932156

CRA EXPLORATION PTY. LIMITED

DRILL-HOLE SUMMARY LOG

EL NAME: ZEEHAN 4 HOLE NAME: DD93 ZG106
EL NUMBER: EL 38/89 PROSPECT: GRIEVES
DATE DRILLED: NOV 1993
LOGGED BY: RGP

AMG EAST: 364628 GRID EAST: 60997
AMG NORTH: 5349794 GRID NORTH: 48200
RL: TOTAL DEPTH: 161.0

DEPTH	AZIM. (AMG)	INCLIN.
0	142° ?	-50°
80 m	—	-48.5°
160 m	148°	-49°

OBJECTIVES OF HOLE: To test for stratabound primary mineralisation at base of Gordon lst adjacent to Grieves Fault.

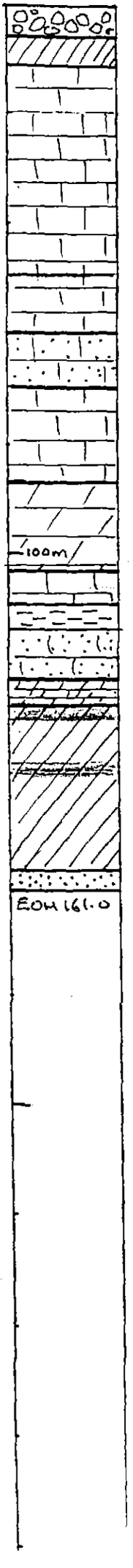
LITHOLOGICAL SUMMARY:

DFROM	DTO	COMMENTS
0	5.9	GRAVELS
5.9	10.85	CLAYS
10.85	59.75	LIME MUDSTONE (LOW & Fault at 47.6-51.0 m)
59.75	69.45	CALCARENITE
69.45	86.45	DOLOMITE MUDSTONE
86.45	103.0	DOLOMITE MUDSTONE (High & fault at 100-103m)
103.0	109.9	LIME MUDSTONE
109.9	113.6	CARBONACEOUS LIMESTONE
113.6	122.7	CALCARENITE / BIOCLASTIC LST / CARB LST.
122.7	127.1	ANKERITE - DOLOMITE ALTERED ROCK.
127.1	157.9	CLAYS
157.9	161.0	MOINA SANDSTONE

MINERALISATION SUMMARY:

DFROM	DTO	COMMENTS
49.5	49.8	0.3m @ 1.0% Zn
128.2	130.2	2.0m @ 1.4% Zn
138.1	140.5	2.4m @ 1.5% Zn

CONCLUSIONS:



AMG 364628 E
5349794 N
60997E

932157

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1 of 9

TENEMENT NAME ZEEHAN 4 No. EL 38/89

PLAN – MAP REFERENCE

CO-ORDINATES 48200N AZIMUTH 142° AMG DRILLERS D.D.TAS COMMENCED 26/10/93 DEPTH 161.00 HOLE No. DD93ZG10

RL COLLAR INCLINATION -50° DRILL TYPE LY38 COMPLETED 12/11/93 CASING LEFT DPO No(s) 77119

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Structural Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) Zn
0	2	–			PRECOLLAR – NO CORE (Peat and gravels)						
2.0	2.9	0.6	HQ	4	QUARTZITE GRAVELS						
2.9	4.4	0.55	HQ	4	LIMESTONE. Grey. In situ?		3757901	2.9	4.4	0.55	95
4.4	5.9	0.1	HQ	5	LIMESTONE AND QUARTZITE GRAVELS Caving ground?						
5.9	7.9	–	HQ	–	NO RECOVERY						
7.9	8.9	0.45	HQ	5	CLAY Dark brown.		902	7.9	8.9	0.45	299
8.9	9.8	–	HQ	–	NO REC.						
9.8	10.6	0.3	HQ	5	CLAY AND GRAVEL Dark brown clay, and quartzite gravels.		903	9.8	10.85	0.5	1870
10.6	10.85	0.2	HQ	5	CLAY AND PYRITE Dark brown clay, and massive pyrite. Pyrite appears to be forming in the clay above the fresh limestone.						
10.85	14.8	3.35	HQ	2F	LIME MUDSTONE Grey fine-grained carbonate mud. Stylolites common almost giving rock a brecciated appearance. Mud looks to have been fluidal, displaying soft sediment features. Locally contains bivalve fossils. 1? % fine calcite veins		904	10.85	14.8	3.35	32

DRILL RUNS

From	To	Rec	RQD
0	2	–	–
	2.9	0.6	4
	4.4	0.55	4
	5.9	0.1	5
	6.9	–	–
	7.9	–	–
	8.9	0.45	5
	9.8	–	–
	10.8	0.45	5
	11.9	1.15	2V
	13.35	1.25	2F
	14.9	1.05	2F

RQ = ROCK QUALITY

1 = CORE >30cm
2 = 10–30
3 = 3–10
4 = 1–3
5 = <1cm

B = Bedding
C = Cleavage
V = Veining
F = Fractures
X = Brecciated

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C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZG106

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	~~Graphic Log~~ RQD	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) Zn	DRILL RUNS FROM	TO	REC	RQD
14·8	18·8	2·05	HQ	5	CLAY AND BROKEN LIMESTONE		3757905	14·8	18·8	2·05	530	14·9	16·4	0·8	5
					Dark grey to dark brown. Strongly calcite veined carbonate mudstone as for 10·85–14·8, and dark grey clay weathered limestone. Minor light brown carbonate (ankerite?) veining between 16·4–17·0m.								17·0	0·2	5
													17·9	0·25	5
													18·45	0·5	5
													18·8	0·25	5
					Dark ~~grey~~ brown gritty clay caving in from ~15m.								19·9	1·05	2F
					Zone of sludge at ~17·9–18·35 may be some of this caving from 15m. Uncertain.								20·9	0·95	2F
													22·4	1·5	2F
													23·9	1·4	1F
18·8	31·15	12·1	HQ	2F	LIME MUDSTONE.		906	18·8	23·0	4·1	85		25·5	1·6	1F
					Similar to 10·85–14·8		907	23·0	27·0	3·85	68		26·9	1·35	2F
					Less stylolitic ~~r~~more commonly with bands of dark grey lime mud. Mud shows compaction ~~r~~ dewatering structures. Locally contains bivalve (?) fossils.		908	27·0	31·15	4·15	27		28·5	1·55	2F
													29·9	1·5	1F
													31·5	1·36	1F
					Minor (<2%) fine calcite veins. One 10mm calcite vein 11 to C.A.								32·9	1·2	4F
													34·5	1·45	3F
					Minor dolomite 21·45 – 22·2m								35·9	1·5	2F
					Minor patchy pervasive light brown carbonate alteration (ankerite?) at 20·8m, 29·1m.								37·5	1·45	2
													38·9	1·45	4
					Bedding irregular due to compaction – soft-sed features, but generally at 90° to C.A.								40·5	1·5	4
													41·9	1·5	3F
													43·5	1·3	4F
31·15	45·0	12·95	HQ	3F	FRACTURED LIME MUDSTONE		909	31·15	35·9	4·3	144		44·9	1·35	3
					Grey lime mudstone as for 18·8–31·15 but strongly fractured along stylolite surfaces. Stylolites are approximately parallel to C.A. ⇒ Devonian cleavage direction?		910	35·9	40·5	4·4	101				
							911	40·5	45·0	4·25	83				
					Some brecciated zones at 31·5, 34·0 & 37·5, 40·3 – 43·2m. Rare vein and pervasive ankerite alteration around 31·5m.										

[redacted]

C.R.A. EXPLORATION PTY. LIMITED

932159 DRILL CORE LOG

SHEET No. 3 of 9

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZG106

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log Rqd	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) Zn	DRILL RUNS From	To	REC	RQ
45·0	51·5	5·3	HQ	5X	BRECCIATED AND VEINED LIME MUDSTONE		375912	45·0	49·5	4·0	1160	44·9	46·5	1·55	3V
					FAULT ZONE.		913	49·5	49·8	0·25	1·01%		47·9	1·35	3F
					Grey lime mudstone as for 18·8-31·5.		914	49·8	51·5	1·05	632		48·8	0·7	5X
					Large white calcite-dolomite veins at low ∠ or								49·8	0·75	5X
					parallel to C.A. Angular limestone fragments caught								50·8	[illegible]	5X
					up in vein at margins ⇒ post lithification veining.								51·75	0·6	4X
					From 47·6-51·50 m is rubbly and brecciated								52·8	0·55	3F
					core. Centre of fault zone? Appears ⊥ to C.A.								53·9	0·85	4F
					From 49·5-49·8 m is massive, spongy porous								55·4	1·5	3F
					pyrite.								56·9	1·3	3F
													58·5	1·6	3F
51·5	56·5	4·0	HQ	4F	FRACTURED LIME MUDSTONE		915	51·5	56·5	4·0	105		59·3	0·45	4F
					Light grey even-textured lime mud, cut by fine								59·9	0·5	4X
					network of stylolites. Lacks the wispy banded										
					or irregular darker mud layers common between										
					18·8-51·5 m.										
					Moderately fractured along stylolites. Fracturing										
					probably due to close proximity of fault.										
56·5	58·3	1·75	HQ	3F	FRACTURED LIME MUDSTONE.		916	56·5	58·3	1·75	194				
					Grey lime mudstone with darker grey wisps and										
					irregular bands of lime mud. Darker material may										
					be infill of stromatactis cavities.										
					Moderately fractured as for 51·5-56·5 m.										
58·3	59·75	1·05	HQ	4X	BRECCIATED AND VEINED DOLOMITE.		917	58·3	59·75	1·05	173				
					Light grey massive dolomite cut by 20% 0·5-5 mm										
					carbonate veins. Strongly fractured post-veining.										
					Honey-yellow mineral in carbonate veins at 58·6 m										
					⇒ sphalerite? <1% of interval.										

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

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SHEET No. 5 of 9

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZG106

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log RQD	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) Zn	DRILL RUNS From	To	Rec	RQD
86.45	88.25	1.4	~~HQ~~/NQ	3F	LAMINATED DOLOMITE MUDSTONE Light grey fine to very fine grained dolostone. 1-5mm regular laminations defined by grainsize and colour variation. Not wispy. Contact between limestone and dolomite at 86.45m is knife-sharp. Minor ankerite replacement along laminations 87.7m S_o – c.a ✗ 75° 86.4S S_o – cA ✗ 75° Reduce to NQ at 86.65m		3757925	86.65	88.25	1.4	154	86.65	87.9	1.1	3F
													88.4	0.4	3F
													91.3	2.3	4F
													94.3	2.6	3F
													97.3	2.9	2F
													99.4	2.25	3X
88.25	93.0	3.8	NQ	3F	DOLOMITE MUDSTONE Light to mid-grey dolomite mudstone. Partly massive, even textured, and partly wispy banded (stromatactis infill?). Local 10-30mm beds containing bivalve fossils. 150mm of light brown 0.2mm grainsize clastic sediment. Core cut by minor stylolites and 1-2mm dolomite veins.		926	88.25	93.0	3.8	194				
93.0	100.0	3.85	NQ	3F	PARTLY DOLOMITISED LIME MUDSTONE. Mid-grey dolomitised mudstone with darker grey wispy banded lime mud that is undolomitised (infilling stromatactis cavities). Gradual decrease in dolomitisation from 93.0-94.0, not a sharp boundary. Unit is similar in appearance to 71.9-75.5m. 2% of 0.5-2mm dolomite veins. Moderate to strongly fractured 96.75-100.0m.		927	93.0	96.75	3.6	123				
							928	96.75	100.0	3.25	224				

[redacted] EXP[redacted]ATI[redacted]Y. L[redacted]ED [redacted] [redacted] TENEMENT [redacted] [redacted] [redacted] [redacted] [redacted]

DRILL CORE LOG

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZG106

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Grading Log Rec	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) Zn	DRILL RUNS From	To	Rec	RQ
3.6	118.65	[redacted] 4.9	NQ	2F	CALCARENITE Grey 0.2mm grainsize carbonate sand. Quite massive overall, but locally with irregular patches of darker grey carbonate mud/sand. 2-5% of 1-3mm dolomite veins		375793 [redacted] 3	113.6	118.65	4.9	198	113.6	114.25	0.55	4F
													115.3	1.0	4F
													118.3	2.95	1F
												[redacted]	119.5	1.35	3F
													120.5	0.9	3F
												[redacted]	121.3	0.75	2F
8.65	121.0	[redacted] 2.3	NQ	3F	BIOCLASTIC (?) LIMESTONE Grey limestone that appears to be made up of carbonate sand and fossil debris replaced by white carbonate sand. Core mod-strongly fractured.		934	118.65	121.0	2.3	1330	[redacted]	123.1	1.8	2F
													123.7	0.55	3x
													124.3	0.55	5x
												[redacted]	125.35	0.95	5x
													126.1	0.7	4x
												[redacted]	127.2	0.95	4x
1.0	122.7	[redacted] 1.7	NQ	2F	CARBONACEOUS LIMESTONE Similar to 109.9-113.6m, but grey to dk grey and not as carbonaceous. Moderately well developed shear (?) partings at low-mod ∠ to C.A. Breccia band 10mm wide at 121.1m, 15° - C.A. Foliation 122m 40° - C.A. 2-5% 1-5mm irregular dolomite veins.		935	121.0	122.7	1.7	2340				
2.7	127.1	[redacted] 4.0	NQ	4x	ANKERITE ∧ ALTERED SKELETAL DOLOMITE. Light grey dolomite with elongate, almost spiny fragments of skeletal material. Minor patchy pervasive haematite alteration (staining of CO_3?), 2-5% of interval. Pervasive replacement of dolomite by a light to honey-brown mineral. Looks like ankerite? ~10-15% of interval. Core is strongly brecciated with considerable light green clay in breccia zones. Breccia is post-haematite + ankerite (?) as there are		936	122.7	123.7	0.95	1180				
							937	123.7	124.9	1.1	1930				
							938	124.9	126.1	1.1	1010			CORE LOSS	
							939	126.1	127.1	0.85	2010			CORE LOSS	

[redacted] EXP[redacted]ATI[redacted]Y. L[redacted]ED [redacted]

DRILL CORE LOG

TENEMENT NAME [redacted] No. [redacted]

PLAN – MAP REFERENCE

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZG106

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphite log RQ	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) Zn	DRILL RUNS From	To	REC	RQ
					fragments of altered and mineralised rock in breccia.							27.2	128.2	0.6	5
													128.8	0.4	5
7.1	128.2	[redacted]	NQ	5	CLAY		3757940	127.1	128.2	0.7	670p		130.2	1.4	5
		0.7			Light grey clay zone with brecciated colourless								131.7	[redacted]	5
					gypsum(?) vein.								132.5	0.4	5
													133.0	0.65	5
8.2	130.2	[redacted]	NQ	5	CLAY		941	128.2	129.2	0.8	1.18%		134.6	1.7	5
		1.8			Light grey, red and dark-grey to black plastic clays.		942	129.2	130.2	1.0	1.6%		136.2	1.4	5
					Between 129.35 - 129.55 is yellow-grey ankerite								137.4	0.3	5
					altered coarse grained limestone.								139.3	1.75	4
													141.86	2.3	4
0.2	138.1	[redacted]	NQ	5	CLAY		943	130.2	131.2	0.7	269p		143.9	2.15	5
		6.0			[redacted] plastic clay. Some foliations visible in		944	131.2	132.2	0.65	245p		145.3	1.5	5
					clay, suggestive of total replacement of pe-existing		945	132.2	133.2	0.85	222p		148.2	3.05	5
					rock. Yellow, orange brown-red.		946	133.2	134.2	1.0	394p		149.15	0.95	5
							947	134.2	135.2	0.90	755p		150.2	–	5
8.1	140.5	2.25	NQ	4	GOSSANOUS CLAY ROCK.		948	135.2	136.2	1.0	682p				
					- Yellow-brown well banded rock. Bands of vuggy		949	136.2	137.4	0.3	534p				
					gossanous material interspersed with yellow clay.		950	137.4	138.1	0.6	437p				
					138.2 banding – C.A ∠ 60°		951	138.1	139.3	1.15	1.57%				
							952	139.3	140.5	1.1	1.43%				
0.5	149.15	8.9	NQ	5	CLAY.		953	140.5	141.5	0.95	542p				
					Yellow-orange plastic clay with some reddish		954	141.5	142.5	095	557p				
					(haematitic?) clay zones.		955	142.5	143.5	1.0	553p				
					Hole lost at 149.15m due to clays closing		956	143.5	144.5	1.1	578p				
					in on rod string. Redrilled with HQ.		957	144.5	145.5	1.05	478p				
							958	145.5	146.5	1.05	454p				
9.15	150.2	–	NQ	5	NO RECOVERY		959	146.5	147.5	1.05	448p				
					(Presumably clay).		960	147.5	149.15	1.75	509p				

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. .....

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH m	DEPTH To(M)	Core Rec. (M)	Core Size	Log RQD	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)
·2	151·7	1·5	NQ	5	CLAY Dark reddish-purple (haematitic?) plastic clay.		3757961	150·2	151·7	1·5	
7	157·9	6·5	NQ	5	CLAY Yellow-brown plastic clay with minor sandy zones.		962	151·7	152·7	1·0	
							963	152·7	153·7	1·0	
							964	153·7	154·7	1·0	
							965	154·7	155·7	1·[illegible]	
9	161·0	2·45	NQ	3F	SANDSTONE Light grey medium grainsize quartz sandstone. Top 400 mm is reddish-grey oxidised coarse sand to grit. Contact with clay is sharp – 70° to C.A. ⇒ MOINA SANDSTONE.		966	155·7	156·7	1·3	
							967	156·7	157·9	1·1	
							968	157·9	161·0	2·45	
					END OF HOLE AT 161·00 m.						

DRILL RUNS

From	To	Rec	RQD
50·2	150·3	0·1	5
	151·3	0·9	5
	151·8	0·6	5
	154·3	2·5	5
	156·3	2·4	5
	157·3	0·9	5
	158·9	1·55	4F
	161·0	1·5	3F

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