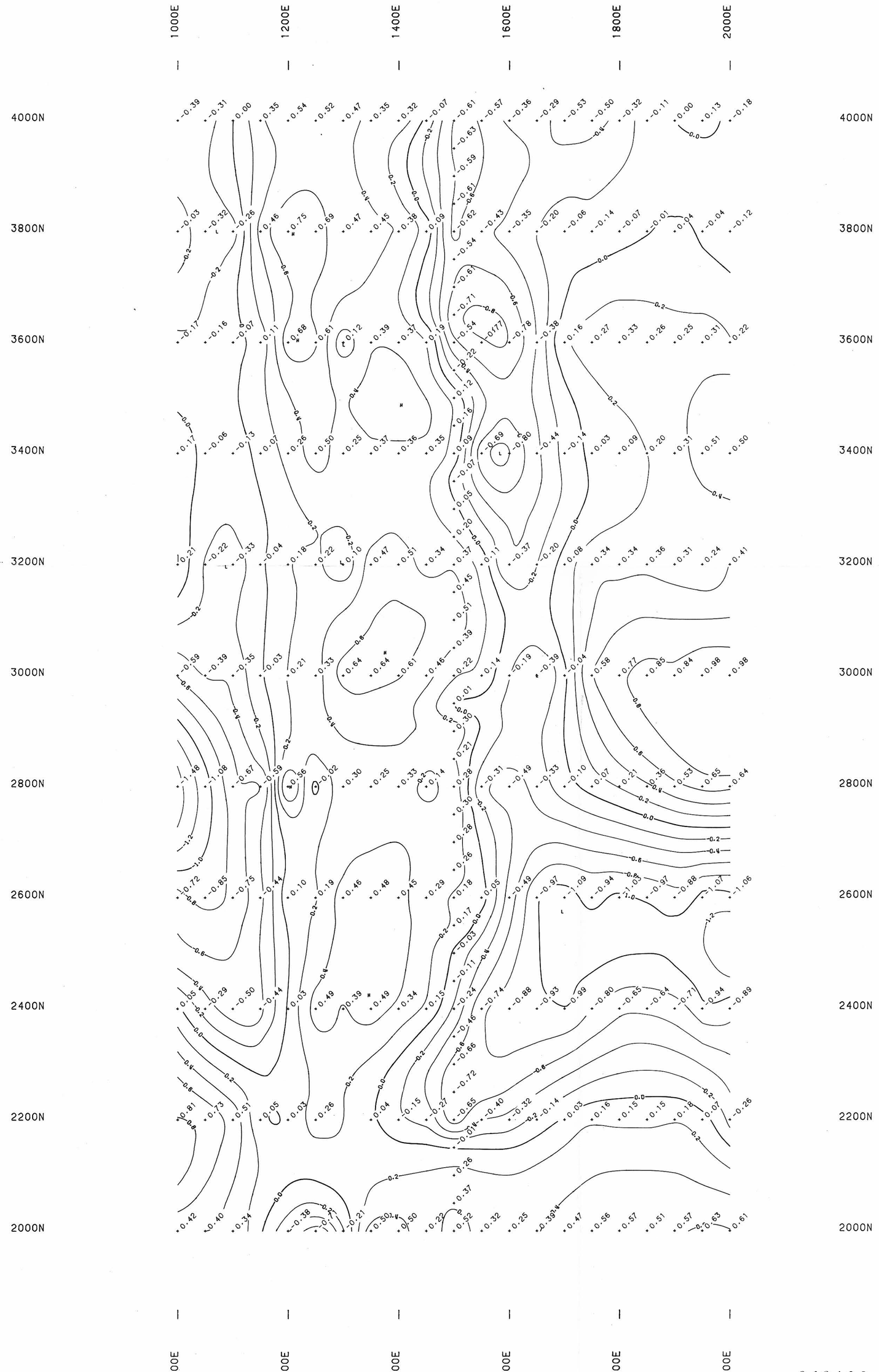
EL 4/78, Zeehan
Myrtle Grid

# Bedrock geochemistry and gravity

1:5000
computer graphics by CEANET
gravity survey by WONGELA

5 cm

M82/389 Report 279 Appendix 3




649102

A-80-82 GORDON RECC. SASSAFRAS GRID GRAVITY RESIDUALS 2ND ORDER TREND
SCALE 1:5000 CONTOUR INTERVAL 0.2 MILLIGAL

5 cm



1270




A-80-82 PYRAMID GRID BOUGER GRAVITY CORR'N DENSITY 2.6 GM/CC
SCALE 1:2500 CONTOUR INTERVAL 0.2 MILLIGALS DATA:- SOLO APRIL 1981

649103

649104

APPENDIX 6

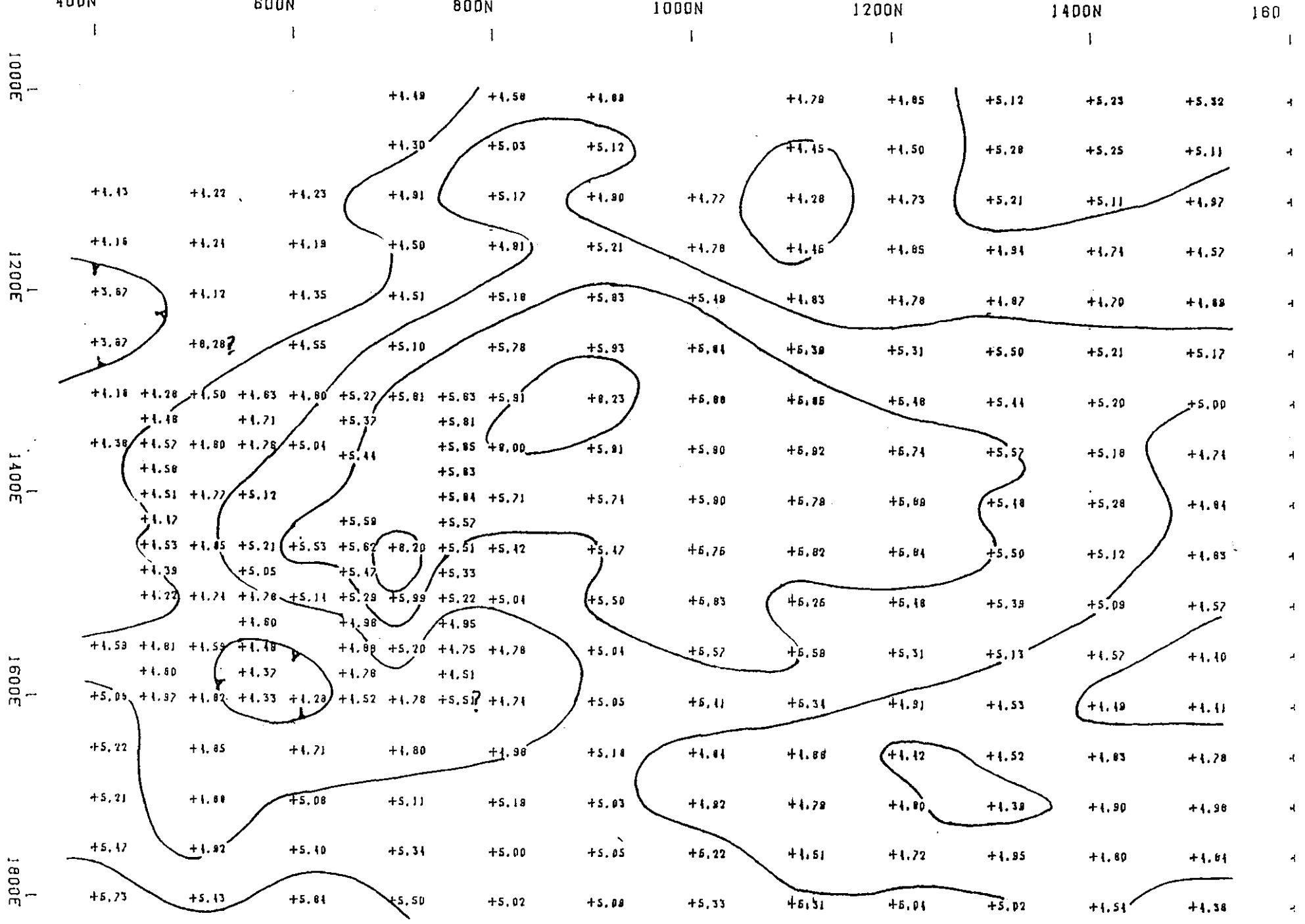
AUSTRAL - INFILL GRAVITY RESIDUALS

by Mitre Geophysics

5 cm

649105

# AUSTRAL GRAVITY RESIDUALS (LINEAR REGIONAL REMOVED) SCALE 1:5000 NO TERRAIN CORR



649106

APPENDIX 7

AUSTRAL GRAVITY REPORT

by S. Collins

649107

Amoco Minerals Australia Company — Inter-Office Correspondence

Date: February 11, 1982

To: P.J. Jones
B.G. Roxburgh

From: S. Collins

Subject: REPORT ON THE AUSTRAL GRAVITY ANOMALY SUBSEQUENT TO DRILL TESTING

---

A residual gravity anomaly of up to 1 milligal has been defined on the Austral grid running from 600N to 1400N and 1250E to 1500E. Three diamond drillhole Nos. ZT-81-A4, ZT-81A5 and ZT-81-A7 were drilled to test this anomaly. All holes failed to intersect significant mineralization in terms of the creation of the gravity anomaly.

Possible causes of the gravity anomaly other than mineralization are lithology controlled density variations or weathering variations. The latter of these seems unlikely as the highest gravity is generally over a creek where the deepest alluvium and/or weathering would be expected. The gravity anomaly is thus most likely to be caused by lithological density variation. This hypothesis is supported by the shape of the gravity anomaly which is conformable with known variations in strike directions. However measurements on four core samples indicate density variations less than 0.1 gm/cc which is not consistent with the anomaly produced. Further density measurements are planned for the drill core together with radiometric density logging in the hole and computer modelling to test the possibility of a lithological densisty anomaly. Downhole SIROTEM will be surveyed in the holes to test for adjacent massive sulfide occurrences.

S. COLLINS
PROJECT GEOPHYSICIST

SC:jm

APPENDIX 8

ZT-79A-1, 80A-2, 81A-4 thru 10 - DRILL LOGS AND SECTIONS
(INCLUDING LOGS ONLY FOR HOLES ZT-79-2, 80-3 thru 8, 81A-3)

649109

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-79A-1

| | | |
|---|---|---|
| Location | : | 1800N:1225E |
| Declination | : | 50° |
| Azimuth | : | 270°G |
| Total Depth | : | 163.0 meters |

Assay Results

76-82 = 6m @ 1.06% Pb + 1.66% Zn + 1.6 g/t Ag

130-143 = 13m @ 2.61% Pb + 0.62% Zn + 13.8 g/t Ag

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-79-1 — PAGE 1 OF 3

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT | ZEEHAN – TAS. No. A7860 | ELEVATION meters | COMMENCED 14 Nov '79 | BORE HOLE SURVEY | | | | | | INSTRUMENT | ACID (HCL) | | | | |
| | | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | | | |
| PROSPECT | AUSTRAL VALLEY – FLUX QUARRY. | DIP COLLAR 50° GRID WEST. | COMPLETED 26 Nov '79 | 50 m | 53° | — | 163 | 65° | | | | | | | |
| CO-ORDINATES | 1800 mN 1225 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 163 meters | 100 m | 54° | — | | | | | | | | | |
| BEARING | 251° TN MN GN | LOGGED BY PHILIP JONES. | | 140 m | 55° | — | | | | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | ASSAYS Pb | ASSAYS Zn | ASSAYS Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 13.00 | TRICONE DRILLING<br>Sand/Gravels to 2.5m.<br>Black/grey dolomites & siltstones from 2.5m to 13.00m. | | | | | | | | | |
| *START HQ CORE. | | | | 21129 | 13.00 | 14.00 | 1.00 | <5 | 59 | 510 | 0.5 |
| 13.00 | 19.00 | SILTSTONE - Massive, fine grained, siliceous?? matrix, grey to dark grey, extremely fractured, occasionally veined & rugby, minor horizons of fossil debris. | | 21130 | 14.00 | 15.00 | 1.00 | <5 | 22 | 600 | <0.5 |
| | | | | 21131 | 15.00 | 16.00 | 1.00 | <5 | 14 | 1320 | 0.6 |
| | | | | 21132 | 16.00 | 17.00 | 1.00 | <5 | 5 | 228 | 0.5 |
| 19.00 | 20.90 | COQUINA - dark grey, silicified, very soft & light with minor leached pyrite voids?? POOR CORE RECOVERY DUE TO SOFTNESS. | | 21133 | 17.00 | 18.00 | 1.00 | <5 | 14 | 514 | <0.5 |
| | | | | 21134 | 18.00 | 19.00 | 1.00 | 6 | 11 | 424 | 0.6 |
| | | | | 21135 | 19.00 | 20.00 | 1.00 | 7 | 10 | 620 | 0.6 |
| 20.90 | 38.30 | LIMESTONE - grey, very weathered, foliated, calcite veined & clayey. Rugby zone at 27.30 – 28.70<br>Bedding attitudes 60° to c.a at 32.5m<br>45° to c.a at 36.7m<br>Limestone generally very silty (maybe carbonaceous?). | | 21136 | 20.00 | 21.00 | 1.00 | <5 | 30 | 530 | 0.5 |
| | | | | 21137 | 21.00 | 22.00 | 1.00 | <5 | 73 | 1470 | 0.9 |
| | | | | 21138 | 22.00 | 23.00 | 1.00 | <5 | 16 | 233 | 0.7 |
| | | | | 21139 | 23.00 | 24.00 | 1.00 | <5 | 16 | 68 | <0.5 |
| | | | | 21140 | 24.00 | 25.00 | 1.00 | <5 | 13 | 66 | <0.5 |
| 38.30 | 47.00 | CLAYSTONE - Dark grey, grey and yellow, massive silty clays containing occasional fragments of very weathered fossiliferous siltstones. | | 21141 | 25.00 | 26.00 | 1.00 | <5 | 18 | 37 | <0.5 |
| | | | | 21142 | 26.00 | 27.00 | 1.00 | <5 | 38 | 193 | 0.5 |
| | | | | 21143 | 27.00 | 28.00 | 1.00 | <5 | 49 | 150 | 0.5 |
| 47.00 | 53.00 | SANDSTONE - Fine grained sandstones & massive siltstones, very fossiliferous (shell fragments), grey, weakly bedded, & occasionally brecciated (50.40m) | Trace pyrite 51.60m | 21144 | 28.00 | 29.00 | 1.00 | <5 | 95 | 730 | 0.7 |
| | | | | 21154 | 29.00 | 30.00 | 1.00 | <5 | 34 | 2400 | <0.5 |
| *50.40 HQ → NQ Coring. | | | | 21155 | 30.00 | 31.00 | 1.00 | <5 | 8 | 1020 | <0.5 |
| | | Bedding attitude 25° to c.a at 48.4m.<br>Rugby from 47.40m to 48.00m. | | 21156 | 31.00 | 32.00 | 1.00 | <5 | 7 | 193 | <0.5 |
| | | | | 21157 | 32.00 | 33.00 | 1.00 | <5 | 6 | 58 | <0.5 |
| 53.00 | 54.60 | CHERT BRECCIA - grey, massive, crystalline, occasionally rugby & fractured sedimentary breccia. Fragments generally rounded, dark grey crystalline chert or siltstone! Fragments up to 5cm in length. | | 21181 | 33.00 | 34.00 | 1.00 | <5 | 3 | 39 | <0.5 |
| | | | | 21182 | 34.00 | 35.00 | 1.00 | <5 | 20 | 155 | <0.5 |
| | | | | 21183 | 35.00 | 36.00 | 1.00 | <5 | 21 | 128 | <0.5 |
| | | | | 21184 | 36.00 | 37.00 | 1.00 | 5 | 23 | 244 | <0.5 |
| 54.60 | 60.00 | COQUINA - Grey, silicified, very soft & highly porous. Fossil debris composed mainly of broken shells. Very poor core recovery. | | 21185 | 37.00 | 38.00 | 1.00 | <5 | 16 | 46 | <0.5 |
| | | | | 21186 | 38.00 | 39.00 | 1.00 | <5 | 5 | 77 | <0.5 |
| | | | | 21187 | 39.00 | 40.00 | 1.00 | 7 | 59 | 740 | <0.5 |
| 60.00 | 63.00 | SILTSTONE - Very hard, massive but extensively fractured, grey to beige in colour. 50% recovery. | | 21188 | 40.00 | 41.00 | 1.00 | 5 | 89 | 570 | <0.5 |
| | | | | 21189 | 41.00 | 42.00 | 1.00 | 10 | 151 | 1000 | 1.2 |
| 63.00 | 64.20 | CLAYSTONE - Mottled grey and yellow clays, silty and sandy component. | | 21190 | 42.00 | 43.00 | 1.00 | 5 | 228 | 1870 | 0.6 |
| | | | | 21191 | 43.00 | 44.00 | 1.00 | 20 | 252 | 3954 | 3.0 |
| 64.20 | 69.00 | SILTSTONE - Fossiliferous in part, grey/yellow, very hard, but containing clayey zones and intervals of intense fracturing giving rise to poor recoveries overall.<br>Bedding attitude 35° to c.a at 64.90m. | | 21192 | 44.00 | 45.00 | 1.00 | 16 | 417 | 2664 | 2.6 |
| | | | | 21193 | 45.00 | 46.00 | 1.00 | NO | CORE | RECOVERED. | |
| | | | | 21224 | 46.00 | 47.00 | 1.00 | 9 | 32 | 1410 | <0.5 |
| | | | | 21225 | 47.00 | 48.00 | 1.00 | 15 | 45 | 1800 | <0.5 |
| 69.00 | 81.00 | CLAYSTONE - Grey to Black, mottled clays, minor fragments of weathered, porous fine sandstone, massive & silicified siltstone very dense & heavy containing ≈ 2% diss. pyrite. Black, very disturbed pyritic clays (shales ??) occur from 75.50m to 76.50m. Pyrite disseminated as well as in nodular accumulations. | Minor Disseminated py in siltstones.<br>75.5 – 76.5 ≈ 10% diss py | 21226 | 48.00 | 49.00 | 1.00 | <5 | <1 | 1720 | <0.5 |
| | | | | 21227 | 49.00 | 50.00 | 1.00 | <5 | <1 | 1240 | <0.5 |
| | | | | 21228 | 50.00 | 51.00 | 1.00 | <5 | 16 | 1140 | <0.5 |
| | | | | 21229 | 51.00 | 52.00 | 1.00 | <5 | 300 | 1.16% | <0.5 |
| | | | | 21230 | 52.00 | 53.00 | 1.00 | <5 | 8 | 1430 | <0.5 |
| | | | | 21231 | 53.00 | 54.00 | 1.00 | <5 | 59 | 1880 | <0.5 |
| | | | | 21232 | 54.00 | 55.00 | 1.00 | <5 | 28 | 1530 | <0.5 |

69170

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-79-1 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 81.00 | 85.00 | SANDSTONE BRECCIA - Crystalline, fine to medium grained, heavy brown, foliated in part, silty ferruginous Sandstone tectonic breccias and minor intervals of light grey claystones (Argh??). | 35% pyrite 81.00-81.40 as matrix to Breccia. | 21233 | 55 | 56 | 1.00 | <5 | <1 | 2680 | <0.5 |
| | | | | 21234 | 56 | 57 | 1.00 | NO CORE RECOVERED. | | | |
| | | | | 21235 | 57 | 58 | 1.00 | 7 | 129 | 2210 | 0.6 |
| | | | | 21236 | 58 | 59 | 1.00 | <5 | 131 | 1150 | <0.5 |
| | | Between 81.00 & 81.40 sulphide (pyrite ≈ 35%) cemented breccia. Minor manganiferous staining. Pyrite has oxidised surface (rimedope) concretionary goethite?? | | 21237 | 59 | 60 | 1.00 | 5 | 181 | 1610 | <0.5 |
| | | | | 21238 | 60 | 61 | 1.00 | <5 | 96 | 1800 | <0.5 |
| | | | | 21239 | 61 | 62 | 1.00 | <5 | 400 | 6600 | <0.5 |
| 85.00 | 94.70 | SANDSTONE BRECCIA - Heavy brown, highly (drusy quartz filled) siliceous sandstone tectonic breccia. Weakly ferruginous & manganiferous. Some vughs containing white and pink crystals or concretionary accumulations probably zeolite?? | 1-2% iron oxides occuring as disseminations and smears along fractures | 21240 | 62 | 63 | 1.00 | <5 | 109 | 3550 | <0.5 |
| | | | | 21241 | 63 | 64 | 1.00 | 17 | 1000 | 1.66% | <0.5 |
| | | | | 21242 | 64 | 65 | 1.00 | 12 | 500 | 2.15% | 3.3 |
| | | | | 21243 | 65 | 66 | 1.00 | <5 | 400 | 2.14% | <0.5 |
| | | | | 21244 | 66 | 67 | 1.00 | <5 | 400 | 0.44% | <0.5 |
| | | Breccia fragments up to 4cm in length - very angular. | | 21245 | 67 | 68 | 1.00 | <5 | 113 | 4550 | <0.5 |
| | | Mineralization from 93.20 - 94.70 1-2% pyrite almost completely oxidised. Associated concretionary goethite ≈ 7% (massive in part). | 1-2% pyrite as matrix of breccia, also ≈ 7% goethite (oxide product of pyrite!) | 21246 | 68 | 69 | 1.00 | <5 | 55 | 2890 | <0.5 |
| | | | | 21095 | 69 | 70 | 1.00 | 11 | 900 | 1.21% | 8.1 |
| | | | | 21096 | 70 | 71 | 1.00 | 29 | 700 | 5600 | 8.7 |
| 94.70 | 101.50 | CLAYSTONE - Manganiferous stained, silty to gritty, mottled light grey & yellow containing thin quartz veinlets. | | 21097 | 71 | 72 | 1.00 | 20 | 1030 | 4400 | 2.2 |
| | | | | 21098 | 72 | 73 | 1.00 | 18 | 1500 | 9500 | 3.1 |
| 101.50 | 107.00 | FERRUGINOUS CLAYSTONE - Deeply weathered, bright orange, ochre brown coloured, massive leached fat clays. Minor silt content. Weakly to moderately ferruginous. | | 21099 | 73 | 74 | 1.00 | 13 | 1500 | 1.55% | 2.7 |
| | | | | 21100 | 74 | 75 | 1.00 | 24 | 1476 | 3500 | 4.9 |
| | | | | 21101 | 75 | 76 | 1.00 | 33 | 989 | 2400 | 4.2 |
| 107.00 | 107.80 | IRONSTONE - concretionary goethite with clayey matrix, massive, heavy & moderately fractured. | | 21102 | 76 | 77 | 1.00 | 26 | 1.06% | 1.61% | 3.1 |
| | | | | 21103 | 77 | 78 | 1.00 | 11 | 6200 | 1.74% | <0.5 |
| 107.80 | 110.00 | FERRUGINOUS CLAYSTONE - Orange, ochre brown coloured, bedded?? fat clays. Bedding attitudes in plastic clays disturbed by drill rotation. | | 21104 | 78 | 79 | 1.00 | 9 | 2.96% | 3.39% | 6.5 |
| | | | | 21105 | 79 | 80 | 1.00 | 13 | 4300 | 9900 | <0.5 |
| | | | | 21106 | 80 | 81 | 1.00 | NO CORE RECOVERY. | | | |
| 110.00 | 112.00 | CLAYSTONE - mottled pink (royellow), plastic, silty clays, with grey white mottling texture. | | 21107 | 81 | 82 | 1.00 | 8 | 1.34% | 2.22% | <0.5 |
| | | | | 21108 | 82 | 83 | 1.00 | 13 | 2000 | 7300 | 3.9 |
| 112.00 | 129.00 | CLAYSTONE - Mottled pale ochre/brown to orange/brown sandy and silty, ferruginous clays. Undisturbed bedding 50° to ca at 120.10 m. Minor thin intersections of sandy or gritty ironstone. | | 21109 | 83 | 84 | 1.00 | 6 | 1523 | 8200 | 2.5 |
| | | | | 21110 | 84 | 85 | 1.00 | 10 | 885 | 1300 | 1.3 |
| | | | | 21111 | 85 | 86 | 1.00 | 11 | 1110 | 1800 | 2.0 |
| | | | | 21112 | 86 | 87 | 1.00 | 16 | 2700 | 4100 | 3.3 |
| 129.00 | 143.40 | IRONSTONE BRECCIA - Massive, concretionary, dark brown in part brecciated, ironstone. Minor ferruginous, clayey intervals. White rhombic crystalls (not CALCITE) very evident in vughs & on fracture surfaces. | | 21113 | 87 | 88 | 1.00 | 13 | 2093 | 4800 | 0.8 |
| | | | | 21114 | 88 | 89 | 1.00 | 7 | 1200 | 6000 | 4.2 |
| | | | | 21115 | 89 | 90 | 1.00 | 6 | 1445 | 2300 | 1.9 |
| | | | | 21116 | 90 | 91 | 1.00 | 14 | 2195 | 4700 | 13.2 |
| 143.40 | 148.80 | DOLOMITIC SILTSTONE BRECCIAS - Grey, vughy, slumped brecciated, massive & very dense rock with interbeds of black, fat, plastic weakly laminated clays (shales) forming thigh zones. Non clayey rock very competent & fresh. | | 21117 | 91 | 92 | 1.00 | 122 | 1400 | 6700 | <0.5 |
| | | | | 21118 | 92 | 93 | 1.00 | 12 | 2530 | 2550 | 2.4 |
| | | | | 21119 | 93 | 94 | 1.00 | 7 | 1.81% | 7200 | 5.3 |
| | | | | 2120 | 94 | 95 | 1.00 | 11 | 8600 | 600 | 2.6 |
| | | | | 2121 | 95 | 96 | 1.00 | 5 | 2990 | 586 | 0.8 |
| 148.80 | 149.20 | CLAYEY IRONSTONE - orange brown, brecciated, ferruginous clayey ironstone grit. | | 2122 | 96 | 97 | 1.00 | 9 | 2660 | 568 | 2.4 |
| | | | | 2123 | 97 | 98 | 1.00 | 11 | 1090 | 209 | 3.3 |
| 149.20 | 150.20 | DOLOMITE BRECCIA/CLAYEY SILTSTONE - grey vughy, massive and heavy fresh dolomite breccia interbedded with bedded dk grey to fawn brown silty clays (siltstone). Bedding 40° to ca. at 149.80 m. | | 2124 | 98 | 99 | 1.00 | 9 | 950 | 190 | 4.2 |
| | | | | 2125 | 99 | 100 | 1.00 | 9 | 750 | 198 | 0.8 |
| | | | | 2126 | 100 | 101 | 1.00 | 13 | 1370 | 127 | 1.1 |
| | | | | 2127 | 101 | 102 | 1.00 | 16 | 5500 | 600 | <0.5 |
| 150.20 | 151.20 | CLAYEY IRONSTONE - Bedded ferruginous white to yellow clays and banded, gritty, concretionary ironstones. Minor thin quartz veinlets cutting core axis. Bedding 151 m - 25° to ca. Core very oxidised. | | 2128 | 102 | 103 | 1.00 | 16 | 2420 | 2016 | 1.3 |
| | | | | 21145 | 103 | 104 | 1.00 | 23 | 1420 | 2970 | 1.4 |
| | | | | 21146 | 104 | 105 | 1.00 | 41 | 2080 | 2950 | 0.9 |
| | | | | 21147 | 105 | 106 | 1.00 | 14 | 1160 | 2290 | 0.8 |
| | | | | 21148 | 106 | 107 | 1.00 | 10 | 1010 | 1334 | 0.4 |
| | | | | 21149 | 107 | 108 | 1.00 | 15 | 1450 | 3530 | 0.9 |

690111

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-79-1 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % |
|---|---|---|---|
| 151.20 | 154.40 | SILTSTONE - Bedded, clayey, white to orange brown, ferruginous, extremely oxidised & possibly micaceous. | |
| 154.40 | 163.00 | SILTSTONE - Massive, dark grey, very heavy (dense) rough in part, brecciated ?(Tectonic) in the bottom with black, fine grained, sandstone which is clayey, very soft and crumbles to form a black silty/sandy clay fragments. No bedding attitudes. Fractured in the hard siltstone @ 45° to c.a. | |
| END OF HOLE | | END OF HOLE 163 metres. | |

| SAMPLE NUMBER | METERAGE From | To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|
| 21150 | 108 | 109 | 1.00 | 9 | 1340 | 2770 | 0.6 |
| 21151 | 109 | 110 | 1.00 | 13 | 1870 | 4060 | 0.5 |
| 21152 | 110 | 111 | 1.00 | 7 | 550 | 1068 | 0.5 |
| 21153 | 111 | 112 | 1.00 | 7 | 310 | 461 | 0.6 |
| 21158 | 112 | 113 | 1.00 | 12 | 850 | 1756 | 0.8 |
| 21159 | 113 | 114 | 1.00 | 9 | 930 | 1581 | 1.0 |
| 21160 | 114 | 115 | 1.00 | 12 | 2400 | 7300 | 6.6 |
| 21161 | 115 | 116 | 1.00 | 15 | 2600 | 6600 | <0.5 |
| 21162 | 116 | 117 | 1.00 | 12 | 1930 | 4710 | 2.4 |
| 21163 | 117 | 118 | 1.00 | 16 | 1600 | 3250 | 1.0 |
| 21164 | 118 | 119 | 1.00 | 21 | 2100 | 4900 | 1.3 |
| 21165 | 119 | 120 | 1.00 | 6 | 770 | 1540 | 1.1 |
| 21166 | 120 | 121 | 1.00 | 31 | 1200 | 2740 | 1.9 |
| 21167 | 121 | 122 | 1.00 | 8 | 1080 | 2980 | 1.7 |
| 21168 | 122 | 123 | 1.00 | 9 | 1800 | 5000 | <0.5 |
| 21169 | 123 | 124 | 1.00 | 6 | 2400 | 7700 | <0.5 |
| 21170 | 124 | 125 | 1.00 | 14 | 2900 | 8100 | <0.5 |
| 21171 | 125 | 126 | 1.00 | 18 | 2200 | 4280 | 2.5 |
| 21172 | 126 | 127 | 1.00 | 12 | 2620 | 3860 | 3.2 |
| 21173 | 127 | 128 | 1.00 | 15 | 2860 | 3500 | 4.8 |
| 21174 | 128 | 129 | 1.00 | 18 | 2320 | 4280 | 2.7 |
| 21175 | 129 | 130 | 1.00 | 31 | 8700 | 6300 | 1.8 |
| 21176 | 130 | 131 | 1.00 | 61 | 2.42 | 8500 | 10.9 |
| 21177 | 131 | 132 | 1.00 | 57 | 3.06 | 7800 | 23.5 |
| 21178 | 132 | 133 | 1.00 | 44 | 3.69 | 8600 | 12.7 |
| 21179 | 133 | 134 | 1.00 | 31 | 1.72 | 7100 | 3.3 |
| 21180 | 134 | 135 | 1.00 | 63 | 2.80 | 8100 | 2.8 |
| 21194 | 135 | 136 | 1.00 | 64 | 2.23 | 5600 | 23.2 |
| 21195 | 136 | 137 | 1.00 | 65 | 2.33 | 5400 | 25.3 |
| 21196 | 137 | 138 | 1.00 | 59 | 2.48 | 5800 | 5.3 |
| 21197 | 138 | 139 | 1.00 | 57 | 2.87 | 4900 | 22.6 |
| 21198 | 139 | 140 | 1.00 | 75 | 1.79 | 4600 | 4.0 |
| 21199 | 140 | 141 | 1.00 | 149 | 3.73 | 4700 | 19.7 |
| 21200 | 141 | 142 | 1.00 | 225 | 3.08 | 5200 | 11.4 |
| 21201 | 142 | 143 | 1.00 | 63 | 1.78 | 4000 | 15.2 |
| 21202 | 143 | 144 | 1.00 | 14 | 1680 | 4620 | 1.7 |
| 21203 | 144 | 145 | 1.00 | 7 | 1500 | 5100 | 4.9 |
| 21204 | 145 | 146 | 1.00 | 13 | 3600 | 1.00 | <0.5 |
| 21205 | 146 | 147 | 1.00 | 8 | 870 | 4930 | 1.2 |
| 21206 | 147 | 148 | 1.00 | 25 | 2660 | 2560 | 1.7 |
| 21207 | 148 | 149 | 1.00 | 10 | 4220 | 4030 | 4.8 |
| 21208 | 149 | 150 | 1.00 | 16 | 3485 | 2080 | 8.1 |
| 21209 | 150 | 151 | 1.00 | 16 | 2040 | 2720 | 23.0 |
| 21210 | 151 | 152 | 1.00 | 17 | 3765 | 3650 | 24.0 |
| 21211 | 152 | 153 | 1.00 | 25 | 910 | 1600 | 7.1 |
| 21212 | 153 | 154 | 1.00 | 11 | 540 | 2070 | 5.8 |
| 21213 | 154 | 155 | 1.00 | 20 | 595 | 2845 | 7.7 |
| 21214 | 155 | 156 | 1.00 | 14 | 300 | 4900 | 6.7 |
| 21215 | 156 | 157 | 1.00 | 14 | 600 | 7100 | 1.0 |
| 21216 | 157 | 158 | 1.00 | 17 | 400 | 1.01 | 7.0 |
| 21217 | 158 | 159 | 1.00 | 11 | 300 | 1.02 | 6.1 |
| 21218 | 159 | 160 | 1.00 | 12 | 200 | 5200 | 5.2 |
| 21219 | 160 | 161 | 1.00 | 9 | 200 | 7000 | 11.7 |
| 21220 | 161 | 162 | 1.00 | 6 | 200 | 1.16 | 12.2 |
| 21221 | 162 | 163 | 1.00 | 7 | 200 | 1.10 | 11.3 |

64917

649113

Amoco Minerals Australia Company

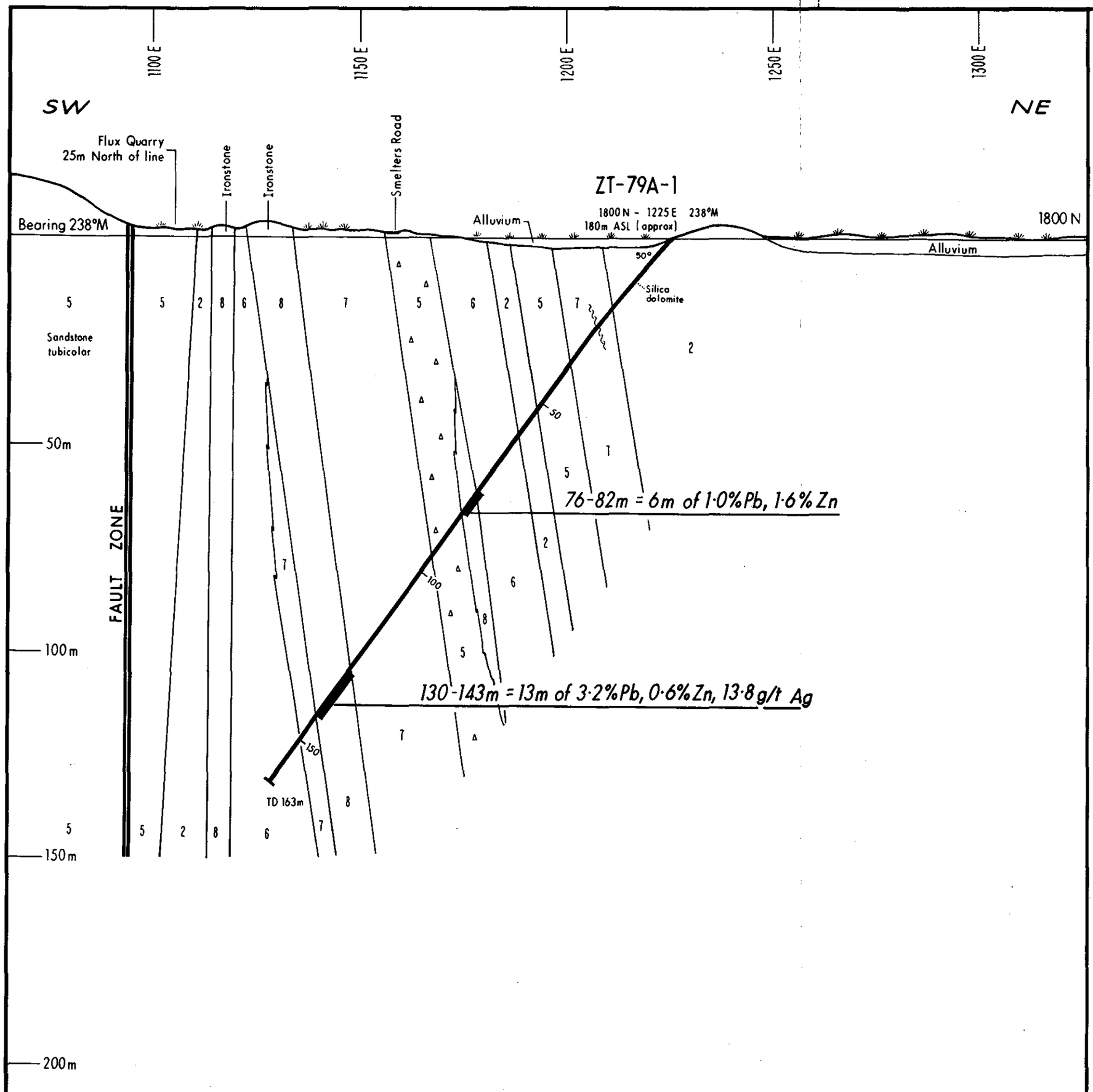
# ZEEHAN PROJECT
# A-78-60
# EL 4/78, TASMANIA

PROSPECT: **AUSTRAL**

## CROSS SECTION DRILLHOLE ZT-79A-1

Scale: Vertical and horizontal - 1:1000

5 cm




## Legend

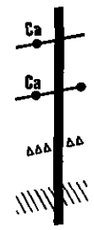
| | |
|---|---|
| Limestone | 1 33 |
| Dolomite..... (breccia) | 2 29 |
| Fossil breccia | 3 46 |
| Slump breccia | 4 41 |
| Sandstone | 5 61 |
| Siltstone | 6 69 |
| Shale | 7 8 |
| Mineralization and/or ironstone | 8 14 |
| Siderite/calcite/ankerite/breccia | 9 12 |
| Laminar limestone | 10 37 |
| Slumped limestone | 11 28 |
| Conglomerate | 12 65 |
| Calcite/siderite veins | Ca/Sd |

Vein orientation unknown

Vein orientation accurate

Brecciation (tectonic)

Zone of Pb/Zn Ca/Sd mineralization




REPORT 279

M82-1850

649114

OCEANA PROSPECT

DRILLHOLE DATA

ZT-79-2

| | | |
|---|---|---|
| Location | : | 3700N:1500E |
| Declination | : | 60° |
| Azimuth | : | 270°G |
| Total Depth | : | 235.90 meters |

Assay Results

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 65-218 | = | 153m | @ | 5.10% | Pb + | 3.50% | Zn + | 41.7 g/t Ag |
| including | 65-96 | = | 31m | @ | 0.66% | Pb + | 3.28% | Zn + | 1.9 g/t Ag |
| | 96-122 | = | 26m | @ | 22.26% | Pb + | 11.69% | Zn + | 203.4 g/t Ag |
| including | 103-118 | = | 15m | @ | 33.29% | Pb + | 19.22% | Zn + | 336.7 g/t Ag |
| | 122-204 | = | 82m | @ | 0.68% | Pb + | 1.01% | Zn + | 3.0 g/t Ag |
| including | 204-218 | = | 14m | @ | 8.37% | Pb + | 2.95% | Zn + | 56.7 g/t Ag |

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-79-2 — PAGE 1 OF 5

| | | | | BORE HOLE SURVEY | | | INSTRUMENT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN - TAS No. A7860. | ELEVATION meters | COMMENCED 28 Nov 1979 | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing |
| PROSPECT OCEANA. VALLEY. | DIP COLLAR 60° GRID WEST. | COMPLETED 22 Dec 1979 | 0 | 60 | — | 150 | 57° | — | | | |
| CO-ORDINATES 3700 mN 1500 mE | CORE SIZE HQ, NQ, BQ | TOTAL LENGTH 235.90 meters | 50 | 65 | — | 200 | 73° | — | | | |
| BEARING TN MN 270 GN | LOGGED BY PA JONES. | | 100 | 63 | — | 235 | 71° | — | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag. | Cd | Hg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 25.00 | TRICONE DRILLING. Silty Dolomites. | | 21247 | 25 | 26 | 1 | 22 | 317 | 3956 | <0.5 | | |
| | | | | 21248 | 26 | 27 | 1 | 17 | 390 | 3664 | 0.5 | | |
| 25.00 | 40.50 | SILTY DOLOMITE - completely weathered, mottled | | 21249 | 27 | 28 | 1 | 17 | 342 | 3074 | <0.5 | | |
| | | grey olive/brown. | | 21250 | 28 | 29 | 1 | 19 | 268 | 3405 | <0.5 | | |
| | | | | 21251 | 29 | 30 | 1 | 16 | 148 | 3941 | <0.5 | | |
| 40.50 | 45.00 | DOLOMITE - black, carbonaceous, silty dolomite, completely | | 21252 | 30 | 31 | 1 | 16 | 500 | 5300 | 3.6 | | |
| | | weathered. | | 21253 | 31 | 32 | 1 | 15 | 600 | 6500 | 6.3 | | |
| | | | | 21254 | 32 | 33 | 1 | NO | CORE | RECOVERED | | | |
| 45.00 | 47.00 | DOLOMITE - interbedded with silicified grey siltstones. | | 21255 | 33 | 34 | 1 | 14 | 256 | 3385 | <0.5 | | |
| | | | | 21256 | 34 | 35 | 1 | 17 | 52 | 2178 | <0.5 | | |
| 47.00 | 61.00 | DOLOMITE - mottled grey/black, silty, fossiliferous & | | 21257 | 35 | 36 | 1 | 18 | 50 | 2579 | <0.5 | | |
| | | completely weathered, with minor silicified beds (at 60.6m) | | 21258 | 36 | 37 | 1 | 29 | 57 | 2878 | <0.5 | | |
| | | | | 21259 | 37 | 38 | 1 | 10 | 35 | 3490 | <0.5 | | |
| 61.00 | 75.50 | DOLOMITE BRECCIA - Sedimentary Breccia, completely | | 21260 | 38 | 39 | 1 | 11 | 176 | 3793 | <0.5 | | |
| | | weathered, black to grey, rugby, heavily siderite veinlets, | | 21261 | 39 | 40 | 1 | 15 | 125 | 2648 | <0.5 | | |
| | | Breccia fragments of silicified siltstone & dolomite. Zone | | 21262 | 40 | 41 | 1 | 20 | 63 | 3543 | <0.5 | | |
| | | with heavy water inflows. | | 21263 | 41 | 42 | 1 | 7 | 400 | 4900 | <1.0 | | |
| | | | | 21264 | 42 | 43 | 1 | 8 | 119 | 2704 | <0.5 | | |
| 75.50 | 85.00 | SILTY DOLOMITE - grey olive brown, mottled, weakly | | 21265 | 43 | 44 | 1 | 5 | 91 | 1062 | 0.5 | | |
| (HQ to | 81.00m) | siderite veined. | | 21266 | 44 | 45 | 1 | 3 | 64 | 2359 | <0.5 | | |
| | | | | 21267 | 45 | 46 | 1 | 5 | 37 | 2414 | <0.5 | | |
| 85.00 | 86.50 | DOLOMITE BRECCIA - black to dark grey sedimentary | Disseminated Pb-Zn | 21268 | 46 | 47 | 1 | 4 | 40 | 3460 | <0.5 | | |
| | | breccia?? containing angular & sub rounded fragments. | 5% ?? combined. | 21269 | 47 | 48 | 1 | 5 | 89 | 4300 | 3.1 | | |
| | | Extremely finely disseminated Pb/Zn mineralization. | | 21270 | 48 | 49 | 1 | 6 | 61 | 2835 | 3.0 | | |
| | | impossible to estimate grade. Highly weathered. | | 21271 | 49 | 50 | 1 | 9 | 65 | 2150 | 2.7 | | |
| | | | | 21272 | 50 | 51 | 1 | 6 | 62 | 3000 | 2.8 | | |
| 86.50 | 91.60 | SILTY DOLOMITE - grey olive brown, mottled & | | 21273 | 51 | 52 | 1 | 5 | 500 | 5300 | 6.9 | | |
| | | completely weathered. | | 21274 | 52 | 53 | 1 | 6 | 91 | 4260 | 3.0 | | |
| | | | | 21275 | 53 | 54 | 1 | <5 | 300 | 3800 | 8.7 | | |
| 91.60 | 92.00 | BRECCIA - grey, weathered. Contains rounded fragments | | 21276 | 54 | 55 | 1 | 8 | 95 | 4190 | 2.6 | | |
| | | of dolomite & silicified siltstones. Highly weathered | | 21277 | 55 | 56 | 1 | 13 | 254 | 4950 | 2.5 | | |
| | | | | 21278 | 56 | 57 | 1 | <5 | 79 | 3310 | 2.5 | | |
| 92.00 | 95.90 | CALCMICRITE - grey, massive, very dense, dolomitic | | 21279 | 57 | 58 | 1 | 11 | 1000 | 4200 | 8.7 | | |
| | | muddy micrite? fossiliferous in part. | | 21280 | 58 | 59 | 1 | 6 | 800 | 6000 | 9.1 | | |
| | | | | 21281 x | 59 | 60 | 1 | <5 | 7400 | 3.99 | <1.0 | 204 | 9 |
| 95.90 | 98.10 | BRECCIA - dark grey to black, sub rounded to | Disseminated Pb-Zn | 21282 x | 60 | 61 | 1 | 6 | 2100 | 9100 | 10.8 | 53 | 2.8 |
| | | angular breccia, heavily mineralized with finely | | 21283 x | 61 | 62 | 1 | 7 | 1700 | 1.32 | 15.2 | 38 | 2.8 |
| | | disseminated Pb-Zn. Fragments predominantly | | 21284 x | 62 | 63 | 1 | 5 | 2800 | 1.08 | <1.0 | 24 | 0.5 |
| | | light grey dolomite & siltstones with minor grey & | | 21285 x | 63 | 64 | 1 | <5 | 2000 | 1.05 | <1.0 | 39 | 0.1 |
| | | black silty dolomite. Minor siderite veinlets. Rock | | 21286 x | 64 | 65 | 1 | 10 | 5400 | 3900 | 2.1 | 67 | 0.1 |
| | | highly weathered & very clayey still. | | 21287 x | 65 | 66 | 1 | 5 | 1.800 | 13.41 | 11.3 | 1240 | 0.2 |
| | | | | 21288 x | 66 | 67 | 1 | <5 | 1.26 | 5.44 | 1.5 | 638 | <0.1 |
| 98.10 | 100.30 | CLAYSTONE - black, extremely weathered, highly mineralized | Disseminated Pb-Zn | 21289 x | 67 | 68 | 1 | 5 | 8800 | 4.82 | 2.7 | 420 | <0.1 |
| | | disseminated Pb-Zn, minor siderite veined, and | ≈10% combined. | 21290 x | 68 | 69 | 1 | <5 | 1500 | 1.87 | 7.9 | 39 | <0.1 |
| | | occaissionally brecciated (tectonic ??). | | 21291 x | 69 | 70 | 1 | 5 | 6800 | 3.58 | 2.2 | 198 | <0.1 |

6469-Pt 2

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag. | Cd | Sn | Hg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100.30 | 104.00 | IRONSTONE - clayey, highly leached but containing minor disseminated relict galena. Disseminated cerussite also present. | Disseminated PbSd cerussite ≈ 5%. | 21292 | 70 | 71 | 1 | <5 | 7200 | 3.62 | 2.1 | 210 | | <0.1 |
| | | | | 21293 | 71 | 72 | 1 | <5 | 2800 | 2.01 | <1.0 | 56 | <5 | <0.1 |
| | | | | 21294 | 72 | 73 | 1 | <5 | 8700 | 3.56 | <1.0 | 312 | 10 | <0.1 |
| | | High grade lead zone from 103.50 to 103.70 of cerussite &/or anglesite?? | Massive cerussite 103.50 to 103.70. | 21295 | 73 | 74 | 1 | <5 | 4900 | 3.10 | <1.0 | 202 | <5 | <0.1 |
| | | | | 21296 | 74 | 75 | 1 | 6 | 5600 | 3.99 | <1.0 | 224 | <5 | <0.1 |
| | | | | 21297 | 75 | 76 | 1 | 12 | 7600 | 3.46 | <1.0 | 248 | 10 | <0.1 |
| 104.00 | 107.00 | MASSIVE Pb-Zn SULPHIDE - coarse grained, very weathered, with considerable clay matrix. Possible high water inflows. | Massive galena & sphalerite. ≈ 25% combined PbZn | 21298 | 76 | 77 | 1 | 6 | 5200 | 2.23 | <1.0 | 146 | 9 | <0.1 |
| | | | | 21299 | 77 | 78 | 1 | 10 | 3200 | 1.98 | <1.0 | 90 | <5 | <0.1 |
| | | | | 21300 | 78 | 79 | 1 | 10 | 1300 | 1.59 | <1.0 | 43 | 16 | <0.1 |
| | | | | 21303 | 79 | 80 | 1 | 9 | 3200 | 2.53 | 1.7 | 129 | <5 | <0.1 |
| 107.00 | 111.00 | SEMI MASSIVE & OXIDISED Pb-Zn SULPHIDE - in a ferruginous, orange-yellow claystone. High grade cerussite from 107.00 to 107.30 m. More Cerussite from 108.60 to 108.70m. | Semi Massive galena & sphalerite. Cerussite 107.00 - 107.30 108.60 - 108.70 | 21304 | 80 | 81 | 1 | 10 | 500 | 1.66 | 1.3 | 45 | <5 | <0.1 |
| | | | | 21305 | 81 | 82 | 1 | 10 | 1500 | 1.08 | 3.3 | 36 | 7 | <0.1 |
| | | | | 21306 | 82 | 83 | 1 | 9 | 1300 | 1.77 | <1.0 | 82 | <5 | <0.1 |
| | | | | 21307 | 83 | 84 | 1 | 11 | 2100 | 2.83 | 1.4 | 74 | <5 | <0.1 |
| | | | | 21308 | 84 | 85 | 1 | 17 | 1.12 | 4.05 | 2.7 | 554 | <5 | <0.1 |
| 111.00 | 117.00 | MASSIVE Pb-Zn SULPHIDE - coarse grained, showing annealing textures, with minor zones of black mineralized clays. Ore quite rugby, occaissionally well banded (indicating near vertical dip) and the zone making a lot of water | Massive galena & sphalerite, banded. ≈ 30% Pb & 20% Zn. | 21309 | 85 | 86 | 1 | 15 | 2.44 | 2.71 | 4.2 | 705 | <5 | <0.1 |
| | | | | 21310 | 86 | 87 | 1 | 9 | 6700 | 2.44 | <1.0 | 161 | <5 | <0.1 |
| | | | | 21311 | 87 | 88 | 1 | 9 | 4600 | 2.57 | 2.0 | 162 | <5 | <0.1 |
| | | | | 21312 | 88 | 89 | 1 | 8 | 7100 | 2.61 | <1.0 | 205 | <5 | <0.1 |
| | | | | 21313 | 89 | 90 | 1 | 10 | 4900 | 1.97 | 3.8 | 104 | <5 | <0.1 |
| | | | | 21314 | 90 | 91 | 1 | 10 | 5000 | 1.03 | 4.6 | 96 | <5 | <0.1 |
| 117.00 | 121.20 | CLAYSTONE - yellow orange & ferruginous with disseminated galena and cerussite. | Disseminated gn and cerussite ≈ 5%. | 21315 | 91 | 92 | 1 | 9 | 4500 | 1.83 | <1.0 | 132 | <5 | <0.1 |
| | | | | 21316 | 92 | 93 | 1 | 9 | 5700 | 2.98 | <1.0 | 203 | <5 | <0.1 |
| | | | | 21317 | 93 | 94 | 1 | 6 | 5200 | 5.95 | <1.0 | 305 | <5 | <0.1 |
| 121.20 | 126.50 | BRECCIA - black to grey angular breccia, (tectonic?) with minor silicified siltstone interbeds. Breccia weakly mineralized containing both galena/sphalerite fragments and galena disseminations. Highly mineralized zone from 126.00 to 126.50 of ≈ 15% Pb/Zn. Lot of siderite fragments in breccia as well as veining. | Disseminated Pb/Zn ≈ 5% | 21318 | 94 | 95 | 1 | 7 | 6900 | 4.87 | 2.1 | 315 | <5 | <0.1 |
| | | | | 21319 | 95 | 96 | 1 | 11 | 1.60 | 4.08 | 2.7 | 555 | <5 | <0.1 |
| | | | High grade Pb/Zn 126.00 to 126.50 ≈ 15%. | 21320 | 96 | 97 | 1 | 28 | 8.25 | 4.05 | 5.9 | 2360 | <5 | 0.3 |
| | | | | 21321 | 97 | 98 | 1 | 35 | 8.05 | 3.73 | 10.2 | 995 | 31 | 0.4 |
| | | | | 21322 | 98 | 99 | 1 | 83 | 10.60 | 2600 | 11.3 | 90 | 26 | <0.1 |
| | | | | 21323 | 99 | 100 | 1 | 86 | 14.40 | 4000 | 25.3 | 130 | 34 | 0.2 |
| | | | | 21324 | 100 | 101 | 1 | 89 | 2.53 | 8000 | 95.0 | 27 | 107 | 3.8 |
| | | | | 21325 | 101 | 102 | 1 | 77 | 1.80 | 1.02 | 11.1 | 14 | 17 | 1.0 |
| 126.50 | 134.00 | SILTY DOLOMITE - very soft, grey to olive brown, bedded and/or slumped (& brecciated) silty dolomite. Bedding indicates vertical or steeply west dipping attitudes. | | 21326 | 102 | 103 | 1 | 204 | 2.03 | 1.06 | 13.8 | 7 | 36 | <0.1 |
| | | | | 21327 | 103 | 104 | 1 | 164 | 47.70 | 1.15 | 418 | 80 | 38 | 4.0 |
| | | | | 21328 | 104 | 105 | 1 | 450 | 24.60 | 32.60 | 404 | 2500 | 123 | 6.0 |
| | | | | 21329 | 105 | 106 | 1 | 521 | 41.90 | 18.00 | 450 | 1600 | 79 | 9.0 |
| 134.00 | 173.50 | SILICIFIED DOLOMITE (SILTSTONE?) - heavily siderite veined, (very coarse grained dolomite crystals), grey, crystalline, rugby and brecciated. 4% disseminated pale pink/brown sphalerite. Ground extensively broken and fractured, poor recoveries in general. 1.5m cavern 154.5 to 156.00. Moderate grade Pb/Zn ≈ 5% from 151.00 to 152.00 also 166.00 to 167.00 averaging ≈ 7% combined Pb/Zn. | 151.00 - 152.00 ≈ 5% Pb/Zn 166.00 - 167.00 ≈ 7% Pb/Zn. Lot of Disseminated sphalerite. | 21330 | 106 | 107 | 1 | 346 | 36.30 | 25.50 | 247 | 2050 | 137 | 11.0 |
| | | | | 21331 | 107 | 108 | 1 | 181 | 34.20 | 4.13 | 187 | 265 | 58 | 3.6 |
| | | | | 21332 | 108 | 109 | 1 | 149 | 2.51 | 7100 | 36.4 | 16 | 26 | 0.5 |
| | | | | 21333 | 109 | 110 | 1 | 644 | 31.10 | 13.75 | 21.4 | 1050 | 48 | 35.0 |
| | | | | 21334 | 110 | 111 | 1 | 644 | 2.68 | 11.69 | 1219 | 750 | 59 | 71.0 |
| | | | | 21335 | 111 | 112 | 1 | 487 | 23.10 | 39.90 | 191 | 900 | 148 | 11.0 |
| | | | | 21336 | 112 | 113 | 1 | 405 | 41.90 | 32.10 | 242 | 2200 | 45 | 4.6 |
| | | | | 21337 | 113 | 114 | 1 | 341 | 43.70 | 31.30 | 252 | 2550 | 200 | 5.8 |
| | | | | 21338 | 114 | 115 | 1 | 494 | 47.20 | 21.40 | 339 | 1500 | 45 | 5.2 |
| 173.50 | 176.00 | SIDERITE - massive zone of white veined siderite, coarsely crystalline and containing only minor zinc mineralization. | ≈ 1% Zn. | 21339 | 115 | 116 | 1 | 488 | 47.40 | 23.50 | 458 | 1900 | 72 | 5.1 |
| | | | | 21340 | 116 | 117 | 1 | 313 | 56.60 | 14.80 | 524 | 1100 | 55 | 4.1 |
| | | | | 21341 | 117 | 118 | 1 | 159 | 18.50 | 17.80 | 61.2 | 1100 | 32 | 12.0 |
| | | | | 21342 | 118 | 119 | 1 | 88 | 7.75 | 5300 | 10.3 | 15 | 50 | 0.7 |
| 176.00 | 199.00 | SILICIFIED DOLOMITE (SILTSTONE?) - coarsely crystalline dolomite with minor fine grained sections. Core extensively brecciated and broken. Heavily | | 21343 | 119 | 120 | 1 | 115 | 5.47 | 3800 | 9.5 | 5 | 68 | 0.2 |
| | | | | 21344 | 120 | 121 | 1 | 89 | 4.63 | 3800 | 9.5 | 11 | - | - |
| (NQ to 191.00) | | | | 21345 | 121 | 122 | 1 | 55 | 13.80 | 2.93 | 36.0 | 238 | - | - |
| | | | | 21346 | 122 | 123 | 1 | 20 | 1.42 | 1.79 | 6.4 | 136 | - | - |

64916

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag | Cd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| cont. | | siderite veined, grey with minor black, dolomitic siltstone interbeds. In general poor recoveries | 185.70- 185.80 15% Zn | 21347 | 123 | 124 | 1 | 12 | 1.26 | 1.32 | 3.2 | 113 |
| | | 185.70 to 185.80 = 15% Zn coarse grained, pale brown. | | 21348 | 124 | 125 | 1 | 28 | 2.23 | 1.53 | 8.0 | 116 |
| | | | | 21349 | 125 | 126 | 1 | 17 | 1.73 | 2.80 | 4.7 | 188 |
| | | | | 21350 | 126 | 127 | 1 | 69 | 13.40 | 2.23 | 40.0 | 179 |
| 199.00 | 202.00 | BRECCIA - grey, silty dolomite breccia (slump breccia?) | | 21351 | 127 | 128 | 1 | 5 | 1.24 | 2.06 | 2.7 | 118 |
| | | both rounded and sub angular fragments, minor | | 21352 | 128 | 129 | 1 | 15 | 1.86 | 2.34 | 6.4 | 134 |
| | | siderite. | | 21353 | 129 | 130 | 1 | 10 | 0.85 | 0.96 | 1.9 | - |
| | | | | 21354 | 130 | 131 | 1 | <5 | 0.53 | 1.08 | 1.3 | - |
| 202.00 | 218.00 | SILICIFIED DOLOMITE BRECCIA - grey, in part brecciated, | 204.50- 218.00 | 21355 | 131 | 132 | 1 | 6 | 0.42 | 1.08 | 1.6 | - |
| | | bedded, very intensively siderite veined and | ≈ 10% Pb/Zn combined | 21356 | 132 | 133 | 1 | 7 | 0.49 | 1.14 | 1.5 | - |
| | | moderately mineralized. Bedding 45% to c.a. 203.50m | | 21357 | 133 | 134 | 1 | 7 | 0.50 | 1.24 | 2.2 | - |
| | | 75% to c.a. at 202.60m. | | 21358 | 134 | 135 | 1 | 16 | 0.46 | 1.00 | 1.9 | - |
| | | Mineralization 204.50 - 218 ≈ 10% Pb/Zn combined. | | 21357 | 135 | 136 | 1 | 33 | 0.38 | 1.68 | 1.9 | - |
| | | mainly as coarse grained disseminations in | | 21360 | 136 | 137 | 1 | 22 | 0.28 | 0.92 | 1.6 | - |
| | | siderite zones or as thick veins or accumulations. | | 21361 | 137 | 138 | 1 | 12 | 3100 | 3530 | 1.9 | - |
| | | 213.00 - 214.00 Cavern. | | 21362 | 138 | 139 | 1 | <5 | 2600 | 1080 | 1.5 | - |
| 218.00 | 229.00 | | | 21363 | 139 | 140 | 1 | 19 | 0.32 | 1.30 | 1.8 | - |
| | | SILTY DOLOMITE - grey to dark grey, slumped, | | 21364 | 140 | 141 | 1 | 79 | 1.75 | 3.60 | 8.8 | 229 |
| | | intensely siderite veined from 218.00 to 221.00. | | 21365 | 141 | 142 | 1 | 18 | 7400 | 5000 | 3.8 | - |
| | | Bedding indicating dip 85° E. Poor core recoveries | | 21366 | 142 | 143 | 1 | 13 | 9000 | 4900 | 4.2 | - |
| | | | | 21367 | 143 | 144 | 1 | 10 | 1.31 | 0.25 | 4.6 | - |
| 229.00 | 235.90 | SILICIFIED DOLOMITE (SILTSTONE) - intensely | | 21368 | 144 | 145 | 1 | <5 | 0.13 | 0.08 | 0.8 | - |
| | | siderite veined, grey, crystalline, massive but | | 21369 | 145 | 146 | 1 | <5 | 2400 | 1430 | 1.3 | - |
| END OF | HOLE. | intensely fractured. Very poor core recoveries. | | 21370 | 146 | 147 | 1 | <5 | 850 | 2000 | <0.5 | - |
| | | End of hole due to bad ground, no core recoveries, | | 21371 | 147 | 148 | 1 | 11 | 3400 | 9400 | 1.9 | - |
| | | and caving ground. | | 21372 | 148 | 149 | 1 | 9 | 4000 | 7300 | 24 | - |
| | | | | 21373 | 149 | 150 | 1 | 15 | 0.35 | 0.86 | 1.7 | - |
| | | | | 21374 | 150 | 151 | 1 | 14 | 9000 | 4740 | 5.4 | - |
| | | | | 21375 | 151 | 152 | 1 | 36 | 0.28 | 2.90 | 1.5 | - |
| | | | | 21376 | 152 | 153 | 1 | 130 | 0.57 | 2.30 | 2.7 | - |
| | | | | 21377 | 153 | 154 | 1 | 6 | 1700 | 2720 | 3.0 | - |
| | | | | 21378 | 154 | 155 | 1 | 9 | 3470 | 4860 | 3.2 | - |
| | | | | 21379 | 155 | 156 | 1 | NO CORE RECOVERY | | | | |
| | | | | 21380 | 156 | 157 | 1 | 22 | 0.22 | 0.81 | 1.1 | - |
| | | | | 21381 | 157 | 158 | 1 | 11 | 1920 | 2990 | 1.2 | - |
| | | | | 21382 | 158 | 159 | 1 | 49 | 9300 | 2.73 | 4.5 | 169 |
| | | | | 21383 | 159 | 160 | 1 | 27 | 1.76 | 6900 | 6.3 | 51 |
| | | | | 21384 | 160 | 161 | 1 | 8 | 1900 | 3800 | 1.3 | 22 |
| | | | | 21385 | 161 | 162 | 1 | 21 | 8500 | 1.02 | 2.9 | 63 |
| | | | | 21386 | 162 | 163 | 1 | 8 | 1.09 | 3400 | 3.7 | 22 |
| | | | | 21387 | 163 | 164 | 1 | 86 | 3100 | 3.47 | 3.4 | 137 |
| | | | | 21388 | 164 | 165 | 1 | NO CORE RECOVERY. | | | | ◆ |
| | | | | 21389 | 165 | 166 | 1 | NO CORE RECOVERY. | | | | |
| | | | | 21390 | 166 | 167 | 1 | 143 | 2.75 | 5.80 | 10.0 | 224 |
| | | | | 21391 | 167 | 168 | 1 | 22 | 0.14 | 0.94 | 1.0 | - |
| | | | | 21392 | 168 | 169 | 1 | 18 | 0.08 | 1.10 | 1.1 | - |
| | | | | 21393 | 169 | 170 | 1 | 7 | 0.09 | 0.84 | 0.6 | - |
| | | | | 21394 | 170 | 171 | 1 | 8 | 0.14 | 0.94 | 0.5 | - |
| | | | | 21395 | 171 | 172 | 1 | 12 | 0.07 | 1.10 | 0.9 | - |
| | | | | 21396 | 172 | 173 | 1 | 26 | 0.07 | 1.90 | 1.1 | - |
| | | | | 21397 | 173 | 174 | 1 | 19 | 0.25 | 0.94 | 1.4 | - |
| | | | | 21398 | 174 | 175 | 1 | 9 | 1690 | 2640 | 1.4 | - |
| | | | | 21399 | 175 | 176 | 1 | 17 | 4050 | 9200 | 2.7 | - |

64914

DRILL LOG HOLE No. — PAGE 4 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Cd | Sn | Hg | St |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 21400 | 176 | 177 | 1.00 | 16 | 4780 | 9500 | 3.0 | | | | |
| | | | | 21406 | 177 | 118 | 1.00 | 73 | 0.45 | 2.70 | 2.0 | | | | |
| | | | | 21407 | 178 | 179 | 1.00 | 10 | 1900 | 3130 | 2.6 | | | | |
| | | | | 21408 | 179 | 180 | 1.00 | 16 | 4200 | 3850 | 3.0 | | | | |
| | | | | 21409 | 180 | 181 | 1.00 | 9 | 8900 | 3520 | 4.6 | | | | |
| | | | | 21410 | 181 | 182 | 1.00 | 8 | 2940 | 2340 | 2.0 | | | | |
| | | | | 21411 | 182 | 183 | 1.00 | 10 | 2.00 | 0.19 | 4.9 | | | | |
| | | | | 21412 | 183 | 184 | 1.00 | 6 | 2360 | 2810 | 2.5 | | | | |
| | | | | 21413 | 184 | 185 | 1.00 | 28 | 3760 | 8200 | 3.7 | | | | |
| | | | | 21414 | 185 | 186 | 1.00 | 46 | 0.39 | 2.50 | 2.7 | | | | |
| | | | | 21415 | 186 | 187 | 1.00 | 8 | 3070 | 3040 | 2.4 | | | | |
| | | | | 21416 | 187 | 188 | 1.00 | 6 | 2990 | 1580 | 2.3 | | | | |
| | | | | 21417 | 188 | 189 | 1.00 | 5 | 3970 | 1560 | 3.0 | | | | |
| | | | | 21424 | 189 | 190 | 1.00 | 11 | 2230 | 3540 | 3.4 | 25 | | | |
| | | | | 21425 | 190 | 191 | 1.00 | 13 | 0.18 | 1.13 | 1.2 | 45 | | | |
| | | | | 21426 | 191 | 192 | 1.00 | 10 | 0.11 | 1.07 | 1.2 | 19 | | | |
| | | | | 21427 | 192 | 193 | 1.00 | 16 | 0.23 | 1.17 | 1.2 | 60 | | | |
| | | | | 21428 | 193 | 194 | 1.00 | 11 | 2360 | 7850 | 1.5 | .42 | | | |
| | | | | 21429 | 194 | 195 | 1.00 | 14 | 3960 | 4620 | 1.7 | 28 | | | |
| | | | | 21430 | 195 | 196 | 1.00 | 20 | 4200 | 8000 | 2.8 | 46 | | | |
| | | | | 21431 | 196 | 197 | 1.00 | 21 | 1760 | 9000 | 1.7 | 61 | | | |
| | | | | 21432 | 197 | 198 | 1.00 | 9 | 7600 | 4930 | 3.4 | 16 | | | |
| | | | | 21433 | 198 | 199 | 1.00 | NO CORE RECOVERY. | | | | | | | |
| | | | | 21434 | 199 | 200 | 1.00 | 21 | 379 | 6760 | 1.1 | <5 | | | |
| | | | | 21435 | 200 | 201 | 1.00 | 34 | 298 | 6450 | 1.0 | 6 | | | |
| | | | | 21436 | 201 | 202 | 1.00 | 16 | 210 | 5050 | <0.5 | <5 | | | |
| | | | | 21437 | 202 | 203 | 1.00 | 10 | 1160 | 4330 | 0.6 | 24 | | | |
| | | | | 21438 | 203 | 204 | 1.00 | 29 | 1340 | 7500 | 1.6 | 42 | | | |
| | | | | 21439 | 204 | 205 | 1.00 | 71 | 4.44 | 3.01 | 32.3 | 176 | 30 | 1.5 | 22 |
| | | | | 21440 | 205 | 206 | 1.00 | 64 | 17.90 | 4500 | 79.1 | 24 | <5 | 2.2 | 27 |
| | | | | 21441 | 206 | 207 | 1.00 | 43 | 5.89 | 2500 | 46.0 | 11 | 5 | 0.3 | 5 |
| | | | | 21442 | 207 | 208 | 1.00 | 7 | 1.10 | 5300 | 18.3 | 13 | 12 | <0.1 | <2 |
| | | | | 21443 | 208 | 209 | 1.00 | 36 | 20.50 | 4000 | 80.5 | 19 | 5 | 3.6 | <2 |
| | | | | 21444 | 209 | 210 | 1.00 | 52 | 34.90 | 4.91 | 301.0 | 198 | 32 | 0.9 | <2 |
| | | | | 21445 | 210 | 211 | 1.00 | 18 | 2.87 | 8800 | 22.4 | 37 | 15 | 0.5 | <2 |
| | | | | 21446 | 211 | 212 | 1.00 | 27 | 1.19 | 2.37 | 7.6 | 123 | 17 | 0.8 | <2 |
| | | | | 21447 | 212 | 213 | 1.00 | 7 | 2350 | 3850 | 0.8 | — | — | — | — |
| | | | | 21448 | 213 | 214 | 1.00 | NO CORE RECOVERY. | | | | | | | |
| | | | | 21449 | 214 | 215 | 1.00 | 15 | 5.54 | 5500 | 14.9 | 20 | 17 | 0.4 | <2 |

64911S

DRILL LOG HOLE No. PAGE 5 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Cd | Sn | Hg | Sb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 21450* | 215 | 216 | 1 | 9 | 2.66 | 8600 | 20.3 | 29 | 22 | 0.4 | <2 |
| | | | | 21451* | 216 | 217 | 1 | 30 | 4.29 | 1.87 | 28.4 | 78 | 12 | 0.6 | <2 |
| | | | | 21452* | 217 | 218 | 1 | 316 | 15.60 | 24.90 | 135.0 | 1270 | 7 | 5.8 | 95 |
| | | | | 21453 | 218 | 219 | 1 | NO CORE RECOVERY. | | | | | | | |
| | | | | 21454* | 219 | 220 | 1 | 39 | 1.09 | 3.39 | 6.5 | 116 | <5 | 1.0 | <2 |
| | | | | 21455 | 220 | 221 | 1 | 6 | 310 | 3940 | 0.9 | <5 | | | |
| | | | | 21456 | 221 | 222 | 1 | NO CORE RECOVERY. | | | | | | | |
| | | | | 21457 | 222 | 223 | 1 | NO CORE RECOVERY. | | | | | | | |
| | | | | 21458 | 223 | 224 | 1 | 9 | 720 | 3700 | 0.8 | <5 | | | |
| | | | | 21459 | 224 | 225 | 1 | 8 | 400 | 5160 | 0.5 | <5 | | | |
| | | | | 21460 | 225 | 226 | 1 | 9 | 285 | 3900 | 0.8 | <5 | | | |
| | | | | 21461 | 226 | 227 | 1 | 8 | 257 | 5140 | 1.3 | <5 | | | |
| | | | | 21462 | 227 | 228 | 1 | 11 | 362 | 6000 | 0.7 | 8 | | | |
| | | | | 21463 | 228 | 229 | 1 | 12 | 518 | 6740 | 1.2 | 9 | | | |
| | | | | 21464 | 229 | 230 | 1 | 8 | 890 | 4000 | 0.9 | 19 | | | |
| | | | | 21465 | 230 | 231 | 1 | 5 | 406 | 1170 | 0.5 | <5 | | | |
| | | | | 21466 | 231 | 232 | 1 | 7 | 6400 | 2930 | 1.8 | 11 | | | |
| | | | | 21467 | 232 | 233 | 1 | 13 | 3490 | 9420 | 2.3 | 60 | | | |
| | | | | 21468 | 233 | 234 | 1 | 12 | 6000 | 6550 | 3.0 | 35 | | | |
| | | | | 21469 | 234 | 235 | 1 | 6 | 4270 | 3430 | 1.7 | 10 | | | |
| | | | | 21470 | 235 | 236 | 1 | 5 | 2710 | 1310 | 1.6 | <5 | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | * Accurate assays for geochemical assays > 1% | | | | | | | | | | | |

64919

649120

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-80A-2

| | | |
|---|---|---|
| Location | : | 1850N:1300E |
| Declination | : | 60° |
| Azimuth | : | 270°G |
| Total Depth | : | 331.0 meters |

Assay Results

| | | | |
|---|---|---|---|
| | 40-46 | = | 6m @ 0.69% Pb + 1.62% Zn + 5.8 g/t Ag |
| | 284-299 | = | 15m @ 0.80% Pb + 0.86% Zn + 4.8 g/t Ag |
| including | 284-290 | = | 6m @ 1.44% Pb + 0.64% Zn + 5.1 g/t Ag |
| and | 294-299 | = | 5m @ 0.29% Pb + 1.40% Zn + 3.8 g/t Ag |

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80A-2 — PAGE 1 OF 7

| | | | |
|---|---|---|---|
| PROJECT ZEEHAN-TAS No. A79-60-B | ELEVATION meters | COMMENCED 14/3/80 | |
| PROSPECT AUSTRAL - Flux Quarry. | DIP COLLAR 60° GW | COMPLETED 8/4/80 | |
| CO-ORDINATES 1850 mN 1300 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 331 meters | |
| BEARING 251° TN 240° MN 270 GN | LOGGED BY P.A. JONES. | | |

| BORE HOLE SURVEY Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing |
|---|---|---|---|---|---|
| 50 | 60° | 240.5 | 200 m | 61.5 | 238 |
| 100 | 60° | 241° | 250 | 61.5 | 239 |
| 150 | 61° | 241 | 300 | 61.5 | 239 |

INSTRUMENT: Depth (m) | Dip | Bearing

| METERAGE From | To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 5.00 | Tricone - Alluvial quartzite & conglomeratic gravels | | 21682 | 5 | 6 | 1 | 18 | 2680 | 1550 | 1.2 |
| START HQ | CORING. | | | 21683 | 6 | 7 | 1 | 34 | 720 | 9520 | <1.0 |
| 5.00 | 6.40 | DOLOMITE: Completely weathered brown/black carbonaceous silty dolomite. | | 21684 | 7 | 8 | 1 | <5 | 243 | 9460 | 1.1 |
| | | | | 21685 | 8 | 9 | 1 | <5 | 144 | 7580 | <0.5 |
| | | | | 21686 | 9 | 10 | 1 | <5 | 186 | 6950 | <0.5 |
| 6.40 | 7.50 | DOLOMITE: olive grey to brown, siderite veined, highly weathered clayey silty dolomite. Minor disseminated sphalerite associated with siderite. | Minor disseminated sphalerite. | 21687 | 10 | 11 | 1 | <5 | 846 | 2490 | 0.5 |
| | | | | 21688 | 11 | 12 | 1 | <5 | 225 | 7940 | <0.5 |
| | | | | 21689 | 12 | 13 | 1 | <5 | 501 | 7280 | <0.5 |
| | | | | 21690 | 13 | 14 | 1 | 13 | 305 | 3670 | 1.3 |
| 7.50 | 26.00 | SIDERITE/ANKERITE ROCK: massive, hard and dense grey, weakly siderite veined ankerite rock interbedded with minor silty dolomites, grey to black of weakly mineralized. Massive, mineralized Ankerite/siderite vughy breccia from 9.00 to 11.00 metres. Minor Pb/Zn and pyritic mineralization. | Minor Pb/Zn and pyritic mineralization associated with siderite veining in breccia. | 21691 | 14 | 15 | 1 | NO | CORE | RECOVERY | |
| | | | | 21692 | 15 | 16 | 1 | <5 | 368 | 3970 | 0.8 |
| | | | | 21693 | 16 | 17 | 1 | 8 | 240 | 8850 | 1.5 |
| | | | | 21694 | 17 | 18 | 1 | <5 | 383 | 3770 | 0.9 |
| | | | | 21695 | 18 | 19 | 1 | 5 | 82 | 985 | <0.5 |
| | | | | 21696 | 19 | 20 | 1 | 5 | 72 | 940 | <0.5 |
| | | | | 21697 | 20 | 21 | 1 | <5 | 93 | 1230 | 0.5 |
| 26.00 | 39.00 | SANDSTONE: Poorly sorted, white to light grey, speckled coarse grained arkosic sandstone. Large quartz phenocrysts present. Ground badly broken. | | 21698 | 21 | 22 | 1 | <5 | 370 | 1530 | 0.8 |
| | | | | 21699 | 22 | 23 | 1 | 5 | 2800 | 6720 | 4.1 |
| | | | | 21700 | 23 | 24 | 1 | <5 | 1250 | 5880 | 2.5 |
| | | | | 21701 | 24 | 25 | 1 | <5 | 259 | 1870 | 0.8 |
| | | TRICONED 26.10 m to 34.50 NO SLUDGE SAMPLES. | | 21702 | 25 | 26 | 1 | 5 | 107 | 1440 | 1.0 |
| | | | | - | 26 | 27 | 1 | TRICONED - | NO SLUDGE/CORE. | | |
| 39.00 | 46.00 | Ankerite Siderite Mineralized Breccia: massive, dense yellow/grey/green, vughy Pb/Zn mineralized breccia. 40-42 m ≈ 2% Pb/Zn combined 42-45 m ≈ 5% Pb/Zn combined. Zone very weathered but mineralized material hard and resistant. Poor recoveries in some badly broken areas. Lot of accessory pyrite to mineralization. | Pb/Zn 2% 40-42m. Pb/Zn 5% 42-45 m. 5% pyrite | - | 27 | 28 | 1 | " | | | " |
| | | | | - | 28 | 29 | 1 | " | | | " |
| | | | | - | 29 | 30 | 1 | " | | | " |
| | | | | - | 30 | 31 | 1 | " | | | " |
| | | | | - | 31 | 32 | 1 | " | | | " |
| | | | | - | 32 | 33 | 1 | " | | | " |
| | | | | - | 33 | 34 | 1 | " | | | " |
| | | | | - | 34 | 35 | 1 | " | | | " |
| 46.00 | 48.00 | DOLOMITE: Black to olive green, silty, completely weathered dolomite. Very minor calcite veining. | | 21703 | 35 | 36 | 1 | <5 | 476 | 3510 | 1.0 |
| | | | | 21704 | 36 | 37 | 1 | 9 | 66 | 1160 | <0.5 |
| | | | | 21705 | 37 | 38 | 1 | <5 | 58 | 1180 | <0.5 |
| 48.00 | 50.20 | COQUINA: silicified, grey, very light, fossiliferous (coralline fragments as well as shelly debris) coquina. | | 21706 | 38 | 39 | 1 | 19 | 330 | 9260 | <1.0 |
| | | | | 21671 | 39 | 40 | 1 | <5 | 700 | 2300 | 4.8 |
| | | | | 21672 | 40 | 41 | 1 | <5 | 1.76% | 1.08% | 13.7 |
| 50.20 | 51.50 | SILTSTONE: weathered, grey, clayey, weakly calcite veined siltstone. Ground very broken. Poor core recoveries. | | 21673 | 41 | 42 | 1 | <5 | 3200 | 6500 | 3.4 |
| | | | | 21674 | 42 | 43 | 1 | <5 | 1.34% | 7300 | 8.8 |
| | | | | 21675 | 43 | 44 | 1 | <5 | 5000 | 9300 | 3.6 |
| | | | | 21676 | 44 | 45 | 1 | 13 | 1300 | 4.97% | 3.7 |
| 51.50 | 63.00 | SANDSTONE: grey/brown, medium to coarse grained arkosic sandstone containing thin black clayey interbeds (shales?). Core completely weathered, ground badly broken, poor recoveries ≈ 35%. Cavity 54.50 m - 57.50 m. | | 21677 | 45 | 46 | 1 | <5 | 600 | 1.38% | 1.5 |
| | | | | 21678 | 46 | 47 | 1 | NO | CORE | RECOVERY | |
| | | | | 21679 | 47 | 48 | 1 | <5 | 1200 | 4500 | 2.3 |
| | | | | 21680 | 48 | 49 | 1 | <5 | 300 | 900 | <0.5 |
| | | | | 21681 | 49 | 50 | 1 | <5 | 200 | 800 | <0.5 |

64021

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80A-2 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.00 | 78.50 | CLAYSTONE : mottled, black/grey and minor orange/yellow massive silty fat clays — decomposed DOLOMITE? Very fine grained pyrite present as disseminations. | Pyrite as fine disseminations. | 21707 | 50 | 51 | 1 | 11 | 1240 | 4470 | 1.8 |
| | | | | 21708 | 51 | 52 | 1 | 11 | 1830 | 3860 | 1.9 |
| | | | | 21709 | 52 | 53 | 1 | 13 | 2480 | 6210 | 2.8 |
| | | | | 21710 | 53 | 54 | 1 | 10 | 1170 | 4780 | 1.8 |
| 78.50 | 82.30 | DOLOMITE BRECCIA : Dark grey, silty, soft sediment slump brecciated Dolomite. Minor fine grained disseminated pyrite. Minor siderite. Core extensively weathered and broken ≈ 50% recovery. | Pyrite as fine disseminations. | 21711 | 54 | 55 | 1 | 17 | 1550 | 5560 | 3.2 |
| | | | | 21712 | 55 | 56 | 1 | NO | CORE | RECOVERY | |
| | | | | 21713 | 56 | 57 | 1 | NO | CORE | RECOVERY | |
| | | | | 21714 | 57 | 58 | 1 | 8 | 250 | 1650 | 0.6 |
| | | | | 21715 | 58 | 59 | 1 | 5 | 203 | 1580 | 0.6 |
| 82.30 | 91.40 | CALCLUTITE : slumped grey calclutites, highly foliated, very broken, minor calcite veining (minor siderite). Some zones decomposed to fat silty clays. | | 21716 | 59 | 60 | 1 | <5 | 743 | 2080 | 1.0 |
| | | | | 21717 | 60 | 61 | 1 | <5 | 1029 | 2430 | 1.2 |
| | | | | 21718 | 61 | 62 | 1 | 6 | 1540 | 6510 | 1.5 |
| | | | | 21719 | 62 | 63 | 1 | <5 | 268 | 6350 | <0.5 |
| 91.40 | 145.40 | CALCLUTITE : Interbedded, light grey and grey foliated calclutites and very fossiliferous (shelly) thinly bedded calclutites. Minor, black, dolomitic clay interbeds present. Black shaley limestone, extremely weathered from 100.90m to 101.40m. Numerous zones throughout sequence are completely weathered giving rise to silty clays with relict rock fragments. Minor calcite veining in general. Vein 101.70 - 101.90 contains 2% sphalerite. (red/brown in colour). Core badly fractured and broken from 106 to 127 metres. Core extensively foliated and microfaulted from 129 m to 135 metres. Calcite healed breccia's (tectonic) 106-107; 131.20-131.40. Bedding 47° to ca at 92.50m; 40° to ca at 128m. Cavities 140.70m - 141.50; 141.70 - 145.40. | Calcite Vein 2% sphalerite 101.70 - 101.90m. | 21720 | 63 | 64 | 1 | 10 | 1460 | 8050 | 0.9 |
| | | | | 21721 | 64 | 65 | 1 | 14 | 1930 | 1.25% | <1.0 |
| | | | | 21722 | 65 | 66 | 1 | 8 | 3430 | 9320 | 2.5 |
| | | | | 21723 | 66 | 67 | 1 | 8 | 706 | 4750 | 0.8 |
| | | | | 21724 | 67 | 68 | 2 | 40 | 1182 | 1.18 | 2.2 |
| | | | | | 68 | 69 | | | | | |
| | | | | 21725 | 69 | 70 | 2 | 14 | 304 | 3700 | <0.5 |
| | | | | | 70 | 71 | | | | | |
| | | | | 21726 | 71 | 72 | 2 | 22 | 128 | 1530 | <0.5 |
| | | | | | 72 | 73 | | | | | |
| | | | | 21727 | 73 | 74 | 2 | 24 | 192 | 1630 | <0.5 |
| | | | | | 74 | 75 | | | | | |
| | | | | 21728 | 75 | 76 | 2 | 14 | 80 | 2440 | <0.5 |
| | | | | | 76 | 77 | | | | | |
| | | | | 21729 | 77 | 78 | 2 | <5 | 340 | 1.18 | <0.5 |
| | | | | | 78 | 79 | | | | | |
| 145.40 | 182.20 | SILTSTONE / SHALE : laminated clayey siltstones interbedded with completely weather laminar shales. (massive grey/black clays!). Pyrite up to 5% in sections of core. Zone extremely cavernous and honeycombed giving poor recoveries overall ≈ 20%. Some cavities possibly pyrite lined or filled. Cavities: 147.20-156.50; 157.20-160.70; 170-172, honeycombed & porous 172-175.70m; cavity 179.80-182.20m. Minor silicified coquina core ≈ 182 metres. Mineralized (Pb/Zn) siderite/ankerite rock 180-181 probably caved from above. Bedding 30° at 147 metres. | Massive pyrite possibly lining cavities? | 21730 | 79 | 80 | 2 | 14 | 186 | 2700 | <0.5 |
| | | | | | 80 | 81 | | | | | |
| | | | | 21731 | 81 | 82 | 2 | 10 | 216 | 2020 | <0.5 |
| | | | | | 82 | 83 | | | | | |
| | | | | 21739 | 83 | 84 | 1 | 7 | 55 | 246 | <0.1 |
| START NQ CORING | | | | 21740 | 84 | 85 | 1 | 5 | 35 | 114 | <0.1 |
| 176 | m | | | 21741 | 85 | 86 | 1 | <5 | 30 | 92 | <0.1 |
| | | | | 21742 | 86 | 87 | 1 | 5 | 26 | 48 | <0.1 |
| | | | | 21743 | 87 | 88 | 1 | 5 | 26 | 23 | <0.1 |
| | | | | 21744 | 88 | 89 | 1 | 6 | 105 | 79 | <0.1 |
| | | | | 21745 | 89 | 90 | 1 | 7 | 56 | 103 | <0.1 |
| | | | | 21746 | 90 | 91 | 1 | 8 | 35 | 73 | <0.1 |
| 182.20 | 185.60 | CALCARENITE : massive, grey, well sorted, medium grained, weakly calcite veined calcarenite, becoming finer grained and laminated towards the base of the sequence. | | 21747 | 91 | 92 | 1 | 5 | 218 | 2740 | <0.1 |
| | | | | 21748 | 92 | 93 | 1 | 5 | 28 | 112 | <0.1 |
| | | | | 21749 | 93 | 94 | 1 | 6 | 30 | 65 | <0.1 |
| | | | | 21750 | 94 | 95 | 1 | <5 | 34 | 99 | <0.1 |
| | | | | 21751 | 95 | 96 | 1 | 5 | 25 | 135 | <0.1 |
| 185.60 | 191.00 | SANDSTONE : brecciated, Quartz and calcite veined grey and dark grey, very weathered, soft clayey Sandstone in a dark grey dolomite matrix. Cavity 187.00 - 190.70 metres. | | 21752 | 96 | 97 | 1 | 5 | 36 | 131 | <0.1 |
| | | | | 21753 | 97 | 98 | 1 | 5 | 38 | 168 | <0.1 |
| | | | | 21754 | 98 | 99 | 1 | 6 | 35 | 94 | <0.1 |
| | | | | 21755 | 99 | 100 | 1 | <5 | 34 | 164 | <0.1 |
| | | | | 21756 | 100 | 101 | 1 | 9 | 349 | 4630 | <0.1 |
| | | | | 21757 | 101 | 102 | 1 | 6 | 740 | 1680 | <0.1 |
| | | | | 21758 | 102 | 103 | 1 | 10 | 500 | 5080 | <0.1 |

649129

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80A-8 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % |
|---|---|---|---|
| 191.00 | 196.30 | SANDSTONE: coarsely laminar, medium to coarse grained grey/white quartzose sandstone. Ground very broken with recoveries around 30%. Bedding 37° to c.a at 194.50 metres. | |
| 196.30 | 197.50 | SANDSTONE BRECCIA: completely weathered soft, grey, sediment slump brecciated sandstone with black silty dolomite matrix. Sandstone fragments medium grained and well sorted. | |
| 197.50 | 199.50 | SANDSTONE: grey/white, medium grained, well sorted quartzose sandstone. Minor quartz veinlets. Bedding 35° to c.a at 197.50m. | |
| 199.50 | 201.70 | SANDSTONE BRECCIA: black, soft sediment slump brecciated, medium grained sandstone with carbonaceous and silty dolomite matrix. Minor pyrite. | Minor pyrite as blebs or fine disseminations. |
| 201.70 | 203.40 | SANDSTONE: coarse grained, poorly sorted, fossiliferous porous and vughy grey sandstone. | |
| 203.40 | 206.00 | SANDSTONE: grey/white, medium grained, well sorted, massive in part vughy sandstone. | |
| 206.00 | 211.10 | SANDSTONE BRECCIA: slump brecciated, interbedded grey, quartzose, medium grained sandstone and very laminar, black, pyritic silty dolomites (laminations highly contorted due to slumping). Pyrite as thin beds parallel to contorted bedding planes. | Pyrite 2-3% |
| 211.10 | 213.00 | SANDSTONE: finely laminar, pyritic, grey, well sorted, porous and weakly vughy sandstone. Crystalline pyrite vein x 1cm in width parallel to bedding plane. Bedding 40° to ca at 212.50 metres. Porosity in sandstone may be due to leaching of pyrite! | Vein pyrite 1cm width at 211.80 metres |
| 213.00 | 227.00 | SANDSTONE: interbedded grey and dark grey, fine to coarse grained, in part fossiliferous sandstones. Minor pyrite blebs present. Core generally massive with no bedding. Minor qtz veining. Sandstone very quartzose. Sections of core vughy & very porous (highly weathered) | Minor pyrite. |
| 227.00 | 228.90 | DOLOMITIC SILTSTONE BRECCIA: black, slump brecciated, dolomitic siltstone. Extremely weathered, clayey and very soft. with minor qtz veining. Fragments in breccia up to 3cm across. | |
| 228.90 | 238.60 | BRECCIA: mottled grey/white/black slump brecciated siltstone/fine grained sandstone. Extremely weathered & clayey. Minor quartz and calcite veining. Matrix possibly black dolomitic siltstone. Pyritic in part. Breccia fragments generally 1-2.5 cm across. (well sorted!) | Minor disseminated pyrite. |

| SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|
| 21759 | 103 | 104 | 1 | 7 | 117 | 411 | <0.1 |
| 21760 | 104 | 105 | 1 | <5 | 481 | 954 | <0.1 |
| 21761 | 105 | 106 | 1 | <5 | 127 | 707 | <0.1 |
| 21762 | 106 | 107 | 1 | <5 | 356 | 1068 | <0.1 |
| 21763 | 107 | 108 | 1 | 5 | 377 | 1360 | <0.1 |
| 21764 | 108 | 109 | 1 | <5 | 165 | 680 | <0.1 |
| 21765 | 109 | 110 | 1 | 6 | 225 | 513 | <0.1 |
| 21766 | 110 | 111 | 1 | <5 | 139 | 467 | <0.1 |
| 21767 | 111 | 112 | 1 | <5 | 71 | 219 | <0.1 |
| 21768 | 112 | 113 | 1 | 6 | 74 | 362 | <0.1 |
| 21769 | 113 | 114 | 1 | 6 | 34 | 35 | <0.1 |
| 21770 | 114 | 115 | 1 | 7 | 35 | 63 | <0.1 |
| 21771 | 115 | 116 | 1 | <5 | 31 | 73 | <0.1 |
| 21772 | 116 | 117 | 1 | 5 | 29 | 414 | <0.1 |
| 21773 | 117 | 118 | 1 | 6 | 40 | 209 | <0.1 |
| 21774 | 118 | 119 | 1 | 6 | 38 | 88 | <0.1 |
| 21775 | 119 | 120 | 1 | 5 | 36 | 140 | <0.1 |
| 21776 | 120 | 121 | 1 | 6 | 48 | 657 | <0.1 |
| 21777 | 121 | 122 | 1 | 5 | 34 | 44 | <0.1 |
| 21778 | 122 | 123 | 1 | 7 | 35 | 71 | <0.1 |
| 21779 | 123 | 124 | 1 | 8 | 45 | 390 | <0.1 |
| 21780 | 124 | 125 | 1 | 21 | 341 | 2780 | <0.1 |
| 21781 | 125 | 126 | 1 | 5 | 39 | 611 | <0.1 |
| 21782 | 126 | 127 | 1 | 8 | 282 | 2190 | <0.1 |
| 21783 | 127 | 128 | 1 | <5 | 48 | 922 | <0.1 |
| 21784 | 128 | 129 | 1 | 6 | 45 | 118 | <0.1 |
| 21785 | 129 | 130 | 1 | 8 | 38 | 40 | <0.1 |
| 21809 | 130 | 131 | 1 | 5 | 60 | 37 | 2.1 |
| 21810 | 131 | 132 | 1 | <5 | 49 | 22 | 1.7 |
| 21811 | 132 | 133 | 1 | <5 | 45 | 44 | 1.5 |
| 21812 | 133 | 134 | 1 | <5 | 46 | 25 | 1.6 |
| 21813 | 134 | 135 | 1 | 5 | 49 | 44 | 1.7 |
| 21814 | 135 | 136 | 1 | 6 | 25 | 20 | 2.1 |
| 21815 | 136 | 137 | 1 | 6 | 30 | 76 | 1.6 |
| 21816 | 137 | 138 | 1 | 5 | 31 | 101 | 1.5 |
| 21817 | 138 | 139 | 1 | 6 | 48 | 60 | 1.6 |
| 21818 | 139 | 140 | 1 | <5 | 45 | 21 | 1.6 |
| 21819 | 140 | 141 | 1 | <5 | 45 | 47 | 1.8 |
| – | 141 | 142 | 1 | NO | CORE | RECOVERY (Cavity) | |
| – | 142 | 143 | 1 | " | " | " | |
| – | 143 | 144 | 1 | " | " | " | |
| – | 144 | 145 | 1 | " | " | " | |
| – | 145 | 146 | 1 | " | " | " | |
| 21820 | 146 | 147 | 1 | 14 | 27 | 145 | 1.9 |
| – | 147 | 148 | 1 | NO | CORE | RECOVERY (Cavity) | |
| – | 148 | 149 | 1 | " | " | " | |
| – | 149 | 150 | 1 | " | " | " | |
| – | 150 | 151 | 1 | " | " | " | |
| – | 151 | 152 | 1 | " | " | " | |
| – | 152 | 153 | 1 | " | " | " | |
| – | 153 | 154 | 1 | " | " | " | |
| – | 154 | 155 | 1 | " | " | " | |
| – | 155 | 156 | 1 | " | " | " | |

6491223

Amoco Minerals Australia Company

DRILL LOG HOLE No. ZT-809-2 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 238.60 | 246.00 | DOLOMITIC SILTSTONE BRECCIA: Black, completely weathered, pyritic, dense, slump brecciated dolomitic siltstone. Fragments sub angular to rounded. | Minor pyrite | 21821 | 156 | 157 | 1 | 27 | 37 | 90 | 2.1 |
| | | | | - | 157 | 158 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 158 | 159 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 159 | 160 | 1 | NO | CORE | RECOVERY | |
| 246.00 | 250.00 | SANDSTONE / SILTSTONE: grey, massive, fine grained sandstone/siltstone. Badly broken ground gives rise to extremely weathered zones in an otherwise competent sequence. Minor fine grained pyrite as disseminations. | Minor disseminated pyrite. | 21822 | 160 | 161 | 1 | <5 | 34 | 457 | 1.9 |
| | | | | 21823 | 161 | 162 | 1 | <5 | 19 | 142 | 2.5 |
| | | | | - | 162 | 163 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 163 | 164 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 164 | 165 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 165 | 166 | 1 | NO | CORE | RECOVERY | |
| 250.00 | 262.50 | LIMESTONE: dark grey, brecciated and very foliated, extremely weathered silty limestone with minor dark grey to black silty dolomites. Minor calcite veining. Abundant fine grained pyrite. Limestones & dolomites occasionally completely decomposed to silty black clays. NO Bedding. | 2% pyrite as fine disseminations. | - | 166 | 167 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 167 | 168 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 168 | 169 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 169 | 170 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 170 | 171 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 171 | 172 | 1 | NO | CORE | RECOVERY. | |
| | | | | 21824 | 172 | 173 | 1 | 7 | 29 | 59 | 2.2 |
| 262.50 | 265.10 | LIMESTONE ??: Completely weathered dark grey limestone, manifest now by dark grey to black, massive, but silty clays. Completely weathered white calcite veins present. | | 21825 | 173 | 174 | 1 | <5 | 41 | 38 | 1.6 |
| | | | | - | 174 | 175 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 175 | 176 | 1 | NO | CORE | RECOVERY. | |
| | | | | 21826. | 176 | 177 | 1 | 29 | 6160 | 490 | 5.8 |
| 265.10 | 275.90 | SILTSTONE: fine grained, well sorted, grey, massive, very broken and pugby siltstone. Pugh zones composed of clayey silts, black & massive. Minor qtz veining. Cavity 267.70 - 268.80 m. Rock in general very weathered. | | - | 177 | 178 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 178 | 179 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 179 | 180 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 180 | 181 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 181 | 182 | 1 | NO | CORE | RECOVERY. | |
| 275.90 | 284.00 | CLAYSTONE: Orange/olive brown/white sandy and silty clays. Minor mottling. Completely weathered and oxidised sandstones and siltstones; minor shales. | | 21827 | 182 | 183 | 1 | <5 | 53 | 92 | 1.7 |
| | | | | 21828 | 183 | 184 | 1 | <5 | 45 | 146 | 1.9 |
| | | | | 21829 | 184 | 185 | 1 | 15 | 52 | 134 | 2.3 |
| | | | | 21830 | 185 | 186 | 1 | 16 | 50 | 123 | 1.9 |
| 284.00 | 293.50 | IRONSTONE BRECCIA: yellow/orange, pugby, very porous sandy, extremely weathered, pugby, ironstone breccia. Pugh zones of silty or sandy yellow to white weakly ferruginous clays. Recoveries through badly broken ground ≤ 65% | | 21831 | 186 | 187 | 1 | 17 | 88 | 4470 | 2.0 |
| | | | | - | 187 | 188 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 188 | 189 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 189 | 190 | 1 | NO | CORE | RECOVERY. | |
| | | | | 21832 | 190 | 191 | 1 | <5 | 65 | 206 | 1.9 |
| | | | | 21833 | 191 | 192 | 1 | <5 | 17 | 227 | 2.2 |
| 293.50 | 297.50 | SILTSTONE BRECCIA: Grey (greeny yellow), massive, very dense, pugby (quartz lined) sideritic, pugby siltstone slump?? breccia. Pugh zones major component of rock and are generally black to dark grey silty clays. More resistant sections of core, less weathered siltstone breccia, up to 20-30 cm in length, angular to sub angular fragments in breccia generally ≤ 2 cm in width. Minor disseminated Galena & sphalerite. Very fine grained Cavity 296.70 - 297.20 m. | Very fine grained, minor galena & sphalerite. | - | 192 | 193 | 1 | NO | CORE | RECOVERY | |
| | | | | 21834 | 193 | 194 | 1 | <5 | 13 | 47 | 1.8 |
| | | | | 21835 | 194 | 195 | 1 | <5 | 12 | 43 | 2.0 |
| | | | | 21836 | 195 | 196 | 1 | <5 | 11 | 32 | 2.1 |
| | | | | 21837 | 196 | 197 | 1 | <5 | 18 | 24 | 1.9 |
| | | | | 21838 | 197 | 198 | 1 | <5 | 16 | 40 | 1.7 |
| | | | | 21839 | 198 | 199 | 1 | <5 | 15 | 22 | 1.4 |
| | | | | 21840 | 199 | 200 | 1 | 7 | 23 | 34 | 1.6 |
| | | | | 21841 | 200 | 201 | 1 | 6 | 26 | 36 | 1.5 |
| | | | | 21842 | 201 | 202 | 1 | <5 | 17 | 20 | 1.7 |
| | | | | 21843 | 202 | 203 | 1 | <5 | 15 | 43 | 2.2 |
| 297.50 | 306.00 | Fine grained SANDSTONE / SILTSTONE: Moderately sorted light grey, quartz veined, massive, dense quartzose, fine grained sandstone / siltstone. Major proportion of rock sandy pugby clays - completely weathered sections of core. Minor well bedded, pyritic siltstones (301m) Bedding 32° to c.a. at 301 m. | Bedded minor pyrite in siltstone (laminar) | 21844 | 203 | 204 | 1 | <5 | 62 | 342 | 2.1 |
| | | | | 21845 | 204 | 205 | 1 | <5 | 61 | 230 | 1.8 |
| | | | | 21846 | 205 | 206 | 1 | <5 | 26 | 92 | 2.1 |
| | | | | 21847 | 206 | 207 | 1 | <5 | 62 | 311 | 2.0 |
| | | | | 21848 | 207 | 208 | 1 | 9 | 40 | 350 | 2.1 |
| | | | | 21849 | 208 | 209 | 1 | 12 | 25 | 38 | 1.6 |

6401221

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80A-2 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 306.00 | 311.00 | QUARTZITE: pink to cream, silicified, fine grained, brecciated?, clay veined sandstone. Rock very massive but badly broken. | | 21850 | 209 | 210 | 1 | 6 | 23 | 50 | 1.9 |
| | | | | 21851 | 210 | 211 | 1 | <5 | 29 | 29 | 2.1 |
| | | | | 21852 | 211 | 212 | 1 | <5 | 21 | 437 | 2.2 |
| | | | | 21853 | 212 | 213 | 1 | <5 | 15 | 338 | 1.9 |
| 311.00 | 319.80 | SANDSTONE: medium to coarse grained, very weathered, grey, foliated sandstone. Poor core recoveries in generally soft porous sandstones. | | 21854 | 213 | 214 | 1 | <5 | 10 | 20 | 2.2 |
| | | | | 21855 | 214 | 215 | 1 | <5 | 50 | 24 | 2.0 |
| | | | | 21856 | 215 | 216 | 1 | 5 | 8 | 48 | 1.8 |
| | | | | 21857 | 216 | 217 | 1 | <5 | 10 | 63 | 1.6 |
| 319.80 | 323.70 | SANDSTONE: cream to pink/white, medium grained, foliated, weathered, very soft, porous clayey sandstone. | | 21858 | 217 | 218 | 1 | <5 | <5 | 60 | 2.0 |
| | | | | 21859 | 218 | 219 | 1 | <5 | <5 | 22 | 1.3 |
| | | | | 21860 | 219 | 220 | 1 | <5 | 16 | 74 | 1.7 |
| | | | | 21861 | 220 | 221 | 1 | 14 | 50 | 177 | 2.0 |
| 323.70 | 331.00 | SANDSTONE: grey, foliated slumped? weakly siderite veined, medium grained sandstone with minor siltstone interbeds. Trace of galena and sphalerite within siderite veinlets. Poor core recoveries in soft ground ~ 25%. | Trace galena, sphalerite in thin veinlets. | 21862 | 221 | 222 | 1 | 11 | 60 | 170 | 1.9 |
| | | | | 21863 | 222 | 223 | 1 | <5 | 46 | 47 | 1.7 |
| | | | | 21864 | 223 | 224 | 1 | <5 | 40 | 34 | 1.6 |
| E.O.H | 331.00m | | | 21865 | 224 | 225 | 1 | <5 | 7 | 604 | 1.8 |
| | | | | 21866 | 225 | 226 | 1 | <5 | 12 | 54 | 1.5 |
| | | | | 21867 | 226 | 227 | 1 | <5 | 7 | 77 | 1.4 |
| | | | | 21868 | 227 | 228 | 1 | <5 | 30 | 160 | 1.8 |
| | | | | 21869 | 228 | 229 | 1 | 5 | 15 | 47 | 1.6 |
| | | | | - | 229 | 230 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 230 | 231 | 1 | NO | CORE | RECOVERY | |
| | | | | 21870 | 231 | 232 | 1 | <5 | <5 | 26 | 1.7 |
| | | | | 21871 | 232 | 233 | 1 | <5 | <5 | 37 | 1.8 |
| | | | | 21872 | 233 | 234 | 1 | 6 | 18 | 158 | 1.5 |
| | | | | 21873 | 234 | 235 | 1 | 15 | <5 | 45 | 1.8 |
| | | | | 21874 | 235 | 236 | 1 | 5 | 21 | 26 | 1.6 |
| | | | | 21875 | 236 | 237 | 1 | <5 | 27 | 245 | 2.7 |
| | | | | 21876 | 237 | 238 | 1 | <5 | 18 | 127 | 2.3 |
| | | | | 21877 | 238 | 239 | 1 | 11 | 35 | 1826 | 2.9 |
| | | | | 21878 | 239 | 240 | 1 | 37 | 145 | 1315 | 3.0 |
| | | | | 21879 | 240 | 241 | 1 | 6 | 75 | 1864 | 2.4 |
| | | | | 21880 | 241 | 242 | 1 | 10 | 53 | 328 | 2.7 |
| | | | | 21881 | 242 | 243 | 1 | 11 | 52 | 197 | 2.5 |
| | | | | 21882 | 243 | 244 | 1 | 11 | 65 | 824 | 2.9 |
| | | | | 21883 | 244 | 245 | 1 | 16 | 48 | 135 | 2.8 |
| | | | | 21884 | 245 | 246 | 1 | 7 | 31 | 164 | 3.1 |
| | | | | 21885 | 246 | 247 | 1 | <5 | 27 | 136 | 2.7 |
| | | | | 21886 | 247 | 248 | 1 | 14 | 75 | 324 | 3.3 |
| | | | | 21887 | 248 | 249 | 1 | <5 | 32 | 845 | 2.8 |
| | | | | 21888 | 249 | 250 | 1 | <5 | 197 | 2790 | 3.0 |
| | | | | 21889 | 250 | 251 | 1 | <5 | 33 | 95 | 2.7 |
| | | | | 21890 | 251 | 252 | 1 | <5 | 28 | 41 | 2.5 |
| | | | | 21891 | 252 | 253 | 1 | <5 | 34 | 74 | 2.7 |
| | | | | 21892 | 253 | 254 | 1 | <5 | 129 | 430 | 3.2 |
| | | | | 21893 | 254 | 255 | 1 | 5 | 42 | 369 | 2.8 |
| | | | | 21894 | 255 | 256 | 1 | 10 | 106 | 1604 | 3.2 |
| | | | | 21895 | 256 | 257 | 1 | <5 | 118 | 656 | 2.6 |
| | | | | 21896 | 257 | 258 | 1 | 16 | 360 | 849 | 3.0 |
| | | | | 21897 | 258 | 259 | 1 | <5 | 180 | 603 | 2.9 |
| | | | | 21898 | 259 | 260 | 1 | <5 | 107 | 475 | 2.6 |
| | | | | 21899 | 260 | 261 | 1 | <5 | 40 | 290 | 2.6 |
| | | | | 21900 | 261 | 262 | 1 | <5 | 25 | 88 | 2.8 |

649125

Amoco Minerals Australia Company

DRILL LOG HOLE No. ZT- 80A - 2 PAGE 6 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 21901 | 262 | 263 | 1 | 10 | 180 | 692 | 3.3 |
| | | | | 21902 | 263 | 264 | 1 | 17 | 125 | 155 | 3.2 |
| | | | | 21903 | 264 | 265 | 1 | 17 | 157 | 563 | 3.6 |
| | | | | 21904 | 265 | 266 | 1 | 9 | 270 | 1236 | 3.4 |
| | | | | 21905 | 266 | 267 | 1 | <5 | 121 | 994 | 2.9 |
| | | | | 21906 | 267 | 268 | 1 | <5 | 72 | 468 | 3.3 |
| | | | | - | 268 | 269 | 1 | NO | CORE | RECOVERY. | |
| | | | | 21907 | 269 | 270 | 1 | <5 | 106 | 2620 | 2.8 |
| | | | | 21908 | 270 | 271 | 1 | <5 | 109 | 902 | 3.1 |
| | | | | 21909 | 271 | 272 | 1 | <5 | 51 | 921 | 3.4 |
| | | | | 21910 | 272 | 273 | 1 | <5 | 47 | 2600 | 3.2 |
| | | | | - | 273 | 274 | 1 | NO | CORE | RECOVERY. | |
| | | | | - | 274 | 275 | 1 | NO | CORE | RECOVERY. | |
| | | | | 21911 | 275 | 276 | 1 | 16 | 2110 | 9450 | 4.4 |
| | | | | 21786 | 276 | 277 | 1 | 28 | 717 | 2780 | 8.8 |
| | | | | 21787 | 277 | 278 | 1 | 33 | 3660 | 2100 | 15.5 |
| | | | | 21788 | 278 | 279 | 1 | 29 | 3720 | 3690 | 9.6 |
| | | | | 21789 | 279 | 280 | 1 | 23 | 1440 | 1905 | 10.2 |
| | | | | 21790 | 280 | 281 | 1 | 20 | 1570 | 2020 | 9.6 |
| | | | | 21791 | 281 | 282 | 1 | 15 | 1270 | 1317 | 1.4 |
| | | | | 21792 | 282 | 283 | 1 | 14 | 1440 | 1938 | 1.8 |
| | | | | 21793 | 283 | 284 | 1 | 12 | 913 | 1015 | 1.5 |
| | | | | 21794 | 284 | 285 | 1 | 22 | 1.71% | 7400 | 9 |
| | | | | 21795 | 285 | 286 | 1 | 30 | 1.42 | 5900 | 9 |
| | | | | 21796 | 286 | 287 | 1 | 31 | 9210 | 3980 | 0.4 |
| | | | | 21797 | 287 | 288 | 1 | 54 | 1.69 | 7500 | 4 |
| | | | | 21798 | 288 | 289 | 1 | 102 | 1.75 | 7200 | 5 |
| | | | | 21799 | 289 | 290 | 1 | 98 | 1.16 | 6600 | 3 |
| | | | | 21800 | 290 | 291 | 1 | 406 | 6610 | 6340 | 0.4 |
| | | | | 21801 | 291 | 292 | 1 | 614 | 4390 | 4610 | 1.1 |
| | | | | 21802 | 292 | 293 | 1 | 502 | 5360 | 4120 | 20.1 |
| | | | | 21803 | 293 | 294 | 1 | 645 | 2920 | 5260 | 0.8 |
| | | | | 21804 | 294 | 295 | 1 | 12 | 3900 | 1.45 | 5 |
| | | | | 21805 | 295 | 296 | 1 | <5 | 5200 | 2.18 | 2 |
| | | | | 21806 | 296 | 297 | 1 | <5 | 3600 | 1.81 | 2 |
| | | | | 21807 | 297 | 298 | 2 | <5 | 4000 | 3.12 | 20 |
| | | | | - | 298 | 299 | | | | | |
| | | | | 21808 | 299 | 300 | 1 | 30 | 3800 | 7120 | 1.2 |
| | | | | 21912 | 300 | 301 | 1 | 76 | 3820 | 1790 | 3.5 |
| | | | | 21913 | 301 | 302 | 1 | 89 | 1680 | 3850 | 2.3 |
| | | | | 21914 | 302 | 303 | 1 | 50 | 588 | 1250 | 1.9 |
| | | | | 21915 | 303 | 304 | 1 | 6 | 626 | 522 | 1.7 |
| | | | | 21916 | 304 | 305 | 1 | <5 | 404 | 867 | 2.4 |
| | | | | 21917 | 305 | 306 | 1 | <5 | 349 | 660 | 2.2 |
| | | | | 21918 | 306 | 307 | 1 | 24 | 319 | 674 | 3.2 |
| | | | | 21919 | 307 | 308 | 1 | 30 | 314 | 629 | 3.6 |
| | | | | 21920 | 308 | 309 | 1 | 29 | 217 | 326 | 3.8 |
| | | | | 21921 | 309 | 310 | 1 | 19 | 105 | 172 | 1.4 |
| | | | | 21922 | 310 | 311 | 1 | <5 | 45 | 115 | 1.4 |
| | | | | 21923 | 311 | 312 | 1 | <5 | 62 | 181 | 1.9 |
| | | | | 21924 | 312 | 313 | 1 | 17 | 131 | 590 | 2.0 |
| | | | | 21925 | 313 | 314 | 1 | <5 | 368 | 727 | 2.1 |
| | | | | 21926 | 314 | 315 | 1 | <5 | 98 | 326 | 1.7 |

64926

Amoco Minerals Australia Company

DRILL LOG HOLE No. ZT-80A-2 PAGE 7 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 21927 | 315 | 316 | 1 | 15 | 1450 | 3160 | 2.9 |
| | | | | – | 316 | 317 | 1 | NO | CORE | RECOVERY | |
| | | | | 21928 | 317 | 318 | 1 | 13 | 79 | 374 | 2.1 |
| | | | | 21929 | 318 | 319 | 1 | 16 | 42 | 194 | 1.9 |
| | | | | 21930 | 319 | 320 | 1 | <5 | 79 | 445 | 2.3 |
| | | | | 21931 | 320 | 321 | 1 | <5 | 107 | 516 | 2.0 |
| | | | | 21932 | 321 | 322 | 1 | <5 | 17 | 67 | 1.6 |
| | | | | 21939 | 322 | 323 | 1 | <5 | 329 | 1112 | 2.2 |
| | | | | 21940 | 323 | 324 | 1 | <5 | 729 | 175 | 2.6 |
| | | | | 21941 | 324 | 325 | 1 | <5 | 1000 | 1332 | 2.6 |
| | | | | 21942 | 325 | 326 | 1 | 48 | 170 | 338 | 4.1 |
| | | | | 21943 | 326 | 327 | 1 | <5 | 94 | 225 | 2.1 |
| | | | | 21944 | 327 | 328 | 1 | 37 | 82 | 329 | 1.9 |
| | | | | 21945 | 328 | 329 | 1 | <5 | 59 | 140 | 2.1 |
| | | | | – | 329 | 330 | 1 | NO | CORE | RECOVERY | |
| | | | | – | 330 | 331 | 1 | NO | CORE | RECOVERY | |
| | | | | END OF HOLE | 331 | metres. | | | | | |

6491621

649128

Amoco Minerals Australia Company

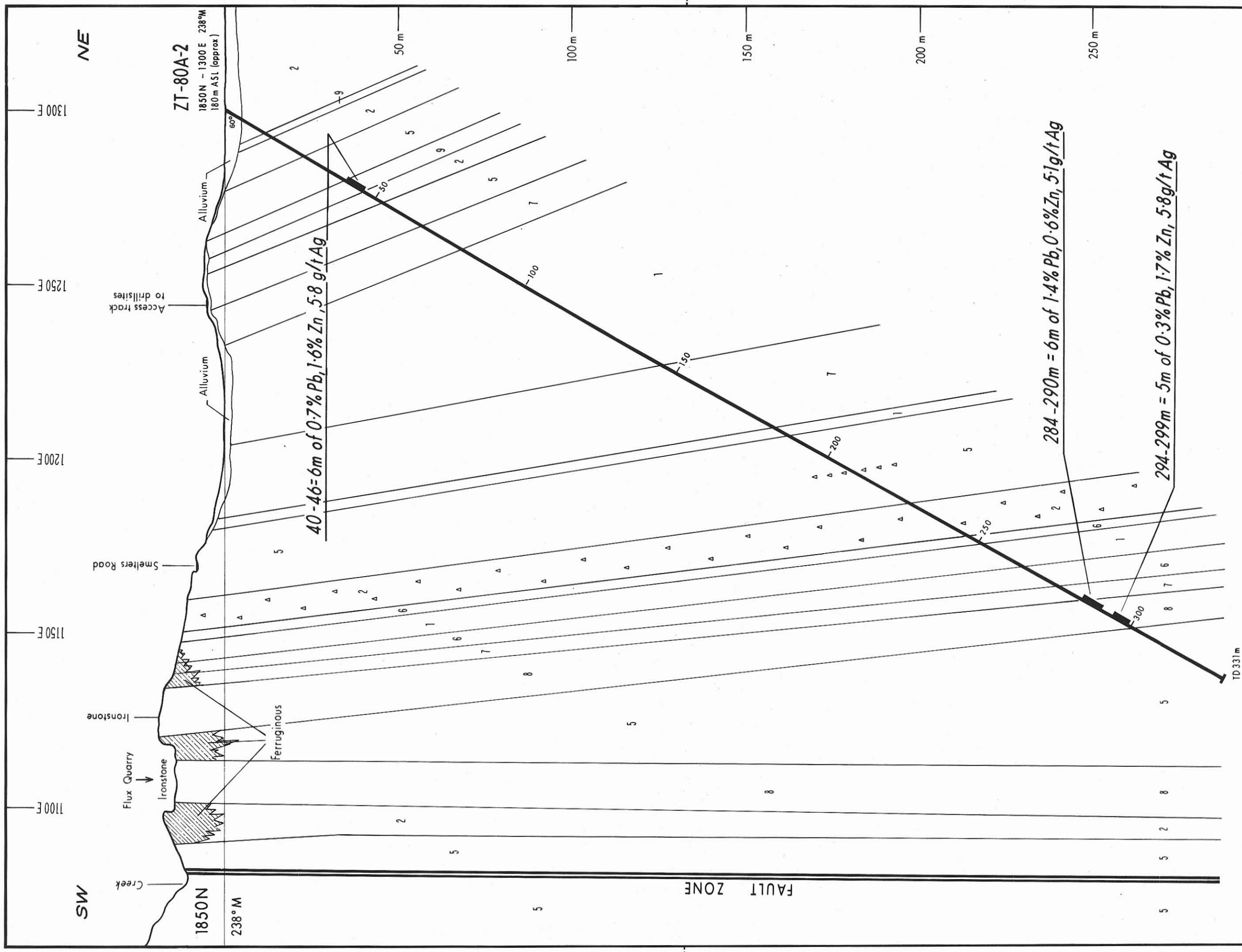
# ZEEHAN PROJECT
# A-78-60
# EL 4/78, TASMANIA

PROSPECT: **AUSTRAL**

## CROSS SECTION DRILLHOLE ZT-80A-2

Scale: Vertical and horizontal - 1:1000

5 cm




## Legend

| | | |
|---|---|---|
| Limestone | 1 | 33 |
| Dolomite.....(breccia) | 2 | 29 |
| Fossil breccia | 3 | 46 |
| Slump breccia | 4 | 41 |
| Sandstone | 5 | 61 |
| Siltstone | 6 | 69 |
| Shale | 7 | 8 |
| Mineralization and/or ironstone | 8 | 14 |
| Siderite/calcite/ankerite/breccia | 9 | 12 |
| Laminar limestone | 10 | 37 |
| Slumped limestone | 11 | 28 |
| Conglomerate | 12 | 65 |
| Calcite/siderite veins | Ca/Sd | |

Vein orientation unknown — Ca

Vein orientation accurate — Ca

Brecciation (tectonic)

Zone of Pb/Zn Ca/Sd mineralization

REPORT 279

M82-1845

649129

OCEANA PROSPECT

DRILLHOLE DATA

ZT-80-3

| | | |
|---|---|---|
| Location | : | 3200N:1515E |
| Declination | : | 60° |
| Azimuth | : | 270°G |
| Total Depth | : | 399.70 meters |

Assay Results

237-238 = 1m @ 8.25% Pb + 0.39% Zn + 73.6 g/t Ag

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-3 — PAGE 1 OF 8

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN-TAS No. A7860 | ELEVATION meters | COMMENCED 01 FEB 1980 | BORE HOLE SURVEY | | | | | | INSTRUMENT EASTMAN CAMERA | | | | | |
| | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | | | |
| PROSPECT OCEANA | DIP COLLAR 60° | COMPLETED 15 FEB 1980 | 0 | 60° | 217 | 150 | 59.5 | 189 | 300 | 52° | IN CASING | | | |
| CO-ORDINATES 3200 N 1515 E | CORE SIZE HQ, NQ, BQ | TOTAL LENGTH 399.70 meters | 50 | 62 | IN CASING | 200 | 56 | 183 | 350 | 47° | 175 | | | |
| BEARING TN MN 270° GN | LOGGED BY P.A. JONES | | 100 | 61 | IN CASING | 250 | 65° | IN CASING | 400 | 41 | 173 | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 19.50 | Tricone: Dolomitic grey clays. Start HQ coring. | | 22020 | 19 | 20 | 1 | < 5 | 31 | 38 | < 1 |
| | | | | 22021 | 20 | 21 | 1 | < 5 | 35 | 18 | < 1 |
| 19.50 | 39.00 | LIMESTONE: interbedded, massive, grey, fossiliferous calcarenites and black, carbonaceous, massive pyritic (silty?) dolomites. Minor calcite veining 40° to c.a.; Bedding 35° to c.a at 23.00 metres. | Minor Pyrite within Dolomite. | 22022 | 21 | 22 | 1 | < 5 | 36 | 33 | < 1 |
| | | | | 22023 | 22 | 23 | 1 | 6 | 36 | 23 | < 1 |
| | | | | 22024 | 23 | 24 | 1 | 6 | 38 | 23 | < 1 |
| | | | | 22025 | 24 | 25 | 1 | 5 | 36 | 20 | < 1 |
| | | | | 22026 | 25 | 26 | 1 | < 5 | 34 | 17 | < 1 |
| 39.00 | 52.50 | SOFT SEDIMENT SLUMPED LIMESTONE: interbedded calcarenites and calclutites with carbonaceous and very pyritic micritic dolomites. Pyrite very fine grained averaging 15% of Dolomite. Rock soft sediment slumped, with contorted and wavy bedding. General attitude 35° to c.a at 41.50 m and 45° to c.a. at 51.00 m. Trace galena 51.60 m in calcite vein. Moderate calcite veining at 48m and 52 m. | Fine grained pyrite, 15% within Dolomite, as beds or disseminations. Trace galena 51.60 m. | 22027 | 26 | 27 | 1 | < 5 | 38 | 89 | < 1 |
| | | | | 22028 | 27 | 28 | 1 | < 5 | 32 | 16 | < 1 |
| | | | | 22029 | 28 | 29 | 1 | < 5 | 34 | 45 | < 1 |
| | | | | 22030 | 29 | 30 | 1 | < 5 | 28 | 16 | < 1 |
| | | | | 22031 | 30 | 31 | 1 | 6 | 32 | 18 | 1 |
| | | | | 22032 | 31 | 32 | 1 | < 5 | 32 | 25 | 1 |
| | | | | 22033 | 32 | 33 | 1 | < 5 | 46 | 92 | < 1 |
| | | | | 22034 | 33 | 34 | 1 | < 5 | 39 | 103 | < 1 |
| | | | | 22035 | 34 | 35 | 1 | < 5 | 36 | 21 | < 1 |
| | | | | 22036 | 35 | 36 | 1 | < 5 | 36 | 20 | 1 |
| 52.50 | 55.00 | LIMESTONE: grey, massive, calcarenite (very fossiliferous - shelly detritus) interbedded with carbonaceous (silty?) dolomites. Very minor calcite veining. | | 22037 | 36 | 37 | 1 | 6 | 34 | 12 | 1 |
| | | | | 22038 | 37 | 38 | 1 | 6 | 38 | 13 | 1 |
| | | | | 22039 | 38 | 39 | 1 | 5 | 31 | 13 | 1 |
| | | | | 22040 | 39 | 40 | 1 | < 5 | 25 | 8 | < 1 |
| | | | | 22041 | 40 | 41 | 1 | < 5 | 29 | 11 | < 1 |
| 55.00 | 63.20 | LIMESTONE: Brecciated and soft sediment slumped grey, broken limestone. Contorted bedding, core micro faulted and fractured with calcite cement. Intense veining 61-63 m. Minor siderite and sphalerite assoc with calcite. | Sphalerite average 1% 62.00 to 62.50 m. | 22042 | 41 | 42 | 1 | < 5 | 30 | 10 | < 1 |
| | | | | 22043 | 42 | 43 | 1 | < 5 | 36 | 11 | 1 |
| | | | | 22044 | 43 | 44 | 1 | < 5 | 38 | 9 | 1 |
| | | | | 22045 | 44 | 45 | 1 | < 5 | 33 | 14 | < 1 |
| | | | | 22046 | 45 | 46 | 1 | < 5 | 45 | 11 | < 1 |
| | | | | 22047 | 46 | 47 | 1 | < 5 | 41 | 263 | < 1 |
| 63.20 | 69.00 | LIMESTONE: (60:40) well bedded, soft sediment slumped calclutite with fossiliferous calcarenites and carbonaceous pyritic silty? dolomites. Carbonaceous layers generally < 2cm thick, some sections of limestone weakly laminated. Minor veining and tectonic brecciation 66.50m. Minor siderite/sphalerite at 66.60 m. Bedding 30° to c.a at 66m. | Disseminate pyrite within black Dolomites. Minor sphalerite 66.60 | 22048 | 47 | 48 | 1 | < 5 | 108 | 543 | < 1 |
| | | | | 22049 | 48 | 49 | 1 | < 5 | 139 | 842 | 1 |
| | | | | 22050 | 49 | 50 | 1 | < 5 | 178 | 560 | 1 |
| | | | | 22051 | 50 | 51 | 1 | < 5 | 62 | 89 | < 1 |
| | | | | 22052 | 51 | 52 | 1 | < 5 | 312 | 884 | 1 |
| | | | | 22053 | 52 | 53 | 1 | < 5 | 323 | 1740 | 1 |
| | | | | 22054 | 53 | 54 | 1 | < 5 | 217 | 708 | 1 |
| | | | | 22055 | 54 | 55 | 1 | < 5 | 120 | 375 | 1 |
| 69.00 | 87.00 | LIMESTONE: Dark grey, massive, fossiliferous (shelly) calclutites with minor interbeds of slumped black carbonaceous, laminar dolomites? Tectonic breccia 69 - 69.50 with calcite matrix. Bedding 40° to c.a at 75m. Moderate amount of microfaulting, minor calcite veining 20° to c.a. & 45° to c.a (perpendicular to bedding). Massive calcite and siderite vein 85.50 to 86.00. | | 22056 | 55 | 56 | 1 | < 5 | 76 | 252 | 1 |
| | | | | 22057 | 56 | 57 | 1 | < 5 | 90 | 226 | 1 |
| | | | | 22058 | 57 | 58 | 1 | < 5 | 93 | 1440 | 1 |
| | | | | 22059 | 58 | 59 | 1 | < 5 | 98 | 2360 | 1 |
| | | | | 22060 | 59 | 60 | 1 | < 5 | 171 | 653 | 1 |
| | | | | 22061 | 60 | 61 | 1 | < 5 | 186 | 1020 | 1 |
| | | | | 22062 | 61 | 62 | 1 | < 5 | 78 | 2650 | < 1 |
| | | | | 22063 | 62 | 63 | 1 | < 5 | 84 | 6250 | < 1 |
| START | NQ CORING at 89.70 metres. | | | 22064 | 63 | 64 | 1 | < 5 | 84 | 1420 | < 1 |

69360

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-3 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % |
|---|---|---|---|
| 87.00 | 104.00 | SOFT SEDIMENT SLUMPED LIMESTONE: dark grey calcilutite with minor interbeds of slumped?, black, carbonaceous, laminated ± pyritic dolocrite. Bedding 103-50 m 25° to c.a. | Pyrite smears on foliation? plane. |
| 104.00 | 110.50 | CALCILUTITE / DOLOMITE 50:50, Pyritic carbonaceous black laminar dolomites interbedded with fine grained, dark grey, crystalline, massive, calcilutite. Bedding 37° at 108m. | Bedded and disseminated fine grained pyrite ± 5% of Dolomite. |
| 110.50 | 112.50 | BRECCIA: Sedimentary breccia containing abundant rounded, colloform textured oolliths (large diameter oolliths). Fragments of fissile material (subrounded) in carbonate matrix. | |
| 112.50 | 123.00 | LIMESTONE (30:20) massive, dark grey, with shelly fossiliferous beds prominent, calcilutites interbedded with carbonaceous weakly pyritic shaley dolomites. Minor carbonate veining (calcite). Bedding 40° to c.a at 121 metres. The fissile dolomitic interbeds increase in abundance down hole. | Trace pyrite in carbonaceous dolomites. |
| 123.00 | 128.50 | TECTONIC BRECCIA. Bedded calcilutites and black carbonaceous dolomites brecciated and healed with an infusion of carbonate cement. Fragments very angular, poorly sorted & in general less than 5cm in length. Strong calcite veining also (perpendicular to bedding). Trace sphalerite associated with with calcite veining. Very minor galena also present generally with minor siderite. | Trace sphalerite, galena with minor siderite. |
| 128.50 | 154.00 | SLUMPED LIMESTONE: Dark grey, finely bedded, weakly calcite veined calcilutite with shelly fossiliferous beds (generally <5cm in width) interbedded with contorted (slumped?, load moled?) black, pyritic, carbonaceous foliated dolomite. Beds are generally 1-2 cm in width. Bedding 27° to c.a at 130.50 m; 25° to c.a at 148.50 m. Calcite veining 133.50 m - 134.00 m moderate to strong (breccia). Cavity 153.00 to 154.00 filled with black muds (NO CORE RECOVERY). | |
| 154.00 | 157.00 | BRECCIATED LIMESTONE: Strongly calcite veined, micro faulted, brecciated & cavernous limestone with minor carbonaceous black dolomites (± 10%). Cavity 154.50 - 155.00 (NO CORE RECOVERY). | |

| SAMPLE NUMBER | METERAGE From | To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|
| 22065 | 64 | 65 | 1 | <5 | 354 | 675 | 1 |
| 22066 | 65 | 66 | 1 | <5 | 121 | 1220 | <1 |
| 22067 | 66 | 67 | 1 | <5 | 104 | 5000 | <1 |
| 22068 | 67 | 68 | 1 | <5 | 87 | 420 | <1 |
| 22069 | 68 | 69 | 1 | <5 | 64 | 155 | <1 |
| 22070 | 69 | 70 | 1 | <5 | 92 | 182 | <1 |
| 22071 | 70 | 71 | 1 | <5 | 154 | 672 | <1 |
| 22072 | 71 | 72 | 1 | <5 | 85 | 1540 | <1 |
| 22073 | 72 | 73 | 1 | <5 | 81 | 417 | <1 |
| 22074 | 73 | 74 | 1 | <5 | 75 | 190 | <1 |
| 22075 | 74 | 75 | 1 | <5 | 112 | 575 | <1 |
| 22076 | 75 | 76 | 1 | <5 | 85 | 222 | <1 |
| 22077 | 76 | 77 | 1 | <5 | 68 | 232 | <1 |
| 22078 | 77 | 78 | 1 | <5 | 64 | 234 | <1 |
| 22079 | 78 | 79 | 1 | <5 | 70 | 189 | <1 |
| 22080 | 79 | 80 | 1 | <5 | 69 | 262 | <1 |
| 22081 | 80 | 81 | 1 | <5 | 88 | 405 | <1 |
| 22082 | 81 | 82 | 1 | <5 | 190 | 434 | 1 |
| 22083 | 82 | 83 | 1 | <5 | 221 | 864 | <1 |
| 22084 | 83 | 84 | 1 | <5 | 80 | 1550 | <1 |
| 22085 | 84 | 85 | 1 | <5 | 174 | 1600 | <1 |
| 22086 | 85 | 86 | 1 | <5 | 386 | 1570 | <1 |
| 22087 | 86 | 87 | 1 | <5 | 531 | 884 | <1 |
| 22088 | 87 | 88 | 1 | <5 | 353 | 882 | <1 |
| 22089 | 88 | 89 | 1 | <5 | 96 | 433 | <1 |
| 22090 | 89 | 90 | 1 | <5 | 102 | 439 | <1 |
| 21498 | 90 | 91 | 1 | <5 | 108 | 383 | <0.5 |
| 21499 | 91 | 92 | 1 | <5 | 86 | 436 | <0.5 |
| 21500 | 92 | 93 | 1 | <5 | 89 | 425 | <0.5 |
| 21951 | 93 | 94 | 1 | <5 | 88 | 333 | <0.5 |
| 21952 | 94 | 95 | 1 | <5 | 57 | 874 | <0.5 |
| 21953 | 95 | 96 | 1 | <5 | 30 | 192 | <0.5 |
| 21954 | 96 | 97 | 1 | <5 | 27 | 78 | <0.5 |
| 21955 | 97 | 98 | 1 | <5 | 23 | 34 | <0.5 |
| 21956 | 98 | 99 | 1 | <5 | 21 | 26 | <0.5 |
| 21957 | 99 | 100 | 1 | <5 | 19 | 79 | <0.5 |
| 21958 | 100 | 101 | 1 | <5 | 20 | 66 | <0.5 |
| 21959 | 101 | 102 | 1 | <5 | 12 | 41 | <0.5 |
| 21960 | 102 | 103 | 1 | 5 | 9 | 22 | <0.5 |
| 21961 | 103 | 104 | 1 | <5 | 11 | 19 | <0.5 |
| 21962 | 104 | 105 | 1 | 6 | 13 | 31 | <0.5 |
| 21963 | 105 | 106 | 1 | 6 | 22 | 21 | <0.5 |
| 21964 | 106 | 107 | 1 | 5 | 30 | 22 | <0.5 |
| 21965 | 107 | 108 | 1 | 6 | 9 | 13 | <0.5 |
| 21966 | 108 | 109 | 1 | 5 | 14 | 15 | <0.5 |
| 21967 | 109 | 110 | 1 | 5 | 14 | 83 | <0.5 |
| 21968 | 110 | 111 | 1 | 5 | 15 | 31 | <0.5 |
| 21969 | 111 | 112 | 1 | <5 | 17 | 54 | <0.5 |
| 21970 | 112 | 113 | 1 | <5 | 13 | 36 | <0.5 |
| 21971 | 113 | 114 | 1 | <5 | 12 | 19 | <0.5 |
| 21972 | 114 | 115 | 1 | <5 | 14 | 28 | <0.5 |
| 21973 | 115 | 116 | 1 | <5 | 12 | 37 | <0.5 |
| 21974 | 116 | 117 | 1 | <5 | 19 | 19 | <0.5 |

64913

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-3 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % |
|---|---|---|---|
| 159.00 | 170.20 | LIMESTONE: massive, grey, interbedded fossiliferous (pisoliths, shell fragments & other debitus) and non-fossiliferous calclutites, calcarenites and minor carbonaceous black dolomites. Moderate calcite veining and brecciation. Sequence rhythmically bedded. Bedding 43° to c.a at 160.70 metres. | |
| 170.20 | 175.90 | LIMESTONE / DOLOMITE: Foliated (laminated?) dark grey to black interbedded muddy calclutites and pyritic, carbonaceous shaley? dolomites. Minor calcite veining. Bedding 40° to c.a at 175.50 | |
| 175.90 | 181.10 | PISOLITHIC LIMESTONE: large pisoliths in arenaceous carbonate matrix along with fragments of colonial corals (bryzoa) possibly slumped into place, inter-bedded with soft sediment slumped, carbonaceous black pyritic dolomites and black calclutites & calcmicrites. Minor calcite veining (coloured pink by hematite staining??). | |
| 181.10 | 182.70 | SHALEY DOLOMITE: fissile and well laminated, pyritic (minor cross bedding?) and weakly calcite veined. Bedding 37° to c.a at 181.50m. | Disseminated pyrite. |
| 182.70 | 186.00 | SILTY DOLOMITE: laminated, massive, silty black / dark grey dolomite with thin interbeds of limestone; non-fossiliferous & grey. | |
| 186.00 | 218.50 | FOSSIL BRECCIA: Possibly slumped debris from reefal environment close to edge of basin. Fossil fragments include bryzoa (up to 7cm across) & other detritic colonial corals, algal balls - pisoliths, (up to 3 cm in width) as well as minor shell fragments in sparry or micritic cement. Unit becomes less fossiliferous down hole with calclutites and dolomites predominant. Possibly emplaced by turbidity currents and/or slumping. Moderate calcite veining, minor brecciation. 212.50m to 213.50. Bedding 198 m - 30° to c.a. | |
| 218.50 | 235.30 | SLUMPED LIMESTONE: grey, massive, crudely bedded, micritic limestone, gradually becoming more fossiliferous towards the base of the unit (increasing shell fragments and minor coral fragments) Moderate calcite veining, very little carbonaceous dolomite present, darker, siltier matrix for limestone (foliated micrite?). Bedding 235m - 45° to c.a. | |

| SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|
| 21975 | 117 | 118 | 1 | <5 | 10 | 15 | <0.5 |
| 21976 | 118 | 119 | 1 | <5 | 20 | 51 | <0.5 |
| 21977 | 119 | 120 | 1 | <5 | 80 | 212 | <0.5 |
| 21978 | 120 | 121 | 1 | <5 | 59 | 203 | <0.5 |
| 21979 | 121 | 122 | 1 | <5 | 90 | 277 | <0.5 |
| 21980 | 122 | 123 | 1 | <5 | 72 | 222 | 2.6 |
| 21981 | 123 | 124 | 1 | <5 | 31 | 70 | 2.8 |
| 21982 | 124 | 125 | 1 | <5 | 26 | 72 | 2.4 |
| 21983 | 125 | 126 | 1 | <5 | 45 | 84 | 2.6 |
| 21984 | 126 | 127 | 1 | <5 | 43 | 103 | 2.4 |
| 21985 | 127 | 128 | 1 | 5 | 114 | 1120 | 2.9 |
| 21986 | 128 | 129 | 1 | <5 | 171 | 710 | 2.5 |
| 21987 | 129 | 130 | 1 | <5 | 102 | 620 | 2.8 |
| 21988 | 130 | 131 | 1 | <5 | 88 | 398 | 2.5 |
| 21989 | 131 | 132 | 1 | <5 | 49 | 187 | 2.4 |
| 21990 | 132 | 133 | 1 | <5 | 61 | 253 | 2.3 |
| 21991 | 133 | 134 | 1 | <5 | 408 | 1740 | 2.5 |
| 21992 | 134 | 135 | 1 | <5 | 100 | 540 | 2.4 |
| 21993 | 135 | 136 | 1 | <5 | 320 | 970 | 2.4 |
| 21994 | 136 | 137 | 1 | <5 | 79 | 378 | 2.7 |
| 21995 | 137 | 138 | 1 | <5 | 166 | 540 | 2.8 |
| 21996 | 138 | 139 | 1 | <5 | 102 | 500 | 2.8 |
| 21997 | 139 | 140 | 1 | <5 | 61 | 435 | 2.6 |
| 21998 | 140 | 141 | 1 | <5 | 35 | 110 | 2.3 |
| 21999 | 141 | 142 | 1 | <5 | 100 | 265 | 2.6 |
| 22000 | 142 | 143 | 1 | <5 | 78 | 396 | 2.7 |
| 21508 | 143 | 144 | 1 | <5 | 28 | 71 | <0.5 |
| 21509 | 144 | 145 | 1 | <5 | 23 | 53 | <0.5 |
| 21510 | 145 | 146 | 1 | 5 | 18 | 34 | <0.5 |
| 21511 | 146 | 147 | 1 | <5 | 14 | 23 | <0.5 |
| 21512 | 147 | 148 | 1 | 5 | 11 | 15 | <0.5 |
| 21513 | 148 | 149 | 1 | 6 | 20 | 19 | <0.5 |
| 21514 | 149 | 150 | 1 | 6 | 17 | 14 | <0.5 |
| 21515 | 150 | 151 | 1 | 5 | 18 | 44 | <0.5 |
| 21516 | 151 | 152 | 1 | 5 | 33 | 40 | <0.5 |
| 21517 | 152 | 153 | 1 | <5 | 46 | 48 | <0.5 |
| 21518 | 153 | 154 | 1 | NO CORE RECOVERY. | | | |
| 21519 | 154 | 155 | 1 | <5 | 94 | 164 | <0.5 |
| 21520 | 155 | 156 | 1 | <5 | 24 | 109 | <0.5 |
| 21521 | 156 | 157 | 1 | <5 | 28 | 79 | <0.5 |
| 21522 | 157 | 158 | 1 | <5 | 17 | 40 | <0.5 |
| 21523 | 158 | 159 | 1 | <5 | 18 | 22 | <0.5 |
| 21524 | 159 | 160 | 1 | <5 | 26 | 29 | <0.5 |
| 21525 | 160 | 161 | 1 | <5 | 15 | 67 | <0.5 |
| 21526 | 161 | 162 | 1 | <5 | 12 | 20 | <0.5 |
| 21527 | 162 | 163 | 1 | <5 | 12 | 15 | <0.5 |
| 21528 | 163 | 164 | 1 | <5 | 25 | 66 | <0.5 |
| 21529 | 164 | 165 | 1 | <5 | 14 | 38 | <0.5 |
| 21530 | 165 | 166 | 1 | <5 | 12 | 34 | <0.5 |
| 21531 | 166 | 167 | 1 | <5 | 11 | 11 | <0.5 |
| 21532 | 167 | 168 | 1 | <5 | 10 | 290 | <0.5 |
| 21533 | 168 | 169 | 1 | <5 | 12 | 55 | <0.5 |
| 21534 | 169 | 170 | 1 | 7 | 18 | 22 | <0.5 |

640132

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-3 — PAGE 4 OF 8

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % |
|---|---|---|---|
| 235.30 | 238.20 | FOSSILIFEROUS LIMESTONE / DOLOMITE BRECCIA. Highly brecciated (fracture?), calcite veined, mineralized interbedded limestone and dolomite. Vein like galena mineralization in siderite/calcite gangue. Core very broken, Recovery 80% | 5-7% Galena from 237-238m in siderite gangue |
| 238.20 | 239.50 | BEDDED DOLOMITE/LIMESTONE. Well bedded, finely laminar black dolomite and dark grey laminated limestone. Bedding 65° to ca 239.30m. Calcite veining perpendicular to bedding. Veining weak to moderate and increasing down hole. | |
| 239.50 | 280.00 | INTERBEDDED LIMESTONE/DOLOMITE. Generally massive, slumped, grey limestone grading ↓ down hole, into an interbedded sequence of limestones & dolomite. These appear to be rhythmically bedded. Fossil content (mainly shelly detritus) increasing down hole. Minor zones of brecciation (breccias < 5cm wide with calcite cement). Bed of light grey, calcarenite from 270.50m to 281.40. (Massive & very fossiliferous). Graded bedding in the rhythmic sequence indicates sequence right way up. Bedding 40° to ca at 262m; 45° to ca at 275m 35° to ca at 278m. Very little calcite veining present in latter part of unit. Moderate to strong 237.50 to 247.50m. Dolomite (very dark & possibly silty) near the base of the unit is approximately 40% of the total volume. Rock from 276 to 279.5m possibly slumped (very blocky) containing rounded & sub angular fragments in laminar (cream/grey) sequence. | |
| 280.00 | 283.40 | LIMESTONE: white to light grey, calcarenite containing pyritic veinlets parallel to finely bedding (generally veinlets < 2mm in width). Shell fragments in limestone as well as pisolites and boulders. Unit becomes fossil breccia near the base. | Veinlet pyrite, veins < 2mm width. |
| 283.40 | 286.50 | SHALEY DOLOMITE: Fissile shaley dolomites, dark grey to black, brecciated, moderately calcite veined, moderately pyritic 2-3% as disseminations with coarser blebs present in minor amounts. Minor grey limestone present as thin interbeds. Bedding 42° to c.a at 284.50m | 2-3% pyrite disseminated in Dolomite. |
| 286.50 | 292.80 | LIMESTONE: Predominantly (≈75%) finely bedded, soft sediment slumped (load cast?), grey, massive limestone with thin (< 5cm) interbeds of black carbonaceous pyritic dolomite. Limestone has minor fossil debris (shells). Minor calcite veining and very minor pyritic blebs present. Bedding 45° to c.a at 289.50m. Cavity 290m to 291m | |

| SAMPLE NUMBER | METERAGE From | To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|
| 21535 | 170 | 171 | 1 | 5 | 10 | 20 | <0.5 |
| 21536 | 171 | 172 | 1 | 7 | 14 | 13 | <0.5 |
| 21537 | 172 | 173 | 1 | 9 | 12 | 15 | <0.5 |
| 21538 | 173 | 174 | 1 | 5 | 11 | 18 | <0.5 |
| 21539 | 174 | 175 | 1 | 5 | 14 | 58 | <0.5 |
| 21540 | 175 | 176 | 1 | 5 | 20 | 11 | <0.5 |
| 21541 | 176 | 177 | 1 | <5 | 19 | 21 | <0.5 |
| 21542 | 177 | 178 | 1 | <5 | 18 | 16 | <0.5 |
| 21543 | 178 | 179 | 1 | <5 | 84 | 11 | <0.5 |
| 21544 | 179 | 180 | 1 | <5 | 22 | 8 | <0.5 |
| 21545 | 180 | 181 | 1 | 7 | 22 | 9 | <0.5 |
| 21546 | 181 | 182 | 1 | 7 | 17 | 10 | <0.5 |
| 21547 | 182 | 183 | 1 | <5 | 14 | 10 | <0.5 |
| 21548 | 183 | 184 | 1 | <5 | 21 | 19 | <0.5 |
| 21549 | 184 | 185 | 1 | 5 | 9 | 11 | <0.5 |
| 21550 | 185 | 186 | 1 | 5 | 15 | 11 | <0.5 |
| 21551 | 186 | 187 | 1 | <5 | 12 | 11 | <0.5 |
| 21552 | 187 | 188 | 1 | <5 | 16 | 9 | <0.5 |
| 21553 | 188 | 189 | 1 | <5 | <5 | 11 | <0.5 |
| 21554 | 189 | 190 | 1 | 9 | <5 | 7 | <0.5 |
| 21555 | 190 | 191 | 1 | 7 | 12 | 5 | <0.5 |
| 21556 | 191 | 192 | 1 | 5 | 14 | 9 | <0.5 |
| 21557 | 192 | 193 | 1 | <5 | 13 | <5 | <0.5 |
| 21558 | 193 | 194 | 1 | <6 | 10 | 9 | <0.6 |
| 21559 | 194 | 195 | 1 | 6 | 14 | 10 | <0.5 |
| 21560 | 195 | 196 | 1 | <6 | 12 | 10 | <0.5 |
| 21561 | 196 | 197 | 1 | <6 | 9 | 9 | <0.5 |
| 21562 | 197 | 198 | 1 | <5 | 12 | 7 | <0.5 |
| 21563 | 198 | 199 | 1 | <5 | <5 | 9 | <0.5 |
| 21564 | 199 | 200 | 1 | <5 | <5 | <5 | <0.5 |
| 21565 | 200 | 201 | 1 | <5 | 11 | 36 | <0.5 |
| 21566 | 201 | 202 | 1 | <5 | 14 | 44 | <0.5 |
| 21567 | 202 | 203 | 1 | <5 | 11 | 18 | <0.5 |
| 21568 | 203 | 204 | 1 | <5 | <5 | 30 | <0.5 |
| 21569 | 204 | 205 | 1 | <5 | <5 | 13 | <0.5 |
| 21570 | 205 | 206 | 1 | <5 | 14 | 40 | <0.5 |
| 21571 | 206 | 207 | 1 | <5 | 20 | 25 | <0.5 |
| 21572 | 207 | 208 | 1 | <5 | 9 | 10 | <0.5 |
| 21573 | 208 | 209 | 1 | <5 | 10 | 10 | <0.5 |
| 21574 | 209 | 210 | 1 | <5 | 9 | 17 | <0.5 |
| 21575 | 210 | 211 | 1 | <5 | 10 | 21 | <0.5 |
| 21642 | 211 | 212 | 1 | < 5 | 39 | 22 | < 0.5 |
| 21643 | 212 | 213 | 1 | < 5 | 30 | 81 | < 0.5 |
| 21644 | 213 | 214 | 1 | < 5 | 46 | 28 | < 0.5 |
| 21645 | 214 | 215 | 1 | < 5 | 51 | 66 | < 0.5 |
| 21646 | 215 | 216 | 1 | < 5 | 42 | 47 | < 0.5 |
| 21647 | 216 | 217 | 1 | < 5 | 38 | 26 | < 0.5 |
| 21648 | 217 | 218 | 1 | < 5 | 46 | 161 | < 0.5 |
| 21649 | 218 | 219 | 1 | < 5 | 59 | 323 | < 0.5 |
| 21650 | 219 | 220 | 1 | < 5 | 209 | 292 | < 0.5 |
| 21651 | 220 | 221 | 1 | < 6 | 74 | 184 | < 0.5 |
| 21652 | 221 | 222 | 1 | < 5 | 43 | 42 | < 0.5 |
| 21658 | 222 | 223 | 1 | < 5 | 51 | 142 | < 0.5 |

64033

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 292.80 | 295.00 | SOFT SEDIMENT SLUMPED LIMESTONE: Porous, friable limestone, grey-brown in colour with part of the carbonate matrix dissolved giving arenaceous (porous) texture. Weakly pyritic, moderately calcite veined, minor brecciation? Core badly broken with recoveries approximating 85%. | trace pyrite | 21654 | 223 | 224 | 1 | <5 | 55 | 217 | <0.5 |
| | | | | 21655 | 224 | 225 | 1 | <5 | 45 | 102 | <0.5 |
| | | | | 21576 | 225 | 226 | 1 | <5 | 54 | 70 | <0.5 |
| | | | | 21577 | 226 | 227 | 1 | <5 | 43 | 52 | <0.5 |
| | | | | 21578 | 227 | 228 | 1 | <5 | 40 | 29 | <0.5 |
| | | | | 21579 | 228 | 229 | 1 | <5 | 42 | 53 | <0.6 |
| | | | | 21580 | 229 | 230 | 1 | <5 | 34 | 55 | <0.5 |
| 295.00 | 317.20 | BEDDED DOLOMITE: Black, very laminar, carbonaceous, moderately pyritic dolomite interbedded with dark grey, crudely laminar (load casted?) massive muddy limestone. Minor calcite veining. Seatbaus of core consisting entirely of shelly debries and pisoliths in a micritic matrix. Minor sedimentary breccias generally ≤ 5cm width. Bedding 42° to ca at 298.00m and 40° at 317m | Minor pyrite | 21656 | 230 | 231 | 1 | <5 | 30 | 14 | <0.5 |
| | | | | 21657 | 231 | 232 | 1 | <5 | 33 | 91 | <0.5 |
| | | | | 21658 | 232 | 233 | 1 | <5 | 35 | 35 | <0.5 |
| | | | | 21659 | 233 | 234 | 1 | <5 | 57 | 156 | <0.5 |
| | | | | 21660 | 234 | 235 | 1 | <5 | 78 | 258 | <0.5 |
| | | | | 21661 | 235 | 236 | 1 | <5 | 114 | 314 | <0.5 |
| | | | | 21662 | 236 | 237 | 1 | <5 | 211 | 273 | <0.5 |
| | | | | 21663 | 237 | 238 | 1 | 20 | 8.25 | 3900 | 73.6 |
| | | | | 21664 | 238 | 239 | 1 | 8 | 200 | 399 | <0.5 |
| 317.20 | 318.00 | CALCARENITE: white, massive crystalline calcarenite | | 21665 | 239 | 240 | 1 | <5 | 115 | 304 | <0.5 |
| START | BQ Coring at 322.50 metres. | | | 21666 | 240 | 241 | 1 | <5 | 207 | 517 | <0.5 |
| 318.00 | 334.50 | SOFT SEDIMENT SLUMPED LIMESTONE: grey, massive, weakly calcite veined calcilutite with thin interbeds of dark grey dolomite. Bedding 45° to c.a at 329m., Calcilutite contains numerous thin horizons of fossil debris (broken shells + oolithes etc). Large calcite vein 325.60 - 325.95 Polygonally folded, black carbonaceous rock present in minor amounts generally approximating an attitude perpendicular to bedding. | | 21667 | 241 | 242 | 1 | <5 | 74 | 164 | <0.5 |
| | | | | 21668 | 242 | 243 | 1 | <5 | 44 | 88 | <0.5 |
| | | | | 21669 | 243 | 244 | 1 | <5 | 130 | 450 | <0.5 |
| | | | | 21670 | 244 | 245 | 1 | <5 | 105 | 207 | <0.5 |
| | | | | | 246 | 247 | | | | | |
| | | | | 37586 | 247.5 | 248 | 3 | 6 | 90 | 20 | <1 |
| | | | | | 248 | 249 | | | | | |
| | | | | | 249 | 250 | | | | | |
| | | | | 37587 | 250.5 | 251 | 3.5 | 8 | 60 | 50 | <1 |
| 334.50 | 355.50 | LIMESTONE / DOLOMITE (60/40): Dark grey, weakly laminated, fossiliferous in part, calcarenite and calcilutites interbedded with black, very laminar carbonaceous, very pyritic (disseminated and bedded) shaley dolomite. Rock foliated? Weakly calcite veined, load casted. Minor sedimentary structures observed; flame structures, graded bedding. Carbonaceous calcite vein with slight brecciation 348m. | Disseminated + Bedded pyrite 2% | | 251 | 252 | | | | | |
| | | | | | 252 | 253 | | | | | |
| | | | | | 253 | 254 | | | | | |
| | | | | 37588 | 254 | 255 | 3 | 8 | 46 | 14 | <1 |
| | | | | | 255 | 256 | | | | | |
| | | | | | 256 | 257 | | | | | |
| | | | | 37589 | 257 | 258 | 3 | 8 | 110 | 36 | <1 |
| | | | | | 258 | 259 | | | | | |
| | | | | | 259 | 260 | | | | | |
| | | | | 37590 | 260 | 261 | 3 | 10 | 42 | 38 | <1 |
| | | | | | 261 | 262 | | | | | |
| | | | | | 262 | 263 | | | | | |
| | | | | 37591 | 263 | 264 | 3 | 12 | 30 | 48 | <1 |
| | | | | | 264 | 265 | | | | | |
| | | | | | 265 | 266 | | | | | |
| | | | | 37592 | 266 | 267 | 3 | 6 | 30 | 26 | <1 |
| | | | | | 267 | 268 | | | | | |
| | | | | | 268 | 269 | | | | | |
| 355.50 | 386.10 | MUDDY LIMESTONE: dark grey to black, massive (weakly foliated?) moderately to weakly fossiliferous load casted calcilutite with rare interbeds of black dolomite (generally <2cm thick). Minor calcite veining. Becoming more foliated and possibly shalier down hole. Bedding 55° to ca at 356m; 50° to ca at 375m. | | 37593 | 269 | 270 | 3 | 8 | 32 | 22 | <1 |
| | | | | | 270 | 271 | | | | | |
| | | | | | 271 | 272 | | | | | |
| | | | | 37594 | 272 | 273 | 3 | 8 | 30 | 14 | <1 |
| | | | | | 273 | 274 | | | | | |
| | | | | | 274 | 275 | | | | | |
| 386.10 | 387.40 | BRECCIA: Tectonic angular breccia with calcilutite and dolomite fragments in a calcite carbonaceous cement | | 37595 | 275 | 276 | 3 | 8 | 34 | 20 | <1 |

64912

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT - 80 - 3 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 387.40 | 396.60 | LIMESTONE: light grey, massive, crystalline, occasionally brecciated, strongly calcite veined fossiliferous calcarenite grading down hole into a darker grey calcilutite. | | | 276 | 277 | | | | | |
| | | | | | 277 | 278 | | | | | |
| | | | | 37596 | 278 | 279 | 3 | 8 | 36 | 46 | <1 |
| | | | | | 279 | 280 | | | | | |
| | | | | | 280 | 281 | | | | | |
| 396.60 | 399.70 | CALCILUTITE / SHALEY DOLOMITE (60:40) dark grey, fossiliferous, massive, local coated (crudely bedded ?) calcilutites interbedded with finely laminar, black, pyritic, carbonaceous shaley dolomite. Minor calcite veining. Bedding 55° to c.a. at 399. Minor pyrite within shaley dolomite and within calcite veining or calcite blebs in unit. | Minor disseminated pyrite, minor py blebs. | 37597 | 281 | 282 | 3 | 6 | 105 | 55 | <1 |
| | | | | | 282 | 283 | | | | | |
| | | | | | 283 | 284 | | | | | |
| | | | | 37598 | 284 | 285 | 3 | 8 | 50 | 120 | <1 |
| | | | | | 285 | 286 | | | | | |
| | | | | | 286 | 287 | | | | | |
| | | | | 37599 | 287 | 288 | 3 | 8 | 28 | 640 | <1 |
| | | | | | 288 | 289 | | | | | |
| | | | | | 289 | 290 | | | | | |
| | | | | 37600 | 290 | 291 | 3 | 6 | 32 | 40 | <1 |
| | | | | | 291 | 292 | | | | | |
| END OF HOLE | | | | | 292 | 293 | | | | | |
| 399.70m. | | | | 37601 | 293 | 294 | 3 | 8 | 26 | 22 | <1 |
| | | | | | 294 | 295 | | | | | |
| | | * HOLE MAKING WATER. | | | 295 | 296 | | | | | |
| | | | | 37602 | 296 | 297 | 3 | 10 | 26 | 22 | 1 |
| | | | | | 297 | 298 | | | | | |
| | | | | | 298 | 299 | | | | | |
| | | | | 37603 | 299 | 300 | 3 | 8 | 36 | 26 | <1 |
| | | | | | 300 | 301 | | | | | |
| | | | | | 301 | 302 | | | | | |
| | | | | 37604 | 302 | 303 | 3 | 4 | 28 | 26 | 1 |
| | | | | | 303 | 304 | | | | | |
| | | | | | 304 | 305 | | | | | |
| | | | | 37605 | 305 | 306 | 3 | 6 | 30 | 20 | <1 |
| | | | | | 306 | 307 | | | | | |
| | | | | | 307 | 308 | | | | | |
| | | | | 37606 | 308 | 309 | 3 | 4 | 24 | 18 | <1 |
| | | | | | 309 | 310 | | | | | |
| | | | | | 310 | 311 | | | | | |
| | | | | 37607 | 311 | 312 | 3 | 4 | 26 | 16 | <1 |
| | | | | | 312 | 313 | | | | | |
| | | | | | 313 | 314 | | | | | |
| | | | | 37608 | 314 | 315 | 3 | 4 | 26 | 16 | <1 |
| | | | | | 315 | 316 | | | | | |
| | | | | | 316 | 317 | | | | | |
| | | | | 37609 | 317 | 318 | 3 | 2 | 26 | 18 | <1 |
| | | | | | 318 | 319 | | | | | |
| | | | | | 319 | 320 | | | | | |
| | | | | 37610 | 320 | 321 | 3 | 4 | 32 | 42 | <1 |
| | | | | | 321 | 322 | | | | | |
| | | | | | 322 | 323 | | | | | |
| | | | | 37611 | 323 | 324 | 3 | 4 | 34 | 36 | <1 |
| | | | | | 324 | 325 | | | | | |
| | | | | | 325 | 326 | | | | | |
| | | | | 37612 | 326 | 327 | 3 | 2 | 22 | 18 | <1 |
| | | | | | 327 | 328 | | | | | |
| | | | | | 328 | 329 | | | | | |

649133

Amoco Minerals Australia Company

DRILL LOG HOLE No. ZT-80-3 PAGE 7 OF 8

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 37613 | 329 | 330 | 3 | 6 | 46 | 30 | <1 |
| | | | | | 330 | 331 | | | | | |
| | | | | | 331 | 332 | | | | | |
| | | | | 37614 | 332 | 333 | 3 | 18 | 18 | 22 | <1 |
| | | | | | 333 | 334 | | | | | |
| | | | | | 334 | 335 | | | | | |
| | | | | 37615 | 335 | 336 | 3 | 12 | 34 | 22 | <1 |
| | | | | | 336 | 337 | | | | | |
| | | | | | 337 | 338 | | | | | |
| | | | | 37616 | 338 | 339 | 3 | 14 | 16 | 16 | <1 |
| | | | | | 339 | 340 | | | | | |
| | | | | | 340 | 341 | | | | | |
| | | | | 37617 | 341 | 342 | 3 | 10 | 12 | 14 | 1 |
| | | | | | 342 | 343 | | | | | |
| | | | | | 343 | 344 | | | | | |
| | | | | 37618 | 344 | 345 | 3 | 10 | 36 | 28 | <1 |
| | | | | | 345 | 346 | | | | | |
| | | | | | 346 | 347 | | | | | |
| | | | | 37619 | 347 | 348 | 3 | 22 | 28 | 50 | <1 |
| | | | | | 348 | 349 | | | | | |
| | | | | | 349 | 350 | | | | | |
| | | | | 37620 | 350 | 351 | 3 | 20 | 36 | 60 | <1 |
| | | | | | 351 | 352 | | | | | |
| | | | | | 352 | 353 | | | | | |
| | | | | 37621 | 353 | 354 | 3 | 24 | 20 | 40 | <1 |
| | | | | | 354 | 355 | | | | | |
| | | | | | 355 | 356 | | | | | |
| | | | | 37622 | 356 | 357 | 3 | 10 | 28 | 46 | <1 |
| | | | | | 357 | 358 | | | | | |
| | | | | | 358 | 359 | | | | | |
| | | | | 37623 | 359 | 360 | 3 | 10 | 16 | 26 | <1 |
| | | | | | 360 | 361 | | | | | |
| | | | | | 361 | 362 | | | | | |
| | | | | 37624 | 362 | 363 | 3 | 20 | 28 | 34 | <1 |
| | | | | | 363 | 364 | | | | | |
| | | | | | 364 | 365 | | | | | |
| | | | | 37625 | 365 | 366 | 3 | 8 | 16 | 24 | <1 |
| | | | | | 366 | 367 | | | | | |
| | | | | | 367 | 368 | | | | | |
| | | | | 37626 | 368 | 369 | 3 | 8 | 16 | 20 | <1 |
| | | | | | 369 | 370 | | | | | |
| | | | | | 370 | 371 | | | | | |
| | | | | 37627 | 371 | 372 | 3 | 20 | 16 | 34 | <1 |
| | | | | | 372 | 373 | | | | | |
| | | | | | 373 | 374 | | | | | |
| | | | | 37628 | 374 | 375 | 3 | 8 | 16 | 30 | <1 |
| | | | | | 375 | 376 | | | | | |
| | | | | | 376 | 377 | | | | | |
| | | | | 37629 | 377 | 378 | 3 | 12 | 36 | 100 | <1 |
| | | | | | 378 | 379 | | | | | |
| | | | | | 379 | 380 | | | | | |
| | | | | 37630 | 380 | 381 | 3 | 22 | 20 | 44 | <1 |
| | | | | | 381 | 382 | | | | | |

649136

Amoco Minerals Australia Company

DRILL LOG HOLE No. ZT-80-3 PAGE 8 OF 8

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 382 | 383 | | | | | |
| | | | | 37631 | 383 | 384 | 3 | 18 | 60 | 180 | <1 |
| | | | | | 384 | 385 | | | | | |
| | | | | | 385 | 386 | | | | | |
| | | | | 37632 | 386 | 387 | 3 | 24 | 32 | 50 | <1 |
| | | | | | 387 | 388 | | | | | |
| | | | | | 388 | 389 | | | | | |
| | | | | 37633 | 389 | 390 | 3 | 18 | 28 | 60 | <1 |
| | | | | | 390 | 391 | | | | | |
| | | | | | 391 | 392 | | | | | |
| | | | | 37634 | 392 | 393 | 3 | 8 | 20 | 44 | <1 |
| | | | | | 393 | 394 | | | | | |
| | | | | | 394 | 395 | | | | | |
| | | | | 37635 | 395 | 396 | 3 | 14 | 50 | 70 | <1 |
| | | | | | 396 | 397 | | | | | |
| | | | | | 397 | 398 | | | | | |
| | | | | 37636 | 398 | 399 | 2 | 14 | 75 | 46 | <1 |
| | | | | | 399 | 400 | | | | | |
| | | | | E.O.H | | | | | | | |

64913

649138

OCEANA PROSPECT

DRILLHOLE DATA

ZT-80-4

| | | |
|---|---|---|
| Location | : | 3420N:1490E |
| Declination | : | 66° |
| Azimuth | : | 270°G |
| Total Depth | : | 360.30 meters |

Assay Results

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 247-258 | = | 11m | @ | 12.00% | Pb | + | 4.00% | Zn + 89.0 g/t Ag |
| including | 250-258 | = | 8m | @ | 15.00% | Pb | + | 5.40% | Zn + 113.0 g/t Ag |
| | 302-307 | = | 5m | @ | 22.30% | Pb | + | 1.99% | Zn + 323.0 g/t Ag |
| including | 304-307 | = | 3m | @ | 36.00% | Pb | + | 3.20% | Zn + 530.0 g/t Ag |

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT - 80 - 4 — PAGE 1 OF 7

| | | | |
|---|---|---|---|
| PROJECT ZEEHAN TAS No. 7860 | ELEVATION meters | COMMENCED 18 FEB 1980 | |
| PROSPECT OCEANA | DIP COLLAR 66° GW | COMPLETED 28 FEB 1980 | |
| CO-ORDINATES 3420 mN 1490 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 360.30 meters | |
| BEARING 228° TN 217° MN 270° GN | LOGGED BY P.A. JONES. | | |

BORE HOLE SURVEY — INSTRUMENT EASTMAN CAMERA

| Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing |
|---|---|---|---|---|---|---|---|---|
| 50 | 66° | 211° | 200 | 67 | 202 | 350 | 59.5 | 180 |
| 100 | 67° | 245° | 250 | 65 | 191 | | | |
| 150 | 67.5 | 216 | 300 | 64 | 188 | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % |
|---|---|---|---|
| 0.00 | 9.00 | TRICONE : Conglomeratic Alluvial Gravels. START HQ CORING. | |
| 9.00 | 32.50 | DOLOMITE: LIMESTONE BRECCIA : Tectonically brecciated, massive to thicky laminare dark grey dolomite and light grey fossiliferous limestone. Core extremely brecciated, calcite and siderite veined and micro-faulted. Bad ground of sideritic, black, carbonaceous Dolomite (silty?) from 27.00 to 27.30m. Bedding 25° to c.a. at 14.50m. Cavity 9.80m to 11.00m | Trace pyrite calcite veins. |
| 32.50 | 42.30 | SILTY DOLOMITE : weakly brecciated, foliated, black carbonaceous silty dolomite with interbeds of dark grey dolomitic limestones. Core moderately calcite veined with only minor to trace siderite. Tectonic breccia 38.10 to 38.65m. Trace pyrite with Calcite veins. Bedding 37° at 32.60. | Trace pyrite calcite veins |
| 42.30 | 58.80 | LIMESTONE BRECCIA : limestone ; light grey to white, massive to laminar, weakly fossiliferous karstic? breccia. limey grey, very laminar, muddy dolomitic limestones from 46.40 to 47.70m. Breccia grades into a grey, moderately veined (calcite) Dolomite. Karstic breccia healed by an infusion of calcite with minor siderite. Bedding 46.50m — 35° to c.a. | |
| 58.80 | 62.20 | CARBONACEOUS DOLOMITE: Dark grey to black, carbonaceous, strongly calcite veined, foliated silty Dolomite. Minor amounts of siderite present with calcite veining. Strong foliation 15° to c.a. (almost parallel). Possible fold hinge?? | |
| 62.20 | 76.20 | SILTY DOLOMITE / LIMESTONE : interbedded, dark grey, foliated, laminar, massive silty Dolomites and light grey, occasionally weakly fossiliferous muddy calcilutites. Moderately calcite veined, well bedded sequence, minor, microfaulting & little brecciation. Bedding 16° to ca 63.80m; 22° to ca 67.50m 37° to ca 69.50m. | |
| 76.20 | 78.60 | DOLOMITIC FOSSIL BRECCIA : very weathered, dark grey and black, brecciated dolomite containing abundant coralline fossil debris. Minor calcite veining. | |

| SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|
| 36927 | 9.00 | 10.00 | 3 | 4 | 165 | 670 | <1 |
| | 10 | 11 | | NO CORE RECOVERY | | | |
| | 11 | 12 | | | | | |
| 36928 | 12 | 13 | 3 | 6 | 85 | 840 | <1 |
| | 13 | 14 | | | | | |
| | 14 | 15 | | | | | |
| 36929 | 15 | 16 | 3 | 6 | 60 | 950 | <1 |
| | 16 | 17 | | | | | |
| | 17 | 18 | | | | | |
| 36930 | 18 | 19 | 3 | 8 | 180 | 1400 | <1 |
| | 19 | 20 | | | | | |
| | 20 | 21 | | | | | |
| 36931 | 21 | 22 | 3 | 8 | 260 | 770 | <1 |
| | 22 | 23 | | | | | |
| | 23 | 24 | | | | | |
| 36932 | 24 | 25 | 3 | 6 | 120 | 1150 | <1 |
| | 25 | 26 | | | | | |
| | 26 | 27 | | | | | |
| 36933 | 27 | 28 | 3 | 4 | 290 | 950 | <1 |
| | 28 | 29 | | | | | |
| | 29 | 30 | | | | | |
| 36934 | 30 | 31 | 3 | 16 | 135 | 720 | <1 |
| | 31 | 32 | | | | | |
| | 32 | 33 | | | | | |
| 36935 | 33 | 34 | 3 | 16 | 44 | 160 | <1 |
| | 34 | 35 | | | | | |
| | 35 | 36 | | | | | |
| 36936 | 36 | 37 | 3 | 38 | 130 | 280 | <1 |
| | 37 | 38 | | | | | |
| | 38 | 39 | | | | | |
| 36937 | 39 | 40 | 3 | 10 | 410 | 880 | <1 |
| | 40 | 41 | | | | | |
| | 41 | 42 | | | | | |
| 36938 | 42 | 43 | 3 | 8 | 60 | 250 | <1 |
| | 43 | 44 | | | | | |
| | 44 | 45 | | | | | |
| 36939 | 45 | 46 | 3 | 8 | 210 | 510 | <1 |
| | 46 | 47 | | | | | |
| | 47 | 48 | | | | | |
| 36940 | 48 | 49 | 3 | 4 | 230 | 970 | <1 |
| | 49 | 50 | | | | | |
| | 50 | 51 | | | | | |
| 36941 | 51 | 52 | 3 | 4 | 195 | 1200 | <1 |
| | 52 | 53 | | | | | |
| | 53 | 54 | | | | | |

64913

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Ag | Pb | Zn | As |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 78.60 | 85.50 | CALCARENITE : light grey, calcite veined, massive very fossiliferous, oolitic calcarenite with minor interbeds of brecciated karstic? limestones (calcilutites) and thin, black, carbonaceous dolomite. Rock foliated, probably slumped in part (disturbed bedding). Minor siderite. | | 36942 | 54 | 55 | 3 | 6 | 370 | 940 | <1 |
| | | | | | 55 | 56 | | | | | |
| | | | | | 56 | 57 | | | | | |
| | | | | 36943 | 57 | 58 | 3 | 6 | 145 | 490 | <1 |
| | | | | | 58 | 59 | | | | | |
| | | | | | 59 | 60 | | | | | |
| 85.50 | 95.00 | SEDIMENTARY BRECCIA : large and small fragments of country rock, few isolated fragments of fossils in an Iron/Calcium carbonate cement. Zone strongly calcite veined. Cavity 87.00 to 88.00 (sand filled?) Carbonaceous dolomite also present as matrix for breccia. | | 36944 | 60 | 61 | 4 | 6 | 130 | 430 | <1 |
| | | | | | 61 | 62 | | | | | |
| | | | | | 62 | 63 | | | | | |
| | | | | | 63 | 64 | | | | | |
| | | | | 36945 | 64 | 65 | 3 | 12 | 70 | 225 | <1 |
| | | | | | 65 | 66 | | | | | |
| 95.00 | 97.00 | CALCITE/SIDERITE CRUSH ZONE: rock very weathered, core extensively broken, heavily calcite and siderite veined. | | | 66 | 67 | | | | | |
| | | | | 36946 | 67 | 68 | 3 | 10 | 170 | 420 | <1 |
| | | | | | 68 | 69 | | | | | |
| 97.00 | 101.00 | FOSSILIFEROUS CALCARENITE : white to light grey, moderately calcite veined, weathered (sericitically altered) oolitic calcarenite. Minor brecciation. Minor siderite associated with calcite. No bedding, unit very massive & homogeneous. | | | 69 | 70 | | | | | |
| | | | | 36947 | 70 | 71 | 3 | 8 | 150 | 590 | <1 |
| | | | | | 71 | 72 | | | | | |
| | | | | | 72 | 73 | | | | | |
| | | | | 36948 | 73 | 74 | 3 | 8 | 125 | 570 | <1 |
| | | | | | 74 | 75 | | | | | |
| 101.00 | 118.50 | SEDIMENTARY FOSSIL BRECCIA: Calcarenite above grades downhole into a massive sequence of slump brecciated calcilutites, fossiliferous calcarenites, and black carbonaceous dolomites. Coralline limestone fragments and pisolithes quite common (near reefal environment ?). Core extensively calcite/siderite veined. No bedding. Minor pyritic zones. Cavity 108.00 to 104.50 metres. | Minor pyrite. | | 75 | 76 | | | | | |
| | | | | 36949 | 76 | 77 | 3 | 12 | 165 | 750 | <1 |
| | | | | | 77 | 78 | | | | | |
| | | | | | 78 | 79 | | | | | |
| | | | | 36950 | 79 | 80 | 3 | 8 | 80 | 400 | 1 |
| | | | | | 80 | 81 | | | | | |
| | | | | | 81 | 82 | | | | | |
| | | | | 36764 | 82 | 83 | 3 | 6 | 60 | 490 | 1 |
| | | | | | 83 | 84 | | | | | |
| 118.50 | 123.80 | BRECCIATED CALCILUTITE : grey, massive foliated, un-fossiliferous calcilutites, heavily calcite veined, with minor siderite. Thin carbonaceous laminae present roughly every 5cm. Bedding extremely disturbed. | | | 84 | 85 | | | | | |
| | | | | 36765 | 85 | 86 | 3 | 8 | 470 | 1200 | 1 |
| | | | | | 86 | 87 | | | | | |
| | | | | | 87 | 88 | | NO CORE RECOVERY | | | |
| | | | | 36766 | 88 | 89 | 3 | 6 | 90 | 940 | 1 |
| 123.80 | 125.50 | Oolitic Calcarenite: light grey, massive, oolitic calcarenite with disturbed interbeds of dark grey oolitic, muddy? calcilutites? | | | 89 | 90 | | | | | |
| | | | | | 90 | 91 | | | | | |
| | | | | 36767 | 91 | 92 | 3 | 4 | 85 | 200 | 1 |
| | | | | | 92 | 93 | | | | | |
| 125.50 | 150.70 | CALCILUTITE/CALCARENITE BRECCIA : Extremely brecciated highly calcite/siderite veined grey massive calcilutites/calcarenites and dark grey dolomitic calcilutites. Minor sericitically altered, quite weathered zones present throughout. Cavity 131.50 - 132.20 containing concretionary pyrite lining. Oolitic sections of core present as very large fragments within sedimentary Breccia? | | | 93 | 94 | | | | | |
| | | | | 36768 | 94 | 95 | 3 | 4 | 140 | 610 | 1 |
| | | | | | 95 | 96 | | | | | |
| | | | | | 96 | 97 | | | | | |
| | | | | 36769 | 97 | 98 | 3 | 4 | 55 | 90 | 1 |
| | | | | | 98 | 99 | | | | | |
| | | | | | 99 | 100 | | | | | |
| | | | | 36770 | 100 | 101 | 3 | 4 | 95 | 220 | 1 |
| 150.70 | 179.00 | Interbedded CALCILUTITES/CALCARENITES: Grey, massive, weakly foliated, moderately calcite veined calcilutites interbedded with light grey fossiliferous (shelly) calcarenites and minor thin silty black laminar dolomite. Calcarenites generally 5-15cm in width, dolomite generally <2cm. Possible fold hinge at 174 m bedding parallel to c.a. | | | 101 | 102 | | | | | |
| | | | | | 102 | 103 | | | | | |
| | | | | 36771 | 103 | 104 | 3 | 4 | 90 | 170 | 1 |
| | | | | | 104 | 105 | | | | | |
| | | | | | 105 | 106 | | | | | |
| | | | | 36772 | 106 | 107 | 3 | 4 | 20 | 80 | 1 |

64910

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-4 — PAGE 3 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 150.70 | 179.00 | Con't: Bedding becoming very disturbed down hole. Bedding 30° to ca at 157m; 23° at 166m; 22° at 170m; 0° at 174m and 25° at 177m. Cavity 178.20 - 178.70m. Breccia 157.50 - 157.65 (tectonic) | | | 107 | 108 | | | | | |
| | | | | | 108 | 109 | | | | | |
| | | | | 36773 | 109 | 110 | 3 | 6 | 300 | 120 | 1 |
| | | | | | 110 | 111 | | | | | |
| | | | | | 111 | 112 | | | | | |
| 179.00 | 200.00 | SLUMPED CALCLUTITES: grey and dark grey, massive soft sediment slumped (bedding very disturbed) calclutites. Sections of core very fossiliferous (corals, shells, burrows?). Parts of slumped calclutite sequence very pelletal. Minor zones (thin) of laminar caldlutites. Very minor, black thin, dolomite interbeds. Bedding 25° to ca at 185m. 30° to ca at 194m. | | 36774 | 112 | 113 | 3 | 12 | 300 | 1150 | 1 |
| | | | | | 113 | 114 | | | | | |
| | | | | | 114 | 115 | | | | | |
| | | | | 36775 | 115 | 116 | 3 | 6 | 60 | 195 | 1 |
| | | | | | 116 | 117 | | | | | |
| | | | | | 117 | 118 | | | | | |
| | | | | 36776 | 118 | 119 | 3 | 4 | 100 | 180 | 1 |
| | | | | | 119 | 120 | | | | | |
| | | | | | 120 | 121 | | | | | |
| 200.00 | 208.00 | SLUMP BRECCIA: dark grey, fossiliferous, slump brecciated calcarenites in a silty, black fossiliferous dolomite matrix. Minor grey calclutites. Large fragments of coral (bryzoa) and also large shell fragments, present with oolitic debris. Fragments up to 7.5cm across. | | 36777 | 121 | 122 | 3 | 8 | 75 | 250 | 1 |
| | | | | | 122 | 123 | | | | | |
| | | | | | 123 | 124 | | | | | |
| | | | | 36778 | 124 | 125 | 3 | 4 | 220 | 260 | 1 |
| | | | | | 125 | 126 | | | | | |
| | | | | | 126 | 127 | | | | | |
| 208.00 | 210.50 | CALCARENITE: very fossiliferous (oolites & shell fragments) light grey, coarse grained, massive calcarenite with minor interbeds of dark grey to black pelletal dolomite? | | 36779 | 127 | 128 | 3 | 10 | 200 | 175 | 1 |
| | | | | | 128 | 129 | | | | | |
| | | | | | 129 | 130 | | | | | |
| 210.50 | 225.35 | Interbedded SLUMPED DOLOMITE/CALCLUTITE: very laminar, black silty dolomites rhythmically interbedded with very disturbed bedded grey to dark grey calclutites. Pelletal calclutites also present (product of slumping). Very minor fossiliferous calcarenitic horizons present. | | 36780 | 130 | 131 | 3 | 6 | 1600 | 190 | 1 |
| | | | | | 131 | 132 | | | | | |
| | | | | | 132 | 133 | | | | | |
| | | | | 36781 | 133 | 134 | 3 | 8 | 320 | 1050 | 2 |
| | | | | | 134 | 135 | | | | | |
| | | | | | 135 | 136 | | | | | |
| 225.35 | 229.50 | FOSSILIFEROUS CALCARENITE: light grey very fossiliferous (shelly minove corals & oolites) calcavenites & calclutites. Brecciated in part with minor pyrite. Thin black silty dolomite interbeds increasing with depth down hole. Bedding 35° to ca at 226m. | Minor pyrite. | 36782 | 136 | 137 | 3 | 8 | 230 | 260 | 1 |
| | | | | | 137 | 138 | | | | | |
| | | | | | 138 | 139 | | | | | |
| | | | | 36783 | 139 | 140 | 2 | 6 | 1400 | 690 | 1 |
| | | | | | 140 | 141 | | | | | |
| | | | | 36784 | 141 | 142 | 3 | 4 | 50 | 90 | 1 |
| | | | | | 142 | 143 | | | | | |
| 229.50 | 247.30 | Interbedded DOLOMITE/CALCLUTITE/CALCARENITE: Finely laminar black silty dolomites (1-4cm) interbedded with dark grey massive, occasionally foliated unfossiliferous (pelletal in part) calclutites. Minor very fossiliferous calcavenite horizons (shelly). Dolomite pyritic. Minor calcite veining. Bedding 30° to ca 230, 30° to c.a. 238. | Minor pyrite. | | 143 | 144 | | | | | |
| | | | | 36785 | 144 | 145 | 3 | 4 | 60 | 80 | <1 |
| | | | | | 145 | 146 | | | | | |
| | | | | | 146 | 147 | | | | | |
| | | | | 36786 | 147 | 148 | 3 | 4 | 65 | 135 | <1 |
| | | | | | 148 | 149 | | | | | |
| 247.30 | 247.90 | BRECCIA: yellow-green, siderite/ankerite/calcite breccia containing 2% Pb/Zn mineralization as disseminations and small blebs. | 2% Pb/Zn mineraliz'n. | | 149 | 150 | | | | | |
| | | | | 36787 | 150 | 151 | 3 | 6 | 80 | 150 | <1 |
| | | | | | 151 | 152 | | | | | |
| | | | | | 152 | 153 | | | | | |
| 247.90 | 248.45 | CALCLUTITE: Foliated, grey, calcite veined calclutite. | | 36788 | 153 | 154 | 3 | 6 | 90 | 195 | <1 |
| | | | | | 154 | 155 | | | | | |
| 248.45 | 250.50 | BRECCIA: yellow-green, siderite/ankerite (minor calcite) foliated & mineralized breccia. Approximately 5% Pb/Zn mineralization in veinlets blebs and disseminations. | 5% Pb/Zn mineraliz'n. | | 155 | 156 | | | | | |
| | | | | 36789 | 156 | 157 | 3 | 6 | 50 | 120 | <1 |
| | | | | | 157 | 158 | | | | | |
| | | | | | 158 | 159 | | | | | |
| | | | | 36790 | 159 | 160 | 3 | 6 | 60 | 60 | <1 |

64914

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-4 — PAGE 4 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 250.50 | 254.00 | SEMI-MASSIVE SIDERITE/GALENA/SPHALERITE MINERALIZATION. Brecciated fragments of grey calclutites ? in yellow-green siderite/ankerite breccia. (matrix to mineralization) Mineralization very irregular with very high grade sections of core interspersed throughout low grade zones. Approx. 15% Pb 5% Zn. Veinlets and blebs & massive. Core extensively broken - but good recoveries. | Approximately 15% Pb and 5% Zn. | | 160 | 161 | | | | | |
| | | | | | 161 | 162 | | | | | |
| | | | | 36791 | 162 | 163 | 3 | 6 | 75 | 36 | <1 |
| | | | | | 163 | 164 | | | | | |
| | | | | | 164 | 165 | | | | | |
| | | | | 36792 | 165 | 166 | 3 | 8 | 48 | 16 | <1 |
| | | | | | 166 | 167 | | | | | |
| | | | | | 167 | 168 | | | | | |
| 254.00 | 258.50 | BRECCIA: Mineralized siderite/ankerite yellow green breccia grading approximately 5% Pb/Zn. | 5% Pb/Zn as disseminations and veinlets. | 36793 | 168 | 169 | 3 | 8 | 620 | 34 | 1 |
| | | | | | 169 | 170 | | | | | |
| | | | | | 170 | 171 | | | | | |
| 258.50 | 274.00 | CALCLUTITE: grey brecciated, moderately to strongly calcite veined, load casted, massive calclutite. Minor finely disseminated sphalerite. 261.90 to 262.10 calcite Breccia; large twinned calcite crystals with 7% pyrite as fine grained disseminations. | minor sphalerite as disseminations. | 36794 | 171 | 172 | 3 | 8 | 150 | 85 | <1 |
| | | | | | 172 | 173 | | | | | |
| | | | | | 173 | 174 | | | | | |
| | | | | 36795 | 174 | 175 | 3 | 8 | 36 | 42 | <1 |
| | | | | | 175 | 176 | | | | | |
| | | | | | 176 | 177 | | | | | |
| 274.00 | 274.80 | TECTONIC BRECCIA: with calcite cement, fragments comprised of very angular pieces of calclutites. | | 36796 | 177 | 178 | 3 | 6 | 110 | 210 | 1 |
| | | | | | 178 | 179 | | | | | |
| | | | | | 179 | 180 | | | | | |
| 274.80 | 280.00 | FOSSILIFEROUS LIMESTONE: grey, weak to moderately calcite veined, brecciated, oolitic and pisolithic limestone. Minor beds of unfossiliferous, massive grey calclutites. Minor disseminated sphalerite assoc. with siderite blebs and accumulations. | Disseminated sphalerite. Minor. | 36797 | 180 | 181 | 3 | 6 | 44 | 175 | 1 |
| | | | | | 181 | 182 | | | | | |
| | | | | | 182 | 183 | | | | | |
| | | | | 36798 | 183 | 184 | 3 | 16 | 95 | 80 | 1 |
| | | | | | 184 | 185 | | | | | |
| | | | | | 185 | 186 | | | | | |
| 280.00 | 288.20 | SEDIMENTARY BRECCIA: large and small limestone fragments, fossil debris (oolites, pisoliths & minor coral fragments) with moderate calcite veining. Fragments generally subrounded — slump brecciated. | | 36799 | 186 | 187 | 3 | 10 | 20 | 75 | 1 |
| | | | | | 187 | 188 | | | | | |
| | | | | | 188 | 189 | | | | | |
| | | | | 36800 | 189 | 190 | 3 | 14 | 90 | 65 | 1 |
| | | | | | 190 | 191 | | | | | |
| 288.20 | 291.10 | BRECCIA: yellow-green, siderite/ankerite weakly mineralized breccia. 1-2% Pb/Zn mineralization as disseminations. Minor vughs present, generally siderite lined. | 1-2% Pb/Zn mineraliz'n as disseminations. | | 191 | 192 | | | | | |
| | | | | 37551 | 192 | 193 | 3 | 8 | 32 | 32 | <1 |
| | | | | | 193 | 194 | | | | | |
| | | | | | 194 | 195 | | | | | |
| | | | | 37552 | 195 | 196 | 3 | 6 | 28 | 34 | <1 |
| 291.10 | 294.00 | BRECCIATED LIMESTONE: Calcite/siderite veined, grey, brecciated fossiliferous limestone. Minor, dark grey interbeds of silty, carbonaceous dolomite. Minor disseminated sphalerite. | Disseminated minor sphalerite. | | 196 | 197 | | | | | |
| | | | | | 197 | 198 | | | | | |
| | | | | 37553 | 198 | 199 | 3 | 6 | 20 | 34 | <1 |
| | | | | | 199 | 200 | | | | | |
| | | | | | 200 | 201 | | | | | |
| 294.00 | 297.80 | BRECCIA: weakly Pb/Zn mineralized, yellow green, massive siderite/ankerite breccia. ≈ 2% Pb/Zn. Possible fine cpy inclusions with galena in siderite lined vughs? | 2% Pb/Zn as disseminations. | 37554 | 201 | 202 | 3 | 4 | 24 | 26 | <1 |
| | | | | | 202 | 203 | | | | | |
| | | | | | 203 | 204 | | | | | |
| | | | | 37555 | 204 | 205 | 4 | 4 | 20 | 20 | <1 |
| 297.80 | 298.80 | LIMESTONE: load casted?, interbedded limestone and and dark grey silty siderite veined dolomite. | | | 205 | 206 | | | | | |
| | | | | | 206 | 207 | | | | | |
| | | | | | 207 | 208 | | | | | |
| | | | | 37556 | 208 | 209 | 3 | 6 | 110 | 70 | 1 |
| | | | | | 209 | 210 | | | | | |
| | | | | | 210 | 211 | | | | | |
| | | | | 37557 | 211 | 212 | 3 | 8 | 75 | 75 | 1 |
| | | | | | 212 | 213 | | | | | |

ZT 80 4

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-4 — PAGE 5 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 298.80 | 308.00 | MINERALIZED BRECCIA : yellow green, Pb/Zn mineralized, Siderite / ankerite breccia. Rock very foliated and vughy with minor calcite veining. Semi massive Pb/Zn mineralization grading 25% Pb/Zn from 304.90 to 306.70 m. * ankerite / siderite seems to be partially replacing brecciated grey limestones!! | 25% Pb/Zn mineralization ± 305 - 307 m. Overall grade @ 7.5% Pb/Zn for intersection. | | 213 | 214 | | | | | |
| | | | | 37558 | 214 | 215 | 3 | 8 | 40 | 38 | 1 |
| | | | | | 215 | 216 | | | | | |
| | | | | | 216 | 217 | | | | | |
| | | | | 37559 | 217 | 218 | 3 | 8 | 160 | 44 | 1 |
| | | | | | 218 | 219 | | | | | |
| | | | | | 219 | 220 | | | | | |
| | | | | 37560 | 220 | 221 | 3 | 20 | 40 | 48 | <1 |
| 308.00 | 314.20 | LIMESTONE / DOLOMITE : interbedded, dark grey, massive, to weakly laminar, occaissionally fossiliferous calclutites, with black finely laminar (< 3cm in width) silty dolomites. Minor foliation plane parallel to bedding. Minor calcite veining generally < 3mm in width, perpendicular to bedding. Bedding 33° to ca. at 309.5m. | | | 221 | 222 | | | | | |
| | | | | | 222 | 223 | | | | | |
| | | | | 37561 | 223 | 224 | 3 | 24 | 44 | 28 | <1 |
| | | | | | 224 | 225 | | | | | |
| | | | | | 225 | 226 | | | | | |
| | | | | 37562 | 226 | 227 | 3 | 16 | 60 | 30 | <1 |
| | | | | | 227 | 228 | | | | | |
| | | | | | 228 | 229 | | | | | |
| 314.20 | 332.00 | SLUMPED LIMESTONE : massive sequence of light grey to grey, load casted and slumped, occaissionally weakly fossiliferous calclutites. Minor interbeds of dark grey dolomite, and very fossiliferous calclutites (minor corals, shells & worm burrows??). Numerous breccia and calcite veined zones. Bedding 35° to ca at 318m; 35° to ca at 329 m. | | 37563 | 229 | 230 | 3 | 24 | 60 | 105 | <1 |
| | | | | | 230 | 231 | | | | | |
| | | | | | 231 | 232 | | | | | |
| | | | | 37564 | 232 | 233 | 3 | 12 | 60 | 26 | <1 |
| | | | | | 233 | 234 | | | | | |
| | | | | | 234 | 235 | | | | | |
| | | | | 37565 | 235 | 236 | 3 | 14 | 190 | 32 | <1 |
| 332.00 | 338.20 | SLUMPED LIMESTONE / DOLOMITE : dark grey fossiliferous calclutites interbedded with black, laminar, carbonaceous and load casted dolomite. Lot of coralline and shelly detritus. (slumped off reefal environment ??). Bedding 40° to ca at 336 m. | | | 236 | 237 | | | | | |
| | | | | | 237 | 238 | | | | | |
| | | | | 37566 | 238 | 239 | 3 | 14 | 320 | 60 | <1 |
| | | | | | 239 | 240 | | | | | |
| | | | | | 240 | 241 | | | | | |
| | | | | 37567 | 241 | 242 | 3 | 12 | 250 | 36 | <1 |
| 338.20 | 340.50 | MINERALIZED SEDIMENTARY BRECCIA : Pyritic sedimentary slump breccia containing both large and small, angular and rounded fragments. Concretionary nodules = pisoliths up to 1.5cm across. Pyrite as accumulations along fragment boundaries. 3-4% pyrite. | 3-4% pyrite. | | 242 | 243 | | | | | |
| | | | | | 243 | 244 | | | | | |
| | | | | 37568 | 244 | 245 | 3 | 12 | 330 | 280 | 1 |
| | | | | | 245 | 246 | | | | | |
| | | | | | 246 | 247 | | | | | |
| | | | | 21581 | 247 | 248 | 1 | 29 | 5.09 | 0.21 | 26.9 |
| 340.50 | 343.70 | Interbedded CALCARENITE / DOLOMITE : very fossiliferous (shells, minor pisoliths) light grey, massive calcarenite interbedded with thin beds of load casted black carbonaceous silty dolomite. Large calcite vein 242.70-242.80. Bedding 32° to c.a. at 343m. | | 21582 | 248 | 249 | 1 | 23 | 3.93 | 0.95 | 26.3 |
| | | | | 21583 | 249 | 250 | 1 | 21 | 2.54 | 0.15 | 21.5 |
| | | | | 21584 | 250 | 251 | 1 | 147 | 12.50 | 12.70 | 85.2 |
| | | | | 21585 | 251 | 252 | 1 | 105 | 17.60 | 10.10 | 127.7 |
| | | | | 21586 | 252 | 253 | 1 | 192 | 29.40 | 10.90 | 200.5 |
| | | | | 21587 | 253 | 254 | 1 | 195 | 25.30 | 5.10 | 196.9 |
| 343.70 | 355.00 | SLUMPED DOLOMITE: black, extremely foliated, slumped carbonaceous dolomite (weakly fossiliferous in part) rhythmically interbedded with thin layers of non-fossiliferous calclutites, very fossiliferous (oolitic & shelly) grey, load casted and disturbed bedded calclutites and calcarenites. Minor blebby pyrite. Slump brecciated from 353.80 - 355-00 m. Weakly calcite veined. Bedding 33° to ca at 346.40 m. | Minor pyrite. | 21588 | 254 | 255 | 1 | 15 | 3.14 | 0.10 | 16.3 |
| | | | | 21589 | 255 | 256 | 1 | 156 | 11.90 | 3.74 | 97.5 |
| | | | | 21590 | 256 | 257 | 1 | 18 | 4.71 | 0.16 | 26.5 |
| | | | | 21591 | 257 | 258 | 1 | 71 | 15.40 | 0.15 | 151.1 |
| | | | | 21592 | 258 | 259 | 1 | 6 | 5800 | 900 | 43 |
| | | | | 21613 | 259 | 260 | 1 | | | | |
| | | | | 21614 | 260 | 261 | 1 | | | | |
| | | | | 21615 | 261 | 262 | 1 | | | | |
| | | | | 21616 | 262 | 263 | 1 | | | | |
| | | | | 21617 | 263 | 264 | 1 | | | | |
| | | | | 21618 | 264 | 265 | 1 | | | | |
| | | | | 21619 | 265 | 266 | 1 | | | | |

69743

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-4 — PAGE 6 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 355.00 | 358.80 | LIMESTONE: light grey, massive, non fossiliferous, sandy calcarenite (foliated?) Moderately calcite veined, minor brecciation. | | 21620 | 266 | 267 | 1 | <5 | 158 | 147 | 0.5 |
| | | | | 21621 | 267 | 268 | 1 | <5 | 286 | 106 | <0.5 |
| | | | | 21622 | 268 | 269 | 1 | <5 | 140 | 198 | <0.5 |
| | | | | 21623 | 269 | 270 | 1 | <5 | 106 | 207 | 0.5 |
| 358.80 | 360.30 | FOSSILIFEROUS LIMESTONE: light grey, very fossiliferous, massive limestone with minor thin interbeds of black disturbed dolomite. Rock moderately calcite veined. Lot of oolitic fossil debris and possible stromatolites (convolute textured concretionary growth). Cavity 359.80 - 360.20 m. | | 21624 | 270 | 271 | 1 | <5 | 155 | 167 | 0.5 |
| | | | | 21625 | 271 | 272 | 1 | <5 | 163 | 362 | 0.8 |
| | | | | 21626 | 272 | 273 | 1 | <5 | 195 | 530 | 0.7 |
| | | | | 21627 | 273 | 274 | 1 | <5 | 351 | 320 | 0.6 |
| | | | | 21628 | 274 | 275 | 1 | <5 | 294 | 419 | 1.0 |
| | | | | 21629 | 275 | 276 | 1 | <5 | 670 | 340 | 0.9 |
| | | | | 21630 | 276 | 277 | 1 | <5 | 1130 | 311 | 1.4 |
| END | OF | HOLE 360.30 metres. | | 21631 | 277 | 278 | 1 | <5 | 770 | 305 | 0.9 |
| | | | | 21632 | 278 | 279 | 1 | <5 | 325 | 120 | <0.5 |
| | | | | 21633 | 279 | 280 | 1 | 5 | 680 | 259 | 1.8 |
| | | * Hole making water. | | 21634 | 280 | 281 | 1 | 5 | 488 | 221 | 1.1 |
| | | | | 21635 | 281 | 282 | 1 | <5 | 560 | 560 | 1.4 |
| | | | | 21636 | 282 | 283 | 1 | <5 | 455 | 171 | 2.0 |
| | | | | 21637 | 283 | 284 | 1 | <5 | 2080 | 268 | 2.4 |
| | | | | 21638 | 284 | 285 | 1 | <5 | 1620 | 274 | 2.3 |
| | | | | 21639 | 285 | 286 | 1 | <5 | 2550 | 376 | 2.9 |
| | | | | 21640 | 286 | 287 | 1 | <5 | 1270 | 522 | 2.5 |
| | | | | 21641 | 287 | 288 | 1 | <5 | 3510 | 363 | 3.4 |
| | | | | 21593 | 288 | 289 | 1 | 4 | 7410 | 919 | 4.3 |
| | | | | 21594 | 289 | 290 | 1 | 11 | 1.19 | 0.08 | 9.8 |
| | | | | 21595 | 290 | 291 | 1 | 21 | 1.38 | 0.18 | 11.9 |
| | | | | 21596 | 291 | 292 | 1 | 5 | 4930 | 982 | 3.2 |
| | | | | 21597 | 292 | 293 | 1 | 4 | 1030 | 1568 | 0.8 |
| | | | | 21598 | 293 | 294 | 1 | 3 | 830 | 546 | 0.7 |
| | | | | 21599 | 294 | 295 | 1 | 9 | 6240 | 1250 | 5.2 |
| | | | | 21600 | 295 | 296 | 1 | 17 | 7400 | 4490 | 6.2 |
| | | | | 21601 | 296 | 297 | 1 | 35 | 1.81 | 0.15 | 20.7 |
| | | | | 21602 | 297 | 298 | 1 | 25 | 1.48 | 0.25 | 14.8 |
| | | | | 21603 | 298 | 299 | 1 | 6 | 2440 | 4540 | 2.5 |
| | | | | 21604 | 299 | 300 | 1 | 14 | 1.82 | 0.23 | 13.0 |
| | | | | 21605 | 300 | 301 | 1 | 10 | 2510 | 584 | 3.1 |
| | | | | 21606 | 301 | 302 | 1 | 7 | 2240 | 941 | 2.6 |
| | | | | 21607 | 302 | 303 | 1 | 19 | 1.32 | 0.14 | 11.4 |
| | | | | 21608 | 303 | 304 | 1 | 17 | 2.18 | 0.11 | 15.7 |
| | | | | 21609 | 304 | 305 | 1 | 42 | 12.90 | 0.47 | 72.0 |
| | | | | 21610 | 305 | 306 | 1 | 427 | 58.70 | 3.90 | 1040.0 |
| | | | | 21611 | 306 | 307 | 1 | 486 | 3640 | 5.30 | 477.0 |
| | | | | 21612 | 307 | 308 | 1 | 6 | 5580 | 629 | 4.9 |
| | | | | 37569 | 308 | 309 | 3 | 12 | 330 | 170 | <1 |
| | | | | | 309 | 310 | | | | | |
| | | | | | 310 | 311 | | | | | |
| | | | | 37570 | 311 | 312 | 3 | 10 | 1850 | 590 | 2 |
| | | | | | 312 | 313 | | | | | |
| | | | | | 313 | 314 | | | | | |
| | | | | 37571 | 314 | 315 | 3 | 8 | 1100 | 220 | <1 |
| | | | | | 315 | 316 | | | | | |
| | | | | | 316 | 317 | | | | | |
| | | | | 37572 | 317 | 318 | 3 | 20 | 190 | 340 | 1 |
| | | | | | 318 | 319 | | | | | |

64914

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-4 — PAGE 7 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 319 | 320 | | | | | |
| | | | | 37573 | 320 | 321 | 3 | 12 | 75 | 165 | <1 |
| | | | | | 321 | 322 | | | | | |
| | | | | | 322 | 323 | | | | | |
| | | | | 37574 | 323 | 324 | 3 | 14 | 150 | 610 | 1 |
| | | | | | 324 | 325 | | | | | |
| | | | | | 325 | 326 | | | | | |
| | | | | 37575 | 326 | 327 | 3 | 14 | 250 | 420 | 1 |
| | | | | | 327 | 328 | | | | | |
| | | | | | 328 | 329 | | | | | |
| | | | | 37576 | 329 | 330 | 3 | 10 | 260 | 500 | <1 |
| | | | | | 330 | 331 | | | | | |
| | | | | | 331 | 332 | | | | | |
| | | | | 37577 | 332 | 333 | 3 | 10 | 180 | 570 | <1 |
| | | | | | 333 | 334 | | | | | |
| | | | | | 334 | 335 | | | | | |
| | | | | 37578 | 335 | 336 | 3 | 12 | 340 | 640 | 1 |
| | | | | | 336 | 337 | | | | | |
| | | | | | 337 | 338 | | | | | |
| | | | | 37579 | 338 | 339 | 3 | 14 | 220 | 1300 | 1 |
| | | | | | 339 | 340 | | | | | |
| | | | | | 340 | 341 | | | | | |
| | | | | 37580 | 341 | 342 | 3 | 8 | 140 | 380 | 1 |
| | | | | | 342 | 343 | | | | | |
| | | | | | 343 | 344 | | | | | |
| | | | | 37581 | 344 | 345 | 3 | 8 | 420 | 770 | 1 |
| | | | | | 345 | 346 | | | | | |
| | | | | | 346 | 347 | | | | | |
| | | | | 37582 | 347 | 348 | 3 | 10 | 180 | 570 | <1 |
| | | | | | 348 | 349 | | | | | |
| | | | | | 349 | 350 | | | | | |
| | | | | 37583 | 350 | 351 | 3 | 10 | 95 | 310 | 1 |
| | | | | | 351 | 352 | | | | | |
| | | | | | 352 | 353 | | | | | |
| | | | | 37584 | 353 | 354 | 3 | 10 | 170 | 910 | <1 |
| | | | | | 354 | 355 | | | | | |
| | | | | | 355 | 356 | | | | | |
| | | | | 37585 | 356 | 357 | 4 | 6 | 210 | 820 | <1 |
| | | | | | 357 | 358 | | | | | |
| | | | | | 358 | 359 | | | | | |
| | | | | | 359 | 360 | | | | | |
| | | | | | 360 | 361. | | | | | |
| | | | | | END OF HOLE | | | 360.30 metres. | | | |

69314

649146

OCEANA PROSPECT

DRILLHOLE DATA

ZT-80-5

| | | |
|---|---|---|
| Location | : | 3600N:1590E |
| Declination | : | 65° |
| Azimuth | : | 270°G |
| Total Depth | : | 475.30 meters |

Assay Results

No visible mineralization.

**Amoco Minerals Australia Company**

DRILL LOG — HOLE No. ZT-80-5 — PAGE 1 OF 9

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN - TAS No. 7860 | ELEVATION meters | COMMENCED 29 FEB 1980 | BORE HOLE SURVEY | | | | | | INSTRUMENT EASTMAN CAMERA | | | | |
| | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | | |
| PROSPECT OCEANA | DIP COLLAR 65° GW | COMPLETED | 50 | 66.5° | 218° | 200 | 61° | 210° | 350 | 55° | 195° | | |
| CO-ORDINATES 3600 mN 1590 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 475.30 meters | 100 | 67° | 215° | 250 | 61° | 205° | 400 | 55 | 187° | | |
| BEARING 228 TN 217 MN 270 GN | LOGGED BY PHILIP. A. JONES | | 150 | 65° | 213° | 300 | 57° | 202° | 450 | 54 | 187° | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 12.00 | TRICONE: Chocolate Brown, completely Weathed Dolomite. START HQ CORING. | | | 12.00 | 13.00 | 1 | 26 | 85 | 350 | <1 |
| | | | | | 13 | 14 | 1 | | | | |
| 12.00 | 14.20 | DOLOMITE: chocolate brown, very weathered, cavernous silty dolomite. | | | 14 | 15 | 1 | | | | |
| | | | | | 15 | 16 | 1 | 13 | 220 | 570 | <1 |
| | | | | | 16 | 17 | 1 | | | | |
| 14.20 | 15.50 | LIMESTONE: dark grey, massive, load casted calclutite? with black carbonaceous interbeds of dolomite. | | | 17 | 18 | 1 | | | | |
| | | | | | 18 | 19 | 1 | 18 | 95 | 390 | <1 |
| | | | | | 19 | 20 | 1 | | | | |
| | | | | | 20 | 21 | 1 | | | | |
| 15.50 | 18.50 | DOLOMITE: Chocolate brown, very weathered silty dolomite. Poor recoveries through broken soft ground. | | | 21 | 22 | 1 | 16 | 28 | 100 | <1 |
| | | | | | 22 | 23 | 1 | | | | |
| | | | | | 23 | 24 | 1 | | | | |
| 18.50 | 32.00 | DOLOMITE / LIMESTONE: black, foliated, load casted, carbonaceous and laminar dolomite interbedded with dark grey massive, slumped? cavernous occaisionally fossiliferous calclutites (oolitic). Minor calcite veining. Bedding 30° to ca at 21.50 m; 50° to ca - 30 m. Cavities: 22.50 - 23.30 m; 24.00 - 24.40 m. | | | 24 | 25 | 1 | 10 | 36 | 38 | <1 |
| | | | | | 25 | 26 | 1 | | | | |
| | | | | | 26 | 27 | 1 | | | | |
| | | | | | 27 | 28 | 1 | 12 | 28 | 38 | <1 |
| | | | | | 28 | 29 | 1 | | | | |
| | | | | | 29 | 30 | 1 | | | | |
| | | | | | 30 | 31 | 1 | 8 | 24 | 55 | <1 |
| 32.00 | 36.50 | LIMESTONE: generally light grey, massive but occaisionally very laminar, fossiliferous (very Oolitic) calcarenites with minor interbeds of grey unfossiliferous load casted calclutites and black carbonaceous dolomites. Interbeds generally < 3 cm in width. Moderate calcite veining. Bedding 45° to ca at 35 m. Cavity 33.70 - 34.80 m. Minor zones of brecciation - calcite healed. | | | 31 | 32 | 1 | | | | |
| | | | | | 32 | 33 | 1 | | | | |
| | | | | | 33 | 34 | 1 | 6 | 20 | 46 | <1 |
| | | | | | 34 | 35 | 1 | | | | |
| | | | | | 35 | 36 | 1 | | | | |
| | | | | | 36 | 37 | 1 | 8 | 24 | 60 | <1 |
| | | | | | 37 | 38 | 1 | | | | |
| | | | | | 38 | 39 | 1 | | | | |
| | | | | | 39 | 40 | 1 | 18 | 110 | 90 | <1 |
| 36.50 | 59.00 | DOLOMITE / CALCLUTITE / CALCARENITE: Interbedded black laminar, thinly bedded, pyritic dolomites rhythmically intercalated with dark grey, massive, unfossiliferous calclutites and grey shelly calcarenites. Minor calcite veining and brecciation. Fossil beds generally 1 to 5 cm in width. Minor load casting. Cavity 36.80 to 40.00. Bedding 45° to ca at 48.70 m; 40° to c.a at 55.50 m. | | | 40 | 41 | 1 | | | | |
| | | | | | 41 | 42 | 1 | | | | |
| | | | | | 42 | 43 | 1 | 6 | 24 | 32 | <1 |
| | | | | | 43 | 44 | 1 | | | | |
| | | | | | 44 | 45 | 1 | | | | |
| | | | | | 45 | 46 | 1 | 10 | 20 | 40 | <1 |
| | | | | | 46 | 47 | 1 | | | | |
| | | | | | 47 | 48 | 1 | | | | |
| | | | | | 48 | 49 | 1 | 8 | 44 | 170 | <1 |
| 59.00 | 79.70 | DOLOMITE / CALCLUTITE: interbedded black, massive, silty dolomites and dark grey massive calclutites. Minor shelly calcarenites present in thin beds. Rock weakly calcite veined, weakly brecciated in part, and slumped (possibly load casted). Minor siderite. Rock quite broken also has tendency to spall on coring. Bedding 30° to ca at 65 m. | | | 49 | 50 | 1 | | | | |
| | | | | | 50 | 51 | 1 | | | | |
| | | | | | 51 | 52 | 1 | 8 | 55 | 165 | <1 |
| | | | | | 52 | 53 | 1 | | | | |
| | | | | | 53 | 54 | 1 | | | | |
| | | | | | 54 | 55 | 1 | 12 | 70 | 90 | <1 |
| | | | | | 55 | 56 | 1 | | | | |
| | | | | | 56 | 57 | 1 | | | | |

GSV 1969

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-5 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 79.70 | 86.00 | CAVITY : Cavity filled with Mt Zeehan conglomerate alluvial gravels. Must be connected to surface. | | | 57 | 58 | 1 | 8 | 60 | 250 | <1 |
| | | | | | 58 | 59 | 1 | | | | |
| | | | | | 59 | 60 | 1 | | | | |
| 86.00 | 87.00 | BRECCIA : grey calclutites tectonically brecciated and calcite healed. Moderate to strong calcite veining. | | | 60 | 61 | 1 | 6 | 28 | 70 | <1 |
| | | | | | 61 | 62 | 1 | | | | |
| | | | | | 62 | 63 | 1 | | | | |
| 87.00 | 117.50 | CALCLUTITES / DOLOMITE : Interbedded dark grey very fossiliferous (shelly, minor corals) calclutites, unfossiliferous dark grey calclutites and black massive spotted dolomites. Bedding quite disturbed, but not very pronounced, weakly foliated, Rock moderately calcite veined. Minor pyrite with calcite veins. Bedding 40° to c.a at 99m; 40° to ca at 105.5am. Two calcite breccia zones, 10-15 cm in width at 92.20 and 116.50m. | Minor pyrite with calcite veins. Minor pink staining to calcite - hematite?? | | 63 | 64 | 1 | 8 | 32 | 34 | <1 |
| | | | | | 64 | 65 | 1 | | | | |
| | | | | | 65 | 66 | 1 | | | | |
| | | | | | 66 | 67 | 1 | 8 | 24 | 100 | <1 |
| | | | | | 67 | 68 | 1 | | | | |
| | | | | | 68 | 69 | 1 | | | | |
| | | | | | 69 | 70 | 1 | 8 | 20 | 95 | <1 |
| | | | | | 70 | 71 | 1 | | | | |
| | | | | | 71 | 72 | 1 | | | | |
| | | | | | 72 | 73 | 1 | 8 | 16 | 90 | <1 |
| 117.50 | 138.90 | SLUMPED CALCLUTITES: grey, massive, unfossiliferous calclutites with minor interbeds (< 2cm in width) of black carbonaceous dolomite. Minor coal fragments in calclutite. Bedding very disturbed (slumped!) Minor thin beds (< 5cm width) of light grey oolitic and shelly calcarenites. Slumping (or load casting) becoming more severe towards base of unit. Dolomites pyritic Bedding 40° to ca at 127 m. | Disseminated pyrite in Dolomite. | | 73 | 74 | 1 | | | | |
| | | | | | 74 | 75 | 1 | | | | |
| | | | | | 75 | 76 | 1 | 6 | 36 | 70 | <1 |
| | | | | | 76 | 77 | 1 | | | | |
| | | | | | 77 | 78 | 1 | | | | |
| | | | | | 78 | 79 | 1 | 14 | 120 | 660 | <1 |
| | | | | | 79 | 80 | 1 | | | | |
| | | | | | 80 | 81 | 1 | | | | |
| | | | | | 81 | 82 | 1 | | | | |
| 138.90 | 139.80 | CALCITE BRECCIA : extremely angular fragments of grey calclutites in a calcite matrix. Tectonic breccia. | | | 82 | 83 | 1 | CAVITY | | | |
| | | | | | 83 | 84 | 1 | | | | |
| | | | | | 84 | 85 | 1 | 14 | 220 | 430 | <1 |
| 139.80 | 150.80 | Interbedded CALCLUTITES / DOLOMITE : dark grey, silty, unfossiliferous calclutites interbedded with black, very carbonaceous and very pyritic (extremely fine grained ≥ 15-20%) Dolomite. Dolomitic beds are generally 5-10 cm in width, are definitely foliated (foliation subparallel to ca), very fissile and are weakly calcite veined. Minor thin breccia zones are present, & the core is moderately broken. Bedding 40° to ca at 143.40 m. | | | 85 | 86 | 1 | | | | |
| | | | | | 86 | 87 | 1 | | | | |
| | | | | | 87 | 88 | 1 | 6 | 105 | 200 | <1 |
| | | | | | 88 | 89 | 1 | | | | |
| | | | | | 89 | 90 | 1 | | | | |
| | | | | | 90 | 91 | 1 | 6 | 140 | 550 | <1 |
| | | | | | 91 | 92 | 1 | | | | |
| | | | | | 92 | 93 | 1 | | | | |
| | | | | | 93 | 94 | 1 | 10 | 60 | 410 | <1 |
| 150.80 | 189.30 | CALCLUTITES / DOLOMITE : light grey, massive to thickly laminar, unfossiliferous calclutites (generally 5-20 cm in width) rhythmically bedded with thin (< 2cm in width) black carbonaceous dolomite. Minor fossiliferous horizons (shelly, oolitic), < 5cm in width, occur throughout the sequence. Core weakly calcite veined. Core load coated with moderately disturbed dolomitic beds. Bedding 38° to ca at 164.60 m, 35° to ca at 177.50 m, 46° to ca at 184.80 m. | | | 94 | 95 | 1 | | | | |
| | | | | | 95 | 96 | 1 | | | | |
| | | | | | 96 | 97 | 1 | 8 | 55 | 280 | <1 |
| | | | | | 97 | 98 | 1 | | | | |
| | | | | | 98 | 99 | 1 | | | | |
| | | | | | 99 | 100 | 1 | 8 | 28 | 85 | <1 |
| | | | | | 100 | 101 | 1 | | | | |
| | | | | | 101 | 102 | 1 | | | | |
| | | | | | 102 | 103 | 1 | 24 | 16 | 50 | <1 |
| | | | | | 103 | 104 | 1 | | | | |
| 189.30 | 190.60 | TECTONIC BRECCIA: tectonically brecciated, bedded calclutites and dolomites. Moderately to strongly calcite veined. | | | 104 | 105 | 1 | | | | |
| | | | | | 105 | 106 | 1 | 6 | 16 | 14 | <1 |
| | | | | | 106 | 107 | 1 | | | | |
| | | | | | 107 | 108 | 1 | | | | |
| | | | | | 108 | 109 | 1 | 6 | 16 | 22 | <1 |
| | | | | | 109 | 110 | 1 | | | | |

64134

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-5 — PAGE 3 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 190.60 | 206.00 | DOLOMITE / CALCLUTITE : laminar and highly foliated, black carbonaceous pyritic silty dolomites (generally 2-5cm in width) interbedded with light grey, laminar and slumped fossiliferous (shells & pisoliths) and unfossiliferous calclutites. Minor calcite veining. Badly broken ground. Cavities 200.40 - 202.80 ; 203.30 - 205.00. | disseminated pyrite (very fine grained) in Dolomite. | | 110 | 111 | 1 | | | | |
| | | | | | 111 | 112 | 1 | 6 | 28 | 140 | <1 |
| | | | | | 112 | 113 | 1 | | | | |
| | | | | | 113 | 114 | 1 | | | | |
| | | | | | 114 | 115 | 1 | 8 | 20 | 55 | <1 |
| | | | | | 115 | 116 | 1 | | | | |
| | | | | | 116 | 117 | 1 | | | | |
| 206.00 | 231.00 | CALCLUTITE / DOLOHITE : slump brecciated, grey and dark grey, massive and laminar calclutites and silty dolomites. Moderately calcite veined, minor aidesite. Slump breccia fragments generally subrounded (minor pisoliths). Minor tectonic breccias - with angular frag's. Bedding 35° to c.a. 217m.; 45° at 231m.; Minor coral fragments present throughout the sequence. | | | 117 | 118 | 1 | 6 | 20 | 20 | <1 |
| | | | | | 118 | 119 | 1 | | | | |
| | | | | | 119 | 120 | 1 | | | | |
| | | | | | 120 | 121 | 1 | 6 | 24 | 40 | <1 |
| | | | | | 121 | 122 | 1 | | | | |
| | | | | | 122 | 123 | 1 | | | | |
| | | | | | 123 | 124 | 1 | 6 | 24 | 36 | <1 |
| | | | | | 124 | 125 | 1 | | | | |
| 231.00 | 242.00 | SILTY DOLOMITE : black, silty, massive and weakly foliated dolomites with minor thin interbeds of grey, in part laminar (pellelal ?) calclutites. Bedding 40° to c.a. at 233.20m. | | | 125 | 126 | 1 | | | | |
| | | | | | 126 | 127 | 1 | 6 | 16 | 24 | <1 |
| | | | | | 127 | 128 | 1 | | | | |
| | | | | | 128 | 129 | 1 | | | | |
| | | | | | 129 | 130 | 1 | 8 | 20 | 38 | <1 |
| 242.00 | 246.50 | SLUMP BRECCIA : grey, massive calclutite fragments (up to 10's of cm's in width) in a matrix of black silty dolomite. Bedding obliterated due to soft sediment slumping. | | | 130 | 131 | 1 | | | | |
| | | | | | 131 | 132 | 1 | | | | |
| | | | | | 132 | 133 | 1 | 8 | 20 | 38 | <1 |
| | | | | | 133 | 134 | 1 | | | | |
| | | | | | 134 | 135 | 1 | | | | |
| 246.50 | 248.00 | SHALEY DOLOHITE : very laminar, grey, shaley Dolomite (calclutites ??). Bedding 30° at 247m. | | | 135 | 136 | 1 | 6 | 36 | 75 | <1 |
| | | | | | 136 | 137 | 1 | | | | |
| | | | | | 137 | 138 | 1 | | | | |
| 248.00 | 261.80 | SLUMPED CALCLUTITE: grey calclutite rhythmically interbedded with thin black carbonaceous dolomite beds (<2cm in width). Sequence soft sediment slumped with minor brecciation apparent. Fossiliferous breccia zone 250.60 - 251.00m. Minor calcite veining. | | | 138 | 139 | 1 | 6 | 240 | 2800 | <1 |
| | | | | | 139 | 140 | 1 | | | | |
| | | | | | 140 | 141 | 1 | | | | |
| | | | | | 141 | 142 | 1 | 6 | 65 | 190 | <1 |
| | | | | | 142 | 143 | 1 | | | | |
| | | | | | 143 | 144 | 1 | | | | |
| 261.80 | 263.50 | SHALEY DOLOHITE : very laminar, grey, well bedded Dolomite (calclutites). Possibly muddy calclutites ? Minor pyrite on cleavage / bedding surfaces. Bedding 37° to c.a. at 263.m. Tectonic Breccia 263 - 263.50m. | Pyrite smears on bedding/cleavage surfaces. | | 144 | 145 | 1 | 6 | 12 | 20 | <1 |
| | | | | | 145 | 146 | 1 | | | | |
| | | | | | 146 | 147 | 1 | | | | |
| | | | | | 147 | 148 | 1 | 8 | 16 | 16 | <1 |
| | | | | | 148 | 149 | 1 | | | | |
| 263.50 | 272.80 | SLUMPED CALCLUTITE / DOLOHITE : thickly bedded (5-20 cm in width) sequence of light grey massive calclutites and dark grey to black silty dolomites. Bedding disturbed due to soft sediment slumping. Minor fossils. Tectonic breccia 263.50 - 266.50. | | | 149 | 150 | 1 | | | | |
| | | | | | 150 | 151 | 1 | 8 | 24 | 460 | <1 |
| | | | | | 151 | 152 | 1 | | | | |
| | | | | | 152 | 153 | 1 | | | | |
| | | | | | 153 | 154 | 1 | 6 | 28 | 150 | <1 |
| | | | | | 154 | 155 | 1 | | | | |
| 272.80 | 284.80 | FOSSILIFEROUS SLUMP BRECCIA : soft sediment slumped and brecciated, calclutites, calcarenites (very fossiliferous) and silty dolomites in a matrix of black silty, carbonaceous dolomite and calcite. Breccia very fossiliferous containing abundant coral fragments, shells, oolite and other detritus. Breccia extremely calcite veined. Minor disseminated pyrite. Shelly horizons very porous, honeycombed and soft - poor recoveries in general. | Minor disseminated pyrite. | | 155 | 156 | 1 | | | | |
| | | | | | 156 | 157 | 1 | 6 | 20 | 36 | <1 |
| | | | | | 157 | 158 | 1 | | | | |
| | | | | | 158 | 159 | 1 | | | | |
| | | | | | 159 | 160 | 1 | 6 | 16 | 24 | <1 |
| | | | | | 160 | 161 | 1 | | | | |
| | | | | | 161 | 162 | 1 | | | | |
| | | | | | 162 | 163 | 1 | 6 | 16 | 16 | <1 |

GA 91 [illegible]

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-5 — PAGE 4 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 284.80 | 285.20 | SAND FILLED CAVITY : probably honeycombed fossil breccia. | | | K3 | 164 | 1 | | | | |
| | | | | | 164 | 165 | 1 | | | | |
| 285.20 | 290.00 | FOSSIL BRECCIA : very weathered, porous and honeycombed, cavernous shelly fossil breccia. | | | 165 | 166 | 3 | 6 | 12 | 230 | <1 |
| | | | | | 166 | 167 | 1 | | | | |
| | | | | | 167 | 168 | 1 | | | | |
| 290.00 | 343.00 | SLUMPED BRECCIA : grey to dark grey fossiliferous slump breccia. Moderately to strongly calcite veined; in part honeycombed and soft. Breccia comprised of calcilutite and dolomite fragments in a dark grey to black dolomitic matrix, further healed by calcite. Fragments generally angular to subangular. Lot of coralline fragments as well as oolitic and shelly horizons. Sections of unit less brecciated giving more of a slumped appearance. Numerous cavities present: 300 - 302 m; 320 - 330.70; 337.50 - 339.50 m (partial recovery); 341.10 - 343.00. | | | 168 | 169 | 3 | 6 | 20 | 50 | <1 |
| | | | | | 169 | 170 | 1 | | | | |
| | | | | | 170 | 171 | 1 | | | | |
| | | | | | 171 | 172 | 3 | 4 | 20 | 24 | <1 |
| | | | | | 172 | 173 | 1 | | | | |
| | | | | | 173 | 174 | 1 | | | | |
| | | | | | 174 | 175 | 3 | 6 | 20 | 40 | <1 |
| | | | | | 175 | 176 | 1 | | | | |
| | | | | | 176 | 177 | 1 | | | | |
| | | | | | 177 | 178 | 3 | 4 | 24 | 65 | <1 |
| | | | | | 178 | 179 | 1 | | | | |
| 343.00 | 348.20 | LAMINAR LIMESTONE : tectonic brecciated, light grey, extremely laminar limestone (muddy?), moderately calcite veined & fractured. Cavity 345.50 - 348.20 m. | | | 179 | 180 | 1 | | | | |
| | | | | | 180 | 181 | 3 | 4 | 36 | 205 | <1 |
| | | | | | 181 | 182 | 1 | | | | |
| | | | | | 182 | 183 | 1 | | | | |
| 348.20 | 377.00 | SLUMPED CALCILUTITES : light grey, pelletal in part, slumped, weakly fossiliferous and moderately calcite veined calcilutites interbedded with minor, thin, dark grey calcilutites. Sequence very cavernous and honeycombed. Cavities 350 - 350.30 m; 353.80 - 355.80; 359 - 364.50; 368 - 371; 371.80 - 372.40; 374 - 374.30 m. Cavities due to honeycombed fossiliferous (shelly) limestones (highly weathered & very soft) poor recoveries! | Minor pyrite. | | 183 | 184 | 1 | 6 | 20 | 42 | <1 |
| | | | | | 184 | 185 | 1 | | | | |
| | | | | | 185 | 186 | 1 | | | | |
| | | | | | 186 | 187 | 3 | 8 | 20 | 40 | <1 |
| | | | | | 187 | 188 | 1 | | | | |
| | | | | | 188 | 189 | 1 | | | | |
| | | | | | 189 | 190 | 3 | 6 | 28 | 90 | <1 |
| | | | | | 190 | 191 | 1 | | | | |
| | | | | | 191 | 192 | 1 | | | | |
| 377.00 | 433.00 | DOLOMITE : dark grey to black, silty, pelletal, dolomite. Very foliated, broken ground, soft giving poor recoveries. Minor fossiliferous horizons. Core weakly calcite veined. Rock very cavernous. Minor zones of soft sediment slumping in fossiliferous calcilutites. Thin, heavily calcite healed tectonic breccias prevalent. Minor clay pugh zones. Bedding parallel to c.a. at 392.50; 40° to c.a. at 404 m; 30° to c.a. 408 m. Light grey laminar silty limestone? giving good bedding intersections 45° to c.a. at 425. Minor blebby pyrite with dark silty dolomites. | | | 192 | 193 | 3 | 6 | 24 | 24 | <1 |
| | | | | | 193 | 194 | 1 | | | | |
| | | | | | 194 | 195 | 1 | | | | |
| | | | | | 195 | 196 | 3 | 6 | 50 | 260 | <1 |
| | | | | | 196 | 197 | 1 | | | | |
| | | | | | 197 | 198 | 1 | | | | |
| | | | | | 198 | 199 | 3 | 4 | 60 | 500 | <1 |
| | | | | | 199 | 200 | 1 | | | | |
| | | | | | 200 | 201 | 1 | | | | |
| | | | | | 201 | 202 | 3 | 38 | 55 | 870 | <1 |
| | | | | | 202 | 203 | 1 | | | | |
| | | | | | 203 | 204 | 1 | | | | |
| 433.00 | 434.00 | LIMESTONE : light grey extremely fossiliferous (shelly) calcarenite / calcirudite. Minor calcite veining. Rock massive & quite hard. | | | 204 | 205 | 4 | 4 | 48 | 270 | <1 |
| | | | | | 205 | 206 | 1 | | | | |
| | | | | | 206 | 207 | 1 | | | | |
| | | | | | 207 | 208 | 1 | | | | |
| 434.00 | 438.00 | DOLOMITE : very pyritic, black, silty, carbonaceous pelletal (in part) dolomite. Rock cross bedded? and very laminar. Rock very soft, weakly broken. | | | 208 | 209 | 3 | 4 | 50 | 230 | <1 |
| | | | | | 209 | 210 | 1 | | | | |
| | | | | | 210 | 211 | 1 | | | | |
| | | | | | 211 | 212 | 3 | 4 | 85 | 350 | <1 |
| | | | | | 212 | 213 | 1 | | | | |
| | | | | | 213 | 214 | 1 | | | | |
| | | | | | 214 | 215 | 3 | 4 | 200 | 460 | <1 |
| | | | | | 215 | 216 | 1 | | | | |

64912

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-5 — PAGE 5 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER |
|---|---|---|---|---|
| 438.00 | 443.50 | CALCLUTITE: interbedded, light and dark grey crudely bedded, pelletal calclutites. Slumped into place but not brecciated. Minor calcite veining. | | |
| 443.50 | 449.00 | SILTY LIMESTONE: dark grey, cavernous, badly fractured and broken silty limestone. (calclutite/calcarenite?) Rock foliated and very soft - moderate/good core recovery. | | |
| 449.00 | 467.40 | CALCLUTITE: An interbedded sequence of dark grey silty dolomites, grey calclutites, and light grey [illegible]: calcarenites. Minor clay pyrite zones. Cavities prevalent. Beds generally 2-5cm in width. Bedding appears to be quite rhythmic. Bedding becoming slumped down hole. Minor coral frags (up to 10cm across) present in mainly but grained slump breccias. Bedding 38° to ca at 450; 47° to ca at 462m. | | |
| 467.40 | 471.00 | SPECKLED CALCARENITE: Sandy, light grey, speckled, massive, calcarenite. Weakly foliated and calcite veined. (SANDSTONE) | | |
| 471.00 | 475.30 | DOLOMITE: Black carbonaceous pyritic, fissile Dolomite. Core extensively broken, soft & possibly soft sediment slumped. Recovery good. | | |
| END OF HOLE 475.30 metres. | | | | |

| METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|
| 216 | 217 | 1 | | | | |
| 217 | 218 | 1 | 4 | 75 | 110 | <1 |
| 218 | 219 | 1 | | | | |
| 219 | 220 | 1 | | | | |
| 220 | 221 | 1 | 4 | 60 | 26 | <1 |
| 221 | 222 | 1 | | | | |
| 222 | 223 | 1 | | | | |
| 223 | 224 | 1 | 4 | 36 | 55 | <1 |
| 224 | 225 | 1 | | | | |
| 225 | 226 | 1 | | | | |
| 226 | 227 | 1 | 4 | 24 | 34 | <1 |
| 227 | 228 | 1 | | | | |
| 228 | 229 | 1 | | | | |
| 229 | 230 | 1 | 4 | 24 | 190 | <1 |
| 230 | 231 | 1 | | | | |
| 231 | 232 | 1 | | | | |
| 232 | 233 | 1 | 8 | 32 | 38 | <1 |
| 233 | 234 | 1 | | | | |
| 234 | 235 | 1 | | | | |
| 235 | 236 | 1 | 10 | 20 | 24 | <1 |
| 236 | 237 | 1 | | | | |
| 237 | 238 | 1 | | | | |
| 238 | 239 | 1 | 6 | 12 | 44 | <1 |
| 239 | 240 | 1 | | | | |
| 240 | 241 | 1 | | | | |
| 241 | 242 | 1 | 8 | 16 | 18 | <1 |
| 242 | 243 | 1 | | | | |
| 243 | 244 | 1 | | | | |
| 244 | 245 | 1 | 4 | 20 | 110 | <1 |
| 245 | 246 | 1 | | | | |
| 246 | 247 | 1 | | | | |
| 247 | 248 | 1 | 6 | 16 | 12 | <1 |
| 248 | 249 | 1 | | | | |
| 249 | 250 | 1 | | | | |
| 250 | 251 | 1 | 4 | 24 | 16 | <1 |
| 251 | 252 | 1 | | | | |
| 252 | 253 | 1 | | | | |
| 253 | 254 | 1 | <2 | 20 | 18 | <1 |
| 254 | 255 | 1 | | | | |
| 255 | 256 | 1 | | | | |
| 256 | 257 | 1 | 14 | 20 | 110 | <1 |
| 257 | 258 | 1 | | | | |
| 258 | 259 | 1 | | | | |
| 259 | 260 | 1 | 10 | 20 | 16 | <1 |
| 260 | 261 | 1 | | | | |
| 261 | 262 | 1 | | | | |
| 262 | 263 | 1 | 10 | 20 | 18 | <1 |
| 263 | 264 | 1 | | | | |
| 264 | 265 | 1 | | | | |
| 265 | 266 | 1 | 8 | 50 | 60 | <1 |
| 266 | 267 | 1 | | | | |
| 267 | 268 | 1 | | | | |
| 268 | 269 | 1 | 8 | 40 | 40 | <1 |

64913

Amoco Minerals Australia Company

DRILL LOG HOLE No. ZT - 80 - 5 PAGE 6 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 269 | 270 | 1 | | | | |
| | | | | | 270 | 271 | 1 | | | | |
| | | | | | 271 | 272 | 3 | 10 | 55 | 40 | <1 |
| | | | | | 272 | 273 | 1 | | | | |
| | | | | | 273 | 274 | 1 | | | | |
| | | | | | 274 | 275 | 3 | 6 | 26 | 18 | <1 |
| | | | | | 275 | 276 | 1 | | | | |
| | | | | | 276 | 277 | 1 | | | | |
| | | | | | 277 | 278 | 3 | 6 | 22 | 24 | <1 |
| | | | | | 278 | 279 | 1 | | | | |
| | | | | | 279 | 280 | 1 | | | | |
| | | | | | 280 | 281 | 3 | 4 | 24 | 26 | <1 |
| | | | | | 281 | 282 | 1 | | | | |
| | | | | | 282 | 283 | 1 | | | | |
| | | | | | 283 | 284 | 3 | 6 | 24 | 100 | <1 |
| | | | | | 284 | 285 | 1 | | | | |
| | | | | | 285 | 286 | 1 | | | | |
| | | | | | 286 | 287 | 3 | 6 | 20 | 22 | <1 |
| | | | | | 287 | 288 | 1 | | | | |
| | | | | | 288 | 289 | 1 | | | | |
| | | | | | 289 | 290 | 3 | 4 | 20 | 18 | <1 |
| | | | | | 290 | 291 | 1 | | | | |
| | | | | | 291 | 292 | 1 | | | | |
| | | | | | 292 | 293 | 3 | 4 | 60 | 160 | <1 |
| | | | | | 293 | 294 | 1 | | | | |
| | | | | | 294 | 295 | 1 | | | | |
| | | | | | 295 | 296 | 3 | 2 | 34 | 65 | <1 |
| | | | | | 296 | 297 | 1 | | | | |
| | | | | | 297 | 298 | 1 | | | | |
| | | | | | 298 | 299 | 3 | 4 | 28 | 60 | <1 |
| | | | | | 299 | 300 | 1 | | | | |
| | | | | | 300 | 301 | 1 | | | | |
| | | | | | 301 | 302 | 3 | 6 | 65 | 250 | <1 |
| | | | | | 302 | 303 | 1 | | | | |
| | | | | | 303 | 304 | 1 | | | | |
| | | | | | 304 | 305 | 3 | 4 | 230 | 570 | <1 |
| | | | | | 305 | 306 | 1 | | | | |
| | | | | | 306 | 307 | 1 | | | | |
| | | | | | 307 | 308 | 3 | <2 | 55 | 210 | <1 |
| | | | | | 308 | 309 | 1 | | | | |
| | | | | | 309 | 310 | 1 | | | | |
| | | | | | 310 | 311 | 3 | 12 | 70 | 300 | <1 |
| | | | | | 311 | 312 | 1 | | | | |
| | | | | | 312 | 313 | 1 | | | | |
| | | | | | 313 | 314 | 1 | 4 | 40 | 220 | <1 |
| | | | | | 314 | 315 | 1 | | | | |
| | | | | | 315 | 316 | 1 | | | | |
| | | | | | 316 | 317 | 3 | 2 | 24 | 85 | <1 |
| | | | | | 317 | 318 | 1 | | | | |
| | | | | | 318 | 319 | 1 | | | | |
| | | | | | 319 | 320 | 3 | 16 | 70 | 130 | <1 |
| | | | | | 320 | 321 | 1 | | | | |
| | | | | | 321 | 322 | 1 | | | | |

64917

Amoco Minerals Australia Company

DRILL LOG HOLE No. ZT- 80- 5 PAGE 7 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 322 | 323 | 1 | 40 | 24 | 70 | <1 |
| | | | | | 323 | 324 | 1 | | | | |
| | | | | | 324 | 325 | 1 | | | | |
| | | | | | 325 | 326 | 1 | 10 | 12 | 46 | <1 |
| | | | | | 326 | 327 | 1 | | | | |
| | | | | | 327 | 328 | 1 | | | | |
| | | | | | 328 | 329 | 1 | 2 | 24 | 48 | <1 |
| | | | | | 329 | 330 | 1 | | | | |
| | | | | | 330 | 331 | 1 | | | | |
| | | | | | 331 | 332 | 1 | 2 | 36 | 200 | <1 |
| | | | | | 332 | 333 | 1 | | | | |
| | | | | | 333 | 334 | 1 | | | | |
| | | | | | 334 | 335 | 1 | 6 | 75 | 350 | <1 |
| | | | | | 335 | 336 | 1 | | | | |
| | | | | | 336 | 337 | 1 | | | | |
| | | | | | 337 | 338 | 1 | 2 | 110 | 460 | <1 |
| | | | | | 338 | 339 | 1 | | | | |
| | | | | | 339 | 340 | 1 | | | | |
| | | | | | 340 | 341 | 1 | 2 | 75 | 620 | <1 |
| | | | | | 341 | 342 | 1 | | | | |
| | | | | | 342 | 343 | 1 | | | | |
| | | | | | 343 | 344 | 1 | 4 | 260 | 1050 | 1 |
| | | | | | 344 | 345 | 1 | | | | |
| | | | | | 345 | 346 | 1 | | | | |
| | | | | | 346 | 347 | 1 | 4 | 160 | 870 | <1 |
| | | | | | 347 | 348 | 1 | | | | |
| | | | | | 348 | 349 | 1 | | | | |
| | | | | | 349 | 350 | 1 | 2 | 145 | 850 | <1 |
| | | | | | 350 | 351 | 1 | | | | |
| | | | | | 351 | 352 | 1 | | | | |
| | | | | | 352 | 353 | 1 | 6 | 175 | 580 | <1 |
| | | | | | 353 | 354 | 1 | | | | |
| | | | | | 354 | 355 | 1 | | | | |
| | | | | | 355 | 356 | 1 | 2 | 20 | 26 | <1 |
| | | | | | 356 | 357 | 1 | | | | |
| | | | | | 357 | 358 | 1 | | | | |
| | | | | | 358 | 359 | 1 | 4 | 32 | 2500 | <1 |
| | | | | | 359 | 360 | 1 | | | | |
| | | | | | 360 | 361 | 1 | | | | |
| | | | | | 361 | 362 | 1 | 6 | 24 | 500 | <1 |
| | | | | | 362 | 363 | 1 | | | | |
| | | | | | 363 | 364 | 1 | | | | |
| | | | | | 364 | 365 | 1 | 4 | 24 | 75 | <1 |
| | | | | | 365 | 366 | 1 | | | | |
| | | | | | 366 | 367 | 1 | | | | |
| | | | | | 367 | 368 | 1 | 2 | 20 | 60 | <1 |
| | | | | | 368 | 369 | 1 | | | | |
| | | | | | 369 | 370 | 1 | | | | |
| | | | | | 370 | 371 | 1 | 8 | 32 | 390 | <1 |
| | | | | | 371 | 372 | 1 | | | | |
| | | | | | 372 | 373 | 1 | | | | |
| | | | | | 373 | 374 | 1 | 4 | 20 | 220 | <1 |
| | | | | | 374 | 375 | 1 | | | | |

691353

Amoco Minerals Australia Company

DRILL LOG HOLE No. ZT-80-5 PAGE 8 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 375 | 376 | 1 | | | | |
| | | | | | 376 | 377 | 1 | 4 | 48 | 110 | <1 |
| | | | | | 377 | 378 | 1 | | | | |
| | | | | | 378 | 379 | 1 | | | | |
| | | | | | 379 | 380 | 1 | 6 | 20 | 165 | <1 |
| | | | | | 380 | 381 | 1 | | | | |
| | | | | | 381 | 382 | 1 | | | | |
| | | | | | 382 | 383 | 1 | 8 | 20 | 100 | <1 |
| | | | | | 383 | 384 | 1 | | | | |
| | | | | | 384 | 385 | 1 | | | | |
| | | | | | 385 | 386 | 1 | 4 | 12 | 36 | <1 |
| | | | | | 386 | 387 | 1 | | | | |
| | | | | | 387 | 388 | 1 | | | | |
| | | | | | 388 | 389 | 1 | 6 | 24 | 85 | <1 |
| | | | | | 389 | 390 | 1 | | | | |
| | | | | | 390 | 391 | 1 | | | | |
| | | | | | 391 | 392 | 1 | 4 | 16 | 16 | <1 |
| | | | | | 392 | 393 | 1 | | | | |
| | | | | | 393 | 394 | 1 | | | | |
| | | | | | 394 | 395 | 1 | 8 | 20 | 200 | <1 |
| | | | | | 395 | 396 | 1 | | | | |
| | | | | | 396 | 397 | 1 | | | | |
| | | | | | 397 | 398 | 1 | 8 | 24 | 32 | <1 |
| | | | | | 398 | 399 | 1 | | | | |
| | | | | | 399 | 400 | 1 | | | | |
| | | | | | 400 | 401 | 1 | 8 | 20 | 16 | <1 |
| | | | | | 401 | 402 | 1 | | | | |
| | | | | | 402 | 403 | 1 | | | | |
| | | | | | 403 | 404 | 1 | 8 | 28 | 18 | <1 |
| | | | | | 404 | 405 | 1 | | | | |
| | | | | | 405 | 406 | 1 | | | | |
| | | | | | 406 | 407 | 1 | 8 | 44 | 195 | <1 |
| | | | | | 407 | 408 | 1 | | | | |
| | | | | | 408 | 409 | 1 | | | | |
| | | | | | 409 | 410 | 1 | 10 | 80 | 200 | <1 |
| | | | | | 410 | 411 | 1 | | | | |
| | | | | | 411 | 412 | 1 | | | | |
| | | | | | 412 | 413 | 1 | 4 | 32 | 80 | <1 |
| | | | | | 413 | 414 | 1 | | | | |
| | | | | | 414 | 415 | 1 | | | | |
| | | | | | 415 | 416 | 1 | 8 | 20 | 24 | <1 |
| | | | | | 416 | 417 | 1 | | | | |
| | | | | | 417 | 418 | 1 | | | | |
| | | | | | 418 | 419 | 1 | 10 | 24 | 14 | <1 |
| | | | | | 419 | 420 | 1 | | | | |
| | | | | | 420 | 421 | 1 | | | | |
| | | | | | 421 | 422 | 1 | 8 | 24 | 12 | <1 |
| | | | | | 422 | 423 | 1 | | | | |
| | | | | | 423 | 424 | 1 | | | | |
| | | | | | 424 | 425 | 1 | 6 | 28 | 28 | <1 |
| | | | | | 425 | 426 | 1 | | | | |
| | | | | | 426 | 427 | 1 | | | | |
| | | | | | 427 | 428 | 1 | 2 | 16 | 16 | <1 |

64913

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-5 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 428 | 429 | 1 | | | | |
| | | | | | 429 | 430 | 1 | | | | |
| | | | | | 430 | 431 | 3 | 4 | 20 | 34 | <1 |
| | | | | | 431 | 432 | 1 | | | | |
| | | | | | 432 | 433 | 1 | | | | |
| | | | | | 433 | 434 | 3 | 8 | 24 | 12 | <1 |
| | | | | | 434 | 435 | 1 | | | | |
| | | | | | 435 | 436 | 1 | | | | |
| | | | | | 436 | 437 | 3 | 10 | 16 | 22 | <1 |
| | | | | | 437 | 438 | 1 | | | | |
| | | | | | 438 | 439 | 1 | | | | |
| | | | | | 439 | 440 | 3 | 12 | 12 | 24 | <1 |
| | | | | | 440 | 441 | 1 | | | | |
| | | | | | 441 | 442 | 1 | | | | |
| | | | | | 442 | 443 | 4 | 8 | 12 | 14 | <1 |
| | | | | | 443 | 444 | 1 | | | | |
| | | | | | 444 | 445 | 1 | | | | |
| | | | | | 445 | 446 | 1 | | | | |
| | | | | | 446 | 447 | 3 | 6 | 12 | 75 | <1 |
| | | | | | 447 | 448 | 1 | | | | |
| | | | | | 448 | 449 | 1 | | | | |
| | | | | | 449 | 450 | 3 | 6 | 20 | 105 | <1 |
| | | | | | 450 | 451 | 1 | | | | |
| | | | | | 451 | 452 | 1 | | | | |
| | | | | | 452 | 453 | 3 | 6 | 24 | 65 | <1 |
| | | | | | 453 | 454 | 1 | | | | |
| | | | | | 454 | 455 | 1 | | | | |
| | | | | | 455 | 456 | 3 | 4 | 20 | 38 | <1 |
| | | | | | 456 | 457 | 1 | | | | |
| | | | | | 457 | 458 | 1 | | | | |
| | | | | | 458 | 459 | 3 | 6 | 70 | 270 | <1 |
| | | | | | 459 | 460 | 1 | | | | |
| | | | | | 460 | 461 | 1 | | | | |
| | | | | | 461 | 462 | 3 | 6 | 80 | 1200 | <1 |
| | | | | | 462 | 463 | 1 | | | | |
| | | | | | 463 | 464 | 1 | | | | |
| | | | | | 464 | 465 | 3 | 6 | 16 | 32 | <1 |
| | | | | | 465 | 466 | 1 | | | | |
| | | | | | 466 | 467 | 1 | | | | |
| | | | | | 467 | 468 | 3 | 14 | 32 | 75 | <1 |
| | | | | | 468 | 469 | 1 | | | | |
| | | | | | 469 | 470 | 1 | | | | |
| | | | | | 470 | 471 | 3 | 14 | 44 | 70 | <1 |
| | | | | | 471 | 472 | 1 | | | | |
| | | | | | 472 | 473 | 1 | | | | |
| | | | | | 473 | 474 | 3 | 16 | 20 | 95 | <1 |
| | | | | | 474 | 475 | 1 | | | | |
| | | | | | 475 | 476 | 1 | | | | |
| | | | | | | | | | | | |
| | | | | | E.O.H. | | | | | | |
| | | | | | 475.30m. | | | | | | |

64015

649156

OCEANA PROSPECT

DRILLHOLE DATA

ZT-80-6

| | | |
|---|---|---|
| Location | : | 3650N : 1350E |
| Declination | : | 60° |
| Azimuth | : | 37°T |
| Total Depth | : | 330 meters |

Assay Results

69- 72= 3m @ 1.52% Pb + 0.28% Zn + 13.3g/t Ag
112-117= 5m @ 1.76% Pb + 1.20% Zn + 6.6g/t Ag
126-134= 8m @ 1.22% Pb + 0.24% Zn + 5.5g/t Ag
212-220= 8m @ 0.45% Pb + 1.39% Zn + 1.0g/t Ag

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80-6 — PAGE 1 OF 7

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN - TAS No. A7860 | ELEVATION meters | COMMENCED 6.8.80 | BORE HOLE SURVEY Bearings mN. | | | | | | INSTRUMENT EASTMAN CAMERA | | | | | |
| | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | | | |
| PROSPECT OCEANA | DIP COLLAR 60° | COMPLETED 14.9.80 | 50 | 65° | N/A | 200 | 63.5 | 035 | 330 | 60.5 | 032 | | | |
| CO-ORDINATES 3650 mN 1350 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 330 meters | 100 | 64° | 035 | 266 | 61.0 | 033 | | | | | | |
| BEARING 037 TN MN GN | LOGGED BY PHIL JONES | | 150 | 64° | 034 | 300 | 59.0 | 034 | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 66.00 | TRICONE Through black and grey dolomitic clays. Poor water return. | | 22351 | 66 | 67 | 1 | 30 | 590 | 7300 | 1 |
| | | | | 22352 | 67 | 68 | 1 | 20 | 290 | 4200 | 2 |
| | | HQ CORING. | | 22353 | 68 | 69 | 1 | 10 | 4050 | 2200 | 4 |
| 66.00 | 68.10 | SILTY DOLOMITE : Black, clayey and silty, completely weathered dolomite. | | 22354 | 69 | 70 | 1 | 22 | 2.55% | 3900 | 10 |
| | | | | 22355 | 70 | 71 | 1 | 10 | 1.20% | 2400 | 6 |
| | | | | 22356 | 71 | 72 | 1 | 8 | 8000 | 1950 | 24 |
| 68.10 | 71.60 | SIDERITE / ANKERITE ROCK : Grey, very dense, rugby in part with open space filling textures observed, weakly mineralized with platey and disseminated galena and sphalerite sideritic and ankeritic dolomite. | Weakly Pb/Zn mineralized < 1% combined. | 22357 | 72 | 73 | 1 | 8 | 750 | 1250 | 2 |
| | | | | 22358 | 73 | 74 | 1 | 8 | 200 | 550 | 1 |
| | | | | 22359 | 74 | 75 | 1 | 8 | 160 | 570 | 7 |
| | | | | 22360 | 75 | 76 | 1 | 8 | 630 | 4800 | 6 |
| | | | | 22361 | 76 | 77 | 1 | 18 | 1450 | 3900 | 2 |
| | | | | | 77 | 78 | 1 | NO | CORE | RECOVERED. | |
| 71.60 | 75.40 | DOLOMITIC SILTY CALCLUTITE : Dark grey to black, completely weathered, rugby, silty and dolomitic calclutite. Minor fine grained bedded ? pyrite. | Minor fine grained pyrite. | 22362 | 78 | 79 | 1 | 12 | 830 | 3400 | 2 |
| | | | | 22363 | 79 | 80 | 1 | 8 | 610 | 1800 | 1 |
| | | | | 22364 | 80 | 81 | 1 | 6 | 310 | 1100 | 35 |
| | | | | 22365 | 81 | 82 | 1 | 5 | 1100 | 1000 | 5 |
| | | | | 22366 | 82 | 83 | 1 | 6 | 420 | 1150 | 4 |
| 75.40 | 92.00 | CALCLUTITE : Interbedded, massive, fresh, grey limestone sedimentary breccias and very weathered light grey, silty porous calclutites. Minor to moderate calcite veining with superimposed minor siderite veining. Trace of galena / sphalerite in some of the sideritic veins. Ground extensively broken with clayey intervals very prominent. Possible bedding trace 40° to c.a. at 88.70 metres. | Trace galena / sphalerite in Calcite / Siderite veins. | 22367 | 83 | 84 | 1 | 12 | 1650 | 2100 | 1 |
| | | | | 22368 | 84 | 85 | 1 | 18 | 170 | 930 | 2 |
| | | | | 22369 | 85 | 86 | 1 | 6 | 910 | 1000 | < 1 |
| | | | | 22370 | 86 | 87 | 1 | 12 | 490 | 670 | < 1 |
| | | | | 22371 | 87 | 88 | 1 | 6 | 135 | 750 | < 1 |
| | | | | 22372 | 88 | 89 | 1 | 6 | 80 | 600 | < 1 |
| | | | | 22373 | 89 | 90 | 1 | 4 | 115 | 600 | < 1 |
| | | | | 22374 | 90 | 91 | 1 | 22 | 380 | 1150 | < 1 |
| | | | | 22375 | 91 | 92 | 1 | 8 | 270 | 1950 | < 1 |
| | | | | 22376 | 92 | 93 | 1 | 12 | 520 | 3100 | 2 |
| | | | | 22377 | 93 | 94 | 1 | 12 | 2300 | 1.15% | 2 |
| 92.00 | 100.50 | DOLOMITE BRECCIA : Black, completely weathered, clayey, silty, pyritic in part, sideritic dolomite breccia. Open space filling by siderite (vughs & fractures) very prevalent, minor to trace Pb/Zn as disseminations. Possible relict bedding = 15° to c.a at 99.5m. | Trace / Minor Pb-Zn as disseminations | 22378 | 94 | 95 | 1 | 10 | 1800 | 8100 | 8 |
| | | | | 22379 | 95 | 96 | 1 | 10 | 5200 | 9200 | 7 |
| | | | | 22380 | 96 | 97 | 1 | 8 | 3300 | 7300 | 3 |
| | | | | 22381 | 97 | 98 | 1 | 18 | 1.35% | 1.76% | 50 |
| | | | | 22382 | 98 | 99 | 1 | 8 | 1200 | 7400 | 2 |
| | | | | 22383 | 99 | 100 | 1 | 10 | 2300 | 4500 | 3 |

6469

DRILL LOG HOLE No. ZT - 80 - 6 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100.5 | 110.0 | SILTY DOLOMITE: Fine grained, very weathered, pughy, grey to dark grey, silty ankeritic dolomite. Ground moderately broken. Minor relict laminar bedding? ≤ 40° to c.a. at 105 metres. Weakly weathered sections tend to be dark, massive and dense. | | 22384 | 100 | 101 | 1 | 8 | 530 | 3700 | 1 |
| | | | | 22385 | 101 | 102 | 1 | 8 | 135 | 3900 | 1 |
| | | | | 22386 | 102 | 103 | 1 | 16 | 185 | 4100 | 1 |
| | | | | 22387 | 103 | 104 | 1 | 10 | 860 | 7200 | 3 |
| | | | | 22388 | 104 | 105 | 1 | 16 | 2900 | 1.82% | 14 |
| | | | | 22389 | 105 | 106 | 1 | 8 | 590 | 6900 | 2 |
| | | | | 22390 | 106 | 107 | 1 | 8 | 430 | 6700 | 1 |
| | | | | 22391 | 107 | 108 | 1 | 12 | 570 | 5100 | 1 |
| 110.0 | 134.5 | SIDERITE/ANKERITE DOLOMITE BRECCIA: Cream, grey to black, extensively brecciated, open pore space infilled, weakly mineralized rock. Minor disseminated sphalerite (pale pink in colour) and blebby to platey galena. Breccia fragments very angular, and average 1-3cm in diameter. Core shows strong preferred orientation of sideritic infilling material ≤ 30° to ca. Core extensively fractured and broken with minor interbedded clay zones. | Minor galena/sphalerite randomly distributed throughout the breccia. | 22392 | 108 | 109 | 1 | 10 | 980 | 4800 | 2 |
| | | | | 22393 | 109 | 110 | 1 | 22 | 1600 | 5400 | 2 |
| | | | | 22394 | 110 | 111 | 1 | 10 | 4000 | 3300 | 2 |
| | | | | 22395 | 111 | 112 | 1 | 10 | 5000 | 6900 | 2 |
| | | | | 22396 | 112 | 113 | 1 | 14 | 3700 | 1.44% | 6 |
| | | | | 22397 | 113 | 114 | 1 | 14 | 6000 | 1.39% | 13 |
| | | | | 22398 | 114 | 115 | 1 | 16 | 2.25% | 9400 | 7 |
| | | | | 22399 | 115 | 116 | 1 | 16 | 1.75% | 1.21% | 5 |
| | | | | 22400 | 116 | 117 | 1 | 14 | 2950 | 1.04% | 2 |
| | | | | 22401 | 117 | 118 | 1 | 12 | 2750 | 8600 | 2 |
| | | | | 22402 | 118 | 119 | 1 | 18 | 310 | 5100 | 1 |
| | | | | 22403 | 119 | 120 | 1 | 8 | 3150 | 5600 | 2 |
| 134.5 | 151.00 | SILTY LIMESTONE: Completely weathered, weakly calcite veined, occaissionally brecciated, grey to dark grey dolomitic silty limestone. Very minor siderite with calcite. Minor corralline fossil imprints. | | 22404 | 120 | 121 | 1 | 10 | 1900 | 1.06% | 2 |
| | | | | 22405 | 121 | 122 | 1 | 10 | 1950 | 1.04% | 2 |
| | | | | 22406 | 122 | 123 | 1 | 10 | 7300 | 6800 | 4 |
| | | | | 22407 | 123 | 124 | 1 | 8 | 870 | 5500 | 1 |
| | | | | 22408 | 124 | 125 | 1 | 10 | 4100 | 3600 | 3 |
| | | | | 22409 | 125 | 126 | 1 | 14 | 8600 | 2800 | 5 |
| 151.0 | 159.5 | SIDERITIC DOLOMITE: Dark grey, massive crystalline dolomite, strongly calcite/siderite veined with minor quartz?? Minor pyrite is associated with disseminated minor sphalerite and trace galena. Ground intensely brecciated and broken with numerous pugh zones present. Sections of core vuggy. Disseminated sulphides at times oriented parallel to sideritic veining. | Minor disseminated sphalerite - trace galena. | 22410 | 126 | 127 | 1 | 10 | 2.00% | 1300 | 8 |
| | | | | 22411 | 127 | 128 | 1 | 8 | 1.55% | 670 | 6 |
| | | | | 22412 | 128 | 129 | 1 | 4 | 2750 | 960 | 2 |
| | | | | 22413 | 129 | 130 | 1 | 10 | 1.70% | 3000 | 8 |
| | | | | 22414 | 130 | 131 | 1 | 8 | 3600 | 4700 | 2 |
| | | | | 22415 | 131 | 132 | 1 | 24 | 2900 | 4600 | 1 |
| | | | | 22416 | 132 | 133 | 1 | 10 | 1.05% | 2600 | 5 |
| | | | | 22417 | 133 | 134 | 1 | 24 | 2.50% | 1550 | 12 |
| | | | | 22418 | 134 | 135 | 1 | 10 | 2700 | 4900 | 2 |
| 159.5 | 173.0 | SILTY DOLOMITE: Completely weathered, dark grey to black, silty dolomite. Minor relict fine bedding at 40° to ca at 166 metres. | | 22419 | 135 | 136 | 1 | 16 | 2450 | 6600 | 3 |
| | | | | 22420 | 136 | 137 | 1 | 10 | 900 | 4900 | 1 |
| | | | | 22421 | 137 | 138 | 1 | 12 | 1000 | 4400 | 1 |
| | | CONT OVER. | | 22422 | 138 | 139 | 1 | 10 | 1850 | 5300 | 2 |

094E 0178

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 159.5 | 173.0 | SILTY DOLOMITE CON'T: Minor sideritic veinleted sections of core quite rughy. Core broken and very pughy. | | 22423 | 139 | 140 | 1 | 20 | 630 | 3300 | 6 |
| | | | | 22424 | 140 | 141 | 1 | 12 | 550 | 2500 | 1 |
| | | | | 22425 | 141 | 142 | 1 | 18 | 360 | 2600 | 1 |
| | | | | 22426 | 142 | 143 | 1 | 12 | 50 | 135 | 2 |
| 173.0 | 177.0 | DOLOMITIC SILTSTONE: Light grey, massive, very well sorted, weakly calcareous and ankeritic veined, in part pelletal siltstone. | | 22427 | 143 | 144 | 1 | 38 | 65 | 380 | <1 |
| | | | | 22428 | 144 | 145 | 1 | 12 | 370 | 2050 | 1 |
| | | | | 22429 | 145 | 146 | 1 | 12 | 80 | 300 | <1 |
| | | | | 22430 | 146 | 147 | 1 | 10 | 48 | 140 | <1 |
| 177.0 | 180.8 | CALCAREOUS SANDSTONE: Light grey, speckled, extensively siderite/ankerite veined brecciated, coarse grained sandstone. Core moderately broken, pughy in lobr part. Ankerite forming grey white rosettes. Breccia's composed mainly of angular fragments of country rock in a siderite/ankerite matrix. | | 22431 | 147 | 148 | 1 | 10 | 65 | 38 | <1 |
| | | | | 22432 | 148 | 149 | 1 | 10 | 440 | 1950 | 1 |
| | | | | 22433 | 149 | 150 | 1 | 14 | 230 | 890 | 1 |
| | | | | 22434 | 150 | 151 | 1 | 16 | 2650 | 3000 | 1 |
| | | | | 22435 | 151 | 152 | 1 | 14 | 5450 | 4600 | 2 |
| | | | | 22436 | 152 | 153 | 1 | 14 | 2250 | 3700 | 2 |
| | | | | 22437 | 153 | 154 | 1 | 10 | 2350 | 4600 | 2 |
| | | | | 22438 | 154 | 155 | 1 | 8 | 540 | 2300 | 1 |
| 180.8 | 195.5 | SILTY DOLOMITE: Completely weathered, dark grey to grey, silty, weakly calcite/ankerite veinleted dolomite. Minor fossiliferous bed composed of oolitic & coralline debris. Minor siderite. | | 22439 | 155 | 156 | 1 | 18 | 3850 | 4600 | 3 |
| | | | | 22440 | 156 | 157 | 1 | 12 | 4350 | 3500 | 3 |
| | | | | | 157 | 158 | 1 | NO | CORE | RECOVERED | |
| | | | | | 158 | 159 | 1 | " | " | " | |
| | | | | 22441 | 159 | 160 | 1 | 14 | 1800 | 4500 | 2 |
| | | | | 22442 | 160 | 161 | 1 | 14 | 540 | 2800 | 2 |
| 195.5 | 203.0 | SEDIMENTARY SLUMP BRECCIA: Rounded to angular fragments of silty sparitic limestone, in a dark grey to black muddy dolomitic matrix. Fragments up to 5cm in length, generally rounded (due to rolling??). Fragments are composed almost entirely of shell fragments and oolitic pieces of sparry limestone. Minor ankerite/siderite veinlets with trace sphalerite. | Trace sphalerite in veinlets. | 22443 | 161 | 162 | 1 | 32 | 470 | 1850 | 1 |
| | | | | 22444 | 162 | 163 | 1 | 18 | 630 | 830 | 1 |
| | | | | 22445 | 163 | 164 | 1 | 20 | 330 | 930 | 1 |
| | | | | 22446 | 164 | 165 | 1 | 18 | 220 | 1050 | <1 |
| | | | | 22447 | 165 | 166 | 1 | 14 | 160 | 2000 | 1 |
| | | | | 22448 | 166 | 167 | 1 | 14 | 165 | 1650 | 1 |
| | | | | 22449 | 167 | 168 | 1 | 14 | 270 | 2000 | 1 |
| | | | | 22450 | 168 | 169 | 1 | 14 | 490 | 3400 | 1 |
| | | | | 26401 | 169 | 170 | 1 | 16 | 760 | 5400 | 2 |
| 203.0 | 219.00 | ANKERITIC COLLAPSE BRECCIA?: Angular breccia fragments up to 5cm in length, of ankerite material in a dark black/green matrix of pyritic dolomite. Rock is stained brown/yellow/green due to large amounts of very fine grained pyrite. Rock very dense, but very weathered, very clayey in part. Cavity 216-217. Minor siderite veining. | | 26402 | 170 | 171 | 1 | 16 | 610 | 4300 | 1 |
| | | | | 26403 | 171 | 172 | 1 | 75 | 180 | 1550 | <1 |
| | | | | 26404 | 172 | 173 | 1 | 18 | 85 | 1150 | <1 |
| | | | | 26405 | 173 | 174 | 1 | 8 | 16 | 320 | <1 |
| | | | | 26406 | 174 | 175 | 1 | 10 | 44 | 390 | <1 |
| | | | | 26407 | 175 | 176 | 1 | 8 | 36 | 310 | <1 |
| | | | | 26408 | 176 | 177 | 1 | 8 | 55 | 630 | <1 |
| | | | | 26409 | 177 | 178 | 1 | 8 | 60 | 195 | <1 |

69469

DRILL LOG HOLE No. ZT-80-6 PAGE 4 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 219.0 | 240.5 | SIDERITE / ANKERITE BRECCIA: Cream/grey/white, vughy, weakly galena, sphalerite, pyrite mineralized, extremely shattered and brecciated, dolomitized rock. Concretionary growth rings of calcite, siderite and ankerite present. Pb/Zn mineralization present as disseminations and thin veinlets or blebs. Moderate pyrite veining present or as disseminations in the darker dolomitic matrix of the breccia. Minor push zones present. Cavity 220.5-222.0 m. Breccia fragments range in size from 0.5 cm to 4cm. Breccia matrix composed of fine grained black silty dolomite. Fragments in breccia generally angular, some sub angular. Lot of open space pore filling by ankerite and siderite. Core recovery averaged approx. 50%. | Minor Pb/Zn/Py mineralization. Fragments of massive galena occur in sections of breccia." (0.5-10cm) (size) | 26410 | 178 | 179 | 1 | 8 | 55 | 810 | <1 |
| | | | | 26411 | 179 | 180 | 1 | 6 | 10 | 125 | <1 |
| | | | | 26412 | 180 | 181 | 1 | 8 | 24 | 195 | <1 |
| | | | | 26413 | 181 | 182 | 1 | 10 | 105 | 630 | <1 |
| | | | | 26414 | 182 | 183 | 1 | 10 | 65 | 370 | <1 |
| | | | | 26415 | 183 | 184 | 1 | 10 | 210 | 340 | <1 |
| | | | | 26416 | 184 | 185 | 1 | 8 | 90 | 300 | <1 |
| | | | | 26417 | 185 | 186 | 1 | 8 | 85 | 440 | <1 |
| | | | | 26418 | 186 | 187 | 1 | 10 | 230 | 630 | <1 |
| | | | | 26419 | 187 | 188 | 1 | 10 | 130 | 1500 | <1 |
| | | | | 26420 | 188 | 189 | 1 | 10 | 115 | 1500 | <1 |
| | | | | 26421 | 189 | 190 | 1 | 10 | 32 | 240 | <1 |
| | | | | 26422 | 190 | 191 | 1 | 18 | 48 | 105 | <1 |
| | | | | 26423 | 191 | 192 | 1 | 8 | 40 | 135 | <1 |
| | | | | 26424 | 192 | 193 | 1 | 8 | 38 | 150 | <1 |
| | | | | 26425 | 193 | 194 | 1 | 12 | 34 | 85 | <1 |
| | | | | 26426 | 194 | 195 | 1 | 10 | 40 | 105 | <1 |
| 240.5 | 257.9 | ANKERITIC COLLAPSE BRECCIA?: Grey to greeny black, very dense, massive, brecciated in part, vughy, fine grained ankeritic dolomite breccia. Angular breccia fragments up to 2cm in diam. Minor clayey zones of completely weathered material. Poor core recoveries through zone. | | 26427 | 195 | 196 | 1 | 8 | 34 | 80 | <1 |
| | | | | 26428 | 196 | 197 | 1 | 8 | 22 | 28 | <1 |
| HQ → NQ | | | | 26429 | 197 | 198 | 1 | 8 | 40 | 90 | <1 |
| 242.20m. | | | | 26430 | 198 | 199 | 1 | 8 | 36 | 44 | <1 |
| | | | | 26431 | 199 | 200 | 1 | 10 | 38 | 115 | <1 |
| | | | | 26432 | 200 | 201 | 1 | 10 | 32 | 510 | <1 |
| | | | | 26433 | 201 | 202 | 1 | 8 | 40 | 75 | <1 |
| | | | | 26434 | 202 | 203 | 1 | 8 | 40 | 85 | <1 |
| 257.9 | 261.0 | CALCLUTITE: Grey, occaissionally pelatal (concretionary nodules up to 2cm in diam) moderately qtz/calcite veined, fine grained, massive calclutite with minor interbeds of browny grey muddy dolomite (Beds < 5cm). | | 26435 | 203 | 204 | 1 | 10 | 40 | 1050 | <1 |
| | | | | 26436 | 204 | 205 | 1 | 8 | 22 | 640 | <1 |
| | | | | 26437 | 205 | 206 | 1 | 18 | 310 | 1750 | <1 |
| | | | | 26438 | 206 | 207 | 1 | 8 | 95 | 810 | <1 |
| | | | | 26439 | 207 | 208 | 1 | 10 | 490 | 5000 | <1 |
| | | | | 26440 | 208 | 209 | 1 | 10 | 780 | 5100 | <1 |
| 261.0 | 264.0 | ANGULAR DOLOMITE BRECCIA: greeny grey to black, vughy, weakly siderite veined, clayey, angular breccia. Rock very dense, massive? possibly pyritic (very fine grained). Breccia fragments are both angular to sub-angular and of numerous lithologies - not only host material (Sedimentary breccia?). | | 26441 | 209 | 210 | 1 | 8 | 1500 | 9700 | <1 |
| | | | | | 210 | 212 | 2 | CAVITY. | | | |
| | | | | 26442 | 212 | 213 | 1 | 14 | 4800 | 1.14% | <1 |
| | | | | 26443 | 213 | 214 | 1 | 12 | 6950 | 1.06% | <1 |
| | | | | 26444 | 214 | 215 | 1 | 10 | 5000 | 2.60% | <1 |
| | | | | 26445 | 215 | 216 | 1 | 10 | 5500 | 3.50% | <1 |
| | | | | | 216 | 217 | 1 | CAVITY | | | |
| | | | | 26446 | 217 | 218 | 1 | 14 | 7450 | 1.73% | 1 |

649160

DRILL LOG HOLE No. ZT-80-6 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 264.0 | 281.40 | FOSSIL BRECCIA: Massive, grey, heavily calcite/ankerite veined fossil breccia. (sedimentary slump breccia!) Fossils include coraline fragments, stromatolites, nodules, shelly fragments and oolites indicating a possible shallow water environment. Fragments vary in size up to 10's of cm. Zones of pugby material indicating karsting? Calcite / Ankerite (minor siderite) veining contains traces of very fine grained pink/white coloured sphalerite + fine grained galena. Breccia very dolomitized, lot of pervasive fine grained ankerite present. | | 26447 | 218 | 219 | 1 | 8 | 2850 | 3.00% | <1 |
| | | | | 26448 | 219 | 220 | 1 | 12 | 3800 | 1.09% | 3 |
| | | | | 26449 | 220 | 221 | 1 | 16 | 5200 | 8800 | 3 |
| | | | | | 221 | 222 | 1 | CAVITY | | | |
| | | | | 26450 | 222 | 223 | 1 | 14 | 2900 | 8700 | 2 |
| | | | | 26451 | 223 | 224 | 1 | 20 | 2900 | 8900 | 2 |
| | | | | 26452 | 224 | 225 | 1 | 16 | 1700 | 7600 | 1 |
| | | | | 26453 | 225 | 226 | 1 | 14 | 7600 | 5700 | 4 |
| | | | | 26454 | 226 | 227 | 1 | 12 | 2600 | 8900 | 1 |
| | | | | 26455 | 227 | 228 | 1 | 14 | 580 | 4300 | 1 |
| | | | | 26456 | 228 | 229 | 1 | 12 | 1600 | 5400 | 1 |
| | | | | 26457 | 229 | 230 | 1 | 16 | 570 | 4500 | 1 |
| | | | | 26458 | 230 | 231 | 1 | 10 | 310 | 1850 | <1 |
| | | | | | 231 | 232 | 1 | NO CORE | | RECOVERED | |
| 281.4 | 289.5 | CALCLUTITE: Dark grey and light grey, massive, silty dolomites and calclutites. Possibly soft sediment slumped. Minor thin interbeds of oolitic and shelly calcarenites present. (5-10 cm in width). Weak to moderate qtz/calcite veining, minor ankerite, minor stylolites present. Good core recoveries (>80%) even in pugby zones. | | 26459 | 232 | 233 | 1 | 26 | 1.45% | 8000 | 7 |
| | | | | 26460 | 233 | 234 | 1 | 18 | 1.50% | 5300 | 5 |
| | | | | 26461 | 234 | 235 | 1 | 28 | 5000 | 1.46% | 4 |
| | | | | 26462 | 235 | 236 | 1 | 18 | 1600 | 7600 | 2 |
| | | | | 26463 | 236 | 237 | 1 | 55 | 2200 | 4200 | 1 |
| | | | | 26464 | 237 | 238 | 1 | 16 | 5500 | 3200 | 2 |
| | | | | 26465 | 238 | 239 | 1 | 18 | 5800 | 5900 | 2 |
| | | | | 26466 | 239 | 240 | 1 | 14 | 2000 | 5500 | 1 |
| | | | | 26467 | 240 | 241 | 1 | 12 | 1950 | 1.10% | <1 |
| 289.5 | 291.5 | DOLOMITE / CALCLUTITE BRECCIA: Silty, black, moderately qtz / calcite veined dolomite containing grey/brown, porous, weakly fossiliferous calclutite fragments or slumped calclutite interbeds. Minor siderite veining associated with calcite. Numerous clayey zones present representing cw host rock (ie karsting). | | 26468 | 241 | 242 | 1 | 14 | 1150 | 1.25% | <1 |
| | | | | 26469 | 242 | 243 | 1 | 18 | 940 | 7200 | <1 |
| | | | | 26470 | 243 | 244 | 1 | 18 | 270 | 3400 | <1 |
| | | | | 26471 | 244 | 245 | 1 | 14 | 1850 | 6200 | 1 |
| | | | | 26472 | 245 | 246 | 1 | 20 | 1800 | 7000 | 1 |
| | | | | 26473 | 246 | 247 | 1 | 14 | 1200 | 1.55% | <1 |
| | | | | 26474 | 247 | 248 | 1 | 14 | 960 | 7800 | <1 |
| | | | | 26475 | 248 | 249 | 1 | 12 | 780 | 1.15% | <1 |
| | | | | 26476 | 249 | 250 | 1 | 12 | 680 | 3000 | <1 |
| 291.5 | 297.0 | TECTONIC BRECCIA: Strongly calcite/siderite/ankerite veined, brecciated, weakly fossiliferous dolomitised calclutites. The breccia contains abundant disseminated ankerite with trace amounts of yellow fine grained sphalerite and blebby fine grained galena. Core badly shattered in sections with poor recoveries. | Trace of sphalerite and galena. | 26477 | 250 | 251 | 1 | 10 | 560 | 4700 | <1 |
| | | | | 26478 | 251 | 252 | 1 | 10 | 850 | 3700 | <1 |
| | | | | 26479 | 252 | 253 | 1 | 10 | 540 | 3700 | <1 |
| | | | | 26480 | 253 | 254 | 1 | 12 | 2100 | 2200 | 1 |
| | | | | 26481 | 254 | 255 | 1 | 16 | 3900 | 3300 | 3 |
| | | | | 26482 | 255 | 256 | 1 | 10 | 4800 | 1300 | 2 |
| | | | | 26483 | 256 | 257 | 1 | 12 | 2600 | 1150 | 1 |

CSG

DRILL LOG HOLE No. ZT-80-6 PAGE 6 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 291.5 | 297.0 | TECTONIC BRECCIA con't: Minor fine grained, disseminated pyrite occurs in the darker dolomitic material. Fragments in the breccia are very angular and of host rock material. | Minor pyrite. (very fine grained) | 26484 | 257 | 258 | 1 | 14 | 75 | 720 | <1 |
| | | | | 26485 | 258 | 259 | 1 | 14 | 130 | 630 | <1 |
| | | | | 26486 | 259 | 260 | 1 | 12 | 50 | 160 | <1 |
| | | | | 26487 | 260 | 261 | 1 | 14 | 310 | 640 | <1 |
| | | | | 26488 | 261 | 262 | 1 | 14 | 850 | 2800 | <1 |
| | | | | 26489 | 262 | 263 | 1 | 20 | 550 | 4500 | <1 |
| 297.0 | 315.6 | FOSSIL BRECCIA: Predominantly light grey stromatolitic, coralline, oolitic and laminar fragments up to 10's of cm in width, cemented in a black dolomitic matrix containing abundant fine grained pyrite. (From 297.0 to 300.) Very minor calcite veining in massive competent sequence. From 300 to 315.6m the sequence is comprised of darker grey, oolitic, minor coralline, pelletal (nodules vary from pea size to the size of a walnut) shelly fragments with numerous fragments of black dolomite or lighter grey calclutite cemented in a very black, silty dolomite matrix containing abundant syngenetic, laminar and/or bleby pyrite up to ≈ 3%. laminar pyrite parallels the dolomite laminations. Fragments in breccia have a rough alignment in places at 35° to the ca possibly representing crude bedding. Minor thin pugby zones due to karsting in CW breccia material. | Abundant fine grained pyrite. (Syngenetic & remobilized.) | 26490 | 263 | 264 | 1 | 16 | 290 | 7600 | 1 |
| | | | | 26491 | 264 | 265 | 1 | 14 | 32 | 170 | <1 |
| | | | | 26492 | 265 | 266 | 1 | 70 | 230 | 1100 | 1 |
| | | | | 26493 | 266 | 267 | 1 | 12 | 105 | 300 | <1 |
| | | | | 26494 | 267 | 268 | 1 | 12 | 360 | 1000 | 1 |
| | | | Trace of galena and sphalerite in thin calcite veinlets. | 26495 | 268 | 269 | 1 | 20 | 260 | 1000 | 1 |
| | | | | 26496 | 269 | 270 | 1 | 22 | 260 | 1450 | 1 |
| | | | | 26497 | 270 | 271 | 1 | 10 | 55 | 2200 | <1 |
| | | | | 26498 | 271 | 272 | 1 | 12 | 440 | 5700 | 1 |
| | | | | 26499 | 272 | 273 | 1 | 18 | 1400 | 9600 | 2 |
| | | | | 26500 | 273 | 274 | 1 | 6 | 80 | 3000 | 1 |
| | | | | 27451 | 274 | 275 | 1 | 16 | 50 | 2000 | 1 |
| | | | | 27452 | 275 | 276 | 1 | 14 | 32 | 420 | <1 |
| | | | | 27453 | 276 | 277 | 1 | 16 | 80 | 1100 | 1 |
| | | | | 27454 | 277 | 278 | 1 | 12 | 135 | 1250 | 1 |
| | | | | 27455 | 278 | 279 | 1 | 6 | 32 | 350 | <1 |
| | | | | 27456 | 279 | 280 | 1 | 6 | 36 | 330 | <1 |
| | | | | 27457 | 280 | 281 | 1 | 12 | 105 | 1300 | <1 |
| | | | | 27458 | 281 | 282 | 1 | 24 | 85 | 580 | <1 |
| | | | | 27459 | 282 | 283 | 1 | 10 | 40 | 720 | <1 |
| | | | | 27460 | 283 | 284 | 1 | 8 | 40 | 620 | <1 |
| | | | | 27461 | 284 | 285 | 1 | 12 | 135 | 470 | <1 |
| | | | | 27462 | 285 | 286 | 1 | 8 | 36 | 530 | <1 |
| 315.6 | 330.0 | DOLOMITE: Black, massive to laminar, silty dolomite with minor dark grey to grey muddy calclutite interbeds and/or fragments. Very minor shelly detritus present. Tectonic breccia with associated qtz/carbonate veining occurs from 319.40 - 320.40 m. The zone was intensely shattered giving rise to v. poor recoveries (≈ 30%.) Vein has an attitude ≈ 25° to ca. Bedding at 325m ≈ 40° to ca. (interbed | | 27463 | 286 | 287 | 1 | 8 | 32 | 880 | <1 |
| | | | | 27464 | 287 | 288 | 1 | 8 | 44 | 400 | <1 |
| | | | | 27465 | 288 | 289 | 1 | 6 | 140 | 640 | <1 |
| | | | | 27466 | 289 | 290 | 1 | 8 | 160 | 1200 | <1 |
| | | | | 27467 | 290 | 291 | 1 | 6 | 110 | 800 | <1 |
| | | | | 27468 | 291 | 292 | 1 | 10 | 3100 | 1800 | 2 |
| | | | | 27469 | 292 | 293 | 1 | 8 | 740 | 270 | 1 |
| | | | | 27470 | 293 | 294 | 1 | 10 | 390 | 620 | <1 |
| | | | | 27471 | 294 | 295 | 1 | 12 | 240 | 2.45% | 1 |
| | | | | 27472 | 295 | 296 | 1 | 8 | 750 | 480 | <1 |

649162

DRILL LOG HOLE No. ZT-80-6 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 315.6 | 330.0 | DOLOMITE CON'T: of light grey calclutile in black dolomitic sequence). A distinct foliation marks bedding attitudes by shearing out the delicate laminations. Minor very fine grained pyrite occurs as disseminations and as thin beds throughout dolomite. A trace of galena and sphalerite occurs in thin qtz/calcite veinlets. Core badly broken in sections with recoveries over the last 3 metres generally averaging 30-50%. | Minor fine grained pyrite. | 27473 | 296 | 297 | 1 | 32 | 55 | 210 | 1 |
| | | | | 27474 | 297 | 298 | 1 | 24 | 70 | 80 | <1 |
| | | | | 27475 | 298 | 299 | 1 | 6 | 16 | 30 | <1 |
| | | | Trace galena / sphalerite in thin qtz/calcite veinlets. | 27476 | 299 | 300 | 1 | 10 | 8 | 14 | <1 |
| | | | | 27477 | 300 | 301 | 1 | 8 | 16 | 18 | <1 |
| | | | | 27478 | 301 | 302 | 1 | 8 | 12 | 16 | <1 |
| | | | | 27479 | 302 | 303 | 1 | 8 | 20 | 24 | <1 |
| | | | | 27480 | 303 | 304 | 1 | 8 | 24 | 16 | <1 |
| | | | | 27481 | 304 | 305 | 1 | 10 | 65 | 300 | <1 |
| | | | | 27482 | 305 | 306 | 1 | 10 | 12 | 18 | <1 |
| | | | | 27483 | 306 | 307 | 1 | 6 | 12 | 14 | <1 |
| | | END OF HOLE 330.0 metres. | | 27484 | 307 | 308 | 1 | 10 | 16 | 16 | <1 |
| | | | | 27485 | 308 | 309 | 1 | 10 | 16 | 24 | <1 |
| | | | | 27486 | 309 | 310 | 1 | 14 | 16 | 16 | <1 |
| | | | | 27487 | 310 | 311 | 1 | 10 | 8 | 10 | <1 |
| | | | | 27488 | 311 | 312 | 1 | 12 | 16 | 18 | <1 |
| | | | | | 312 | 313 | 1 | NO | CORE | RECOVERY. | |
| | | | | 27489 | 313 | 314 | 1 | 6 | 16 | 32 | <1 |
| | | | | 27490 | 314 | 315 | 1 | 8 | 100 | 150 | <1 |
| | | | | 27491 | 315 | 316 | 1 | 14 | 450 | 700 | <1 |
| | | | | 27492 | 316 | 317 | 1 | 12 | 65 | 260 | <1 |
| | | | | 27493 | 317 | 318 | 1 | 28 | 85 | 75 | <1 |
| | | | | 27494 | 318 | 319 | 1 | 32 | 390 | 100 | <1 |
| | | | | 27495 | 319 | 320 | 1 | 20 | 75 | 350 | <1 |
| | | | | 27496 | 320 | 321 | 1 | 115 | 270 | 60 | <1 |
| | | | | 27497 | 321 | 322 | 1 | 20 | 180 | 200 | <1 |
| | | | | 27498 | 322 | 323 | 1 | 12 | 80 | 125 | <1 |
| | | | | 27499 | 323 | 324 | 1 | 10 | 370 | 90 | <1 |
| | | | | 27500 | 324 | 325 | 1 | 8 | 210 | 310 | <1 |
| | | | | 27501 | 325 | 326 | 1 | 12 | 580 | 310 | <1 |
| | | | | 27502 | 326 | 327 | 1 | 125 | 320 | 34 | <1 |
| | | | | 27503 | 327 | 328 | 1 | 10 | 145 | 190 | <1 |
| | | | | 27504 | 328 | 329 | 1 | 10 | 165 | 160 | <1 |
| | | | | 27505 | 329 | 330 | 1 | 10 | 195 | 26 | <1 |
| | | | | | EOH | | | | | | |

649133

649164

OCEANA PROSPECT

DRILLHOLE DATA

ZT-80-7

| | | |
|---|---|---|
| Location | : | 3420N : 1250E |
| Declination | : | 50° |
| Azimuth | : | 37°T |
| Total Depth | : | 250 meters |

Assay Results

167-169= 2m @ 12.0% Pb + 11.0% Zn + 70g/t Ag.pa

**Amoco Minerals Australia Company**

DRILL LOG — HOLE No. ZT-80-7 — PAGE 1 OF 7

| | | | | | BORE HOLE SURVEY | | | INSTRUMENT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN | No. A7860 | ELEVATION 188 meters | COMMENCED 18-9-80 | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing |
| PROSPECT OCEANA | | DIP COLLAR 50° GE | COMPLETED 25-9-80 | 50 | 48 | 040 | 125 | 41.5 | 048 | | | |
| CO-ORDINATES 3420 mN 1250 mE | | CORE SIZE HQ | TOTAL LENGTH 250 meters | 75 | 46 | 043 | 200 | 41.5 | 052 | | | |
| BEARING 037 TN MN GN | | LOGGED BY PHILIP JONES | | 100 | 44 | 045 | 250 | 40.5 | 051 | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 16 | TRICONE Gravels to 4 metres, | | 27351 | 16.3 | 19.3 | 3 | 110 | 65 | 165 | <1 |
| | | weathered dolomitic clays to 16.0 metres. | | 27352 | 19.3 | 22.3 | 3 | 26 | 16 | 90 | <1 |
| HQ | Coring. | | | 27353 | 22.3 | 25.3 | 3 | 16 | 16 | 55 | <1 |
| 16.0 | 38.0 | INTERBEDDED CALCLUTITE/DOLOMITE/CARENITE: | Disseminated and | 27354 | 25.3 | 28.3 | 3 | 250 | 24 | 180 | <1 |
| | | massive grey, weakly calcite (minor siderite) | laminar pyrite in | 27355 | 28.3 | 31.3 | 3 | 12 | 12 | 30 | <1 |
| | | veined calclutites interbedded with dark grey | black dolomite | 27356 | 31.3 | 34.3 | 3 | 16 | 20 | 65 | <1 |
| | | laminar to thickly bedded carbonaceous | | 27357 | 34.3 | 37.3 | 3 | 20 | 16 | 55 | <1 |
| | | dolomites with minor fossiliferous (shelly) | | 27358 | 37.3 | 40.3 | 3 | 16 | 8 | 34 | <1 |
| | | calcarenites and laminar micritic muds. Beds | | 27359 | 40.3 | 43.3 | 3 | 26 | 24 | 135 | <1 |
| | | generally <5cm in thickness, dolomite contains | | 27360 | 43.3 | 46.3 | 3 | 10 | 12 | 16 | <1 |
| | | fine grained disseminated pyrite, moderate | | 27361 | 46.3 | 49.3 | 3 | 8 | 12 | 14 | <1 |
| | | number of stylolites within calclutites. Calcite/ | | 27362 | 49.3 | 52.3 | 3 | 8 | 12 | 16 | <1 |
| | | siderite cemented tectonic breccia 22.50-23.35 | | 27363 | 52.3 | 55.3 | 3 | 10 | 8 | 16 | <1 |
| | | metres. Veining weak to moderate - calcite. | | 27364 | 55.3 | 58.3 | 3 | 10 | 8 | 18 | <1 |
| | | Rock moderately microfaulted. Bedding 21m | | 27365 | 58.3 | 61.3 | 3 | 14 | 12 | 40 | <1 |
| | | 40° to c.a., 27m 43° to c.a. | | 27366 | 61.3 | 64.3 | 3 | 14 | 16 | 280 | <1 |
| 38.0 | 45.8 | LAMINAR CALCLUTITE: light grey to grey, | Minor laminar | 27367 | 64.3 | 67.3 | 3 | 18 | 12 | 48 | <1 |
| | | laminar, to thickly bedded, cleaved, muddy | pyrite | 27368 | 67.3 | 70.3 | 3 | 14 | 12 | 34 | <1 |
| | | calclutites and dolomitic calclutites. Minor | | 27369 | 70.3 | 73.3 | 3 | 22 | 44 | 210 | <1 |
| | | thin beds of calcrudites (plus qtz frags) and | | 27370 | 73.3 | 76.3 | 3 | 14 | 20 | 85 | <1 |
| | | stylolitized massive calclutites. Calcite/siderite | | 27371 | 76.3 | 79.3 | 3 | 16 | 8 | 32 | <1 |
| | | healed tectonic breccia 43.10 to 43.50 metres. | | 27372 | 79.3 | 82.3 | 3 | 10 | 8 | 20 | <1 |
| | | Minor thinly bedded laminar pyrite present. | | 27373 | 82.3 | 85.3 | 3 | 8 | 8 | 14 | <1 |
| | | Bedding 39m 42° to ca, cleavage 55° to ca, | | 27374 | 85.3 | 88.3 | 3 | 590 | 8 | 560 | <1 |
| | | 44.50 metres 48° to ca, cleavage 65° to ca | | 27375 | 88.3 | 91.3 | 3 | 10 | 8 | 18 | <1 |
| | | Core breaking along cleavage planes. | | 27376 | 91.3 | 94.3 | 3 | 8 | 8 | 14 | <1 |
| 45.8 | 53.60 | FOLIATED CALCLUTITE: foliated (cleaved?) | | 27377 | 94.3 | 97.3 | 3 | 10 | 12 | 28 | <1 |
| | | grey, massive, weakly calcite veined, | | 27378 | 97.3 | 100.3 | 3 | 6 | 8 | 14 | <1 |
| | | stylolitized, calcite with rare thin fossiliferous | | 27379 | 100.3 | 103.3 | 3 | 6 | 8 | 16 | <1 |
| | | calcarenite interbeds. Minor zone of | | 27380 | 103.3 | 106.3 | 3 | 8 | 8 | 16 | <1 |
| | | tectonism from 49.70 to 50.0 metres. | | 27381 | 106.3 | 109.3 | 3 | 8 | 12 | 18 | <1 |
| | | | | 27382 | 109.3 | 112.3 | 3 | 10 | 16 | 75 | <1 |
| | | | | 27383 | 112.3 | 115.3 | 3 | 12 | 8 | 24 | <1 |
| | | | | 27384 | 115.3 | 118.3 | 3 | 8 | 8 | 16 | <1 |

649163

DRILL LOG HOLE No. ZT-80-7 PAGE 2 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Cd | Sb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.6 | 64.5 | INTERBEDDED CALCLUTITE/CALCARENITE/DOLOHITE: Soft sediment deformed calclutites and silty dolomites interbedded with thin (2-5cm width) shelly calcarenites. Rare dolomites generally <2cm in width. Bedding 54.5m 40° to ca, cleavage 75° to ca; 63m 30° to ca, cleavage 63° to ca, Disseminated pyrite in calcarenites as fine blebs. Rock competent, foliated, minor broken areas due to fracturing along carbonaceous cleavage planes. | Minor disseminated pyrite. | 27385 | 118.3 | 121.3 | 3 | 6 | 490 | 150 | <1 | | |
| | | | | 27386 | 121.3 | 124.3 | 3 | 6 | 20 | 22 | <1 | | |
| | | | | 27387 | 124.3 | 127.3 | 3 | 8 | 8 | 16 | <1 | | |
| | | | | 27388 | 127.3 | 130.3 | 3 | 6 | 4 | 12 | <1 | | |
| | | | | 27389 | 130.3 | 133.3 | 3 | 6 | 8 | 16 | <1 | | |
| | | | | 27390 | 133.3 | 136.3 | 3 | 8 | 12 | 18 | <1 | | |
| | | | | 27391 | 136.3 | 139.3 | 3 | 8 | 20 | 310 | <1 | | |
| | | | | 27392 | 139.3 | 142.3 | 3 | 16 | 32 | 95 | <1 | | |
| | | | | 27393 | 142.3 | 145.3 | 3 | 6 | 16 | 40 | <1 | | |
| | | | | 27394 | 145.3 | 148.3 | 3 | 6 | 20 | 38 | <1 | | |
| 64.5 | 71.3 | INTERBEDDED CALCLUTITE/CALCARENITE/DOLOHITE: Massive, rhythmically bedded, silty to sandy grey calclutites and shelly calcarenites containing abundant 'rip up clasts'. Minor thin interbeds of dark grey carbonaceous, silty, laminar dolomite. Minor calcite veining. Graded bedding at 68m indicates the sequence young down hole (as do flame structures) Bedding 68m 40° to ca; Calclutites have abundant stylolites parallel to bedding and also transgressive. Trace pyrite in dolomite. | Trace Pyrite. | 27395 | 148.3 | 151.3 | 3 | 6 | 16 | 40 | <1 | | |
| | | | | 27396 | 151.3 | 154.3 | 3 | 4 | 16 | 80 | <1 | | |
| | | | | 27397 | 154.3 | 157.3 | 3 | 4 | 60 | 250 | <1 | | |
| | | | | 27398 | 157.3 | 160.3 | 3 | 4 | 120 | 500 | <1 | | |
| | | | | 27399 | 160.3 | 163.3 | 3 | 6 | 175 | 860 | <1 | | |
| | | | | 27400 | 163.3 | 165 | 1.7 | 4 | 290 | 1350 | <1 | | |
| | | | | 27564 | 165 | 166 | 1 | 6 | 240 | 1400 | <1 | | |
| | | | | 27565 | 166 | 167 | 1 | 4 | 210 | 1100 | <1 | | |
| | | | | 27551 | 167 | 168 | 1 | 130 | 10.4% | 4.6% | 55 | 290 | <0.005% |
| | | | | 27552 | 168 | 169 | 1 | 270 | 13.5% | 17.5% | 85 | 1150 | 0.01% |
| | | | | 27566 | 169 | 170 | 1 | 4 | 680 | 1350 | <1 | | |
| 71.3 | 75.0 | BRECCIATED CALCLUTITE: grey to dark grey, sandy and silty, soft sediment deformed, tectonically brecciated and strongly calcite healed calclutites. Breccia's 72.6-73.0; 73.5-73.7; 74.0-74.3; 74.6-74.8; Coarsely crystalline calcite comprises breccia matrix (plus minor carbonaceous, host rock fragment content) Trace pyrite. | Trace pyrite | 27567 | 170 | 171 | 1 | 6 | 230 | 5200 | <1 | | |
| | | | | 36001 | 171 | 174 | 3 | 4 | 320 | 1250 | <1 | | |
| | | | | 36002 | 174 | 177 | 3 | 4 | 190 | 900 | <1 | | |
| | | | | 36003 | 177 | 180 | 3 | 2 | 100 | 410 | <1 | | |
| | | | | 36004 | 180 | 183 | 3 | 2 | 75 | 360 | <1 | | |
| | | | | 36005 | 183 | 186 | 3 | 2 | 140 | 450 | <1 | | |
| | | | | 36006 | 186 | 189 | 3 | 4 | 32 | 195 | <1 | | |
| | | | | 36007 | 189 | 192 | 3 | 2 | 16 | 150 | <1 | | |
| 75.0 | 85.7 | INTERBEDDED DOLOHITE/CALCLUTITE: laminar and pelletal, black, silty and carbonaceous dolomites containing minor bedded and disseminated pyrite, interbedded with grey, foliated, massive, in part weakly fossiliferous, calclutites. Shelly fragments predominate over coral and other detritus in beds generally 2cm in width or less. Pelletal units contain abundant shelly and broken fossil detritus. Carbonaceous dolomite beds vary from 2mm in width to | Trace pyrite | 36008 | 192 | 195 | 3 | 4 | 16 | 95 | <1 | | |
| | | | | 36009 | 195 | 198 | 3 | 4 | 44 | 37 | <1 | | |
| | | | | 36010 | 198 | 201 | 3 | 4 | 24 | 36 | <1 | | |
| | | | | 36011 | 201 | 204 | 3 | 4 | 12 | 30 | <1 | | |
| | | | | 36012 | 204 | 207 | 3 | 4 | 12 | 28 | <1 | | |
| | | | | 36013 | 207 | 210 | 3 | 6 | 28 | 140 | <1 | | |
| | | | | 36014 | 210 | 213 | 3 | 6 | 16 | 28 | <1 | | |
| | | | | 36015 | 213 | 216 | 3 | 8 | 8 | 12 | <1 | | |
| | | | | 36016 | 216 | 219 | 3 | 10 | 8 | 22 | <1 | | |
| | | | cont. | 36017 | 219 | 222 | 3 | 8 | 8 | 22 | <1 | | |

094-03

DRILL LOG HOLE No. ZT-80-7 PAGE 3 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | ASSAYS Pb | ASSAYS Zn | ASSAYS Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 75.0 | 85.7 | CONT. 10's of cm's in width. Rock is weakly calcite veined. Bedding 78.5m 35° to ca. Calcite veining 65° to ca (≈ 90° to bedding) 84.50 m 50° to ca. Minor pyrite on cleavage faces along with carbonaceous material. Minor stylolites. | | 36018 | 222 | 225 | 3 | 8 | 12 | 28 | <1 |
| | | | | 36019 | 225 | 228 | 3 | 10 | 24 | 40 | <1 |
| | | | | 36020 | 228 | 231 | 3 | 6 | 16 | 48 | <1 |
| | | | | 36021 | 231 | 234 | 3 | 6 | 12 | 44 | <1 |
| | | | | 36022 | 234 | 237 | 3 | 4 | 12 | 28 | <1 |
| | | | | 36023 | 237 | 240 | 3 | 6 | 12 | 22 | <1 |
| 85.7 | 87.9 | CALCAREOUS SANDSTONE: Speckled light grey to white, medium grained calcareous sandstone containing numerous thin interbeds of soft sediment deformed calclutite and minor carbonaceous dolomite. Unit is quartz carbonate veined. Foliation enhanced by carbonaceous material. Minor tectonic brecciation. Flame structures indicate sequence youngs down hole. Sandstone pelletal near its base. | | 36024 | 240 | 243 | 3 | 32 | 12 | 110 | <1 |
| | | | | 36025 | 243 | 246 | 3 | 400 | 12 | 360 | <1 |
| | | | | 36026 | 246 | 250 | 4 | 155 | 16 | 175 | <1 |
| | | | | EOH. | | | | | | | |
| 87.9 | 109.0 | INTERBEDDED CALCLUTITES / DOLOMITE: massive to laminar, light grey, unfossiliferous, calclutites interbedded with thin (<2cm in width) dark grey silty and carbonaceous dolomite. Rare interbeds of fossiliferous calcarenite occur sporadically. Massive calclutites contain numerous stylolites. Minor zones of tectonism at 90.3-90.5m; 96.8-96.9m; 108.3-108.5m; (all filled with calcite/carbonaceous matrix). Pronounced bedding flexure at 106.5m 20° to ca cleavage 55° to ca; 95.5m 45° to ca; 106m 30° to ca (laminar micritic muds) Minor to moderate calcite veining (trace siderite). Minor fossiliferous sections generally contain coralline and some shelly fragments. Sections of core intensely microfaulted. Core very competent. | | | | | | | | | |
| 109.0 | 123.0 | INTERBEDDED DOLOMITE / CALCLUTITE: Dark grey in part pelletal, foliated, pyritic, silty dolomite beds generally ≤5 cm in width rhythmically interbedded with fossiliferous grey massive calclutites. Beds show signs of soft sediment deformation. | Trace Pb/Zn in tectonic angular breccia. CON'T | | | | | | | | |

64,915-1

DRILL LOG HOLE No. ZT-80-7 PAGE 4 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 109.0 | 123.0 | cont. tectonic breccia 119.75 to 119.9 m with calcite/siderite matrix containing trace Pb/Zn sulphides. Bedding 121.7 m 42° to ca ; 113.5 m 30° to ca and cleavage 65° to ca. Minor to moderate calcite veining - Core relatively unbroken and competent. Minor breakage along carbonaceous filled cleavage surfaces. | | | | | | |
| 123.0 | 129.0 | INTERBEDDED CALCLUTITE/DOLOMITE: Very strongly calcite veined and healed, tectonically brecciated sequence of very fossiliferous calcarenites, weakly fossiliferous calclutites and laminar pyritic dolomites. | | | | | | |
| 129.0 | 144.5 | INTERBEDDED DOLOMITE/CALCLUTITE/CALCARENITE: Fissile and laminar, black, carbonaceous, silty and occasionally pyritic dolomite rhythmically interbedded with massive fossiliferous and unfossiliferous grey calclutites and coarsely crystalline very fossiliferous light grey sparry calcarenites. Moderately calcite veined. Minor calcite/siderite breccia infill from 143.5 to 144.5 containing minor pyrite and trace galena. Fossil fragments generally large shells with abundant shell grit detritus as matrix. Minor pelletal sections. Rip up clasts and flame structures indicate the sequence youngs down hole. Minor stylolites present. Bedding 138.5 m 46° to ca. | Minor pyrite with trace galena | | | | | |
| 144.5 | 158.0 | CALCLUTITE: Soft sediment slumped, or load casted, massive dark grey to grey calclutite with minor dark grey silty dolomite as thin interbeds. Rock strongly calcite healed and brecciated from 147-151 m. Abundant stylolites present. Carbonaceous material remobilized along bedding interfaces. | | | | | | |
| 158.0 | 166.9 | INTERBEDDED CALCLUTITE/DOLOMITE: interbedded rhythmically, laminar to massive (5-20 cm in width) grey fossiliferous and unfossiliferous calclutites and dark | | | | | | |

94G13S

DRILL LOG HOLE No. ZT-80-7 PAGE 5 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 158.0 | 166.9 | CONT grey silty and carbonaceous (2-5 cm in width) dolomite. Very minor fossiliferous calcarenites. Moderate calcite veining with minor siderite and trace sphalerite. Some veins autobrecciation. Bedding 159 m 40° to ca; 165.5 m 38° to c.a. Stylolites present within massive calclutites. Calcite veins both parallel and crosscutting to bedding. Fossils made up of shells, oolites, and broken debris. | | | | | | |
| 166.9 | 169.0 | SEMI MASSIVE ZINC-LEAD SULPHIDE: yellow brown, blebby and veinlet sphalerite and galena appears to be selectively replacing the afore mentioned unit in conjunction with a siderite/ankerite/calcite gangue. Brecciation has occured and angular fragments vary in size from a mm to a number of cm's in width. Zn/Pb ratio roughly 60:40. Grades approximately 15% combined Zn/Pb and sulphides very fine grained. No pyrite. Open pore space infilling evident as is vugh infilling. Initial calcite infilling is rimmed by siderite and followed by Zn/Pb sulphide pulse. Mineralized veining trends ± 30° to ca. | Semi massive Zn/Pb sulphide over 2m. | | | | | |
| 169.0 | 173.7 | FOSSIL BRECCIA: massive sedimentary slump breccia containing angular fragments (to sub angular) of host rock material, corallina limestone, oolitic material, cemented in a dark grey silty dolomitic matrix. Strongly calcite veined. Strongly stylolitized. 0.5cm wide vein of sphalerite from 169.95 to 170.0 Fragments in breccia vary in size up to 10's of cm's. | Trace sphalerite. | | | | | |
| 173.7 | 182.0 | SLUMP BRECCIA: soft sediment slump brecciated or load casted calclutites with a dark grey silty dolomitic matrix. Lot of oolitic and fossil debris material in excess of 10cm diam. Moderate to strong calcite veining. Minor disseminated pyrite. Minor siderite rimming calcite veins. Moderate Number of stylolites. | Trace pyrite | | | | | |

94169

DRILL LOG HOLE No. ZT-80-7 PAGE 6 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 182.0 | 195.6 | FOSSIL BRECCIA: massive sedimentary slump breccia containing angular fragments of host rock material, coralline limestone, colites, cemented in a dark grey silty dolomitic matrix. | | | | | | |
| 195.6 | 199.0 | SLUMPED CALCLUTITE: soft sediment slumped and brecciated, interbedded calclutite with minor dark grey silty dolomite. Minor calcite veining with minor disseminated pyrite | Trace pyrite. | | | | | |
| 199.0 | 217.0 | FOSSIL BRECCIA: predominantly an oolitic grey to black, micritic to calcarenitic dolomite matrix with angular to rounded coralline fragments, pisoliths, shells, laminar muds (exotic to sequence) and other fossil debris slumped into it. Moderate calcite veining with minor disseminated pyrite | Trace pyrite. | | | | | |
| 217.0 | 227.7 | INTERBEDDED DOLOMITE/CALCLUTITE: the fossil breccia grades down hole into a rhythmically bedded dolomite/calclutite sequence. Dolomite is laminar, pyritic, carbonaceous and silty, generally in beds varying between 1cm and 15cm. Minor very fossiliferous sections of dolomite occur close to fossil breccia. Calclutite generally grey, massive, stylolitized, unfossiliferous with beds varying in width from 1-10 cm's. Minor calcarenites present. Bedding 223.5 m 40° to ca; 219.5 m 50° to ca; 227.5 m 42° to ca, Abundant pyrite occurs along bedding contacts as blebs or as disseminations parallel to bedding. Minor to moderate calcite veining, minor tectonic (healed with calcite) breccia's with minor siderite. | Trace pyrite. | | | | | |
| 227.7 | 234.0 | SLUMPED CALCLUTITE: grey, massive, slump brecciated (angular to sub rounded fragments) stylolitized calclutite containing numerous thin interbeds of slumped dark grey silty carbonaceous dolomite (beds < 1.5 cm width) Dolomite occurs also as matrix to breccia. Minor tectonic breccia's with calcite cement. | | | | | | |

64170

DRILL LOG HOLE No. ZT-80-7 PAGE 7 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 234.0 | 240.5 | LAMINAR CALCLUTITE: light grey, laminar, carbonaceous and pyritic calclutite interbedded with thin carbonaceous layers and massive calcarenites. Moderate number of stylolites. Moderate calcite (trace siderite) veining. Bedding 239m 45° to ca. Rock very competent. | | | | | | |
| 240.5 | 250.0 | LAMINAR SLUMPED DOLARENITE: Finely laminar to massive dark grey to black, speckled sandy and weakly pyritic to part slump brecciated dolomitic arenite. Bedding very apparent but breccia fragments within individual beds are very chaotic in orientation. The fragments are subrounded but generally have lengths 3 to 5 times their widths. Minor calcite veining. Minor tension fractures are calcite healed. Minor to trace siderite. Bedding 242.5m 42° to ca, 247.5 m 45° to ca. | | | | | | |
| | | END OF HOLE 250.0 metres | | | | | | |

69174

649172

OCEANA PROSPECT

DRILLHOLE DATA

ZT-80-8

| | | |
|---|---|---|
| Location | : | 3700N : 1575E |
| Declination | : | 55° |
| Azimuth | : | 217°T |
| Total Depth | : | 228.6 meters |

Assay Results

160-167= 7m @ 0.6% Pb + 3.12% Zn + 13.7g/t Ag

incl

165-167= 2m @ 1.7% Pb + 7.7% Zn + 29.0g/t Ag

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT - 80 - 8 — PAGE 1 OF 5

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT | ZEEHAN - TAS No. A7860 | ELEVATION meters | COMMENCED 26·9·80 | BORE HOLE SURVEY | | | INSTRUMENT EASTMAN CAMERA | | | | | | | |
| | | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | | |
| PROSPECT | OCEANA | DIP COLLAR 55° GW | COMPLETED 15·10·80 | 50 | 61.5 | 217.5 | 200 | 64.5 | 222 | | | | | |
| CO-ORDINATES | 3700 mN 1575 mE | CORE SIZE HQ | TOTAL LENGTH 228.6 meters | 100 | 61.5 | 222 | | | | | | | | |
| BEARING | 217° TN MN GN | LOGGED BY PHILIP JONES | | 150 | 62.5 | 222 | | | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TRICONE | | 27612 | 24 | 25 | 1 | 26 | 1600 | 3800 | 3 | | |
| 0 | 24.0 | Black, dark grey to brown massive silty clays. | NO SLUDGE. | 27613 | 25 | 27 | 2 | 16 | 1000 | 4900 | 3 | | |
| | | HQ CORING | | 27614 | 27 | 28 | 1 | 14 | 1400 | 5200 | 2 | | |
| 24.0 | 35.0 | DOLOMITE: Black to grey, completely weathered, | | 27615 | 28 | 30 | 2 | 12 | 310 | 760 | 1 | | |
| | | silty, carbonaceous? rubbly dolomite with minor | | | 30 | 31 | 1 | NO | CORE | - CAVITY | | | |
| | | thin sections of relatively unweathered, very | | 27616 | 31 | 33 | 2 | 10 | 65 | 250 | <1 | | |
| | | dense, massive, ankeritic dolomite. Very poor | | 27617 | 33 | 34 | 1 | 12 | 28 | 180 | <1 | | |
| | | recoveries through loose ground. (≈ 45%) | | 27618 | 34 | 35 | 1 | 10 | 14 | 100 | <1 | | |
| | | | | 27619 | 35 | 36 | 1 | 10 | 30 | 100 | <1 | | |
| 35.0 | 40.4 | ANKERITIC DOLOMITE: Massive, very dense, | | 27620 | 36 | 37 | 1 | 10 | 26 | 75 | <1 | | |
| | | ankerite veinleted, black to dark olive brown | | 27621 | 37 | 38 | 1 | 6 | 24 | 90 | <1 | | |
| | | dolomite. Core extensively broken, rugby in | | 27622 | 38 | 39 | 1 | 18 | 26 | 85 | <1 | | |
| | | part. Recovery ≈ 75%. | | 27623 | 39 | 41 | 2 | 10 | 18 | 80 | <1 | | |
| | | | | 27624 | 41 | 42 | 1 | 8 | 22 | 95 | <1 | | |
| 40.4 | 48.2 | SILTY DOLOMITE: Dark grey to grey, very silty | Pyrite staining. | 27625 | 42 | 43 | 1 | 6 | 14 | 160 | <1 | | |
| | | clayey, dolomite. C Weathered, Minor cw siderite | | 27626 | 43 | 44 | 1 | 8 | 12 | 180 | <1 | | |
| | | veinlets and possibly very fine grained pyrite (olive | | 27627 | 44 | 45 | 1 | 8 | 24 | 105 | <1 | | |
| | | yellow staining of clays). Minor thin zones of dense, | | 27628 | 45 | 47 | 2 | 12 | 20 | 90 | <1 | | |
| | | very weathered rugby dolomite (Breccia's??). | | 27629 | 47 | 48 | 1 | 38 | 16 | 90 | <1 | | |
| | | Core recovery ≈ 65%. | | 27630 | 48 | 49 | 1 | 10 | 30 | 180 | <1 | | |
| | | | | 27631 | 49 | 50 | 1 | 8 | 26 | 230 | <1 | | |
| 48.2 | 49.6 | TECTONIC BRECCIA: Core very weathered but | | 27632 | 50 | 51 | 1 | 10 | 22 | 510 | <1 | | |
| | | showing relict brecciation textures with angular | | 27633 | 51 | 52 | 1 | 8 | 20 | 730 | <1 | | |
| | | fragments of light grey ankeritic dolomite in a | | 27634 | 52 | 53 | 1 | 10 | 30 | 660 | <1 | | |
| | | matrix of dark grey silty dolomite. Minor | | 27635 | 53 | 54 | 1 | 8 | 60 | 760 | <1 | | |
| | | ankerite & siderite rugby fillings and veinlets. Core | | 27636 | 54 | 55 | 1 | 8 | 65 | 650 | 1 | | |
| | | Recovery ≈ 95%. | | 27637 | 55 | 57 | 2 | 6 | 75 | 840 | <1 | | |
| | | | | 27638 | 57 | 58 | 1 | 6 | 50 | 520 | <1 | | |
| 49.6 | 66.0 | DOLOMITE: Interbedded olive grey, grey and black | Pyrite staining? | 27639 | 58 | 59 | 1 | 6 | 32 | 500 | <1 | | |
| | | silty carbonaceous clays - Dolomite. Minor zones | | 27640 | 59 | 60 | 1 | 6 | 18 | 460 | <1 | | |
| | | of fresher material being very dense ankeritic, | | 27641 | 60 | 61 | 1 | 24 | 65 | 770 | <1 | | |
| | | massive dolomite. Minor cw sideritic veinlets, | | 27642 | 61 | 62 | 1 | 6 | 140 | 1050 | <1 | | |
| | | possibly minor very fine grained pyrite. Core | | 27643 | 62 | 63 | 1 | 8 | 170 | 1250 | <1 | | |
| | | recovery ≈ 80%. | | 27644 | 63 | 64 | 1 | 6 | 115 | 740 | <1 | | |

64013

DRILL LOG HOLE No. ZT-80-8 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.0 | 69.8 | BRECCIA: Angular to sub-rounded fragments of ankeritic dolomite in a black silty dolomite matrix. Ankeritic dolomite fragments are comprised of coarse grained crystalline white to cream ankerite in a finer ankeritic matrix. Trace galena. Breccia moderately vughy. Dolomite moderately carbonaceous. | Trace galena | 27645 | 64 | 66 | 2 | 100 | 310 | 890 | 2 |
| | | | | 27646 | 66 | 67 | 1 | 6 | 920 | 800 | 1 |
| | | | | 27647 | 67 | 68 | 1 | 4 | 340 | 1650 | 1 |
| | | | | 27648 | 68 | 70 | 2 | 4 | 180 | 3200 | <1 |
| | | | | 27649 | 70 | 71 | 1 | 4 | 80 | 2000 | <1 |
| | | | | 27650 | 71 | 72 | 1 | 68 | 320 | 1230 | <1 |
| | | | | 27651 | 72 | 74 | 2 | 24 | 610 | 2090 | 1 |
| 69.8 | 80.4 | SIDERITE / ANKERITE BRECCIA: Weakly mineralized siderite veinlated ankeritic dolomite. Minor disseminated colloform pink sphalerite and veinlet-ed and disseminated galena (75-76 metres). Vughs through breccia infilled or lined with siderite and or ankerite. Trace to minor pyrite. Core very broken & rubbly - recovery ~ 85%. Massive, fractured siderite from 79.7 to 80.4 m. | Minor galena/sphalerite. Trace to minor pyrite. | 27652 | 74 | 75 | 1 | 62 | 1510 | 2790 | 2 |
| | | | | 27653 | 75 | 76 | 1 | 70 | 1370 | 3280 | 2 |
| | | | | 27654 | 76 | 77 | 1 | 185 | 1060 | 2880 | 3 |
| | | | | 27655 | 77 | 79 | 2 | 64 | 560 | 4160 | 3 |
| | | | | 27656 | 79 | 80 | 1 | 745 | 430 | 1720 | 3 |
| | | | | 27657 | 80 | 81 | 1 | 120 | 1230 | 3210 | 2 |
| | | | | 27658 | 81 | 82 | 1 | 4 | 180 | 980 | 1 |
| | | | | 27659 | 82 | 84 | 2 | 6 | 135 | 220 | <1 |
| | | | | 27660 | 84 | 85 | 1 | 2 | 24 | 120 | <1 |
| 80.4 | 100.0 | ANKERITIC DOLOMITE: Grey, massive, ankerite veinleted, in part brecciated dolomite. Coarsely crystalline white to cream ankerite crystals comprise most of rock cemented in a grey/black dolomitic matrix. Ground badly broken with intervening soft clayey intervals. LITTLE TO NO CORE RECOVERY from 86.3 to 88.0, 89.5 to 90.0 & 91-94 metres. | | 27661 | 85 | 86 | 1 | 4 | 28 | 160 | <1 |
| | | | | | 86 | 88 | 2 | NO CORE - CAVITY | | | |
| | | | | 27662 | 88 | 90 | 2 | 4 | 40 | 180 | <1 |
| | | | | 27663 | 90 | 91 | 1 | 4 | 70 | 50 | <1 |
| | | | | | 91 | 95 | 4 | NO CORE RECOVERY. | | | |
| | | | | 27664 | 95 | 96 | 1 | 6 | 85 | 1750 | <1 |
| | | | | 27665 | 96 | 97 | 1 | 4 | 34 | 610 | <1 |
| | | | | 27666 | 97 | 98 | 1 | 4 | 65 | 1950 | <1 |
| | | | | 27667 | 98 | 100 | 2 | 4 | 36 | 420 | 1 |
| 100.0 | 121.4 | SANDSTONE: Micaceous, weakly ankerite/siderite veinleted, brecciated, grey, fine to medium grained sandstone containing thin interbeds of CM clayey material. Core badly broken with recoveries ± 100%. Some mottled yellow and grey clays suggest a brecciated texture at 110m. Possible bedding 116m - 20° to c.a. | | 27668 | 100 | 101 | 1 | 8 | 50 | 165 | <1 |
| | | | | 27669 | 101 | 102 | 1 | 8 | 28 | 165 | <1 |
| | | | | 27670 | 102 | 103 | 1 | 8 | 20 | 195 | <1 |
| | | | | 27671 | 103 | 104 | 1 | 8 | 22 | 250 | <1 |
| | | | | 27672 | 104 | 105 | 1 | 8 | 18 | 210 | <1 |
| | | | | 27683 | 105 | 106 | 1 | 6 | 18 | 195 | <1 |
| | | | | 27684 | 106 | 107 | 1 | 8 | 14 | 145 | <1 |
| | | | | 27685 | 107 | 108 | 1 | 8 | 20 | 175 | <1 |
| 121.4 | 123.9 | ANKERITIC DOLOMITE: Yellow, olive grey, massive, very dense, vughy, pyritic and very weathered clayey ankeritic dolomite. | | 27686 | 108 | 109 | 1 | 8 | 18 | 280 | <1 |
| | | | | 27687 | 109 | 110 | 1 | 10 | 12 | 44 | 1 |
| | | | | 27688 | 110 | 111 | 1 | 8 | 10 | 22 | <1 |
| | | | | 27689 | 111 | 112 | 1 | 8 | 8 | 20 | <1 |
| | | | | 27690 | 112 | 113 | 1 | 8 | 10 | 20 | <1 |
| | | | | 27691 | 113 | 114 | 1 | 6 | 12 | 26 | <1 |

69-1

DRILL LOG HOLE No. ZT-80-8 PAGE 3 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 123.9 | 127.0 | DOLOMITE BRECCIA: Black and mottled, CW massive, fat clays, calcite, ankerite veinleted, sulphide smelling (None visible!). Weathered breccia? | | 27692 | 114 | 115 | 1 | 6 | 28 | 48 | < 1 |
| | | | | 27693 | 115 | 116 | 1 | 8 | 24 | 75 | < 1 |
| | | | | 27694 | 116 | 117 | 1 | 8 | 26 | 100 | < 1 |
| | | | | 27695 | 117 | 118 | 1 | 10 | 30 | 680 | < 1 |
| 127.0 | 139.0 | SANDSTONE: Completely weathered, micaceous, grey, massive fat clays - after a fine grained sandstone? | | 27696 | 118 | 119 | 1 | 12 | 20 | 320 | < 1 |
| | | | | 27697 | 119 | 120 | 1 | 8 | 14 | 26 | < 1 |
| | | | | 27698 | 120 | 121 | 1 | 8 | 14 | 185 | < 1 |
| | | | | 27699 | 121 | 122 | 1 | 6 | 10 | 180 | < 1 |
| 139.0 | 147.0 | SANDSTONE / SILTSTONE: Very weathered, ± broken, clayey, laminar in part, micaceous fine sandstones and siltstones weakly ankerite veined. Minor sulphosalts present on core after decomposing sulphides? Bedding 135.5 - 38° to ca. | | 27700 | 122 | 123 | 1 | 8 | 18 | 55 | < 1 |
| | | | | 27673 | 123 | 124 | 1 | 52 | 50 | 65 | 1 |
| | | | | 27674 | 124 | 125 | 1 | 30 | 40 | 620 | 2 |
| | | | | 27675 | 125 | 126 | 1 | 24 | 60 | 805 | 33 |
| | | | | 27676 | 126 | 127 | 1 | 35 | 78 | 655 | < 1 |
| | | | | 27701 | 127 | 128 | 1 | 10 | 20 | 100 | < 1 |
| 147.0 | 166.80 | BLACK CLAY: (DOLOMITE ??) Massive, dark grey to black, fat silty clays. Clays show relict brecciation textures from 163.90 m and have relict ankerite/siderite and quartz fragments incorporated in the clay matrix. Minor sphalerite occurs as disseminations and blebs of dark red sphalerite crystals from 165.5 to 166.90 m. Associated minor galena and pyrite occurs in conjunction with the sphalerite. Cavities from 161.0 - 163.50 ± from 166.8 - 169.5m. | | 27702 | 128 | 129 | 1 | 8 | 16 | 48 | < 1 |
| | | | | 27703 | 129 | 130 | 1 | 8 | 14 | 26 | < 1 |
| | | | | 27704 | 130 | 131 | 1 | 8 | 20 | 24 | < 1 |
| | | | | 27705 | 131 | 132 | 1 | 8 | 30 | 30 | < 1 |
| | | | | 27706 | 132 | 133 | 1 | 8 | 16 | 36 | < 1 |
| | | | | 27707 | 133 | 134 | 1 | 10 | 10 | 30 | < 1 |
| | | | | 27708 | 134 | 135 | 1 | 10 | 8 | 36 | < 1 |
| | | | | 27709 | 135 | 136 | 1 | 8 | 6 | 22 | < 1 |
| | | | | 27710 | 136 | 137 | 1 | 8 | 12 | 16 | < 1 |
| | | | | 27711 | 137 | 138 | 1 | 8 | 16 | 24 | < 1 |
| | | | | 27712 | 138 | 139 | 1 | 6 | 10 | 90 | < 1 |
| 166.8 | 169.5 | CAVITY: 2.7m wide, minor clay infilling? | | 27713 | 139 | 140 | 1 | 10 | 12 | 28 | 2 |
| | | | | 27714 | 140 | 141 | 1 | 8 | 14 | 115 | 1 |
| 169.5 | 184.5 | SEDIMENTARY SANDSTONE BRECCIA: Rounded to ellipsoidal, light grey, medium grained quartzose sandstone fragments cemented in a dark grey, silty foliated matrix. Weakly quartz carbonate veined. Core extensively shattered with minor clay zones. Recovery = 100 %. | | 27715 | 141 | 142 | 1 | 10 | 14 | 46 | 1 |
| | | | | 27716 | 142 | 143 | 1 | 8 | 14 | 16 | 1 |
| | | | | 27717 | 143 | 144 | 1 | 10 | 14 | 16 | 1 |
| | | | | 27718 | 144 | 145 | 1 | 8 | 12 | 24 | 1 |
| | | | | 27719 | 145 | 146 | 2 | 10 | 12 | 26 | 1 |
| | | | | | 146 | 147 | | | | | |
| | | | | 27720 | 147 | 148 | 1 | 10 | 20 | 230 | 1 |
| 184.5 | 200.5 | SANDSTONE: Well bedded, laminar in part, fine grained to coarse grained interbedded fawn & light grey to grey quartzose sandstones. Grey beds generally foliated and micaceous siltstone's. | | 27721 | 148 | 149 | 1 | 8 | 26 | 115 | < 1 |
| | | | | 27722 | 149 | 150 | 1 | 8 | 32 | 160 | 1 |
| | | | | 27723 | 150 | 151 | 1 | 16 | 200 | 940 | 1 |
| | | | | 27724 | 151 | 152 | 1 | 12 | 75 | 510 | 1 |
| | | CON'T OVER | | 27725 | 152 | 153 | 1 | 10 | 28 | 470 | < 1 |

64915

DRILL LOG HOLE No. ZT-80-8 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 184.5 | 200.5 | SANDSTONE: CON'T. - Some cleavage faces coated with chloritic and carbonaceous material. Bedding is soft sediment slumped in part, possibly load casted, with numerous flame structures prevalent. (bedding younging up the hole?). Bedding: 191m - 15° to ca; 199.5 22° to ca. | | 27726 | 153 | 154 | 1 | 8 | 40 | 560 | 1 |
| | | | | 27727 | 154 | 155 | 1 | 10 | 100 | 1750 | <1 |
| | | | | 27728 | 155 | 156 | 1 | 14 | 95 | 2400 | 1 |
| | | | | 27729 | 156 | 157 | 1 | 18 | 105 | 320 | 1 |
| | | | | 27730 | 157 | 158 | 1 | 18 | 100 | 310 | 1 |
| | | | | 27731 | 158 | 159 | 1 | 18 | 135 | 550 | 1 |
| | | | | 27677 | 159 | 160 | 1 | 37 | 250 | 1380 | <1 |
| | | | | 27678 | 160 | 161 | 1 | 117 | 3370 | 3.02% | 7 |
| 200.5 | 211.7 | BRECCIATED INTERBEDDED SHALE/SANDSTONE: | | | 161 | 163 | 2 | CAVITY - NO CORE RECOVERY | | | |
| | | Grey, clayey, fissile shales rhythmically interbedded with white to cream micaceous medium grained sandstones. Core badly brecciated with bedding being very contorted. Minor calcite and quartz infilling. Breccia fragments very angular. Bedding: 209.5 - 15° to ca. | | 27679 | 163 | 164 | 1 | 75 | 870 | 1.66% | 4 |
| | | | | 27680 | 164 | 165 | 1 | 165 | 1580 | 1.79% | 8 |
| | | | | 27681 | 165 | 166 | 1 | 1250 | 8350 | 4.40% | 52 |
| | | | | 27682 | 166 | 167 | 1 | 310 | 2.56% | 11.00% | 25 |
| | | | | 27732 | 167 | 170 | 3 | CAVITY - NO CORE RECOVERY | | | |
| | | | | 27733 | 170 | 171 | 1 | 40 | 3900 | 1.15% | 6 |
| | | | | 27734 | 171 | 172 | 1 | 36 | 500 | 1800 | 4 |
| 211.7 | 214.80 | SEDIMENTARY SANDSTONE BRECCIA: Massive, grey green, weakly quartz veined, pelletal sandstone sedimentary breccia. All fragments sub rounded to very rounded light cream/green coarse grained sandstone cemented in a grey silty micaceous matrix. Fragments generally 0.5 to 1cm in width with minor larger pieces. Minor crystalline quartz in vugs and fractures. | | 27735 | 172 | 173 | 1 | 8 | 560 | 2500 | 4 |
| | | | | 27736 | 173 | 174 | 3 | 16 | 470 | 1550 | 2 |
| | | | | | 174 | 175 | | | | | |
| | | | | | 175 | 176 | | | | | |
| | | | | 27737 | 176 | 177 | 1 | 10 | 680 | 1900 | 2 |
| | | | | | | | | | | | |
| | | | | 27738 | 177 | 180 | 3 | 22 | 2000 | 3700 | 4 |
| | | | | 27739 | 180 | 181 | 1 | 34 | 970 | 4600 | 6 |
| | | | | 27740 | 181 | 182 | 1 | 22 | 250 | 800 | 3 |
| | | | | 27741 | 182 | 183 | 1 | 10 | 400 | 1800 | 1 |
| 214.8 | 228.6 | LAMINAR SILTSTONE/SANSTONE: Buff, olive micaceous siltstone rhythmically interbedded with cream coloured coarse grained micaceous sandstones. Bedding: 215m - 15° to c.a.; 221.0 m - 30° to ca; 227 m - 20° to c.a. | | 27742 | 183 | 184 | 1 | 18 | 180 | 780 | 2 |
| | | | | 27743 | 184 | 185 | 1 | 18 | 95 | 660 | 2 |
| | | | | 27744 | 185 | 186 | 1 | 55 | 70 | 570 | 2 |
| | | | | 27745 | 186 | 187 | 1 | 30 | 70 | 590 | 2 |
| | | | | 27746 | 187 | 188 | 1 | 30 | 90 | 420 | 2 |
| | | | | 27747 | 188 | 189 | 1 | 22 | 70 | 350 | 2 |
| | | | | 27748 | 189 | 190 | 1 | 70 | 65 | 650 | 2 |
| END OF HOLE. | | | | 27749 | 190 | 191 | 1 | 26 | 140 | 1100 | 3 |
| | | | | 27750 | 191 | 192 | 1 | 28 | 120 | 1350 | 3 |
| | | | | 29702 | 192 | 193 | 1 | 24 | 55 | 630 | 1 |
| | | | | 29703 | 193 | 194 | 2 | 24 | 34 | 260 | 1 |
| | | | | | 194 | 195 | | | | | |
| | | | | 29704 | 195 | 196 | 1 | 16 | 50 | 620 | <1 |

69173

DRILL LOG HOLE No. ZT-80-8 PAGE 5 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 29705 | 196 | 197 | 1 | 20 | 50 | 730 | 1 |
| | | | | 29706 | 197 | 198 | 1 | 20 | 55 | 550 | 1 |
| | | | | 29707 | 198 | 199 | 1 | 34 | 36 | 320 | 1 |
| | | | | 29708 | 199 | 200 | 1 | 36 | 18 | 230 | 1 |
| | | | | 29709 | 200 | 201 | 1 | 36 | 18 | 980 | 1 |
| | | | | 29710 | 201 | 202 | 1 | 50 | 12 | 470 | 1 |
| | | | | 29711 | 202 | 203 | 1 | 85 | 75 | 1150 | 2 |
| | | | | 29712 | 203 | 204 | 1 | 32 | 34 | 1050 | 1 |
| | | | | 29713 | 204 | 205 | 1 | 46 | 38 | 920 | 1 |
| | | | | 29714 | 205 | 206 | 1 | 50 | 46 | 750 | 2 |
| | | | | 29715 | 206 | 207 | 1 | 70 | 30 | 620 | 1 |
| | | | | 29716 | 207 | 208 | 1 | 55 | 65 | 850 | 1 |
| | | | | 29717 | 208 | 209 | 1 | 34 | 80 | 760 | 1 |
| | | | | 29718 | 209 | 210 | 1 | 22 | 140 | 750 | 2 |
| | | | | 29719 | 210 | 211 | 1 | 28 | 340 | 2200 | 2 |
| | | | | 29720 | 211 | 212 | 1 | 48 | 230 | 1450 | 2 |
| | | | | 29721 | 212 | 213 | 1 | 120 | 105 | 490 | 1 |
| | | | | 29722 | 213 | 214 | 1 | 24 | 85 | 420 | 2 |
| | | | | 29723 | 214 | 215 | 1 | 16 | 155 | 320 | 4 |
| | | | | 29724 | 215 | 216 | 1 | 16 | 260 | 380 | 1 |
| | | | | 29725 | 216 | 217 | 1 | 14 | 900 | 2600 | 1 |
| | | | | 29726 | 217 | 218 | 1 | 10 | 200 | 500 | 1 |
| | | | | 29727 | 218 | 219 | 1 | 8 | 280 | 360 | 1 |
| | | | | 29728 | 219 | 220 | 1 | 6 | 150 | 260 | 1 |
| | | | | 29729 | 220 | 221 | 1 | 8 | 90 | 210 | 1 |
| | | | | 29730 | 221 | 222 | 1 | 8 | 230 | 300 | 1 |
| | | | | 29731 | 222 | 223 | 1 | 6 | 220 | 280 | 1 |
| | | | | 29732 | 223 | 224 | 1 | 10 | 175 | 200 | 1 |
| | | | | 29733 | 224 | 225 | 1 | 8 | 220 | 260 | 1 |
| | | | | 29734 | 225 | 226 | 1 | 8 | 230 | 340 | 1 |
| | | | | 29735 | 226 | 227 | 1 | 8 | 230 | 290 | 1 |
| | | | | 29736 | 227 | 228 | 1 | 60 | 200 | 410 | 3 |
| | | | | | 228 | 229 | | | | | |
| | | | | END OF HOLE | | | | | | | |

64811

649178

OCEANA PROSPECT

DRILLHOLE DATA

ZT-80-9

Location : 3700N : 1575E
Declination : 55°
Azimuth : 217°T
Total Depth : 228.6 meters

Assay Results

1- 24= 23m @ 2.82% Pb + 2.12% Zn + 9.9g/t Ag
incl
4- 9= 5m @ 7.30% Pb + 1.88% Zn + 16.8g/t Ag
120-186= 66m @ 2.45% Pb + 0.82% Zn + 12.5g/t Ag
incl
148-162= 14m @ 3.25% Pb, 0.4% Zn + 8.7g/t Ag
172-186= 14m @ 5.80% Pb + 1.28% Zn + 21.7g/t Ag
incl
182-186= 4m @ 12.95% Pb + 3.09% Zn + 76.0g/t Ag

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT - 80 - 9 — PAGE 1 OF 5

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT | ZEEHAN - TAS No. A7860 | ELEVATION meters | COMMENCED 17-10-80 | BORE HOLE SURVEY | | | | | | INSTRUMENT EASTMAN CAMERA. | | | | |
| | | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | | |
| PROSPECT | OCEANA | DIP COLLAR 50° | COMPLETED 26-10-80 | 50 | 50.5 | 317 | 200 | 54 | 319 | | | | | |
| CO-ORDINATES | 3600 mN 1400 mE | CORE SIZE HQ, NQ. | TOTAL LENGTH 200.2 meters | 100 | 52.0 | 317 | | | | | | | | |
| BEARING | TN 313° MN GN | LOGGED BY PHILIP JONES | | 150 | 53.0 | 316 | | | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1.5 | TRICONE : Gravel 0.5m, Black brown silty | | 29501 | 1 | 2 | 1m | 105 | 2.95% | 5750 | 6 |
| | | clays 0.5 to 1.5metres. | | 29502 | 2 | 3 | 1 | 18 | 1.80% | 1.00% | 8 |
| | | | | 29503 | 3 | 4 | 1 | 22 | 1.55% | 1.35% | 6 |
| | | HQ CORING | | 29504 | 4 | 5 | 1 | 40 | 7.10% | 2.90% | 14 |
| | | | | 29505 | 5 | 6 | 1 | 32 | 14.4% | 1.50% | 32 |
| 1.5 | 13.5 | DOLOMITE : Completely weathered, grey to black | | 29506 | 6 | 7 | 1 | 50 | 6.15% | 3.25% | 28 |
| | | brown, silty, in part brecciated dolomite. Ferrug- | | 29507 | 7 | 8 | 1 | 22 | 5.80% | 1.50% | 8 |
| | | inous from 4.5 metres with mottled black orange | | 29508 | 8 | 9 | 1 | 12 | 3.05% | 2500 | 2 |
| | | clays with abundant hematite staining on | | 29509 | 9 | 10 | 2m | 16 | 1.95% | 7000 | 6 |
| | | fracture surfaces. 75% Core recovery | | | 10 | 11 | | | | | |
| | | | | 29510 | 11 | 12 | 1 | 18 | 1.30% | 1.65% | 6 |
| 13.5 | 29.6 | ANKERITE SIDERITE BRECCIA: Weakly mineralized, | 15% Pb-Zn 18-19 m | 29511 | 12 | 13 | 1 | 16 | 1.15% | 1.25% | 2 |
| | | disseminated and blebby galena and sphalerite, | 5% Pb-Zn 22.24 m | 29512 | 13 | 14 | 2 m | 12 | 1.05% | 8500 | 4 |
| | | massive but badly broken, clay infilled in part, | | | 14 | 15 | | | | | |
| | | cavernous, vuggy ankeritic and sideritic veined and | | 29513 | 15 | 16 | 2 m | 10 | 4500 | 3150 | 2 |
| | | infilled breccia. Semi massive mineralization from | | | 16 | 17 | | | | | |
| | | 18-19m @ ± 15% Zn/Pb. and 22-24 ± 5% Pb/Zn. Poor | | 29514 | 17 | 18 | 1 | 8 | 6500 | 6750 | 2 |
| | | core recoveries averaging 45%. Sand and clay | | 29515 | 18 | 19 | 1 | 110 | 5.85% | 19.0% | 46 |
| | | filled cavities encountered from 21-22m and 24-27 | | 29516 | 19 | 20 | 1 | 16 | 1.25% | 1.35% | 8 |
| | | metres. Breccia is composed of fine and coarse | | 29517 | 20 | 21 | 1 | 10 | 4700 | 1500 | 4 |
| | | grained crystalline ankerite in a dark dolomitic | | | 21 | 22 | | NO | CORE | RECOVERY - SAND SEAM | |
| | | matrix siderite veined during dolomitisation. | | 29518 | 22 | 23 | 2 m | 26 | 2.25% | 1.20% | 16 |
| | | | | | 23 | 24 | | | | | |
| 29.6 | 57.3 | INTERBEDDED CLAYS: (DOLOMITE) Grey to black | 5% pyrite | | 24 | 25 | | NO | CORE | RECOVERY - SAND SEAM | |
| | | with minor olive grey (pyrite stained) massive | | | 25 | 26 | | " | " | " | " |
| | | silty clays containing minor thin seams of rubbly | | | 26 | 27 | | " | " | " | " |
| | | relatively unaltered silty, dense, grey, dolomite. | | 29519 | 27 | 28 | 2m | 10 | 4300 | 3900 | 4 |
| | | Minor siderite ± calcite (quartz?) Some sections | | | 28 | 29 | | | | | |
| | | of clay more porous + siltier than others. Up | | 29520 | 29 | 30 | 2m | 8 | 1200 | 1.00% | 2 |
| | | to 5% pyrite in clays from 51.5 to 57.3 metres. | | | 30 | 31 | | | | | |
| | | | | 29521 | 31 | 32 | 1m | 8 | 330 | 3100 | <1 |
| 57.3 | 59.0 | ANKERITE PYRITE BRECCIA: Angular breccia frag- | Trace galena | 29522 | 32 | 33 | 1 | 8 | 340 | 2200 | 1 |
| | | ments of ankerite in a fine grained pyrite (minor | 5-10% pyrite | 29523 | 33 | 34 | 2m | 10 | 34 | 1550 | <1 |
| | | siderite) matrix. Trace galena. Pyrite 5-10% | | | 34 | 35 | | | | | |

69-03

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.3 | 59.0 | ANKERITE PYRITE BRECCIA: Con't Ground very broken, core recovery ≈ 65%. | Trace galena | 29524 | 35 | 36 | 1m | 20 | 55 | 1850 | < 1 |
| | | | | 29525 | 36 | 37 | 1 | 10 | 390 | 3900 | < 1 |
| | | | | 29526 | 37 | 38 | 1 | 8 | 520 | 2800 | < 1 |
| 59.0 | 74.5 | INTERBEDDED CLAYS: (DOLOMITE) Grey to black, silty, weakly calcite veined, pyritic completely weathered dolomite. | Minor pyrite | 29527 | 38 | 39 | 1 | 10 | 24 | 870 | < 1 |
| | | | | 29528 | 39 | 40 | 1 | 10 | 34 | 1100 | < 1 |
| | | | | 29623 | 40 | 41 | 1 | 10 | 135 | 370 | < 1 |
| | | | | 29624 | 41 | 42 | 1 | 8 | 420 | 1300 | < 1 |
| 74.5 | 78.0 | DOLOMITE: Massive, dense, fine grained, dark grey ankeritic dolomite. Possibly brecciated, moderately clay zoned, trace siderite and galena. Massive material badly fractured. Recoveries generally good > 90%. | Trace galena | 29625 | 42 | 43 | 1 | 8 | 710 | 3700 | 1 |
| | | | | 29626 | 43 | 44 | 1 | 8 | 1850 | 31500 | 2 |
| | | | | 29627 | 44 | 45 | 1 | 10 | 1.42% | 1850 | 8 |
| | | | | 29628 | 45 | 46 | 1 | 8 | 200 | 1050 | 1 |
| | | | | 29629 | 46 | 47 | 1 | 8 | 105 | 480 | < 1 |
| | | | | 29630 | 47 | 48 | 1 | 8 | 80 | 280 | < 1 |
| 78.0 | 83.5 | MINERALIZED CLAY BRECCIA: Mottled black, orange, yellow, grey silty clays with minor massive angular brecciated, dense sideritic and ankeritic dolomite. Weakly to moderately mineralized. Galena and sphalerite visible as coarse grained disseminations in mottled clays. Moderate amount of pyrite present as blebs and as breccia infill material. Minor quartz. | 80-83 m 10% Pb/Zn ?? pyrite. ~5% | 29631 | 48 | 49 | 1 | 10 | 45 | 220 | < 1 |
| | | | | 29632 | 49 | 50 | 1 | 12 | 95 | 460 | < 1 |
| | | | | 29633 | 50 | 51 | 1 | 10 | 55 | 250 | < 1 |
| | | | | 29634 | 51 | 52 | 1 | 10 | 32 | 100 | < 1 |
| | | | | 29635 | 52 | 53 | 1 | 10 | 24 | 110 | < 1 |
| | | | | 29636 | 53 | 54 | 1 | 12 | 32 | 135 | < 1 |
| | | | | 29637 | 54 | 56 | 2 | 12 | 50 | 270 | < 1 |
| | | | | 29638 | 56 | 57 | 1 | 12 | 400 | 1850 | 2 |
| | | | | 29639 | 57 | 58 | 1 | 28 | 1.65% | 1.05% | 6 |
| 83.5 | 95.4 | COLLAPSE BRECCIA: Angular and rounded, small and large sized fragments occur in a matrix of pyritic, black, silty dolomitic clay. Fragments include Moina Sandstone (both white & pink coarse grained sandstone) olive green, oxidised? massive ankeritic dolomite, pyrite fragments, quartz fragments and black carbonaceous material (wood!) along with dolomite fragments. Minor galena and sphalerite in sulphide smelting core. Fragments vary in size up to 35cm across down to 1-2 mm. in diameter. Abundant very weathered pyrite fragments. Fossil leaves 91-92 Sequence possibly Karstic collapse breccia & infill with material derived from surface ie Moina fragments. | Minor Pb/Zn 5-10% pyrite. | 29640 | 58 | 59 | 1 | 12 | 3300 | 4300 | 2 |
| | | | | 29641 | 59 | 60 | 1 | 14 | 1550 | 3950 | 2 |
| | | | | 29642 | 60 | 61 | 1 | 12 | 80 | 390 | < 1 |
| | | | | 29643 | 61 | 62 | 1 | 14 | 60 | 310 | < 1 |
| | | | | 29644 | 62 | 63 | 1 | 12 | 105 | 320 | < 1 |
| | | | | 29645 | 63 | 64 | 1 | 18 | 90 | 530 | < 1 |
| | | | | 29646 | 64 | 65 | 1 | 16 | 80 | 350 | < 1 |
| | | | | 29647 | 65 | 66 | 1 | 12 | 135 | 610 | < 1 |
| | | | | 29648 | 66 | 67 | 1 | 16 | 115 | 980 | < 1 |
| | | | | 29649 | 67 | 68 | 1 | 18 | 140 | 660 | < 1 |
| | | | | 29650 | 68 | 69 | 1 | 20 | 970 | 4800 | < 1 |
| | | | | 29651 | 69 | 70 | 1 | 12 | 420 | 4500 | < 1 |
| | | | | 29652 | 70 | 71 | 1 | 12 | 75 | 1500 | < 1 |
| | | | | 29653 | 71 | 72 | 1 | 10 | 145 | 100 | 1 |
| | | | | 29654 | 72 | 73 | 1 | 16 | 660 | 4500 | 2 |
| | | | | 29655 | 73 | 74 | 1 | 14 | 980 | 7700 | 2 |
| | | | | 29656 | 74 | 75 | 1 | 10 | 1250 | 6350 | 2 |

649130

DRILL LOG HOLE No. ZT- 80- 9 PAGE 3 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95.4 | 119.6 | MASSIVE PYRITIC CLAY (DOLOMITE): Generally black, massive, silty clays with minor grey clay interbeds. Mottled orange and grey clay from 99.7 to 101.0. Light grey, dense, sideritic veined dolomite from 95.4 to 97.5. containing abundant pyrite possibly as vugh infill as seen by filigree texture. | Minor Pyrite. | 29657 | 75 | 76 | 1 | | | | |
| | | | | 29658 | 76 | 77 | 1 | 10 | 2550 | 6150 | 2 |
| | | | | 29659 | 77 | 78 | 1 | 12 | 2750 | 1.00% | 3 |
| | | | | 29660 | 78 | 79 | 1 | 16 | 1350 | 1.60% | 3 |
| | | | | 29661 | 79 | 80 | 1 | 14 | 1050 | 8400 | 3 |
| | | | | 29662 | 80 | 81 | 1 | 14 | 3350 | 1.20% | 8 |
| | | | | 29663 | 81 | 82 | 1 | 12 | 8600 | 1.70% | 12 |
| | | | | 29664 | 82 | 83 | 1 | 8 | 970 | 1.30% | 2 |
| 119.6 | 183.0 | SIDERITE /ANKERITE MINERALIZED ROCK: Coarse grained white ankerite crystals and cream coloured fine grained siderite set in a matrix of dark grey ankeritic dolomite. Core vughy and porous in part, brecciated (dolomitisation) very fractured, clay veined and weakly mineralized. Siderite veinleting gives 'brain texture' to core. Minor clay zones present and numerous cavities: 125.2 - 128; 159 - 160.2; 162.2 - 163.8; 163.9 - 166; 167 - 168; 171 - 172.10; 175.2 - 181.8. Lead/zinc mineralization occurs as disseminations, blebs, thin veinlets, as coarse grained accumulations and to a minor extent as semi massive and massive. Grades vary from metre to metre, however, the following are the higher grade intercepts. Zinc grades seem to increase downhole. | Minor mineralization apart from intercepts reported in description. | 29665 | 83 | 84 | 1 | 10 | 1750 | 9150 | 2 |
| | | | | 29666 | 84 | 85 | 1 | 16 | 3150 | 7600 | 4 |
| | | | | 29667 | 85 | 86 | 1 | 16 | 4300 | 1.5% | 4 |
| | | | | 29668 | 86 | 87 | 1 | 20 | 1.00% | 7900 | 8 |
| | | | | 29669 | 87 | 88 | 1 | 18 | 5100 | 1.05% | 7 |
| | | | | 29670 | 88 | 89 | 1 | 20 | 4150 | 1.30% | 8 |
| | | | | 29671 | 89 | 90 | 1 | 16 | 3550 | 6200 | 6 |
| | | | | 29672 | 90 | 91 | 1 | 16 | 3750 | 5100 | 6 |
| | | | | 29673 | 91 | 92 | 1 | 14 | 9550 | 9900 | 16 |
| | | | | 29674 | 92 | 93 | 1 | 12 | 4170 | 2600 | 11 |
| | | | | 29675 | 93 | 94 | 1 | 14 | 6050 | 5300 | 6 |
| | | | | 29676 | 94 | 95 | 1 | 14 | 1800 | 1.55% | 3 |
| | | | | 29677 | 95 | 96 | 1 | 12 | 1950 | 4150 | 2 |
| | | | | 29678 | 96 | 97 | 1 | 12 | 2150 | 1.65% | 2 |
| | | | | 29679 | 97 | 98 | 1 | 14 | 1100 | 1.05% | 2 |
| | | | | 29680 | 98 | 99 | 1 | 14 | 290 | 2300 | 2 |
| | | | | 29681 | 99 | 100 | 1 | 22 | 4500 | 8200 | 6 |
| NQ CORING FROM 148 m. | | 148 - 150 5% Pb/Zn 20% Core Recovery. | | 29682 | 100 | 101 | 1 | 28 | 4250 | 1.15% | 12 |
| | | 160 - 162 7½% Pb/Zn | | 29683 | 101 | 102 | 1 | 14 | 3000 | 1.85% | 2 |
| | | 166 - 173.5 5-10% Pb/Zn 20% Core Recovery. | | 29684 | 102 | 103 | 1 | 22 | 2500 | 1.65% | 6 |
| | | 173.5 - 175.5 20% Pb Recovery 10%. | | 29685 | 103 | 104 | 1 | 14 | 450 | 7500 | 1 |
| | | 181.8 - 183 60% Pb/Zn (60:40) Recovery 15%. | | 29686 | 104 | 105 | 1 | 14 | 320 | 4700 | 1 |
| | | | | 29687 | 105 | 106 | 1 | 12 | 490 | 9100 | 1 |
| 183.0 | 195.0 | MASSIVE CLAYS: Mottled, ferruginous, orange, red and yellow (minor grey) silty clays. Ironstone 183.0 - 183.10. Ground badly caverneous: 183.10 - 184.50; 186.0 - 187.50; 188.4 - 191.0; 192 - 195. Minor quartz from 191.0 to 192.0 possibly marking OCEANA FAULT ZONE! | | 29688 | 106 | 107 | 1 | 12 | 1000 | 7550 | 5 |
| | | | | 29689 | 107 | 108 | 1 | 10 | 380 | 1.30% | 1 |
| | | | | 29690 | 108 | 109 | 1 | 16 | 890 | 6800 | 1 |
| | | | | 29691 | 109 | 110 | 1 | 18 | 530 | 4900 | 2 |
| | | | | 29692 | 110 | 111 | 1 | 20 | 390 | 2750 | 1 |
| | | | | 29693 | 111 | 112 | 1 | 18 | 200 | 2500 | 1 |
| | | | | 29694 | 112 | 113 | 1 | 14 | 140 | 3000 | <1 |
| | | | | 29695 | 113 | 114 | 1 | 16 | 170 | 2500 | 1 |

64093

DRILL LOG HOLE No. ZT-80-9 PAGE 4 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 195.0 | 200.2 | SANDSTONE BRECCIA: Moina Sandstone on northern side of Oceana Fault. Coarse grained light grey sandstone fragments set in a matrix of grey to dark grey silty and micaceous fine grained sandstones. Rounded fragments to sub rounded comprise sedimentary breccia. | | 29696 | 114 | 115 | 1 | 18 | 370 | 3100 | 1 |
| | | | | 29697 | 115 | 116 | 1 | 14 | 2150 | 7100 | 2 |
| | | | | 29698 | 116 | 117 | 1 | 18 | 3500 | 8600 | 2 |
| | | | | 29699 | 117 | 118 | 1 | 18 | 6800 | 1.00% | 3 |
| | | | | 29700 | 118 | 119 | 1 | 14 | 3600 | 8950 | 2 |
| | | | | 29701 | 119 | 120 | 1 | 18 | 5250 | 3700 | 3 |
| | | | | 29529 | 120 | 122 | 2 | 10 | 7700 | 1.00% | 4 |
| E.O.H | 200.2 | | | 29530 | 122 | 123 | 1 | 8 | 9000 | 3600 | 4 |
| | | | | 29531 | 123 | 124 | 1 | 14 | 1.4% | 8000 | 6 |
| | | | | 29532 | 124 | 125 | 1 | 8 | 5900 | 2900 | 4 |
| | | | | | 125 | 128 | 3 | CAVITY - NO CORE RECOVERY. | | | |
| | | | | 29533 | 128 | 129 | 1 | 10 | 1.15% | 7500 | 4 |
| | | | | 29534 | 129 | 131 | 2 | 90 | 3700 | 7000 | 2 |
| | | | | 29535 | 131 | 133 | 2 | 12 | 4100 | 5000 | 2 |
| | | | | 29536 | 133 | 134 | 1 | 10 | 8100 | 2100 | 4 |
| | | | | 29537 | 134 | 135 | 1 | 46 | 5900 | 2850 | 2 |
| | | | | 29538 | 135 | 136 | 1 | 14 | 9600 | 5250 | 4 |
| | | | | 29539 | 136 | 137 | 1 | 16 | 5700 | 8750 | 2 |
| | | | | 29540 | 137 | 138 | 1 | 10 | 4500 | 3750 | 2 |
| | | | | 29541 | 138 | 139 | 1 | 18 | 1.90% | 8750 | 6 |
| | | | | 29542 | 139 | 140 | 1 | 18 | 1.65% | 9250 | 6 |
| | | | | 29543 | 140 | 141 | 1 | 36 | 1.58% | 1.55% | 6 |
| | | | | 29544 | 141 | 143 | 2 | 30 | 1.05% | 3.25% | 4 |
| | | | | 29545 | 143 | 144 | 1 | 36 | 1.00% | 1.80% | 4 |
| | | | | 29546 | 144 | 145 | 1 | 16 | 1.00% | 4350 | 4 |
| | | | | 29547 | 145 | 146 | 1 | 10 | 7000 | 3100 | 2 |
| | | | | 29548 | 146 | 147 | 1 | 14 | 1.95% | 4550 | 10 |
| | | | | 29549 | 147 | 148 | 1 | 10 | 1.60% | 3900 | 4 |
| | | | | 29550 | 148 | 150 | 2 | 16 | 9.30% | 2500 | 22 |
| | | | | 29601 | 150 | 152 | 2 | 6 | 1.00% | 3450 | 4 |
| | | | | 29602 | 152 | 153 | 1 | 10 | 1.60% | 2850 | 4 |
| | | | | 29603 | 153 | 154 | 1 | 10 | 2.80% | 2000 | 8 |
| | | | | 29604 | 154 | 155 | 1 | 10 | 4.25% | 1750 | 14 |
| | | | | 29605 | 155 | 156 | 1 | 16 | 1.30% | 5500 | 6 |
| | | | | 29606 | 156 | 157 | 1 | 14 | 2.05% | 3800 | 8 |
| | | | | 29607 | 157 | 159 | 2 | 14 | 1.45% | 5750 | 6 |
| | | | | | 159 | 160 | | CAVITY - NO CORE RECOVERY | | | |
| | | | | 29608 | 160 | 161 | 1 | 28 | 5.90% | 7500 | 22 |
| | | | | 29609 | 161 | 162 | 1 | 34 | 4.20% | 1.30% | 18 |

64G-132

DRILL LOG HOLE No. PAGE 5 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 29610 | 162 | 164 | 2 | 8 | 2700 | 1900 | 2 |
| | | | | 29611 | 164 | 166 | 2 | 26 | 1.05% | 1.30% | 4 |
| | | | | 29612 | 166 | 168 | 2 | 34 | 2.25% | 1.80% | 12 |
| | | | | 29613 | 168 | 170 | 2 | 12 | 1.68% | 5000 | 8 |
| | | | | 29614 | 170 | 171 | 1 | 16 | 7500 | 7750 | 4 |
| | | | | | 171 | 172 | 1 | NO | CORE | RECOVERY | |
| | | | | 29615 | 172 | 175 | 3 | 55 | 3.80% | 1.85% | 75 |
| | | | | | 175 | 182 | 7 | NO | CORE | RECOVERY | |
| | | | | 29616 | 182 | 183 | 1 | 430 | 44.0% | 9.75% | 250 |
| | | | | 29617 | 183 | 186 | 3 | 90 | 2.60% | 8750 | 18 |
| | | | | 29618 | 186 | 188 | 2 | 34 | 9600 | 3800 | 16 |
| | | | | | 188 | 191 | 3 | NO | CORE | RECOVERY | |
| | | | | 29619 | 191 | 192 | 1 | 22 | 3300 | 2400 | 4 |
| | | | | | 192 | 195 | 3 | NO | CORE | RECOVERY | |
| | | | | 29620 | 195 | 198 | 3 | 90 | 720 | 50 | 8 |
| | | | | 29621 | 198 | 199 | 1 | 36 | 550 | 175 | <1 |
| | | | | 29622 | 199 | 200 | 1 | 95 | 700 | 160 | <1 |
| | | | | END OF HOLE 200.20 metres. | | | | | | | |

64,963

649184

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-80A-3

| | | |
|---|---|---|
| Location | : | 1610N:1300E |
| Declination | : | 55° |
| Azimuth | : | 270°G |
| Total Depth | : | 373.5 meters |

Assay Results

294-296 = 2m @ 0.42% Pb + 2.05% Zn + 15.5 g/t Ag

341-355 = 14m @ 0.86% Pb + 0.23% Zn + 4.4 g/t Ag

including 347-351 = 4m @ 2.25% Pb + 0.28% Zn + 9.0 g/t Ag

**Amoco Minerals Australia Company**

DRILL LOG — HOLE No. ZT- 80A - 3 — PAGE 1 OF 7

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT | ZEEHAN - TAS | No. A79 - 60 - B | ELEVATION meters | COMMENCED | 9 April 80 | BORE HOLE SURVEY | | | INSTRUMENT | | | | | |
| | | | | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing |
| PROSPECT | AUSTRAL VALLEY | | DIP COLLAR 55° GW | COMPLETED | 22 April 80 | 50 | 56° | 236° | 200 | 60° | 222° | 350 | 57.5 | 199 |
| CO-ORDINATES | 1610 N mN | 1300E mE | CORE SIZE HQ, NQ | TOTAL LENGTH | 373.5 meters | 100 | 58° | 232° | 250 | 61° | 216° | | | |
| BEARING | 249 TN 238 MN 270 GN | | LOGGED BY T.A. JONES | | | 150 | 59.5° | 227° | 300 | 58° | 196° | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 15.00 | TRICONE : 0-1.5m Alluvial Gravels Mt. Zeehan Conglomerate 1.5-10.0m Dolomite?? Completely weathered black silty clays. 10.0-15.0m Interbedded limestones and Dolomite | | 22117 | 15 | 16 | 1 | 14 | 56 | 45 | <1 |
| | | | | 22118 | 16 | 17 | 1 | 11 | 44 | 29 | <1 |
| | | | | 22119 | 17 | 18 | 1 | 8 | 37 | 40 | <1 |
| START HQ | CORING | | | 22120 | 18 | 19 | 1 | 6 | 99 | 127 | <1 |
| | | | | 22121 | 19 | 20 | 1 | 10 | 30 | 180 | <1 |
| 15.00 | 24.00 | CALCLUTITE / DOLOMITE : Interbedded, foliated (possibly slumped) grey calclutites and dark grey dolomite. Rock extensively broken, had pugh zones prevalent and minor calcite veined. | | 22122 | 20 | 21 | 1 | 10 | 55 | 200 | <1 |
| | | | | 22123 | 21 | 22 | 1 | 12 | 53 | 179 | <1 |
| | | | | 22124 | 22 | 23 | 1 | 10 | 44 | 143 | <1 |
| | | | | 22125 | 23 | 24 | 1 | 8 | 44 | 148 | <1 |
| | | | | 22126 | 24 | 25 | 1 | 10 | 43 | 183 | <1 |
| 24.00 | 33.00 | DOLOMITE : Black, silty dolomite, siderite veined, brecciated in part, very clayey, highly weathered and minor calcite veined. Fine grained, disseminated pyrite present. NO CORE 28.50 - 31.20. | Disseminated minor pyrite. | 22127 | 25 | 26 | 1 | 8 | 54 | 323 | <1 |
| | | | | 22128 | 26 | 27 | 1 | 10 | 84 | 220 | <1 |
| | | | | | 27 | 28 | 1 | CAVITY | NO | CORE | RECOVERY |
| | | | | 22129 | 28 | 29 | 1 | 9 | 196 | 520 | <1 |
| | | | | | 29 | 30 | 1 | CAVITY | NO | CORE | RECOVERY |
| 33.00 | 40.50 | CALCLUTITE : grey, heavily calcite veined (36.00 - 40.00) badly fractured and broken, brecciated (slumped?) and pughy calclutites and minor fossiliferous calcarenites. | | | 30 | 31 | 1 | CAVITY | NO | CORE | RECOVERY |
| | | | | 22130 | 31 | 32 | 1 | 19 | 215 | 2980 | <1 |
| | | | | 22131 | 32 | 33 | 1 | 17 | 60 | 228 | <1 |
| | | | | 22132 | 33 | 34 | 1 | 11 | 92 | 131 | <1 |
| | | | | | 34 | 35 | 1 | CAVITY | NO | CORE | RECOVERY |
| 40.50 | 50.00 | SANDSTONE : porous, coarse grained, grey, fossiliferous (41 - 42.50) slumped, well sorted, and weakly calcareous sandstone. Minor black pughy sections possibly completely weathered black Dolomite interbeds. | | | 35 | 36 | 1 | " | " | " | " |
| | | | | 22133 | 36 | 37 | 1 | 14 | 53 | 622 | <1 |
| | | | | 22134 | 37 | 38 | 1 | 12 | 92 | 290 | <1 |
| | | | | | 38 | 39 | 1 | CAVITY | NO | CORE | RECOVERY |
| | | | | | 39 | 40 | 1 | " | " | " | " |
| | | | | 22135 | 40 | 41 | 1 | 12 | 28 | 106 | <1 |
| 50.00 | 64.90 | DOLOMITE : Black and dark grey, very silty, calcareous, weakly calcite veined Dolomite. Core very clayey, badly broken with minor quartz veining (5cm). Recoveries a 50%. Minor fine grained pyrite. | Minor pyrite. | 22136 | 41 | 42 | 1 | 10 | 22 | 87 | <1 |
| | | | | 22137 | 42 | 43 | 1 | 11 | 29 | 184 | <1 |
| | | | | 22138 | 43 | 44 | 1 | 12 | 44 | 227 | <1 |
| | | | | 22139 | 44 | 45 | 1 | 9 | 22 | 147 | <1 |
| | | | | 22140 | 45 | 46 | 1 | 8 | 14 | 68 | <1 |
| | | | | 22141 | 46 | 47 | 1 | 11 | 14 | 171 | <1 |
| 64.90 | 67.60 | ANKERITE / SIDERITE BRECCIA : containing weakly disseminated Pb/Zn (1-2%) mineralization. Rock is dark grey green in colour, very dense, and massive but badly fractured and broken. NO CORE RECOVERY 66.40 to 68.30 m. | 1-2% Pb/Zn as disseminations. | | 47 | 48 | 1 | CAVITY | NO | CORE | RECOVERY |
| | | | | | 48 | 49 | 1 | " | " | " | " |
| | | | | | 49 | 50 | 1 | " | " | " | " |
| | | | | 22142 | 50 | 51 | 1 | 12 | 48 | 120 | <1 |
| | | | | 21946 | 51 | 52 | 1 | 9 | 62 | 108 | <1 |
| | | | | 21947 | 52 | 53 | 1 | 10 | 77 | 198 | <1 |
| 67.60 | 81.00 | INTERBEDDED CALCLUTITES / DOLOMITES : Technically brecciated, heavily calcite veined, pughy in part, pughy over numerous zones and very cavernous. Possible Zone of Faulting (CRUSH ZONE). | | 21948 | 53 | 54 | 1 | 8 | 64 | 188 | <1 |
| | | | | 21949 | 54 | 55 | 1 | 6 | 107 | 322 | <1 |
| | | | | 21950 | 55 | 56 | 1 | 6 | 88 | 141 | <1 |
| | | | | 22001 | 56 | 57 | 1 | 8 | 117 | 418 | <1 |
| | | | | 22002 | 57 | 58 | 1 | 7 | 499 | 1720 | 1 |
| | | | | 22003 | 58 | 59 | 1 | 45 | 804 | 2670 | 2 |
| | | | | 22004 | 59 | 60 | 1 | 6 | 198 | 7470 | 1 |

6401 C?

Amoco Minerals Australia Company

DRILL LOG | HOLE No. | 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 81.00 | 94.50 | CALCLUTITE: grey, slumped, in part pelletal, foliated weakly fossiliferous and moderately calcite veined cavernous calclutite. Minor thin (<2cm) dark grey carbonaceous dolomite interbeds. Cavity 89.5 - 90.60m. Bedding 45°toca at 87m | | 22005 | 60 | 61 | 1 | 7 | 894 | 6310 | 2 |
| | | | | 22006 | 61 | 62 | 1 | <5 | 289 | 2620 | 1 |
| | | | | 22007 | 62 | 63 | 1 | 7 | 427 | 3070 | <1 |
| | | | | 22008 | 63 | 64 | 1 | 6 | 844 | 2270 | <1 |
| | | | | 22009 | 64 | 65 | 1 | <5 | 8700 | 2230 | 4 |
| | | | | 22010 | 65 | 66 | 1 | <5 | 597 | 3250 | 2 |
| 94.50 | 105.00 | DOLOMITE: dark grey to black, silty, heavily calcite veined, very soft and broken cavernous dolomite. Cavity 99-102 m. Minor pugh zones. Core very foliated with calcite veins oriented // to ca and sheared out remnants of bedding are oriented sub // to the c.a. Minor breccia zones prevalent (tectonic). | | 22011 | 66 | 67 | 1 | 8 | 319 | 6220 | 1 |
| | | | | - | 67 | 68 | 1 | NO | CORE | RECOVERY. | |
| | | | | 22012 | 68 | 69 | 1 | <5 | 88 | 648 | 1 |
| | | | | 22013 | 69 | 70 | 1 | <5 | 106 | 740 | 1 |
| | | | | - | 70 | 71 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 71 | 72 | 1 | " | " | " | |
| | | | | 22014 | 72 | 73 | 1 | <5 | 80 | 2470 | 1 |
| | | | | | 73 | 74 | 1 | NO | CORE | RECOVERY | |
| 105.00 | 134.00 | CALCLUTITE: pale grey, very foliated (sub // to ca) weakly calcite veined, occasionally pelletal cavernous (generally pugh filled) competent rock. Cavities: 107-107.90, 108.50-111.10, 116.10-118.20, 131.80-132.60. No accurate bedding through massive but foliated sequence. | | 22015 | 74 | 75 | 1 | <5 | 25 | 2680 | 1 |
| | | | | - | 75 | 76 | 1 | NO | CORE | RECOVERY | |
| | | | | 22016 | 76 | 77 | 1 | <5 | 1269 | 4050 | 1 |
| START NQ CORING 126 metres | | | | 22017 | 77 | 78 | 1 | 6 | 224 | 671 | 1 |
| | | | | 22018 | 78 | 79 | 1 | 11 | 218 | 1840 | 1 |
| | | | | - | 79 | 80 | 1 | NO | CORE | RECOVERY | |
| | | | | - | 80 | 81 | 1 | " | " | " | |
| 134.00 | 145.00 | INTERBEDDED CALCLUTITE / DOLOMITE: light grey non-fossiliferous and fossiliferous, foliated and weakly calcite veined calclutites and calcarenites with interbeds of dark grey silty dolomites from 5-20cm in width. The Dolomite is pyritic and carbonaceous. Bedding 32° to ca at 140m. Microfaulting and foliation distort bedding attitudes. | Fine grained disseminated pyrite. | 22019 | 81 | 82 | 1 | 6 | 36 | 280 | 1 |
| | | | | 22143 | 82 | 83 | 1 | 12 | 156 | 710 | <1 |
| | | | | 22144 | 83 | 84 | 1 | 10 | 163 | 690 | <1 |
| | | | | 22145 | 84 | 85 | 1 | 10 | 150 | 1080 | <1 |
| | | | | 22146 | 85 | 86 | 1 | 10 | 160 | 580 | <1 |
| | | | | 22147 | 86 | 87 | 1 | 10 | 116 | 484 | <1 |
| | | | | 22148 | 87 | 88 | 1 | 9 | 172 | 482 | <1 |
| | | | | 22149 | 88 | 89 | 1 | 11 | 70 | 138 | <1 |
| | | | | | 89 | 90 | 1 | NO | CORE | RECOVERY | |
| | | | | | 90 | 91 | 1 | " | " | " | |
| 145.00 | 160.00 | BRECCIATED CALCLUTITE: moderately to strongly calcite veined, brecciated, grey, foliated calclutites with minor interbeds of fossiliferous calcarenites and black carbonaceous dolomites (generally <2 cm in width). | | 22150 | 91 | 92 | 1 | 13 | 158 | 1190 | <1 |
| | | | | 22151 | 92 | 93 | 1 | 11 | 105 | 362 | <1 |
| | | | | 22152 | 93 | 94 | 1 | 8 | 38 | 168 | <1 |
| | | | | 22153 | 94 | 95 | 1 | 11 | 50 | 187 | <1 |
| | | | | 22154 | 95 | 96 | 1 | 13 | 82 | 346 | <1 |
| 160.00 | 168.00 | LIMESTONE: white to light grey, massive to laminar, spavry and micritic limestones possibly containing abundant but extremely fine grained pyrite disseminations. Core weakly calcite veined. Cavities 163 - 163.30, 164 - 164.50 m. Bedding 38° toca 164.50. Massive limestone has pygmatically folded and foliated very thin carbonaceous layers present approximately 0.5mm thick. | | 22155 | 96 | 97 | 1 | 14 | 217 | 349 | <1 |
| | | | | 22156 | 97 | 98 | 1 | 13 | 184 | 494 | <1 |
| | | | | 22157 | 98 | 99 | 1 | 15 | 344 | 1570 | <1 |
| | | | | | 99 | 100 | 1 | NO | CORE | RECOVERY | |
| | | | | | 100 | 101 | 1 | " | " | " | |
| | | | | | 101 | 102 | 1 | " | " | " | |
| | | | | 22158 | 102 | 103 | 1 | 11 | 53 | 75 | <1 |
| | | | | 22159 | 103 | 104 | 1 | 11 | 147 | 770 | <1 |
| | | | | 22160 | 104 | 105 | 1 | 13 | 108 | 344 | <1 |
| | | | | 22161 | 105 | 106 | 1 | 11 | 54 | 95 | <1 |
| | | | | 22162 | 106 | 107 | 1 | 10 | 64 | 377 | <1 |
| | | | | | 107 | 108 | 1 | NO | CORE | RECOVERY | |
| | | | | 22163 | 108 | 109 | 1 | 11 | 127 | 750 | <1 |
| | | | | | 109 | 110 | 1 | NO | CORE | RECOVERY | |
| | | | | | 110 | 111 | 1 | " | " | " | |
| | | | | | 111 | 112 | 1 | MISSING SAMPLE | | | |
| | | | | | 112 | 113 | 1 | MISSING SAMPLE | | | |

64913

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 168.00 | 199.60 | Interbedded CALCLUTITES/DOLOMITES: grey, foliated, fossiliferous and non fossiliferous, pelletal in part, calclutites interbedded with black to dark grey occasionally laminar silty and carbonaceous dolomite. Core weakly calcite veined, and shows evidence of soft sediment slumping. Rock very cavernous: 168.10 - 168.40, 176.60 - 177.10 m. Bedding 41° to ca 184m; 33° to ca 196 m. | | 22166 | 113 | 114 | 1 | 20 | 103 | 458 | <1 |
| | | | | 22167 | 114 | 115 | 1 | 9 | 54 | 193 | <1 |
| | | | | 22168 | 115 | 116 | 1 | 12 | 104 | 449 | <1 |
| | | | | | 116 | 117 | 1 | NO | CORE | RECOVERY | CAVITY |
| | | | | | 117 | 118 | 1 | " | " | " | " |
| | | | | 22169 | 118 | 119 | 1 | 11 | 83 | 350 | <1 |
| | | | | 22170 | 119 | 120 | 1 | 11 | 145 | 462 | <1 |
| | | | | 22171 | 120 | 121 | 1 | 10 | 177 | 830 | <1 |
| | | | | 22172 | 121 | 122 | 1 | 14 | 638 | 2960 | <1 |
| 199.60 | 202.50 | LIMESTONE: Massive and laminar; white to light grey sparry and micritic limestones. Very thin <0.5mm carbonaceous laminae, often physically folded throughout. Rock foliated and microfaulted. Bedding 35° to ca 202m. Pugby core from 202 - 202.50m. | | 22173 | 122 | 123 | 1 | 12 | 92 | 315 | <1 |
| | | | | 22174 | 123 | 124 | 1 | 11 | 85 | 260 | <1 |
| | | | | 22175 | 124 | 125 | 1 | 11 | 44 | 660 | <1 |
| | | | | 22176 | 125 | 126 | 1 | 7 | 73 | 298 | <1 |
| | | | | 37637 | 126 | 127 | 3 | 10 | 85 | 600 | <1 |
| | | | | | 127 | 128 | | | | | |
| | | | | | 128 | 129 | | | | | |
| 202.50 | 229.60 | Interbedded CALCLUTITES/DOLOMITE: grey, slumped, foliated, in part pelletal, microfaulted, calclutites and more massive calcarenites; interbedded with black silty, carbonaceous and weakly pyritic dolomite. Dolomite beds generally <5cm in width. Dolomite beds highly contorted due to slumping of thin beds. Core weakly calcite veined and badly broken ground is only found in the badly foliated sections of core. Foliation is sub // to ca. Minor pugh zones present. Bedding 30° to ca at 216m. | Minor fine pyrite. | 37638 | 129 | 130 | 3 | 22 | 170 | 1900 | <1 |
| | | | | | 130 | 131 | | | | | |
| | | | | | 131 | 132 | | | | | |
| | | | | 37639 | 132 | 133 | 3 | 14 | 32 | 110 | <1 |
| | | | | | 133 | 134 | | | | | |
| | | | | | 134 | 135 | | | | | |
| | | | | 37640 | 135 | 136 | 3 | 22 | 16 | 30 | <1 |
| | | | | | 136 | 137 | | | | | |
| | | | | | 137 | 138 | | | | | |
| | | | | 37641 | 138 | 139 | 3 | 14 | 12 | 24 | <1 |
| | | | | | 139 | 140 | | | | | |
| | | | | | 140 | 141 | | | | | |
| 229.60 | 231.00 | SANDY CALCARENITE: Grey, well bedded, laminar, weakly calcite veined, foliated (⊥ to bedding), coarse grained sandy calcarenite. Bedding 35° to c.a. at 230 metres | | 37642 | 141 | 142 | 3 | 14 | 40 | 120 | <1 |
| | | | | | 142 | 143 | | | | | |
| | | | | | 143 | 144 | | | | | |
| | | | | 37643 | 144 | 145 | 3 | 8 | 16 | 30 | <1 |
| | | | | | 145 | 146 | | | | | |
| 231.00 | 234.80 | CALCLUTITE: grey, extremely foliated, strongly calcite veined, massive calclutite with numerous thin dark grey silty dolomite interbeds (<0.5cm) Calclutite fossiliferous between 234.60 & 234.80m. | | | 146 | 147 | | | | | |
| | | | | 37644 | 147 | 148 | 3 | 10 | 12 | 55 | <1 |
| | | | | | 148 | 149 | | | | | |
| | | | | | 149 | 150 | | | | | |
| | | | | 37645 | 150 | 151 | 3 | 12 | 16 | 50 | <1 |
| 234.80 | 240.00 | SANDY CALCARENITE BRECCIA: slump brecciated, coarse grained, well sorted, massive sandy calcarenites grading downhole into bedded sandy calcarenites. Core weakly calcite veined. Sections of rock very porous & friable (generally browny/grey in colour) giving rise to poor recoveries Bedding 45° to ca at 237.60 metres. | | | 151 | 152 | | | | | |
| | | | | | 152 | 153 | | | | | |
| | | | | 37646 | 153 | 154 | 3 | 8 | 260 | 46 | <1 |
| | | | | | 154 | 155 | | | | | |
| | | | | | 155 | 156 | | | | | |
| | | | | 37647 | 156 | 157 | 3 | 14 | 75 | 50 | <1 |
| | | | | | 157 | 158 | | | | | |
| | | | | | 158 | 159 | | | | | |
| 240.00 | 251.00 | CALCLUTITE: grey, very foliated, moderately calcite veined, in part pelletal, cavernous calclutites and dark grey sandy calcarenites. Minor amount of siderite veining, veining calcite, containing minor disseminated sphalerite. Cavities 242.20 - 242.90; 243.30 - 244.00; 244.60 - 249.50. | Minor sphalerite. | 37648 | 159 | 160 | 3 | 150 | 95 | 55 | 1 |
| | | | | | 160 | 161 | | | | | |
| | | | | | 161 | 162 | | | | | |
| | | | | 37649 | 162 | 163 | 3 | 10 | 28 | 38 | 1 |
| | | | | | 163 | 164 | | | | | |
| | | | | | 164 | 165 | | | | | |
| | | | | 37650 | 165 | 166 | 3 | 10 | 105 | 155 | 1 |

94 0 80 -3

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80R-3 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 251.00 | 253.00 | CALCLUTITE: well bedded, laminar, microfaulted, weakly calcite veined (minor siderite) grey and dark grey interbedded calclutites and silty calclutites. Bedding 37° to ca at 252.50 metres. | | | 166 | 167 | | | | | |
| | | | | | 167 | 168 | | | | | |
| | | | | 37651 | 168 | 169 | 3 | 6 | 60 | 115 | 1 |
| | | | | | 169 | 170 | | | | | |
| | | | | | 170 | 171 | | | | | |
| 253.00 | 256.80 | DOLOMITE: black, silty, and occasionally sandy, calcareous, weakly calcite veined (minor hematite staining) dolomite. Minor interbedded laminar calclutites present. Zone cavernous from 253.30 - 254.50 m. Dolomite is very soft and decomposes rapidly on contact with air and water. | | 37652 | 171 | 172 | 3 | 14 | 30 | 65 | 1 |
| | | | | | 172 | 173 | | | | | |
| | | | | | 173 | 174 | | | | | |
| | | | | 37653 | 174 | 175 | 3 | 10 | 22 | 26 | 1 |
| | | | | | 175 | 176 | | | | | |
| | | | | | 176 | 177 | | | | | |
| | | | | 37654 | 177 | 178 | 3 | 8 | 28 | 32 | 1 |
| | | | | | 178 | 179 | | | | | |
| 256.80 | 272.50 | SANDSTONE: fine grained, well sorted, grey, massive, calcite and quartz veined (minor siderite) brecciated in part sandstone interbedded with very soft, crumbly black to dark grey porous sandstones and dayey and silty black dolomites. Zone very cavernous: 256.80 - 265.30; 266.50 - 267.60; 268.60 - 272.20. No bedding attitudes in massive sequence. Pb/Zn mineralized siderite/calcite vein? 256.90? | Minor Pb/Zn assoc. with siderite vein. | | 179 | 180 | | | | | |
| | | | | 37655 | 180 | 181 | 3 | 8 | 44 | 270 | 1 |
| | | | | | 181 | 182 | | | | | |
| | | | | | 182 | 183 | | | | | |
| | | | | 37656 | 183 | 184 | 3 | 8 | 140 | 1200 | 2 |
| | | | | | 184 | 185 | | | | | |
| | | | | | 185 | 186 | | | | | |
| | | | | 37657 | 186 | 187 | 3 | 8 | 290 | 1150 | 2 |
| | | | | | 187 | 188 | | | | | |
| | | | | | 188 | 189 | | | | | |
| 272.50 | 292.40 | LIMESTONE: light grey, foliated, massive and laminar, moderately calcite veined calclutites with interbeds of grey calcareous sandy calcarenites. Tectonic breccia 273.50 - 273.80. Ground very cavernous: 273.80 - 274.50; 275 - 275.50; 276 - 280; 281 - 284; 285 - 291; Calcarenite core very porous, soft and badly fractured giving rise to poor recoveries. | | 37658 | 189 | 190 | 3 | 4 | 60 | 400 | 1 |
| | | | | | 190 | 191 | | | | | |
| | | | | | 191 | 192 | | | | | |
| | | | | 37659 | 192 | 193 | 3 | 6 | 130 | 410 | 1 |
| | | | | | 193 | 194 | | | | | |
| | | | | | 194 | 195 | | | | | |
| | | | | 37660 | 195 | 196 | 3 | 6 | 44 | 150 | 1 |
| | | | | | 196 | 197 | | | | | |
| 292.40 | 295.50 | SIDERITE/ANKERITE MINERALIZED ROCK: grey green, massive, very dense, sideritic veined ankerite rock containing disseminated colloform? textured sphalerite, with minor filtigree textured galena. ± 2% Pb/Zn. The hangingwall is manifest by a Tectonic, siderite healed breccia. Cavity 292 - 292.80; 293.30 - 294.70. | Disseminated Pb/Zn mineralization averaging approx. 2% combined. | | 197 | 198 | | | | | |
| | | | | 37661 | 199 | 199 | 3 | 6 | 50 | 140 | 1 |
| | | | | | 199 | 200 | | | | | |
| | | | | | 200 | 201 | | | | | |
| | | | | 37662 | 201 | 202 | 3 | 8 | 36 | 70 | 1 |
| | | | | | 202 | 203 | | | | | |
| | | | | | 203 | 204 | | | | | |
| 295.50 | 316.10 | Interbedded SILTSTONES/SANDSTONES: black and grey, weakly calcareous, rugby, porous, and very soft clayey siltstones and sandstones. Zone extremely cavernous: 295.50 - 297.30; 297.50 - 299.90; 300.80 - 301.20; 304.50 - 307.60; 309.80 - 312.20; 312.40 - 313.70. Core recovery was approximately 10%. Much of the core was washed during drilling. | | 37663 | 204 | 205 | 3 | 8 | 105 | 480 | 1 |
| | | | | | 205 | 206 | | | | | |
| | | | | | 206 | 207 | | | | | |
| | | | | 37664 | 207 | 208 | 3 | 12 | 55 | 110 | 1 |
| | | | | | 208 | 209 | | | | | |
| | | | | | 209 | 210 | | | | | |
| | | | | 37665 | 210 | 211 | 3 | 8 | 85 | 410 | 1 |
| | | | | | 211 | 212 | | | | | |
| | | | | | 212 | 213 | | | | | |
| 316.10 | 341.60 | Interbedded SANDSTONES: light grey, very porous, friable, soft, quartzose coarse grained sandstones interbedded with more massive, dense and hard, weakly quartz veined, fine grained sandstones. Recoveries over the softer zones approximately 20%. No Core 324 - 326m | | 37666 | 213 | 214 | 3 | 16 | 160 | 850 | 2 |
| | | | | | 214 | 215 | | | | | |
| | | | | | 215 | 216 | | | | | |
| | | | | 37667 | 216 | 217 | 3 | 8 | 90 | 220 | <1 |
| | | | | | 217 | 218 | | | | | |
| | | | | | 218 | 219 | | | | | |

6469356

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80A-3 — 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 341.60 | 354.40 | MINERALIZED SIDERITE/CALCITE ROCK: cream coloured dense, massive, siderite veined, weakly to moderately mineralized rock. Rock foliated, vuggy and the mineralization is either disseminated or veinleted galena with minor sphalerite. The core is badly fractured and broken giving recoveries varying from 45% to 75%. Layering in sections of the zone appears to be a primary feature enhanced by the influx of siderite into the sequence. | 3.5% Pb/Zn combined. | | 219 | 220 | 3 | 8 | 40 | 95 | <1 |
| | | | | | 220 | 221 | | | | | |
| | | | | | 221 | 222 | | | | | |
| | | | | 37669 | 222 | 223 | 3 | 8 | 105 | 190 | <1 |
| | | | | | 223 | 224 | | | | | |
| | | | | | 224 | 225 | | | | | |
| | | | | 37670 | 225 | 226 | 3 | 8 | 70 | 230 | <1 |
| | | | | | 226 | 227 | | | | | |
| | | | | | 227 | 228 | | | | | |
| | | | | 37671 | 228 | 229 | 3 | 8 | 100 | 280 | <1 |
| 354.40 | 373.50 | SANDSTONE: interbedded medium to coarse grained dark grey, massive, well sorted, in part vuggy, weakly fossiliferous sandstones and cream to grey, coarse grained very soft and weakly clayey sandstones. Clayey sections have poor core recoveries. Recoveries overall 50-60%. | | | 229 | 230 | | | | | |
| | | | | | 230 | 231 | | | | | |
| | | | | 37672 | 231 | 232 | 3 | 6 | 24 | 130 | <1 |
| | | | | | 232 | 233 | | | | | |
| | | | | | 233 | 234 | | | | | |
| | | | | 37673 | 234 | 235 | 3 | 10 | 60 | 280 | <1 |
| | | | | | 235 | 236 | | | | | |
| | | | | | 236 | 237 | | | | | |
| END OF HOLE 373.50m. | | | | 37674 | 237 | 238 | 3 | 10 | 230 | 1000 | 1 |
| | | | | | 238 | 239 | | | | | |
| | | | | | 239 | 240 | | | | | |
| | | | | 37675 | 240 | 241 | 3 | 8 | 125 | 2550 | <1 |
| | | | | | 241 | 242 | | | | | |
| | | | | | 242 | 243 | | | | | |
| | | | | 37676 | 243 | 244 | 3 | 8 | 65 | 2200 | <1 |
| | | | | | 244 | 245 | | | | | |
| | | | | | 245 | 246 | | | | | |
| | | | | | 246 | 247 | | CAVITY | NO | CORE | |
| | | | | | 247 | 248 | | " | " | " | |
| | | | | | 248 | 249 | | " | " | " | |
| | | | | 37677 | 249 | 250 | 3 | 50 | 150 | 740 | 2 |
| | | | | | 250 | 251 | | | | | |
| | | | | | 251 | 252 | | | | | |
| | | | | 37678 | 252 | 253 | 3 | 8 | 65 | 175 | 2 |
| | | | | | 253 | 254 | | | | | |
| | | | | | 254 | 255 | | | | | |
| | | | | 37679 | 255 | 256 | 3 | 10 | 310 | 1350 | 3 |
| | | | | | 256 | 257 | | | | | |
| | | | | | 257 | 258 | | | | | |
| | | | | | 258 | 259 | | CAVITY | NO | CORE | |
| | | | | | 259 | 260 | | " | " | " | |
| | | | | | 260 | 261 | | " | " | " | |
| | | | | | 261 | 262 | | " | " | " | |
| | | | | | 262 | 263 | | " | " | " | |
| | | | | | 263 | 264 | | " | " | " | |
| | | | | | 264 | 265 | | " | " | " | |
| | | | | 37680 | 265 | 266 | 3 | 6 | 225 | 520 | 2 |
| | | | | | 266 | 267 | | | | | |
| | | | | | 267 | 268 | | | | | |
| | | | | 37681 | 268 | 269 | 3 | 6 | 210 | 870 | 2 |
| | | | | | 269 | 270 | | | | | |
| | | | | | 270 | 271 | | | | | |
| | | | | 37682 | 271 | 272 | 3 | 16 | 170 | 5500 | 2 |

69439

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80A-3 — PAGE 6 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Au | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 272 | 273 | | | | | |
| | | | | | 273 | 274 | | | | | |
| | | | | 37683 | 274 | 275 | 2 | 10 | 230 | 1350 | 1 |
| | | | | | 275 | 276 | | | | | |
| | | | | | 276 | 277 | | CAVITY | NO | CORE | |
| | | | | | 277 | 278 | | " | " | " | |
| | | | | | 278 | 279 | | " | " | " | |
| | | | | | 279 | 280 | | " | " | " | |
| | | | | 37684 | 280 | 281 | 1 | 8 | 65 | 670 | 1 |
| | | | | | 281 | 282 | | CAVITY | NO | CORE | |
| | | | | | 282 | 283 | | " | " | " | |
| | | | | | 283 | 284 | | " | " | " | |
| | | | | | 284 | 285 | 1 | 12 | 32 | 440 | <1 |
| | | | | | 285 | 286 | | CAVITY | NO | CORE | |
| | | | | | 286 | 287 | | " | " | " | |
| | | | | | 287 | 288 | | " | " | " | |
| | | | | | 288 | 289 | | " | " | " | |
| | | | | | 289 | 290 | | " | " | " | |
| | | | | | 290 | 291 | | " | " | " | |
| | | | | | 291 | 292 | 1 | 10 | 32 | 85 | <1 |
| | | | | 22091 | 292 | 293 | 1 | 13 | 498 | 3640 | 1 |
| | | | | 22092 | 293 | 294 | 1 | 7 | 535 | 3050 | 1 |
| | | | | 22093 | 294 | 295 | 1 | 33 | 3600 | 2.75% | 3 |
| | | | | 22094 | 295 | 296 | 1 | 12 | 4200 | 1.36% | 3 |
| | | | | | 296 | 297 | | CAVITY | NO | CORE | |
| | | | | | 297 | 298 | 4 | 8 | 60 | 180 | <1 |
| | | | | | 298 | 299 | | | | | |
| | | | | | 299 | 300 | | | | | |
| | | | | | 300 | 301 | | | | | |
| | | | | | 301 | 302 | 4 | 6 | 75 | 260 | <1 |
| | | | | | 302 | 303 | | | | | |
| | | | | | 303 | 304 | | | | | |
| | | | | | 304 | 305 | | | | | |
| | | | | | 305 | 306 | | CAVITY | NO | CORE | |
| | | | | | 306 | 307 | | " | " | " | |
| | | | | | 307 | 308 | 3 | 12 | 590 | 420 | <1 |
| | | | | | 308 | 309 | | | | | |
| | | | | | 309 | 310 | | | | | |
| | | | | | 310 | 311 | | CAVITY | NO | CORE | |
| | | | | | 311 | 312 | | " | " | " | |
| | | | | | 312 | 313 | | " | " | " | |
| | | | | | 313 | 314 | 3 | 10 | 30 | 90 | <1 |
| | | | | | 314 | 315 | | | | | |
| | | | | | 315 | 316 | | | | | |
| | | | | | 316 | 317 | | CAVITY | NO | CORE | |
| | | | | | 317 | 318 | | " | " | " | |
| | | | | | 318 | 319 | 3 | 12 | 18 | 60 | <1 |
| | | | | | 319 | 320 | | | | | |
| | | | | | 320 | 321 | | | | | |
| | | | | | 321 | 322 | 3 | 6 | 8 | 24 | <1 |
| | | | | | 322 | 323 | | | | | |
| | | | | | 323 | 324 | | | | | |
| | | | | | 324 | 325 | 3 | 8 | 14 | 38 | <1 |

649190

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-80A-3 — PAGE 7 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 325 | 326 | | | | | |
| | | | | | 326 | 327 | | | | | |
| | | | | | 327 | 328 | 3 | 6 | 22 | 48 | <1 |
| | | | | | 328 | 329 | | | | | |
| | | | | | 329 | 330 | | | | | |
| | | | | | 330 | 331 | 3 | 12 | 20 | 50 | <1 |
| | | | | | 331 | 332 | | | | | |
| | | | | | 332 | 333 | | | | | |
| | | | | | 333 | 334 | 3 | 14 | 60 | 90 | <1 |
| | | | | | 334 | 335 | | | | | |
| | | | | | 335 | 336 | | | | | |
| | | | | | 336 | 337 | 3 | 14 | 125 | 480 | <1 |
| | | | | | 337 | 338 | | | | | |
| | | | | | 338 | 339 | | | | | |
| | | | | | 339 | 340 | 2 | 8 | 135 | 500 | <1 |
| | | | | | 340 | 341 | | | | | |
| | | | | 22095 | 341 | 342 | 2 | 7 | 4200 | 3390 | 2 |
| | | | | | 342 | 343 | | | | | |
| | | | | 22096 | 343 | 344 | 2 | <5 | 830 | 747 | 1 |
| | | | | | 344 | 345 | | | | | |
| | | | | 22097 | 345 | 346 | 2 | <5 | 2700 | 3160 | 2 |
| | | | | | 346 | 347 | | | | | |
| | | | | 22098 | 347 | 348 | 1 | <5 | 1.23% | 2700 | 5 |
| | | | | 22099 | 348 | 349 | 1 | 15 | 2.41% | 2800 | 8 |
| | | | | 22100 | 349 | 350 | 1 | 24 | 4.37% | 4400 | 14 |
| | | | | 22101 | 350 | 351 | 1 | <5 | 9400 | 1210 | 6 |
| | | | | 22102 | 351 | 352 | 1 | <5 | 2300 | 2150 | 3 |
| | | | | 22103 | 352 | 353 | 1 | <5 | 3800 | 1670 | 4 |
| | | | | 22104 | 353 | 354 | 1 | <5 | 5500 | 819 | 6 |
| | | | | 22105 | 354 | 355 | 1 | <5 | 2900 | 1480 | 3 |
| | | | | | 355 | 356 | 1 | NO | CORE | RECOVERY | |
| | | | | | 356 | 357 | 1 | " | " | " | |
| | | | | | 357 | 358 | 1 | " | " | " | |
| | | | | 22106 | 358 | 359 | 1 | 6 | 156 | 256 | 1 |
| | | | | | 359 | 360 | 3 | 10 | 120 | 310 | <1 |
| | | | | | 360 | 361 | | | | | |
| | | | | | 361 | 362 | | | | | |
| | | | | | 362 | 363 | 3 | 8 | 40 | 60 | <1 |
| | | | | | 363 | 364 | | | | | |
| | | | | | 364 | 365 | | | | | |
| | | | | | 365 | 366 | 3 | 4 | 40 | 44 | <1 |
| | | | | | 366 | 367 | | | | | |
| | | | | | 367 | 368 | | | | | |
| | | | | | 368 | 369 | 3 | 10 | 30 | 110 | <1 |
| | | | | | 369 | 370 | | | | | |
| | | | | | 370 | 371 | | | | | |
| | | | | | 371 | 372 | 3 | 14 | 16 | 36 | <1 |
| | | | | | 372 | 373 | | | | | |
| | | | | | 373 | 374 | | | | | |
| | | END OF HOLE 373.50m. | | | | | | | | | |

64-1691

649192

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-81A-4

| | | |
|---|---|---|
| Location | : | 1300N : 1530E |
| Declination | : | 50° |
| Azimuth | : | 270°G |
| Total Depth | : | 259 meters |

Assay Results

No Significant Mineralization

**Amoco Minerals Australia Company**

DRILL LOG — HOLE No. ZT - 81A - 4 — PAGE 1 OF 12

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN - TAS No. A7860C | ELEVATION meters | COMMENCED 15 OCT '81 | BORE HOLE SURVEY | | | | | | INSTRUMENT Eastman Camera | | | | | |
| | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | | | |
| PROSPECT AUSTRAL EZ/JV AREA | DIP COLLAR 50° G.W | COMPLETED 23 OCT '81 | 50 | 51 | 241 | 200 | 54 | 240 | | | | | | |
| CO-ORDINATES 1300 mN 1530 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 259 meters | 100 | 52.5 | IN CASING | 250 | 55 | 240 | | | | | | |
| BEARING 249 TN 238 MN 270 GN | LOGGED BY P.A. JONES | Machine Used: MINDRILL 10L R.D.D. Pty Ltd. | 150 | 53 | 240 | | | | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 1.00 | GRAVEL: White, quartzose with peat matrix | | 66004 | 17 | 20 | 3 | 6 | 155 | 500 | <1 |
| HW CORING | | | | 66005 | 20 | 22 | 2 | 6 | 90 | 810 | <1 |
| 1.00 | 17.00 | DOLOMITE: Grey to brown, argillaceous, weakly fossiliferous. Very poor recoveries | | 66006 | 22 | 25 | 3 | 6 | 125 | 260 | <1 |
| | | | | 66007 | 25 | 28 | 3 | 6 | 185 | 970 | <1 |
| HQ CORING | | | | 66008 | 28 | 31 | 3 | 4 | 55 | 700 | <1 |
| 17.00 | 27.80 | CALCLUTITE: Very argillaceous, very badly broken and fractured, light to dark grey, weakly calcite | | 66009 | 31 | 34 | 3 | 6 | 70 | 730 | <1 |
| | | | | 66010 | 34 | 37 | 3 | 8 | 140 | 810 | <1 |
| | | veined, minor stylolites, slumpy textured (irregular | | 66011 | 37 | 40 | 3 | 6 | 160 | 860 | <1 |
| | | light grey carbonate plus argillaceous material | | 66012 | 40 | 43 | 3 | 4 | 70 | 390 | <1 |
| | | chaotically cemented into massive and textureless | | 66013 | 43 | 46 | 3 | 4 | 65 | 500 | <1 |
| | | darker grey calclutite). Minor cavities 21.0 - 21.5m, | | 66014 | 46 | 49 | 3 | 6 | 44 | 510 | <1 |
| | | Bedding 47° to ca @ 20m. (Minor relict laminations | | 66015 | 49 | 52 | 3 | 10 | 95 | 195 | <1 |
| | | in black very argillaceous calcmicrite with calcite | | 66016 | 52 | 55 | 3 | 8 | 50 | 145 | <1 |
| | | laminae parallel to bedding). A coarse grained | | 66017 | 55 | 58 | 3 | 50 | 24 | 90 | <1 |
| | | calcite vein @ 22m ≈ 5cm wide. | | 66018 | 58 | 61 | 3 | 6 | 28 | 100 | <1 |
| | | | | 66019 | 61 | 64 | 3 | 16 | 28 | 100 | <1 |
| 27.80 | 32.90 | FRAGMENTAL FOSSIL BRECCIA: Mottled dark grey, | | 66020 | 64 | 67 | 3 | 6 | 30 | 200 | <1 |
| | | grey and white fragments of colonial corals, crinoid | | 66021 | 67 | 70 | 3 | 4 | 18 | 135 | <1 |
| | | ossicles, stromatoporoids and minor pelletal | | 66022 | 70 | 73 | 3 | 4 | 18 | 400 | <1 |
| | | and oolitic sections occur along with angular to | | 66023 | 73 | 76 | 3 | 4 | 55 | 360 | <1 |
| | | subrounded intraclasts within a matrix of mid | | 66024 | 76 | 79 | 3 | 4 | 80 | 640 | <1 |
| | | grey argillaceous micrite. A moderate amount | | 66025 | 79 | 82 | 3 | 6 | 90 | 300 | <1 |
| | | of medium grained crystalline cross cutting calcite | | 66250 | 82 | 85 | 3 | 8 | 55 | 220 | 1 |
| | | veins occurs throughout section. Stylolites are | | 66256 | 85 | 88 | 3 | 8 | 44 | 240 | 1 |
| | | developed along contact surfaces between fragments | | 66257 | 88 | 91 | 3 | 8 | 55 | 200 | 1 |
| | | and matrix. Minor interbeds of bedded grey calc- | | 66046 | 91 | 94 | 3 | 22 | 155 | 890 | <1 |
| | | lutite and dark grey to black argillaceous calclutite | | 66047 | 94 | 97 | 3 | 24 | 55 | 160 | <1 |
| | | occur towards the base of the sequence. | | 66048 | 97 | 100 | 3 | 20 | 16 | 55 | <1 |
| | | Bedding 50° @ 32.8 metres. | | 66049 | 100 | 103 | 3 | 16 | 12 | 48 | <1 |
| | | | | 66050 | 103 | 106 | 3 | 14 | 14 | 40 | <1 |
| 32.90 | 36.00 | CALCLUTITE: Interbedded dark grey / grey, crudely | Trace very fine grained | 66051 | 106 | 109 | 3 | 12 | 16 | 32 | <1 |
| | | bedded slumpy (large exotic fragments of light | pyrite as disseminations | 66052 | 109 | 112 | 3 | 16 | 14 | 34 | <1 |
| | | grey skeletal debris occurs in a matrix of | within dolomik matrix. | 66053 | 112 | 115 | 3 | 14 | 14 | 70 | <1 |
| | | | | 66054 | 115 | 118 | 3 | 16 | 16 | 110 | <1 |

69803

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 32.90 | 36.00 | coarsely crystalline dolomite with a calcite cement) | | 66055 | 118 | 121 | 3 | 14 | 36 | 155 | <1 |
| CONT: | | weakly calcite veined, moderately weathered | | 66056 | 121 | 124 | 3 | 12 | 36 | 300 | <1 |
| | | (differentially weathered as skeletal debris is very | | 66057 | 124 | 127 | 3 | 12 | 95 | 1100 | <1 |
| | | porous compared to the more massive dolomite matrix) | | | 127 | 136 | 9 | CAVITY - NO CORE | | | |
| | | and very weathered and clayey towards the base | | 66058 | 136 | 139 | 3 | 10 | 65 | 600 | <1 |
| | | of the unit. Here core is extensively broken and | | 66059 | 139 | 142 | 3 | 10 | 75 | 400 | <1 |
| | | pushy. A lot of stylolites occur parallel to bedding | | 66060 | 142 | 145 | 3 | 10 | 60 | 290 | <1 |
| | | planes but others occur perpendicular and may | | 66061 | 145 | 148 | 3 | 12 | 80 | 260 | 1 |
| | | also occur at the contact of fragments & matrix. | | 66062 | 148 | 151 | 3 | 12 | 28 | 85 | <1 |
| | | Bedding 47° @ 33.7m. | | 66063 | 151 | 154 | 3 | 12 | 20 | 42 | <1 |
| | | | | 66064 | 154 | 157 | 3 | 10 | 20 | 115 | <1 |
| 36.00 | 44.40 | FRAGMENTAL FOSSIL BRECCIA: Very fossiliferous, | Trace siderite/sphalerite | 66065 | 157 | 160 | 3 | 12 | 12 | 34 | <1 |
| | | chaotically fragmental limestone containing | within calcite veins. | 66066 | 160 | 163 | 3 | 10 | 30 | 110 | <1 |
| | | abundant pellets, pisoliths, shell debris, minor | | 66067 | 163 | 166 | 3 | 10 | 38 | 200 | <1 |
| | | stromatoporoid fragments (up to 4cm width) and | Abundant finely | 66068 | 166 | 169 | 3 | 10 | 28 | 195 | <1 |
| | | minor solitary coral and colonial coral pieces in | disseminated pyrite. | 66069 | 169 | 172 | 3 | 10 | 48 | 580 | 1 |
| | | a matrix of mid to dark grey calclutite and minor | | 66070 | 172 | 175 | 3 | 10 | 48 | 270 | 1 |
| | | dark grey to black argillaceous calclutite. Angular | | 66071 | 175 | 178 | 3 | 10 | 28 | 1000 | 1 |
| | | to subrounded intraclasts are common, sometimes | | 66072 | 178 | 181 | 3 | 12 | 90 | 440 | 1 |
| | | comprising 80% of Breccia. Zones throughout the | | 66073 | 181 | 184 | 3 | 12 | 70 | 70 | <1 |
| | | sequence may be strongly calcite veined sometimes | | 66074 | 184 | 187 | 3 | 10 | 80 | 480 | <1 |
| | | containing rose pink siderite and a trace of | | 66075 | 187 | 190 | 3 | 10 | 48 | 260 | <1 |
| | | yellow red crystalline sphalerite. Abundant dissemin- | | 66076 | 190 | 193 | 3 | 12 | 30 | 630 | <1 |
| | | ated pyrite (1-2%) occurs near solution contacts | | 66077 | 193 | 196 | 3 | 12 | 90 | 560 | <1 |
| | | (stylolite boundaries) with fragments and/or matrix. | | 66207 | 196 | 199 | 3 | 6 | 50 | 370 | 1 |
| | | Minor pugh zones are present along with preferentially | | 66208 | 199 | 202 | 3 | 6 | 32 | 320 | 1 |
| | | weathered porous zones. Moderate stylolitization | | 66209 | 202 | 205 | 3 | 4 | 85 | 760 | 1 |
| | | occurs around fragmental boundaries and along | | 66210 | 205 | 208 | 3 | 4 | 20 | 550 | 1 |
| | | crude bedding surfaces. | | 66211 | 208 | 211 | 3 | 6 | 80 | 1100 | 1 |
| | | | | 66212 | 211 | 214 | 3 | 4 | 32 | 1000 | 1 |
| 44.40 | 46.35 | SLUMPY CALCLUTITE: Interbedded dark grey and | Trace pyrite as blebs. | 66213 | 214 | 217 | 3 | 6 | 50 | 1250 | 1 |
| | | light grey calclutite, weakly calcite veined and | | 66214 | 217 | 220 | 3 | 6 | 55 | 270 | 1 |
| | | weakly fossiliferous. Dark grey to black thin interbeds | | 66215 | 220 | 223 | 3 | 6 | 40 | 1850 | 1 |
| | | are composed of argillaceous dolomite with a calcite cement. | | 66216 | 223 | 226 | 3 | 10 | 95 | 950 | 1 |
| | | The calclutite is very massive and contains minor | | 66217 | 226 | 229 | 3 | 6 | 26 | 155 | 1 |
| | | clastic grains of sand sized particles as well as minor | | 66218 | 229 | 232 | 3 | 4 | 14 | 80 | 1 |
| | | blebby pyrite. Stylolite interfaces are comprised of | | 66219 | 232 | 235 | 3 | 4 | 46 | 360 | 1 |
| | | recrystallized white calcite and black very carbon- | | 66220 | 235 | 238 | 3 | 8 | 28 | 175 | 1 |
| | | | | 66221 | 238 | 241 | 3 | 6 | 22 | 155 | 1 |

649194

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | ASSAYS Pb | ASSAYS Zn | ASSAYS Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 44.40 | 46.35 | -aceous material. Slumpy texture is manifest | | 66222 | 241 | 244 | 3 | 6 | 20 | 55 | 1 |
| Cont' | | by rounded intraclasts and contorted bedding | | 66223 | 244 | 247 | 3 | 6 | 40 | 100 | 1 |
| | | interfaces. Bedding 42° @ 46 metres. | | 66224 | 247 | 250 | 3 | 6 | 22 | 55 | 1 |
| | | | | 66225 | 250 | 253 | 3 | 4 | 20 | 85 | 1 |
| 46.35 | 48.20 | FOSSIL BRECCIA: Rock composed of | Trace to minor pyrite. | 66226 | 253 | 256 | 3 | 6 | 65 | 1200 | 1 |
| | | fragments of stromatoporoids, solitary corals, | | 66227 | 256 | 259 | 3 | 4 | 28 | 240 | 1 |
| | | oolites, pisoliths and pellets in a mixture of | | | | | | | | | |
| | | medium grained crystalline dolomite (argillaceous) with | | | | | | | | | |
| | | a calcite cement plus very fine grained grey calc- | | | | | | | | | |
| | | lutite matrix. Fossil casts are comprised of | | | | | | | | | |
| | | coarse grained sparry cement - minor dolomite. | | | | | | | | | |
| | | Moderate calcite veining throughout with a | | | | | | | | | |
| | | fracture zone at 48.00, 20 cm in width, manifest | | | | | | | | | |
| | | by extensive calcite veining with minor pervasive | | | | | | | | | |
| | | pyrite (2%) as stalagtites within vughs. Trace | | | | | | | | | |
| | | pyrite elsewhere on fracture faces. | | | | | | | | | |
| 48.20 | 57.20 | DOLOMITE: Black, medium to fine grained, laminar, | Minor pyrite as very fine | | | | | | | | |
| | | calcite cemented argillaceous dolomite interbedded | grained disseminations | | | | | | | | |
| | | with dark grey argillaceous, massive to laminar | 2-3% | | | | | | | | |
| | | calcilutite. Minor thin interbeds (<5 cm) of very | | | | | | | | | |
| | | fossiliferous (oolites, pisoliths, minor corals and | | | | | | | | | |
| | | shell fragments) calcarenites. The fossil debris is | | | | | | | | | |
| | | cemented in sparite. NO calcite veining present (poss- | | | | | | | | | |
| | | ibly due to low carbonate content). Moderate to | | | | | | | | | |
| | | severe stylolitization giving appearance that thin | | | | | | | | | |
| | | laminations have been drawn out forming some- | | | | | | | | | |
| | | thing similar to cleavage or foliation planes. | | | | | | | | | |
| | | Detrital fine grained muscovite is present through- | | | | | | | | | |
| | | out dolomite. Very fine disseminated pyrite occurs | | | | | | | | | |
| | | throughout. Bedding 45° @ 51 metres. | | | | | | | | | |
| 57.20 | 60.20 | PISOLITIC/SKELETAL LIMESTONE: White to light | Disseminated fine | | | | | | | | |
| | | grey, with pisoliths, oncoliths (up to 15 cm diam) | grained pyrite present | | | | | | | | |
| | | comprised of concretionary layered balls with both | in dolomite matrix. | | | | | | | | |
| | | carbonate and quartz nuclei and minor intraclasts | Minor blebby pyrite. | | | | | | | | |
| | | of very fossiliferous calcarenites, minor oolites and | | | | | | | | | |
| | | corals in a matrix of black, medium grained calcite | | | | | | | | | |

649163

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 57.20 | 60.20 | CON'T: cemented dolomite. Core is slumpy textured with many fragmental and pisolitic boundaries showing signs of stylolitization. Weakly calcite veined. | | | | | | |
| 60.20 | 62.80 | LAMINAR CALCLUTITE/CALCMICRITE: Light grey to dark grey, very laminar (but grading to more massive down hole), finely interbedded calclutites and darker calcmicrites. Minor soft sediment deformation. Dropstone indicates sequence right way up. Micrite predominates down hole. Minor calcite veining parallel to bedding @ 60.30 metres. Minor olive beige very thin horizons appear to be clay rich laminae, occaissionally remobilized into cross cutting fracture infillings. Bedding 40° to c.a. @ 61.30 metres. | Weakly disseminated very fine grained pyrite trace galena? | | | | | |
| 62.80 | 70.60 | INTERBEDDED LAMINAR CALCLUTITES AND PISOLITIC LIMESTONES: Light grey to black, slump textured, calclutite and skeletal calcarenites (coralline fragments, oolites and shelly debris) in a calcite cemented dolomite matrix passing downhole into very laminar, white to light grey, differentially weathered and porous, weakly pyritic, argillaceous calcmicrites with minor 'spotty' calcarenite laminae (recrystallized). This unit in turn grades down hole (@ 68 m) into a very stylolitized, very pisolitic and oncolitic white to light grey, differentially weathered and leached calclutite with minor carbonaceous dolomite veinlets throughout - due to stylolitization. | Pyrite as disseminations and smears along cleavage or fracture surfaces. | | | | | |
| 70.60 | 83.00 | SLUMPY CALCLUTITE / DOLOMITE: Interbedded, in part chaotically, grey very fossiliferous (skeletal debris, pisoliths, oolites and minor fine grained pellets, minor corals and shell fragments) calclutite and beige grey very porous (coquina!) leached, pyritic, calcite cemented dolomite matrix. Weakly calcite veined; minor recrystallization of carbonate paralleling carbonaceous stylolite boundaries. Differentially | Pyrite as disseminations on fracture surfaces. | | | | | |

649136

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 70.60 | 83.00 | CON'T : Weathered and porous, broken sections occur from 72.5m - 78.0m. Large coralline fragments, up to 5cm in width, occur sporadically. Dolomite is weakly argillaceous. Fine grained disseminated pyrite occurs along fracture surfaces generally in the dolomite host. The slumpy texture is due to the chaotic orientation of bedding and intraclasts. Some slickensiding is evident on foliation planes. Bedding 37° to c.a. @ 77metres. | | | | | | |
| 83.00 | 85.20 | LAMINAR CALCLUTITE / CALCMICRITE : Very laminar, thinly bedded, alternating layers of white to light grey, very fine grained, crystalline carbonate with minor disseminated pyrite paralleling bedding. Calclutite grades downhole into a more dark grey calcmicrite containing abundant very fine grained blebby pyrite accumulations. Bedding 40° to c.a. @ 84.7m. | Disseminated bedded pyrite and pyrite accumulations. | | | | | |
| 85.20 | 91.80 | INTERBEDDED CALCLUTITE / DOLOMITE : Grey, massive, thickly bedded, calclutites interbedded with black, massive, calcite cemented fine grained dolomite. The unit is very fossiliferous from 88m - 91.80m. with abundant coralline fragments encrusted by thin layers of micrite, minor shell casts and minor flower imprints from crinoids plus other skeletal debris occuring within a black calcite cemented dolomite matrix. The fossiliferous zone is moderately slumpy with chaotic bedding and numerous intraclasts. Bedding 38° to c.a. @ 89.80 metres. | | | | | | |
| 91.80 | 101.30 | INTERBEDDED DOLOMITE / CALCLUTITE : Massive, black calcite cemented, fine grained dolomite generally <20 cm in width, interbedded with thin (<10 cm) light grey massive calclutite. Core unfossiliferous. Very weak calcite veining. One major calcite fracture zone @ 93.5m. Minor thin pyrite zones. Core hard and unbroken. Minor foliation perpendicular to bedding manifest by stylolitic growth | Trace pyrite on fracture surfaces. | | | | | |

64901-1

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 91.80 | 101.30 | CON'T : only near calcite healed fracture zone. Rest of sequence very competent. | | | | | | |
| 101.30 | 109.90 | FOSSIL BRECCIA : Chaotically oriented, sub-angular to rounded intraclasts of grey fossiliferous and unfossiliferous calclutites, coralline fragments, pellets, oolites and pisolites with minor stromato-poroids and abundant fragmental and skeletal debris set in a matrix of black calcite cemented dolomite. Minor solution leaching around fragment boundaries, possibly replaced in places by fine grained pyrite. The dolomite matrix increases down hole as the breccia becomes finer grained and less chaotically bedded eventually grading into the next lithology - dolomite. | Fine grained pyrite disseminated around certain fragmental boundaries. | | | | | |
| 109.90 | 115.40 | DOLOMITE : Black argillaceous (micaceous) weakly pyritic, calcite cemented dolomicrite with light grey to grey unfossiliferous to very fossiliferous (skeletal debris, oolites and pisolites, minor oncolites and coral fragments) calclutite and calcarenite interbeds generally <10cm in width. Moderate stylolitization and slumping textures evident. The fossil content increases at the expense of the dolomite matrix down hole. Bedding 55° to c.a @ 112m. | Trace very fine blebs of pyrite throughout dolomite matrix. | | | | | |
| 115.40 | 136.50 | INTERBEDDED FOSSIL BRECCIAS, DOLOMITE AND CALCARENITE : Very fossiliferous (stromat-oporoids, colonial corals, oolites, crinoid fragments, skeletal debris, minor shell fragments and numerous intraclasts) breccia with a fossiliferous dolomite matrix, calcite cemented, interbedded with skeletal calcarenites ; light grey, containing abundant oolites, crinoid ossicle fragments and other skeletal debris, beds generally from 5-30cm width, and black argillaceous weakly pyritic dolomite containing minor calclutite interbeds. The zone becomes differentially weathered, leached and porous to- | Pyrite occurs as disseminations and accumulations between fragment boundaries and within the dolomite. | | | | | |

64193

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 115.40 | 136.50 | CON'T : wards the base of the sequence and core becomes increasingly broken. Minor calcite veining throughout. Weathering is related to 9Metre wide cavity from 127m to 136 metres. | | | | | | |
| HQ → NQ (140) | | | | | | | | |
| 136.50 | 156.80 | CALCMICRITE / DOLOMITE : Interbedded, slump textured, dark grey unfossiliferous to weakly fossiliferous, very fine grained, massive calcmicrite and black, massive to weakly foliated, argillaceous calcite cemented dolomite. Zone weakly calcite veined, moderately stylolitized, Cavity from 142.2 - 142.7 m. surrounded by zone of leaching and differential weathering giving very argillaceous porous appearance to core. Minor fossiliferous horizons ≤ 5cm in width containing shell fragments and possibly ammonites fragments. Bedding 48° to c.a @ 146.5 metres. | | | | | | |
| 156.80 | 161.60 | FOSSIL BRECCIA : Very fossiliferous (colonial corals up to 5cm width, coral fragments, shell fragments and pisoliths) sections of core in a matrix of calcite cemented, very pyritic, medium grained very carbonaceous, argillaceous dolomite occur with less fossiliferous, more porous and leached (weathered) slump textured, interbedded beige grey and dark grey argillaceous calclutites and dolomites. Cavity 160 - 161 m. Zone moderately calcite veined. Bedding 156.8 m. 39° to c.a. | Disseminated and blebby pyrite up to 3% within black Dolomite Matrix. | | | | | |
| 161.60 | 167.10 | CALCLUTITE : Grey, massive, slumpy textured, strongly stylolitized, moderately calcite veined, in part fractured, competent, unfossiliferous calclutite with thin interbeds (≤ 20cm) of disturbed, slumpy textured, black, foliated, calcite cemented argillaceous dolomite. Tectonic Breccia 164.8 m ≤ 10 - 15 cm wide with angular fragments of host rock lying within a black very carbonaceous carbonate rich pugh. Mod. fracturing surrounds this. | | | | | | |

649139

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 167.10 | 169.20 | INTERBEDDED ARGILLACEOUS CALCMICRITES AND DOLOMITE: The unit is preferentially weathered with argillaceous micrite being very porous due to incomplete leaching. Micrite is beige/grey argillaceous, moderately skeletal, contains minor rounded (ovoid) sparite clusters, and is interbedded with a more competent black to dark grey, massive but thinly bedded calcite cemented argillaceous dolomite. Rock is similar in appearance to the unit above - slump textured. | | | | | | |
| 169.20 | 181.00 | INTERBEDDED CALCLUTITE/DOLOMITE: Rhythmically bedded, slumpy textured, grey, massive generally unfossiliferous competent calclutites and black argillaceous massive to weakly laminar calcite cemented dolomite. Broken and fractured core from 170.80m to 170.87m. Moderate to strong stylolitization (being very carbonaceous and in part weakly pyritic). Minor calcite veining. Where slumping is excessive intraclasts occur within a dolomite matrix. The beginning of the unit is moderately fossiliferous (169.20 - 171.50m) with mainly shell fragments and skeletal debris being evident. Minor pellets were observed with coralline fragment nuclei. Bedding 40° to c.a. @ 173.0 metres. | Trace pyrite in dolomite and stylolites. | | | | | |
| 181.00 | 188.80 | SKELETAL CALCARENITE: Very fossiliferous light grey skeletal and pelletal calcarenite with a mid grey micritic (cryptocrystalline - cherty appearance) matrix with minor thin carbonaceous dolomite interbeds. Dolomite crystals are coarse grained, cream/white and occur as aggregates distributed throughout the thin interbeds with the remainder being argillaceous/carbonaceous skeletal detritus. Fossiliferous material is comprised mainly of cryptocrystalline pellets from 0.5 to 2mm, minor oolites, minor fine grained fragments of coral, numerous shelly fragments and minor large | Minor pyrite as very fine grained blebs or as coarser grained disseminations. | | | | | |

002679

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 181.00 | 188.80 | CON'T: intraclasts of cherty textured white to cream cryptocrystalline calclutites (some containing Manganese dendrites). Core moderately stylolitized, very competent, weakly calcite veined, and moderately slumpy textured. 1cm wide white pugh seam present @ 185m. | | | | | | |
| 188.80 | 198.95 | INTERBEDDED CALCLUTITE / DOLOMITE / SKELETAL CALCARENITE: Rhythmically interbedded, mid to dark grey, massive, calclutites and calcmicrites, dark grey to black massive to weakly laminar, carbonaceous, fine grained, calcite cemented dolomite and thinly bedded (<5cm) extremely fossiliferous (pellets, pisoliths, shelly and fragmental, crinoidal and minor pellets replaced by coarsely crystalline dolomite.) skeletal calcarenites. Core moderately calcite veined (5cm thick vein @ 177.40m). Core very competent and weakly to moderately stylolitized. Bedding 60° to c.a. @ 195.5 metres and 45° to c.a. @ 190.10 metres. | Black to dark grey calclutite and dolomite contain very fine grained pyrite - 3 to 4%. Occuring parallel to and transgressive to bedding. | | | | | |
| 198.95 | 202.30 | LAMINAR CALCLUTITE AND CALCMICRITE: Very laminar black, carbonaceous and stylolitized micrite lamellae within a mid grey massive to weakly laminar calclutite. Minor spotty ? calcarenite thin interbeds with a micritic matrix. The spots are comprised of coarsely crystalline sparite generally ovoid to rounded but with the original textures obliterated due to recrystallization. One large calcite vein, perpendicular to bedding, traverses the core from 199.2 to 200.0 metres. Bedding 45° to c.a. @ 199.3m | | | | | | |
| 202.30 | 212.10 | INTERBEDDED CALCLUTITE / CALCARENITE / DOLOMITE: Grey, massive to weakly laminar, occaissionally fossiliferous (shell fragments) calclutites interbedded with very fossiliferous (shelly detritus, minor crinoid ossicles and pellets - comprised of recrystallized coarse grained sparite) grey to light grey, massive, | Disseminated pyrite within calclutite: bedded fine grained pyrite occurs within the dolomite. | | | | | |

094901

DRILL LOG HOLE No. ZT-81A-4 PAGE 10 OF 12

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 202.30 | 212.10 | CON'T: but generally thinly bedded skeletal calc-arenites (< 5cm width) and black, very laminar calcite cemented, weakly pyritic, carbonaceous (slickensided cleavage surfaces) moderately slumpy or load casted fine grained dolomite. Zone moderate to strongly calcite veined, core broken from 207-209 metres, the rest being very competent. Core is strongly stylolitized along bedding and also at an angle approx. perpendicular to bedding and paralleling some calcite veins. Bedding 40° to c.a. @ 208.4 m. | | | | | | |
| 212.10 | 214.30 | SLUMPED CALCARENITE / CALCLUTITE: light to mid grey skeletal (pellets, shelly debris, minor coralline fragments) calcarenites with a dolomite matrix interbedded with finer grained weakly fossiliferous more massive calclutites (soft sediment deformed giving appearance of being intraclasts). Area in between intraclasts and slumped beds is infilled with coarsely crystalline very fossiliferous (skeletal debris) dolomite. Core strongly stylolitized in dolomitized areas. Moderate to strong calcite veining @ 214m. | | | | | | |
| 214.30 | 218.60 | CALCMICRITE: Black fine grained very argillaceous very pyritic (5-10% of very fine grained to fine grained disseminations) calcmicrites with thin (< 5cm) interbeds of very fossiliferous (pelletal and shelly fragments comprised of recrystallized sparite) skeletal calcrudites with a black cryptocrystalline micritic matrix (weakly pyritic). Calcite healed breccia @ 216.75 m within black silty calcmicrites. Minor stylolites perpendicular to bedding. Bedding 34° to c.a. @ 215.2 m. | Micrites very pyritic with up to 5-10% occuring as very fine disseminations. | | | | | |
| 218.60 | 226.60 | INTERBEDDED CALCLUTITE / DOLOMITE: Interbedded grey massive unfossiliferous, fine grained calclutites and thin black to dark grey argillaceous foliated? dolomite (< 5cm in width). Minor calcarenite units observed, generally skeletal and very fossiliferous (fossil casts comp- | Trace pyrite. | | | | | |

62949

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 218.60 | 226.60 | CON'T: rised of sparite). The unit is slump textured/ load casted with abundant pelletal structures caused by deformation and not wave action. Minor quartz replacement of carbonate as rims surrounding fragments within the calcarenites. Dolomitization also occurs as coarse grained crystals selectively replacing certain fossils. Core moderately calcite veined and stylolitised. Bedding 30° @ 223.5m | | | | | | |
| 226.60 | 227.90 | LAMINAR CALCLUTITE / CALCMICRITE: Light grey to fawn cryptocrystalline weakly pyritic, laminar calcmicrite interbedded with a sugary, fine textured, laminar, grey, dolomitized ankeritic? calclutite. More massive sections of core have a spotty texture due to white sparite clasts within a light grey matrix of calclutite/ micrite. Pronounced stylolithes parallel to bedding. Bedding 30° to c.a. @ 227.10 metres. | | | | | | |
| 227.90 | 236.00 | SLUMPY CALCLUTITE/DOLOMITE: Massive cryptocrystalline to fine grained, grey to black, weakly to highly fossiliferous (skeletal debris), pelletal, calclutite with thin interbeds of highly deformed and foliated, argillaceous calcite cemented dolomite. Core is moderately calcite veined and has in the more massive sections numerous clasts or fragments comprised of recrystallised coarse white sparite. Minor sections of core have chaotic orientation of bedding possibly indicating brecciation with intraclasts being quite prevalent. | | | | | | |
| 236.00 | 243.90 | RYTHMICALLY BEDDED CALCLUTITE / DOLONITE / CALCARENITE: Grey massive fine grained, speckled, fossiliferous (fine grained skeletal debris) calclutites are rhythmically interbedded with black laminar to massive calcite cemented fine grained dolomite (minor intraclasts of black/brown micrite) and speckled light and dark grey, sandy textured, very fossiliferous (skeletal fine shelly debris, oolites, oolith, pellets and minor crinoids) calcarenites with a micritic | Sphalerite @ 242.65m yellow, coarsely Xlline, within white, calcite filled, vuoid structure. | | | | | |

C02679

DRILL LOG HOLE No. ZT-81A-4 PAGE 12 OF 12

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 236.00 | 243.90 | CONT: matrix. Minor recrystallized spaite occurs within some casts. Calcite vein 4cm wide @ 238m. Weak veining otherwise. Minor parts of core show deformation due to loading / or slumping; graded bedding indicates sequence right way up as do flame structures. Bedding 47° to ca. @ 236.8 metres. | | | | | | |
| 243.90 | 259.00 | INTERBEDDED SLUMPY DOLOMITE/ CALCLUTITE / CALCARENITE: Soft sediment deformed (giving pelletal appearance) massive pyritic very fossiliferous skeletal calcarenites (2-25cm in width) and weakly fossiliferous massive, crypto-crystalline to very fine grained calclutites within a black foliated calcite cemented dolomite (pyritic) matrix. The speckled appearance in both the calcarenites and calclutites is due to coarsely crystalline white calcium carbonate inclusions or clasts (possibly infilling or grain replacement?) Core weakly calcite veinleted. Very minor stylolitization. Minor carbonaceous material on fracture surfaces, high argillaceous component within dolomite. Minor disseminated pyrite as smears on fracture surfaces. Core very competent. | 2 Types of Pyrite: 1) very fine grained accumulations or blebs brassy in colour 2) Very fine to 0.5mm grained sized disseminations, crystalline and bright yellow in colour. Average through sequence of ≈ 3% but grades up to 15% over short intervals. | | | | | |
| END OF HOLE | | | | | | | | |
| | | Hole Cased off with 40mm PVC plastic pipe (To bottom). | | | | | | |

640904

649205

Amoco Minerals Australia Company

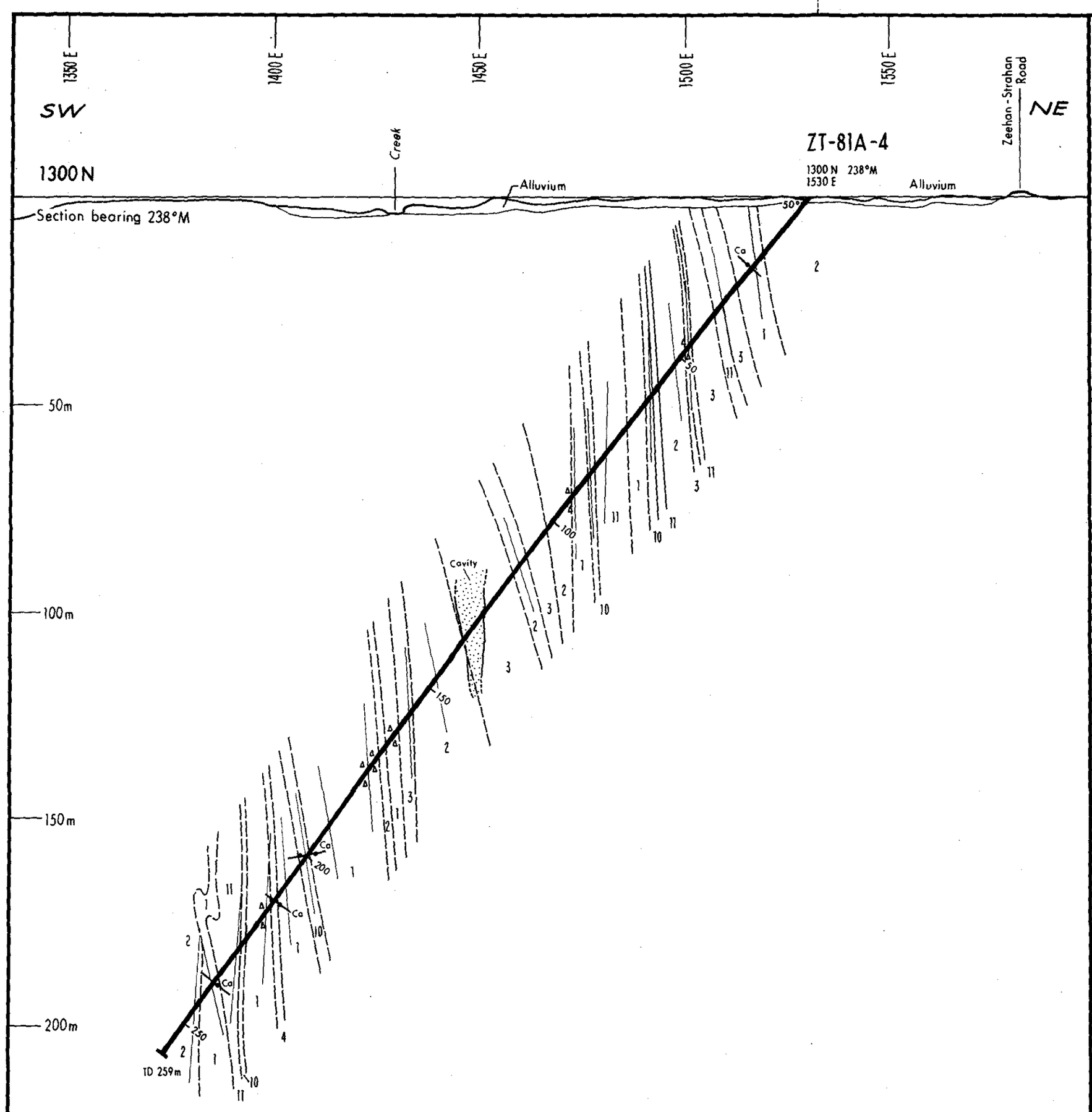
# ZEEHAN PROJECT
# A-78-60
# EL 4/78, TASMANIA

PROSPECT: **AUSTRAL**

## CROSS SECTION DRILLHOLE ZT-81A-4

Scale: Vertical and horizontal - 1:1000

5 cm




## Legend

| | |
|---|---|
| Limestone | 1 33 |
| Dolomite..... (breccia) | 2 29 |
| Fossil breccia | 3 46 |
| Slump breccia | 4 41 |
| Sandstone | 5 61 |
| Siltstone | 6 69 |
| Shale | 7 8 |
| Mineralization and/or ironstone | 8 14 |
| Siderite/calcite/ankerite/breccia | 9 12 |
| Laminar limestone | 10 37 |
| Slumped limestone | 11 28 |
| Conglomerate | 12 65 |
| Calcite/siderite veins | Ca/Sd |

Vein orientation unknown — Ca

Vein orientation accurate — Ca

Brecciation (tectonic)

Zone of Pb/Zn Ca/Sd mineralization

REPORT 279

M82-1843

649206

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-81A-5

| | | |
|---|---|---|
| Location | : | 897.5N : 1373E |
| Declination | : | 50° |
| Azimuth | : | 270°G |
| Total Depth | : | 340 meters |

Assay Results

201-202 = 1m @ 0.63% Pb + 1.15% Zn + 5.0g/t Ag

278-281 = 3m @ 0.57% Pb + 0.59% Zn + 2.3g/t Ag

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-81A-5 — PAGE 1 OF 16

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT | ZEEHAN - TAS No. A7860C | ELEVATION meters | COMMENCED 28 OCT '81 | BORE HOLE SURVEY | | | | | | INSTRUMENT Eastman Single Shot. | | | | |
| | | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | | |
| PROSPECT | AUSTRAL EZ/JV AREA | DIP COLLAR 50° GW | COMPLETED 5 NOV '81 | 50 | 51.5 | 238 | 200 | 51 | 236 | 350 | 53.5 | 233 | | |
| CO-ORDINATES | 897.5 mN 1373 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 340 meters | 100 | 51 | 238 | 250 | 53 | 236 | | | | | |
| BEARING | 249 TN 238 MN 270 GN | LOGGED BY P.A. JONES | Machine Used: MINPRILL 101 A.P.D. Pty Ltd. | 150 | 51 | 238 | 300 | 53 | 234 | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 0.00 | 3.00 | GRAVEL : White and pink, quartzose with peat matrix. | | | | | | |
| HQ Coring (75 m) | | FRAGMENTAL FOSSIL BRECCIA : comprised of coralline debris, shell fragments, crinoid ossicles, intraclasts of grey very fossiliferous skeletal calcarenites and calclutites and minor pellets set in a matrix of black, weakly pyritic, coarse grained, cream, argillaceous calcite cemented dolomite. Minor siderite veining in association with weak calcite veining. Strong stylolitization developed along intraclast boundaries. | Pyrite as very fine grained disseminations and as fine grained wispy veinlets ≤ 2% at 3.4 metres. | | | | | |
| 5.80 | 10.50 | SOFT SEDIMENT DEFORMED CALCLUTITE : Grey massive, unfossiliferous calclutite occurs interbedded with thin black carbonaceous and weakly pyritic coarse grained calcite cemented dolomite. The dolomite becomes coarser grained downhole with individual crystals, cream in colour, up to 0.5 mm in diameter. Pyrite becomes more abundant downhole also. Rock is soft sediment deformed (slumpy textured) and contains a large number of intraclasts. Minor dolomite interbeds are very fossiliferous with abundant skeletal debris. Core mod. to strongly calcite veined (2 generations : one perpendicular to the other) with associated weak siderite. Core strongly stylolitized. | Very minor siderite veinleting with trace sphalerite.<br><br>1% disseminated pyrite within coarse grained dolomite matrix. | | | | | |
| 10.50 | 13.40 | FRAGMENTAL FOSSIL BRECCIA : comprised of stromatoporoid fragments, oncolites, colonial corals, oolites and crinoid ossicles, shelly and skeletal debris with numerous intraclast fragments comprised of calclutite set within a matrix of black, medium to coarse grained, calcite cemented | Minor blebby pyrite within calcite veins and trace sphalerite in fine siderite veinlets. | | | | | |

102649

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 10.50 | 13.40 | CON'T: carbonaceous and argillaceous dolomite. Large fossil fragments generally from 0.5cm to 5cm in diameter. Core weakly to moderately calcite veined with very weak siderite. Trace sphalerite @ 12.6 metres within siderite veinlet. | | | | | | |
| 13.40 | 19.10 | INTERBEDDED DOLOMITE/SLUMPY CALCLUTITE: Thickly bedded, massive, black, pyritic (up to 15% as very fine grained disseminations and fine blebbs) argillaceous, medium grained weakly calcite cemented dolomite interbedded with 5-15 cm thick, grey, very fossiliferous, skeletal calcarenites, containing stromatoporoid fragments, minor pellets, pisoliths, corals, shells and other skeletal debris. Very weakly calcite veinleted. Sections of core very weathered and porous (16.35m). One large calcite/siderite vein cuts perpendicular to bedding and has crystal growth into the centre of the vein. Core becomes increasingly soft sediment deformed down hole. Some fracture surfaces show signs of slickensiding. Bedding 25° to c.a @ 15 metres. | Average pyrite content ≈ 5% but can be up to 15% in narrow sections. | | | | | |
| 19.10 | 30.80 | FRAGMENTAL FOSSIL BRECCIA: Predominantly comprised of stromatoporoid fragments, minor corals, abundant micritic and lutitic intraclasts, and in the upper portion of the unit abundant skeletal and pelletal slumped calcarenite units set within a matrix of black, pyritic, argillaceous, calcite cemented dolomite. Minor weak siderite veining and calcite veining with trace pyrite. Cavernous zones from 24.25m, 28.30-30.80 metres. Minor secondary dolomitization apparent (coarse grained cream crystals intermixed with pyrite). Minor zones throughout the sequence contain very laminar syngenetic? pyrite as matrix to the breccia. (@25.5m) Core weakly stylolitized. | Pyrite as disseminations within dolomite. | | | | | |

64926S

DRILL LOG HOLE No. ZT-81A-5 PAGE 3 OF 16

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 30.80 | 32.10 | LAMINAR MICRITE: Interbedded, thinly bedded to laminar, grey to fawn and black micrites and argillaceous dolomitized calclutites. Cross bedding evident. Core porous and very weathered. Minor thin beds with speckled appearance due to ovoid, calcite filled casts within the sequence. Bedding 45° to c.a. @ 31.85m.; Weak calcite veining perpendicular to bedding. | Trace pyrite within black dolomitized laminae. | | | | | |
| 32.10 | 45.40 | INTERBEDDED CALCLUTITE / CALCARENITE / DOLOMITE: Soft sediment deformed, grey, very fossiliferous (pelletal: up to 1cm diam, and very skeletal with minor large coralline fragments possibly slumped into position) calclutites and skeletal calcarenites interbedded with thin (<5cm) disturbed layers of black carbonaceous and argillaceous weakly pyritic, fine to medium grained, weakly calcite cemented dolomite. Zone moderately calcite veined and occasionally tectonically brecciated (42.80m) Secondary dolomitization occurs sporadically and is manifest by medium to large grain sized cream dolomite crystals replacing calcite → seen in pelletal limestone @ 42.90m. Sections of core very porous and leached giving coquina effect. 34-34.5, 36.2-36.40 metres. Core strongly stylolitized with carbonaceous infillings. Bedding 35° to.ca @ 43 metres. | Trace pyrite. | | | | | |
| 45.40 | 48.35 | LAMINAR MICRITE: Very laminar (lamellae from 0.5 mm to 1cm in width) white to dark grey micrites and calclutites. Minor speckled, thick lamellae, due to ovoid calcite filled casts. Core very competant and weakly calcite veined. Minor slickensiding occurring @ 48m in connection with calcite vein and weak tectonic brecciation. Bedding 45° to ca. @ 46.80 metres. | | | | | | |

69209

DRILL LOG HOLE No. ZT-81A-5 PAGE 4 OF 16

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 48.35 | 53.60 | RHYTHMICALLY INTERBEDDED DOLOMITE/SKELETAL CALCARENITE / CALCLUTITE: Light grey, fine grained weakly pyritic massive skeletal calclutites are rhythmically interbedded with black fine grained crystalline, massive to laminar, argillaceous, calcite cemented dolomite and light grey, very fossiliferous (abundant skeletal debris, corals, minor pellets) calcarenites. Coral fragments are rounded (possibly solitary corals). Sections of core foliated and moderately stylolitized. Weak to moderate calcite veining (both perpendicular to and parallel to bedding. Dolomite to Limestone ratio ≈ 40:60. Bedding 37° toca@53m | Trace pyrite | | | | | |
| 53.60 | 63.00 | RHYTHMICALLY INTERBEDDED DOLOMITE / CALCLUTITE: Weakly laminar to massive rhythmically interbedded (≈ 3-7 cm widths) fine grained, argillaceous and pyritic calcite cemented black dolomites and grey to dark grey occaissionly weakly pyritic calclutites. Moderate to strong stylolitization both parallel to and transgressive to bedding. Core weakly calcite veined predominantly perpendicular (transgressive to bedding) to c.a., however, one vein @ 61m, calcite - carbonaceous infilled, is heavily slickensided. Bedding 45° to c.a. @ 61.5 metres. | Trace pyrite. | | | | | |
| 63.00 | 68.10 | SLUMPY CALCLUTITE: Grey massive, soft sediment deformed, (slumpy!) calclutites interbedded with heavily stylolitized carbonaceous and argillaceous, pyritic, fine grained, weakly calcite cemented dolomite. Cbeds generally ~2cm width. Large blocks of coralline detritus up to 10cm in width occur sporadically throughout. Intraclastic, sub rounded fragments occur in a dolomite matrix. Calclutite to dolomite ratio 70:30 | Trace to minor pyrite in dolomite. | | | | | |
| 68.10 | 70.20 | INTERBEDDED DOLOMITE / CALCLUTITE: Rhythmically interbedded, very pyritic, weakly laminar, strongly stylolitized (primary?) occaissionally very | ≈ 5% pyrite as blebbs and fine disseminations within the dolomite and | | | | | |

69210

DRILL LOG HOLE No. ZT-81A-5 PAGE 5 OF 16

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 69.10 | 70.20 | CON'T: fossiliferous (shelly debris, crinoidal fragments and pyritized pellets - either replaced by pyrite or rolled around on a sulphide rich sea bed, calcite cemented dolomite, very fine grained interbedded with grey to dark grey micritic calclutites which are generally massive and featureless, apart from being pyritic and containing abundant but very fine grained shelly debris in narrow horizons. Rounding of pellets along with numerous intraclasts and fossil debris suggests possible slumping. Bedding 42° to c.a. @ 70 metres | 3% pyrite in muddy calclutites. | | | | | |
| 70.20 | 74.50 | SLUMP BRECCIA: Weakly slump brecciated, massive and fossiliferous, grey to dark grey, in part pelletal calclutites and fragmental calcarenites within a black, very fine grained, calcite cemented pyritic and argillaceous dolomite. More massive breccia from 72.80 to 73.80 with rip-up clasts of a white coarse grained calcarenite up to 5-7 cm in length by 0.5 cm width, deposited chaotically within the dolomite matrix. Other portions of core have foliated pelletal textures with rounded calclutite fragments set in the dolomite. Minor large intraclasts up to 3-4 cm in diameter occur sporadically and are generally subrounded. Weak calcite veining present transgressive to bedding. Dolomite matrix has speckled appearance due to white, medium grained calcite filled ovoid casts. | | | | | | |
| HQ → NQ (75m) | | | | | | | | |
| 74.50 | 115.90 | SOFT SEDIMENT DEFORMED CALCLUTITE / CALCARENITE: Interbedded massive, very fossiliferous (skeletal shell fragments, minor oolitic sections, crinoid frags., numerous pellets and minor colonial corals, stromatoporoid fragments and intraclasts) grey to white/grey calclutites and calcarenites and soft sediment deformed, contorted, medium grained dolomite, calcite | | | | | | |

69271

DRILL LOG HOLE No. ZT-81A-5 PAGE 6 OF 16

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 74.50 | 115.90 | CON'T: cemented, very argillaceous and weakly carbonaceous. Core moderately calcite veined and stylolitized. Occaissionally dolomite has speckled (white) appearance due to fine skeletal debris component. Soft sediment deformation evidenced at contacts between dolomite and limestone where boundaries are very contorted, wavy and heavily stylolitized. Minor sections of core show signs of being ripped up giving rise to angular intraclasts. Secondary dolomitization is observed with coarse grained, white, crystals selectively replacing (pervasively) portions of the core. | | | | | | |
| 115.90 | 123.20 | INTERBEDDED CALCLUTITES / CALCARENITES: Thickly laminar, well interbedded, massive and unfossiliferous grey calclutites, dark grey skeletal, calclutites very fossiliferous fragmental, speckled, calcarenites (crinoidal, shelly, with oncalites and pisolites and abundant debris) and minor laminar to massive black, fine grained weakly pyritic, calcite cemented dolomite. Bedding contacts are very sharp and well defined with minor stylolitization on bedding planes. Core weakly calcite veined (both transgressive and parallel to bedding). Beds vary from mm's to 5-10 cm in widths. Bedding: 48° to ca. @ 118.8m. | Trace pyrite. | | | | | |
| 123.20 | 123.65 | CALCAREOUS QUARTZ LITHIC ARENITE: Rounded, coarse grained grey, quartz grains, along with beige grey laminar, argillaceous, micrite lithic fragments (rip up clasts) are cemented in a calcareous and weakly pyritic matrix. Core has speckled appearance due to quartz grains and lithic fragments may be derived from near shore muds ripped up during severe current activity or storm activity. Minor rounded and concretionary layered oncalites are present indicating transport and movement also. | Trace disseminated pyrite within calcareous matrix | | | | | |

64923

DRILL LOG HOLE No. ZT-81A-5 PAGE 7 OF 16

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 123.65 | 129.65 | INTERBEDDED CALCLUTITE/CALCARENITE/ DOLOMITE: Thinly interbedded, massive, grey calcilutites speckled white/grey calcarenites, very fossiliferous (crinoidal, shelly and skeletal debris) fragmental calcarenites and laminar finely interbedded black pyritic, carbonaceous, calcite cemented and occaissionally speckled and fossiliferous dolomite. Dolomite is fine grained. Secondary dolomitization, very coarse grained, grey/cream and crystalline, occurs as pervasive replacements for calcite (128.2m). Moderate stylolitization. Graded bedding in thin very fossiliferous horizons indicates sequence youngging up hole (128.3 m). Bedding: 59° to c.a. @ 129m | Trace galena/sphalerite in calcite siderite vein @ 126.30m. Sph - pale yellow in colour. Minor to trace blebby pyrite near contact zones between beds. | | | | | |
| 129.65 | 144.90 | SLUMPY TEXTURED CALCLUTITE / CALCARENITE: Slumpy textured and soft sediment deformed grey to black calclutites and micrites interbedded with very fossiliferous pisolitic and fragmental calcarenites and black thinly bedded occaissionally speckled carbonaceous dolomite. Crude bedding planes evidenced occaissionally, however, most of the sequence is characterized by chaotic and contorted bedding contacts, moderate to strong stylolitization, with core moderately calcite veined and weakly mineralized. Galena/Sphalerite in veins @ 135.4m; 137.2 m; 144.2 m; Ghosting textures are observed in portions of the core where intermittent black micritic material diffuses into dark grey calclutites along weakly evident bedding planes. Bedding 48° to c.a. @ 137 metres. | Trace sphalerite/galena in calcite auto-brecciated veins at 135.4; 137.2; 144.2; Veins are from 0.5cm to 3 cm wide comprised of calcite siderite. Pb/Zn values vary from trace to 3% within vein material. | | | | | |
| 144.90 | 153.90 | SLUMP TEXTURED CALCLUTITES/FRAGMENTAL CALCARENITES/DOLOMITES: This sequence is similar to that observed above with the main difference being the higher content of dolomite and the very pelletal nature of the calcarenites indicating slumping? Large coralline frags. are present, pisolites and oncalites (with concretionary | Trace sphalerite (pink brn) in calcite veinlets @ 148.9, 149.05; 149.60. Veins transgressive to bedding. Trace pyrite along foliation planes as well as fine disseminations. | | | | | |

62693

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 144.90 | 153.00 | CON'T: growth rings) along with a large proportion of fragmental debris are also indicative of slumping. Soft sediment deformation also very evident along with load casting with possible primary stylolitization. Dolomite is very carbonaceous with fracture and cleavage surfaces being smeared by pyrite. These may also be slickensided. Secondary dolomitization is also apparent with large blebs of rock comprised of very coarse grained, cream crystalline dolomite surrounded by unaltered black argillaceous micrites and dolomites. Bedding: 50° to ca @ 149.5m. | | | | | | |
| 153.00 | 155.15 | SKELETAL AND FRAGMENTAL CALCARENITE / CALCRUDITE: Light grey, well sorted, uniform textured, massive, unbedded, dolomitised, calcite veined, skeletal and fragmental calcarenite to fine calcirudite. Fragments and fossil debris comprised of pellets, concretionary oncalites (from 1-2mm to 0.7cm.) with a central nuclei, shelly debris, colonial coralline fragments, and possible crinoid ossicles. Most of debris is very rounded and of even grain size. Unit is strongly calcite veined and is bound on both the hanging and footwalls by calcite healed tectonic? breccias, containing a trace sphalerite and minor siderite. Secondary dolomitization (coarse grained, white very crystalline) occurs pervasively throughout, generally replacing oncalites or other rounded intraclasts and to a lesser degree replacing the black micritic matrix of the calcarenite. | Trace sphalerite in two calcite breccias @ 153 and 155.15 m. sphalerite (pink-brown) | | | | | |
| 155.15 | 181.40 | INTERBEDDED FRAGMENTAL CALCARENITES / CALCLUTITES / DOLOMITE: Randomly interbedded light grey, coarse to fine grained, well sorted, fossil fragmental (shells, pisolites, oncalites, corals, crinoids and intraclasts) calcarenites, white speckled (frags) massive to laminar, black, very carbonaceous, very pyritic, calcite cemented dolomite and grey to dark | Trace pink sphalerite in calcite / siderite veins @ 166.15, 173.2m. | | | | | |

64927

DRILL LOG HOLE No. ZT-81A-5 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Ba | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 155.15 | 181.40 | CON'T: grey, massive, fragmental to non-fossiliferous calcilutites. Unit soft sediment deformed, possibly slumped as graded bedding evidenced (64.8 - bedding younging up hole) as well as numerous concretionary layered oncolites and large fragments of colonial corals present in an otherwise shelly fragmental sequence. Fossil frags @ 66.20m. been pyritized. Pyrite content throughout unit varies but averages 2-3%, is very fine grained with the exception of blebby veins @ 179.3m. Coarsely fragmental calcarenites occasionally show signs of secondary dolomitization, manifest by coarsely crystalline cream to white dolomite crystals either replacing or selectively growing within certain frags. or in the matrix. Unit cut by major Calcite/siderite breccia @ 178-178.60m. Core weakly to mod. calcite veined, with trace siderite and sphalerite @ 166.15; 173.20m. Veins autobrecciated. Bedding 48° to ca. @ 161.30m.; 58° to ca @ 181 metres. | | | | | | | | | | | |
| 181.40 | 224.60 | VEIN MINERALIZED CALCLUTITES/DOLOMITES: Soft sediment deformed, slumped in part (coralline frags. up to 20cm in width, minor concretionary layered oncolites up to 3cm in width) massive grey stylolitized, occasionally very fossiliferous and speckled (fragmental debris) calcilutites randomly interbedded with calcite cemented, pyritic, argillaceous and carbonaceous black, speckled, foliated (laminar to massive) with beds from 0.5cm to 10cm in width, dolomite. Primary dolomite is fine grained but dolomitization occurs sporadically throughout core and is manifest by coarse grained grey cream crystals. Minor interbeds of very fossiliferous fragmental (shells, crinoids, minor corals and other debris) light grey calcarenites, generally <15 cm in width and occuring sporadically throughout the sequence. Unit heavily calcite veined plus siderite and is autobrecciated and weakly Pb/Zn. | Gn/Sph/Py in calcite veins 1mm to 3mm in width @ 182.15; Pink sph trace gn in calcite breccia @ 184m; Gn/Sph @ 186.9; Trace Gn/Sph @ 187.15m; 188.4-188.6m = 7% Pb/Zn; 188.85-189.05m = 2% Pb/Zn; 196.6-197.4m = 1% Pb/Zn; 194.3-194.5 Trace gn/sph 194.9-195.15 1% Zn/Pb 197.05 Trace sph (pink) 198.6-199.05 1% sph (pink) 200.9-201.25 1% Zn/Pb 201.55-202.8 15% Pb/Zn sph both pink/red and yellow/green + pyrite 214-218.9 trace gn/sph/py | 66277 | 188 | 189 | 1 | 10 | 4800 | 2500 | 3 | — | 4 |
| | | | | | 189 | 190 | 1 | | | | | | |
| | | | | | 190 | 191 | 1 | | | | | | |
| | | | | 66026 | 191 | 192 | 1 | 6 | 8000 | 3250 | 3 | 55 | |
| | | | | | 192 | 193 | | | | | | | |
| | | | | | 193 | 194 | | | | | | | |
| | | | | 66278 | 194 | 195 | 1 | 8 | 2100 | 5200 | 1 | — | 10 |
| | | | | 66279 | 195 | 196 | 1 | 6 | 540 | 1950 | 2 | — | 4 |
| | | | | 66280 | 196 | 197 | 1 | 4 | 100 | 910 | 1 | — | 4 |
| | | | | 66281 | 197 | 198 | 1 | 4 | 180 | 1100 | <1 | — | 6 |
| | | | | 66282 | 198 | 199 | 1 | 4 | 360 | 1550 | 1 | — | <4 |
| | | | | 66027 | 199 | 200 | 1 | 4 | 270 | 2700 | <1 | 60 | |
| | | | | 66028 | 200 | 201 | 1 | 4 | 1450 | 2850 | 1 | 65 | |
| | | | | 66029 | 201 | 202 | 1 | 8 | 6300 | 1.15% | 5 | 145 | |
| | | | | 66030 | 202 | 203 | 1 | 6 | 7000 | 5900 | 1 | 50 | |
| | | | | 66031 | 203 | 204 | 1 | 4 | 1650 | 3000 | <1 | 55 | |
| | | | | 66032 | 204 | 205 | 1 | 4 | 750 | 1000 | <1 | 60 | |
| | | | | | 205 | 206 | | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 181.40 | 224.60 | CON'T : plus pyrite mineralized. Sphalerite occurs as discrete medium to coarse grained disseminations and vary in colour from pink/red to yellow/green. Galena is generally medium grained and finely disseminated. Zn : Pb ratio ≈ 70:30. The mineralization is associated with veins and veinlets from ≈ 5 cm in width down to < 1 mm. Major gangue minerals are calcite/siderite/pyrite. It appears as if the siderite and associated Pb/Zn mineralization has enter the host rocks through fractures and openings only to be invaded by a later pulse of calcite which widened the fractures further and produced autobrecciation textures. Slickensiding on fracture surfaces. The veins and breccia's in general transgress the bedding at a high angle. Vein @ 191 m ≈ 10° to c.a. 201 m ≈ 15° to c.a. ; 204.4 ≈ 15° to c.a. Bedding 55° to ca @ 192.2 ; 58° to c.a 200.8 m; 50° to c.a. @ 208 m. ; 40° to c.a. @ 220 metres. Cavity and very weathered and leached zone from 210.3 - 211: Cavity 211 - 214 ; 214 - 217 ; Cavity 217 - 217.80 m ; Cavity 218 - 218.90 m. Minor very broken and porous core from 214 - 218.90 m. comprised of dolomite breccia containing minor pyrite and trace galena/ sphalerite. Cavity 223 - 223.5. Core from 220 - 224 very leached and porous. | | | | | | |
| 224.60 | 234.60 | INTERBEDDED CALCAREOUS QUARTZ ARENITES/ CALCLUTITES / DOLOMITE : Speckled grey white, massive to pelletal (beds varying in width from 2-3 mm to a couple of metres) med. to coarse grained, well sorted and rounded grains, calcite cemented, quartz arenite generally within a black argillaceous dolomite matrix. Minor calcareous fossiliferous debris present (generally rounded and worn) interbedded with laminar, black and dark grey dolomite and massive, laminar and pelletal, grey, soft sediment deformed and slumped calclutites. Minor thin | 1% Disseminated and blebby pyrite within dolomite and to lesser extent within the arenite. | | | | | |

64926

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 224.60 | 234.60 | CON'T : (~ 2cm) interbeds of very fossiliferous fragmental and shelly calcarenites. Sequence very deformed by slump action and current activity with numerous intraclasts present within individual beds. Load casting evident as are flame structures and rip up clasts and with minor graded bedding indicate sequence younging up hole. Core mod. stylolitized, and veined. Trace siderite with calcite. Bedding 35° to ca @ 233 m ; 52° to ca @ 229.8m. | | | | | | |
| 234.60 | 248.50 | INTERBEDDED CALCLUTITES/DOLOMITES/ QUARTZOSE CALCARENITES: Dark grey massive, weakly foliated and stylolitized, occaissionally finely speckled (white) weakly fossiliferous calclutites interbedded with thin (2-7cm width) dark grey to black, laminar but cross foliated, speckled, weakly fossiliferous, pyritic and very carbonaceous argillaceous, calcite cemented dolomite. From 244.35 to 245.30 m the unit is quartzose and very pyritic calcarenites. Quartz grains are rounded, disseminated throughout, and take up approximately 15% of the total vol of rock. Core is heavily calcite veined and brecciated from 241.2 to 247.60 m. Heavy stylolitization within dolomites with minor slickensiding on fracture and cleavage surfaces. Bedding: 50° to ca @ 238.3 m ; 57° to ca @ 246.6 m. | Minor disseminated (1-3%) and veinlated pyrite within dolomite and calclutite. | | | | | |
| 248.50 | 276.40 | INTERBEDDED SOFT SEDIMENT DEFORMED CALCLUTITES / CALCARENITES / DOLOMITE : Massive sequence of soft sediment deformed (pelletal & foliated) weakly calcite veined, heavily stylolitized, weakly carbonaceous (cleavage and fracture surfaces predominate) unfossiliferous grey calclutites with minor thin interbeds early in the sequence of very shelly and fossiliferous calcarenites (generally ~5 cm in width) passing downhole into black to dark grey thin (<2cm) laminar to massive chaotically bedded, calcite cemented, pyritic dolomite. Minor calcareous quartz arenite interbeds from 251.3 to 251.35. Graded | Trace sphalerite @ 263.2 Pyrite bed 1-2mm in width @ 269 metres. | | | | | |

69621

DRILL LOG HOLE No. ZT-81A-5 PAGE 12 OF 16

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Ba |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 248.50 | 276.40 | CONT: bedding @ 253.7m indicates sequence younging up hole. Tectonic breccia @ 249 ± 5cm in width; 258.7 ± 5cm width; 262 m ± 2cm width. Calcite cemented with trace siderite. Yellow sphalerite ≈ 5% @ 263.2 as coarse grained disseminations in fragmental shelly calcarenite over approx 3cm of width. Isoclinally folded, 1-2mm thick pyrite bed observed at 269m. Dolomite interbeds from 274 m become increasingly dolomitized (becoming coarser grained and more iron rich). Bedding 43° to c.a. @ 255.90m; 57° to c.a. @ 261.2m. | | | | | | | | | | |
| 276.40 | 283.50 | WEAKLY Pb/Zn MINERALIZED CALCITE / SIDERITE, BRECCIATED, DOLOMITISED CALCILUTITE: Pink/yellow finely crystalline siderite and white calcite with trace quartz have replaced portions of the dolomitized (fine to medium grained, and very ferrous) calcilutite which in turn has been partially autobrecciated and recemented by further infusion of calcite. Sporadically throughout the core and generally within the dolomitized calcilutites, occurs the fine grained crystalline galena and sphalerite (pink/yellow) as disseminations and fine blebs, estimated to be 3% galena/sphalerite from 278 - 282m. Grades are higher over more narrow intervals. The zone 278.5 to 279.8 and 280.8 to 283.5 is comprised of 75% to 80% calcite 20% - 15% Siderite and the rest dolomitized calcilutite frags. Core from 276.40 to 278.5 and the intermediate zone 279.8 to 280.8 is weakly dolomitized interbedded calcilutite and laminar speckled dolomite, brecciated and strongly veined by calcite and siderite (trace galena/sphalerite). Possible graded bedding @ 279.5m in heavily dolomitized, sideritic, blebby bedded galena mineralized calcilutite / calcarenite. Bedding 47° to ca. @ 278.05 metre. | ≈ 3% Galena/Sphalerite from 278 - 282 metres | 66033 | 278 | 279 | 1 | 4 | 3600 | 6150 | 3 | 50 |
| | | | | 66034 | 279 | 280 | 1 | 4 | 8200 | 6300 | 2 | 10 |
| | | | | 66035 | 280 | 281 | 1 | 4 | 5400 | 5100 | 2 | 45 |
| | | | | 66036 | 281 | 282 | 1 | 4 | 3500 | 1850 | 1 | 35 |
| | | | | 66037 | 282 | 283 | 1 | 4 | 680 | 570 | <1 | 35 |
| | | | | 66038 | 283 | 284 | 1 | 4 | 590 | 930 | 1 | 35 |

63578

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Ba |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 283.50 | 292.20 | SOFT SEDIMENT DEFORMED CALCLUTITE/DOLOMITE: Interbedded sequence of soft sediment deformed slumpy textured, massive to foliated, grey mod to strongly stylolitized calclutites, occaissionally speckled white (minor fragmental debris) and black massive to laminar, also speckled, pyritic argillaceous, calcite cemented dolomite. Minor calcareous quartz arenite unit from 288.05 to 288.15m Coarse grained rounded quartz grains within a skeletal calcarenite matrix, calcite cemented. Siderik calcite veins from 285.4-285.60, 286-286.20, 288.2 to 288.40 all containing either a trace galena or sphaleirite. Approx 7.5% py @ 285.5 to 285.55 within calcarenite cut by siderite calcite vein containing galena. Approx 2% py @ 292m as disseminations and blebbs within or surrounding black dolomite chaotically set within a calclutite matrix. Core moderately broken from 289.7-291.7m. Bedding 60° to ca @ 289m. | Calcite Siderite veins with trace gn/spl @ 285.4-285.60<br>286-286.20<br>288.2-288.4<br><br>7.5% py @ 285.5 m<br>2% py @ 292 m | | | | | | | | | | |
| 292.20 | 296.00 | LAMINAR CALCLUTITE/DOLOMITE: Sequence of thinly interbedded, extensively foliated olive grey to black calcite cemented dolomite and laminar grey, occaissionally saccaroidal textured (calcite) calclutite. Core cut obliquely by calcite minor siderite, trace galena/sphaleirite vein showing evidence of brecciation near vein contacts with host rocks. Vein ≈ 20° to ca @ 295m. and ≈ 20 cm width. from 294.4 to 295.4 m. Bedding 45° to ca. @ 295.5 metres. Lamellae vary in width from <1 mm to 0.5 cm. | Trace gn/spl in calcite siderite vein. | 66039 | 294 | 295 | 1 | 4 | 530 | 1000 | <1 | 60 |
| | | | | 66041 | 295 | 296 | 1 | 4 | 720 | 4150 | 1 | 430 |
| 296.00 | 303.00 | INTERBEDDED CALCLUTITE/DOLOMITE: Soft sediment deformed sequence of interbedded, slumpy textured and more massive; with sharply defined contacts, weakly foliated calclutites and thinly bedded (<3cm) black carbonaceous and argillaceous, weakly pyritic, laminar to massive | | | | | | | | | | |

94-036

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Ba |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 296.00 | 303.00 | CONT: calcite cemented dolomite. Minor very thin (≤3cm) interbeds of very fossiliferous shelly calcarenites. Minor speckled white beds due to fine fragmental fossil debris. Tectonic breccia, calcite cemented with broken core from 296.25 – 296.60 m. Weak calcite veining overall. Bedding 53° to c.a. @ 300 m. | | 66042 | 303 | 304 | 1 | 6 | 1950 | 3500 | 3 | 70 |
| 303.00 | 308.20 | CALCITE SIDERITE VEIN: White coarsely crystalline, calcite occurs as a colloform textured vein: layering ≈ 15° to 20° to ca. Siderite becomes evident towards centre of vein from 306-307m. Vein formation has brecciated hangingwall from 303 – 303.70 and to a lesser extent on the footwall. Angular calclutite fragments have been weakly aligned due to shearing? or autobrecciation. A trace galena/sphalerite occurs within the brecciated portion of the vein. | Trace galena/sphalerite in calcite/siderite vein breccias | 66040 | 304 | 305 | 1 | 2 | 350 | 210 | <1 | 95 |
| | | | | 66043 | 305 | 306 | 1 | 2 | 1600 | 410 | <1 | 3850 |
| | | | | 66044 | 306 | 307 | 1 | 2 | 870 | 2100 | <1 | 490 |
| | | | | 66045 | 307 | 308 | 1 | 2 | 3200 | 1600 | 1 | 110 |
| 308.20 | 310.20 | INTERBEDDED CALCLUTITE/DOLOMITE: Massive, gray, weakly stylolitized (both parallel to and perpendicular to bedding) calclutites interbedded with thin (≤3cm) black, pyritic, argillaceous, foliated dolomite. Core weakly calcite veined. Disseminated, coarse grained galena at 308.75 within a calcite/galena rimmed, rounded intraclast within a matrix of massive calclutite. Further disseminated galena occurs at 309 m within a calcite, weakly siderific vein ≈ 1mm in width. Bedding: 35° to c.a. @ 309.75 metres. | Trace galena/sphalerite @ 308.75 and 309 m within calcite/siderite veins and veinlets. | | | | | | | | | |
| 310.20 | 312.35 | WEAKLY QUARTZOSE CALCLUTITE: Massive, gray, stylolitized (Carbonaceous infilled) veined calclutite containing approx. 15% fine to med. grained rounded and well sorted detrital quartz grains. Calcite veins @ 311.75m, 311.95 m with both being 4 cm in width infilled by coarse grained calcite, minor host rock angular fragments plus trace sphalerite. | Trace sphalerite within veins @ 311.75; 311.95m | | | | | | | | | |

649220

DRILL LOG HOLE No. ZT-81A-5 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 312.35 | 317.80 | BRECCIATED AND VEINED LAMINAR CALCLUTITES AND DOLOMITES: Massive and laminar, grey, speckled with white calcite casted fragmental debris, thinly bedded calclutites and black very laminar carbonaceous and argillaceous pyritic calcite cemented dolomites. Core extensively calcite veined, minor weak siderite veining from 313.50 to 317.80 is in part brecciated. Siderite veining is cut by a later phase of calcite veining. Secondary dolomitization has occurred near the vein/breccia zones and is manifest by oxidation of the iron within the dolomite/siderite (manganosiderite?) crystals. Possible fold axis @ 315.80 m where cleavage almost parallel to core axis and bedding highly disturbed, veined and weakly brecciated. Bedding 55° to c.a. @ 314 m. | Trace pyrite | | | | | |
| 317.80 | 323.50 | INTERBEDDED CALCLUTITE / DOLOMITE: Soft sediment deformed, rhythmically interbedded, massive grey, slumpy textured in part heavily stylolitized, grey calclutites and black laminar to thinly bedded massive (< 3cm in width) pyritic, argillaceous calcite cemented dolomite. Unit has fine detrital quartz grains apparent. Minor thin interbeds of very fossiliferous shelly calcarenites are present throughout. Core moderately calcite veined (all transgress bedding, are generally 1cm in width and contain host rock fragments). Minor slickensiding and faulting apparent. Minor core pelletal in texture due to foliation. Bedding 47° to c.a. @ 319.80 metres. | Trace pyrite. | | | | | |
| 323.50 | 340.00 | INTERBEDDED MASSIVE AND LAMINAR QUARTZOSE CALCLUTITES / DOLOMITES / CALCAREOUS QUARTZ ARENITES: Massive, grey, textureless, heavily stylolitized, sandy calclutites, grading down hole into a more weakly laminar sequence of calclutites and dolomites grading further into a soft sediment deformed, slumpy textured, | Trace pyrite. | | | | | |

64922

DRILL LOG HOLE No. ZT-81A-5 PAGE 16 OF 16

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 323.50 | 340.00 | CON'T : thinly interbedded, (overall speckled appearance) calcareous, quartz arenites, with minor sandy calcite cemented dolomites. Weak calcite veining. Minor fossiliferous horizons with fragment casts replaced by both quartz and calcite. Bedding: 57° to c.a @ 331.20 m and 50° to c.a. @ 339.60 metres. | | | | | | |
| E.O.H | 340.00 | METRES. | | | | | | |

64922

649223

Amoco Minerals Australia Company

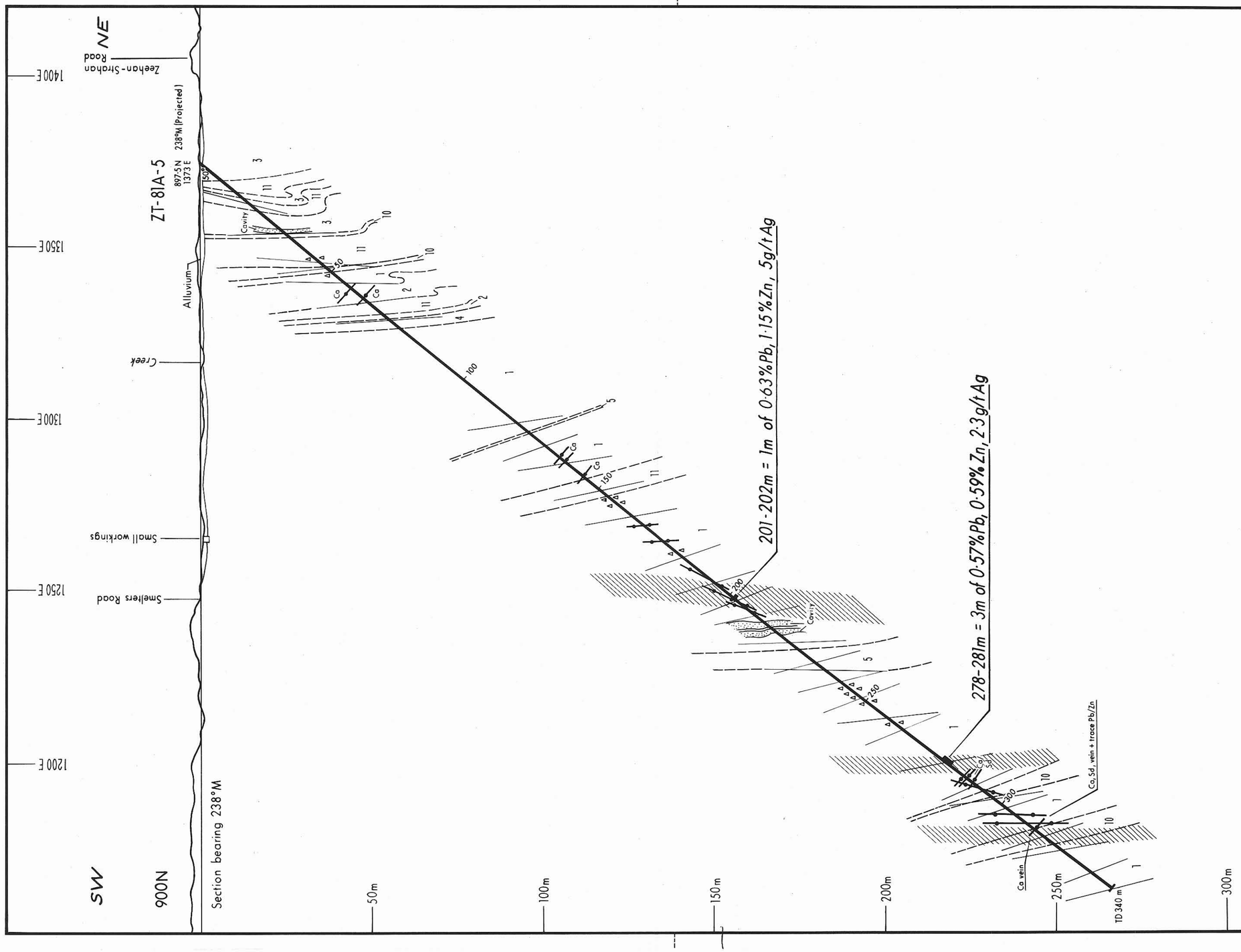
# ZEEHAN PROJECT
# A-78-60
# EL 4/78, TASMANIA

PROSPECT: **AUSTRAL**

## CROSS SECTION DRILLHOLE ZT-81A-5

Scale: Vertical and horizontal - 1:1000

5 cm




## Legend

| | |
|---|---|
| Limestone | 1 33 |
| Dolomite..... (breccia) | 2 29 |
| Fossil breccia | 3 46 |
| Slump breccia | 4 41 |
| Sandstone | 5 61 |
| Siltstone | 6 69 |
| Shale | 7 8 |
| Mineralization and/or ironstone | 8 14 |
| Siderite/calcite/ankerite/breccia | 9 12 |
| Laminar limestone | 10 37 |
| Slumped limestone | 11 28 |
| Conglomerate | 12 65 |
| Calcite/siderite veins | Ca/Sd |

Vein orientation unknown — Ca

Vein orientation accurate — Ca

Brecciation (tectonic)

Zone of Pb/Zn Ca/Sd mineralization

REPORT 279

M82-1842

649224

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-81A-6

| | | |
|---|---|---|
| Location | : | 1695N : 1050E |
| Declination | : | 55° |
| Azimuth | : | 090°G |
| Total Depth | : | 194.2 meters |

Assay Results

42- 43 = 1m @ 0.63% Pb + 5.00% Zn + 18.0g/t Ag
74- 77 = 3m @ 9.50% Pb + 6.60% Zn + 71.3g/t Ag
153-167 = 14m @ 2.54% Pb + 0.35% Zn + 40.4g/t Ag
181-183 = 2m @ 4.20% Pb + 0.18% Zn + 40.0g/t Ag

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-81A-6 — PAGE 1 OF 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN-TAS No. A7860B | ELEVATION meters | COMMENCED 10 NOV '81 | BORE HOLE SURVEY | | | | | | INSTRUMENT Eastman Single Shot | | | | | |
| | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing |
| PROSPECT AUSTRAL | DIP COLLAR 55° GE | COMPLETED 28 NOV'81 | 57 | 56 | 057.5° | 194 | 59 | 055 | | | | | | |
| CO-ORDINATES 1695 mN 1050 mE | CORE SIZE HQ, NQ. | TOTAL LENGTH 194 meters | 111 | 57 | 060 | | | | | | | | | |
| BEARING 069° TN 058° MN 090° GN | LOGGED BY P.A. JONES | Machine Used: MINDRILL 101, ADP Pty Ltd. | 174 | 57.5 | 055 | | | | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 6.50 | INTERBEDDED QUARTZ ARENITES AND | | 66228 | 0 | 3.0 | 3 | 4 | 90 | 8 | <1 |
| HQ-HW Coring. | | QUARTZOSE SILTSTONES: Interbedded, white | | 66229 | 3.0 | 6.0 | 3 | 4 | 50 | 6 | <1 |
| | | greeny-grey, massive and weakly foliated, coarse | | 66230 | 6.0 | 9.0 | 3 | 14 | 160 | 6 | <1 |
| | | grained (well sorted, rounded quartz grains), | | 66231 | 9.0 | 12.5 | 3.5 | 105 | 80 | 65 | 3 |
| | | weakly argillaceous quartz arenites and | | 66232 | 12.5 | 15.7 | 3.2 | 110 | 75 | 26 | 3 |
| | | laminar very argillaceous and moderately quartz- | | 66233 | 15.7 | 18.7 | 3.0 | 16 | 240 | 6 | 3 |
| | | ose siltstones. Minor quartzite pebbled arenites. | | 66234 | 18.7 | 21.7 | 3.0 | 24 | 310 | 10 | 2 |
| | | Core moderately weathered. | | 66235 | 21.7 | 24.7 | 3.0 | 55 | 180 | 10 | 2 |
| | | | | 66236 | 24.7 | 27.7 | 3.0 | 14 | 85 | 8 | 3 |
| 6.50 | 16.00 | TUBICOLAR ARGILLACEOUS QUARTZ ARENITE: | | 66237 | 27.7 | 30.7 | 3.0 | 240 | 970 | 2100 | 3 |
| | | Moderately weathered, orange-yellow limonite | | 66238 | 30.7 | 33.7 | 3.0 | 18 | 1650 | 950 | 2 |
| | | stained, grey green coloured, argillaceous and | | 66239 | 33.7 | 36.7 | 3.0 | 8 | 120 | 530 | 1 |
| | | micaceous, medium grained quartzose arenites. | | 66240 | 36.7 | 39.0 | 2.3 | 34 | 240 | 3000 | 4 |
| | | Tubules filled by white to light grey coarse | | 66078 | 39.0 | 40.0 | 1.0 | 22 | 210 | 1900 | 2 |
| | | grained crystalline quartz and argillaceous | | 66079 | 40.0 | 41.0 | 1.0 | 55 | 2300 | 5500 | 9 |
| | | material. Minor quartz filled vughs. Core massive | | 66080 | 41.0 | 42.0 | 1.0 | 24 | 155 | 2500 | 1 |
| | | and unbedded but weakly foliated and weakly | | 66081 | 42.0 | 43.0 | 1.0 | 135 | 6300 | 5.00% | 18 |
| | | quartz veined. | | 66082 | 43.0 | 44.0 | 1.0 | 18 | 260 | 3600 | 1 |
| | | | | 66083 | 44.0 | 45.0 | 1.0 | 10 | 300 | 820 | 2 |
| 16.00 | 20.30 | THINLY INTERBEDDED SILTSTONE / QUARTZ | | 66084 | 45.0 | 46.0 | 1.0 | 8 | 185 | 1300 | <1 |
| | | ARENITE: Laminar and thinly interbedded | | 66241 | 46.0 | 48.7 | 2.7 | 30 | 90 | 520 | 1 |
| | | green grey argillaceous quartzose siltstones and | | 66242 | 48.7 | 51.7 | 3.0 | 6 | 55 | 300 | <1 |
| | | thinly bedded, coarse grained micaceous and | | 66243 | 51.7 | 54.7 | 3.0 | 24 | 90 | 650 | <1 |
| | | weakly argillaceous fawn beige quartz arenites. | | 66244 | 54.7 | 57.7 | 3.0 | 620 | 120 | 135 | 2 |
| | | Quartz grains are generally well sorted and sub- | | 66245 | 57.7 | 60.7 | 3.0 | 340 | 165 | 48 | 4 |
| | | rounded. Both siltstones and arenites are thinly | | 66246 | 60.7 | 63.7 | 3.0 | 140 | 320 | 890 | 2 |
| | | bedded being < 1cm in width. The unit grades | | 66247 | 63.7 | 66.7 | 3.0 | 12 | 180 | 40 | 1 |
| | | downhole into a hematitic stained pink/white | | 66248 | 66.7 | 69.7 | 3.0 | 6 | 1400 | 14 | <1 |
| | | arenaceous unit. Bedding 17° to c.a. @ 18.4 m. Core | | 66249 | 69.7 | 72.0 | 2.3 | 12 | 300 | 120 | 1 |
| | | also limonite and ferruginous veined towards | | 66085 | 72.0 | 73.0 | 1.0 | 10 | 1350 | 36 | 2 |
| | | the base of the sequence. | | 66086 | 73.0 | 74.0 | 1.0 | 10 | 2300 | 36 | 4 |
| | | | | 66087 | 74.0 | 75.0 | 1.0 | 570 | 15.9% | 6.0% | 150 |
| | | | | 66088 | 75.0 | 76.0 | 1.0 | 125 | 3.9% | 3.8% | 22 |

64922

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.30 | 22.80 | FERRUGINOUS SLUMPY QUARTZ ARENITES / SILTSTONES: Ferruginous and limonitic stained and veinleted, pink-orange / grey-green, slump textured, soft sediment deformed, thinly interbedded coarse grained quartzose arenites, fine to medium grained argillaceous micaceous quartz arenites, and minor quartzose argillaceous siltstones. Minor pebbly argillaceous quartz arenites. | Minor boxworked orange/yellow veinlets after pyrite. | 66089 | 76.0 | 77.0 | 1.0 | 135 | 8.7% | 10.0% | 42 |
| | | | | 66090 | 77.0 | 78.0 | 1.0 | 20 | 5000 | 2900 | 1 |
| | | | | 66091 | 78.0 | 79.0 | 1.0 | 20 | 2200 | 2400 | 2 |
| | | | | 66092 | 79.0 | 80.0 | 1.0 | 22 | 470 | 370 | 3 |
| | | | | 66093 | 80.0 | 81.0 | 1.0 | 18 | 180 | 2550 | <1 |
| | | | | 66094 | 81.0 | 82.0 | 1.0 | 800 | 980 | 3200 | 1 |
| | | | | 66095 | 82.0 | 83.0 | 1.0 | 18 | 300 | 3500 | <1 |
| | | | | 66096 | 83.0 | 84.0 | 1.0 | 20 | 310 | 6800 | <1 |
| | | | | 66097 | 84.0 | 85.0 | 1.0 | 18 | 300 | 6700 | <1 |
| | | | | 66098 | 85.0 | 86.0 | 1.0 | 26 | 940 | 9800 | 1 |
| 22.80 | 24.70 | INTERBEDDED SILTSTONE / QUARTZ ARENITE: Thinly bedded to massive, grey-green quartzose, argillaceous siltstones interbedded with thinly bedded, coarse grained, well rounded and sorted, quartzose and argillaceous, beige coloured arenites. Core weakly foliated and limonite stained. Bedding 24° to ca. @ 24.3 m. | | 66099 | 86.0 | 87.0 | 1.0 | 18 | 250 | 3300 | <1 |
| | | | | 66100 | 87.0 | 88.0 | 1.0 | 10 | 90 | 1300 | <1 |
| | | | | 66101 | 88.0 | 89.0 | 1.0 | 10 | 100 | 1350 | <1 |
| | | | | 66102 | 89.0 | 90.0 | 1.0 | 8 | 65 | 1400 | <1 |
| | | | | 66103 | 90.0 | 91.0 | 1.0 | 22 | 660 | 5300 | 1 |
| | | | | 66104 | 91.0 | 92.0 | 1.0 | 24 | 2600 | 9600 | 3 |
| | | | | 66105 | 92.0 | 93.0 | 1.0 | 16 | 480 | 4200 | 1 |
| | | | | 66106 | 93.0 | 94.0 | 1.0 | 16 | 740 | 3800 | 1 |
| 24.70 | 27.80 | INTERBEDDED QUARTZ ARENITES AND CONGLOMERATIC QUARTZ ARENITES: Interbedded argillaceous quartz, beige coloured, arenites and grey green micaceous siltstones occur from 24.7 to 25.5 but grade downhole into a massive unbedded sequence of conglomeratic (pink, rounded, very coarse grained, quartzose pebbles plus minor rounded translucent quartz fragments) grey green argillaceous matrixed medium to coarse grained quartz arenites. Trace coarse grained crystalline pyrite in vughs. Core weakly limonite stained. Pink pebbles up to 1.5 cm in diameter. | Trace pyrite as coarse grained vugh infillings. | 66107 | 94.0 | 95.0 | 1.0 | 46 | 480 | 7500 | <1 |
| | | | | 66108 | 95.0 | 96.0 | 1.0 | 20 | 210 | 4500 | <1 |
| | | | | 66109 | 96.0 | 97.0 | 1.0 | 20 | 210 | 4700 | <1 |
| | | | | 66110 | 97.0 | 98.0 | 1.0 | 16 | 280 | 4000 | <1 |
| | | | | 66111 | 98.0 | 99.0 | 1.0 | 18 | 220 | 1800 | <1 |
| | | | | 66112 | 99.0 | 100.0 | 1.0 | 20 | 450 | 3400 | <1 |
| | | | | 66113 | 100.0 | 101.0 | 1.0 | 18 | 320 | 2700 | 1 |
| | | | | 66114 | 101.0 | 102.0 | 1.0 | 14 | 190 | 1850 | <1 |
| | | | | 66115 | 102.0 | 103.0 | 1.0 | 16 | 175 | 2100 | <1 |
| | | | | 66116 | 103.0 | 104.0 | 1.0 | 20 | 3100 | 1.10% | 4 |
| | | | | 66117 | 104.0 | 105.0 | 1.0 | 18 | 670 | 4400 | 3 |
| | | | | 66118 | 105.0 | 106.0 | 1.0 | 16 | 760 | 4000 | 2 |
| | | | | 66119 | 106.0 | 107.0 | 1.0 | 44 | 3100 | 6700 | 9 |
| | | | | 66120 | 107.0 | 108.0 | 1.0 | 40 | 1450 | 1.30% | 5 |
| 27.80 | 32.00 | SUB-ANGULAR QUARTZ PEBBLE CONGLOMERATE: Large rounded to sub rounded white quartz pebbles (up to 3-4 cm diam.) and minor honey brown coarse grained arenite fragments (sub angular) are set in a coarse grained quartzose and very argillaceous, pyritic matrix. Pyrite content | Trace white/pink fine grained disseminated sphalerite | 66121 | 108.0 | 109.0 | 1.0 | 24 | 940 | 6000 | 2 |
| | | | | 66122 | 109.0 | 110.0 | 1.0 | 50 | 3600 | 1.50% | 4 |
| | | | | 66123 | 110.0 | 111.0 | 1.0 | 26 | 2100 | 9700 | 3 |
| | | | | 66124 | 111.0 | 112.0 | 1.0 | 20 | 1750 | 6800 | 3 |
| | | | Pyrite disseminated throughout matrix. | 66125 | 112.0 | 113.0 | 1.0 | 14 | 155 | 3000 | <1 |
| | | | | 66126 | 113.0 | 114.0 | 1.0 | 14 | 95 | 4300 | <1 |

6492

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 27.80 | 32.00 | CON'T: very variable and generally fine to medium grained, crystalline and disseminated. Core weakly quartz veined 1-3 mm in width, weakly foliated. | Trace galena/sphalerite in coarsely crystalline sugary textured qtz fracture infilling | 66127 | 114.0 | 115.0 | 1.0 | 22 | 230 | 5700 | 2 |
| | | | | 66128 | 115.0 | 116.0 | 1.0 | 8 | 60 | 3300 | 2 |
| | | | | 66129 | 116.0 | 117.0 | 1.0 | 16 | 180 | 3900 | 2 |
| | | | | 66130 | 117.0 | 118.0 | 1.0 | 14 | 80 | 2150 | 1 |
| | | | | 66131 | 118.0 | 119.0 | 1.0 | 12 | 65 | 2800 | <1 |
| 32.00 | 35.70 | CROSS BEDDED QUARTZ ARENITE: Honey brown very coarse grained with well sorted and rounded quartz grains, crossed bedded, sugary textured, very porous and permeable weakly argillaceous and siliceous cemented quartz arenite. | | 66132 | 119.0 | 120.0 | 1.0 | 14 | 80 | 1450 | 1 |
| | | | | 66133 | 120.0 | 121.0 | 1.0 | 14 | 75 | 2400 | 2 |
| | | | | 66134 | 121.0 | 122.0 | 1.0 | 14 | 70 | 1450 | 2 |
| | | | | 66135 | 122.0 | 123.0 | 1.0 | 16 | 80 | 2700 | 2 |
| | | | | 66136 | 123.0 | 124.0 | 1.0 | 14 | 75 | 3100 | 1 |
| | | | | 66137 | 124.0 | 125.0 | 1.0 | 16 | 46 | 1200 | <1 |
| | | | | 66138 | 125.0 | 126.0 | 1.0 | 16 | 40 | 1750 | 1 |
| 35.70 | 41.50 | PYRITIC CONGLOMERATIC QUARTZ ARENITE: A massive, grey to dark grey and beige very pyritic (≈7%) and weakly lead-zinc mineralized, conglomeratic (white fine grained pebbles, generally < 1cm in diam., well rounded to ovoid in shape comprised of milky quartz) coarse grained, quartzose and argillaceous (olive grey and fine grained) arenites. Core weakly to moderately foliated. Pyrite content varies but averages ≈ 7% with narrower sections being semi-massive and trace galena/sphalerite @ 36.65 and 39.65 m. Core becomes less conglomeratic down hole grading eventually into a quartz arenite. Towards base of unit core becomes very brecciated (fault contact.) | Minor galena-sphalerite Sphalerite deep red brown and generally coarsely crystalline. Galena also coarsely crystalline. | 66139 | 126.0 | 127.0 | 1.0 | 16 | 46 | 3000 | 1 |
| | | | | 66140 | 127.0 | 128.0 | 1.0 | 12 | 70 | 2000 | 2 |
| | | | | 66141 | 128.0 | 129.0 | 1.0 | 12 | 450 | 3300 | 3 |
| | | | | 66142 | 129.0 | 130.0 | 1.0 | 18 | 85 | 1350 | 1 |
| | | | | 66143 | 130.0 | 131.0 | 1.0 | 12 | 340 | 3100 | 2 |
| | | | | 66144 | 131.0 | 132.0 | 1.0 | 12 | 1750 | 1800 | 2 |
| | | | | 66145 | 132.0 | 133.0 | 1.0 | 16 | 620 | 3200 | 2 |
| | | | | 66146 | 133.0 | 134.0 | 1.0 | 26 | 330 | 4500 | 1 |
| | | | | 66147 | 134.0 | 135.0 | 1.0 | 14 | 140 | 1200 | 3 |
| | | | | 66148 | 135.0 | 136.0 | 1.0 | 18 | 370 | 1750 | 4 |
| | | | | 66149 | 136.0 | 137.0 | 1.0 | 42 | 2800 | 3000 | 8 |
| | | | | 66150 | 137.0 | 138.0 | 1.0 | 16 | 610 | 2700 | 4 |
| | | | | 66151 | 138.0 | 139.0 | 1.0 | 16 | 370 | 2000 | 5 |
| | | | | 66152 | 139.0 | 140.0 | 1.0 | 18 | 530 | 3400 | 3 |
| | | | | 66168 | 140.0 | 141.0 | 1.0 | 14 | 450 | 2400 | 2 |
| | | | | 66153 | 141.0 | 142.0 | 1.0 | 16 | 1000 | 3000 | 4 |
| 41.50 | 57.30 | FAULT BRECCIA: The fault breccia is comprised predominantly of fine grained grey green and coarse grained fawn-beige siltstones and sandstones with minor dark grey and pink sandstone fragments set within a micaceous pyritic beige coloured clay matrix. All fragments are very angular. Some contain disseminated galena and pyrite. The zone is highly pyritic, from 5-7%, early on but decreases down hole. Fault contains numerous sections | Moderate pyrite as disseminations throughout the matrix. ≈ 1-2 overall. | 66154 | 142.0 | 143.0 | 1.0 | 12 | 260 | 4100 | 3 |
| | | | | 66155 | 143.0 | 144.0 | 1.0 | 14 | 460 | 6500 | 3 |
| | | | | 66156 | 144.0 | 145.0 | 1.0 | 16 | 1450 | 1250 | 5 |
| | | | | 66157 | 145.0 | 146.0 | 1.0 | 16 | 1700 | 280 | 2 |
| | | | | 66158 | 146.0 | 147.0 | 1.0 | 22 | 2350 | 1350 | 9 |
| | | | Minor galena sphalerite ≈ 5% Zn + 1% Pb + 5% py from 41.7-42.7. Sphalerite is red brown and coarse grained. | 66159 | 147.0 | 148.0 | 1.0 | 18 | 2600 | 960 | 4 |
| | | | | 66160 | 148.0 | 149.0 | 1.0 | 18 | 2650 | 175 | 3 |
| | | | | 66161 | 149.0 | 150.0 | 1.0 | 20 | 3700 | 150 | 5 |
| | | | | 66162 | 150.0 | 151.0 | 1.0 | 12 | 1850 | 450 | 2 |
| | | | | 66163 | 151.0 | 152.0 | 1.0 | 16 | 9000 | 1600 | 16 |

640224

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 41.50 | 57.30 | CON'T: of unbrecciated country rock from 47.10 to 47.45 (massive pyritic, beige medium grained sandstone) 50.35 to 51.7 (interbedded beige massive sandstones and grey green/fawn thinly bedded siltstones and sandstones) 53.7 to 55.3 (Interbedded pink and beige, white coarse grained, micaceous sandstones). Core Pb/Zn mineralized from 41.70 to 42.70 with coarsely crystalline red/brown sphalerite being disseminated over narrow portions of core along with minor galena and ± 5% pyrite. | | 66164 | 152.0 | 153.0 | 1.0 | 86 | 8200 | 4200 | 39 |
| | | | | 66165 | 153.0 | 154.0 | 1.0 | 42 | 1.15% | 9200 | 15 |
| | | | | 66166 | 154.0 | 155.0 | 1.0 | 110 | 2.20% | 3700 | 19 |
| | | | | 66167 | 155.0 | 156.0 | 1.0 | 100 | 4.10% | 4200 | 21 |
| | | | | 66169 | 156.0 | 157.0 | 1.0 | 105 | 4.70% | 4300 | 80 |
| | | | | 66170 | 157.0 | 158.0 | 1.0 | 105 | 2.50% | 3300 | 37 |
| | | | | 66171 | 158.0 | 159.0 | 1.0 | 60 | 3.50% | 1950 | 36 |
| | | | | 66168 | 159.0 | 160.0 | 1.0 | 65 | 1.80% | 3150 | 39 |
| | | | | 66172 | 160.0 | 161.0 | 1.0 | 85 | 2.00% | 3600 | 46 |
| | | | | 66173 | 161.0 | 162.0 | 1.0 | 145 | 1.60% | 2600 | 52 |
| | | | | 66174 | 162.0 | 163.0 | 1.0 | 48 | 5.30% | 1850 | 29 |
| | | | | 66175 | 163.0 | 164.0 | 1.0 | 42 | 2.10% | 2500 | 40 |
| 57.30 | 62.80 | TUBICOLAR AND BIOTURBATED SILTSTONE: Massive weakly foliated, weakly quartz veined, grey green, very micaceous, argillaceous, quartzose (medium grained rounded well sorted) bioturbated and tubicolar, slumpy textured siltstones. Core weakly pyritic. Tubules and bioturbation scars infilled by fawn grey micaceous quartzose siltstones. Bedding on thin hematic red/pink sandstone interbed 63° to c.a. @ 58.7m. Angular tectonic breccia's from 59.35 - 59.7 (clay matrix) 60.30 - 60.5 (clay matrix) 60.8 - 61.1 (clay matrix) 61.6 - 61.85 (clay pyrite matrix) 62.5 - 62.7 (clay matrix). | Minor fine grained pyrite | 66176 | 164.0 | 165.0 | 1.0 | 55 | 2.00% | 2600 | 61 |
| | | | | 66177 | 165.0 | 166.0 | 1.0 | 32 | 1.40% | 2700 | 49 |
| | | | | 66178 | 166.0 | 167.0 | 1.0 | 38 | 1.25% | 3000 | 41 |
| | | | | 66179 | 167.0 | 168.0 | 1.0 | 16 | 5500 | 1750 | 6 |
| | | | | 66180 | 168.0 | 169.0 | 1.0 | 16 | 7900 | 1300 | 5 |
| | | | | 66181 | 169.0 | 170.0 | 1.0 | 26 | 2.00% | 2050 | 6 |
| | | | | 66182 | 170.0 | 171.0 | 1.0 | 32 | 9300 | 2900 | 8 |
| | | | | 66183 | 171.0 | 172.0 | 1.0 | 22 | 3400 | 2200 | 32 |
| | | | | 66184 | 172.0 | 173.0 | 1.0 | 28 | 3400 | 2650 | 7 |
| | | | | 66185 | 173.0 | 174.0 | 1.0 | 20 | 3200 | 2600 | 8 |
| | | | | 66186 | 174.0 | 175.0 | 1.0 | 32 | 3400 | 3000 | 24 |
| | | | | 66187 | 175.0 | 176.0 | 1.0 | 44 | 4200 | 4800 | 3 |
| | | | | 66188 | 176.0 | 177.0 | 1.0 | 50 | 3700 | 4900 | 3 |
| | | | | 66190 | 177.0 | 178.0 | 1.0 | 38 | 5900 | 4100 | 3 |
| 62.80 | 63.70 | FAULT BRECCIA: Breccia comprised of angular beige-grey siltstone fragments set within a beige clay matrix. | | 66191 | 178.0 | 179.0 | 1.0 | 26 | 3900 | 4300 | 3 |
| | | | | 66192 | 179.0 | 180.0 | 1.0 | 16 | 4200 | 4500 | 3 |
| | | | | 66193 | 180.0 | 181.0 | 1.0 | 20 | 1850 | 1650 | 30 |
| | | | | 66194 | 181.0 | 182.0 | 1.0 | 24 | 3.20% | 1550 | 76 |
| 63.70 | 72.30 | INTERBEDDED FINE AND COARSE GRAINED QUARTZ ARENITES: Interbedded, micaceous, thinly bedded, fawn argillaceous fine grained sandstones, pink coarse grained quartz sandstones and white coarse grained micaceous and argillaceous quartz sandstones. Weakly quartz veined and moderately brecciated. | | 66195 | 182.0 | 183.0 | 1.0 | 18 | 5.20% | 2100 | 4 |
| | | | | 66196 | 183.0 | 184.0 | 1.0 | 14 | 8000 | 135 | 2 |
| | | | | 66197 | 184.0 | 185.0 | 1.0 | 22 | 5800 | 30 | <1 |
| | | | | 66198 | 185.0 | 186.0 | 1.0 | 18 | 7100 | 30 | <1 |
| | | | | 66199 | 186.0 | 187.0 | 1.0 | 14 | 3600 | 670 | 16 |
| | | | | 66200 | 187.0 | 188.0 | 1.0 | 36 | 2100 | 520 | 10 |
| | | | | 66201 | 188.0 | 189.0 | 1.0 | 26 | 1900 | 530 | 24 |
| | | | | 66202 | 189.0 | 190.0 | 1.0 | 24 | 2800 | 810 | <1 |

649628

DRILL LOG HOLE No. ZT-81A-6 PAGE 5 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.30 | 74.10 | ARGILLACEOUS QUARTZ PEBBLE CONGLOMERATE: Sub angular to sub rounded, milky quartz pebbles (fractured occaisionally) are deposited, along with finer gravel sized and coarse grained sand sized quartz debris in a beige argillaceous clay matrix. Minor honey brown quartz-arenite host rock fragments (angular to sub rounded) are also present with grain sizes of fragments generally < 1.5 cm and averaging 2-3 mm. The conglomerate is massive and becomes finer grained down hole. Poor recoveries were obtained towards the base of the unit due to increasing argillaceous component of the matrix | | 66203 | 190.0 | 191.0 | 1.0 | 22 | 360 | 5200 | <1 |
| | | | | 66204 | 191.0 | 192.0 | 1.0 | 28 | 155 | 8400 | 1 |
| | | | | 66205 | 192.0 | 193.0 | 1.0 | 32 | 85 | 3900 | <1 |
| | | | | 66206 | 193.0 | 194.0 | 1.0 | 24 | 75 | 2900 | <1 |
| 74.10 | 76.50 | ZINC/LEAD MINERALIZED QUARTZOSE DOLOMITE: Contorteedly bedded, laminar, black and dark grey argillaceous and quartzose (coarse grained, milky quartz aggregates and rounded grains) slumpy textured dolomite. Dolomite is moderately mineralized with semi-massive galena/sphalerite occurring @ 74.10-74.15 and 76.00-76.50 m. The dolomite between these two zones contains abundant sphalerite (red brown and coarse grained, crystalline) and galena (as coarse grained disseminations and aggregates) averaging approximately 5% Zn/Pb. Mineralization appears to be bedded as it follows bedding traces. The milky quartz detritus varies as does the argillaceous content indicative of bedding. Minor conglomerate from 75.7 to 75.9 (comprised of sandstone fragments, minor dolomite and trace galena/sphalerite, sub angular to sub rounded) is beige brown and has sandy clay matrix. | Semi-massive sphalerite/galena from 74.10-74.15 and 76.00-76.50 ± 25% Zn/Pb. Lot of fine grained disseminated pyrite ± 2-3%. | | | | | | | | |
| 76.50 | 78.50 | LAMINAR PYRITIC DOLOMITE: White to light grey, finely laminar, very pyritic (finely disseminated | Fine grained disseminated cubic pyrite ± 15% | | | | | | | | |

62646

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 76.50 | 78.50 | CON'T : brassy coloured and cubic shaped) argillaceous dolomite. Bedding soft sediment deformed, with minor elongate intraclasts present. Minor very thin (generally <3mm in width) black and dark grey argillaceous dolomite interbeds or laminae present throughout vughy core. | | | | | | |
| 78.50 | 109.10 | ARGILLACEOUS PYRITIC DOLOMITE: Thinly interbedded and massive black and dark grey very argillaceous and weakly carbonaceous, pyritic dolomite. Weakly calcite and trace quartz veining. Minor pyrite veining as well as pyrite being disseminated throughout vughy core. Minor disseminated coarse grained yellow to dark brown sphalerite present at 106.7 and 108.35. Core soft sediment deformed. Heavily pyritic mineralized areas @ 85.8, 90.0, 94.2, 94.6, 95.35 and 98.7 m. Minor zones within the dolomite appear to be brecciated (slump brecciated?) from 81.0 to 85.8m. Dolomite is generally quite massive and dark grey but is also laminar to finely bedded with the lamellae being very argillaceous massive, black and weakly carbonaceous. Core completely weathered with relict bedding textures being observed: 80° to c.a. @ 80.5m; 70° to c.a. @ 100.7 metres. | Pyrite 2-3% Minor sphalerite @ 106.7 and 108.35. | | | | | |
| 109.10 | 114.60 | MINERALIZED IRONSTONE / DOLOMITE BRECCIA: Angular fragments of massive ironstone, vughy siderite, (both vughy and mineralized fragments) dolomite, galena and sphalerite and quartz are set within a matrix of grey-olive-brown argillaceous dolomite. Fragments vary in size from a few mm to 5cm in width. Vughs within ironstone are generally filled with white quartz. The siderite fragments are generally smaller than the | Minor Pb/Zn throughout, with sphalerite being red-brown and coarse grained. Found disseminated with galena fragments and minor fine grained pyrite. | | | | | |

649630

DRILL LOG HOLE No. ZT-81A-6 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 109.10 | 114.60 | CON'T: ironstone but seem to occur intimately with the galena and sphalerite (red/brown) Minor fine grained pyrite throughout matrix. | | | | | | |
| 114.60 | 116.70 | IRONSTONE: Massive to concretionary, red-brown, limonitic and goerthitic, weakly pyritic (minor yellow sphalerite) ironstone. Core very porous but infilled with white to grey quartz giving a speckled appearance. Core brecciated towards base of sequence, hence broken core and poor recoveries. | Minor disseminated pyrite with trace yellow sphalerite as fine and coarse grained disseminations | | | | | |
| 116.70 | 134.10 | PYRITIC IRONSTONE / DOLOMITE / SIDERITE BRECCIA: Sub angular and sub rounded ferruginous, red-brown, goerthitic fragments (possibly weathered siderite), light grey dolomite fragments set in a black argillaceous, carbonaceous, very pyritic (extremely fine grained) dolomite matrix. Moderate amounts of milky quartz as fine to coarse grained aggregates set within the dolomite matrix and also occurring within the ironstone fragments as vugh or pore space infilling. Breccia becoming finer grained down hole with less ironstone fragments apparent. Poor recoveries. | Extremely fine grained pyrite. | | | | | |
| 134.10 | 138.80 | INTERBEDDED IRONSTONE / FERRUGINOUS CLAYS: Quartz filled, porous, massive, ironstone breccia (possibly sedimentary as fragments are very rounded) interbedded with black, yellow and orange laminar and massive clays. Minor siderite/ankerite weakly mineralized material possibly indicates ironstone due to the weathering of the siderite/ankerite breccia. Core recovery very poor due to clay high infilling ironstone zones. Recovery ≈ 30% | Minor galena within siderite/ankerite breccia material @ 137m. | | | | | |

69679

DRILL LOG HOLE No. ZT-81A-6 PAGE 8 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 138.80 | 149.20 | INTERBEDDED CLAYS / DOLOMITE / SIDERITE AND IRONSTONE: Possibly brecciated ? (hard to tell due to extremely weathered nature of core) grey and dark grey argillaceous clays, interbedded with olive brown massive dolomite, cream siderite/ankerite material and brown goerthitic ironstone fragments and interbeds. Core contortedly bedded (disturbed by drilling). Minor yellow, orange, cream clay interbeds towards the base of the sequence. Poor core recoveries due to pughy nature of core. Minor quartz fragments distributed sporadically throughout the matrix. | | | | | | |
| 149.20 | 153.20 | CREAM / YELLOW / ORANGE CLAYSTONE: Massive to weakly laminar cream yellow and orange clays becoming progressively more ferruginous downhole until passing into a badly broken ironstone. | | | | | | |
| 153.20 | 166.50 | IRONSTONE BRECCIA: Dark red/ brown, massive and brecciated, goerthitic and weakly limonitic ironstone breccia's with a yellow pughy clay matrix. Breccia fragments are angular to sub angular and vary from mm to 1 cm in width. Core recovery is very low due to extremely broken core with pughy matrix and is approx. 25% Minor concretionary textures within ironstone. Ironstone very pughy and porous, some clay infilled + some quartz infilled. Other sections of ironstone containing rounded quartz grains indicating ironstone may have originally been a sediment. | | | | | | |
| 166.50 | 182.30 | FERRUGINOUS ORANGE CLAYSTONE: Ferruginous, orange / yellow, minor crimson coloured massive | Ironstone @ 182 m. | | | | | |

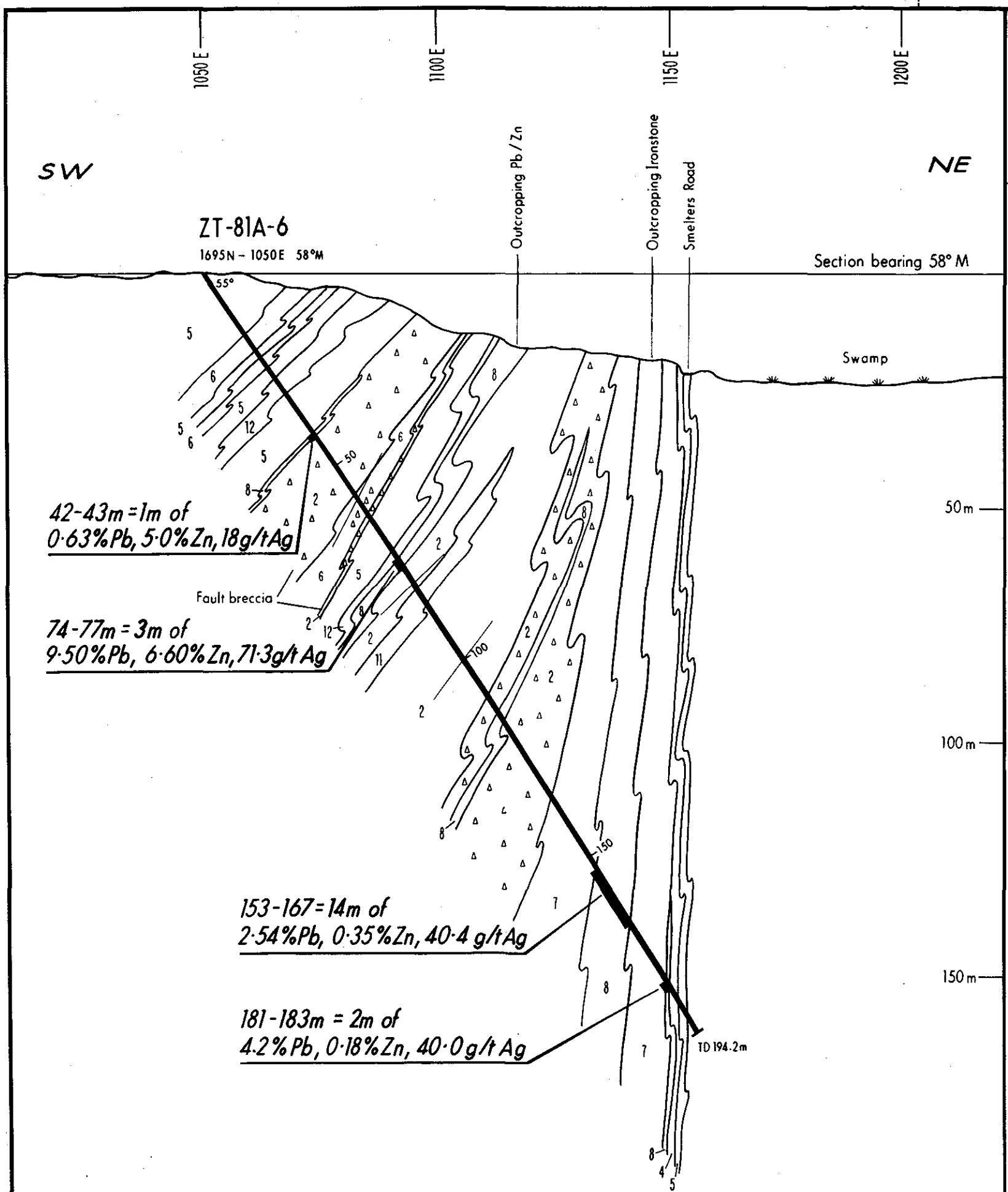
64922

DRILL LOG HOLE No. ZT-81A-6 PAGE 9 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 166.50 | 182.30 | CON'T: laminar and pebbly argillaceous claystones. Minor thin zones (< 2cm in width) of dark brown, goerthitic ironstone (boxworked?) and pebbly claystone due to rounded ironstone pebbles set within the ferruginous clay matrix. Minor breccia zones (sedimentary?) with angular fragments of laminar claystone, weakly ferruginous, set in an orange clay matrix. Minor laminar zones indicating a bedded sequence. Small quartz rich interbeds generally present in association with ferruginous material. Poor recoveries ≈ 60% | | | | | | |
| 182.30 | 186.00 | PYRITIC LAMINAR SLUMP BRECCIA: Light grey, fragmental, laminar, pyritic slump breccia. Laminar fragments of olive grey argillaceous and weakly silty material chaotically set within light grey argillaceous dolomite matrix. Pyrite medium grained and crystalline. Poor Recoveries ≈ 60%. | Pyrite medium grained and found as laminations or aggregates concentrating on or close to lamellae. | | | | | |
| 186.00 | 188.30 | MOTTLED FERRUGINOUS SANDSTONE AND CLAYSTONE: Mottled grey/orange/red brecciated argillaceous claystones interbedded with weakly ferruginous porous (lenticular pores) fine grained cream sandstones. Core extremely broken and recoveries poor ≈ 50%. Minor druzy quartz. Minor ferruginous zones and small fragments of ironstone at the base of the sequence. | | | | | | |
| 188.30 | 194.20 | PYRITIC SLUMPY DOLOMITE: Dark grey to black very pyritic, laminar and massive, slumpy (contortedly bedded) argillaceous dolomite. Minor fragments of weakly porous silicified? massive dolomite. Pyrite is coarse grained and crystalline ≈ 5-7%, and occurs as accumulations and as disseminations throughout the matrix. Portions of core appear to be slump brecciated. Minor angular quartz aggregates. | Minor to moderate, 5-7% pyrite as coarsely crystalline aggregates sporadically distributed throughout. | | | | | |
| END OF HOLE | | 194.20 Metres. | | | | | | |

69233

649234




Amoco Minerals Australia Company

# ZEEHAN PROJECT
# A-78-60
# EL 4/78, TASMANIA

**PROSPECT: AUSTRAL**

# CROSS SECTION DRILLHOLE ZT-81A-6

**Scale: Vertical and horizontal - 1:1000**

5 cm

## Legend

| | | |
|---|---|---|
| Limestone | 1 | 33 |
| Dolomite..... (breccia) | 2 | 29 |
| Fossil breccia | 3 | 46 |
| Slump breccia | 4 | 41 |
| Sandstone | 5 | 61 |
| Siltstone | 6 | 69 |
| Shale | 7 | 8 |
| Mineralization and/or ironstone | 8 | 14 |
| Siderite/calcite/ankerite/breccia | 9 | 12 |
| Laminar limestone | 10 | 37 |
| Slumped limestone | 11 | 28 |
| Conglomerate | 12 | 65 |
| Calcite/siderite veins | Ca/Sd | |

Vein orientation unknown — Ca

Vein orientation accurate — Ca

Brecciation (tectonic)

Zone of Pb/Zn Ca/Sd mineralization

REPORT 279

M82-1841

649235

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-81A-7

| | | |
|---|---|---|
| Location | : | 750N : 1535E |
| Declination | : | 50° |
| Azimuth | : | 250°G |
| Total Depth | : | 254 meters |

Assay Results

| | | | | | | |
|---|---|---|---|---|---|---|
| | 50.2- 52.2 | = 2.0m @ | 1.40% | Pb + 0.16% | Zn + 42.5g/t | Ag |
| | 122.0-125.0 | = 3.0m @ | 4.34% | Pb + 0.29% | Zn + 17.0g/t | Ag |
| including | 124.0-125.0 | = 1.0m @ | 10.60% | Pb + 0.27% | Zn + 42.0g/t | Ag |
| and | 244.0-245.8 | = 1.8m @ | 0.06% | Pb + 1.89% | Zn + 1.0g/t | Ag |

**Amoco Minerals Australia Company**

DRILL LOG — HOLE No. ZT-81A-7 — PAGE 1 OF 13

| | | | | BORE HOLE SURVEY | | | INSTRUMENT Eastman Single Shot | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN - TAS No. A7860 C | ELEVATION meters | COMMENCED 24 NOV '81 | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing |
| PROSPECT AUSTRAL EZ/JV AREA | DIP COLLAR 50° GSW | COMPLETED 8 DEC '81 | | 50 | 52.5 | 218 | 200 | 55 | 216 | | | |
| CO-ORDINATES 750 mN 1535 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 254 meters | | 100 | 53.5 | 215 | 250 | 55 | 216 | | | |
| BEARING 229° TN 218° MN 250° GN | LOGGED BY P.A. JONES | Machine Used: MINDRILL 10L A.D.D. Pty Ltd. | | 150 | 54 | 215 | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 0.00 | 5.00 | GRAVEL: Fluvio-alluvial, white, siliceous, quartzose sandstone gravels, rounded and have silt and peat matrix. | | | | | | |
| HW - HQ Coring | | | | | | | | |
| 5.00 | 12.00 | CHAOTICALLY BEDDED FOSSILIFEROUS CALCARENITES / CALCLUTITES / DOLOMITES: Soft sediment deformed and slumped, very fossiliferous (plant, shell and other fragmental debris) and weathered (leached and porous) beige grey to grey calcarenites, chaotically interbedded with light and dark grey more massive and less fossiliferous calclutites and black, calcite cemented dolomites. Core badly broken and weathered. Chaotic bedding orientation along with abundant intraclasts indicate a possible slumping environment. Core weakly calcite veined. Stylolitization common along chaotic bedding contacts as well as around intraclast boundaries. Poor core recoveries ≈ 60%. | | | | | | |
| 12.00 | 16.20 | CALCAREOUS QUARTZ ARENITES / DOLOMITES: Laminar, light grey to grey white, fine to coarse grained, well sorted, with rounded particles, quartzose, calcite cemented arenite interbedded with thin (≤ 1cm) black to dark grey, foliated, calcite cemented dolomite. Minor, very fossiliferous fragmental calcarenites present generally ≤ 2cm in width. Wispy textured dolomite is possibly due to loading pressure as well as erosional forces. Core very weathered, (porous and leached) with recoveries ≈ 75% Bedding 50° to c.a. @ 15 metres. | | | | | | |

64936

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | ASSAYS Pb | ASSAYS Zn | ASSAYS Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16.20 | 50.20 | SOFT SEDIMENT DEFORMED CALCLUTITES / DOLOMITES / CALCARENITES: Grey, massive, generally unfossiliferous, weakly stylolitized, calclutites interbedded with thin, (< 5cm wide) black, load casted and wispy textured calcite cemented, weakly fossiliferous dolomites and grey white very fossiliferous fragmental (shelly, crinoidal, pelletal occasionally pyritized) calcarenites and calcrudites. Calcite veining weak to mod. with more intense zones from 25.2 to 27.6 and 43.2 to 44.2 m. The latter zone has associated with it pervasive dolomitization of the matrix. Approx 3-4% blebby pyrite occurs throughout this zone and is bronze yellow in colour. Very fine grained pyrite @ 46.7 m is yellow white in colour and occurs as fine blebbs and disseminations. Minor very weathered (leached and porous) zones. Bedding 49° to c.a. @ 28.4 m and 43° to c.a. @ 50 metres. | 3-4% Pyrite from 43.2-44.2 m<br>≥ 1% pyrite @ 46.7 m. | | | | | | | | | |
| 50.20 | 52.20 | Pb/Zn MINERALIZED CALCITE/SIDERITE CEMENTED, ANGULAR BRECCIA: Large angular fragments of host rock, chaotically oriented; including calclutites, dolomite, sideritic dolomitized rock and calcite and siderite fragments set within a dolomite matrix which in turn has been invaded by white calcite. Large fragments up to 10-15 cm in width have pervasive calcite and to a lesser degree siderite, veinleting throughout as do a number of the smaller fragments. Pyrite occurs as blebbs and as vugh fillings and averages 1-3%. The galena occurs as very fine grained disseminations and streaky accummulations throughout the matrix with pale yellow very fine grained sphalerite being very much subordinate. Stylolitization occurs throughout the unit. Vein/breccia has sharp foot-wall, hangingwall contacts ≈ 50° to c.a. | ≈ 2% Pb/Zn from 50.2-52.2 m with 1-3% pyrite. | 66258 | 50.20 | 51.20 | 1 | 100 | 8500 | 1100 | 37 |
| | | | | 66259 | 51.20 | 52.20 | 1 | 90 | 1.95% | 2000 | 48 |

64963

DRILL LOG HOLE No. ZT-81A-7 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | ASSAYS Pb | ASSAYS Zn | ASSAYS Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.20 | 53.70 | VEINED FOSSILIFEROUS CALCLUTITE: Beige grey, strongly calcite veined, slightly weathered, weakly fossiliferous (oncolites 1-15cm, crinoids, shelly debris) calclutites with very minor thin, black, calcite cemented dolomite ≈ 0.5 cm in width. Thick calcite vein (10 cm wide) from 53.60 - 53.80 cnts c.a @ ≈ 35°. | | | | | | | | | |
| 53.70 | 55.75 | MINERALIZED CALCITE/SIDERITE MATRIXED ANGULAR BRECCIA: Heavily calcite veined and brecciated (tectonically) grey, dolomitized, (medium grained, grey-cream, crystalline) calclutites with an angular breccia zone from 54.20 m to 55.20 m containing disseminated galena/sphalerite/pyrite mineralization. Sphalerite is yellow and reddish in colour, is coarse grained & disseminated. Galena is finely disseminated. Breccia has dolomite matrix (dark grey to black and calcite cemented). | ≈ 15% Pb/Zn from 54.5 to 54.90 metres with ≈ 3% pyrite. | 66260 | 54.50 | 55.00 | 0.5 | 36 | 8500 | 1050 | 22 |
| 55.75 | 62.10 | CALCITE VEINED CALCLUTITE: Light grey to grey, massive, strongly calcite veined, dolomitized calclutite with thin (<0.5 cm wide) black laminar calcite cemented carbonaceous dolomite interbeds. Minor thin horizons containing fossil debris (shelly, oolitic) but generally the sequence is unfossiliferous. Calcite veins, containing minor siderite, generally 1-3mm wide but up to 1cm in width are oriented from 10-20° to c.a. These are cut perpendicularly by thin calcite veinlets. Dolomite interbeds show evidence of secondary dolomitization with cream white coarse grained dolomite crystals being pervasive throughout. Core becomes progressively dolomitic and darker in colour down hole. Calcite healed tectonic breccia from 60.1 to 60.3 metres. Bedding: 55° to c.a. @ 61.8 metres. | | | | | | | | | |

69238

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 62.10 | 80.00 | FOSSILIFEROUS DOLOMITE / MICRITE : Dark grey to black, argillaceous, fossiliferous (shelly debris) massive micrites interbedded with black laminar, calcite cemented, carbonaceous dolomite. Weakly calcite veined and badly broken with numerous rugh zones. Very fossiliferous (colonial corals, and shelly fragmental debris) horizons, from 10-30 cm in width of fragmental calcarenites and calcrudites occur towards the base of the sequence bound by dark micrites from 73.4 to 76.0 m Possibly indicative of minor slumping. Minor fossil fragments occaission-ally pyritized. Bedding 44° to c.a. @ 67 m ; 45° to c.a. @ 79.4 metres. | Trace pyrite | | | | | |
| 80.00 | 101.50 | INTERBEDDED CALCLUTITE / DOLOMITE : Rhythmically interbedded, massive, grey, unfossiliferous, calclutites and black laminar, carbonaceous, wispy and load textured calcite cemented dolomite Dolomite interbeds generally ≤ 1.5 cm in width, have sharp contacts which are generally stylolitized. Minor fossiliferous calcarenite horizons of psolitic and pelletal fossil debris. Calcite gash veins and thin veinlets occur throughout with certain zones heavily veined and occaissionally brecciated 88.0-88.4 ; 88.8-89.0 ; 89.6-89.80 ; Badly weathered leached and porous zone from 95-97 m (60% recovery) This portion of core strongly calcite veined. Minor secondary dolomitization of sequence. Bedding 42° @ 82.7 m ; 57° to c.a. @ 99.8 and 52° to c.a. @ 100.35 metres. | Trace pyrite | | | | | |
| 101.50 | 116.00 | INTERBEDDED DOLOMITE / CALCLUTITE : Rhythmic-ally interbedded, laminar to massive, black, argillaceous, pyritic, calcite cemented dolomite varying in width from 1-7 cm, with grey to beige grey, massive unfossiliferous, weakly argillaceous calclutites. Thin fossiliferous | Trace sphalerite (pink-brown) @ 112.5 m within 5 cm wide calcite vein. | | | | | |

64993

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101.50 | 116.00 | CON'T: horizons (oolitic, fine shelly debris) of grey calcarenite occur throughout but are more prevalent towards the base of the sequence. Core is heavily calcite veined from 112-115.8m. Minor sections of core badly broken. Minor zones of leached and porous core. Overall the sequence is more argillaceous compared to the cleaner calcilutites further up the hole. Trace sphalerite in calcite vein (5 cm wide) @ 112.50m Vein trends 35° to c.a. Tectonic breccia from 113.4 to 115.4 with angular fragments of host rock material cemented by dolomite/calcite. Dolomite is coarse grained & very crystalline. Bedding 41° to c.a. @ 107.2m; 56° to c.a @ 109.2; 46° to c.a. @ 116 metres. | Trace pyrite and sphalerite from 113.4 to 115.4 within brecciated sequence. | | | | | | | | | |
| HQ-NQ (118.0) | | | | | | | | | | | | |
| 116.00 | 121.00 | SLUMPED FOSSILIFEROUS CALCARENITES/ CALCLUTITES/DOLOMITES: Pisolitic (1-4mm diam.) grey calcarenites chaotically interbedded with slumpy dark grey weakly fossiliferous massive calclutites and black calcite cemented dolomite. Core strongly veined and weakly brecciated. Minor leached and porous sections Dolomite occurs as matrix within brecciated portions of core and is generally very coarse grained and crystalline. Core badly broken towards base of sequence - poor recoveries from 118-121 ≈ 20% with a cavity 118.5 to 119 metres. Core strongly stylolitized. | | | | | | | | | |
| 121.00 | 124.70 | Pb/Zn MINERALIZED CALCITE/ SIDERITE DOLOMITE BRECCIA: Dark grey to black, massive, calcite veinlated, very pyritic (as disseminations and veinlets) dolomitized dolomite angular breccia. The breccia has been healed by siderite/blebby galena which has been later invaded and cemented by coarse grained white calcite carrying a trace of coarse grained, diss- | 121-124 ≈ 5-7% pyrite + trace galena. 124-124.70 m 5% Pb+ 1% pyrite within calcite/siderite breccia. | 66283 | 121 | 122 | 1 | 4 | 4800 | 2100 | 2 | <4 |
| | | | | 66284 | 122 | 123 | 1 | 4 | 1.18% | 3300 | 4 | <4 |
| | | | | 66285 | 123 | 124 | 1 | 6 | 1.25% | 2600 | 5 | <4 |
| | | | | 66286 | 124 | 125 | 1 | 12 | 10.60% | 2700 | 42 | <4 |

092649

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 121.00 | 124.70 | CON'T: eminated galena. Core badly broken and pughy, recoveries poor ≈ 60%. Cavity @ 121.25 to 121.75 m. Core moderately to strongly calcite veined. | | | | | | |
| 124.70 | 137.85 | SLUMPED INTERBEDDED CALCLUTITES/ CALCARENITES/ DOLOMITE: slumped and soft sediment deformed, grey massive calclutites, light grey very fossiliferous (fragmental debris, shell fragments, colonial coral frags.) calcarenites, black calcite cemented, laminar pyritic dolomite, and minor very laminar grey white calclutites and micrites. Bedding contacts are very contorted with rip up clasts being very apparent, load casting evident and with coralline debris is evidence for slumping. Core moderately to strongly calcite veined, both perpendicular to and parallel to bedding. Most veins are 1-3 mm wide but are up to 5 cm in width, comprised of coarsely crystalline calcite. Core mod. stylolitized. Possible graded bedding indicating sequence young up hole. Bedding 53° to c.a @ 126.6m 45° to c.a @ 137 metres. | | | | | | |
| 137.85 | 140.40 | FRAGMENTAL FOSSIL BRECCIA: Numerous, rounded oval, concretionary layered oncoliths and pisolites are mixed with small and large fragments of predominantly colonial corals, chaotically and randomly set within a black calcite cemented, occasionally speckled white (fragmental debris) dolomite. Along with the abundant fossils are intraclasts of host rock calclutites and to a lesser extent dolomite and calcarenite set also in the dolomite matrix. Core strongly calcite veined with a trace of siderite as very thin <0.50 mm veinlets. | | | | | | |

E 2699

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 140.40 | 143.70 | INTERBEDDED DOLOMITE / CALCLUTITE: Thickly bedded, massive to laminar black carbonaceous and argillaceous, pyritic calcite cemented dolomite is interbedded with dark grey micritic massive weakly fossiliferous calclutites. Minor fossiliferous calclutites and light grey calcarenites. Dolomite has numerous zones containing fragmental white fossil debris (corals, shells) giving speckled white appearance. Tectonite breccia @ 141.4 calcite minor pyrite filled. Minor calcite veining. | Minor pyrite in calcite healed breccia. | | | | | |
| 143.70 | 151.30 | FRAGMENTAL FOSSIL BRECCIA: Abundant angular stromatoporoid, colonial coral, fragmental debris, concretionary pellets and angular intraclasts of micrites, calclutites and fragmental shelly calcarenites are chaotically and randomly set within a fragmental, black, calcite cemented dolomite matrix. Pyrite 1-2% as disseminated blebbs and fine veinlets throughout the dolomite matrix or at contacts between dolomite and intraclasts. Large fossil fragments vary in size from 2-5 cm up to 10-15 cm±. Core weakly calcite veined but strongly stylolitized especially at fragment and intraclast contacts. | Minor fine disseminated and veinlated pyrite ≈ 1-2%. | | | | | |
| 151.30 | 157.60 | LAMINAR CALCLUTITES / MICRITES / DOLOMITE: Interbedded fawn grey to dark grey, very laminar, (lamellae 0.1mm to 0.5 cm in width) occasionally ripple bedded, in part weakly soft sediment deformed weakly quartzose calclutites and micrites with minor interbeds of speckled white calclutites (due to calcite infilling of ovoid casts). More massive black calcite cemented argillaceous (fine to medium grained) dolomite, thickly bedded with light grey massive quartzose (well sorted, fine grained) calclutites occurs from 153.6 to 155.6 metres passing back into a interbedded | | | | | | |

64929

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 151.30 | 157.60 | CON'T: sequence of thicker laminar black dolomites, micrites and lighter grey weakly quartzose calclutites. Lamellae are slightly more intensely soft sediment deformed. Core weakly calcite veined. Tectonic breccia @ 153.8 ± 5cm wide, Core badly broken due to parting along bedding and cleavage planes. Bedding: 45° to c.a. @ 152.6; 44° to c.a @ 157.20 metres. | | | | | | |
| 157.60 | 160.50 | PISOLITHIC FRAGMENTAL CALCARENITE: Massive, light grey, heavily stylolitized, very pisolithic (concretionary layered, pea sized rounded balls) fragmental debris matrixed calcarenite. Stylolites comprised of wriggly carbonaceous filled very thin veinlets. Minor part of core has speckled white texture due to calcite filled ovoid casts. Minor crystalline fawn pink carbonate interlayed with calcarenite, possibly ferroan dolomite? Very weak calcite veining. Unit grades downhole into a slumpy horizon containing more dolomite interbeds. | | | | | | |
| 160.50 | 172.00 | SLUMPED FOSSILIFEROUS CALCLUTITES/ DOLOMITE / PISOLITHIC CALCARENITES: Massive unfossiliferous and fossiliferous fragmental grey calclutites contortedly interbedded with slumpy black, weakly fossiliferous, speckled white, pyritic dolomite and pisolitic and skeletal calcarenites (generally 5-7cm in width but thinner beds are evident) Numerous large fragments of colonial corals 5-15 cm in width appear to be slumped into position as do a number of smaller intraclasts. Core cut by numerous very thin veinlets of calcite (0.5 to 2mm wide). Contorted and slumpy textured dolomite / calclutite contacts generally strongly stylolitized. | Trace pyrite | | | | | |

649213

DRILL LOG HOLE No. ZT-81A-7 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 172.00 | 177.00 | INTERBEDDED LAMINAR CALCLUTITES / DOLOMITE AND MASSIVE CALCLUTITES: Interbedded very laminar (lamellae from 0.1mm to 1-2 mm) white and dark grey micritic calc-lutites and speckled white, massive, light grey, pyritic, calcarenites with minor more massive to weakly laminar black to dark grey, calcite cemented, argillaceous dolomite. Bedding: 45° to c.a. @ 176.6 metre. | Trace pyrite | | | | | |
| 177.00 | 197.00 | RHYTHMICALLY INTERBEDDED DOLOMITE / CALCLUTITE: Black, weakly laminar to massive calcite cemented argillaceous pyritic, thinly bedded (15-20 cm) dolomite is rhythmically interbedded with massive weakly fossiliferous fragmental, grey calclutites and minor very fossiliferous calcarenites. Core weakly to moderately calcite veined, microfaulted and slickensided. Minor blebby pyrite along with fine grained, disseminated, syngenetic pyrite observed at 184.5 m and 182.4 metre occuring in beds from 2-5 mm in width. Bedding: 50° to ca @ 182.4 a 35° to c.a @ 175.7m | Syngenetic fine grained disseminated pyrite @ 182.4, 184.35 as fine interbeds ± 2-5mm wide. Blebby py also. | | | | | |
| 197.00 | 199.60 | FOSSIL INTRACLAST BRECCIA: Fragmental fossil debris (crinoids, corallite, marine plants, and pisolite debris) along with sub angular intraclasts are set in a fragmental black, calcite cemented pyritic dolomite. Intraclasts generally comprised of light grey massive unfossiliferous calclutite & of very fossiliferous calcarenites. Contact boundaries are mod. stylolitized. | Minor pyrite | | | | | |
| 199.60 | 211.40 | SOFT SEDIMENT DEFORMED DOLOMITE / CALCLUTITE / CALCARENITE: Interbedded grey to dark grey and black fossiliferous to un-fossiliferous dolomites, calclutites and calc-arenites. Dolomite is foliated, black, calcite | Minor pyrite as blebbs and infillings (209.8) | | | | | |

64692

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 199.60 | 211.40 | CON'T: cemented and weakly pyritic whereas the calclutite is generally weakly fossiliferous (pelletal 1-2mm to 1.5 cm diam, concretionary layers occasionally pyritized, crinoidal, shelly, corallic with minor white micritic intraclasts) grey, pyritic, foliated and slumpy textured. Core is heavily stylolitized parallel to bedding (cleavage??). Calcarenites are generally light grey in colour, coarse grained, fossil fragmental, pyritic in beds from 3-5 cm to 25 cm in width. Core from 210 to 210.80 comprised of fossil intraclast Breccia, dolomite matrixed. Core weakly calcite veined with minor brecciation @ 203.60 m. and 209.7 metres Bedding 57° to ca @ 206.4 m. Cleavage: 42° to ca @ 209.4 metres. | | | | | | |
| 211.40 | 213.90 | CALCARENITE: Coarse grained fragmental and lithic, light grey, heavily stylolitized clean calcarenite. Fragmental debris comprised of shells, crinoids, minor corals with numerous white/cream microcrystalline lithic carbonate intraclasts up to 2cm in length. Stylolitization is manifest by thin <1mm wide black carbonaceous filled contorted lamellae. Core mod. to strongly calcite veined. Unit very massive, textureless with no bedding. Dolomitization is pervasive throughout matrix with coarse grained, white cream crystalline dolomite occurring as aggregates. | Trace sphalerite as blebbs @ 211.50 m. | | | | | |
| 213.90 | 231.40 | INTERBEDDED CALCLUTITE/CALCARENITE/DOLOMITE: Rhythmically interbedded but soft sediment deformed grey massive weakly pyritic calclutites 5-10 cm in width grey to light grey very fossiliferous (fragmental shelly and marine plant debris) fragmental calcarenites, 2-5 cm in width in a black micritic matrix and thin (<2cm) black | Trace pyrite on fracture surfaces. | | | | | |

62969

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213.90 | 231.40 | CON'T: calcite cemented, unfossiliferous, med. grained, weakly carbonaceous pyritic dolomite. Minor secondary dolomitization, occassionally replacing fossil casts. Weak to mod calcite veining with minor brecciation @ 225.7, 229.15. Dolomite & fossil content increasing slightly downhole. Minor sub angular to sub rounded intraclast fragments (white, comprised of coarsely crystalline calcite) Core becoming more broken downhole. Graded bedding indicating sequence younging up hole. Bedding: 55° to c.a. 218.8 metres. | | | | | | | | | | |
| 231.40 | 233.80 | FOSSIL INTRACLAST BRECCIA: Weakly fossiliferous (corallite and shelly debris) intraclastic (grey/white microcrystalline micritic clasts and calcarenitic clasts) calclutite / dolomite matrixed slump breccia. Moderately to strongly calcite veined, strongly stylolitized and weakly pyritic but strongly dolomitized with coarse grained crystalline dolomite (white/cream - pervasive throughout) Bedding chaotic and very contorted. | Trace pyrite | | | | | | | | | |
| 233.80 | 247.65 | SOFT SEDIMENT DEFORMED CALCLUTITES / DOLOMITE: Thinly interbedded massive and weakly, fossiliferous grey (speckled white) calclutites with minor very fossiliferous coarse grained calcarenites and rhythmically interbedded black calcite cemented weakly pyritic dolomite (< 2cm wide). Core is very soft sediment deformed with contorted and chaotic bedding and contains minor corallite debris and numerous rounded intraclasts. Unit is heavily dolomitized and moderately pyritic. Core is strongly to very heavily calcite veined and brecciated with associated minor py/sphalerite mineralization. Major breccia from 244.0 to 245.8 is coarse grained broken calcite | Minor pyrite and sphalerite in calcite breccia: 244.35 - 244.55 ± 2.5% Zn 245.30 - 245.80 ± 1.5% Zn + pyrite. | 66293 | 244.00 | 245.00 | 1.00 | 8 | 280 | 1.10% | 1 | <4 |
| | | | | 66294 | 245.00 | 245.80 | 0.80 | 16 | 740 | 2.30% | 1 | 10 |

649246

DRILL LOG HOLE No. ZT-81A-7 PAGE 12 OF 13

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 233.80 | 247.65 | CON'T : carbonaceous infilled with minor pyrite, ± 2%, and minor sphalerite ± 1%. Higher grade sections of pink/red sphalerite with ~2-5% yellow/gold tarnished pyrite occurs from 244.35 - 244.55 assaying ± 2.5% Zn and 245.8 - 245.3 metres estimated to assay 1.5% Zn. Zinc occurs as coarse grained blebbs or as very fine pink disseminations (colloform textured). | | | | | | |
| 247.65 | 248.00 | CALCAREOUS QUARTZ ARENITE : Rounded, coarse grained, well sorted, pyritic, white to grey to grey beige, calcite cemented quartzose arenites containing thin lamellae of mixed carbonate/argillite composition. Core is weakly to moderately pyritic (~3%). Unit is laminar and well bedded. Bedding 60° to c.a. @ 248 m. Pyrite content overall ~ 3% but thinner intervals contain up to 10%. Two types of pyrite 1) brassy yellow 2) silvery yellow. The latter is very fine grained. | Pyrite ± 3% | | | | | |
| 248.00 | 249.70 | LAMINAR AND SPECKLED CALCLUTITES / DOLOMITE : Thinly bedded to laminar and speckled light grey calclutites and dark grey to black iron rich (rusty oxidation) calcite cemented dolomite. Speckled texture due to calcite infilling of ovoid casts or vughs. Laminations have been subjected to overprinting by cleavage foliation. Minor slippage and slickensiding along foliation. Trace pyrite as smears on cleavage faces as well as cubic fine grained disseminations. Core weakly to moderately calcite veined, with minor siderite, trace sphalerite. Bedding: 58° to c.a. @ 248.5 metres. | Minor pyrite, trace sphalerite. | | | | | |

64921

DRILL LOG HOLE No. ZT-81A-7 PAGE 13 OF 13

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 249.70 | 254.00 | INTERBEDDED CALCLUTITE/DOLOMITE/CALCARENITE: Light grey massive, weakly fossiliferous calc ites from 2-10 cm in width interbedded with laminar to massive, pyritic and carbonaceous calcite cemented thin, <2cm width, dolomites with minor grey, generally ≈5cm thick, very fossiliferous shelly calcarenites. Minor oolites and other fragmental debris. Core moderately calcite/siderite veined. Minor stylolitization. Trace pyrite. Core more laminar and dolomitic towards base of unit. Bedding 53° to c.a. @ 251m; 55° to c.a. @ 253.7m | Trace pyrite as fracture coated smears. | | | | | |
| END OF HOLE 254 Metres. | | | | | | | | |

64926

649249

SW

NE

750N

Limestone Quarry

Austral Creek

Pyrite slimes

Creek

Creek

Alluvium

ZT-81A-7

750N - 1535E 218°M

Hole collar

Section bearing 218°M

50m

100m

150m

200m

50·2-52·2m = 2m of 1·4%Pb
0·16% Zn, 42·5 g/tAg

122-125m = 3m of 4.34%Pb, 0·29%Zn, 17g/t Ag
including
124-125m = 1m of 10·60%Pb, 0·27%Zn, 42·0g/tAg

244-245·8m = 1·8m of 0·06%Pb, 1·89%Zn, 1g/tAg

TD 250m

Amoco Minerals Australia Company

# ZEEHAN PROJECT
# A-78-60
# EL 4/78, TASMANIA

PROSPECT: AUSTRAL

# CROSS SECTION
# DRILLHOLE ZT-81A-7

Scale: Vertical and horizontal - 1:1000

5 cm

## Legend

| | |
|---|---|
| Limestone | 1 |
| Dolomite..... (breccia) | 2 |
| Fossil breccia | 3 |
| Slump breccia | 4 |
| Sandstone | 5 |
| Siltstone | 6 |
| Shale | 7 |
| Mineralization and/or ironstone | 8 |
| Siderite/calcite/ankerite/breccia | 9 |
| Laminar limestone | 10 |
| Slumped limestone | 11 |
| Conglomerate | 12 |
| Calcite/siderite veins | Ca/Sd |

Vein orientation unknown

Vein orientation accurate

Brecciation (tectonic)

Zone of Pb/Zn Ca/Sd mineralization

REPORT 279

M82-1849

649250

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-81A-8

| | | |
|---|---|---|
| Location | : | 1030.5N : 1340E |
| Declination | : | 45° |
| Azimuth | : | 270°G |
| Total Depth | : | 150 meters |

Assay Results

12 - 13 = 1m @ 3.30% Pb + 5.30% Zn + 23.0g/t Ag

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT-81A-8 — PAGE 1 OF 9

| | | | | BORE HOLE SURVEY | | | INSTRUMENT Eastman Single Shot | | |
|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN - TAS No. A7860C | ELEVATION meters | COMMENCED 1 DEC' 81 | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing |
| PROSPECT AUSTRAL · EZ/JV AREA | DIP COLLAR 45° GW. | COMPLETED 5 DEC' 81 | | 50 | 44 | 237 | | | |
| CO-ORDINATES 1030.5 mN 1340 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 150.8 meters | | 100 | 43.5 | 241 | | | |
| BEARING 249° TN 238° MN 270° GN | LOGGED BY P. A. JONES | Machine Used: MINDRILL 10L A.D.D. Pty Ltd | | 150 | 43.5 | 242 | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 12.00 | GRAVEL: Fluvio-glacial, white to pink, very quartzose, sandy peat matrix. | | | | | | | | | | |
| HW-HQ Coring | | | | | | | | | | | | |
| 12.00 | 24.20 | FOSSIL INTRACLAST BRECCIA: Angular to sub-angular, white to cream, fossil fragments (including stromatoporoids, colonial corals, minor shelly debris, crinoids, plus crinoid flower stems?) and intraclast fragments (very fine grained, microcrystalline white, chert textured, calcilutites and calcimicrites) set within a very fossiliferous (fragmental debris - speckled white appearance) black, carbonaceous and argillaceous, weakly pyritic calcile cemented, medium grained dolomite. Large fossil fragments vary in size from 0.5 cm to 5-25cm in width. Smaller debris generally well fragmented. Slump breccia has vague but ordered bedding texture. Unit is pervasively and weakly veined by thin calcite/siderite minor Zn/Pb veinlets, either cutting c.a. @ 5-15° or cross cutting core @ 40-50°. Sphalerite is red/brown and very coarse grained and galena is more discrete + finer grained disseminations. Estimated to average 5% Pb/Zn from 12-13 metres. Values up to but not exceeding 1% are found throughout the rest of the unit. The Pb/Zn mineralization is allied with extensive dolomitization. The dolomitized material is coarse grained compared to medium grained primary dolomite. Core moderately stylolitized. Minor very weathered, leached and porous sections. Initial core recoveries low due to weathering. (12-17m) Cavity 15.8 to 16.30 metres. | ≃ 5% Zn/Pb @ 12-13m with trace pyrite.<br><br>Trace to minor Zn/Pb in thin veinlets throughout rest of sequence. | 66295 | 12.00 | 13.00 | 1.00 | 55 | 3.30% | 5.30% | 23 | 10 |
| | | | | 66296 | 13.00 | 14.00 | 1.00 | 14 | 7000 | 640 | 5 | 10 |

E2969

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 24.20 | 30.60 | LAMINAR AND SPECKLED MASSIVE CALCLUTITES AND DOLOMITES: Weakly laminar black dolomites and grey calclutites are interbedded with thinly bedded grey, speckled more massive calclutites, very fossiliferous calcarenites and more thickly bedded, laminar, black carbonaceous and argillaceous weakly calcite cemented dolomites. Bedding is weakly contorted due to minor soft sediment deformation but is masked by cleavage foliation. Minor sections very porous and leached due to weathering. Core very weakly calcite veined. Speckled core due to calcite infilling of casts or vughs. Trace to minor pyrite as disseminations and blebbs. Fossiliferous horizons generally <2cm in width. Cavity from 27.8 – 28.6 m: Bedding: 43° to c.a. @ 24.9; 55° to c.a. @ 30.55 metres. | Trace to minor pyrite | | | | | |
| 30.60 | 40.90 | SLUMP TEXTURED CALCLUTITES/DOLOMITE/CALCARENITE: Slump textured and contortedly interbedded, massive, weakly to very fossiliferous (speckled white due to fragmental debris) grey calclutites, very fossiliferous pisolitic and oucalithic (concretionary oucaliths from 4mm diam to 1.5cm diam.) fragmental calcarenites (Minor fragments infilled with coarse grained calcite) and black medium to coarse grained, thinly bedded (<2cm) calcite cemented, argillaceous dolomite. Dolomite interbeds are chaotically oriented & along with such features as large coralline fragments, pisolites and oucalites, and the overall deformed texture indicates slumping. Core is weakly calcite veined, minor siderite, and are generally transgressive to bedding. Core heavily dolomitized (especially pisolitic calcarenite). Cavity 37.0 – 37.2 metres. Minor ferroan dolomite pink/red in colour. Bedding: 56° to c.s. @ 33.70m. | Trace pyrite<br>Trace yellow framboidal sphalerite disseminated @ 39.25 metres. | | | | | |

64922

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | Pb | Zn | Ag | Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40.90 | 44.40 | LAMINAR CALCLUTITES / DOLOMITE: Very fine grained laminae of calclutites and dolomite with minor calcarenites are rhythmically interbedded in the the laminar unit which progressively becomes less laminar down hole, but more thinly bedded. Within the laminations are very fine grained pyrite layers (ironstained after oxidation) Both dolomite and calcarenites are fine grained. Minor thin beds show folding or slumping textures within a sequence of quiescent formed carbonates indicating localized slumping or local erosion and infilling. Core is weakly calcite veined. Bedding: 53° to ca. @ 41.5 m; 48° to ca. @ 44.3 m. Core weakly stylolitized. | Laminar bedded fine grained pyrite 1-2% Minor blebby pyrite. | | | | | | | | | |
| 44.40 | 47.90 | SOFT SEDIMENT DEFORMED CALCLUTITES / DOLOMITES / CALCARENITES: Thinly interbedded (1-4 cm in width), grey, weakly fossiliferous, calclutites, black, massive to laminar, calcite cemented dolomites and grey very fossiliferous fragmental calcarenites. Interbeds are very contorted with wispy texture. Minor ghosting textures as dolomite units seem to merge with calclutites etc. Lot of white fine grained fragmental debris (lot of coralline, marine plant, pisolites and intraclasts) | Minor pyrite veinleting. | | | | | | | | | |
| 47.90 | 56.60 | RHYTHMICALLY BEDDED DOLOMITE/CALCLUTITE: Rhythmically interbedded massive to weakly laminar weakly to unfossiliferous grey to dark grey calclutites and micrites and black calcite cemented argillaceous, medium grained pyritic dolomites. Interbeds vary in width from 2cm to 15cm and have sharp well defined bedding contacts. Minor fossil debris within calclutites comprised mainly of fern like (1-2mm across by 2cm in length) marine plant fragments. These fragments have been replaced by exceptionally | 5% Pb/Zn mineralized siderite/calcite breccia from 50.60m-50.95m. Sphalerite minor galena replace fossil fragments within calclutites. 1-2% Pyrite - brassy yellow in colour, as discrete fine grained cubes. | 66297 | 48.00 | 49.00 | 1.00 | 6 | 470 | 1800 | 1 | 4 |
| | | | | 66298 | 49.00 | 50.50 | 1.50 | 6 | 1050 | 4100 | 1 | 8 |
| | | | | 66299 | 50.50 | 51.00 | 0.50 | 16 | 4800 | 4400 | 5 | 10 |
| | | | | 66300 | 51.00 | 52.00 | 1.00 | 8 | 570 | 1350 | 2 | 8 |
| | | | | 66451 | 52.00 | 53.00 | 1.00 | 6 | 175 | 1300 | 1 | 8 |
| | | | | 66452 | 53.00 | 54.00 | 1.00 | 6 | 165 | 770 | 1 | 6 |

649223

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 47.90 | 56.60 | CON'T: fine grained yellow/green sphalerite? and to a lesser extent by fine grained galena. Pyrite (1-2%) is also observed as disseminations, and to a lesser extent as fine veinlets. Pyrite is brassy yellow in colour and is generally finely cubic. Minor calcite veining and veinleting with associated minor red/pink coarse grained sphalerite mineralization. A massive lead/zinc mineralized siderite/calcite slickensided breccia occurs within the sequence @ 50.6 to 50.95 (35cm width) containing ≈ 5.0% Pb/Zn. Galena occurs as fine grained disseminations pervasive throughout (≈ 4% Pb) and has associated with it fine grained green/yellow sphalerite. Large coarse grained crystals of red sphalerite also occur, & generally contain minor galena inclusions. The texture of the siderite is colloform/mammillary with voids infilled by calcite. Brecciation is apparent with angular host rock dolomitic fragments occurring within siderite/calcite matrix. Fragments are up to 15cm in diam. Contacts between vein and host rock are weakly bleached and recrystallized. Dolomites either side contain abundant disseminated galena blebbs ≈ 1.5% galena and minor fossil replaced sphalerite. Minor thin shelly calcarenite, horizons are observed towards the base of the unit. Core weakly stylolitized but moderately foliated. Bedding: 55° to ca @ 49.5m; 55° to ca @ 52.8m. | Minor (≈ 1.5% galena) galena occurs as fine disseminated blebbs throughout hanging-wall and footwall sequences. | | | | | |
| 56.60 | 70.40 | INTERBEDDED FOSSILIFEROUS CALCLUTITE/CALCARENITE/DOLOMITE: Thinly interbedded (generally from 1-5cm in width, but may be up to 20cm) very fossiliferous (coralline fragments, fern like marine plant frags., shelly frags., with numerous pisolites, oncolites, and oolites - all debris whit to light grey) massive to weakly laminar grey to dark grey, soft sediment deformed | 2-3% disseminated and blebby pyrite. Sphalerite 62.2 - 62.25 with ≈ 5% Zn as yellow green coarse grained zoned crystals within dolomitized core. | | | | | |

649254

DRILL LOG HOLE No. ZT-81A-8 PAGE 5 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 56.60 | 70.40 | CON'T: calclutites, calcarenites and black carbonaceous, calcite cemented, fine grained dolomites. All rock types are pyritic, averaging 2-3% overall, however, concentrates mainly in calclutites. Pyrite occurs as disseminations and fine blebbs and veinlets and varies in colour from silver/yellow (fine grained) to golden yellow (coarse grained). It is also found running contacts between frags and or interfaces between rock types. Numerous sections of core dolomitised (coarse grained, white, crystalline, occasionally pyritic with trace sphalerite @ 62.2 metres). Core from 56.6 - 64.5 m comprised predominantly of coarse fossiliferous fragmental units but grade down hole into more finely fragmental material. From 67.4 to 69.2 core is an intraclastic breccia. Slump breccia frags. are comprised of rip up clasts of white coarsely crystalline (replaced ?) calcarenites, contortedly and chaotically deposited in a predominantly pyritic, fragmental dolomite matrix. Fragments are generally 2-4 mm across by up to 5-10 cm in length. (occasionally laminated). Core weakly calcite veined (1 major vein @ 60.80 m, calcite/carbonaceous infilled). Core moderately stylolitized. Bedding attitudes unobtainable due to slumpy, deformed and very wavy and irregular contacts. | | | | | | |
| HQ - NQ (75.0) | | | | | | | | |
| 70.40 | 78.30 | SLUMPED CALCLUTITE / CALCARENITE: Slumped and deformed, massive, light grey, unfossiliferous and very fossiliferous (minor corals, shells and other fragmental debris) calclutites and speckled calcarenites with numerous interbeds of very thin (<2cm average) carbonaceous, almost entirely dolomitised, black calcite cemented dolomite. Calclutites predominate early but become progressively more fragmental until passing into a calcarenitic sequence towards the base of the unit. The dolomite interbeds are chaot- | Trace to minor pyrite generally as blebbs.<br><br>Trace galena @ 75.95 within calcite/siderite vein. | | | | | |

64923

DRILL LOG HOLE No. ZT-81A-8 PAGE 6 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 70.40 | 78.30 | CON'T: ically and irregularly distributed throughout the zone. The dolomitized portions tend to have ghosted contacts compared to the sharper contacts of the carbonaceous dolomite. Core weakly pyritic, but moderately to strongly stylolitized. Calcite vein with trace sideite and galena @ 75.95. Calcite/sideite angular tectonic breccia (= 5-10 cm wide) @ 75.05 metres. No bedding attitudes due to slumpy texture to core. | | | | | | |
| 78.30 | 91.30 | FRAGMENTAL INTRACLAST FOSSIL BRECCIA: Chaotically and randomly distributed angular to sub rounded intraclasts (composed of calcilutites, calcarenites and minor dolomites) and very fragmental fossil debris (colonial corals, stromatoporoids, shells, crinoids) including oncolites, pisolites minor oolites set within a black, calcite cemented, very fragmental and fossiliferous carbonaceous dolomite matrix. Dolomite matrix is pyritic (finely disseminated). Varies from medium to coarse grained, the latter possibly due to dolomitization. Core highly Stylolitized. Numerous sections of core containing abundant concretionary oncolites, pisolites and pellets, the latter generally = 3mm in diam. Pisolites generally having coralline fragments as nuclei around which concretionary layers have accumulated. They range up to 2-3 cm in diam. and may be both round and ovoid in shape. Core mod. to strongly calcite veined. Core is cut by a myriad of thin & 1-3 mm wide, calcite veinlets being more prominent from 78.3 - 84.5 metres. Large fragments or rip up clasts varying from 20 cm up to 60 cm in length occur sporadically throughout the zone. | | | | | | |

64926

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 91.30 | 108.45 | SOFT SEDIMENT DEFORMED CALCLUTITE/ DOLOMITE: Slumpy textured, soft sediment deformed, chaotically interbedded, sequence of massive weakly fragmental to unfossiliferous, light grey calclutites and black, irregularly and wavy bedded black to dark grey, laminar and massive, weakly fragmental dolomite. Minor dolomitization and minor ghosted contacts between dolomite and calclutite. Minor thin horizons of very fossiliferous calcarenites. Core moderately calcite veined and brecciated from 91.7 to 97.90; 95.8; 101.60 (the latter with trace sphalerite - pink/red). | Trace sphalerite 101.6 metres within calcite filled brecciated vein. Is coarse grained - pink - red. N | | | | | |
| 108.45 | 110.95 | FRAGMENTAL FOSSIL INTRACLAST BRECCIA: Angular to sub angular, massive to laminar, white to light grey intraclasts (calcarenites, calclutites and micrites) and fragmental fossil debris (including colonial corals, shells, crinoids and minor pisolites) are deposited within a black, carbonaceous, foliated, weakly pyritic, coarse grained, crystalline (cream/white coloured) moderately calcite cemented dolomite matrix. (possibly recrystallized). Intraclasts vary in size from 0.5cm to 5-7cm in length. Core moderately to strongly stylolitized with the carbonaceous material filling the stylolitites. A trace pink/yellow fine grained sphalerite occurs within the dolomite matrix. | Trace pink-yellow sphalerite within dolomite matrix. Trace pyrite. | | | | | |
| 110.95 | 120.80 | INTERBEDDED CALCLUTITES/CALCARENITES/ DOLOMITE: Massive grey, very competent calclutites are interbedded with very fossiliferous, light grey shelly calcarenites and very thin laminar fine to medium grained black crystalline calcite cemented dolomite. Calclutites generally from 2-7cm in width, are weakly fossiliferous (occaissionally oolitic) and calcarenites are | | | | | | |

DRILL LOG HOLE No. ZT-81A-8 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 110.95 | 120.80 | CON'T: usually 1-10 cm in width. Dolomites generally vary from 0.3 cm to 2 cm in width. Core weakly to moderately calcite veined, both parallel and perpendicular to bedding. Calcite breccia's @ 113.85, 114.75. Core shows signs of load casting and minor current erosion. Minor soft sediment deformation. Minor stylolitization. Bedding 48° @ 112 m; 53° to ca @ 119.30 metres. | | | | | | |
| 120.80 | 134.60 | SOFT SEDIMENT DEFORMED CALCLUTITE / DOLOMITE / CALCMICRITE / CALCARENITE: Inter-bedded, massive, unfossiliferous grey calclutites speckled white fragmental grey calcarenites, black laminar and contorted dolomites and microcrystalline, laminar, heavily stylolitized, beige/white/grey calcmicrites (occasionally speckled white). Bedding contacts very irregular and contorted (slumpy textured) due to soft sediment deformation. Moderate to strong calcite veining. Bedding in relatively undeformed section of unit 49° to c.a. @ 127.9 m; 50° to @ 126.4 metres. | Trace blebby pyrite within calcite filled vughs? | | | | | |
| 134.60 | 136.15 | FRAGMENTAL FOSSIL INTRACLAST BRECCIA: Large, white to light grey fragments of colonial corals (5-15 cm in length) along with other abundant fragmental debris and numerous angular intraclasts are set within a fine to medium grained, crystalline, black, carbonaceous, calcite cemented dolomite matrix. A number of intraclasts and numerous fossils contain extremely fine grained disseminated pyrite. Trace fine grained disseminated pink sphalerite throughout matrix. Core moderately calcite veined. | Disseminated fine grained pyrite. Trace fine grained pink sphalerite. | | | | | |
| 136.15 | 150.80 | SOFT SEDIMENT DEFORMED DOLOMITE / CALCARENITE / CALCLUTITE: Laminar to massive | | | | | | |

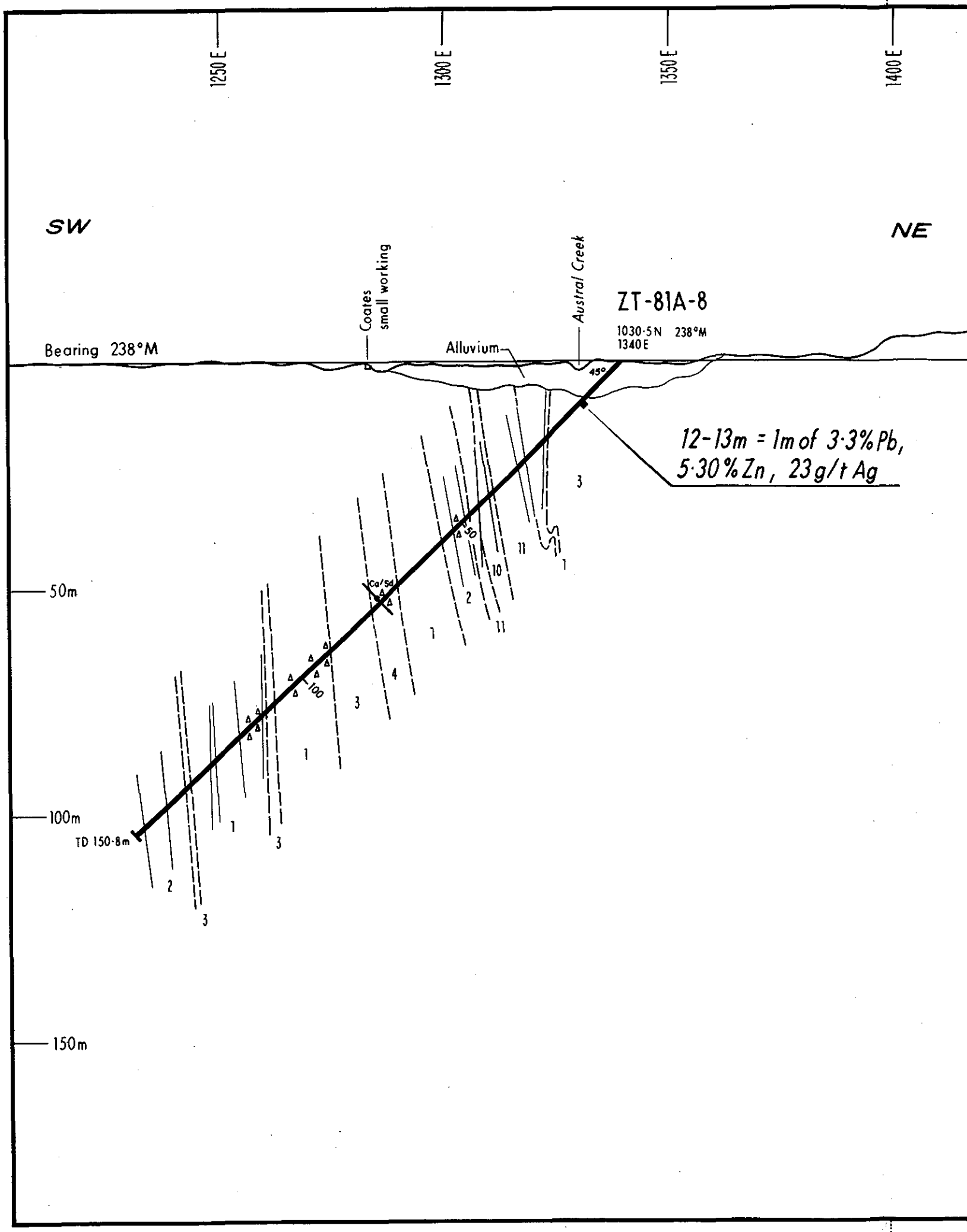
82G 6 SE

DRILL LOG HOLE No. ZT-81A-8 PAGE 9 OF 9

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 136.15 | 150.80 | CON'T: fragmental to unfossiliferous, black, carbonaceous, weakly pyritic dolomites from 2-3 mm to 5 cm in width and grey foliated, pelletal textured, very fossiliferous (shells, crinoids, pellets) calcarenites are interbedded with light to dark grey foliated, massive to weakly laminar, occasionally fossiliferous (fragmental debris) calclutites. Core is moderately soft sediment deformed and weakly tectonically deformed. Section of core from 144.2 - 145.3 m comprised of massive, textureless, grey calclutites interbedded with very laminar black very fine grained dolomite. Core overall has weak, pervasive dolomitization manifest by aggregates of coarse grained, crystalline white dolomite. Core weakly calcite veined, minor stylolitization. Bedding: 51° to c.a. @ 142 m, 52° to c.a. @ 150.2 metres | | | | | | |
| END OF HOLE | | 150.80 metres. | | | | | | |

64925

649260




Amoco Minerals Australia Company

# ZEEHAN PROJECT
# A-78-60
# EL 4/78, TASMANIA

**PROSPECT: AUSTRAL**

# CROSS SECTION DRILLHOLE ZT-81A-8

**Scale: Vertical and horizontal - 1:1000**

5 cm

## Legend

| | | |
|---|---|---|
| Limestone | 1 | 33 |
| Dolomite.....(breccia) | 2 | 29 |
| Fossil breccia | 3 | 46 |
| Slump breccia | 4 | 41 |
| Sandstone | 5 | 61 |
| Siltstone | 6 | 69 |
| Shale | 7 | 8 |
| Mineralization and/or ironstone | 8 | 14 |
| Siderite/calcite/ankerite/breccia | 9 | 12 |
| Laminar limestone | 10 | 37 |
| Slumped limestone | 11 | 28 |
| Conglomerate | 12 | 65 |
| Calcite/siderite veins | Ca/Sd | |

Vein orientation unknown — Ca

Vein orientation accurate — Ca

Brecciation (tectonic)

Zone of Pb/Zn Ca/Sd mineralization

REPORT 279

M82-1846

649261

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-81A-9

| | | |
|---|---|---|
| Location | : | 555N : 1500E |
| Declination | : | 45° |
| Azimuth | : | 242°G |
| Total Depth | : | 149.5 meters |

Assay Results

No Significant Mineralization

**Amoco Minerals Australia Company**

DRILL LOG — HOLE No. ZT-81A-9 — PAGE 1 OF 7

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT | ZEEHAN-TAS No. A7860 C | ELEVATION meters | COMMENCED 11 DEC '81 | BORE HOLE SURVEY | | | INSTRUMENT Eastman Single Shot | | | | | | | |
| | | | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | | |
| PROSPECT | AUSTRAL EZ/JV AREA | DIP COLLAR 45° GW | COMPLETED 15 DEC '81 | 50 | 45.5 | 206 | | | | | | | | |
| CO-ORDINATES | 555 mN 1500 mE | CORE SIZE HQ, NQ | TOTAL LENGTH 149.5 meters | 100 | 46 | 205 | | | | | | | | |
| BEARING | 221 TN 210 MN 242 GN | LOGGED BY P. A. JONES | Machine Used: MINDRILL 10L A.D.D. Pty Ltd. | 150 | 47 | 205 | | | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 0.00 | 3.50 | GRAVEL: White, quartzose, rounded, iron oxide stained, with peat, sandy matrix. | | | | | | |
| HW-HQ Coring | | | | | | | | |
| 3.50 | 7.50 | WEATHERED DOLOMITE: Light to dark grey (oxidised olive brown), fine to medium grained weakly rugby (rugbs infilled by calcite), massive dolomite. Core very broken with poor recoveries due to weathering. Minor sericite content indicative of argillaceous component. | Trace fine blebby pyrite. | | | | | |
| 7.50 | 11.20 | LAMINAR CALCMICRITE / DOLOMITE: Laminar, white to light grey calcareous argillaceous very weathered calcmicrite and dark grey very weathered (olive-brown) dolomites inter-bedded with minor more massive calcmicrites. Again poor recoveries (= 50-60%) due to extreme weathering. Bedding 60° to c.a. @ 10.30 metres. | | | | | | |
| 11.20 | 20.10 | SLUMPED CALCLUTITE / DOLOMITE / CALCARENITE: Very weathered, broken core comprised of slumped, and soft sediment deformed, grey to dark grey, massive and weakly fossiliferous calclutites, contorted and chaotically bedded fine to medium grained, black, massive, calcite cemented, dolomites and fossiliferous very fragmental (corals, and shelly debris) calcarenites. Section of core from 13.5 - 15.5 more a slumped fossil breccia. (lack of identification due to weathering). Numerous large coralline fragments present along with sub angular intraclasts. Core moderately calcite veined. | Trace pyrite. | | | | | |

29269

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 20.10 | 21.80 | LAMINAR CALCLUTITE / CALMICRITES : Thinly interbedded, very laminar, light grey to olive grey, very calcareous, weathered and porous, calclutites and darker grey calcmicrites. Core badly broken along bedding planes. lamellae from <1mm up to 4-5mm. Bedding 55° to c.a. @ 21 metres. | | | | | | |
| 21.80 | 35.50 | INTERBEDDED DOLOMITE / CALCLUTITE / CALCARENITE: Thickly interbedded, massive, black, very carbonaceous, pyritic, argillaceous weakly calcite cemented very fine grained dolomite varying from 1cm up to 15-20 cm in width, grey, massive, to weakly fossiliferous calclutites and light grey very fossiliferous calcarenites. The later generally thinly bedded, <5 cm in width. Core badly broken but good recoveries. Core weakly calcite veined with trace cream-siderite with trace sphalerite @ 33.40 m. Core from 31.00 to 31.30 very schistose with aligned sericite plates giving shimmering effect. Core probably foliated argillaceous dolomite due to overprinting by cleavage. Bedding 56° to c.a. @ 25 m ; 58° to c.a. @ 28.5 metres. | Minor very thin bedded pyrite lamellae within dolomite, minor disseminated pyrite within dolomite and minor coarse blebby pyrite generally within calcite veins and to a lesser extent within dolomite. Trace sphalerite @ 33.40 metres. | | | | | |
| 35.50 | 45.10 | INTERBEDDED PISOLITHIC CALCARENITES / DOLOMITE / CALCLUTITE : Thinly bedded (from 2-5cm in width) light grey, pisolithic, and oncolithic fragmental calcarenites are interbedded with, 1-5cm wide, black, massive, pyritic, carbonaceous, calcite cemented dolomites and minor grey massive calclutite. Core moderately soft sediment deformed with slumpy textured bedding contacts. Cleavage foliation also masking bedding. Core heavily stylolitized. Core moderately broken. Pisolites and oncolites represent concretionary layers of calcareous mud surrounding numerous | Minor to ≈ 1.5% disseminated pyrite within dolomites. Pyrite replaced layers occur around pisolites. | | | | | |

69263

DRILL LOG HOLE No. ZT- 81A - 9 PAGE 3 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 35.50 | 45.10 | CON'T: different nuclei including coral frags, crinoid essicles, host rock frags., and other fragmental debris. On numerous occasions these concretionary layers have been pyritized. Bedding 52° to c.a. @ 40.00 metres. | | | | | | |
| 45.10 | 46.50 | FRAGMENTAL CALCARENITE: Coquina textured fragmental (shells, crinoids, corals and other debris) speckled grey calcarenite with thin wispy and contorted dolomite interbeds. Part of unit weathered and is very porous and leached hence the beige grey colour. Wispy dolomite interbeds vary from 1-5 mm in width. | | | | | | |
| 46.50 | 64.90 | SOFT SEDIMENT DEFORMED FOSSILIFEROUS CALCLUTITES / DOLOMITE: Grey, generally massive, weakly fossiliferous (coral, shelly and other fragmental debris and minor pisolites and oncolites.) moderately stylolitized, soft sediment deformed and slumpy textured calclutites with thin interbeds of black fine grained, calcite cemented, carbonaceous dolomite. Very minor and thin interbeds of very fossiliferous calcarenites. Core badly broken and shattered near two calcite healed angular breccia's. Breccia's from 52.2 - 52.4 (calcite healed); 54.30 - 54.80 (calcite / pyrite healed); 59.20 - 61.50 (angular + calcite, minor pyrite healed). Core moderately calcite veined apart from breccia's. Cavity from 50.2 to 52.0 metres. Core weakly dolomitized from 46.5 to 48.5. Core moderately fossiliferous, somewhat like fossil breccia horizons but with less debris and more matrix, from 63.5 to 64.9 metres. | Minor pyrite in calcite healed angular breccia's | | | | | | |
| 64.90 | 84.20 | SLUMPED CALCLUTITE / DOLOMITE / CALCARENITE: | Sphalerite (pink) as fine | | | | | |
| HQ → NQ (75m) | | Soft sediment slumped, and contortedly inter- | rounded disseminations | | | | | |

64926

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 64.90 | 84.20 | CON'T: bedded, gray, massive, weakly fragmental and pyritic calcilutites, light grey fossiliferous to unfossiliferous calcarenites and black, fine grained, calcite cemented, carbonaceous, dolomite. Core weakly dolomitized with coarser grained, white, crystalline, dolomite aggregates pervasive throughout unit. Core weakly to moderately veined. Trace galena / sphalerite @ 75.2 m and 76.00 m. and 76.3m Calcite minor siderite vein breccia @ 73.20 - 73.50 metres. Unit contains numerous large colonial coral fragments, gastropod casts, and other fragmental debris with sections of unit being very slump brecciated with angular fragments chaotically set within a dolomite matrix. Material appears to have been partly solidified then ripped up and redeposited within the fine dolomite matrix. slump breccia with exotic intraclasts from 77.20 to 77.50 metres. Massive calcite vein from 77.70 - 78.60 metres. | Galena as fine grained to coarse grained aggregates. | | | | | |
| 84.20 | 86.40 | FOSSIL INTRACLAST BRECCIA: Angular intraclasts and subrounded coralline debris are deposited within a medium grained, calcite cemented black, carbonaceous dolomite matrix. Coralline fragments up to 2cm in diameter. Minor pyrite. Bedded fine grained pyrite @ 85.9 m intermixed with yellow / brown argillaceous material. Fine fossiliferous material comprised of fragmental shelly coralline and crinoidal material with minor pisolites. Core badly weathered in narrow sections giving porous and leached texture. | Trace pink sphalerite (coarse grained) in calcite filled vugh. Minor pyrite. | | | | | |
| 86.40 | 96.00 | RHYTHMICALLY INTERBEDDED CALCILUTITES/ DOLOMITES / CALCARENITES: Interbedded grey massive unfossiliferous calcilutites, very fossili- | Trace disseminated pink-brown sphalerite. Trace to minor pyrite. | | | | | |

64969

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 86.40 | 96.00 | CON'T: erous fragmental calclutites, black calcite cemented, fine grained dolomite and light grey very fossiliferous, pisolites and oncolitic fragmental calcarenites. Graded bedded, calcareous quartz arenites occur in the sequence from 95.5 to 96.00 metres with the unit younging up the hole. Minor argillaceous and laminar interbeds occur with the quartzose arenite. (Quartz grains, well sorted and rounded). Core more pisolitic towards base of unit also. Core badly broken brecciated and calcite healed at 89.3 metres to 91.20 metres (poor recoveries) Bedding 43° to ca. @ 87.3 m; 45° to c.a. @ 93.0 m and 43° to ca. @ 96 m. | | | | | | |
| 96.00 | 97.60 | LAMINAR SPECKLED CALCLUTITE / DOLOMITE: Weakly laminar to thinly bedded grey, massive, speckled (sparite cemented ovoid and lenticular pores) heavily stylolitized (approx. parallel to bedding) calclutites, with thin (< 5 mm) interbeds of carbonaceous, weakly, pyritic, fine grained weakly calcite cemented dolomite. Minor dolomitization near tectonic breccia zone @ 97.40. Core very weakly calcite veined. | Calclutites weakly pyritic. | | | | | |
| 97.60 | 102.40 | INTERBEDDED CALCLUTITE / DOLOMITE / CALCARENITE: Well bedded, with sharp laminar contacts, grey massive, pyritic, calclutites (varying in width from 3cm - 10cm) black, laminar to massive, calcite cemented, argillaceous, dolomite (beds generally = 2cm in width) and speckled fragmental very fossiliferous calcarenites (shelly and fragmental debris). Dolomite very fine grained and carbonaceous and weakly pyritic. Minor pervasive dolomitization observed in certain calclutite horizons with clusters of disseminated, coarse grained dolomite being | Minor very fine grained disseminated pyrite in calclutite. Trace blebby pyrite within dolomite. Pyritic smears on cleavage planes. | | | | | |

64926

DRILL LOG HOLE No. ZT-81A-9 PAGE 6 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 97.60 | 102.40 | CON'T: evidenced. Fossiliferous calcarenite horizons generally <5cm in width. Bedding 53° to ca. @ 98m ; 47° to ca. @ 101.7 metres. | | | | | | |
| 102.40 | 112.60 | SOFT SEDIMENT DEFORMED CALCLUTITE/ DOLOMITE/CALCARENITE: Soft sediment deformed and slumpy textured, massive grey calclutites, laminar, but wavy and irregularly bedded, black, massive, fine grained dolomites and thinly interbedded very fossiliferous fragmental shelly calcarenites. Minor sparite filled ovoid pores in certain horizons. Laminar more micritic calclutites also occur from 106.8 to 108.0 m. Core weakly calcite veined. One 5cm wide vein @ 107m parallel to bedding. Other veins from 1-4 mm in width and are transgressive to bedding. Wavy and irregular bedding contacts are slickensided and weakly faulted as evidenced by cut off calcite veins. Bedding 50° to ca @ 110.30 metres. Core moderately foliated and moderately stylolitized. | Trace pyrite. | | | | | |
| 112.60 | 114.80 | THINLY INTERBEDDED MICROCRYSTALLINE CALCMICRITES/ANKERITE: Light beige to grey massive, microcrystalline, slumpy textured, weakly fragmental in part speckled white, micrites, thinly interbedded with tan grey medium grained, contortedly bedded ankerites. Ankerite crystals are very white when acid etched but are tan in colour after oxidation, as distinct from the oxidation of dolomite. Core weakly calcite veined. Interbeds generally do not exceed 1cm in width. Core moderately to strongly stylolitized. (carbonaceous filled). | | | | | | |

93679

DRILL LOG HOLE No. ZT-81A-9 PAGE 7 OF 7

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 114.80 | 149.50 | SLUMPED FRAGMENTAL CALCLUTITES, DOLOMITES / PISOLITIC CALCARENITES: Slumped, and contortedly and wavy, interbedded, grey fragmental calclutites, grey very fossiliferous pisolitic calcarenites and black very fragmental, to weakly so, dolomites. Dolomites vary from white speckled, black, more massive and medium grained to weakly laminar carbonaceous and argillaceous and fine to medium grained. Calcarenites vary from very pisolitic and fragmental to weakly fragmental and generally has pervasive dolomitization apparent. Minor sections within the unit contain abundant, medium to coarse grained, rounded and well sorted quartz grains (quartzose calcarenites). The calclutites are also weakly to very fragmental with minor more massive sections also apparent. Disseminated (1-2%) pyrite occurs throughout the calclutites and calcarenites as well as minor blebby pyrite. Pyrite also occurs replacing concretionary layers around pisolites. Pisolite nuclei vary from coral fragments to fine intraclasts and other fossiliferous debris. Overall the core is heavily dolomitic. Core cut by massive calcite/siderite/pyrite angular leetonic breccia from 138-142 m. Zone has minor galena/sphalerite mineralization associated with it (<1% Pb/Zn). Breccia comprised of host rock, angular, fragments, siderited (yellow/fawn crystals) and dolomitized fragments set within a calcite matrix. Weak siderite vein-emplacement is also apparent accompanied by finely disseminated galena and trace sphalerite mineralization. Core from 142-149.5 is badly broken brecciated, moderately dolomitized and weakly ankeritic, well calcite veined and contains fudgy sections. Hole at this point is entering faulted contact with Amber Slate. Bedding 47° to ca @ 120.7; 50° @ 136.2m. | 1-2% pyrite as fine grained disseminations, blebbs and also occurs replacing concretionary layers around pisolites within calclutites and calcarenites. Calcite/siderite/pyrite breccia with trace galena/sphalerite from 138-142 m. | | | | | | |
| END OF HOLE | | 149.50 METRES. | | | | | | |

64938

649269

Amoco Minerals Australia Company

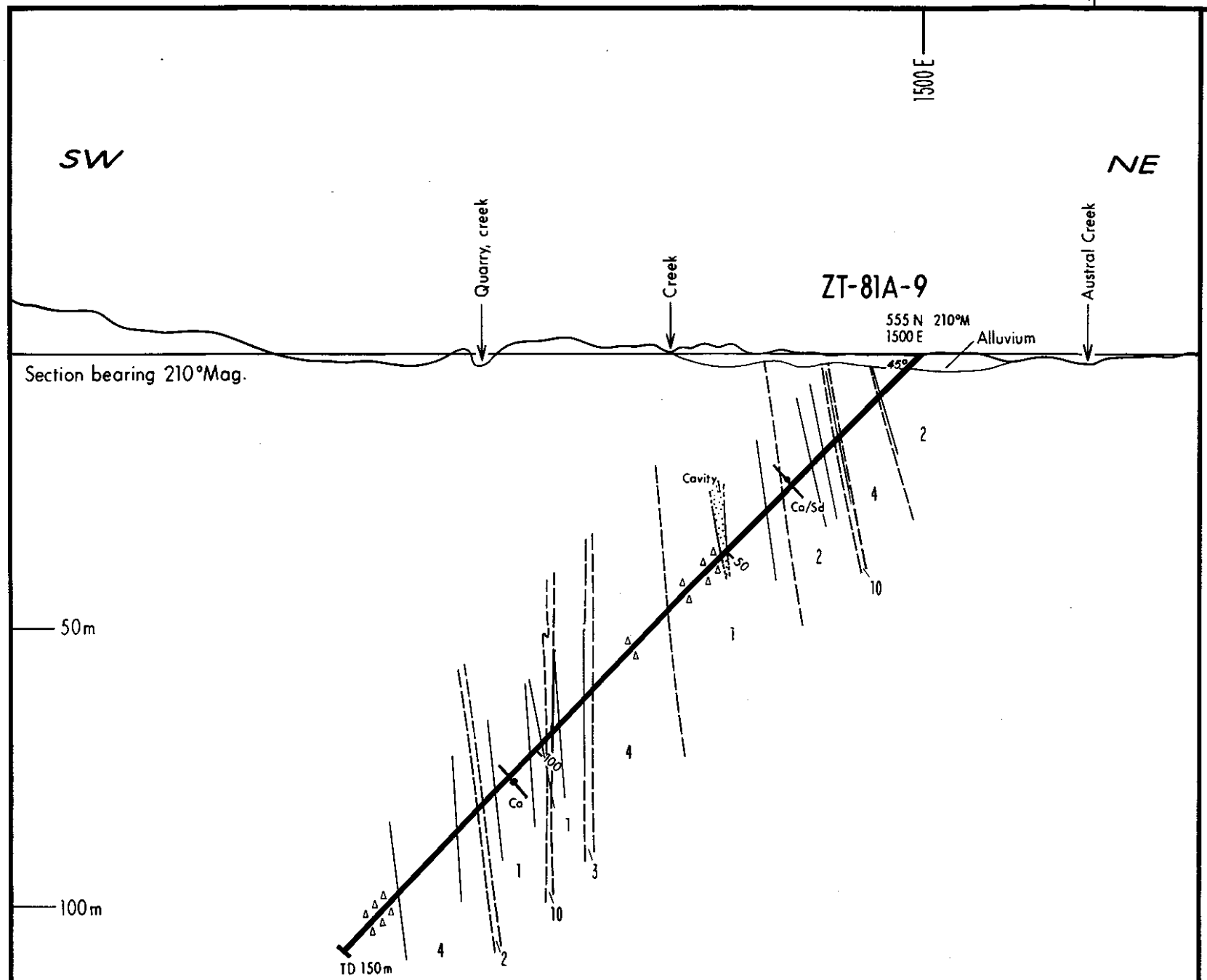
# ZEEHAN PROJECT
# A-78-60
# EL 4/78, TASMANIA

**PROSPECT: AUSTRAL**

# CROSS SECTION DRILLHOLE ZT-81A-9

**Scale: Vertical and horizontal - 1:1000**

5 cm




## Legend

| | |
|---|---|
| Limestone | 1 33 |
| Dolomite..... (breccia) | 2 29 |
| Fossil breccia | 3 46 |
| Slump breccia | 4 41 |
| Sandstone | 5 61 |
| Siltstone | 6 69 |
| Shale | 7 8 |
| Mineralization and/or ironstone | 8 14 |
| Siderite/calcite/ankerite/breccia | 9 12 |
| Laminar limestone | 10 37 |
| Slumped limestone | 11 28 |
| Conglomerate | 12 65 |
| Calcite/siderite veins | Ca/Sd |

Vein orientation unknown — Ca

Vein orientation accurate — Ca

Brecciation (tectonic)

Zone of Pb/Zn Ca/Sd mineralization

REPORT 279

M82-1847

649270

AUSTRAL PROSPECT

DRILLHOLE DATA

ZT-81A-10

| | | |
|---|---|---|
| Location | : | 550N : 1598E |
| Declination | : | 45° |
| Azimuth | : | 255° |
| Total Depth | : | 100.0 meters |

Assay Results

52-58 = 6m @ 1.79% Pb + 0.58% Zn + 14.8g/t Ag

including 52-55 = 3m @ 2.57% Pb + 0.67% Zn + 20.0g/t Ag

Amoco Minerals Australia Company

DRILL LOG — HOLE No. ZT- 81A - 10 — PAGE 1 OF 5

| | | | | BORE HOLE SURVEY | | | INSTRUMENT EASTMAN SINGLE SHOT. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECT ZEEHAN-TAS No. A7860C | ELEVATION meters | COMMENCED 11 DEC' 81 | | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing | Depth (m) | Dip | Bearing |
| PROSPECT AUSTRAL EZ/JV AREA | DIP COLLAR 45° GW | COMPLETED 22 DEC' 81 | | 50 | 46° | 224° | | | | | | |
| CO-ORDINATES 550 mN 1598 mE | CORE SIZE HQ | TOTAL LENGTH 100 meters | | 100 | 47° | 224° | | | | | | |
| BEARING 234 TN 223 MN 244 GN | LOGGED BY P.A. JONES | MACHINE USED: MINDRILL 10L RDD. Pty Ltd. | | | | | | | | | | |

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 0.00 | 5.00 | GRAVEL: White, quartzose, rounded cobbles within a sandy matrix. | | | | | | |
| HW-HQ Coring | | | | | | | | |
| 5.00 | 11.00 | DOLOMITES: Mottled black to dark grey, weakly fossiliferous (shelly, plant debris) very pyritic (disseminated and as fine smears) very argillaceous and carbonaceous fine grained dolomite. Core extremely weathered, hence poor recoveries of ≈ 10% | Disseminated pyrite. | | | | | |
| 11.00 | 13.00 | COMPLETELY WEATHERED LIMESTONE: Non calcareous, white to light grey, kaolinitic, argillaceous, completely weathered and leached limestone. | | | | | | |
| 13.00 | 27.40 | SOFT SEDIMENT DEFORMED, EXTREMELY WEATHERED, CALCLUTITES/ DOLOMITES: Extremely weathered, and leached, porous, very calcareous, slumpy textured, and soft sediment deformed, grey, argillaceous, massive and weakly fossiliferous (shelly, coral frags, other debris) calclutites and dark grey to black weakly pyritic, massive, fossiliferous, and unfossiliferous, fine to medium grained argillaceous dolomite. Core badly broken and with bad weathering gave poor recoveries ≈ 60%. Minor thin light grey very fossiliferous shelly calcarenite interbeds. Core moderately calcite veined and brecciated with minor siderite | Minor disseminated pyrite in dolomite. | | | | | |

12649

DRILL LOG HOLE No. ZT-81A-10 PAGE 2 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 27.40 | 28.60 | INTRACLAST SLUMP BRECCIA: Angular fragments of dolomite, calclutite and calcarenites are set within a dolomite matrix containing 1-2% angular fragmental and blebby pyrite plus trace galena. Fragment sizes vary from up to 5cm in width to frags. a few mm. in diameter. Some angular fragments of calcite also observed. Core again badly weathered and broken making identification difficult. | 1-2% fragmental pyrite plus trace galena. | | | | | |
| 28.60 | 29.50 | CALCARENITE: White coarse grained, weathered and leached and porous, fragmental massive to weakly laminar calcarenite. A major proportion of unit weathered to clay pugh which is highly calcareous. | | | | | | |
| 29.50 | 31.50 | FOSSILIFEROUS CALCLUTITE: White/cream, extremely weathered, pughy, shelly, leached calclutites. Core highly calcareous. Lot of argillaceous material throughout matrix as is evidenced from high proportion of clay pugh. Poor core recoveries. | | | | | | |
| 31.50 | 43.70 | INTERBEDDED BRECCIATED CALCLUTITES / DOLOMITE / SHELLY CALCARENITES: Very weathered, calcareous, brecciated tectonically and calcite veined, very pughy, grey, slumpy textured, massive, unfossiliferous to weakly fossiliferous (gastropods) calclutites, contorted-ly interbedded with white to light grey very fossiliferous shelly calcarenites and black, very argillaceous, carbonaceous, massive, calcite cemented dolomite. Core extremely broken and pughy, with poor recoveries approx. 25%. Carbonaceous filled stylolites evident. Core brecciated (tectonically?) with angular fragments and also pugh or calcite healed, trace siderite. Minor calcite veining. | Trace pyrite in dolomites. | | | | | |

64972

DRILL LOG HOLE No. ZT-81A-10 

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS Cu | ASSAYS Pb | ASSAYS Zn | ASSAYS Ag | ASSAYS Sn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43.70 | 48.00 | QUARTZ ARENITE: Silicified, white-cream, coarse grained; well sorted and rounded grains, massive unbedded quartz arenite. Rusty brown hematite stained? Minor argillaceous interbeds completely weathered and washed away during drilling to give poor recoveries of approx. 10%. Minor yellow cream pugh is observed. | | | | | | | | | | |
| 48.00 | 48.60 | TECTONIC BRECCIA: Silica cemented, angular fragmented tectonic breccia. Breccia fragments comprised of yellow to cream-white, medium to coarse grained sandstones, black sandstones, minor silica replaced shell fragments and other non-calcareous angular to sub-angular debris. Poor recovery ≈ 50%. | | 66261 | 48.50 | 49.0 | 0.5 | 14 | 980 | 2700 | <1 | 8 |
| | | | | 66262 | 49.0 | 50.5 | 1 | 14 | 1250 | 1600 | <1 | 12 |
| | | | | 66263 | 50.0 | 51.0 | 1 | 20 | 3000 | 4000 | 1 | 12 |
| | | | | 66264 | 51.0 | 52.0 | 1 | 18 | 4000 | 8100 | 5 | 14 |
| | | | | 66265 | 52.0 | 53.0 | 1 | 32 | 3.5% | 1.15% | 22 | <4 |
| | | | | 66266 | 53.0 | 54.0 | 1 | 12 | 1.9% | 4000 | 20 | 10 |
| | | | | 66267 | 54.0 | 55.0 | 1 | 24 | 2.3% | 4600 | 18 | <4 |
| | | | | 66268 | 55.0 | 56.0 | 1 | 18 | 1.35% | 4200 | 14 | <4 |
| 48.60 | 52.10 | LAMINAR, PYRITIC, ARGILLACEOUS DOLOMITE: Laminar to thinly interbedded, black and dark gray, weakly fragmental (skeletal debris) fossiliferous, very pyritic (≈7%) and weakly mineralized Pb/Zn slump brecciated, very argillaceous, non-calcareous dolomite. Pyrite occurs as bedded very fine grained disseminations as does the galena/sphalerite from 51.80-52.10 averaging ≈ 3% Pb + 1% Zn. Laminar layers are weakly contorted, possibly soft sediment deformed and occasionally weakly intra-formational brecciated (48.8 m) Bedding 61° to c.a. @ 48.8 m; 45° to c.a @ 50.3 m. | ≈ 3% Pb + 1% Zn @ 51.80 - 52.10 as fine grained disseminations within laminar dolomites<br>Dolomite has ≈ 7% disseminated pyrite as very fine bedded layers. Minor sections of massive pyrite over 0.5 cm width. | 66269 | 56.0 | 57.0 | 1 | 10 | 7100 | 5200 | 7 | 8 |
| | | | | 66270 | 57.0 | 58.0 | 1 | 14 | 1.00% | 5300 | 8 | 6 |
| | | | | 66271 | 58.0 | 59.0 | 1 | 8 | 5000 | 3600 | 3 | 4 |
| | | | | 66272 | 59.0 | 60.0 | 1 | 10 | 2000 | 1750 | 2 | <4 |
| | | | | 66273 | 60.0 | 61.0 | 1 | 8 | 1750 | 1750 | 3 | 6 |
| | | | | 66274 | 61.0 | 62.0 | 1 | 12 | 2700 | 1950 | 4 | 8 |
| | | | | 66275 | 62.0 | 64.0 | 2 | 8 | 330 | 870 | 1 | 4 |
| | | | | 66276 | 64.0 | 66.0 | 2 | 8 | 810 | 560 | <1 | <4 |
| 52.10 | 69.50 | TECTONICALLY BRECCIATED, PYRITIC, SILICIFIED DOLOMITE: Silicified, weakly quartz veinleted, very pyritic ≈ 5-7% overall: varies up to 40% over 10cm widths, weakly mineralized (galena) very fine grained, black, brecciated (tectonically?) fragmental fossiliferous dolomite. The dolomite when unbrecciated is | Disseminated pyrite ≈ 5-7% with minor galena for the first 7 metres. More massive py from 52.3-52.5 (40%) 53.2-53.5 (25%) 54.1-54.6 (30%) 56.7-57.2 (30%) | | | | | | | | | |

DRILL LOG HOLE No. ZT-81A-10 PAGE 4 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 52.10 | 69.50 | CON'T: either very massive, finely pyritic or laminar to thinly bedded and also finely pyritic. Where brecciated, angular fragments are often pyritic (coarse grained and blebby), and dolomite fragments coarse grained but with vughs generally silica infilled. Minor druzy quartz on fracture surfaces. Breccia fragments vary in size from 2-5cm down to <1mm but always very angular. Some frags. very pyritic within generally weakly pyritic matrix. More massive pyrite zones occurs from 52.3-52.5 (40%); 53.2-53.5 (25%); 54.1-54.6 (30%); 56.7-57.2 (30%). Core badly broken, rubbley, with recoveries overall ≤ 50% but down to ≤10% on occasions. | | | | | | |
| 69.50 | 87.00 | EXTREMELY WEATHED, SLUMPY TEXTURED, CALCLUTITE / CALCARENITE / DOLOMITE: Extremely weathered, mottled white/grey/black, argillaceous clays, very calcareous and contain minor, less weathered core of slumpy textured, grey massive calclutites, weakly fossiliferous calclutites, very fossiliferous shelly calcarenites and dark grey to olive grey massive dolomites and ankerites? | | | | | | |
| 87.00 | 91.20 | COMPLETELY WEATHERED INTERBEDDED LIMESTONES AND DOLOMITES: Massive, badly disturbed (through drilling) orange, grey, white yellow and black featureless clays. Clays are non-calcareous, very argillaceous, weakly carbonaceous with some coarser grained sections being evident (possibly calcarenites?) and minor brecciation textures (tectonic angular fragments). | | | | | | |
| 91.20 | 93.40 | COARSE GRAINED QUARTZ ARENITE: Predominantly white/cream, massive, medium to coarse grained, quartz arenite with minor interbeds of | Trace to minor pyrite generally within grey sections of arenite | | | | | |

64926

DRILL LOG HOLE No. ZT-81A-10 PAGE 5 OF 5

| METERAGE From | METERAGE To | DESCRIPTION | MINERALIZATION % | SAMPLE NUMBER | METERAGE From | METERAGE To | METERAGE Length | ASSAYS |
|---|---|---|---|---|---|---|---|---|
| 91.20 | 93.40 | CON'T: grey, weakly pyritic, massive, argillaceous quartz arenites. Sections of core very porous due to leaching of siltier fragments or brecciated beds within the arenite. Core non-calcareous and becomes greyer and finer grained downhole. Possible bedding attitude: 47° to ca. @ 93 metres. Minor vughs quartz filled. Poor recoveries of ≤ 50%. | | | | | | |
| 93.40 | 96.40 | SILICIFIED ARGILLACEOUS AND DOLOMITIC BRECCIATED QUARTZ ARENITE: Vughy, porous, silicified, gray to dark grey, weakly pyritic, massive and laminar bedded, brecciated tectonically dolomitic and argillaceous, coarse to medium grained quartz arenites. Minor vughs filled by quartz. Larger vughs filled or lined by fine grained pyrite. Possible deformed bedding: 35° to ca @ 96.10 m. Core more laminar and weakly brecciated towards base of unit with minor white/pink sphalerite becoming evident, with trace galena | Minor pyrite as fine disseminations or as massive vugh linings and infillings. Trace sphalerite (white/pink) and galena as fine grained disseminations | | | | | |
| 96.40 | 99.20 | INTERBEDDED CHERTS / COARSE GRAINED LITHIC QUARTZ ARENITES: Finely interbedded to laminar, white to fawn, massive, very fine grained (microcrystalline) cherts? interlaminated with more thickly bedded, medium to coarse grained grey fragmental, lithic quartz arenites set within a siliceous matrix. Pale coloured core has occasional spotty texture due to presence of light grey lithic fragments. A very angular tectonic breccia with siliceous matrix occurs from 99.00 to 99.20 m. Fault Contact? | | | | | | |
| 99.20 | 100.00 | WHITE, NON CALCAREOUS MASSIVE CLAYS: Core is comprised of massive, non calcareous, very, kaolinitic, argillaceous (mylonitized) clay possibly the result of faulting as breccia occurs from 99-99.2m. | | | | | | |
| END OF HOLE | | 100.00 METRES. | | | | | | |

64972

649276

Amoco Minerals Australia Company

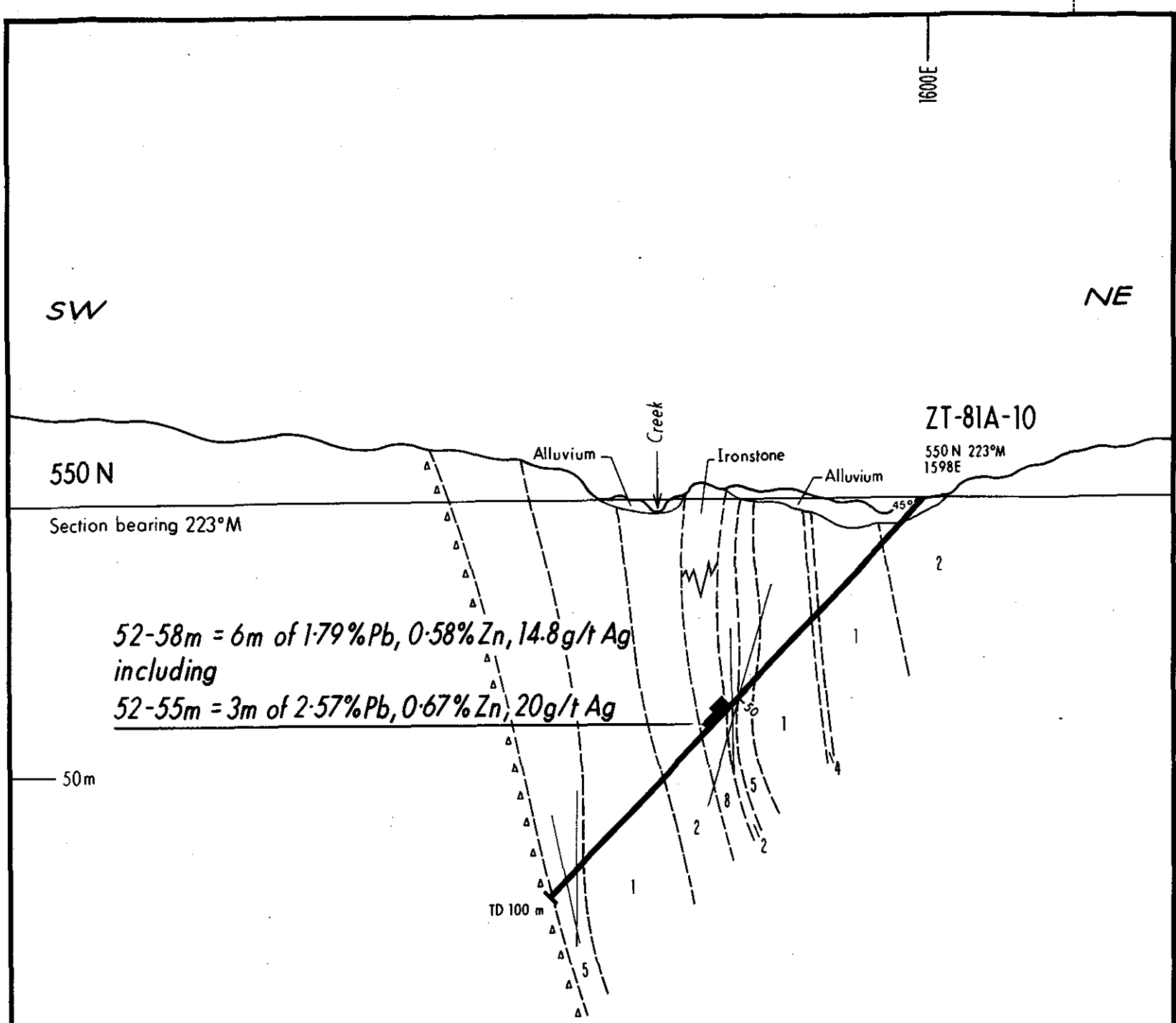
# ZEEHAN PROJECT
# A-78-60
# EL 4/78, TASMANIA

**PROSPECT: AUSTRAL**

# CROSS SECTION DRILLHOLE ZT-81A-10

**Scale: Vertical and horizontal - 1:1000**

5 cm




## Legend

| | |
|---|---|
| Limestone | 1 33 |
| Dolomite..... (breccia) | 2 29 |
| Fossil breccia | 3 46 |
| Slump breccia | 4 41 |
| Sandstone | 5 61 |
| Siltstone | 6 69 |
| Shale | 7 8 |
| Mineralization and/or ironstone | 8 14 |
| Siderite/calcite/ankerite/breccia | 9 12 |
| Laminar limestone | 10 37 |
| Slumped limestone | 11 28 |
| Conglomerate | 12 65 |
| Calcite/siderite veins | Ca/Sd |

Vein orientation unknown — Ca

Vein orientation accurate — Ca

Brecciation (tectonic)

Zone of Pb/Zn Ca/Sd mineralization

REPORT 279

M82-1848

APPENDIX 9

PULSE ELECTROMAGNETIC RECORD SHEETS (Geoterrex)

Norrisprint

# P. E - M

649278

| CLIENT : AMOCO | PROFILE : 1900N. | T. ⇔ R. : 100 | DATE : 19.8.81 |
|---|---|---|---|
| AREA : (NORTH) AUSTRAL | OPERATOR : ES. | Tx. LOOP SIZE : 7 2om T/6. | JOB No. : 85-1351. |
| | | COMPONENT MEASURED : VERT. | MODE OF OPERATIONS : SEP. LOOP |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING ⇔ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1100E | 1. | -1. | 0 | 0.6 | 0.7 | 0.6 | -0.2 | -2.6 | | | |
| | | | | | 0.7 | 0.8 | 0.6 | -0.5. | CONT | | |
| 1150E | 2.5 | -1.1 | -0.8 | 0.8 | 0.9 | 1.1 | 0.7 | 0.1 | | | |
| | | | | 0.8 | 0 | -0.2 | 0.7 | 0.4 | CONT. | | |
| 1200E | 3.5 | -0.7 | -0.5 | 0 | -1. | -3.1 | -3.0 | -5.5 | | | |
| | | | -0.5 | 0 | 0.2 | 0 | 0.6 | 0.3 | CONT. | | |
| 1250E | 2.2 | -0.5 | 0.1 | 0.6 | 0.6 | 1.9 | 0.7 | 0.2 | | | |
| | | | | 0.5 | -0.1 | -0.1 | 0.5 | 0.1 | CONT. | | |
| 1300E | 1.1 | -0.9 | -0.5 | 0.1 | 0.1 | 0.9 | 0.9 | 1.1 | | | |
| | | | | 0.4 | -0.3 | 0 | 0.6 | 0.2 | CONT. | | |
| 1350E | -3.4 | -0.4 | 0.4 | 1.1 | 1.1 | 1.1 | 1.5 | 1.4 | | | |
| | | | -0.4 | -0.2 | -0.1 | -0.2 | 0.4 | 0 | CONT | | |
| 1400E | -3.2 | -0.5 | 0.1 | 1.2 | 1.5 | 2.9 | 2.9 | -0.1 | | | |
| | | | 0.1 | -0.1 | -0.1 | 0.2 | 0 | 0.2 | CONT. | | |
| 1450E | 2 | -0.5 | 0 | 0.5 | 0 | 0.4 | 1 | 0.1 | | | |
| | | | | | 0 | 0.2 | 0.1 | 0.1 | CONT. | | |
| 1500E | -2.3 | -1.9 | -1.1 | -0.9 | -1.5 | -1.5 | 0 | 2.4 | | | |
| | | | | 0.1 | 0.1 | 0.2 | -0.1 | 0 | CONT | | |

649279

Norrisprint

# P. E - M

| CLIENT: AMOCO. | PROFILE: LINE 2600 N | T. – R.: 100 m. | DATE: 15.9.81. |
|---|---|---|---|
| AREA: NORTH AUSTRAL TAS. | OPERATOR: RW. | Tx. LOOP SIZE: 7m. 20 msec TIME BASE | JOB No.: 85-1351 |
| | | COMPONENT MEASURED: VERT. | MODE OF OPERATIONS: SEP LOOP |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | SH/CONT | | REMARKS |
| 1800E | -0.5 | -4.2 | -2.5 | +0.4 | +1.6 | +2.1 | +3.2 | +3.0 | | | |
| | -4.2 | -6.0 | -4.0 | 0 | +1.4 | +1.8 | 0 | +3.2 | | | |
| | +0.3 | -4.2 | -2.5 | -0.2 | +2.0 | +3.0 | +2.5 | +2.2 | CONT | | |
| 1750E | +3.3 | -0.5 | -0.2 | +0.4 | +0.6 | +1.8 | +0.4 | -0.7 | | | |
| | +4.5 | +0.7 | -0.3 | -0.3 | -0.1 | +0.7 | +1.1 | +1.4 | | | |
| | +3.5 | -0.8 | -0.4 | -0.4 | +0.6 | +0.4 | +2.0 | +1.9 | | | |
| 1700E | +1.5 | -1.0 | -1.3 | +0.7 | +1.0 | -3.0 | -6.5 | -3.0 | | | |
| | +2.2 | -1.4 | -0.7 | +0.1 | -0.4 | -2.8 | -2.3 | +0.2 | | | |
| | | | | +0.1 | 0 | -1.0 | +1.0 | +2.0 | CONT | | |
| 1650E | +3.5 | 0 | 0 | +1.4 | +1.6 | +2.9 | +2.9 | - | | | |
| | +2.3 | -0.9 | -1.1 | -0.8 | -1.1 | -0.7 | +2.4 | +2.6 | | | |
| | +2.8 | -1.1 | -1.3 | -1.0 | -1.4 | -0.9 | +2.5 | +2.1 | | | |
| 1600E | +3.7 | +1.0 | +0.6 | +0.6 | +1.0 | +2.4 | +1.0 | +1.8 | | | |
| | +3.5 | +0.7 | +0.3 | +1.0 | +1.2 | | | | | | |
| | | | | +0.6 | +0.7 | +1.6 | +2.0 | +2.3 | CONT | | |
| 1550E | +0.8 | +0.3 | -0.1 | -0.2 | -0.6 | -1.1 | +2.0 | +3.5 | | | V. STEEP CLIFF |
| 1500E | +3.5 | -1.5 | -1.5 | -1.6 | -2.4 | -0.9 | -1.5 | -4.0 | | | |
| | +4.4 | -1.3 | -1.4 | -0.3 | -0.5 | -0.3 | +0.5 | +1.0 | | | |
| | | | | | -0.5 | -0.9 | -1.0 | +2.5 | CONT | | |
| 1450E | +4.4 | -0.9 | -0.3 | +0.2 | +0.4 | +1.1 | -0.2 | -3.6 | | | |
| | +3.4 | -0.6 | -0.1 | +0.6 | 0 | +0.5 | +2.1 | +3.0 | | | |
| | +4.2 | -0.6 | -0.6 | +0.6 | -0.2 | +1.0 | +2.1 | +4.5 | | | |
| | +3.5 | -1.0 | -1.1 | -1.1 | -1.6 | -0.5 | +0.6 | +0.6 | | | |
| | +4.7 | -1.0 | -1.1 | 0 | 0.4 | 0 | +1.0 | +1.8 | | | |
| | | | | 0 | -1.0 | +0.5 | +1.0 | 0 | CONT | | |
| 1400E | +5.0 | -0.8 | -0.8 | 0 | +1.0 | -0.4 | 0 | +0.1 | | | |
| | +4.4 | -0.9 | -0.9 | -0.4 | -1.5 | -1.0 | -1.0 | -1.0 | | | |
| | +5.0 | -0.7 | -0.2 | +0.9 | -0.5 | +0.2 | +3.2 | +2.5 | | | |
| | | | | +0.5 | -0.3 | -0.3 | +0.4 | +0.1 | | | |
| 1350E | +2.0 | -1.0 | -1.0 | 0 | -0.5 | -1.0 | -0.1 | -5.7 | | | |
| | +1.9 | -0.3 | +0.1 | +0.9 | +0.3 | +0.4 | +0.5 | 0 | | | |
| | +1.6 | -1.6 | -2.0 | -2.0 | -2.1 | -1.6 | -3.0 | -0.4 | | | |
| | +1.5 | -1.2 | -1.2 | -0.3 | +0.8 | +1.2 | +0.5 | -2.5 | | | |
| | | | | | +0.5 | -0.5 | +0.5 | -1.0 | CONT. | | |

649280

Norrisprint

# P. E - M

| CLIENT : | PROFILE : | T. = R. : | DATE : |
|---|---|---|---|
| AMOCO. | LINE · 2600N. | 100m. | 15-8-91 |
| AREA : NORTH AUSTRAL TAS. | OPERATOR : RW | Tx. LOOP SIZE : 7m. 20 m sec. T/b. | JOB No. : 85-1351 |
| | | COMPONENT MEASURED : VERT. | MODE OF OPERATIONS : SEP Loop |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1300E | +3·9 | -0.6 | -0.2 | +0·5 | -0·3 | +1·0 | +3·2 | +1·8 | | | |
| | +4·2 | -1·0 | -1·2 | -1·0 | | | | | | | |
| | +4·6 | -0·8 | -0·5 | +0·5 | +0·2 | -0·3 | +0·6 | +2·0 | | | |
| 1250E | +2·2 | -1·3 | -1·0 | -1·0 | -1·5 | -0·6 | +2·4 | +7·8 | | | |
| | +3·0 | -0·4 | -0·5 | -0·5 | 0 | +0·5 | +0·2 | -0·5 | | | |
| | -0·6 | -1·5 | -0·3 | +0·4 | +0·4 | +0·5 | +0·5 | 0. | | | |

649281

Norrisprint

# P. E - M

| CLIENT : AMOCO | PROFILE : 2700N | T. - R. : 100m | DATE : 17.8.81 |
|---|---|---|---|
| AREA : NORTH AUSTRAL. | OPERATOR : RW. | Tx. LOOP SIZE : 7m 20 mode T/B | JOB No. : 85-1351 |
| | | COMPONENT MEASURED : VERT. | MODE OF OPERATIONS : SEP Loop. |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1250E | 3.8 | -0.6 | -0.5 | -0.4 | -1.0 | 0 | 0 | 0 | | | |
| | | | | | -1.0 | -0.2 | -0.5 | 0.5 | CONT. | | |
| | | | | | | | | | | | |
| 1300E | 3.4 | -0.8 | -0.2 | 0 | 0 | 1.2 | 1.2 | 0.2 | | | |
| | | | | | 0 | -0.2 | -0.3 | 0.4 | CONT. | | |
| | | | | | | | | | | | |
| 1350E | 1.4 | -1.8 | -1.5 | -1.0 | -2.1 | -2.9 | -2.7 | -0.7 | | | |
| | 2.8 | -1.8 | -0.5 | 0 | 0.2 | 2.3 | -0.2 | 3.5 | | | |
| | | | -0.5 | 0.4 | -0.7 | 0 | 0.5 | -0.5 | CONT | | |
| | | | -0.5 | -0.6 | -0.8 | -0.4 | -0.5 | -0.5 | CONT | | |
| | | | | | | | | | | | |
| 1400E | 3.2 | -0.8 | 0.2 | 1.3 | 1.0 | 1.0 | 3.0 | 0.3 | | | |
| | | | | 1.3 | -0.3 | 0.2 | -0.5 | 0 | CONT | | |
| | | | | | | | | | | | |
| 1450E | 4.7 | -0.8 | -1.0 | -0.5 | -0.3 | 2.0 | -1.2 | -0.6 | | | |
| | | | | -0.5 | -0.8 | -0.5 | 0 | -0.6 | CONT | | |
| | | | | | | | | | | | |
| 1500E | 2.1 | -1.0 | -0.7 | -0.2 | -2.2 | -3.5 | -0.6 | -2.5 | | | |
| | | | | -0.2 | 0 | -0.4 | -0.3 | -0.3 | CONT | | |
| | | | | | | | | | | | |
| 1550E | 1.5 | -1.2 | -0.4 | -0.4 | -0.2 | 0.4 | 2.1 | 5.5? | | | |
| | | | | -0.4 | -1.0 | -0.3 | -0.2 | 0 | CONT. | | |

Norrisprint

# P. E - M

649282

| CLIENT : AMOCO | PROFILE : 2750N | T. - R. : 100m | DATE : 18·8·81 |
|---|---|---|---|
| AREA : NORTH AUSTRAL | OPERATOR : ES. | Tx. LOOP SIZE : 7m | JOB No. : 85-1351 |
| | | COMPONENT MEASURED : VERT. | MODE OF OPERATIONS : SEP LOOP |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1800E | -0.6 | 0.5 | 2.0 | 1.9 | 2.8 | 5.9 | 6.7 | 2.8 | | | |
| | -0.6 | -1.3 | 1.5 | 2.0 | 2.5 | 1.4 | 4.6 | 2.6 | | | |
| | | | 0 | 0.2 | -0.9 | -1.6 | 3.1 | 3.7 | CONT | | |
| 1750E | -1 | -1. | -1.1 | -1.0 | 0.5 | 0.6 | -0.7 | 0 | | | |
| | -7 | 0 | 0 | 1.1 | 1.9 | 0 | 0.4 | -1.1 | | | |
| | -6.5 | 0.1 | -0.4 | 0.2 | 0.4 | 0 | 0.5 | 0 | CONT | | |
| | | | | 0.2 | -1.5 | -1.1 | 0.6 | 1.5 | CONT. | | |
| 1700E | -4.4 | -0.6 | 0.1 | 0.9 | 0.6 | -2.8 | 2.4 | 0.6 | | | |
| | | | 0.1 | 0.5 | -1.5 | 0 | -1 | 0 | | | |
| 1650E | -5.9 | -1.5 | -1. | -1. | -1.5 | -0.6 | -0.5 | -1.5 | | | |
| | | | -1.0 | 0 | -0.1 | -0.4 | -0.5 | -0.5 | CONT. | | |
| 1600E | 2.9 | -1.1 | -1. | -0.4 | -1. | -0.1 | -0.5 | -1.1 | | | |
| | 2.9 | -1.5 | -0.5 | -0.5 | -0.5 | -0.1 | 0.1 | 1.0 | | | |
| | | | | | | -0.1 | -0.4 | -1.0 | CONT. | | |
| 1550E | 3.6 | -1.3 | -1.1 | -0.6 | -0.9 | 1.6 | -0.1 | 0.1 | | | |
| | | | | -0.5 | -0.5 | -0.4 | -0.3 | -1.1 | CONT | | |
| 1500E | 2.1 | -0.1 | -0.1 | -0.1 | -1.9 | -3.6 | -0.4 | -1.9 | | | |
| | | | | -0.1 | -0.3 | -0.2 | -0.1 | -1.4 | CONT | | |
| 1450E | 0.5 | 0.1 | 0.4 | 0.6 | -0.9 | -0.1 | 3.0 | 2.6 | | | |
| | | | | | -0.9 | -1.0 | 0.1 | -0.9 | CONT. | | |

649283

Norrisprint

# P. E - M

| CLIENT : | PROFILE : | T. – R. : | DATE : |
|---|---|---|---|
| AMOCO. | 2800N. | 100m. | 17.8.81 |
| **AREA :** | **OPERATOR :** | **Tx. LOOP SIZE :** | **JOB No. :** |
| NORTH AUSTRAL. | ES. | 7m. | 85-1351 |
| | | **COMPONENT MEASURED :** VERT. | **MODE OF OPERATIONS :** Sep. Loop |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1550 E | 3.7 | -0.1 | 0.1 | 1.5 | 1.3 | 1.9 | 2.6 | 4.0 | | | |
| | 3.5 | -0.9 | -0.1 | 0.5 | 0.4 | 2.1 | -0.1 | -3.6 | | | |
| | | | | 0.4 | -0.5 | -1.0 | 0.5 | 1.0 | CONT. | | |
| | 3.5 | -1.0 | 0 | -0.2 | 0.6 | 1.7 | 1.5 | 2.4 | CONT. | | |
| | | | | | | | | | | | |
| 1500E | 4.1 | -0.7 | -0.9 | 0.5 | 1.5 | -0.1 | -1.4 | -2.4 | | | |
| | 4.1 | -0.2 | -0.5 | -0.5 | 1.0 | 0 | 0.5 | 0 | CONT | | |
| | 5.0 | 0.7 | 1.5 | 2.3 | 2.0 | 2.1 | 3.6 | 3.4 | | | |
| | 4.5 | -0.2 | -0.9 | -0.2 | -0.5 | 0 | 0.5 | 0 | CONT. | | |
| | | | | | | | | | | | |
| 1450 E | 2.5 | -1.3 | -1.3 | -1.4 | -2.7 | -0.6 | -2.0 | -1.1 | | | |
| | | | -1.3 | 0 | -1.0 | -0.5 | -0.2 | -0.5 | CONT | | |
| | | | | | | | | | | | |
| 1400E | 4.5 | -0.1 | -1.0 | -0.5 | -1.6 | -1.3 | 0.3 | -1.8 | | | |
| | | | -0.7 | 0.3 | -0.5 | -0.2 | 0 | -1.0 | CONT | | |
| | | | | | | | | | | | |
| 1350E | 2.4 | -1.4 | -1.7 | -1.0 | -0.3 | 0 | -1.9 | 0.5 | | | |
| | | | | -1.0 | -0.3 | -0.3 | 0 | -0.5 | CONT. | | |
| | | | | | | | | | | | |
| 1300E | 0.6 | -1.0 | -1.0 | -0.6 | -1.5 | -1.0 | -0.7 | -0.5 | | | |
| | | | | | -1.5 | 0.5 | 0 | -0.5 | CONT | | |
| | | | | | | | | | | | |
| 1250E | -0.5 | -1.2 | -1.2 | -0.2 | -0.4 | 0.4 | -1.2 | 1.6 | | | |
| | | | | | -0.5 | 0.5 | 0 | -0.4 | CONT. | | |

649284

Norrisprint

# P. E - M

| CLIENT : AMOCO | PROFILE : 2800N | T. - R. : 100m | DATE : 18 - 8 - 91 |
|---|---|---|---|
| AREA : NORTH AUSTRAL | OPERATOR : RW | Tx. LOOP SIZE : 7m 20 usec T/B | JOB No. : 85 - 1351 |
| | | COMPONENT MEASURED : VERT. | MODE OF OPERATIONS : SEP LOOP. |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1600E | -0.7 | -0.2 | 0.1 | 0.6 | 0.4 | -1.5 | -2.0 | -0.5 | | | |
| | -0.5 | -0.2 | to.1 | 0.1 | -0.8 | 0 | -1.5 | -0.5 | | | |
| | -0.9 | -0.7 | -0.5 | -0.6 | -1.2 | -0.7 | -0.6 | -0.5 | | | |
| | | | | -0.7 | -0.6 | -0.2 | -0.3 | -0.5 | CONT. | | |
| | | | | | | | | | | | |
| 1650E | -2.5 | -2.0 | -2.5 | -2.0 | -1.4 | -0.2 | -2.0 | 1.4 | | | |
| | | | | -2.0 | -1.4 | -1.0 | -0.5 | 1.3 | CONT. | | |
| | | | | | | | | | | | |
| 1700E | -10.5 | -1.8 | -0.5 | 1.5 | 1.5 | 0.5 | 3.5 | 2.0 | | | |
| | -11.0 | -3.5 | -4.2 | -3.5 | -3.5 | -2.5 | -1.5 | 0.5 | | | |
| | | | | | -3.5 | -2.8 | -2.5 | -1.5 | CONT. | | |
| | | | | | | | | | | | |
| 1750E | -5.5 | -1.9 | -0.9 | -2.0 | 2.2 | 2.2 | 1.2 | -0.7 | | | |
| | | | | -1.9 | -0.8 | 0 | -1.0 | -0.7 | CONT | | |
| | | | | | | | | | | | |
| 1800E | -2.5 | -1.0 | -0.9 | 0.3 | 1.5 | 2.7 | 0.5 | -0.2 | | | |
| | -2.5 | -1.0 | -1.8 | -1.0 | -0.8 | -0.3 | | | | | |
| | | | | | -0.3 | 0 | -0.2 | 0.5 | | | |

649285

Norrisprint

# P. E - M.

| CLIENT: AMOCO | PROFILE: 2800 N Reapect | T. = R.: 100 m | DATE: 21-8-81 |
|---|---|---|---|
| AREA: NORTH ANADARKO | OPERATOR: E.S. | Tx. LOOP SIZE: 8 m | JOB No.: 85-1351 |
| | | COMPONENT MEASURED: VERT. | MODE OF OPERATIONS: Separ. LOOP |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1800E | -2.6 | -7.5 | -1.4 | 2 | -1 | -0.4 | -0.9 | -0.9 | | | |
| | 6.6 | -2.9 | -1 | 0 | -0.5 | 0.1 | -0.7 | -1.5 | | | |
| | 7.4 | -3.0 | -0.5 | 0.6 | -0.4 | 0 | -0.6 | -1.5 | | | |
| | | | | | | | | | | | |
| 1750E | 0 | -3.5 | -1.1 | -0.5 | -0.4 | -0.5 | -1.4 | -0.6 | | | |
| | | | -1 | 0.3 | -0.6 | 0 | -1 | -1.8 | | | |
| | | | | | | | | | | | |
| 1700E | -0.5 | -2.5 | 0.1 | 0.5 | -0.5 | 1.0 | 0.6 | 0.6 | | | |
| | | -2.7 | -1 | 0 | 0 | 0.2 | -0.5 | -0.5 | | | |
| | | | | | | | | | | | |
| 1650E | -3.9 | -2.9 | -0.6 | 0.5 | -1.1 | 0.1 | 0.1 | 0 | | | |
| | | | -0.7 | 0.1 | -0.6 | 0 | -1.1 | -1.2 | | | |
| | | | | | | | | | | | |
| 1600E | -0.4 | -3.1 | -1.4 | -0.4 | -2 | 0.1 | -1.6 | -2.6 | | | |
| | | | | -0.4 | -0.6 | -0.2 | -1.6 | -1.4 | | | |
| | | | | | | | | | | | |
| 1550E | -3.9 | -4.1 | -2.8 | -1.5 | -1.7 | -0.3 | -0.5 | -0.7 | | | |
| | | | -2 | -1.1 | -1.1 | -0.3 | -1.7 | -0.9 | | | |
| | | | | | | | | | | | |
| 1500 | -8.9 | -4.2 | -1.1 | -0.5 | -0.6 | 0.5 | 0.1 | -0.1 | | | |
| | | | | -0.1 | -0.5 | 0 | -1.2 | -1.5 | | | |
| | | | | | | | | | | | |
| 1450 | -9 | -4.4 | -1 | 0 | -0.9 | -0.3 | -1.9 | -1.5 | | | |
| | | -4.3 | -1.7 | -0.7 | -1.4 | -0.1 | -2.0 | -1.5 | | | |
| | | | | | | | | | | | |
| 1400E | -11 | -4.5 | -1.6 | -1.5 | -2.6 | -2.6 | -4 | -4.1 | | | |
| | | | | -0.5 | -0.9 | -0.3 | -2 | -1.9 | | | |
| | | | | | | | | | | | |
| 1350E | -9 | -3.4 | -1.1 | -0.1 | -1.9 | -1.9 | -2.5 | -4.1 | | | |
| | | | | -0.7 | -1.1 | -0.1 | -1.5 | -1.5 | | | |
| N.H | -7.5 | -4.1 | -1.2 | 0 | -0.4 | -0.5 | -0.5 | 0.5 | | | |
| | | | | 0 | -1.2 | -0.4 | -1.6 | -1.5 | | | |

649286

Norrisprint

# P. E - M

| CLIENT : | PROFILE : | T. → R. : | DATE : |
|---|---|---|---|
| AMOCO | 2850N | 100m | 18.8.81 |
| **AREA :** | **OPERATOR :** | **Tx. LOOP SIZE :** | **JOB No. :** |
| NORTH AUSTRAL. | RW | 20 moc TB. 7m | 85-1351 |
| | | **COMPONENT MEASURED :** | **MODE OF OPERATIONS :** |
| | | VERT | SGP LOOP |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1450 E | 1.6 | -0.8 | -0.6 | -0.6 | -1.5 | -0.6 | 0 | 0.2 | | | |
| | 1.4 | -0.8 | -0.7 | -1.2 | -1.4 | -0.6 | -0.7 | 0 | | | |
| | | | | | -1.4 | 0 | -0.5 | -0.4 | CONT. | | |
| | | | | | | | | | | | |
| 1500E | -1.5 | -3.0 | -2.3 | -1.3 | -1.0 | -2.7 | -1.3 | 0 | | | |
| | -1.3 | -3.0 | -2.1 | -1.4 | -1.5 | -1.1 | -0.4 | 0. | | | |
| | | | | | | | | | | | |
| 1550E | -7.5 | -1.8 | -2.5 | -0.6 | -2.8 | -4.5 | -1.2 | -1.7 | | | |
| | -7.0 | -1.6 | -1.2 | -0.5 | -1.6 | -3.4 | -0.2 | -1.5 | | | |
| | | | | | | | | | | | |
| 1600 E | -3.5 | -1.0 | -1.0 | 1.6 | 1.5 | -0.2 | -1.2 | 3.0 | | | |
| | | | | -0.8 | -1.0 | -1.0 | 0 | -1.0 | CONT | | |
| | | | | | | | | | | | |
| 1650 E | -0.7 | -1.5 | 0 | -1.0 | 1.0 | 4.0 | 3.8 | - ? | | | |
| | | -1.5 | 0 | -1.0 | -1.5 | -1.7 | -1.0 | 1.0 | CONT | | |
| | | | | | | | | | | | |
| 1700E | -0.3 | 0.4 | 0.5 | 1.0 | -0.3 | -2.1 | 3.5 | 1.0 | | | |
| | | | | | -0.2 | -1.3 | -0.3 | 1.5 | CONT | | |

649287

Norrisprint

# P. E - M

| CLIENT: AMOCO. | PROFILE: 2900N | T. = R.: 100m | DATE: 18-8-81 |
|---|---|---|---|
| AREA: NORTH AUSTRAL | OPERATOR: EJ. | Tx. LOOP SIZE: 7m | JOB No.: 85-1351 |
| | | COMPONENT MEASURED: VERT. | MODE OF OPERATIONS: SEP Loop |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1800E | -8.5 | 0 | -0.8 | -0.5 | 0.4 | 3.6 | -2.0 | -2.9 | | | |
| | -7 | 0 | 0.4 | 1.4 | 0 | -0.1 | 1.9 | -4.6 | | | |
| | | | | 0 | -0.5 | -1.2 | 1.0 | -0.2 | CONT. | | |
| 1750E | -8.5 | -0.6 | -1.1 | -2.0 | -1.2 | -2.9 | -0.9 | 2.0 | | | |
| | | | | -1.0 | -0.8 | -0.4 | -0.5 | 0 | CONT. | | |
| 1700E | -12 | -1.0 | -1.1 | -1.1 | -2.1 | -1.3 | 2.4 | 2.4 | | | |
| | | | | -0.2 | -1.0 | 1.2 | 1.0 | -0.5 | CONT. | | |
| 1650E | -7.4 | -0.5 | -0.9 | 0.1 | -1.1 | 1.5 | 4.5 | 0.9 | | | |
| | | | | 0.4 | 0.3 | 0.2 | 0 | -0.3 | CONT. | | |
| 1600E | -9 | -0.8 | 0.1 | 0.2 | -0.1 | -0.1 | 0.4 | -1.7 | | | |
| | | | | | -0.4 | 0 | 0 | -0.8 | CONT. | | |
| 1550E | 3.6 | 1.0 | 0.9 | 1.4 | 0 | 0.5 | 3.7 | 1.6 | | | |
| | | | | 1.0 | 0.5 | 0 | 0.5 | 0.4 | CONT. | | |
| 1500E | 3.6 | -0.6 | -1.1 | -1.1 | -1.2 | 1.1 | 0.5 | 0.1 | | | |
| | 3.8 | -0.5 | -1.0 | -0.4 | -0.5 | -2.6 | -2.5 | -1.9 | | | |
| | | | | | -0.9 | -0.5 | -0.3 | 0 | CONT. | | |
| 1450E | 4.0 | -1. | -1. | -1. | -1.9 | -2.1 | -1.4 | -2.6 | | | |
| | | | | | -0.9 | -0.7 | 0 | 0 | CONT. | | |
| 1400E | -1. | -1.1 | -0.3 | -0.4 | -1. | 0.1 | 0.7 | 1. | | | |
| | | | | -0.5 | -1. | 0.2 | 0.4 | 0. | CONT. | | |

649288

Norrisprint

# P. E - M

| CLIENT: AMOCO | PROFILE: 1400N | T. - R.: WDN | DATE: 26-8-81 |
|---|---|---|---|
| AREA: NUBEENA | OPERATOR: E J | Tx. LOOP SIZE: 8 m | JOB No.: 85-1351 |
| | | COMPONENT MEASURED: Vert | MODE OF OPERATIONS: Separated Loop |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1650E | -3.1 | -3.3 | -0.4 | 0.1 | 0.5 | 0.5 | 0.8 | 1.4 | | | |
| | | | -0.5 | 0.2 | -0.1 | 0 | 0.1 | -0.5 | | | |
| 1700 | -5.1 | -2.9 | -0.4 | 0.9 | -0.5 | -0.4 | -0.3 | -0.6 | | | |
| | | -3.4 | -0.5 | 0.4 | -0.1 | 0.4 | 0 | -0.7 | | | |
| 1750 | -3.9 | -2.6 | -0.1 | 0.6 | 0.5 | H | 1 | -0.8 | | | |
| | -5.1 | -3.4 | -0.7 | 0.3 | 0.1 | 0.5 | 0.2 | -0.6 | | | |
| 1800E | -2.9 | -3.3 | -0.5 | 0.5 | -0.4 | 0.9 | 0.9 | -0.9 | | | |
| | | -3 | -0.6 | 0.1 | -0.3 | 0.1 | 0.3 | -0.1 | | | |
| 1850 | -21 | +2.4 | -1 | 0.3 | 0 | 0.5 | 0.4 | 0.1 | | | |
| | -19 | +2.5 | -0.5 | 1 | 0.5 | 0.8 | 0.9 | 0.5 | | | |
| | 17 ? | -3.4) | -0.5 | -0.1 | 0 | -0.1 | -0.2 | -0.5 | | | |
| 1900E | 1.5 | -3.4 | -1.1 | -0.9 | -1 | -0.5 | -1.1 | -1.6 | | | |
| | | -3.2 | -0.6 | 0.2 | -0.1 | 0 | 0 | -0.1 | | | Very Wind/Noisy |
| 2000E | -2 | -2.5 | -0.4 | 0.5 | 0 | 0.3 | 0.6 | -1. | | | |
| | | -2.8 | <0.3 | 0.4 | 0 | 0.2 | -0.2 | -0.6 | | | |
| 1950E | -1.5 | -2.4 | -0.8 | 0.5 | 0.2 | 0.2 | 0 | -0.2 | | | |
| | | -1.4 | -0.5 | 0.2 | -0.3 | 0.4 | 0.3 | -0.1 | | | |
| | | | LINE | 1300N | | | | | | | |
| 1700E | 19 | -11 | -0.2 | 1.4 | 0.9 | 1.6 | 1.6 | 0 | | | |
| cont | 25 | -8.1 | 0.3 | 0.9 | 0 | 0.7 | 1 | 0.1 | | | |
| | 24 | -7 | 0 | 1 | 0.9 | 1.4 | 1.1 | 0.9 | | | |
| 1650E | -5.4 | -3.1 | -0.9 | 0.1 | -0.1 | -0.5 | -0.1 | -0.1 | | | |
| | | -3.4 | -0.9 | 0.2 | 0 | 0.3 | 0.4 | -0.1 | | | |
| 1600E | -2.6 | -3.4 | -1.5 | -0.2 | -0.2 | 0.5 | 0.7 | -3.3 | | | |
| | | | 0.9 | 0.4 | 0.1 | 0.5 | 0.9 | -0.3 | | | |
| 1550 | -0.7 | -4.2 | -3 | -1.6 | -1.6 | -1.2 | -1.3 | -1.1 | | | |
| | -5.1 | -3.9 | -2 | -1.4 | -1 | -0.6 | -0.1 | -0.6 | | | |
| 1500E | -9.5 | -2.5 | -0.9 | -1 | -1.5 | -0.1 | 0 | 1.6 | X10/8 | | x 10/8 |
| | | -2.9 | -0.9 | -0.1 | -0.2 | +0.1 | 0.2 | -0.4 | | | |

649289

Norrisprint

# P. E - M

| CLIENT : Alcoa | PROFILE : 1400N | T. - R. : 100 m | DATE : 25-8-91 |
|---|---|---|---|
| AREA : Nubeena | OPERATOR : ES | Tx. LOOP SIZE : 8 m | JOB No. : 85-1351 |
| | | COMPONENT MEASURED : VERT | MODE OF OPERATIONS : Super Loop |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1000E | 1 | -4 | -1.1 | 0 | 0.4 | 0.3 | 0.2 | -0.4 | | | |
| cont | -7 | -3.6 | -0.6 | 0.3 | -0.1 | 0.4 | 0.1 | -0.4 | | | |
| | -7.1 | -3.1 | -1 | 0.5 | 0.1 | 0.8 | 0.5 | 0.9 | | | |
| | - | | | | | | | | | | |
| 1050E | -3.5 | -3.5 | -1.5 | 0 | -0.5 | 0 | 0.1 | -0.6 | | | |
| | | | -1.5 | 0.5 | -0.2 | -0.1 | 0 | -0.4 | | | V=all windy |
| | | | | | | | | | | | |
| 1100E | -6.1 | -3.6 | -0.9 | 0.6 | 0.3 | 0 | 0.6 | 0 | | | |
| | | | -1.1 | -0.1 | -0.4 | -0.5 | 0 | -0.1 | | | |
| | | | | | | | | | | | |
| 1150 | -6.1 | -4 | -1.4 | -0.5 | -0.6 | -0.6 | 0 | -0.7 | | | |
| | | | -1.4 | -0.2 | -0.2 | 0.1 | 0.1 | -0.2 | | | |
| | | | | | | | | | | | |
| 1200E | -8.5 | -4.1 | -12 | 0.1 | -0.2 | 1 | 1.3 | 1.4 | | | |
| | | | -1 | -0.1 | -0.3 | 0.3 | -0.1 | -0.4 | | | |
| | - | | | | | | | | | | |
| 1250E | -6.9 | -4.3 | -1.1 | 0.5 | 0.3 | 1.6 | 0.6 | 0.7 | | | |
| | | | -1 | 0 | -0.1 | 0.1 | -02 | -0.4 | | | |
| | | | | | | | | | | | |
| 1300E | -54 | -4.5 | -1.2 | -0.8 | -1 | 0 | 0 | -2.4 | | | |
| | | | | -0.2 | -0.8 | 0 | -0.4 | -0.5 | | | |
| | | | | | | | | | | | |
| 1350E | -14 | -4.1 | -2.1 | -1.4 | -2.4 | -1.6 | -2.4 | -2 | | | |
| | | -5.4 | -1.1 | -0.4 | -0.6 | -0.2 | -0.2 | -0.6 | | | |
| | | | | | | | | | | | |
| 1350E | -10 | -3.6 | -1.2 | -0.5 | -0.8 | -1.1 | -1.1 | -1.8 | | | x10/8 RPT 26-8-91 |
| | | -3.5 | -1.0 | -0.1 | -0.4 | 0.4 | -0.1 | -0.3 | | | |
| | | | | | | | | | | | |
| 1400E | -9.4 | -3 | -0.2 | 0.7 | 0.8 | 1.5 | 2.2 | 2 | | | |
| | | -3.2 | -0.5 | 0.2 | -0.2 | 0.6 | 0.2 | -0.1 | | | |
| | | | | | | | | | | | |
| 1450E | -9.5 | -4.1 | -0.6 | 0 | 0.4 | 0.2 | 0 | -2 | | | |
| | | | -0.4 | 0.1 | 0 | 0.5 | 0 | -0.2 | | | |
| | | | | | | | | | | | |
| 1500E | -3.5 | -4 | -0.9 | -0.1 | -0.4 | -0.1 | 0.5 | -0.1 | | | |
| | | | -1 | 0.4 | 0 | 0.2 | -0.1 | 0 | | | |
| | | | | | | | | | | | |
| 1550 | -6.6 | -3.2 | -1.1 | 0.1 | -0.1 | 0.4 | 0.9 | 0.9 | | | |
| | | -3.2 | -0.5 | 0.2 | 0.1 | 0.5 | 0.1 | -0.3 | | | |
| | | | | | | | | | | | |
| 1600E | -2.5 | -3.1 | -1 | -0.3 | -0.4 | -0.4 | -0.9 | -0.5 | | | |
| | | | -0.6 | 0.4 | 0.1 | 0.2 | -0.4 | -0.4 | | | |
| | | | | | | | | | | | |

649290

Norrisprint

# P. E - M

| CLIENT : Amoco | PROFILE : 1600N | T. - R. : 100 m | DATE : 24-8-87 25-8-87 |
|---|---|---|---|
| AREA : Nu Geena | OPERATOR : E.S. | Tx. LOOP SIZE : | JOB No. : 85-1351 |
| | | CO. PONENT MEASURED : Vert. | MODE OF OPERATIONS : separated loop |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 2000E | -8.7 | -5 | -2 | -1.1 | -2 | -0.9 | -1.1 | -1.6 | | | |
| cont | -8.4 | -5 | -1.9 | -0.5 | -1.1 | -0.1 | -0.4 | -1.1 | | | |
| | -8.7 | -5.1 | -2 | -0.4 | -0.4 | 0.6 | 0.6 | -0.4 | | | |
| 1950E | -5.4 | -3.7 | -1.4 | 0.1 | -0.2 | 0 | -0.5 | -0.1 | | | |
| | | | -1.4 | -0.8 | -0.7 | 0 | -0.5 | -1.2 | | | |
| 1900E | -7.7 | -5.6 | -2.9 | -1.5 | -1.9 | -1 | -1.9 | -2.6 | | | |
| | | | -2.9 | -1.5 | -1.8 | -1. | -0.9 | -1 | | | |
| 1850 | -9 | -3.3 | -1.2 | -0.2 | -0.4 | 0.2 | -0.1 | -0.3 | | | |
| | | | | -0.2 | -0.4 | -0.2 | -0.4 | -0.9 | | | |
| 1850E | -7.4 | -3.5 | -0.1 | 1 | 0.4 | 1.2 | 0.7 | 0 | | | 25-8-87 |
| | | -3.5 | -0.8 | 0.5 | 0 | 0.1 | -0.1 | -0.2 | | | RPT |
| 1800 | -9.9 | -4.1 | -0.4 | 0.3 | -0.1 | -0.2 | -0.6 | 0.2 | | | |
| | | | -0.6 | 0.2 | 0 | 0.4 | 0 | -0.3 | | | |
| 1750E | -5.9 | -4 | -0.5 | 0.6 | 0.4 | 1.1 | 0.6 | 0.5 | | | |
| | | -4 | -0.7 | 0 | -0.1 | -0.1 | -0.3 | -0.5 | | | |
| 1700 | -10 | -4 | -1.2 | 0 | -0.6 | -0.1 | 0 | -1 | | | |
| | | | | 0 | -0.1 | 0 | 0 | -0.4 | | | |
| 1650 | -11.1 | -3.2 | -0.6 | 0 | -0.4 | -0.4 | -0.4 | -0.1 | | | |
| | | | | 0.1 | 0 | -0.1 | -0.2 | -0.3 | | | |
| 1600E | -2.1 | -4.2 | -1.1 | 0 | -0.4 | -0.1 | -0.1 | -0.6 | | | |
| | -1.4 | -4 | -0.8 | 0.5 | -0.1 | 0.1 | -0.4 | -1 | | | |
| 1550E | -2.1 | -4.1 | -0.5 | 0 | -0.1 | -0.1 | -1.1 | -0.5 | | | |
| | | -4.1 | -0.6 | 0.1 | 0 | -0.1 | 0 | -0.6 | | | |
| 1500 | -7.4 | -4 | -1 | 0 | -0.2 | 0.4 | 0.8 | 0.8 | | | |
| | | | -1.2 | -0.4 | -0.4 | 0.1 | -0.3 | -0.4 | | | |
| 1450E | -6.1 | -6.2 | -3.1 | -1.4 | -1.1 | -0.5 | -0.9 | -0.9 | | | steel picket |
| cont | | -6.3 | -2.8 | -1.1 | -1.2 | -0.1 | -0.9 | -0.4 | | | |
| 5-N1 | -7 | -6 | -2.9 | -1 | -1.1 | -1.1 | -0.6 | -0.9 | | | moved coil |
| | | | | | | | | | | | |

649291

Norrisprint

# P. E - M

| CLIENT : AMOCO | PROFILE : 1600N | T. = R. : 100 m | DATE : 25-8-81 |
|---|---|---|---|
| AREA : NUBEENA | OPERATOR : ES | Tx. LOOP SIZE : 8 km | JOB No. : [illegible] |
| | | COMPONENT MEASURED : V. & R. T. BEPTHRALH. | MODE OF OPERATIONS : [illegible] |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1400E | -9 | -4.5 | -1.5 | -0.5 | -0.9 | -0.6 | -0.1 | -0.7 | | | |
| | | | -1.2 | -0.5 | -0.1 | 0.3 | -.2 | -0.5 | | | |
| | | | | | | | | | | | |
| 1350E | -9.4 | -5.1 | -2 | -0.1 | -0.1 | 0.6 | 0.6 | -1.5 | | | |
| | | | -1.4 | -0.1 | -0.3 | -0.1 | 0 | -0.4 | | | |
| | | | | | | | | | | | |
| 1300E | -4.5 | -4.5 | -0.6 | 0.3 | 0.2 | 1.4 | 1.5 | -1 | | | |
| cont | | -4.5 | -0.9 | 0.6 | 0.2 | 0.3 | 0.2 | -0.2 | | | |
| | -7.1 | -4.6 | -1.1 | 0.4 | 0 | 0.8 | -0.5 | -1.4 | | | |
| | | | | | | | | | | | |
| 1250E | -8.1 | -4 | -1.5 | 0 | -0.8 | -0.1 | 0.6 | -0.6 | | | |
| | | | -1.4 | -0.2 | -0.1 | 0.1 | 0 | -0.6 | | | |
| | | | | | | | | | | | |
| 1200E | -8.2 | -4.5 | -2 | -0.8 | -0.9 | -0.9 | -0.9 | -1.4 | | | |
| | | | -1.5 | -0.2 | -0.2 | 0 | -0.2 | -0.4 | | | |
| | | | | | | | | | | | |
| 1150E | -9.4 | -5.4 | -2.6 | -1.1 | -1.4 | -0.4 | -0.9 | -1.5 | | | |
| | | | -2.0 | -1 | -0.5 | 0.1 | 0 | -0.5 | | | |
| | | | | | | | | | | | |
| 1100E | -15 | -6.9 | -1.9 | 0.8 | 0.5 | 2.5 | 3 | -0.1 | | | |
| | | | -2 | -0.6 | -0.4 | 0.8 | 0.5 | -0.5 | | | |
| | | | | | | | | | | | |
| 1050 | -15 | -7.4 | -3.5 | -0.6 | -0.4 | 0.1 | -0.1 | -1 | | | |
| | | -8.5 | -3 | -0.6 | -0.5 | 0.4 | 0 | -0.5 | | | |

649292

Norrisprint

# P. E. M.

| CLIENT : Amoco | PROFILE : 1800N | T. ⇌ R. : 100m | DATE : 23.8.81 |
|---|---|---|---|
| AREA : NUBEENA | OPERATOR : ES. | Tx. LOOP SIZE : 7m | JOB No. : 85-1351. |
| | | COMPONENT MEASURED : VERT | MODE OF OPERATIONS : SEP LOOP. |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1350 E | -8.5 | -4.9 | -1.5 | 0 | -0.8 | 0.9 | -0.1 | -2.0 | | | |
| | | | -1.5 | -0.4 | -0.9 | 0.3 | -1.0 | -1.4 | CONT | | |
| 1300E | -7.5 | -4.9 | -1.6 | -0.3 | -1.0 | 0.1 | -0.3 | -1.0 | | | |
| | | | -1.5 | -0.1 | -0.5 | 0.1 | -0.5 | -1.1 | CONT | | |
| 1250E | -2.0 | -4.6 | -2.4 | -0.1 | -0.5 | 0.1 | -0.5 | -2.0 | | | |
| | -2.9 | -4.4 | -1.4 | -0.2 | -0.5 | 0 | -0.5 | -1.5 | CONT | | |
| 1200E | 0.5 | -6.0 | -3.0 | -2.5 | -3.2 | -2.8 | -2.8 | -3.0 | | | V 10/3 |
| | -1.5 | -7.5 | -2.1 | -0.4 | -0.4 | 0 | -0.6 | -0.8 | | | Very noisy |
| 1150E | -0.5 | -5.1 | -2.4 | 0 | 0.1 | 2.4 | 0.9 | -0.6 | | | |
| | | -5.6 | -2.1 | -0.7 | -0.5 | 0.5 | -0.9 | -0.6 | CONT. | | |
| 1100E | -2.5 | -5.5 | -2. | -0.1 | -0.8 | -1. | -2. | -1.5 | | | |
| | | -5.5 | -1.8 | -0.1 | -0.5 | -0.6 | -1. | -1.5 | CONT | | |
| 1050E | 0.5 | 0.1 | 2.5 | 4.5 | 4.5 | 4.6 | 3.0 | 3.0 | | | |
| | 0.2 | -2.5 | 1.0 | 2.5 | 1.9 | 1. | 0.1 | -0.5 | CONT | | V. Noisy |
| | -1. | -0.9 | 1.9 | 3.4 | 2.8 | 2.9 | 1.5 | 1.9 | | | |
| 1000E | 2.4 | -7.0 | -3.0 | -1.5 | -1.0 | 0.1 | -1.0 | -1.5 | | | |
| | | | -3. | -0.9 | -0.9 | -0.5 | -1.5 | -1. | CONT | | |

Norrisprint

P. E - VI

649293

| CLIENT: AMOCO | PROFILE: 1900N | T. - R.: 10 Om. | DATE: 22, 23. 8. 81 |
|---|---|---|---|
| AREA: NUBEENA. | OPERATOR: EJ. | Tx. LOOP SIZE: 7 m | JOB No.: 85 - 1351 |
| | | COMPONENT MEASURED: VERT. | MODE OF OPERATIONS: SEP LOOP. |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 2000 E | -10 5 | -5.1 | -1.4 | 0 | -0.2 | 0.5 | 0.5 | -0.4 | | | |
| | | -5.1 | -1.5 | -0.6 | -0.4 | -0.2 | -1.5 | -1.4 | | | |
| 1950E | -10.5 | -4.1 | -1.0 | 0 5 | 0.5 | 0.5 | -1.5 | -3. | | | |
| | | -4.5 | -0.6 | 0 | 0 | 0.5 | -1.5 | -1.5 | | | |
| 1900E | -5.9 | -4.2 | -0.9 | 0.6 | 0.5 | 1.4 | 1. | -0.6 | | | |
| | | | -1.7 | -0.5 | -1.0 | 0.1 | -1.4 | -1.2 | CONT. | | |
| 1850E | -3.0 | -4.5 | -1.8 | -0.3 | -1.1 | -0.4 | -1.5 | -1.6 | | | |
| | | | | -0.2 | -0.9 | 0.1 | -1.5 | -1.7 | CONT. | | |
| 1800E | -4.1 | -4.5 | -1.5 | -0.5 | -0.9 | 0.1 | -1.4 | -1.3 | | | |
| | | | | -0.5 | -0.9 | 0 | -1.5 | -1.4 | CONT. | | |
| 1800E | -2.5 | -4.2 | -1.5 | -0.1 | -0.9 | -0.6 | -1.5 | -1.5 | | | RPT 23/8/81 |
| 1750E | -8.6 | -4.5 | -2. | -0.6 | -1.4 | -0.6 | -1. | -1.4 | | | |
| | | -4.5 | -1.4 | -0.3 | -1. | -0.5 | -1.5 | -1.4 | CONT | | |
| 1700E | 14 | -4.5 | -1.5 | -0.4 | -0.4 | 0.6 | 0.4 | -0.9 | | | |
| | 17 | -4. | -1.1 | 0 | -0.4 | 0 | -0.5 | -1.2 | CONT | | |
| 1650E | -4.4 | -4.4 | -0.9 | -0.1 | -0.2 | 0 | -0.9 | -1. | | | |
| | | | -0.9 | 0.1 | -0.5 | 0 | -0.4 | -1. | | | |
| 1600E | -9.1 | -4.0 | -1.4 | -0.2 | -0.6 | -0.1 | -0.7 | -1.1 | | | |
| | | | -1.1 | -0.2 | -0.9 | 0.1 | -0.5 | -1.2 | | | |
| 1550E | -13 | -4.4 | -1.1 | -1.0 | -0.6 | 0 | -0.7 | -1.6 | | | |
| | | | -1.2 | 0 | -0.5 | 0 | -1. | -1.4 | | | |
| 1500E | -6.5 | -4.5 | -2. | -0.5 | -1.5 | -1. | -1.2 | -2.8 | | | |
| | | -4.5 | -1. | +0.2 | -0.6 | 0 | -0.9 | -0.6 | | | |
| 1450 E | -7.4 | -4.5 | -1.5 | -0.1 | -0.6 | -0.7 | -1.4 | -1.9 | | | |
| | | | | -0.1 | -0.7 | -0.1 | -0.8 | -0.9 | | | |
| 1400E | -6.8 | -4.6 | -1.6 | -0.6 | -1. | 0.1 | -0.4 | -1.6 | | | |
| | | | -1.5 | -1. | -1. | -0.5 | -1. | -1.4 | | | |

649294

# P. E - M

Norrisprint

| CLIENT : | PROFILE : | T. — R. : | DATE : |
|---|---|---|---|
| AMOCO | 2000N | 100 m. | 24-8-81 |
| AREA : Nubeena | OPERATOR : ES | Tx. LOOP SIZE : 8 m. | JOB No. : 85-1351 |
| | | COMPONENT MEASURED : VERT | MODE OF OPERATIONS : SCDamped (x) |

| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1400E | -6.1 | -3.5 | -1.1 | 0 | -1 | -1 | -0.9 | -1.5 | | | |
| | | | | -0.2 | -0.5 | 0.1 | -0.6 | -1.2 | | | |
| 1350 | -6.5 | -3.9 | -1 | 0 | -1.5 | -1 | -1.1 | -1.6 | | | |
| | | | | | -0.3 | 0 | -0.4 | -0.7 | | | |
| 1300 | -5.9 | -3.9 | -1 | 0.5 | 0 | 0 | 0 | -0.2 | | | |
| | | | -1.1 | -0.1 | -0.2 | -0.1 | -0.5 | -1 | | | |
| 1250 | -7.9 | -4.2 | -1.3 | 0.4 | -0.4 | -0.1 | 1.1 | 1 | | | X 10/8 |
| | | | -1.2 | 0.2 | -0.3 | -0.2 | -0.6 | -0.9 | | | |
| 1200 | -15 | -5.8 | -1 | 0.4 | -1.3 | -1 | -1.5 | -2.4 | | | |
| | | | | 0.4 | -0.5 | 0.2 | -0.5 | -0.8 | | | |
| 1150E | -9.6 | -4 | -0.9 | 0.5 | 0.1 | 1 | 0.1 | -0.6 | | | |
| | | | -0.9 | 0.2 | 0 | 0.6 | -0.1 | -0.2 | | | |
| 1100E | -10.8 | -5.5 | -1.1 | -0.5 | -0.2 | 1.4 | -0.1 | -1.4 | | | |
| | | | -1.1 | -0.5 | -0.1 | 0 | -0.5 | -1.3 | | | |
| 1050E | -11 | -5 | -1.4 | 0.1 | 0 | 0 | 0 | -0.1 | | | |
| | | | -1.4 | -0.1 | 0 | 0.5 | 0.1 | -0.6 | | | |
| 1000E | | | | | | | | | | | too thick bank |

649295

Norrisprint

# P. E - M

| CLIENT : | PROFILE : | T. ↔ R. : | DATE : |
|---|---|---|---|
| AMOCO | 2000N | 100 m. | 24-8-81 |
| **AREA :** | **OPERATOR :** | **Tx. LOOP SIZE :** | **JOB No. :** |
| Nubeena | EP | 8 m. | 85-1351 |
| | | **COMPONENT MEASURED :** | **MODE OF OPERATIONS :** |
| | | VERT | separated loop |

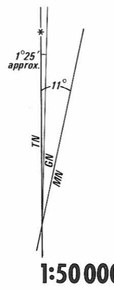
| | CHANNELS | | | | | | | | MODE OF READING | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PLOTTING PT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | REMARKS |
| 1400E | -6.1 | -3.5 | -1.1 | 0 | -1 | -1 | -0.9 | -1.5 | | | |
| | | | | -0.2 | -0.5 | 0.1 | -0.6 | -1.2 | | | |
| 1350 | -1.5 | -3.9 | -1 | 0 | -1.5 | -1 | -1.1 | -1.6 | | | |
| | | | | | -0.3 | 0 | -0.4 | -0.7 | | | |
| 1300 | -5.9 | -3.9 | -1 | 0.5 | 0 | 0 | 0 | -0.2 | | | |
| | | | -1.1 | -0.1 | -0.2 | -0.1 | -0.5 | -1 | | | |
| 1250 | -7.9 | -4.2 | -1.3 | 0.4 | -0.4 | -0.1 | 1.1 | 1 | | | $\times\frac{10}{8}$ |
| | | | -1.2 | 0.2 | -0.3 | -0.2 | -0.6 | -0.9 | | | |
| 1200 | -15 | -5.8 | -1 | 0.4 | -1.3 | -1 | -1.5 | -2.4 | | | |
| | | | | 0.4 | -0.5 | 0.2 | -0.5 | -0.8 | | | |
| 1150E | -9.6 | -4 | -0.9 | 0.5 | 0.1 | 1 | 0.1 | -0.6 | | | |
| | | | -0.9 | 0.2 | 0 | 0.6 | -0.1 | -0.2 | | | |
| 1100E | -10.8 | -5.5 | -1.1 | -0.5 | -0.2 | 1.4 | -0.1 | -1.4 | | | |
| | | | -1.1 | -0.5 | -0.1 | 0 | -0.5 | -1.3 | | | |
| 1050E | -11 | -5 | -1.4 | 0.1 | 0 | 0 | 0 | -0.1 | | | |
| | | | -1.4 | -0.1 | 0 | 0.5 | 0.1 | -0.6 | | | |
| 1000E | | | | | | | | | | | too thick Bulk |

350000E
360000E
145° 20' E
370000E
Remison Bell
41°50'S
5360000N
5350000N
42°00'S
Queenstown

Lead Blocks
Serpentine Hill
McKimmie
Dundas Cuni
Grand Prize
Sassafrass
Big Ben
Montana SL
Crown
Junction
Zeehan Western
Montana
Oonah
Despatch
Doric
Zeehan
Stormsdown
New Mt. Zeehan
Argent
Florence
Tenth Legion
Sylvester
Nike
Kynance
Silver Stream
Comstock
Boss
Susanite
Britiannia
Sth. Comstock
Central Bolstrupi
Silver King
Black Jacks
Spray
Nth. Colonel
Stonehenge
Globe
Cumberland Lake
North Austral
Nth. Tasmanian
Tasmanian
Grubbs
Nubeena
Sth. Nubeena
Swansea
Nubeena
Silver Duke
Montagu
Nth. Austral
Maxine
38M/77
Zeehan Bell
39M/77
J.N.R Enraght-Moony
Monte Cristo
Austral
Electrolytic Zinc
Mariposa
60M/77
4M/77
Oceana
Sunny Corner
Bannockburn
Pyramid
Remine
Little
River
Henty
SOUTHERN
OCEAN
EL 4/78
Myrtle
Grieves
Grieve Siding
Baura
Rose Valley
Mineral Developments
11M/66
Queensberry Mine
12M/66
Henty
River

## Location




1:50000

0 1 2 3
Kilometers

5 cm

Compiled from enlargement of Zeehan 1:63360 scale and Strahan 1:50000 scale geologic maps.
Transverse Mercator Projection

649296

AMOCO

Amoco Minerals Australia Company

| | | | |
|---|---|---|---|
| Project | ZEEHAN | | Nº A-78-60 |
| Project Partner | | | |
| Zeehan EL 4/78 | | | |
| **PROSPECT LOCATION** | | | |
| Map Ref. ANG | K-55-5 | Latitude 42°00'S | Longitude 145°20'E |
| Surveyed | | Date | Scale 1:50000 |
| Drawn | S.F., R. Smyth-King | Date August 1981 | Drawing Nº M80-1476 |

Report 279

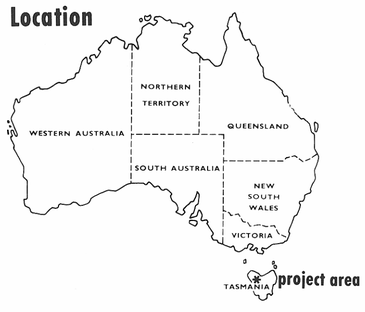
1270

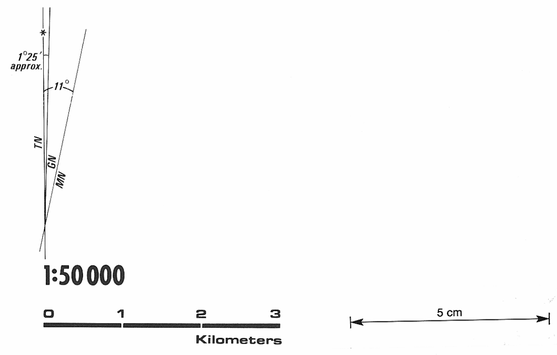
Enclosure 1

350000E
360000E
370000E
145°30'E
41°50'S
53600000N
53500000N
42°00'S
Queenstown

Lead Blocks
Serpentine Hill
Renison Bell
Dundas Cuni
McKimmie
Grand Prize
Big Ben
Montana SL
Crown
Junction
Zeehan Western
Montana
Oonah
Despatch
Doric
Zeehan
Stormsdown
New Mt Zeehan
Argent
Florence
Tenth Legion
Sylvester
Kynance
Silver Stream
Nike
Comstack
Boss
Susanite
Britannia
Sth Comstack
Renison 12M/78
Central Balstrup
Spray
Nth Colonel
Stanenunge
Nth Tasmanian
Tasmanian
Grubbs
Nubeena
Sth Nubeena
Swansea
Silver Duke
Maxim
Montagu
Nth Austral
Silver King
32M/75
38M/77
Zeehan Be
39M/77
J.N.R Enraght – Moony
Renison 29M/75
Monte Cristo
Black Jack's
Mariposa
Sunny Corner
Bannockburn
Grieve Siding
Cumberland Lake
Globe
Remine
Little
Henty
River
EL 4/78
SOUTHERN
OCEAN
Electrolytic Zinc
Austral
60M/77
4M/77
Ocean
Amoco Minerals
35M/81 (3HA)
Malconin Bendall Mining Syndicate
11M/66
12M/66
Queensberry Mine

## Location




Compiled from enlargement of Zeehan 1:63360 scale and Strahan 1:50000 scale geologic maps.
Transverse Mercator Projection

649297

Amoco Minerals Australia Company

| | | | | | |
|---|---|---|---|---|---|
| Project ZEEHAN | | | | Nº A-78-60 | |
| Project Partner | | | | | |
| Zeehan EL 4/78 | | | | | |
| **PRE-EXISTING TENEMENTS** | | | | | |
| Map Ref. ANG | K-55-5 | Latitude | 42°00'S | Longitude | 145°20'E |
| Surveyed | | Date | | Scale | 1:50000 |
| Drawn | R. Smyth-King | Date | August 1978 | Drawing Nº | M78-939 |

Report 279

1270

Enclosure 2

## Legend

QUATERNARY
- Alluvium etc — GR

TERTIARY
- Basalt — 2C 2

DEVONIAN
- Florence Quartzite — 4A 26
  - Undifferentiated quartzites, sandstones, siltstones

SILURIAN
- Amber Slate — 4D1 68
  - Siltstone interbedded with shales
- Crotty Quartzite
  - Undiff. sandstones, siltstones and grits — 4B1 6
  - Sandstone, massive — 4B2 6
  - Sandstone, cross bedded — 4B3 9
  - Sandstone, tubicolar — 4B4 44
  - Sandstone, white, friable — 4B5 6
  - Siltstone — 4D2 57
  - Conglomerate — 4I1 6
  - Grits — 4J1 6

ORDOVICIAN
- Gordon Limestone
  - Sandstone — 4B6 63
  - Sandstone, fossiliferous — 4B7 63
  - Sandstone breccia — 4B8 63
  - Siltstone — 4D3 63
  - Shale — 4E1 63
  - Claystone — 4F 63
  - Limestone — 4G1 33
  - Limestone, fossil breccia — 4G2 46
  - Limestone, slumped — 4G3 41
  - Dolomite, black — 4H1 35
  - Dolomite breccia — 4H2 35
  - Dolomite, silicified — 4H3 35
  - Conglomerate — 4I2 68
  - Ironstone — 5 14
  - Mineralization — 5! 14
- Moina Formation
  - Sandstone, tubicolar — 4B9 70
  - Sandstone — 4B10 64
  - Undifferentiated — 4D4 64
  - Siltstone, tubicolar — 4D5 64
  - Dolomite — 4H4 64
  - Conglomerate — 4I3 64
  - Grit — 4J2 64
  - Ironstone — 5 14
- Mt. Zeehan Conglomerate
  - Undiff. conglomerate, siltstone, sandstone — 4I4 38
  - Ironstone — 5

CAMBRIAN
- Crimson Creek Formation
  - Interbedded shales, siltstones, tuffs, conglomerates — 1E 1 20
  - Tuff, volcano lith-arenite — 1E 2 20
  - Sandstone-tuff — 4B 11 20
  - Shale — 4E 2 20
  - Ironstone — 5 14
  - Siltstone — 4D6 20

PRECAMBRIAN
- Donah Quartzite
  - Undiff. arenite / black shale — 4A1 60
  - Quartzite (micaceous arenites) — 4A2 60
  - Sandstone, brown — 4B12 60
  - Siltstone — 4D7 60
  - Slate (black shale) — 4E3 67
  - Volcanics — 1E 3 60
  - Ironstone — 5 14

**SPL129**
Mt Lyell

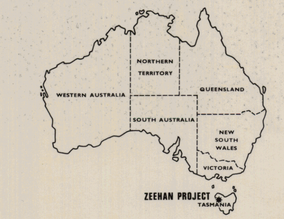
**EL 4/78**
Amoco Minerals

**60M/77**
Electrolytic Zinc (Amoco JV)

41°55'S

145°20'E

## Location




## Symbols

- Geologic contact, position inferred
- Geologic contact, position approximate
- Fault, position accurate
- Fault, position approximate
- Fault, inferred
- Unconformity
- Facies change
- Shear zone
- Zone of intense cleavage
- Brecciation
- Dip and Strike
- Vertical dip and strike
- Vertical foliation
- Quartz vein
- Silicified cemented breccia
- Shaft/prospecting pit
- Adit
- Underground workings
- Costean
- Cutting or quarry
- Dump
- Amoco rock chip location — 36242
- Amoco costean — B
- Amoco drillhole

TN 11° MN

1:2500
0 100 200 meters

5 cm

Amoco Minerals Australia Company

64033S

| | | | | | |
|---|---|---|---|---|---|
| Project | ZEEHAN | | | Nº A-78-608 | |
| Project Partner | | | | | |
| Nubeena | | | | | |
| FACTUAL GEOLOGY | | | | | |
| Map Ref. ANG | K-55-5 | Latitude | 41°55'S | Longitude | 145°20'E |
| Surveyed | P. Jones | Date | 1981 | Scale | 1:2500 |
| Drawn | Hovick | Date | 1982 | Drawing Nº | M82-1814 |

Report 279

1270

Enclosure 3

**SPL129**
Mt Lyell

**EL 4/78**
Amoco Minerals

**60M/77**
Electrolytic Zinc ( Amoco JV)

## Location




## Notes

Gravity survey by Solo Geophysics
Computer graphics by CEA , North Sydney
Correction density 2.6 gm/cc

## Contour Intervals

Values in milligals

TN 11° MN

1:2500
0 100 200 meters

5 cm

41°55'S

145°20'E

Amoco Minerals Australia Company

649299

| | | | | | |
|---|---|---|---|---|---|
| Project | ZEEHAN | | | Nº A-78-608 | |
| Project Partner | | | | | |
| Nubeena | | | | | |
| BOUGUER GRAVITY | | | | | |
| Map Ref. ANG | K-55-5 | Latitude | 41°55'S | Longitude | 145°20'E |
| Surveyed | Solo | Date | 1981 | Scale | 1:2500 |
| Drawn | CEANET, HK | Date | 1982 | Drawing NºM82-1816 | |

Report 279

/271

Enclosure 4

## Legend

QUATERNARY

| | | |
|---|---|---|
| Alluvium etc | GR | |

TERTIARY

| | | |
|---|---|---|
| Basalt | 2C | 2 |

DEVONIAN

| | | |
|---|---|---|
| Florence Quartzite | 4A | 26 |
| Undifferentiated quartzites, sandstones, siltstones | | |

SILURIAN

| | | |
|---|---|---|
| Amber Slate | 4D1 | 68 |
| Siltstone interbedded with shales | | |
| Crotty Quartzite | | |
| Undiff. sandstones, siltstones and grits | 4B1 | 6 |
| Sandstone, massive | 4B2 | 6 |
| Sandstone, cross bedded | 4B3 | 9 |
| Sandstone, tubicolar | 4B4 | 44 |
| Sandstone, white, friable | 4B5 | 6 |
| Siltstone | 4D2 | 57 |
| Conglomerate | 4I1 | 6 |
| Grits | 4J1 | 6 |

ORDOVICIAN

| | | |
|---|---|---|
| Gordon Limestone | | |
| Sandstone | 4B6 | 63 |
| Sandstone, fossiliferous | 4B7 | 63 |
| Sandstone breccia | 4B8 | 63 |
| Siltstone | 4D3 | 63 |
| Shale | 4E1 | 63 |
| Claystone | 4F | 63 |
| Limestone | 4G1 | 33 |
| Limestone, fossil breccia | 4G2 | 46 |
| Limestone, slumped | 4G3 | 41 |
| Dolomite, black | 4H1 | 35 |
| Dolomite breccia | 4H2 | 35 |
| Dolomite, silicified | 4H3 | 35 |
| Conglomerate | 4I2 | 66 |
| Ironstone | 5 | 14 |
| Mineralization | 5' | 12 |
| Moina Formation | | |
| Sandstone, tubicolar | 4B9 | 10 |
| Sandstone | 4B10 | 64 |
| Undifferentiated | 4D4 | 64 |
| Siltstone, tubicolar | 4D5 | 64 |
| Dolomite | 4H4 | 64 |
| Conglomerate | 4I3 | 64 |
| Grit | 4J2 | 64 |
| Ironstone | 5 | 14 |
| Mt. Zeehan Conglomerate | | |
| Conglomerate | 4I4 | 58 |

CAMBRIAN

| | | |
|---|---|---|
| Crimson Creek Formation | | |
| Undifferentiated | 1E1 | 20 |
| Tuff, volcano lith-arenite | 1E 2 | 20 |
| Sandstone-tuff | 4B 11 | 20 |
| Shale | 4E 2 | 20 |
| Ironstone | 5 | 14 |
| Siltstone | 4D6 | 20 |

PRECAMBRIAN

| | | |
|---|---|---|
| Oonah Quartzite | | |
| Undifferentiated | 4A1 | 60 |
| Micaceous quartzite | 4A2 | 60 |
| Sandstone, brown | 4B12 | 60 |
| Siltstone | 4D7 | 60 |

within EL 4/78

39M/77
J.N.R. Enraght-Moony

60M/77
Electrolytic Zinc (Amoco JV)

ZT-80A-2
ZT-79-1
ZT-80A-3
ZT-81A-6
ZT-81A-4
ZT-81A-8
ZT-81A-5
ZT-81A-7
ZT-81A-10
ZT-81A-9

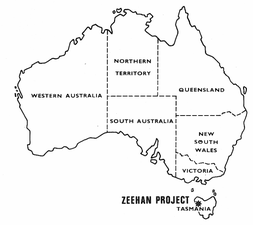
A B C D E F G H J K

Flux Quarry
Quarry
Quarry
Swamp
Swamp
Swamp
Pyritic slime tump
Dump
Dump
Dump
Zeehan Smelter Ruin
Costean 1
Costean 2
Stream Sample
[Channel Samples]
Water race

ZEEHAN-STRAHAN ROAD
OCEANA ROAD
Austral Creek
Crimson Creek
LITTLE HENTY

5359000mN
5358000mN
41°55'S
145°21'E
362000mE

## Location




## Symbols

- Geologic contact, position accurate
- Geologic contact, position approximate
- Fault, position accurate
- Fault, position approximate
- Fault, inferred
- Unconformity
- Facies change
- Shear zone
- Zone of intense cleavage
- Brecciation
- Overturned bedding
- Measured dip and strike
- Plunging anticline (minor)
- Quartz vein (qtz)
- Outcropping Pb/Zn mineralization
- Shaft/prospecting pit
- Adit
- Underground workings
- Costean
- Cutting or quarry
- Dump
- Amoco rock chip location (36242)
- Amoco costean (B)
- Amoco drillhole

TN 11° MN

1:2500
0 100 200 meters

5 cm

Amoco Minerals Australia Company

649300

| | | | | | |
|---|---|---|---|---|---|
| Project | ZEEHAN | | | Nº A·78·60B | |
| Project Partner | | | | | |
| Austral | | | | | |
| FACTUAL **GEOLOGY** showing rockchip locations | | | | | |
| Map Ref. ANG | K-55-5 | Latitude | 41°55'S | Longitude | 145°20'E |
| Surveyed | P. Jones | Date | 1981 | Scale | 1:2500 |
| Drawn | S. Fowler | Date | 1981 | Drawing Nº M81-1725 | |

Report 279

1271

Enclosure 5

within EL 4/78

39M/77
J.N.R. Enraght-Moony

60M/77
Electrolytic Zinc (Amoco JV)

Location




Notes

Computer graphics by CEA, North Sydney

Contour Intervals

250
500
2500

Values in ppm




1:2500
0 100 200 meters

5 cm

Amoco Minerals Australia Company

649301

| | | | | | |
|---|---|---|---|---|---|
| Project | ZEEHAN | | | Nº A-78-608 | |
| Project Partner | | | | | |
| Austral SOIL GEOCHEMISTRY **LEAD** | | | | | |
| Map Ref. ANG | K-55-5 | Latitude | 41°55'S | Longitude | 145°20'E |
| Surveyed | P. Jones | Date | October 1981 | Scale | 1:2500 |
| Drawn | CEANET, S. Fowler | Date | January 1982 | Drawing Nº | M82-1818 |

Report 279

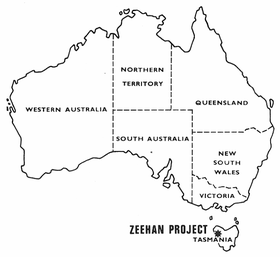
1271 Enclosure 6

within EL 4/78

39M/77
J.N.R. Enraght-Moony

60M/77
Electrolytic Zinc (Amoco JV)

Location




Notes

Computer graphics by CEA, North Sydney

Contour Intervals

300
1000
3000

Values in ppm

1:2500
0 100 200 meters

5 cm

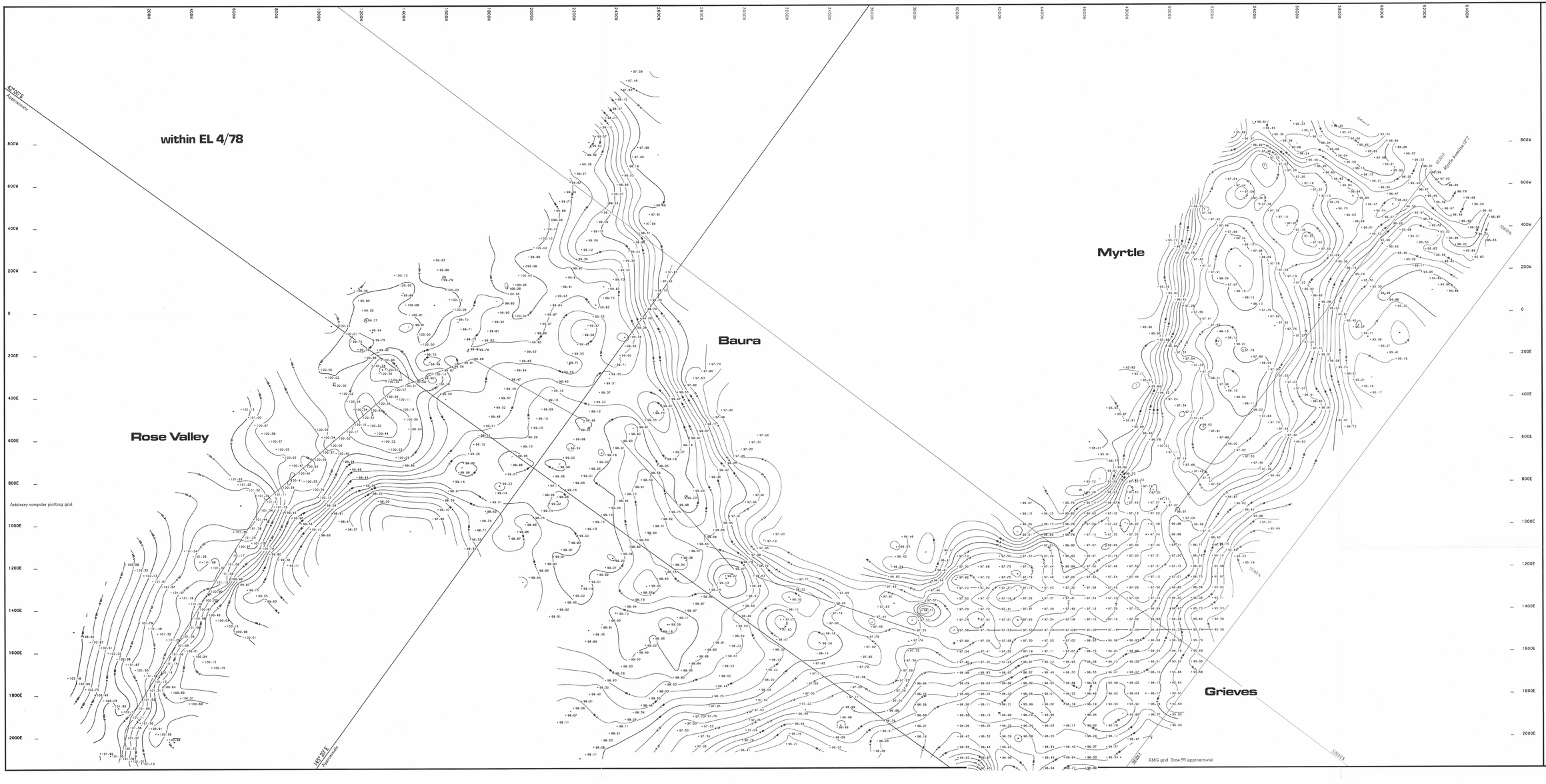
649302

Amoco Minerals Australia Company

| | | | |
|---|---|---|---|
| Project | ZEEHAN | | Nº A-78-608 |
| Project Partner | | | |
| Austral | | | |
| SOIL GEOCHEMISTRY | | | |
| ZINC | | | |
| Map Ref. ANG | K-55-5 | Latitude | 41°55'S |
| Longitude | 145°20'E | | |
| Surveyed | P. Jones | Date | October 1981 |
| Scale | 1:2500 | | |
| Drawn | CEANET, S. Fowler | Date | January 1982 |
| Drawing Nº | M82-1817 | | |

Report 279

1272 Enclosure 7


within EL 4/78
Rose Valley
Baura
Myrtle
Grieves
Arbitrary computer plotting grid
AMG grid Zone 55 (approximate)
Notes
Gravity surveys by Wongela and Solo
Computer graphics by CSANET, North Sydney
1:5000
649303
Amoco Minerals Australia Company
Project ZEEHAN Nº A-78-608
Project Partner
Myrtle to Rose Valley
RESIDUAL GRAVITY
Map Ref. ANG K-55-5 Latitude 41°55'S Longitude 145°20'E
Surveyed Wongela, Solo Date 1981 Scale 1:5000
Drawn CSANET, S.Fowler Date January 1982 Drawing Nº 482-1832
Report 279
Enclosure 8