Figure

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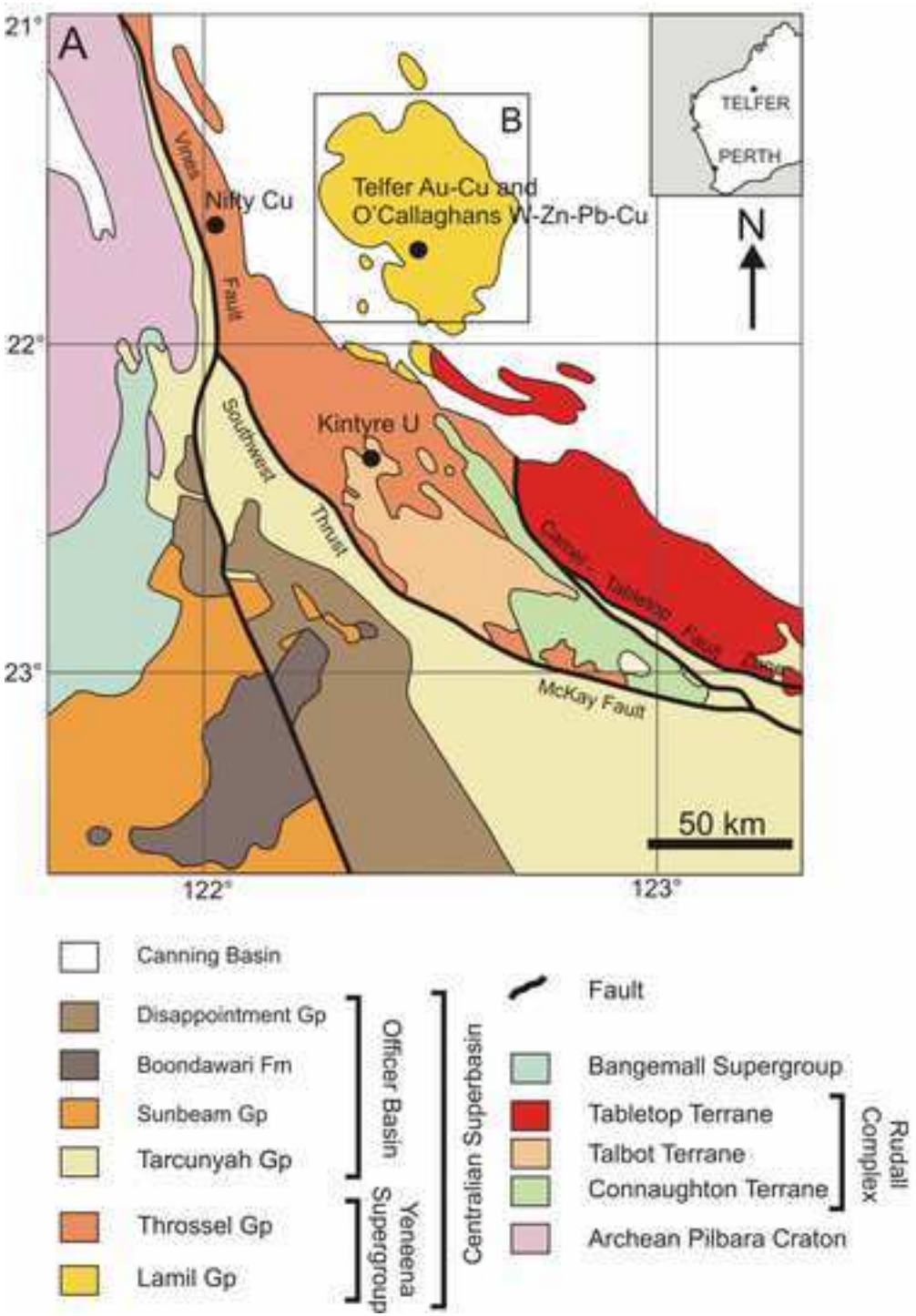

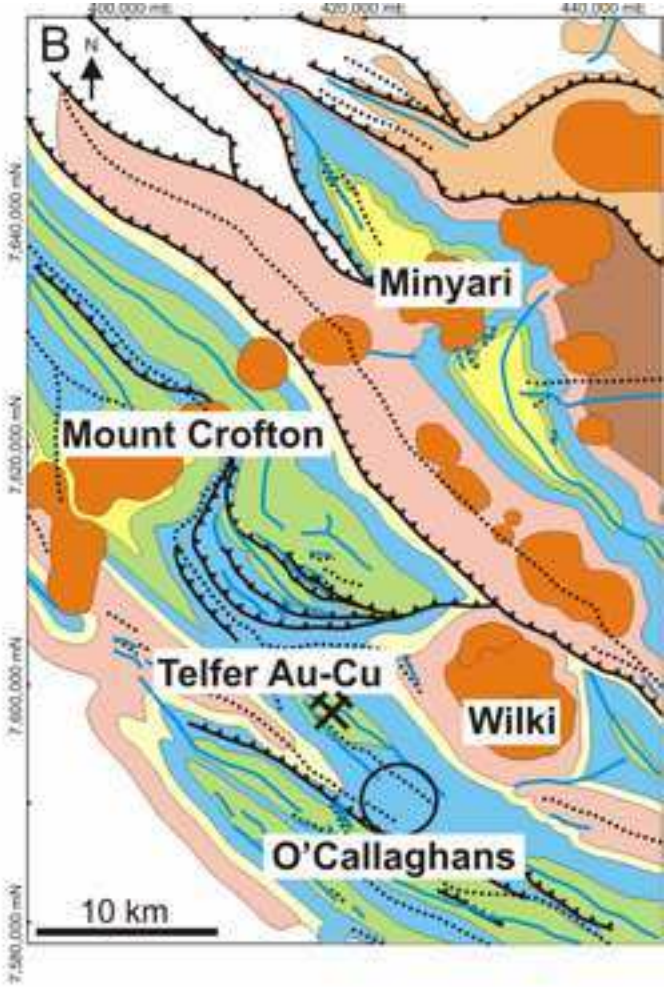

Figure

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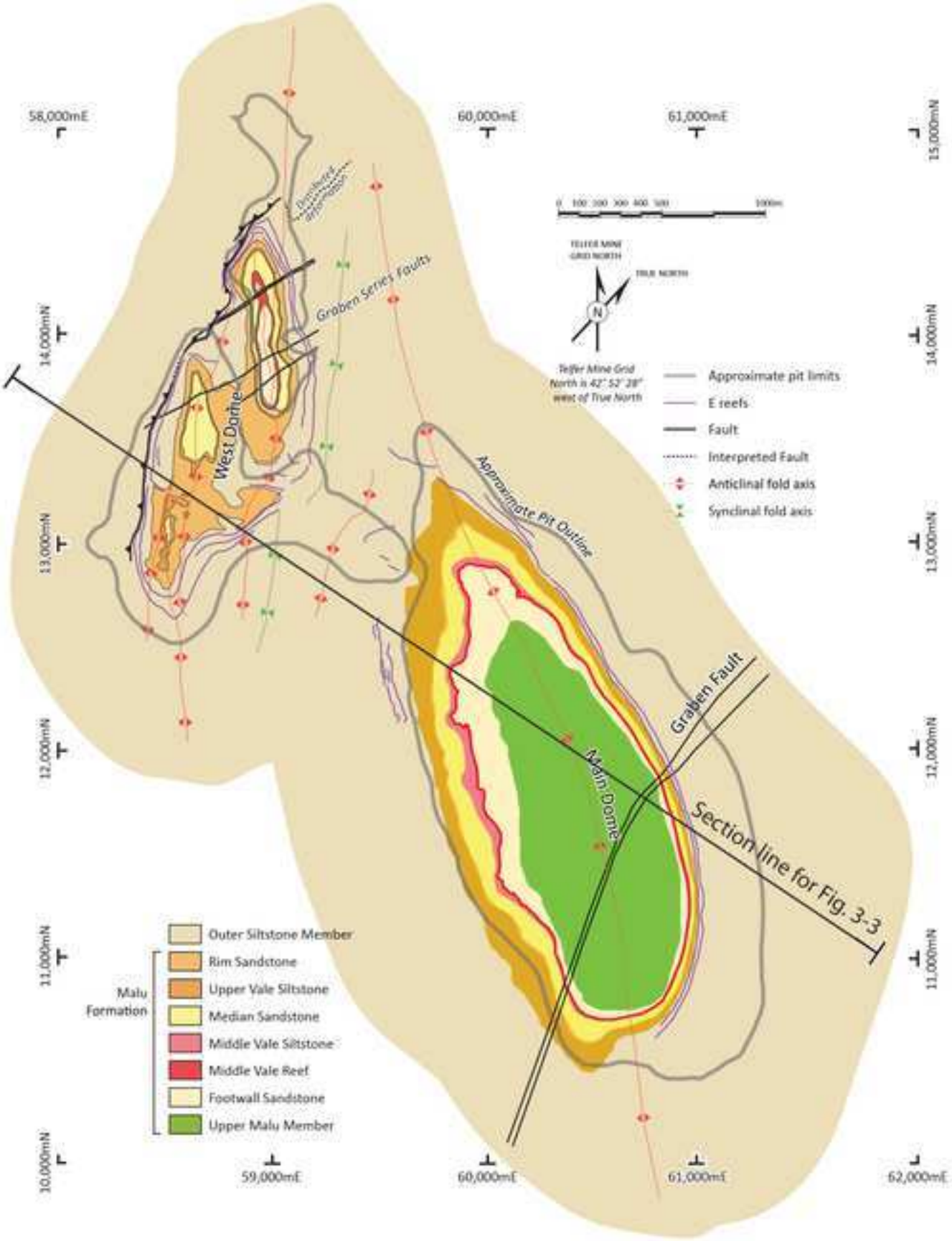

Figure

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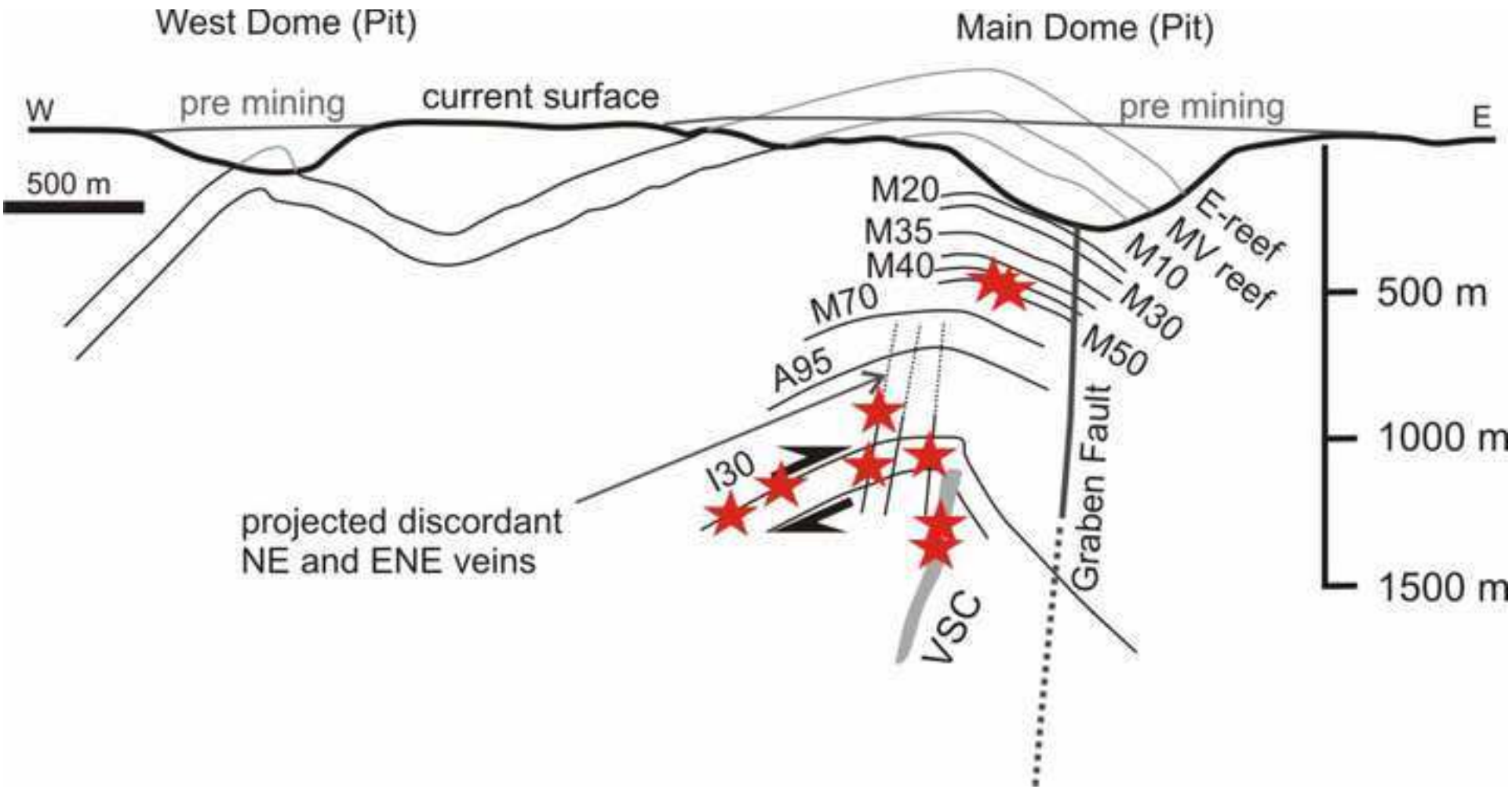

Figure

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Figure

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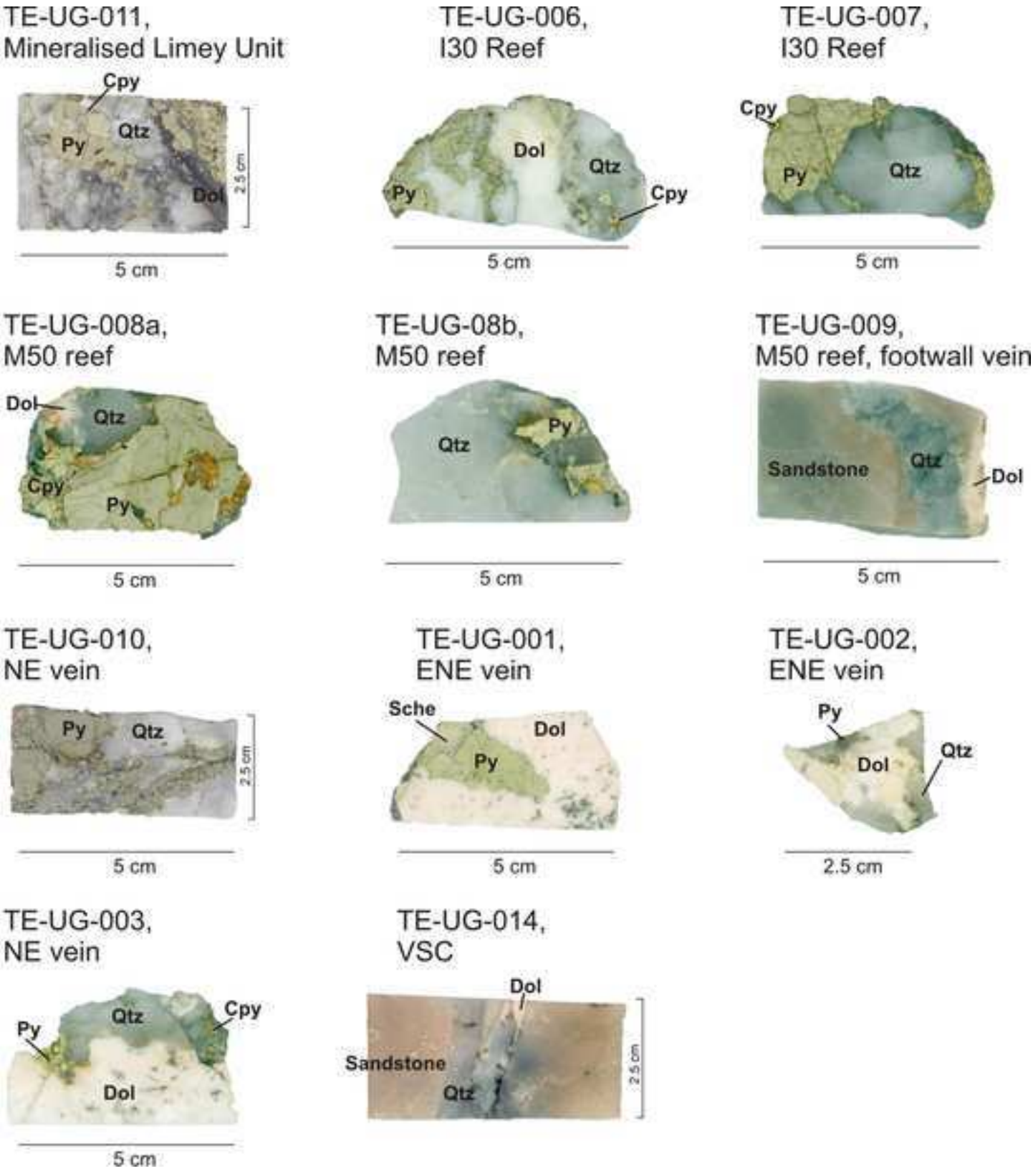

Figure

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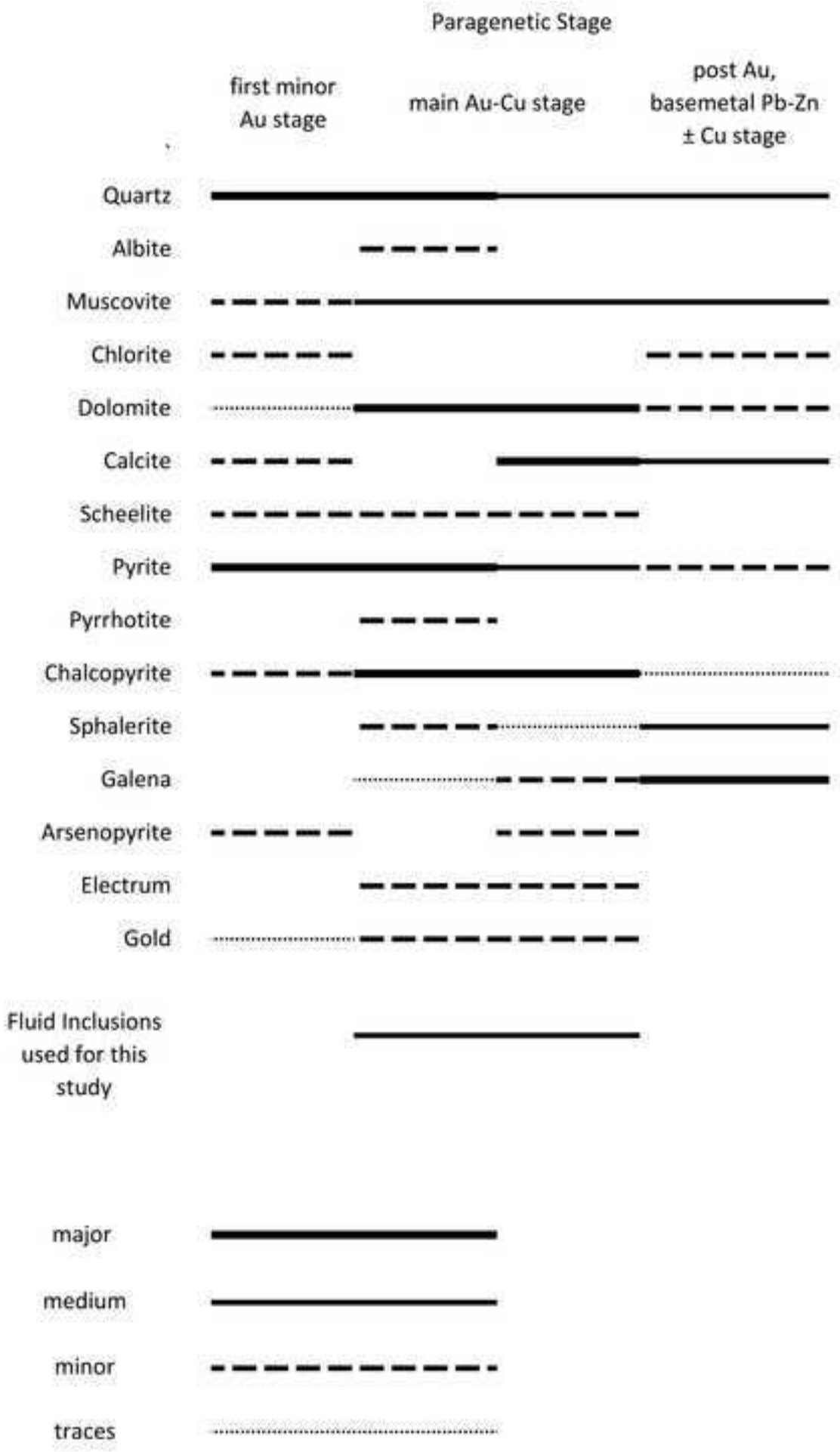

Figure

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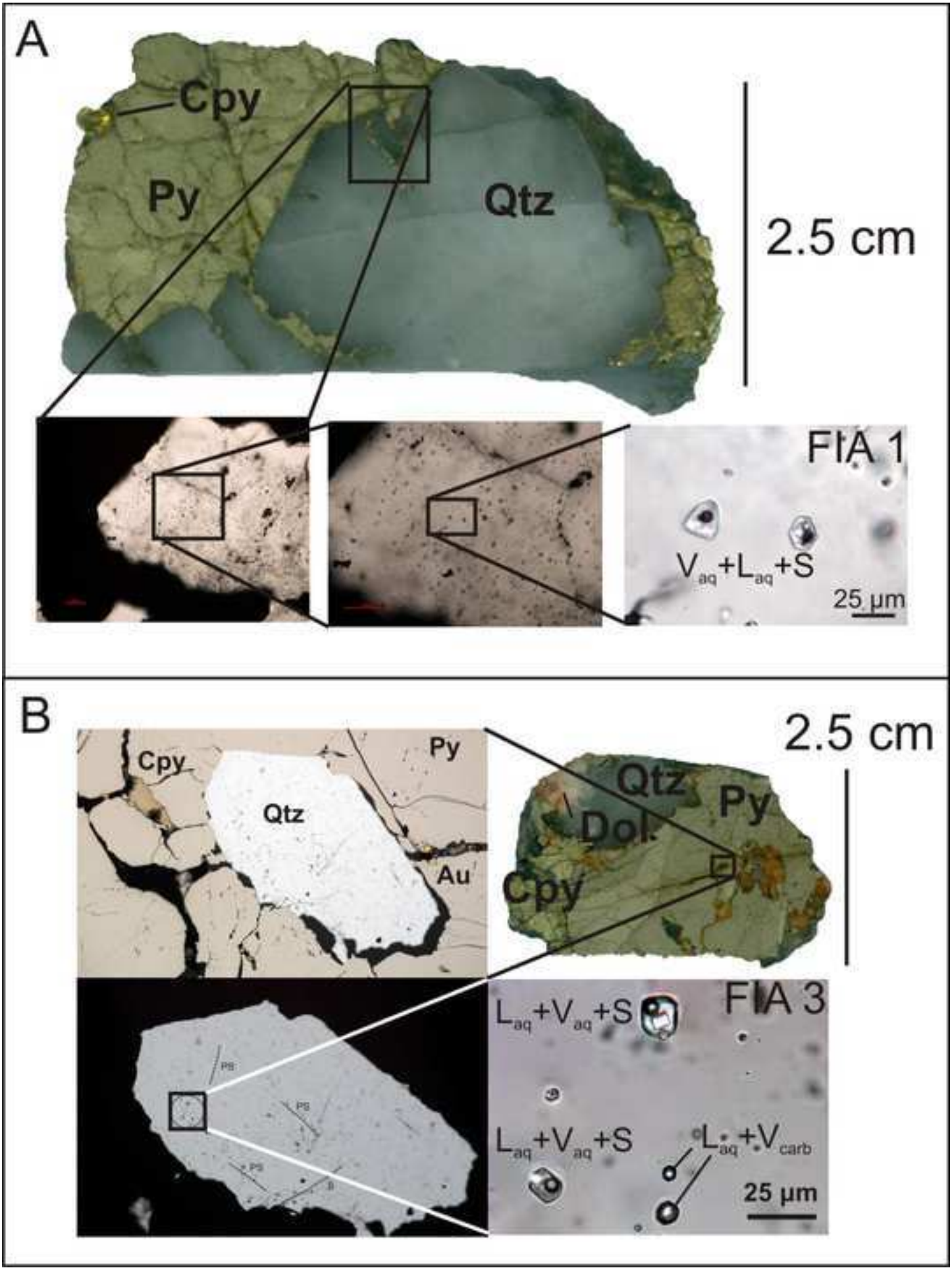
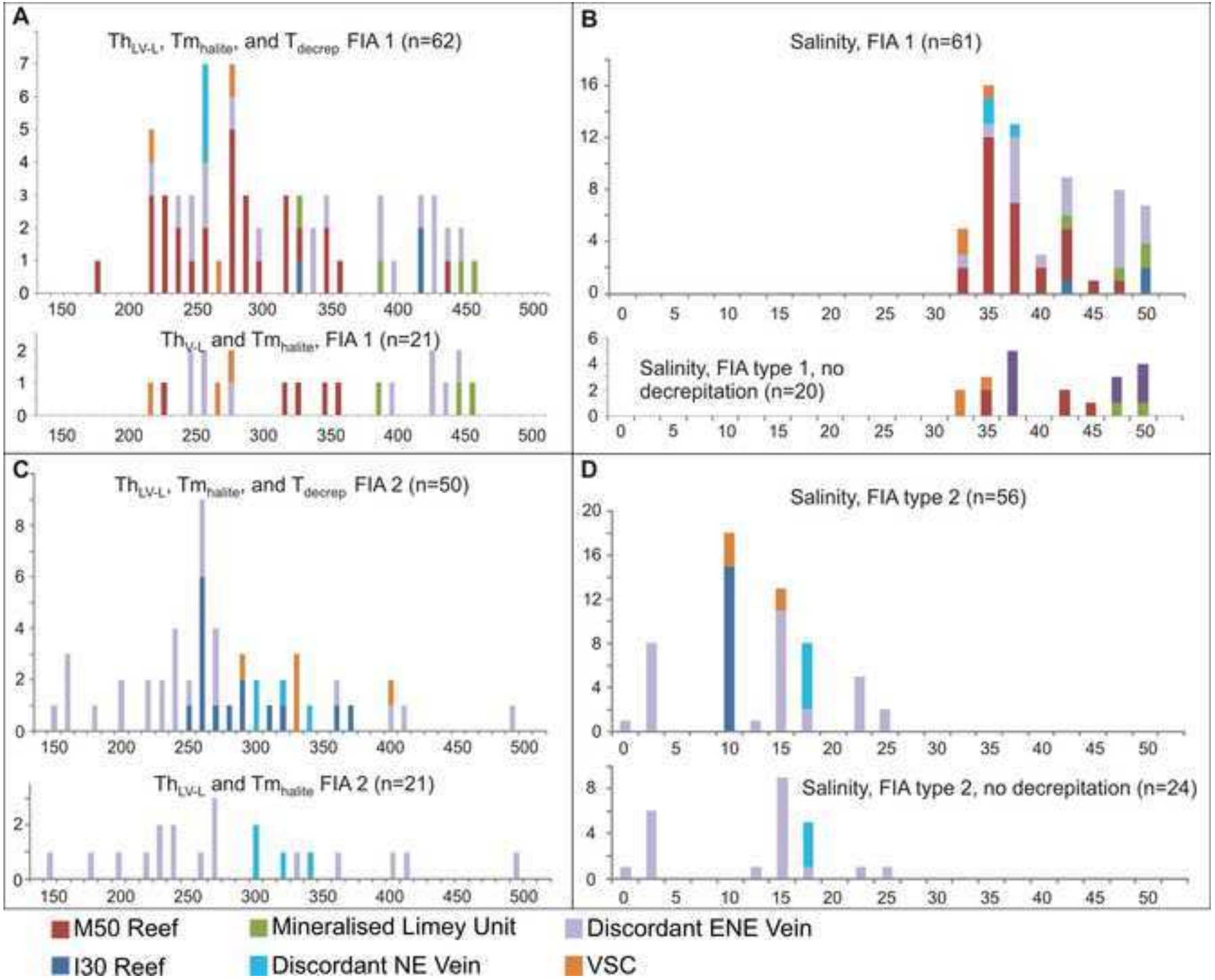


Figure

Click here to download Figure Fig 8_Histogram_FIA.jpg



Figure

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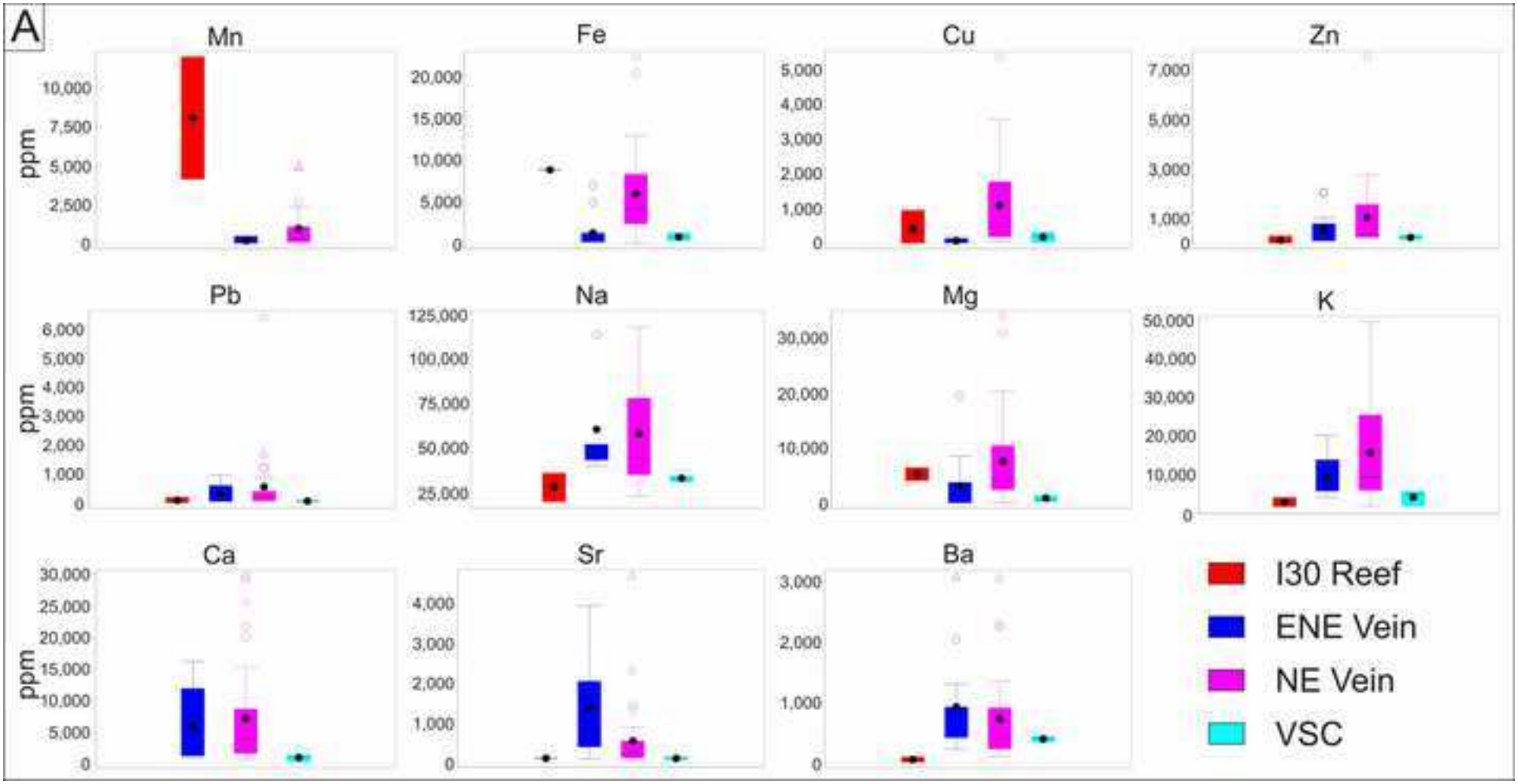

Figure

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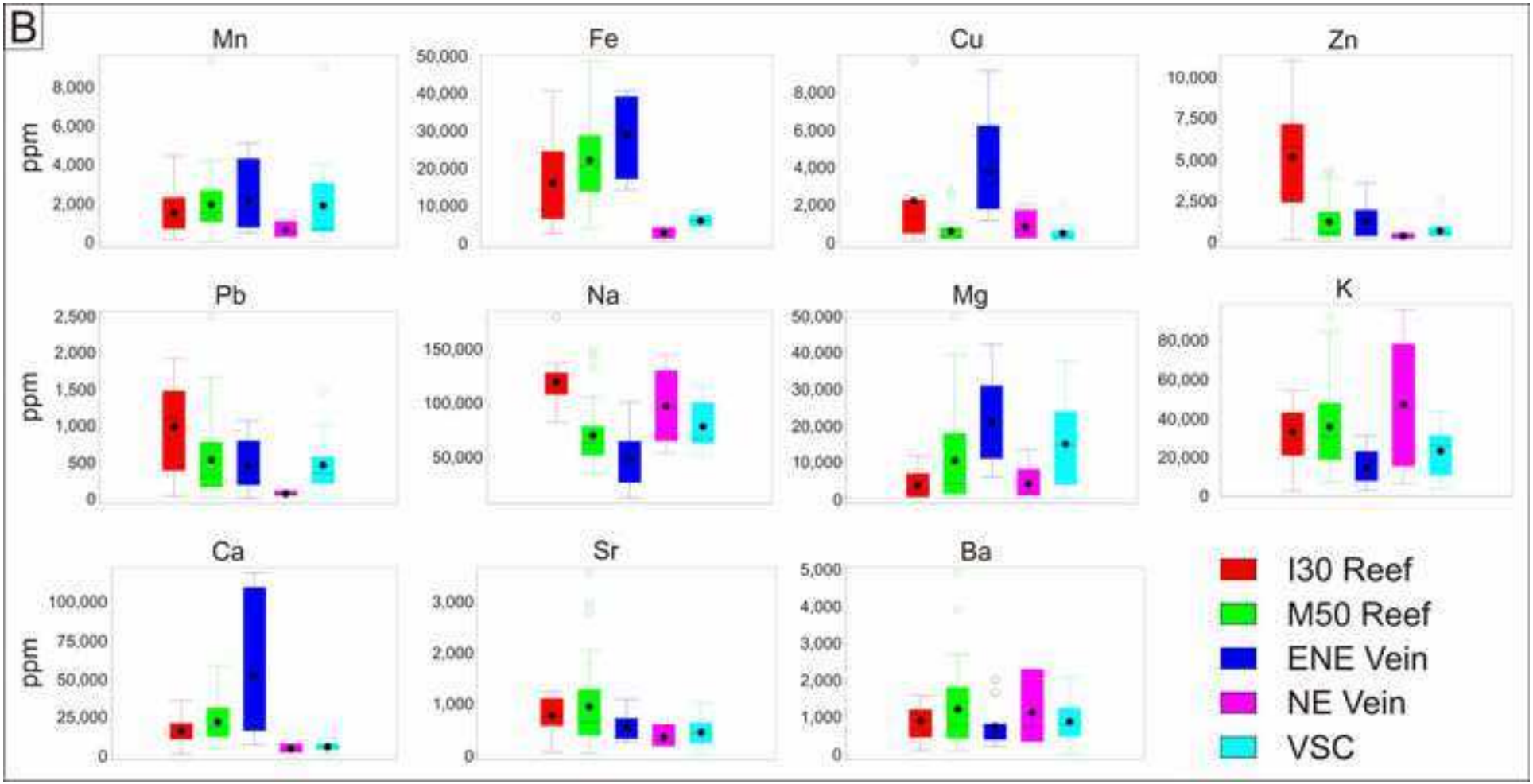

Figure

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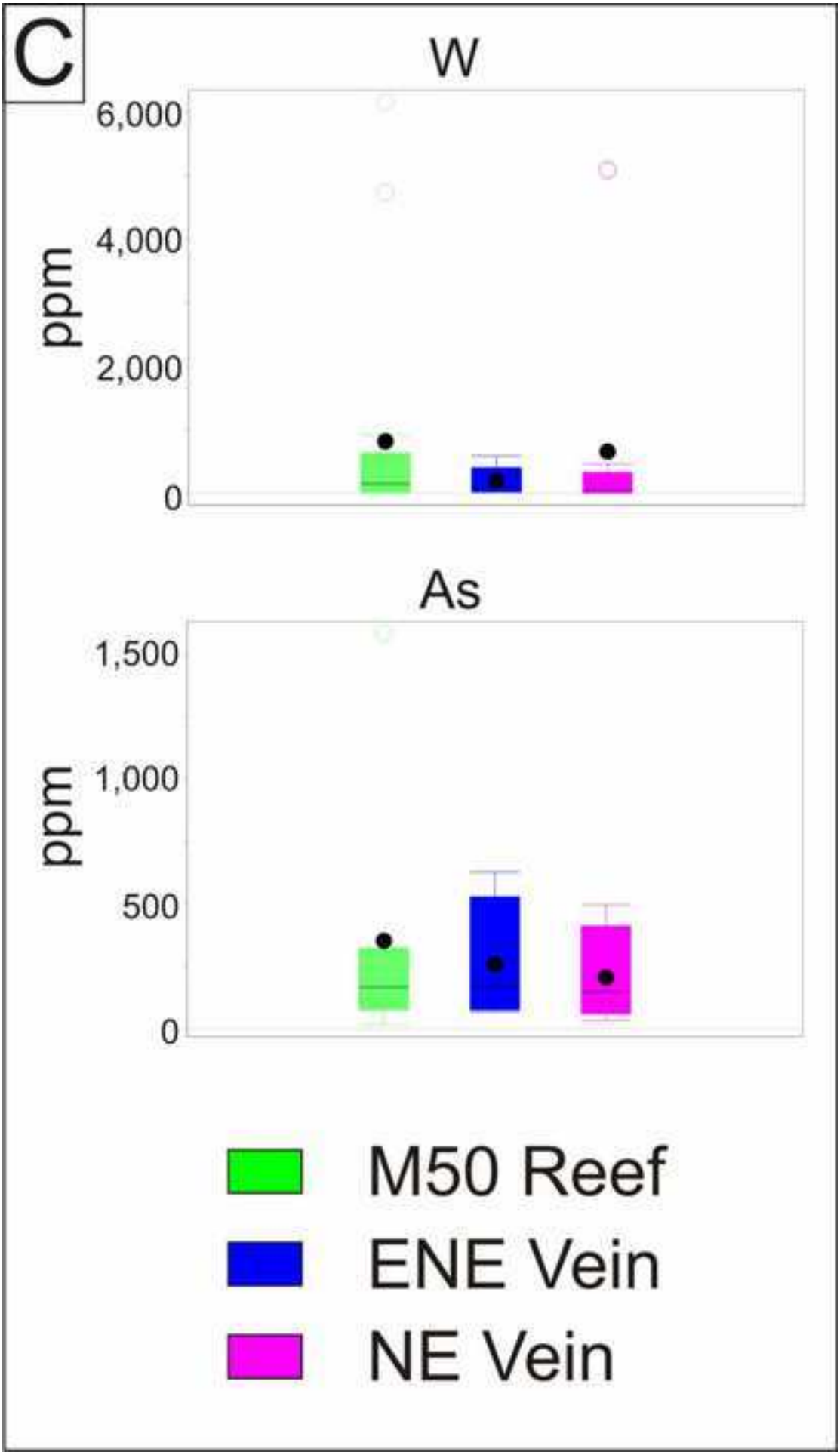

Figure

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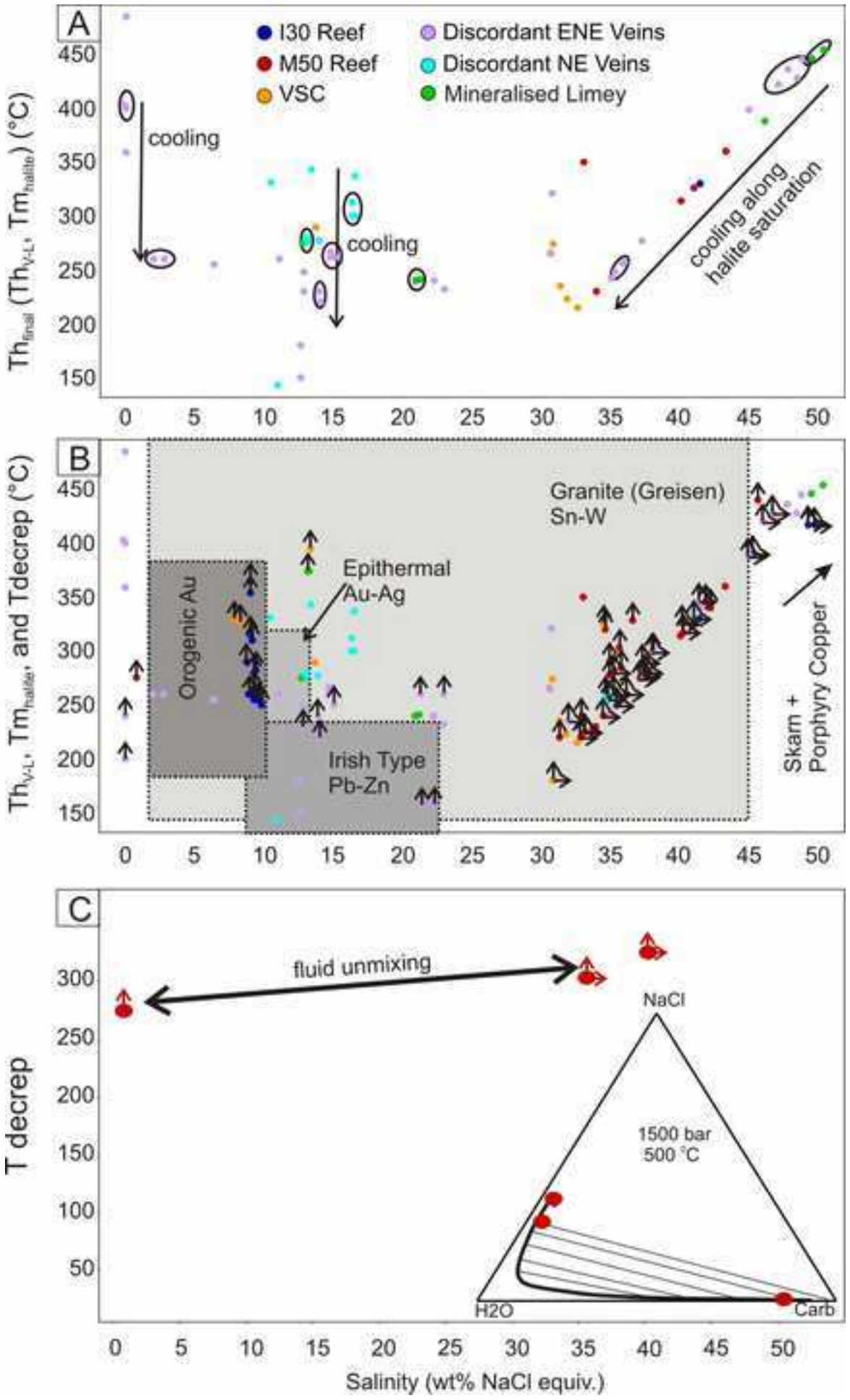

Figure

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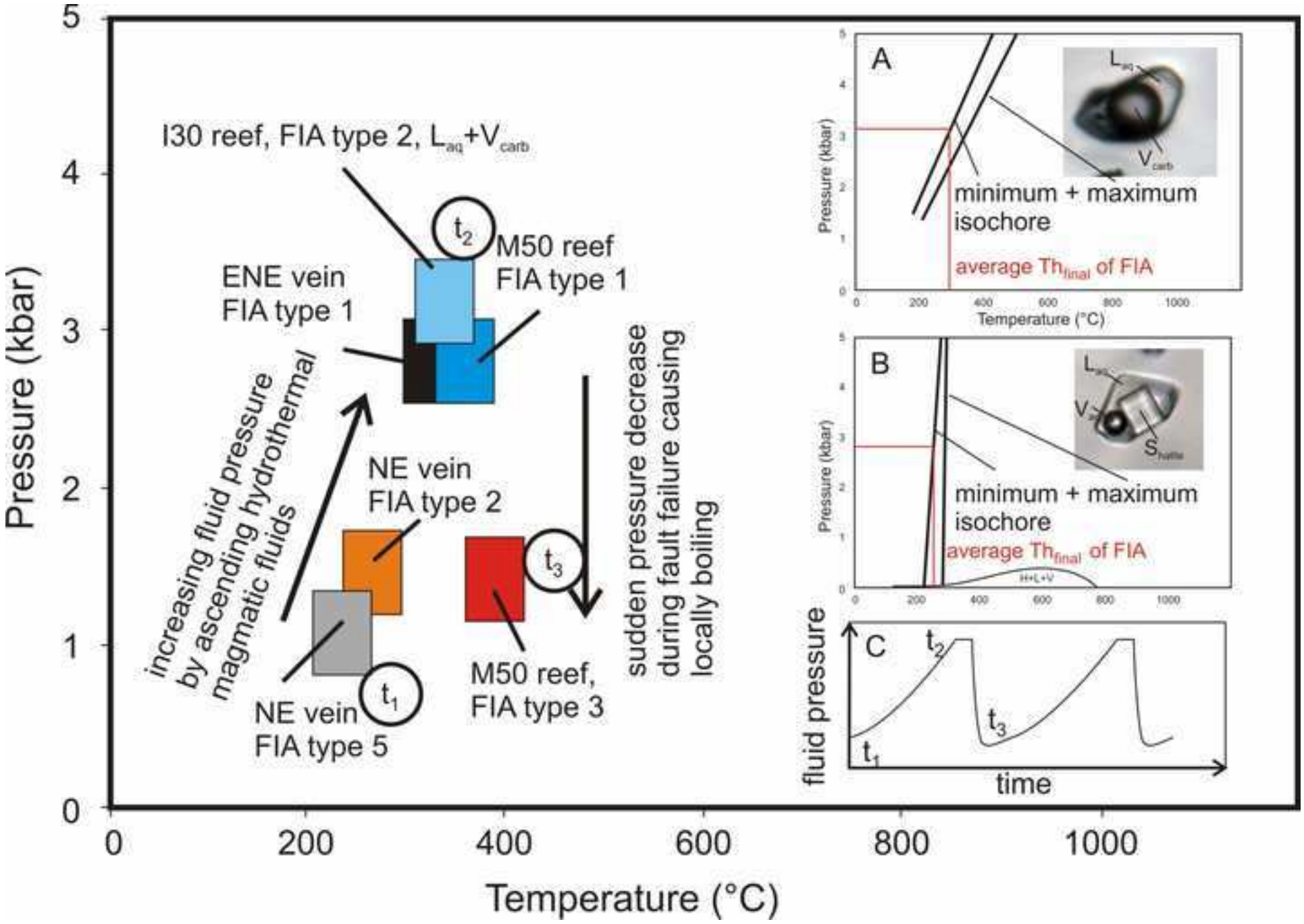

Table

Click here to download Table Tab 1_Sample descrip_revised.xlsx

Vein type	Sample ID		Level	Location Crosscut / hole ID	Chainage or depth [m]	Sample description	host mineral for fluid inclusions	FI types	FI shape	FI size	FIA types
Reef	min Limey	TE-UG-011	underground drill core	MUC14675	243	sample of contact of wallrock (meta-sandstone) with vein of grey dolomite-quartz-pyrite-chalcopyrite	Quartz from vein	$L_{aq}+V_{carb}$ $L_{aq}+V_{aq}+S_{halite}$	negative crystal	10 - 20 µm 10 - 30 µm	1 and 2
	I30	TE-UG-006	4550	254	20	white dolomite-quartz-pyrite-chalcopyrite	Quartz	$L_{aq}+V_{aq}+S_{halite}$	negative crystal	10 - 30 µm	1
							Carbonate	$L_{aq}+V_{aq}$ $L_{aq}+V_{aq}+S_{halite}$		5 - 10 µm 10 - 30 µm	1 and 4
		TE-UG-007	4525	301	33	same vein as sample above, but no dolomite in this sample (quartz-pyrite-chalcopyrite)	Quartz	$L_{aq}+V_{aq}+S_{halite}$	negative crystal	10 - 30 µm	1
	M50	TE-UG-008a	4940	south		quartz-dolomite-pyrite-chalcopyrite-bornite-chalcocite ± visible gold	Quartz	$L_{aq}+V_{aq}$ $L_{aq}+V_{aq}+S_{halite}$ $L_{aq}+V_{carb}$	negative crystal	5 - 10 µm 10 - 30 µm 10 - 20 µm	1,2, 3, and 4
		TE-UG-008b	4940	south		quartz-dolomite-pyrite-chalcopyrite-bornite-chalcocite	Carbonate	$L_{aq}+V_{aq}+S_{halite}$ $L_{aq}+V_{carb}$	crystal irregularly	10 - 30 µm 10 - 20 µm	1 and 2
							Quartz	$L_{aq}+V_{aq}$ $L_{aq}+V_{aq}+S_{halite}$ $L_{aq}+V_{carb}$	irregularly crystal irregularly	5 - 10 µm 10 - 30 µm 10 - 20 µm	1,2, 3, and 4
		TE-UG-009	4940	south		quartz-dolomite-pyrite-chalcopyrite vein in footwall of the M50 reef	Quartz	$L_{aq}+V_{aq}+S_{halite}$ $L_{aq}+V_{carb}$	crystal irregularly	10 - 30 µm 10 - 20 µm	1 and 2
							Carbonate	$L_{aq}+V_{aq}+S_{halite}$ $L_{aq}+V_{carb}$	crystal irregularly	10 - 30 µm 10 - 20 µm	1 and 2
NW Vein		TE-UG-010	underground drill core	MUC150112	89.7	grey dolomite-quartz-pyrite-chalcopyrite	Quartz	$L_{aq}+V_{carb}$ $L_{aq}+V_{aq}+S_{halite}$	negative crystal	10 - 20 µm 10 - 30 µm	1 and 2
ND Vein		TE-UG-001	4528	substation		pink dolomite-quartz-pyrite-chalcopyrite-scheelite	Scheelite	$L_{aq}+V_{carb}$	irregularly	10 - 20 µm	2
							Carbonate	$L_{aq}+V_{carb}$ $L_{aq}+V_{aq}+S_{halite}$	negative crystal	10 - 20 µm 10 - 30 µm	1 and 2
		TE-UG-002	4525	283	43	pink dolomite-quartz-pyrite	Quartz	$L_{aq}+V_{carb}$ $L_{aq}+V_{aq}+S_{halite}$ $L_{aq}+V_{carb}+S_{halite}$	negative crystal	10 - 20 µm 10 - 30 µm 10 - 30 µm	1, 2, and 5
		TE-UG-003	4550	346	75	pink dolomite-quartz-pyrite-chalcopyrite	Quartz	$L_{aq}+V_{carb}$ $L_{aq}+V_{aq}+S_{halite}$;	negative crystal	10 - 20 µm 10 - 30 µm	1 and 2
VSC		TE-UG-014	surface drill core	MRC13061	1075.9	hydrothermal breccia from stockwork corridor; clasts of metasedimentary rock (quartz sandstone); matrix of dolomite-quartz-chalcopyrite-pyrite	Quartz from the matrix of the breccia	$L_{aq}+V_{carb}$ $L_{aq}+V_{aq}+S_{halite}$ $L_{aq}+V_{carb}+S_{halite}$	irregularly irregularly irregularly	5 - 15 µm 5 - 15 µm 5 - 15 µm	1, 2, and 5

Table

Click here to download Table Tab 2_microthermo_results.xlsx

	FIA	FIA type 1	FIA type 2			FIA type 3		FIA type 4		FIA type 5
	FI type in FIA	$L_{aq}+V_{aq}+S_{halite}$ only	$L_{aq}+V_{carb}$ only			$L_{aq}+V_{aq}+S_{halite}$	$L_{aq}+V_{carb}$	$L_{aq}+V_{aq}$ only		$L_{aq}+V_{carb}+S_{halite}$ only
Reef	number of FIAs analysed	13	7		1	2		1	1	
	number of single Fis analysed	36	15		2	5	3	2	2	
	salinity [wt% NaCl equiv]	38 ± 10	9 ± 1		13 ± 0	38 ± 4	1 ± 0	13 ± 0	21 ± 0	
	min - max [wt% NaCl equiv]	31 - 50	9 - 10			36 - 42			-	
	Th(final) min - max [°C]	220 - 454	250 - 365		374	285 - 340	275 ± 0	273	240 - 241	
discordant NE vein	number of FIAs analysed	1		2					2	
	number of single Fis analysed	3		6					6	
	salinity [NaCl equiv wt%]	35 ± 0		16 ± 0					12 ± 2	
	min - max [wt% NaCl equiv]	-		16 - 17					10 - 14	
	Th(final) min - max [°C]	254 - 260		300 - 337					143 - 343	
discordant ENE vein	number of FIAs analysed	8	3	4	3					1
	number of single Fis analysed	20	9	14	7					3
	salinity [NaCl equiv wt%]	32-49	0	14 ± 2	22 ± 2					31 ± 1
	min - max [wt% NaCl equiv]	32 - 49	0	11 - 15	21 - 23					31 - 32
	Th(final) min - max [°C]	220 - 445	200 - 485	150 - 267	157 - 260					230 - 321
VSC	number of FIAs analysed	1	1		1					1
	number of single Fis analysed	3	3		2					4
	salinity [NaCl equiv wt%]	31 ± 2	8		14 ± 1					32 ± 4
	min - max [wt% NaCl equiv]	31 - 33			13 - 14					31 - 35
	Th(final) min - max [°C]	215 - 274	327 - 330							180 - 325

all errors are 2σ

Table

Click here to download Table Tab 3_median_Results_ICP_MS.xlsx

Vein type	host mineral	FI type	Salinity [wt % NaCl equiv]		Na	Mg	K	Ca	Mn	Fe	Cu	Zn	Sr	Ba	Pb	As	Ta	W	K/Na	Ca/Na	K+Ca/Na	K/Ca	Mn/Fe
Discordant ENE Vein	Scheelite	$L_{aq}+V_{carb}$	13	n =	9	7	7	-	9	8	4	7	-	9	7	n.a.	n.a.	n.a.					
				min	39742	75	5247	-	47	131	6	76	-	422	41	n.a.	n.a.	n.a.	0.13		0.13		
				max	50638	395	8797	-	466	771	68	166	-	926	119	n.a.	n.a.	n.a.	0.17		0.17		
				median	43318	113	6292	-	74	241	23	113	-	793	61	n.a.	n.a.	n.a.	0.15		0.15	> 1	0.31
	Quartz	$L_{aq}+V_{carb}$	15	n =	3	3	2	3	-	3	-	3	3	3	3	n.a.	n.a.	n.a.					
				min	45831	1437	3981	849	-	165	-	185	97	231	96	n.a.	n.a.	n.a.	0.09	0.02	0.11		
				max	51784	8472	7555	2509	-	1318	-	522	402	271	714	n.a.	n.a.	n.a.	0.15	0.05	0.19		
				median	48309	2428	5768	1454	-	236	-	331	377	269	176	n.a.	n.a.	n.a.	0.12	0.03	0.15	3.97	<0.24
I30 Reef	Quartz	$L_{aq}+V_{carb}$	10	n =	4	2	4	-	2	1	2	3	1	4	4	n.a.	n.a	n.a					
				min	19020	4057	1500	-	4156	8785	299	9	118	13	2	n.a.	n.a	n.a	0.08		0.08		
				max	35591	6379	4181	-	12011	8785	943	328	118	104	196	n.a.	n.a	n.a	0.12		0.12		
				median	28242	5218	2750	-	8084	8785	621	113	118	51	56	n.a.	n.a	n.a	0.10		0.10	> 1	0.92
Discordant NE Vein	Quartz	$L_{aq}+V_{aq}$	14 - 15	n=	22	21	22	15	16	18	16	17	20	17	19	2	3	5					
				min	22638	118	1767	519	40	294	39	132	46	106	9	33	10	20	0.08	0.02	0.10		
				max	54162	19135	13263	9166	1880	22345	2502	465	4698	1352	1200	155	12	466	0.24	0.17	0.41		
				median	35262	3260	6876	2557	194	3984	236	290	194	366	90	94	11	70	0.19	0.07	0.27	2.69	0.05
VSC	Quartz	$L_{aq}+V_{aq}$	10	n =	6	6	6	6	-	6	2	5	6	5	6	n.a.	n.a	n.a					
				min	30717	276	1219	115	-	257	27	95	38	287	13	n.a.	n.a	n.a	0.04	0.00	0.04		
				max	36891	2882	5585	1942	-	1211	315	328	151	443	74	n.a.	n.a	n.a	0.15	0.05	0.20		
				median	32327	536	4982	919	-	740	171	215	136	413	56	n.a.	n.a	n.a	0.15	0.03	0.18	5.42	<0.24
Discordant ENE Vein	Quartz	$L_{aq}+V_{aq}+S_{halite}$	41	n =	3	2	3	2	2	3	1	3	3	3	3	n.a.	n.a.	n.a.					
				min	113774	4173	15413	7458	145	1129	191	1037	731	1305	473	n.a.	n.a.	n.a.	0.14	0.07	0.20		
				max	124336	19462	20075	16138	481	6946	191	2062	782	3095	955	n.a.	n.a.	n.a.	0.16	0.13	0.29		
				median	124113	11818	17205	11798	313	4874	191	2029	750	2048	819	n.a.	n.a.	n.a.	0.14	0.10	0.23	1.46	0.06
	Quartz	$L_{aq}+V_{aq}+S_{halite}$	42	n=	10	9	10	10	8	4	10	10	10	10	10	4	-	7					
				min	38133	6855	2697	11604	718	16827	1377	232	306	231	188	67	-	20	0.07	0.30	0.38		
				max	105982	50543	36847	78216	6119	48711	10973	1938	1299	1991	1272	626	-	594	0.35	0.74	1.09		
				median	59655	22221	16420	35420	1558	35959	3199	728	573	591	567	167	-	100	0.28	0.59	0.87	0.46	0.04
Discordant NE Vein	Quartz	$L_{aq}+V_{aq}+S_{halite}$	35 - 38	n =	23	18	22	22	10	17	14	13	14	11	13	n.a.	n.a.	n.a.					
				min	53315	147	5262	1083	147	208	187	115	96	251	35	n.a.	n.a.	n.a.	0.10	0.02	0.12		
				max	144250	33855	95381	29683	4943	11353	5355	7534	2348	3064	6438	n.a.	n.a.	n.a.	0.66	0.21	0.87		
				median	82902	6646	26412	6387	909	3897	1221	1151	512	725	211	n.a.	n.a.	n.a.	0.32	0.08	0.40	4.14	0.23
VSC	Quartz	$L_{aq}+V_{aq}+S_{halite}$	30	n=	19	17	15	14	14	10	11	16	18	17	16	5	-	9					
				min	51600	182	3315	767	360	2779	95	63	60	109	38	108	-	10	0.06	0.01	0.08		
				max	115184	37576	43231	11071	9012	9019	2033	2541	1009	2058	1468	196	-	47	0.38	0.10	0.47		
				median	67069	14617	25321	5313	759	5802	249	552	417	827	337	119	-	29	0.38	0.08	0.46	4.77	0.13
I30 Reef	Quartz	$L_{aq}+V_{aq}+S_{halite}$	49	n=	10	9	10	10	10	9	8	10	10	8	10	-	-	1					
				min	81592	207	2048	1064	131	2387	54	104	42	91	30	-	-	25	0.03	0.01	0.04		
				max	179583	11586	53796	35875	4434	40539	9684	10999	1240	1584	1905	-	-	25	0.30	0.20	0.50		
				median	114847	1660	36468	13133	1106	11507	1346	5731	736	1096	1078	-	-	25	0.32	0.11	0.43	2.78	0.10
M50 reef	Quartz	$L_{aq}+V_{aq}+S_{halite}$	35 - 37	n=	27	22	22	21	23	22	20	25	26	26	25	3	1	9					
				min	34371	36	6458	4433	179	4373	54	22	25	95	18	89	3	23	0.19	0.13	0.32		
				max	132678	49769	84108	58607	9368	48629	1009	4314	3577	4918	2484	321	3	561	0.63	0.44	1.08		
				median	56448	2695	35804	18087	1290	19535	359	654	781	921	322	166	3	45	0.63	0.32	0.95	1.98	0.07
	Quartz	$L_{aq}+V_{aq}+S_{halite}$	35	n=	11	8	8	10	9	9	4	7	11	10	7	4	1	8					
				min	48851	2302	7332	6839	1372	6329	162	209	201	270	135	15	2666	2	0.15	0.14	0.29		
				max	96874	39210	25779	41208	4075	35877	2846	1216	2046	2460	500	1584	2666	6158	0.27	0.43	0.69		
				median	71508	16463	20305	18148	1573	24732	1275	464	426	654	239	144	2666	4734	0.28	0.25	0.54	1.12	0.06

- not detected
n.a. not analysed
LVS: three phase L + V + S inclusion
aq LV: two phase aqueous L + V inclusion
carb LV: two phase carbonic L + V inclusion

Table

Deposit	Size	Host rock of mineralization	Intrusion	Distance Intrusion - Mineralization	Age of mineralization	Fluids	Reference
Telfer, Western Australia	25 Moz	metasedimentary rocks of the Lamil Group	monzogranite	5 to > 20 km	650 - 590 Ma	mix of high salinity (≤ 50 wt% NaCl equiv) aqueous and aqueous-carbonic inclusions, low to moderate salinity (1 - 20 wt% NaCl equiv) aqueous and aqueous-carbonic inclusions with CO_2,CH_4 and rare N_2; T between 200 and 450 °C	this study
Mokrsko, Czech Republic	3.2 Moz	granodiorite	granodiorite	within intrusion at contact to greenschist facies volcano-sedimentary rocks	349 Ma	low salinity (< 10 wt% NaCl equiv.) aqueos carbonic fluid inclusions, T = 330 °C	Movrávek, 1995 Boiron et al., 1995
Jilau, Tajikistan	1.9 Moz	granodiorite	granodiorite, quartz monzonite, and tonalite	within intrusion	329 - 306 Ma	low salinity (≤ 6.3 wt% NaCl equiv.) aqueous-carbonic (CO_2-CH_4) fluid inclusions, T = 200 - 410 °C; postdated by low salinity (~ 7 wt % NaCl equiv.), lower T (~ 150 °C) inclusions	Cole et al., 2000
Timbarra, New South Wales, Australia	0.4 Moz	leuco-monzogranite	leuco-monzogranite	within intrusion	242 - 238 Ma	CO2 rich inclusions and low salinity (5 - 7 wt% NaCl equiv.) aqueous inclusions	Mustard, 2001
Fort Knox, Fairbanks district, Alaska	> 7 Moz	porphyritic granite	porphyritic granite	within intrusion	92 Ma	low salinity (2 - 8 wt% NaCl equiv.) aqueous-carbonic inclusions; T = 200 - 500 °C	McCoy et al., 1997
Kori Kollo, Bolivia	~ 5 Moz	dacite porphyry	dacite porphyry	within intrusion	16 Ma	average salinity ~ 18 wt% NaCl equiv., T around 320 °C, no CO_2 reported	Long et al., 1992
Pogo, Alaska	~ 5 Moz	metamorphic rocks of the Yukon-Tanana terrane	granite dikes, quartz diorite, and quartz monzonite	~ 1.5 km	107 - 92 Ma	low salinity (< 10 wt % NaCl equiv.) aqueous carbonic (CO_2 - CH_4) fluid inclusions, T = 300 - 470 °C	Selby et al., 2002; Smith et al., 1999