

# **ZEEHAN ZINC LIMITED**

**Mining Licenses: 43M/85, 19M/1995, 123M/47 &  
9M/2002**

**Exploration Licenses: 20/2002 and 30/2002  
Western Tasmania**

## **RESOURCES ESTIMATION and CLASSIFICATION**

**Prepared By**



**COTLCO PTY. LTD.**

**A.C.N. 068 037 669**

**February 2005**

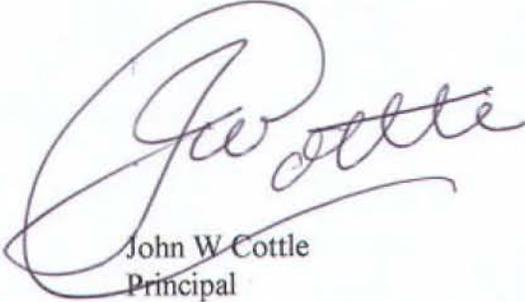


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John W Cottle  
Principal

February 18, 2005

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## 1.0 Introduction

Zeehan Zinc Limited (Zeehan Zinc) requested Cotlco Pty. Ltd. (Cotlco) carry out a resources review (including estimation where necessary and appropriate) and classification of their Silver (Ag), Lead (Pb), Zinc (Zn) lodes in the Comstock Area just west of Zeehan in Tasmania, and the Oceana deposit south of Zeehan. The exploration leases concerned and held by ZZ Exploration Pty. Ltd. include EL 30/2002, surrounding Oceania Tasmania Pty. Ltd. Mining Leases ML 123M/47, ML 43M/85, and ML 19M/95, encompassing the Comstock Area, and EL 20/2002 which covers the Oceana deposit (see Figure 1). The resources detailed in this report comply with the Australasian Code for Reporting of Mineral Resources and Ore Reserves (The JORC Code) 1999.

## 2.0 Summary, Conclusions and Recommendations

### Summary

The resource estimates and classifications according to JORC are listed in the following Table.

<b>Table 3. Zeehan Zinc Estimated Resources</b>				
Classification	Tonnes	Pb%	Zn%	Ag g/t
<b>West Comstock Estimated Resources</b>				
<b>Measured</b>	4,600	12.3	10.6	140
<b>Inferred</b>	12,670	13.4	13.6	160
<b>Sub-Total Resources</b>	<b>17,270</b>	<b>13.1</b>	<b>12.8</b>	<b>155</b>
<b>Balstrup Fault Lode</b>				
<b>Inferred</b>	<b>4,600,000</b>	<b>3.3</b>	<b>5.7</b>	<b>35</b>
<b>Allison's Lode Estimated Resources</b>				
<b>Measured</b>				
Stockpiled Ore	1,400	14.5	21.5	540
Insitu Resource	3,300	4.0	13.4	80
<b>Total Measured</b>	<b>4,700</b>	<b>7.1</b>	<b>15.8</b>	<b>217</b>
<b>Inferred</b>				
Insitu Resource	43,700	2.2	4.8	14
<b>Sub-Total Resources</b>	<b>48,400</b>	<b>2.7</b>	<b>5.9</b>	<b>34</b>
<b>Oceana Deposit</b>				
<b>Inferred</b>	<b>2,100,000</b>	<b>9.2</b>	<b>2.6</b>	<b>88</b>
<b>Total Resources</b>				
<b>Measured</b>	9,300	9.7	13.2	179
<b>Inferred</b>	6,756,370	5.1	4.7	52
<b>Grand Total</b>	<b>6,765,670</b>	<b>5.2</b>	<b>4.8</b>	<b>52</b>

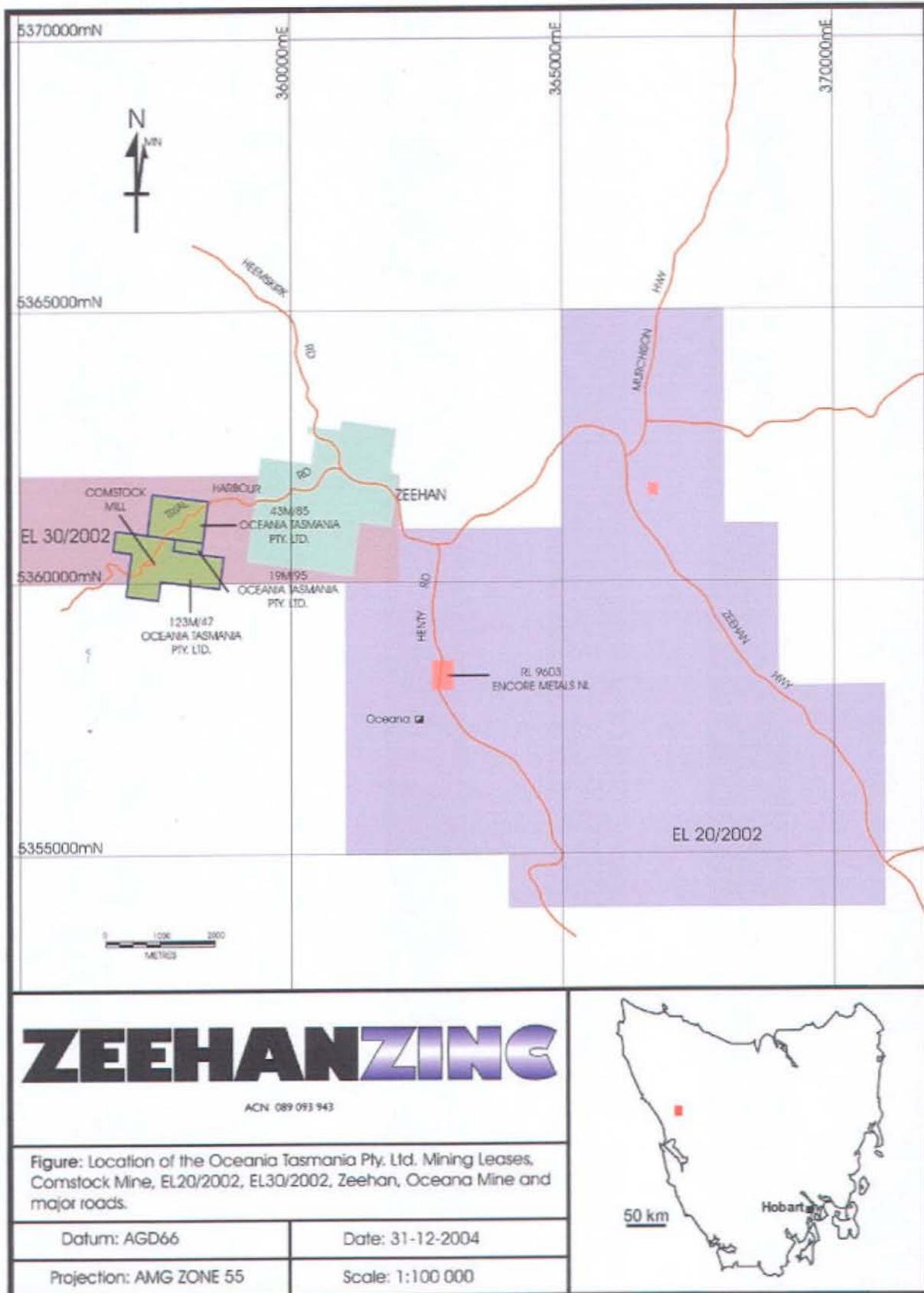


Figure 1. Exploration Licenses and Mining Leases (after Zeehan Zinc)

## Conclusions

For virtually all resources covered in this report the drilling/sampling density is not adequate to allow their classification according to JORC in anything other than the Inferred category.

## Recommendations

However, if the drilling/sampling density is increased (more closely spaced holes) to around the separation distances suggested in the text, then the potential for higher classification of at least a good proportion of the current estimated resources would be strong.

### 3.0 Exploration Database

Site visits were undertaken and geology, interpretation, and surface exposures were reviewed. During Office visits (and subsequently), Zeehan Zinc provided a number of past exploration, geological, and resource estimation reports. Various computerised data sets were also provided, comprising drill hole, costean, and traverse samples, including collar coordinates, downhole surveys, sample interval Pb, Zn, Ag assays, and downhole lithological logs.

The data has been scrutinised on a selective basis for defects such as data entry errors etc., by comparing hardcopy drill hole logs with the actual respective down hole intervals in drill core for a number of holes. Assay certificates were also compared with the downhole logs and the assay values recorded in electronic form. In virtually all instances each data recording medium compared satisfactorily with the others. The adequacy of geological logging and the location of drill holes in 3D space etc. were also spot checked and found to be satisfactory.

Blind duplicate and check assaying programs, should become a routine part of any future drilling/sampling campaign to ensure no systematic biases creep into the recorded data. Specific gravity testing of drill cores should be performed on a small scale, but routine, basis.

#### 4.0 Interpretation and Modelling

A comprehensive understanding of the geological/lithological and structural setting together with mineralisation formation interpretations was gleaned by reviewing many available reports (see References) in preparation for resource estimation and classification. This information will not be repeated here in detail and the interested reader is referred to the references. Suffice it to say that the Zeehan field comprises a highly complex package of isoclinally folded, faulted and metamorphosed, siliceous (eg. shales, sandstone etc.) and carbonaceous (eg. dolomite and limestones), late Proterozoic and early Palaeozoic, sediments and volcanic tuffs of the Crimson Creek Formation and Oonah Formation, respectively. Intrusion of the Heemskirk Granite (underneath ?) and out cropping to the west of the Zeehan field is considered the source of mineralisation and much of the local structural deformation.

At Comstock the mineralisation occurs as both fissure-fill veins in shale and volcanic host rocks and fissure-replacement zones in carbonate, limestone and dolomite, rocks. The fissure-replacement zones also appear to reflect the swell category of 'pinch and swell' mineralisation probably due to tensional dilation in the more ductile carbonate rocks, resulting in the development of high grade virtually 100% massive sulphide pods, ranging in 'ellipsoidal' diameter from centimeters to metres.

The form and habit of the mineralisation ranges from large massive sulphide pods (0.5 to 5m), to disseminated blebs and patches of sulphides in a puggy talcose (weathered dolomite) groundmass, to relatively thin (.2 to 1m) sub-parallel vein packages (up to 5m in width). Consequently, combination of this mineralisation form and habit, along with a relatively sparse drilling density (ie. widely spaced drill holes relative to the mineralisation habit), renders interpretation and modeling of mineralized lodes difficult.

Due to the current sparsity of samples no geostatistical analysis, variography or kriging was able to be carried out on the data or applied during resources estimation and classification. Resource estimates were made on the basis of 'polygons of influence' attached to each drill hole intercept or surface sample point. The generally widely spaced sampling of the lode horizons relative to the mineralisation form and habit described above leaves some uncertainty

as to the interpreted spatial continuity of the mineralisation and as such is reflected in the ultimate classification of the predominant part of estimated resources in the Inferred category.

## 5.0 Resources Estimation and Classification

### West Comstock

West Comstock is a new discovery/surface exposure of mineralisation to the west of the South Comstock open pit. Its approximate position is shown in Figure 2 as a small magenta line, along with the other Comstock Area lodes, drilling, geology and Mining Leases. Further this new exposure could possibly be a southerly extension of the West Lode as referred to by Tear, 2000., even to the extent of high lead reflecting Tear's observation West Lode was "Galena ore". The grades and location of the surface samples taken around the new exposure are shown in Figure 3.

Estimation of the resource considered that approximately 20% comprised massive sulphide pods, including a large 2 to 3m 'ellipsoidal' diameter pod standing on its equatorial edge within a broader puggy talcose mineralized zone. Because of the virtual sulphide purity (Galena, Sphalerite, and Pyrite) of these pods a specific gravity (SG) of 5 tonnes per cubic metre (tcm) is considered appropriate. The other 80% of the mineralized zone while hosting disseminated pods and patches of massive sulphides (included in the above 20%), is considered to have an SG of 2.7 tcm. The estimate is based on an interpreted length of 36m, an average width of 16m and a down dip extent of 10m, with the top 2.5m being considered to be satisfactorily in the measured resource category according to JORC. The bottom 7.5m is categorised as Inferred according to JORC because, despite the evidence of other mined deposits (eg. South Comstock and Allison's), the depth extent is uncertain and the surface samples become less representative with depth extension. A total resource of 17,270 t at 13.1% Pb, 12.8% Zn, and 155 g/t Ag was estimated. This and the resource classification break-up are shown in Table 3.

The current drilling program targeting the depth extent, structure and mineralisation controls as well as grade at depth will possibly enable categorization of much more of this resource in higher categories.

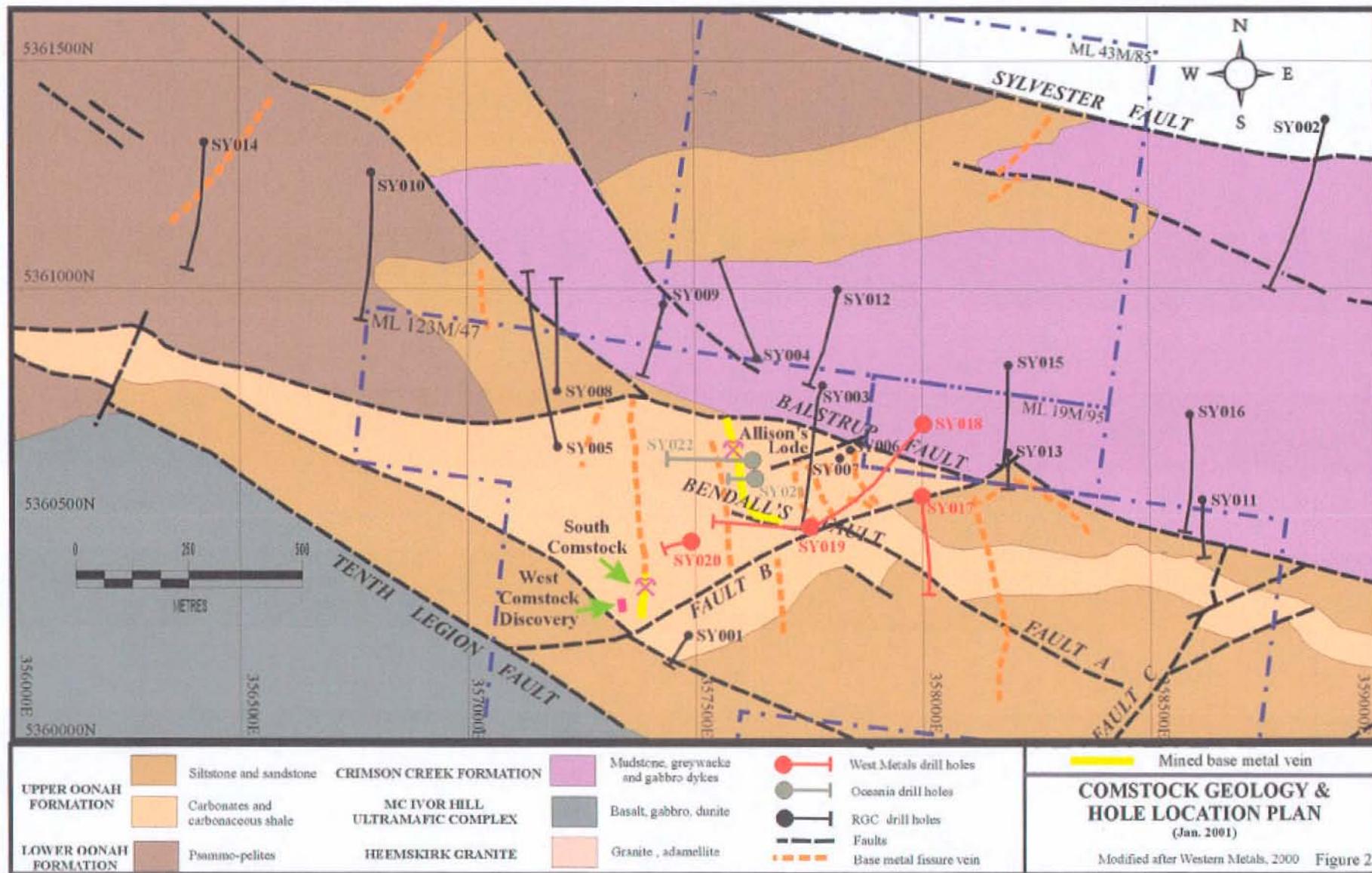
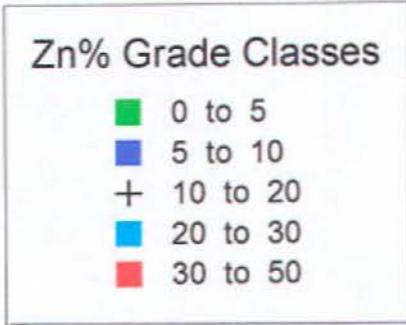
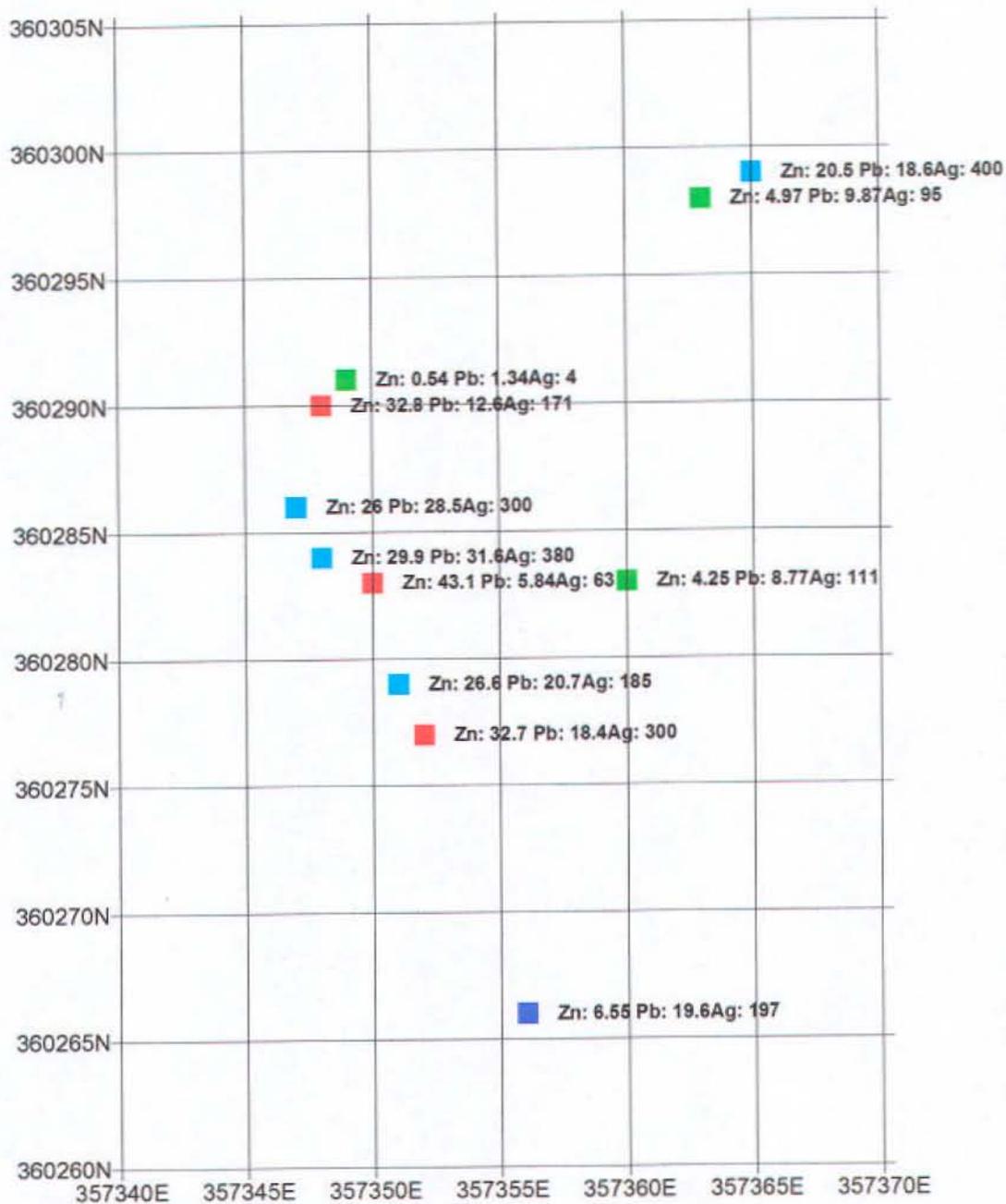


Figure 2: Comstock - Balstrup Fault Area Geology, Drilling and Lodes (After Zeehan Zinc & Western Metals)

**Figure 3: West Comstock Samples - Zn%**



South Comstock

The South Comstock Pit mined the southern extensions of the 'Comstock Main Lode' (see Figure 2). Ore shipments to Pasmenco's Rosebery Mill comprised 6,832 tonnes of 15.3% Zn, 3.6% Pb, and 64 ppm Ag. Disputation between the parties over payments has since been resolved, but not before it provided the trigger for cessation of mining and trucking operations.

Ore is still reported in the walls of the open pit over distances up to 60m. However, no specific physical measurements as to length, width, depth, or sample assays have been recorded. While previous estimates could be considered as reasonable projections of known (actually mined!) mineralisation, still no specific physical measurements as to dimensions and grade are documented. Consequently, its classification even in the Inferred category according to JORC is just not possible.

Balstrup Fault Lode

Renison Goldfields (RGC) estimated an inferred resource along Balstrup Fault based on holes SY003, SY003, SY008, SY009, and SY012 of 6mt at 3.3% Pb, 5.5% Zn, and 34 g/t Ag. Western Metals (WMR) later recalculated this resource at 5.1mt of 2.3% Pb, and 4.0% Zn. Further, WMR made an unofficial 2.8mt estimate of a block of mineralisation in the upper eastern corner of the RGC interpreted block (see Figure 4) based on WMR compositing of a single SY003 intercept grading 4.35% Pb, and 8.68% Zn. After checking RGC's intercepts for reasonableness they were used to re-estimate RGC's interpreted mineralisation block but applying independently generated 'polygons of influence' for each drill hole intercept. (see Figure 4). The intercepts applied in the estimate are listed in Table 1.

Holeid	True Width	Zn%	Pb%	Agppm
SY003	6.61	8.23	4.13	48.00
SY005	4.62	3.34	3.50	21.00
SY008	3.28	5.81	3.68	25.00
SY009	1.35	7.72	4.02	51.00
SY012	4.31	2.42	1.18	25.00

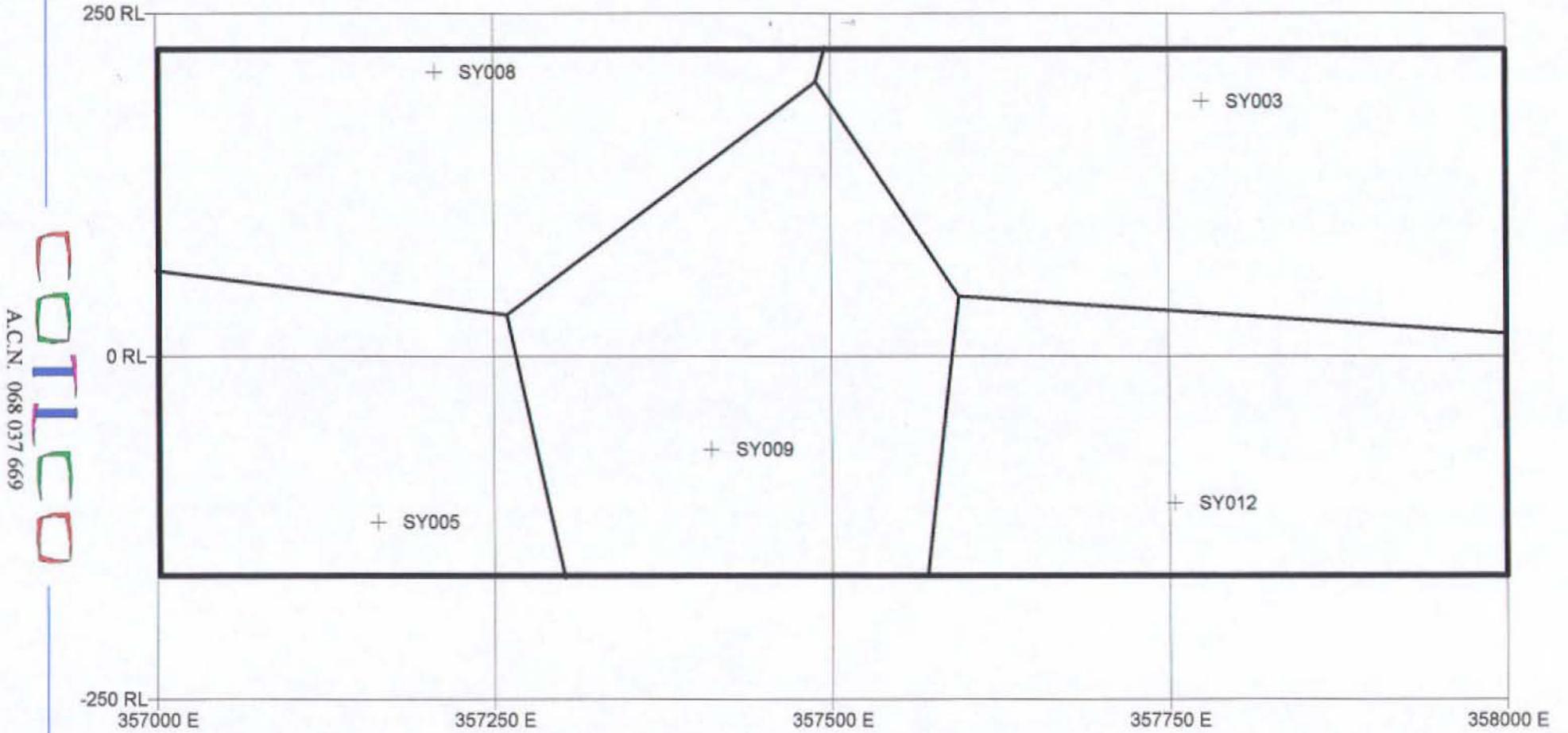


Figure 4. RGC's Estimated Mineralisation Block Showing Location of Drill Hole Intercepts and Cotlco's constructed Polygons of Influence for Weighted Grade Estimations

This approach produced an estimate of 4.6mt of 3.3% Pb, 5.7% Zn, and 35 g/t Ag. Because the relatively large separation of the drill hole intercepts reduces confidence in the reasonableness of the projections this resource is classified in the Inferred resource category according to JORC. (See Table 3). Increased drilling density should increase confidence in lode structure and grade projections but a 50m average spacing confirming spatial continuity would most probably be required before a higher classification category could be supported.

### Allison's Lode

Allison's Lode, with pit floor traverses and plan projected drill holes are shown in Figure 5. Historical mining indicates a depth extent of at least 60m, and the drill hole intercepts of SY021 (55m below pit floor) and SY022 (65m below pit floor) confirm this. Of three horizontal holes drilled by Electrolytic Zinc (EZ) only one (CP47) intersected the lode with a relatively small 1.5m intercept. The other two (CP49 and CP58) did not appear to intersect reasonable width mineralisation. Either way it is relatively clear from the drill hole intercepts that Allison's thins markedly at depth.

Resource estimates were developed by subdividing a strike distance of 47m on the pit floor into lengths of influence for each traverse. Strike influences for the drill holes were similarly generated. The applied influence lengths for each intercept (SY021's 2 neighbouring intercept were combined into one using zero grade in-fill in the actual resource estimate) are shown in Table 2.

Table 2. Allison's Lode Mineralisation Intercepts					Volume of Influence		
Holeid	Length	Pb%	Zn%	Agppm	Strike	Dip	Width
TravA	19	3.57	11.84	52	20	2	10
TravB	11	3.69	13.11	109	12	2	10
TravD	15	4.84	15.60	96	15	2	10
CP47	1.5	6.20	20.00	17	25	40	1.5
SY021	0.8	16.60	26.80	56	20	50	5
SY021	2	0.35	1.05	3	20	50	5
SY022	4	1.10	1.70	17	20	60	5
SY021 (Single Intercept)	6	2.33	3.92	8			

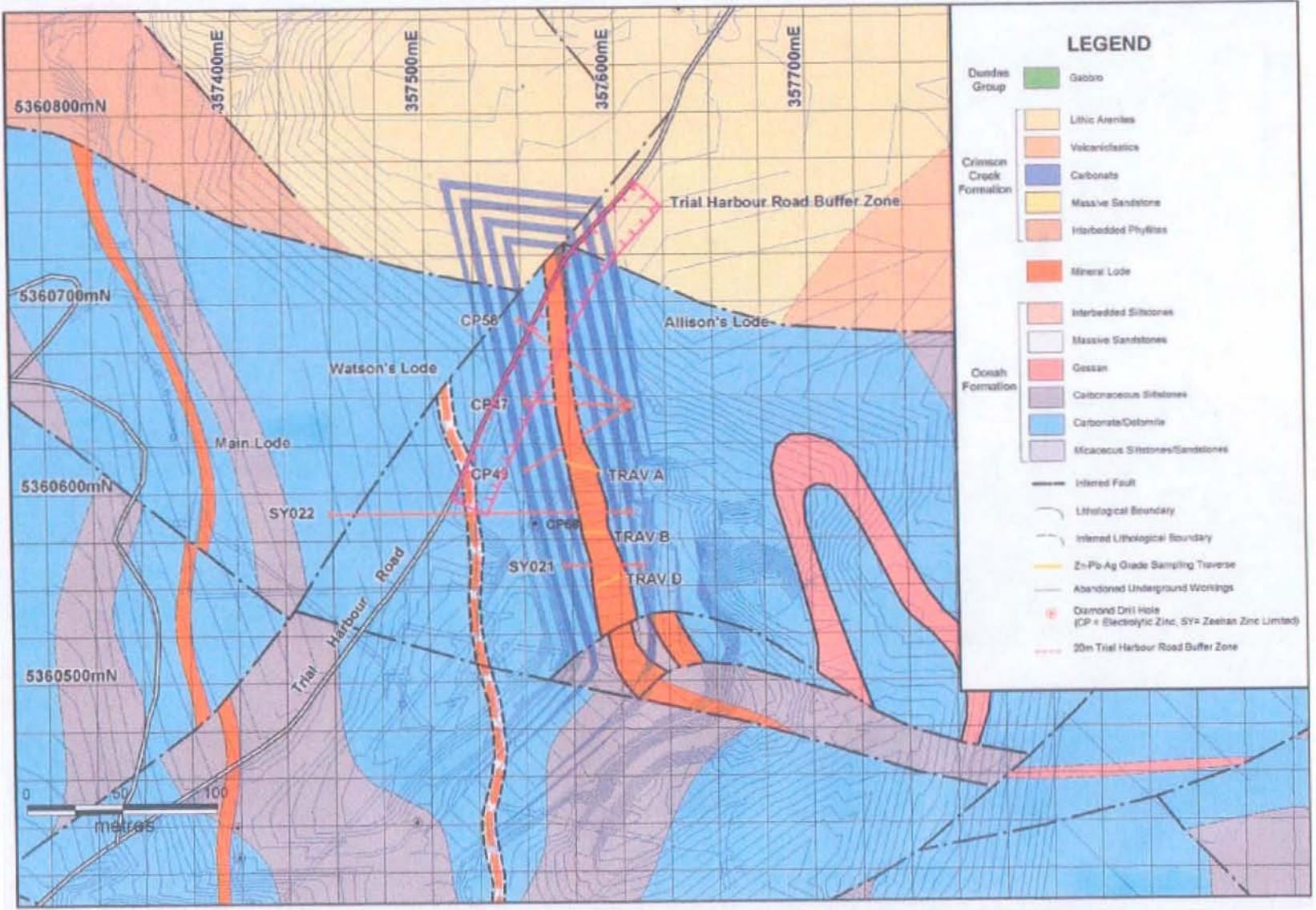


Figure 5. Allison's Lode Pit Floor Plan

It can be seen there that the traverses have only been assigned a down dip influence of 2m. This is because of the abovementioned marked thinning of the lodes reflected in the drill holes. SG was estimated at 3.5 tcm based on an estimated 35% massive sulphides in the pit floor (at 5 tcm) and 65% vein disseminated sulphide mineralisation and barren rock at around 2.7 tcm. The resulting resource estimates and classifications according to JORC are shown in Table 3.

The measured category comprises 1,400 tonnes of stockpiled ore and 3,300 tonnes of insitu resource related to the 2m depth extension of the pit floor traverses. The remainder of the resource is considered to fall in the Inferred category because the marked change in lode dimensions and grade tenor at depth reflected in the drill hole intercepts raises issues of continuity and reduces confidence in the interpreted geological/structural projections, and the continuity of mineralisation dimensions and grade tenor. Such issues are only resolvable by closer spaced drill hole sampling. Unfortunately, there is not nearly enough data to develop/model the spatial continuity mathematically via variography. However, 20m spaced drill hole intersections in the down dip direction would provide much greater confidence in the estimation and classification of resources.

### Oceana

The location of the Oceana deposit is shown on Figure 1. The deposit comprises thick veins, disseminations, and vein stockworks of galena rich and, relatively zinc poor mineralisation. Post mineralisation faulting controls the extents and locally disrupts the mineralisation. Local geology and the mineralisation body are shown in Figure 6.

Two detailed resource estimates of the deposit have been carried out. One by Cyprus in 1988 (2.5 mt at 9.4% Pb, 4.0% Zn, and 75 g/t Ag), and the other by Pasminco in 1994 (2.5 mt at 7.5% Pb, 2.6% Zn, and 50 g/t Ag).

The current estimation is based on all drill hole intercepts (Traverse and Costean data was not available) at least 1m in length and at least 2% combined Pb and Zn. 'Polygon areas of

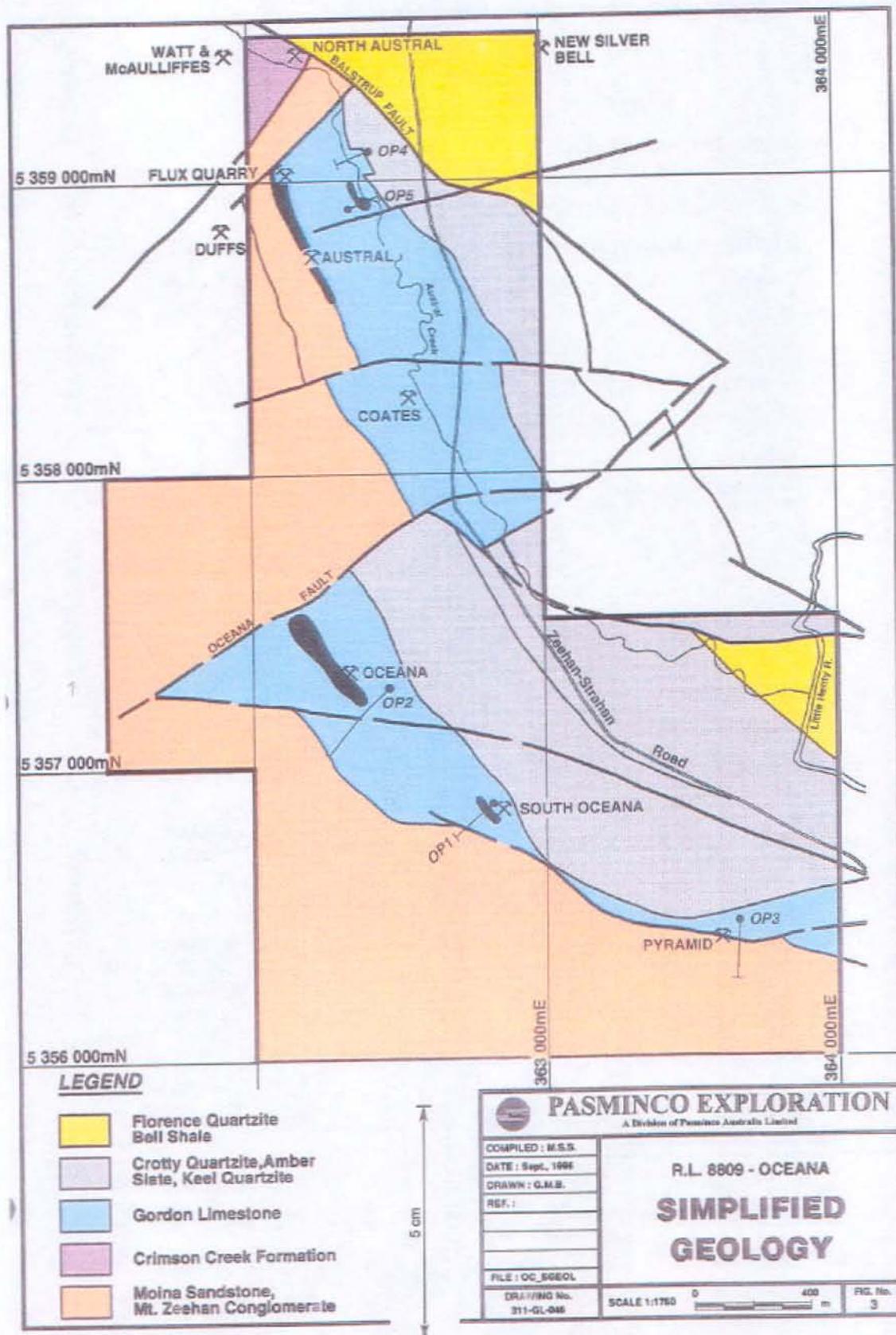


Figure 6. Geology of the Oceana Deposit (after Pasmingo)

influence' were then applied to each intercept (similar to that carried out for the Balstrup Lode) together with the application of the intercept true width. A tonnage factor of 3 tcm was applied, and weighted average grades were estimated for Pb, Zn, and Ag with each intercept being weighted by its interpreted volume of influence. The derived resource estimate amounted to 2.1 mt of 9.2% Pb, 2.6% Zn, and 88 g/t Ag. These figures are also shown in Table 3. It is considered that this Oceana resource can only be classified according to JORC in the Inferred category because of the large separation distances (ie. large volumes dependent on a single hole intercept) between some holes.

<b>Table 3. Zeehan Zinc Estimated Resources</b>					
Classification	Tonnes	Pb%	Zn%	Ag g/t	
<b>West Comstock Estimated Resources</b>					
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<b>Allison's Lode Estimated Resources</b>					
Measured	Stockpiled Ore	1,400	14.5	21.5	540
	In situ Resource	3,300	4.0	13.4	80
	<b>Total Measured</b>	<b>4,700</b>	<b>7.1</b>	<b>15.8</b>	<b>217</b>
Inferred	In situ Resource	43,700	2.2	4.8	14
	<b>Sub-Total Resources</b>	<b>48,400</b>	<b>2.7</b>	<b>5.9</b>	<b>34</b>
<b>Oceana Deposit</b>					
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<b>Total Resources</b>					
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<b>Grand Total</b>	<b>6,765,670</b>	<b>5.2</b>	<b>4.8</b>	<b>52</b>	

## 6.0 References

- Heath, P. 2001        Zeehan Zinc Annual Report, February 2001.  
                              (and all accompanying Reports in Appendices)
- Heath, P. 2002        Comstock Revised Environmental Management Plan, December 2002.
- Richardson, S. 2000    Comstock (Zeehan) Project Final Report, January 2000.
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- Tear, SJ., 2000a        Geological Report on the Comstock Prospect Zeehan, West Tasmania.